Microstructural and Chemical Analysis of Polyurethane and Polyisocyanurate Foam Insulations

by

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Abstract

For some closed cell foam insulation products, the thermal conductivity increases at low temperatures, contrary to single thermal resistance values provided by manufacturers. This phenomenon has been demonstrated in various polyurethane and polyisocyanurate insulations. The reduction in thermal performance has been attributed to the diffusion of air and blowing agent through the foam and to the condensation of blowing agent. Aging processes such as freeze-thaw cycling, moisture accumulation, and polymer degradation further increase thermal conductivity. The initial cell structure plays a role in dictating the thermal performance. To further understand the loss of thermal performance in closed cell foams, microstructure and chemical characterization was performed in this study. The aging behavior of foam insulations was analyzed by imaging foams with SEM and by measuring foam. Changes in the polymer physical attributes were identified and compared to increases in thermal conductivity. This project also used gas chromatography and quantified changes in pentane concentration in polyisocyanurate foams that have undergone aging.

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1 Introduction

A critical element in high performance enclosures is the thermal insulating layer. The thermal insulating layer aims to resist the flux of heat through the assembly. The ability for a material to transfer heat is expressed by its thermal conductivity. Thermal conductivity is linearly proportional to temperature.

However, with closed cell foam insulation products, this is not the case as at low temperatures. Foam insulation products typically exhibit a non-linear relationship to temperature. The thermal conductivity increases as temperatures decreases. This phenomenon has been demonstrated in various foam insulations (polyurethane, polyisocyanurate) which contained a variety of blowing agents (CFC, HCFC, pentane) (Hilado, 1977; Ostrogorsky et al., 1986).

The reduction in thermal performance, due to increased thermal conductivity, has been attributed to the diffusion of air into the polymer, effusion of blowing agent out of the polymer (Levy, 1966), moisture accumulation (Hilado, 1977) and polymer degradation (Ostrogorsky et al., 1986). Moreover, the listed effects that degrade foam insulation product thermal performance increase as the material undergoes aging.

The morphology of the polymer of foams play a pivotal role in dictating the thermal performance. Insight into the aging behavior of foam insulations can be evaluated based off of foam geometry, polymer permeability, cell wall thickness, elongation, percentage of open cells and, density (Hilado and Harding, 1963; Ostrogorsky et al., 1986). During the aging process, changes in the polymer's physical attributes could occur and cause the loss in thermal performance.

This research aims to characterize foam microstructure, to quantify blowing agent in the foam and to relate findings to thermal conductivity values to answer the following research questions:

1. What are the microstructure changes that polyurethane and polyisocyanurate insulations undergo with oven aging and freeze thaw cycling?
2. Is there a detectable change in pentane blowing agent concentration in polyisocyanurate foams that have undergone accelerated oven aging?

2 Literature Review

2.1 Foam Insulation Products

Many types of foam-based insulation products exist. The main polymer types used in foam insulations are polystyrene and polyurethane. Polystyrene insulation products include extruded polystyrene (XPS), expanded polystyrene (EPS), and insulated concrete forms (ICF) (American Chemistry Council, 2011) . Polyurethane insulation products include both spray polyurethane foam (often shortened to SPF, or spray foam) and rigid polyisocyanurate boards. Polystyrene and polyurethane polymers differ in their structural properties and performance. Polystyrenes are linear polymers with repeating units of styrene (Callister, 2007). Polyurethane is an umbrella term used to generalize a wide variety of polymers, hence why spray polyurethane and rigid polyisocyanurate could be categorized together. Polyurethanes must contain urethane functional groups but often consist of a backbone with aromatic hydrocarbons, esters, ethers, urea and (most relevant to polyurethane insulations) isocyanurate groups (Szycher, 2013). Polyurethanes are highly cross-linked polymers, unlike polystyrenes, resulting in different properties. When heated, the two polymers behave differently in relation to their chemical structure: polystyrenes are thermoplastics meaning that they can be molten and formed reversibly with minimal impact to physical properties; polyurethanes are thermosets meaning when they are prepared, the polymer cross-linkages are irreversible, thus they do not melt (Szycher, 2013).

Within the category of spray polyurethane foam, open cell and closed cell types exist. Open cell foams are where the cells of the foam are not interconnected or fully encapsulated by a polymeric cell wall. Closed cell foams consist of fully encapsulated cells surrounded by polymeric cell walls and are not interconnected with surrounding cells (Taylor, 2017). The difference in appearance between the two cell types is illustrated in Figure 1.

Figure 1 Difference between the cellular structure of open and closed cell foams (Taylor, 2017)

Spray foam polyurethane is typically prepared on site using highly pressurized spray guns. Two components, often titled A and B are combined and exothermic reactions between the components produce heat that causes the polymer to expand and form the foam and/or cellular structure. The A component consists of methylene diphenyl diisocyanate (MDI) and the B components consists of a blend of polyols, blowing agent, fire retardant, surfactant, resin, water and catalysts. The composition of A and B components differ among the types of spray foam and the manufacturer (Spray Foam Coalition and American Chemistry Council, 2012). The cellular structure achieved and properties such as thermal conductivity, open cell content or density, depend on the component A and B compositions and process conditions (Członka et al., 2018).

Rigid polyisocyanurate boards are faced with either fiberglass-reinforced felt, aluminum foil or cardboard. Unlike polyurethane spray foam, rigid polyisocyanurate boards are typically manufactured in a facility. As it was discussed earlier, polyisocyanurate is chemically categorized with spray polyurethane foam under the polyurethane polymer category. The A and B components are similar however, the ratio of the MDI in component A is higher than the polyol in component B. This higher proportion of MDI results in the isocyanate groups reacting with themselves to form a highly crosslinked polyisocyanurate polymer. The more cross linkages in the polymer structure results in more superior fire resistance and increased mechanical strength.

Rigid polyisocyanurate boards are prepared through a dynamic molding process. A mixture of the foam components is mixed in a temperature-controlled tank that slowly deposits the liquid on the lower facer that is on a moving, heated surface. The heated surface activates the expansion of the foam on which the top facer is placed (Clinton, 2001).

2.1.1 Foam Insulation Blowing Agents

Open cell foams are blown with water and carbon dioxide. Carbon dioxide gas is formed as a byproduct of the reaction between A and B components. The formation of gas results in the formation of the cellular structure. The carbon dioxide leaves the foam over time after its blown (Svanstrom and Ramnas, 1995).

For closed cell foams, blowing agent selection is more critical compared to open cell foams. The blowing agents is what causes a closed cell foam to have a low average thermal conductivity (between 0.0085-0.012 W/mK at 25°C) compared to air (0.026 W/mK at 25°C) (Perkins et al., 2001). While foams are blown, the blowing agent must react with the liquid components through

an exothermic reaction to form gas. Similarly, to open cell foams, the formation of gas produces the cellular structure. Then, the blowing agent remains in the closed cell foam.

The earliest closed cell polyurethane foams used halogenated refrigerants such as CFC. The industry has since transitioned to HCFCs, HFCs and HFOs. The impact of refrigerants on global warming had driven the transitions to newer, less harmful, blowing agents for closed cell foams. The ideal properties of halogenated blowing agents are: high molecular weight, low thermal conductivity, small effective diffusion coefficients and high vapor pressure at conditions experienced by an insulating material (Murphy, 2010; Zarr and Nguyen, 1994).

Rigid polyisocyanurate boards typically use halocarbon blowing agents like n-pentane or cyclopentane. Pentane based blowing agents are effective insulators but unlike halogenated refrigerants, has a much lower molecular weight (Murphy, 2014).

2.2 Physics - Heat Transfer Modes in Foam Insulation

To understand the thermal performance of foam insulations, it is important to review the underlying physical principles that govern heat transfer. The thermal performance of a foam is dependent on how heat is transferred through it and is described by its thermal conductivity. Thermal conductivity is defined as “the rate of heat transfer through a unit thickness of a material per unit area per unit temperature difference” (Cengel and Ghajar, 2015). Thermal conductivity is used to calculate heat flux between two points of a material via conduction is described by the Fourier Law:

$$q = -\lambda \cdot \frac{\Delta T}{\Delta x} \quad (1)$$

Where:

$$\lambda = \text{thermal conductivity} \left[\frac{W}{mK} \right]$$

$$\Delta T = \text{difference between applied boundary condition temperatures [K]}$$

$$\Delta x = \text{material thickness [m]}$$

However, the thermal conductivity of the foam cellular structure is not homogenous due to the solid and gas components that form a cellular network, therefore heat flux in steady state conditions can be described in vector form:

$$\vec{q} = -\lambda \vec{\nabla T} \quad (2)$$

$$\vec{q} = -\lambda \frac{\partial T}{\partial x} \hat{i} - \lambda \frac{\partial T}{\partial y} \hat{j} - \lambda \frac{\partial T}{\partial z} \hat{k} \quad (3)$$

Equation 2 does not consider the temperature-dependent thermal conductivity of foam insulations. The heat flux equation can be rewritten in the following form to consider the change in thermal conductivity across a thermal gradient.

$$qL = -\lambda(T) \frac{dT}{dx} \quad (4)$$

$$qL = - \int_{T_c}^{T_h} \lambda(T) dT \quad (5)$$

Where:

L is the length of the material [m]

T_h is the temperature at the boundary x = 0 [K]

T_c is the temperature at the boundary x = L [K]

As a foam is heterogenous and as thermal conductivity is dependent on temperature, the definition of thermal conductivity should be examined further. For gasses, thermal conductivity is described by the following formula:

$$\lambda = \frac{n \bar{v} L_{MFP} C_m}{3N_A} \left[\frac{W}{mK} \right] \quad (6)$$

Where:

n = particles per unit volume [per m³]

$\bar{v}$ = mean particle speed [m/s]

L_{MFP} = mean free path [m]

C_m = molar heat capacity [$\frac{J}{mol K}$]

N_A = Avogadro's number i.e. $6.022140857 \times 10^{23} mol^{-1}$

The basis of the above formula for thermal conductivity stems from the kinetic theory of gasses (equation 6). The kinetic theory of gasses describes the ideal behavior of a gas as particles within a closed container at a macroscale:

$$\lambda_{gas} = \frac{1}{3} C_m \bar{v} L_{MFP} \quad (7)$$

The closed container represents the boundaries of a gas particle's movements. Under this theory, gas particles are constantly moving in random directions. Particles collide with each other or the boundaries of the container which results in a change in direction. The mean free path is the average distance between collisions with the boundary or other particles (Knight, 2013). On a microscale, the effective mean free path is a combination of particle and boundary collisions and can be described by the following equation (Van De Walle and Janssen, 2018):

$$L_{MFP\ effective} = \left(\frac{1}{L_{MFP\ particle}} + \frac{1}{L_{MFP\ boundary}} \right)^{-1} \quad (8)$$

Where:

$L_{MFP\ particle}$ is the mean free path between particles colliding other particles

$L_{MFP\ boundary}$ is the mean free path between particles colliding with the cell boundary

The mean free path is dictated by the nature of the boundaries in a system and other co-existing particles. For foams, the mean free path is dictated by the cellular structure. The foam's structure consists of: (1) the cell void (2) solid polymer matrix. Multiple cells are connected by three members called the struts.

For a closed-cell foam, the cell is a polyhedron that consists of four to six sides (Chen, Das, and Battley, 2015). Typically, the geometry of a cell is assumed to be a pentagonal dodecahedra (Schwartz and Bomberg, 1991) (Figure 3). The cell size of foams are typically below 4mm (Van De Walle and Janssen, 2016).

The geometry of an open cell is described as irregular polyhedral where there are 9 to 17 faces of different sizes. Faces are the irregular polyhedron shape is connected by ligaments, or cell walls, that meet at struts (Jang, Kraynik, and Kyriakides, 2008). Cell faces are not opaque walls unlike closed cells.

To visualize the shape of closed and open cells, computer tomography (CT) or computer simulated images are provided in Figure 2 and Figure 3:

Figure 2 Closed cell 3D images simulated using Laguerre models (Chen et al., 2015)

Figure 3 Open Cell 3D CT image (Jang et al., 2008)

Related to cell geometry, the mean free path is dependent on the diameter or cross section area of the cell. The distance between cell walls is proportional to the distance between particle collisions with the boundaries. Cell size dictates the frequency of cell gas collisions as a small cell size would minimize the distance between particles, thus decreasing the mean free path.

The mean particle speed and mean free path is also dependent on the multiple components in the cell existing in multiple phases. The phase of a components governs the thermal conductivity. In liquids, heat is conducted and gasses through molecular collisions and diffusion. In solids, heat is conducted through lattice vibrations and through the flow of free elections (Cengel and Ghajar, 2015).

Predominantly, foams consist of the solid phase polymer network and gas phase blowing agent (or air) in the cells. However, as repetitively discussed in literature, moisture and condensed blowing agent gas would be the components in the foam that are in the liquid phase. Therefore, thermal conductivity is dependent on these components of the foam.

The dominant heat transfer modes in foams is conduction through the solid polymer matrix and gas contained in the cells (Levy, 1966). Figure 4 summaries the heat transfer mechanisms occurring in foams.

Figure 4 Heat transfer mechanisms: a. polymer conduction b. gaseous conduction c. natural convection. d. thermal radiation (from Van De Walle, Claes, and Janssen, 2018)

Heat transfer occurs through the solid cell wall predominantly through conduction. At minimum, 50% of conductive heat transfer is through the foam cell. The cell sizes of a foam are too small for convection to occur so, convection within the cells is negligible (Schuetz and Glicksman, 1984). Further, for closed cell foams, the cell walls are too thin and opaque for radiation to occur. On the macroscale of a foam material, the number of cell walls through which radiation would pass is so large that it minimizes radiative heat transfer. Levy describes this using the equation for radiation between two large bodies where are multiple superimposed walls (Levy, 1966):

$$q = \sigma(T_h^4 - T_c^4)A \quad (9)$$

Where:

σ is the Stefan – Boltzmann constant $1.38064852 \times 10^{-23} \text{ m}^2 \text{ kg s}^{-2} \text{ K}^{-1}$

A is the area [m^2]

The cell walls are additional surfaces through which radiative heat would transfer. To represent one cell wall, a third intermediate temperature can be introduced, and the radiation equation becomes:

$$q = \sigma(T_h^4 - T_i^4)A = \sigma(T_i^4 - T_c^4)A \quad (10)$$

$$T_h > T_i > T_c$$

Within a material there are numerous cell walls, thus, intermediate temperatures. Each additional cell wall would result in the impedance of radiative heat transfer. To describe radiation through numerous cell walls, the following form of equation 11 is the following:

$$q = \frac{4\sigma T^3 \Delta T}{N} \quad (11)$$

Where:

N is the number of cell walls

In a real foam sample, the number of cell walls is so large, the N term in equation 11 approaches infinity. Thus, the radiation component of heat transfer is minimized in closed-cell foams (Levy, 1966). However, it should be noted as open-cell foams do not consist of full enclosed cells, radiative heat transfer is more significant than with close-cell foams.

As mentioned, struts describe the solid polymer structure that connects multiple cells (Schwartz and Bomberg, 1991). Struts are made of the foam polymer and are denser than cell walls and

are approximately triangular with concave sides. The dominant heat transfer mode through struts is conduction, like in the cell wall. In the struts, radiation is blocked by absorption and by anisotropic scattering thus, it is not a significant heat transfer mode (Schuetz and Glicksman, 1984).

2.3 The Aging Process of Closed Cell Foam Insulations

As closed cell foams age over time, an increase in thermal conductivity occurs. This has been well demonstrated since the sixties by numerous authors for polyurethane and polyisocyanurate foams with a variety of blowing agents (Bhattacharjee and Booth, 1995; Bomberg and Kumaran, 1991; Christian, Desjarlais, and Graves, 1998; Cuddihy and Moacanin, 1967; Norton, 1967; Ostrogorsky et al., 1986).

The extent of increase in thermal conductivity depends on the product, blowing agent, temperature and thickness. At the primary stage of aging, the first to occur is the diffusion of air into the foam cellular structure which in turn, increases the cell gas pressure. Depending on the foam, the time range is approximately 5 years. The thermal conductivity of foam increases due to the dilution of the blowing agent gas by air (Bhattacharjee and Booth, 1995).

At secondary stages of aging, the blowing agent becomes absorbed by the solid polymer cell wall. Some blowing agents have been found to diffuse out of the foam at a significantly slower rate than the rate air diffuses in. Time estimates for the diffusion of blowing agent gas are between 10 to 100 years (Bhattacharjee and Booth, 1995).

The composition of gasses within a foam cell affects thermal conductivity (Svanstrom and Ramnas, 1995). Therefore, the mechanisms of diffusion (of air and the blowing agent) and the mechanism of solvation (of the blowing agent into the solid polymer) the processes that affect foam thermal conductivity when foams age (Christian et al., 1998).

2.3.1 Diffusion and Effusion of Air and the Blowing Agent

Diffusion is the result of movement of a substance from high concentration to low concentration. Diffusion is described by Fick's second Law (Norton, 1967):

$$\frac{dc}{dt} = D \frac{d^2c}{dx^2} \quad (12)$$

Where:

c is the gas concentration [amount of substance per unit of length⁻³]

t is time [s]

D is the diffusion constant or coefficient [$\text{length}^2\text{time}^{-1}$]

x is the position [length]

The magnitude of the diffusion coefficient, D , dictates the speed at which a species would diffuse within a certain media. For gasses, the diffusion constant D is primarily influenced by molecular collisions. The Chapman-Enskog theory is used to predict the diffusion constant of gasses within 8% accuracy according to the following expression (Cussler, 1997):

$$D = \frac{A \cdot T^{\frac{3}{2}} \sqrt{\frac{1}{M_1} + \frac{1}{M_2}}}{p \sigma_{12}^2 \Omega} \quad (13)$$

Where:

$$A \text{ is an empirical coefficient} = \frac{1.858 \times 10^{-3} \text{ atm} \cdot A'^2 \cdot \text{cm}^2 \cdot \frac{\sqrt{g}}{\text{mol}}}{K^{\frac{3}{2}}}$$

1 and 2 represent each molecular identity in a binary mixture

T is the absolute temperature [K]

M is the molar mass [$\frac{g}{\text{mol}}$]

p is the pressure [atm]

$\sigma_{12} = \frac{1}{2}(\sigma_1 + \sigma_2)$ is the average collision diameter of gas molecules

Ω is a dimensionless collision integral dependent on temperature

Therefore, this equation shows that diffusion is dependent on temperature, molar mass, and pressure.

For liquids, the diffusion equation is described by the Stokes-Einstein relation:

$$\frac{D_{T1}}{D_{T2}} = \frac{T_1 \mu_{T2}}{T_2 \mu_{T1}} \quad (14)$$

Where:

T_1 and T_2 are absolute temperatures [K]

μ is the dynamic viscosity of the liquids = $\frac{\mu_{viscosity}}{\rho}$ in units of $\left[\frac{length^2}{time} \right]$

Consequently, gasses that are smaller and of lower molecular weight, such as the components of air diffuse into the foam at a faster rate than heavier blowing agents which diffuse out of the foam at a slower rate (Norton, 1967; Bhattacharjee and Booth, 1995).

The above equation (14) assumes an ideal scenario of two gasses in an idealized container with no other components. However, the microstructure of foam, being of multiple cells filled with gas, it is important to consider the mechanism of diffusion for a gas through a solid polymer.

The effective diffusion coefficient describes the rate at which a gas diffuses through a porous media (Ichikawa and Selvadurai, 2012).

$$D_e = \frac{\epsilon_t \delta}{\tau} D \quad (15)$$

Where:

D is the diffusion coefficient in a pure liquid or gas state

ϵ_t is the porosity

δ is the constrictivity

τ is the tortuosity

Constrictivity is a function of the diffusing particle to pore size and is always less than 1. This term describes the relationship between gasses within a foam (air or the blowing agent) and the size of cells, or pores. Its experimental derivation is beyond the scope of this work.

The tortuosity term in equation 15 Describes the extent of curves in a path by the following formula. For foams, this term describes the arrangement of foam cells relative to each other. Tortuosity is always greater than 1 (Ichikawa and Selvadurai, 2012):

$$\tau = \left(\frac{l_e}{l} \right)^2 > 1 \quad (16)$$

Where:

l is the minimum diffusion length

l_e is the minimum effective path length

Within foam insulations, the following atmospheric gases along with older generation blowing agents are present, and their diffusion coefficients are tabulated (Table 1). This table is to serve as a relative comparison of diffusion coefficients between the numerous gasses that exist within a foam. As different products were used in these studies, likely the cellular characteristics that govern constrictivity and tortuosity vary.

Table 1 Effective diffusion coefficients of gasses common in foam insulations at 23°C

Compound	Foam Type	Effective Diffusion Coefficient ($\times 10^{-8} \text{cm}^2/\text{s}$)	Source
Nitrogen	Polyurethane	2.27	(Bhattacharjee et al., 1995)
	Polyisocyanurate	3.67	
	Polyurethane	7.3	
Oxygen	Polyurethane	46.8	(Ostrogorsky et al., 1986)
CFC-11	Polyurethane	4.44	(Bhattacharjee et al., 1995)
	Polyisocyanurate	4.64	(Ostrogorsky et al., 1986)
HCFC-22	Polyurethane	0.655-4.53*	(Ostrogorsky et al., 1986)
Carbon dioxide	Polyurethane (high density)	201	(Ostrogorsky et al., 1986)
	Polyurethane (low density)	317	(Ostrogorsky et al., 1986)

*range of diffusion coefficients for various foam types

As mentioned earlier, components of air diffuse in faster and blowing agents diffuse out slower. Table 1 shows that oxygen was measured to have an effective diffusion coefficient of 46.8 while nitrogen was measured to have an effective diffusion coefficient of 7.3.

2.3.2 Blowing Agent Condensation

In addition to the diffusion of air and the blowing agent, condensation affects the thermal conductivity of cell foams. For closed cell foams specifically, at low temperatures it is known that the blowing agent condenses which results in an increase of thermal conductivity. This is primarily an occurrence based on temperature and not material age. This has been studied in spray polyurethane foams blown with CFC-11 and HCFC-123 (Kumaran et al. 1989).

Condensation of moisture occurs in open cell foams but is not studied in this report.

To explore this further, the conditions inside the cell need to be considered. As mentioned in Section 2.1, spray foams are prepared under high heat and pressure conditions. The properties

of a blowing agent for foam purposes typically possess a high vapor pressure which is what drives cell formation. The high vapor pressure of the blowing agent increases the pressure inside the cell leading to expansion. A high pressure environment in the cell is also what contributes to the overall dimensional stability of the material (Marrucho et al. 2002). As a result of the higher pressure in the cell, a blowing agent does not condense at its reported boiling point temperature. A boiling point temperature is reported at standard conditions for temperature and pressure which are 273.15K and 1 atm.

The condensation behavior described by Kumaran et al. is illustrated in Figure 5. The first region is where the thermal conductivity decreases with temperature, which is consistent with kinetic gas theory. At lower temperatures, the gas molecules move more slowly, thus conduct less heat. The second region is where the gaseous blowing agent begins to change into liquid phase. Point B_c represents the boiling point or condensation point. The thermal conductivity increases as liquids conduct heat more than gases. The intermolecular distances are significantly shorter within a liquid than a gas leading to more collisions thus more transfer of heat through conduction. The third region shows that the thermal conductivity begins to decrease again as expected from kinetic gas theory. Point C_c represents the temperature at which all the blowing agent has condensed. This leaves air as the dominant gas in the cell which has a higher thermal conductivity (Kumaran et al., 1989).

Figure 5 The effect of blowing agent condensation on thermal conductivity (Kumaran et al., 1989)

Thus, independent of the foams age, the thermal conductivity of foams with blowing agents are highly temperature dependent. This temperature dependence is governed by the relationship between the temperature- saturation vapor pressure of the blowing agent. This relationship can be described by the Clausius-Clapeyron equation:

$$\ln\left(\frac{p}{p_0}\right) = \frac{H(T_b - T)}{RT_b T} \quad (17)$$

Where:

H is the molar enthalphy of vaporization [units]

R is the gas constant [units]

p is the blowing agent vapor pressure at a temperature, T

T_b is the boiling point of the blowing agent at standard atmospheric pressure [1 atm], p₀

The Clausius-Clapeyron equation shows the importance of cell gas pressure to the partial pressure of the blowing agent itself. As the thermal conductivity behaves in a curve function in Figure 5, the partial pressure of the blowing agent is also changing. In the gas mixture region, the partial pressure of blowing agent increases with temperature. In the condensation region, the partial pressure of blowing agent decreases with temperature.

2.3.3 Blowing Agent Solubility

The previous section discussed the condensation of blowing agents. Once condensed or in gaseous state, some blowing agents can be absorbed into the solid polymer cell wall or strut. Over time, when blowing agents are absorbed into the solid polymer, the thermal conductivity increases as the dominant gas in the cell becomes air.

Fick's law of diffusion was shown in Section 2.3.1, equation 18. The effective diffusion coefficient of a species is related to its permeation rate by the following relation:

$$D_{eff} = \frac{P}{S} \quad (18)$$

Where:

P is the permeation rate $[\frac{mol}{m \cdot s \cdot Pa}]$

S is the solubility of the blowing agent $[\frac{mol}{m^3 \cdot Pa}]$

The permeation rate describes the mass transfer of a gas through a solid (Ichikawa and Selvadurai, 2012). Every cell wall within a foam is a resistor to gas permeation thus the number of cell walls influences the permeation of gas through a material (Ostrogorsky et al., 1986).

Solubility describes the simultaneous dissolution and precipitation in dynamic equilibrium (cite). When dissolution and precipitation occur at constant rates, the solution has reached a solubility equilibrium. The greater the solubility of a blowing agent into the polymer, the smaller extent of diffusion occurs through the foam as dissolved blowing agent will not diffuse further.

To understand the effective diffusion of gasses in aged polyurethane foams, experimental studies and analytical models were done by Ostrogorsky *et al.* (1986). This study defined aging as the degradation of thermal conductivity due to diffusion of air into the foam. Models using microstructure measurements used to determine cell wall permeability and cell geometry. The permeability of the cell wall was studied in detail in order to account for its role in diffusion. A finding of importance was that denser foams studied resulted in a lower modelled permeability compared to a less dense foam. A foam with the lowest density, thinnest cell walls, largest cell size had the high permeability (Ostrogorsky et al., 1986). This finding highlights the relationship between polymer density to the permeation of gasses through the foam's cell wall.

2.4 Relevant Long-Term Testing Standards

As it has been known for many years that foam insulations experience a loss of thermal resistance over time, numerous testing standards were developed to predict this. Typically, this involves testing the foam right after manufacture, then testing the thermal resistance at time increments. Accelerating aging techniques are often used to simulate the condition of the foam after extended periods (International Organization for Standardization, 1999).

One method of aging is by elevated temperature over long periods of time. This is the quickest way to simulate aging however, it may introduce changes to the material that would not be observed in typical conditions of material use. Alternatively, it is recommended to conduct conditioning over either longer periods of time or at thinner material thicknesses.

The thinning specimen method is described in ISO11561 (Ageing of thermal insulation materials – determination of the long-term change in thermal resistance of closed-cell plastics (accelerated laboratory test methods). With this method, a 25-year lifetime of a material can be simulated in 365 days using a 10mm thick sample. From this standard two methods are presented with similar approaches. Their error has been demonstrated to be within 10%

supported by three to five year aging studies (International Organization for Standardization, 1999).

Another standard that aims to test long term thermal resistance is ASTM C1303 Standard Test Method for Predicting Long-Term Thermal Resistance of Closed-Cell Foam Insulation (ASTM, 2000). Similarly, to the ISO11561 standard, the tested foam is sliced into 10mm slices to increase the aging rate and thermal resistance is tested periodically. What between the two standards is that ISO11561 provides a method to calculate the long term thermal resistance while ASTM C1303 is used to estimate the R-value over certain intervals such as 5 or 10 years (ASTM, 2000; Foam Control, 2008).

The CAN/ULC S770-00 - Determination of Long-Term Thermal Resistance standard also provides a means of comparing estimated R values between closed cell foam materials (Underwriters Laboratories of Canada, 2000). Although similar to the other standards mentioned, the test described can be performed in a shorter amount of time. However, the method does not determine a LTTR value, rather an estimate of the R value after 5 years in storage. For that reason, it is used more to compare products than to inform long term aging effect to R value.

2.5 Scanning Electron Microscopy (SEM)

As discussed in Section 2.2, the understanding of foam cellular microstructure is important to the thermal performance of foam insulation products. The determination of cell geometry and cell parameters have been used to study heat transfer and gas permeability through analytical models. An understanding and analysis of foam cellular microstructure is also critical in the study of mechanical properties of foam materials (Chen et al., 2015; Li, Gao, and Subhash, 2006). Although, this research project focuses solely on thermal properties, the methodologies used in the study of mechanical properties were informative.

Imaging of foam cellular structure has been performed using both optical light microscopy and scanning electron microscopy (SEM). Optical light microscopy uses photons from visible light (200nm-700nm wavelength) and a set of lenses to illuminate and magnify an image. SEM uses an electron source in a low vacuum environment to generate an image. An electron source provides a beam of electrons that scans across the surface of the sample. Once an electron hits the sample surface, secondary electrons are reflected and detected. The electron beam continues to scan a sample surface while the detector generates an image spot by spot. The combination of signals from each point of the sample generates the images (Watt, 1997).

SEM is different than other forms of microscopy because electron beams are focused at a spot, while light microscopy images a whole specimen and uses lenses to increase magnification. For the purposes of imaging the surface of a specimen. The limit of physical resolution is approximately 1nm. The limitations of SEM are more to do with how expensive the equipment is and the challenges in sample preparation. The preparation of samples can result in the introduction of artifacts or undesired observations.

The earliest analysis of foam cellular microstructure using microscopic techniques was performed in 1986 to observe polyurethane foam cellular structure (Ostrogorsky et al., 1986). The purpose of the imaging was to use the observations from the images to supplement an analytical model of aging that predicted diffusion coefficients of polyurethane foam gasses. The blowing agent used to prepare the foams studied was R-11 (trichlorofluoromethane). The foam samples were cast in a resin and cut into thin slices. The slices were then imaged in a scanning electron microscope (SEM). From the images taken, the cell walls and struts were observed. The distance between cell walls was measured to estimate the path of diffusion.

The imaging of foams was also done to evaluate alternative blowing agents (Schwartz and Bomberg, 1991). Spray and laminated polyurethane foams prepared with various blowing agents were imaged using optical microscopy to differentiate the foams and to perform a structural characterization for the purposes of aging modelling. The end goal of the work was to perform accurate measurements than can be used as inputs in modelling foam structure and aging behavior. Samples were imaged and analyzed to determine the distribution of cell areas, aspect ratio, cell wall thickness and cell strut thickness. It was found that the distribution of these measurements was very similar from one image to another of the same foam. The aspect ratio measurements showed the differences between laminated foams and sprayed foams. Laminated foam cells experienced compression in the long axes perpendicular to the rise direction while, Sprayed foam cells experienced compression in the long axes parallel to the rise direction. It was also confirmed that the optical microscopy and image analysis method used was a sufficient method to accurately determine cell wall and cell strut (Schwartz and Bomberg, 1991).

Using microscopy to study cellular structure is also critical for the synthesis of new foams. Czlonka *et al.* prepared rigid polyurethane foams with industrial potato protein as a reinforcement component (Czlonka et al., 2018). An understanding of this potato protein-polyurethane foam morphology in comparison to a typical rigid polyurethane foam was done with microstructure analysis. The measurements of interest were open cell content, cell

diameter, cell wall thickness and cell strut thickness. The analysis of images performed found that the increasing addition of potato protein in the polyol mixture resulted a more inhomogeneous foam with a reduced cell diameter. The reason for this was because the addition of potato protein weakened the cell wall. Weaker cell walls would then result in more cellular rupture leading to cell connectedness or open cell configuration. Further, foams modified with potato protein tended to have a wider distribution of cell sizes.

It should be noted that Schwartz *et al.* (1991) and Czlönka *et al.* (2018) studies used optical microscopy, which uses light, for its microstructure analysis. This is different than SEM that other works have used SEM to perform cellular microstructure analysis.

The analysis of the cellular structure of novel hybrid phenolic foams was performed using SEM to evaluate the effects of various additives in hybrid foams (Desai, Basbagill, Nutt, and Alonso, 2010). Phenolic foams with different compositions of glass and aramid fibers were: prepared, put through accelerated aging and climatic stress. The aging and climatic conditions were simulated in a temperature and RH controlled chamber. The properties of interest were moisture absorption, flammability and dimensional stability. SEM was used to compare the different hybrids then measure cell size before and after climatic stress. The images showed that at the microscopic level, the addition of reinforcement fibers resulted in smaller cell sizes. Further, It was found that the climatic stress of the thermal chamber did not change the cell size of foams (Desai et al., 2010).

Chen *et al.* used SEM to measure the cell size and cell wall thickness of closed-cell polymeric foams to generate Laguerre tessellation models. The purpose of these models was to predict the stiffness, young's modulus and shear modulus of the samples. Although this work focuses on mechanical properties, a discussion on the methodology of determining cell size and wall thickness was provided. To measure the size of closed cell, a cell volume would be the most accurate indicator, however, with 2D images only 2D measurements are possible. The deviations that could result from 2D images are due to the cells being at different depths or altitudes in an image. Despite that, to approximate cell volume or cell size, measure the length along the widest part of the cell in a 2D image is a reasonable estimate. To measure cell wall thickness is more difficult. Cell walls are thin relative to the scale of the image, and cell wall thickness varies along the cell wall. For example, cell walls tend to be thinner in the middle than at the edges where struts are formed connecting adjacent cells. Further, the angle of slicing could result in an edge that appears thicker than the true cell wall. To eliminate this error, the

method of this paper explicitly stated that cell wall measurements were taken from the middle of the cell wall where the thickness is uniform (Chen et al., 2015).

2.6 Gas Chromatography – Flame Ionization Detection (GC-FID)

It has been discussed in Section 2.1.1 that the properties and concentration of blowing agent in a foam insulation product dictates thermal conductivity. To experimentally determine the concentration of the blowing agents in the studied foams, the analytical chemistry technique of gas-chromatography (GC) flame ionization (GC-FID) was employed.

Gas chromatography is a separation method that allows for the separation of components from complicated mixtures – or matrices. The analyte of interest is dissolved in the mobile phase, or phase that flows through the gas chromatograph machine. The mobile phase is then passed through a stationary phase, a column that is coated with a solid surface that interacts with the mobile phase. Components in a matrix are separated on the basis of their affinity for either the mobile or stationary phases. Gas chromatography is named for its mobile phase, which is gaseous. The stationary phase is a capillary column coated with an adsorbent surface.

A gas chromatograph consists of an injection chamber, capillary column and detector that is housed in an oven (Figure 6). At the injector, a liquid sample is withdrawn at the chamber that is at a high temperature. The injection chamber temperature is well above the samples boiling point; therefore, the entire liquid sample is vaporized into the gas phase. Then, the gas sample is carried through the column by a constant flow of an inert gas (typically helium or hydrogen). As the sample passes through the column, the individual components start to separate. The cause of separation is due to the physical properties of the component (*i.e.* boiling point) and the interaction between the column and analyte component. Analytes that have lower boiling points and no favorable interaction with the column will elute or leave the gas chromatograph first. While, analytes with higher boiling points, or more favorable interactions will remain in the GC longer. The time at which an analyte leaves the GC is called the retention time (Skoog et al. 2007) .

Once an analyte leaves the GC column, it passes through a detector. The detector is the component in the GC that quantifies the analytes. Methods of detection include flame-ionization (FID), thermal conductivity (TCD) and mass spectrometry (MS). FID and TCD only quantify analytes leaving the column while MS can identify the chemical structure of analytes. FID and TCD are useful detectors for sensitive detection of hydrocarbons (Skoog et al., 2007). This project specifically used an FID and its method of operation is to be discusses in more detail.

The FID consists of two electrodes placed in a hydrogen and air flame. When analytes exit the column, they are pyrolyzed by the flame which forms cations and free electrons. The formation of cations and free electrons increases the current between electrodes. The increased current is translated into a signal which then results in a peak in a chromatogram. A chromatogram is a spectrum that shows the signal from the FID with respect to retention time (Skoog et al., 2007).

Figure 6 Schematic of a gas chromatograph based off Skoog et al. (2007)

Prior to instrumental analysis, foam samples were prepared based off previously performed experiments in literature. The earliest application of GC reference in this project was done by Svanstrom and Ramnas to analyze the gas phase of polyurethane foams (Svanstrom and Ramnas, 1995). The objective of their work was to identify and quantify the cell gas composition in terms of pressure. The results of their work informed aging studies and experimental determinations of diffusion coefficients. The classes of gas components of interest are found in Table 2:

Table 2 Components of interest in the GC analysis by (Svanstrom and Ramnas, 1995)

Category	Components of Interest
Inorganic	Oxygen, nitrogen, carbon dioxide
Halocarbons	Chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), fluorocarbons (FCs), hydrofluorocarbons (HFCs)
Hydrocarbons	Pentane, cyclopentane
Other	Esters, fluorinated ethers

Polyurethane samples were cut into cylinders and placed into a custom “grinder” assembly (Figure 7 and Figure 8). The assembly was flushed with dinitrogen oxide to flush oxygen and nitrogen and ground into a powder. The gas released after grinding was then fed directly into a GC-MS (gas chromatograph- mass spectrometer). As the matrix of a foam contains many different types of chemicals, as listed in Table 2, it was necessary to use two different columns. One column consisted of a molecular sieve for oxygen and nitrogen while a second column with a porous polymer was used for the remaining gases. A calibration of the method was done using pure gases of known concentrations. The retention time of n-pentane from this publication was 5 minutes.

Figure 7 Grinding assembly used to prepare foam samples for GC (Svanstrom and Ramnas, 1995)

Figure 8 Schematic of sampling system into the GC including the grinder shown in Figure 7 (Svanstrom and Ramnas, 1995)

The Svanstrom and Ramnas paper (1995) presented a thorough methodology but also highlighted the challenges of sampling cellular polymers such as polyurethane and polyisocyanurate foam insulations. The challenge lies in sample preparation and performing it correctly such that the sample accurately represent the cell gasses. During sample preparation, it is challenging to not disturb the equilibrium of the cell gasses within the cell. Changes in cell

temperature or cell pressure would disturb this. The results are summarized by the two graphs below: The methodology presented a means of eliminating error due to sample disruption by utilizing a custom sampling device. However, such a device was not feasible for this project.

Further work by Svanstrom and Ramnas, examined further the analysis of foam cell gas composition (Svanstrom and Ramnas, 1996). The next chapter in the follow up publication on the previous GC work was to analyze the distribution of blowing agents within the foam. As mentioned earlier, air infiltrates the cell, some blowing agent diffuses out after a long period of time, and some blowing agent is absorbed into the solid polymer (discussed in Section 2.3.1). Rigid polyurethane sources from district heating pipes were analyzed to separate CFC-11 in the gas phase and polymer phase. Various approaches were presented and compared. A gravimetric method, or thermal-weight loss method, was used. First, the samples that were ground to a powder and cut into a cylinder were weighed. Then, the samples were heated at 120°C for 14 days. After, a difference in mass was measured to quantify the concentration of CFC-11. The grounded samples represented the total quantify CFC-11 both in the cells and in the solid polymer, while the solid cylinder sample measurements were to account for the CFC-11 in gas phase (Svanstrom and Ramnas, 1996).

An alternative method to the thermal weight loss method is the Schoniger method (Svanstrom and Ramnas, 1996). This method is a volumetric method, meaning that a titration was used to quantify the blowing agent. This method involved powdering the foam and burning it with platinum in an oxygen environment. Then drops of hydrogen peroxide were added to the combusted foam and diluted with isopropanol. The pH was adjusted to 3.6 using perchloric acid. The resulting solution was titrated with mercury (II)-perchlorate and a diphenylcarbazone indicator. The volume of mercury (II)-perchlorate titrated into the sample corresponds to the amount of chlorine ions in the sample which consequently corresponds to the CFC-11 concentration.

Another method of sample preparation was by solvent extraction. The general principle behind a solvent extraction is to separate components of a mixture using a solvent of similar properties. In the context of a solid foam, the cell gas must be strongly soluble in the selected solvent. The attraction between the cell gas should be stronger than the attraction to the cell gas within the foam polymer. The methodology presented by Svanstrom and Ramnas (1996) used isopropanol to extract CFC-11 from polyurethane samples. Similar to the earlier paper's methodology (Svanstrom and Ramnas, 1995), GC-MS was used to analyze the cell gas composition.

The presented results demonstrated that the Schoniger method was more effective for determining the amount of blowing agent in the polymer compared to the thermal weight loss method. The results of the five samples analyzed are presented in Table 3.

Table 3 Distribution of CFC-11 or cyclopentane blowing agent in polyurethane foams (Svanstrom and Ramnas, 1995)

Sample Blowing Agent	Blowing Agent Concentration (% w/w)		
	Gas Phase	Polymer	Total
A [CFC-11]	2.8	4.1	6.6
B [CFC-11]	2.8	3.6	7.9
C [CFC-11]	2.5	3.6	7.2
D [CFC-11]	1.8	3.9	7.0
E [CFC-11]	1.4	2.7	5.2
G [cyclopentane]	1.3	1.3	3.2

For most of the samples analyzed, it was found that most of the blowing agent, CFC-11, was absorbed in the solid polymer of the foam (Table 3). For foams that contained cyclopentane, 30% was found in the condensed form. This was determined from the calculations of partial pressure. In addition to quantifying CFC-11 and cyclopentane blowing agents, a significant amount of carbon dioxide was present in the foams. The carbon dioxide is formed from the manufacture of polyurethane and functions as a co-blowing agent. The results of the solvent extraction are summarized below (Svanstrom and Ramnas, 1996):

Table 4 Cell gas analysis of polyurethane foams from district heating pipes (Svanstrom and Ramnas, 1996)

Sample Blowing Agent	Concentrations in Cell Gas					Foam Density (kg/m ³)	Pressure in Foam (kPa)
	O ₂	N ₂	CO ₂	CFC-11	cyclopentane		
A [CFC-11]	11	35	0.9	51	0	85	110
B [CFC-11]	14	48	0.1	35	0	80	140
C [CFC-11]	9.8	52	0.9	36	0	91	140
D [CFC-11]	2.5	5.6	51	40	0	108	150
E [CFC-11]	17	61	0.1	21	0	46	100
F [CO ₂]	22	21	55	0	0	78	50
G [cyclopentane]	0.8	2.5	59	0	34	68	110

Another publication by Scheutz *et al.* that influenced the methodology of this research project used GC to quantify the release of blowing agents from foam samples taken from decommissioned refrigerators and freezers (Scheutz and Kjeldsen, 2002). The motivation for analyzing the foam from refrigerators in freezers was to understand the environmental impact of disposal. These appliances are often taken apart and their insulation is shredded which results in the accelerated diffusion of the blowing agents into the atmosphere.

Methods used to prepare and analyze the samples build off of the earlier work by Svanstrom and Ramnas (1995, 1996). The thermal weight loss, solvent extraction, batch release and flux chamber methods were used. The thermal weight loss method and solvent extraction method were discussed earlier. The batch release experiment simulated a constant volume environment. Cylinder foam samples were placed in a 1L glass bottle and sealed with Teflon wrap at the opening. At varying time intervals, the gas in the bottle was sampled using headspace GC. The flux chamber experiment consisted of a gas-tight steel cylinder with a built inlet port for gas and an outlet sampling port that was fit with a septum to allow for a needle to sample the gas. A piece of foam was placed inside this chamber and nitrogen gas was fed inside. After 6 hours, the gas in the chamber was sampled from the outlet and analyzed via headspace GC. The method was validated by injecting a known amount of blowing agent into a control chamber. The validation was successful in detecting no errors in the assembly of the chamber and GC analysis (Scheutz and Kjeldsen, 2002).

Building from the GC methods outlined by Svanstrom and Ramnas (1995;1996) and others not included in this literature review (Ascough, 1989; Wan, Tyler, & Nienhuis, 1991)(Ascough, 1989; Wan et al., 1991), Macchi-Tejeda *et al.* (2007) have studied the aging of polyurethane foams and their cell gas composition. The polyurethane foams studied were from an insulating panel product consisting of HCFC141b blowing agent. Gasses were sampled by directly using a syringe and by crushing foam in a sealed bag that is connected to the gas chromatograph. A full quantitation of all cell gasses present was performed using gas chromatography prior to aging. The samples were tested shortly after production and periodically for a total of 6 months. The aging period of 6 months is significantly shorter than the lifetime of the foam, however, it is the period where the most diffusion occurs (Macchi-Tejeda et al., 2007).

The freshly made foams in the Macchi-Tejeda *et al.* (2005) study were not faced for the first 15 days after their production. It was found that the air content in freshly made foam is very low relative to the carbon dioxide content. It was also found that the cell gas composition was different throughout the depths of the foam, confirm the heterogeneous nature of closed cell

foams. The two foams studied had densities of 40 kg/m³ and 45 kg/m³ respectively. The change in cell gas composition was smaller in the foam with the higher density compared to the lower density foam. This is attributed due to the thicker cell walls a higher density foam has. Thicker cell walls would impede the diffusion of gas.

Figure 9 Aging of non-face polyurethane foams of varying densities where the age is on the x-axis and gas composition is on the y-axis (Macchi-Tejeda et al., 2007)

2.7 Basis of this Study

The literature review identified the gas diffusion, blowing agent condensation and blowing agent dissolution mechanism. These mechanisms occur during aging and are known to detriment the performance of insulation foams, especially thermal performance. SEM and GC methodology by others has been reviewed in studies of foam microstructure and cell gas composition. To the best knowledge of the author, the gaps in literature that exist are in studying more recent foam insulations specific to building applications. Since the 80s, 90s, and 00s, there has been many developments and modifications to foam insulation product manufacturing. For example, the blowing agents used in spray polyurethane foams are transitioning from HCFCs to HFOs that possess a lower global warming potential. An understanding of polyisocyanurate is evident in current literature, but there is a gap in the cell gas analysis of rigid polyisocyanurate boards for building applications. In addition to the gap in building foam insulation, a gap in connecting microstructure and blowing agent concentration with foam aging and performance exists.

This project aims to combine microstructure and blowing agent chemical analysis to existing work on thermal performance and aging. Specifically, the microstructure of spray polyurethane

foams and polyisocyanurate foams are examined. The changes in blowing agent concentration of polyisocyanurate are quantified.

To answer the research questions posed in Section 1, the foam samples were taken from a previous thesis on *Effective Conductivity and the Impact of Aging Effects on Foam Insulations in Cold Climates* (Belanger, 2018). This work aimed to study the effective thermal conductivity of a variety of polyurethane and polyisocyanurate foam insulations currently available in the market. Specifically, the effective thermal conductivity was measured before and after laboratory simulated aging. The aging treatments performed were oven heating, freeze thaw cycling, and high moisture exposure. Foam samples were exposed to varying environmental conditions and their thermal conductivity was measured. This research project will analyze select foam samples that have undergone oven aging and freeze thaw cycling to investigate microstructure and blowing agent concentration.

Foam samples were aged in an oven set at 60°C for four months. The thermal conductivity was measured at a range of temperatures every month. This accelerated aging over 6 years (Belanger, 2018). After aging, samples were stored at room temperature.

Foam samples underwent freeze-thaw cycling in a controlled fridge. The temperature of the fridge was programmed to cycle between 40°C and -30°C every 24 hours. The set point was at 40°C and -30°C for 10 hours respectively with a 2-hour transition time. The duration of freeze-thaw cycling was 150 days (Belanger, 2018).

The thermal conductivity testing was performed as per CAN/ULC-S770-15 Standard Test Method for Determination of Long-Term Thermal Resistance of Closed-Cell Thermal Insulating Foams. The temperature range of measurements was -10°C to 0°C with a ΔT between plates of 10°C and 0°C - 30°C with a ΔT between plates of 20°C. The select samples studied by Belanger (2018) are summarized in Table 5 and abbreviations are explained in Table 6.

Table 5 Material properties summary of selected samples by Belanger (2018)

Material Name	Open or Closed Cell	Conductivity [W/mK]	Density [kg/m ³]	Blowing agent	Boiling Point (°C)	Reference
PIA	Closed cell	0.0173	32.0	75:25 n-pentane/isopentane	36.06	(Atlas Roofing Corporation, 2018b; Haynes, 2009)
PIB	Closed cell	0.0248	32.0	75:25 n-pentane/isopentane	36.06	(Atlas Roofing Corporation, 2018a; Haynes, 2009)
PUB	Closed cell	0.025	35.0	HFC-245fa - 1,1,1,3,3-Pentafluoropropane	15.3	(Elastochem, 2015a; Haynes, 2009)
PUX	Closed cell	0.024	30.0	HFO-1233zd(E), trans-1-chloro-3,3,3-trifluoropropene	-18.5	(Elastochem, 2015b; Haynes, 2009)
PUC	Open cell	0.0378	6.83	Water, CO ₂	100, -78.5	(Haynes, 2009)
PUD	Open Cell	0.0333	17.2	Water, CO ₂	100, -78.5	(Elastochem, 2016; Haynes, 2009)

In this study, samples were named to describe the identity of the foam, and the aging process underwent. The naming system is summarized in Table 6 where O=oven aged, NA= not aged, FT=150 freeze-thaw cycles.

Table 6 Naming convention of the studied foam samples and their treatments

	Abbreviation	Description
Polymer	PIY	Polyisocyanurate polymer where Y corresponds to a unique foam identity
	PUY	Polyurethane polymer where Y corresponds to a unique foam identity
Treatment	NA	No treatment, sample was recently obtained from the manufacturer
	O	Samples were placed in an oven at 60°C for 4 months (Belanger, 2018)
	FT	Samples underwent freeze thaw cycles between 40°C and -30°C every 24h for 150 days (Belanger, 2018)

The thermal conductivity curves of select samples are combined in Figure 10 and Figure 11.

Figure 10 Thermal conductivity curves of oven aged foams (Belanger, 2018)

Figure 11 Thermal conductivity curves of freeze-thaw cycled foams (Belanger, 2018)

The order of highest and lowest thermal conductivity for aged samples is: PIB, PUC, PIA, PUD, and PUB. While, for the freeze-thaw cycled samples the order of highest and lowest thermal conductivity is: PIB, PUC, PUDFT, PUB, PIA. No thermal conductivity testing was conducted for PUXFT due to the material warping and not being suitable for testing in the heat flow meter.

The findings of this MRP will relate back to the findings of Belanger (2018). The observations from the thermal conductivity curves will be related to the analysis performed and relationships will be identified.

3 Methodology

Scanning electron microscopy and gas chromatography (GC) were the methods chosen to investigate the microstructure and chemical concentrations of polyurethane and polyisocyanurate insulations. These methods are consistent with those found in literature that have studied microstructure and cell gas composition. Different from literature, are some aspects of the methods. Methods were modified for simplicity given the smaller scope of this research project compared to the endeavors summarized the literature review.

3.1 Scanning Electron Microscopy Method

Scanning electron microscopy (SEM) was used to analyze the structure of the polymer and cells of the foam insulation samples.

The polyisocyanurate boards possess adhered facers as mentioned in Section 2.1. The PIA series possessed a foil facer while the PIB series foams possess a felt facer. Foam samples were prepared by first removing any coatings or barriers. Then they were cut into cubes of 1 cm³ volume (a reference sample is illustrated in Figure 12). Cut were made from the perimeter edge of foam samples and 2 cm away from the edge (as illustrated in Figure 13). The purpose of this was to identify differences at the surface of the foam and the core.

Figure 12 Image of foam sample cube for SEM imaging (not to scale)

Figure 13 Graphical representation (not to scale) of where foam samples were cut for SEM imaging

The SEM images were taken on a JEOL-6380LV model microscope. The magnifications in which images were taken are 30X and 130X at 10kV in a low vacuum 25 Pa environment. Foam samples that were not aged, aged, and underwent freeze thaw cycles were imaged for the purposes of identifying changes to the physical structure.

Measurements of the structural elements were taken from the images using ImageJ microscopy image processing software (National Institutes of Health, 2018). The structural elements of interest were: appearance, cell wall thickness [mm] (letter A in Figure 14,), cell aspect ratio

[dimensionless] (letter B in Figure 14.), cell size [mm²] (letter C in Figure 14.), strut thickness [mm] (letter D in Figure 14).

Any changes in the appearance of the cells in the images was identified and recorded. The purpose of observing the appearance was to highlight the differences between foams that are visual in nature, and do not correspond to a measurement.

The thicknesses of the cell walls were measured at the center of wall as shown in Figure 14. How thick cell walls become during the blowing of a foam is related to how the polymer is distributed in the foam (Schwartz and Bomberg, 1991).

The cell aspect ratio is a shape factor or descriptor that describes the shape of a cell from the minimum and maximum diameter (Chen et al., 2015):

$$aspect\ ratio = \frac{d_{min}}{d_{max}} \quad (19)$$

For a circle, the aspect ratio is 1 where the diameters measured orthogonally are equal. Aspect ratios approaching 0 describe elongated, ellipse shape (Math Open Reference, 2011). Given the three-dimensional structure of the cells, this formula assumes a perfectly spherical geometry. Since it is known that cells are polyhedron in shape (Chen et al., 2015), this shape factor calculated in this report has to be considered as an approximation of the degree to which a cell is circular in two dimensions.

The measurements taken to determine the approximate cell size are illustrated by the diagonal hatching in, letter C. The thickness of cell struts was measured as illustrated in Figure 14, letter D. As discussed with the cell wall thickness, the cell strut thickness is a measure of how the polymer is distributed in the foam. To determine the error associated with measurements taken from the SEM images, statistical calculations were performed and are summarized in Appendix 1.

Figure 14 Illustration of how measurements were taken on a sample

3.2 Gas Chromatography – Flame Ionization Detection Method

The purpose of using GC-FID (gas-chromatography-flame ionization detection) in this project was to quantify the amount of blowing agent in the aged and not aged polyisocyanurate samples PIA. The sample names, blowing agent identities, and selected solvent properties are summarized in Table 7.

Table 7 Properties of blowing agent and solvent

Samples and Solvent	Blowing Agent	Molar mass (g·mol ⁻¹)	Melting Point (°C)	Boiling Point (°C)	Reference
PI-A, PI-B	N-pentane	72.15	-129.67	36.06	Haynes, 2009
75:25 mixture	i-pentane	72.15	-159.8	27.83	
Hexanes				68	

As stated in Table 7, a mixture of two isomers of pentane were used as the blowing agent for the studied PI foams. Throughout this report, the pentane isomer mixture will be simply referred to as pentanes.

The methodology for foam insulation sample preparation was adapted from (Scheutz and Kjeldsen, 2002). However, the paper utilized a custom injection assembly that allowed for a contained crushing of the foam sample, addition of solvent, and sampling into the GC (Figure 7, Section 2.6). For this project, a variety of choices in glassware and solvent volumes were tested out. The journey in method development is illustrated in Table 8 with last line showing weighing bottles being the final chosen glassware.

Table 8 Different glassware and challenges evaluated for the experiments

Image of Glassware	Glassware	Challenges
<p><i>Glass tube</i></p>	Glass tube	Too narrow, foam cubes would float
<p><i>Beaker</i></p>	Beaker	Not airtight, solvent evaporated after one day
<p><i>E flask with cap</i></p>	E flask with cap	The opening was too small resulting in the need to cut foam into cubes. Once cut, the solvent liquid spread with the wider shape of the flask bottom resulting in a shallow depth leaving foams not in contact with the solvent
<p><i>Weighing bottle</i></p>	Weighing bottle	Perfect dimensions (diameter of 40cm, height of 50cm) to place a ~0.5g foam cylinder. Airtightness was achieved by closing the bottle with the glass stopper and then wrapping the top with aluminum foil and tape.

Prior to testing, samples required preparation. It should be noted that the foam insulations studied presented challenges in sample handling. The foam fragments when cut were very static and tend to cling on to tools, glassware or other equipment.

To quantify the concentration of blowing agent foam samples in the solid polymer matrix were placed in a solution of hexane (at a temperature below the boiling point of the blowing agent). A cylinder of foam that weighed approximately 0.5g was cut from both the edge and the core of the material in the shape of a 1cm³ cube(s) (Figure 15). The reason for cutting from the edge and the core was to compare concentrations of blowing agent at those parts of the sample.

Figure 15 Location of sample cut

The process of preparation is as follows:

1. The cylinder was placed in a 40mL weighing bottle
2. 15mL of hexane was then pipetted into the bottle
3. The sample cylinder was secured with two stirring bars or weighted washers
4. The bottle was then sealed with a glass stopper, and wrapped with aluminum foil to ensure no solvent escaped
5. After sealing, the prepared sample was stored for 72 hours at room temperature
6. After 72 hours, approximately 5mL was passed through the solid phase extractor BondElut SPE, (Figure 16)
7. The eluted liquid was then collected in a glass vial
8. The glass vial was then placed in a freezer for 5 hours or till the vial reached a temperature of approximately -5°C
9. The sample was then immediately injected in the GC-FID

Note that the purpose of the solid phase extraction step was to remove polymer fragments, other polar foam additives and water.

The above sequence was then repeated with the glass vial remained at room temperature, approximately 23°C. The two methods were performed to compare any differences in

concentration in pentane blowing agent that dissolved into the solvent at cold temperature (-5°C) and at room temperature (23°C).

Figure 16 Syringe of sample liquid attached to SPE

The conditions at which the GC-FID was operated with are shown in Table 9. The conditions were selected to assure that there would be a sufficient separation between the pentane and the hexane solvent in the column.

Table 9 GC-FID conditions

Column (stationary phase)	SUPELCO100 (nonpolar)
Column length	60 m
Carrier gas (mobile phase)	Helium
Injector Temp	250 °C
Detector Temp	250 °C
Oven Temp	50 °C
Injection Volume	1 μ L

The development of a run method for the GC was not straightforward. Through trial and error, a method in modulating injector, detector and oven temperatures was chosen that provided the best resolution of all components within the sample. The methods are summarized in Table 10.

Table 10 Programmed methods tested for the GC

Method	Initial Column Temperature (°C)	Programmed Heating Rate (°C)	Run time (mins)	Comments
1	170	20	7	Insufficient resolution between pentane and hexane elution
2	170	10	14	Pentane and hexane peaks resolved

Method 2 provided the best results when samples were run. After the GC-FID run, the data was exported, and the spectra was generated in excel. To quantify the amount of blowing agent detected by GC-FID, the area normalization method was used. The area under the hexane and pentane peaks were added separately. The concentration of pentanes was determined as a percentage relative to the hexane solvent. A detailed explanation is provided in Appendix 2 together with a summary of the GC-FID data analysis. The output of the GC-MS then provided an area count (or peak area) of analyte detected in the standard.

Figure 17 Summary of analysis sequence

4 Results

4.1 SEM Imaging Results

Refer to Table 6, section 2.7, for the sample naming convention. The SEM images of the foam samples are presented in Figures 18 to 23. Red circles on select figures highlight observations of importance.

Figure 18 a) Not aged PIA (PIANA) at 30x b) Not aged PIA (PIANA) at 130x c) Not aged PIA (PIANA) original sample (not to scale) d) Freeze-thawed PIA (PIAFT) at 30x e) Freeze-thawed PIA (PIAFT) at 130x f) Freeze-thawed PIA (PIAFT) original sample (not to scale) g) Oven aged PIA (PIAO) at 30x h) Oven aged PIA (PIAO) at 130x i) Oven aged PIA (PIAO) original sample (not to scale)

Figure 19 a) Not aged PIB (PIBNA) at 30x b) Not aged PIB (PIBNA) at 130x c) Not aged PIB (PIBNA) original sample (not to scale) d) Freeze-thawed PIB (PIBFT) at 30x e) Freeze-thawed PIB (PIBFT) at 130x f) Freeze-thawed PIB (PIBFT) original sample (not to scale) g) Oven aged PIB (PIBO) at 30x h) Oven aged PIB (PIBO) at 130x i) Oven aged PIB (PIBO) original sample (not to scale)

Figure 20 a) Not aged PUC (PUCNA) at 30x b) Not aged PUC (PUCNA) at 130x c) Not aged PUC (PUCNA) original sample (not to scale) d) Freeze-thawed PUC (PUCFT) at 30x e) Freeze-thawed PUC (PUCFT) at 130x f) Freeze-thawed PUC (PUCFT) original sample (not to scale)

Figure 21 a) Not aged PUD (PUDNA) at 30x d) Not aged PUD (PUDNA) at 130x c) Not aged PUD (PUDNA) original sample (not to scale) d) Freeze-thawed PUD (PUDFT) at 30x e) Freeze-thawed PUD (PUDFT) at 130x f) Freeze-thawed PUD (PUDFT) original sample (not to scale)

Figure 22 a) Not aged PUX (PUXNA) at 30x b) Not aged PUX (PUXNA) at 130x c) Not aged PUX (PUXNA) original sample (not to scale) d) Freeze-thawed PUX (PUXFT) at 30x e) Freeze-thawed PUX (PUXFT) at 130x f) Freeze-thawed PUX (PUXFT) original sample (not to scale)

Figure 23 a) Not aged PUB (PUBNA) at 30x b) Not aged PUB (PUBNA) at 130x c) Not aged PUB (PUBNA) original sample (not to scale) d) Freeze-thawed PUB (PUBFT) at 30x e) Freeze-thawed PUB (PUBFT) at 130x f) Freeze-thawed PUB (PUBFT) original sample (not to scale)

For the samples imaged, observations on their appearance and measurements of various geometric parameters are presented in the following subsections.

4.1.1 Appearance

Closed cell polyisocyanurate (PIA, PIB), closed cell polyurethane (PUB, PUX) and open cell polyurethane (PUD and PUC) foams possess some differences in appearance at the cellular level.

The open cell foams (PUC, PUD) appear translucent in appearance relative to the closed cell foams (PIA PIB, PUX, PUB). The cell walls of the open cell foams (PUC, PUD) which are visible in the foreground of the images are less opaque than the foreground cell walls of the closed cell foams (PIA PIB, PUX, PUB). This results in a more translucent appearance. This is illustrated in Figure 24 where representative samples are presented:

Figure 24 Comparison of cell wall appearance of PUCO and PUXNA

All PUB samples, PUCO and PUDO exhibited undesired artifacts due to electron charging at the 130X magnification as seen Figure 19 e), Figure 20 b) h), all images in Figure 23. The undesired artifacts observed at the time of imaging were numerous bright, white spots which obstruct the observation of morphological characteristics. The extent of charging on PUCO and PUDO was small relative to PUB samples.

Due to the charging seen in PUB samples (Figure 22), a 10nm coating of gold was applied in order to interpret images. The application of the gold coating caused a change in the appearance where cell walls became thinned and cell measurements could not be performed accurately. Therefore, measurements were not performed on PUB samples.

The PIA series samples are shown in Figure 18. At a 30X scale, differences between not aged, freeze-thawed and oven aged cycles are not apparent. At the 130X scale, differences in cellular structure between the PIA samples are more prominent, especially where the material was cut. When cut, the PIAFT sample exhibits more abrupt breakage at the cell walls compared to PIANA and PIAO. The cell walls appeared to become more brittle and break (refer to red circles on Figures 18 b), e), and h).

A similar observation was made for PIB samples. The PIBFT (Figure 19, letter e) cell wall breakages are a lot more jagged compared to those of the not aged and aged samples (Figure 19 letters a and h).

4.1.2 Cell Aspect Ratio

The cell aspect ratios are summarized in Figure 25 and Table 11. The aspect ratios of aged open cell foams PUCO ($6.52 \times 10^{-1} \pm 4.76 \times 10^{-2}$, Table 11) and PUDO ($5.34 \times 10^{-1} \pm 3.60 \times 10^{-2}$, Table 11) exhibited the smallest aspect ratios indicating they possessed the most elongated cells of all foams studied. The PIAO ($6.27 \times 10^{-1} \pm 2.65 \times 10^{-2}$, Table 11) and PUXO ($6.92 \times 10^{-1} \pm 2.76 \times 10^{-2}$, Table 11) foams possessed smaller aspect ratios compared to their not aged and freeze-thaw cycled samples (PIANA= $6.54 \times 10^{-1} \pm 3.76 \times 10^{-2}$, PIAFT= $7.16 \times 10^{-1} \pm 2.58 \times 10^{-2}$, PUXO= $6.92 \times 10^{-1} \pm 2.76 \times 10^{-2}$, PUXFT= $7.39 \times 10^{-1} \pm 3.67 \times 10^{-2}$, Table 11). The PIB series foams did not display cellular elongation when aged as the average cell aspect ratio of PIBNA is smaller than that of PIBO ($6.77 \times 10^{-1} \pm 2.35 \times 10^{-2}$, Table 11) and PIBFT ($7.23 \times 10^{-1} \pm 2.72 \times 10^{-2}$, Table 11). The cell aspect ratios determined from the SEM images of the foams are summarized in Table 11.

Figure 25 Cell Aspect Ratios of Polyurethane and Polyisocyanurate Foams that Underwent Aging and Freeze-Thaw Cycling

Table 11 Measured cell aspect ratio from SEM images

Sample Name	Average Aspect Ratio and Standard Error	Number of Measurements (n)
PIAO	$6.27 \times 10^{-1} \pm 2.65 \times 10^{-2}$	20
PIAFT	$7.16 \times 10^{-1} \pm 2.58 \times 10^{-2}$	15
PIANA	$6.54 \times 10^{-1} \pm 3.76 \times 10^{-2}$	12
PIBO	$6.77 \times 10^{-1} \pm 2.35 \times 10^{-2}$	22
PIBFT	$7.23 \times 10^{-1} \pm 2.72 \times 10^{-2}$	30
PIBNA	$7.38 \times 10^{-1} \pm 2.61 \times 10^{-2}$	19
PUCNA (open cell)	$6.65 \times 10^{-1} \pm 5.85 \times 10^{-2}$	6
PUCO (open cell)	$6.52 \times 10^{-1} \pm 4.76 \times 10^{-2}$	8
PUDNA (open cell)	$6.27 \times 10^{-1} \pm 4.39 \times 10^{-2}$	10
PUDO (open cell)	$5.34 \times 10^{-1} \pm 3.60 \times 10^{-2}$	12
PUDFT (open cell)	$7.64 \times 10^{-1} \pm 2.22 \times 10^{-2}$	21
PUXO	$6.92 \times 10^{-1} \pm 2.76 \times 10^{-2}$	19
PUXFT	$7.39 \times 10^{-1} \pm 3.67 \times 10^{-2}$	15
PUXNA	$8.16 \times 10^{-1} \pm 4.80 \times 10^{-2}$	7

4.1.3 Cell Cross Section Area

The cell cross section areas measured are summarized in Figure 26 and Table 12. Of all foam samples, the open cell foams possessed the largest cell areas ($PUCNA = 1.69 \times 10^4 \pm 8.20 \times 10^3 \mu m^2$, $PUDO = 1.06 \times 10^4 \pm 2.63 \times 10^3 \mu m^2$, and $PUCO = 1.00 \times 10^4 \pm 3.13 \times 10^3 \mu m^2$, Table 12). The PUXO foam possessed the smallest cell area ($PUXO = 1.13 \times 10^3 \pm 1.41 \times 10^2 \mu m^2$, Table 12).

There is no clear correlation between cell area changes between samples that are not aged, aged and freeze-thaw cycles. On average, the cell area increased in aged samples of PUD, PIA, and PIB when compared to not aged samples. Conversely, the average cell area of PUXO ($1.13 \times 10^3 \pm 1.41 \times 10^2 \mu m^2$, Table 12) was smaller than the PUXNA ($3.29 \times 10^3 \pm 1.02 \times 10^3 \mu m^2$, Table 12) and PUXFT ($3.97 \times 10^3 \pm 7.52 \times 10^2 \mu m^2$, Table 12) samples. The average measured cell areas are summarized in Table 12.

Figure 26 Cell Areas of Polyurethane and Polyisocyanurate Foams that Underwent Aging and Freeze-Thaw Cycling

Table 12 Averaged cell cross section area measured from SEM images

Sample Name	Average Cell Area (µm²) and Standard Error	Number of Measurements (n)
PIAO	$7.35 \times 10^3 \pm 1.40 \times 10^3$	12
PIAFT	$3.28 \times 10^3 \pm 4.91 \times 10^2$	16
PIANA	$4.41 \times 10^3 \pm 4.32 \times 10^2$	38
PIBO	$5.09 \times 10^3 \pm 1.41 \times 10^3$	19
PIBFT	$2.25 \times 10^3 \pm 3.72 \times 10^2$	31
PIBNA	$3.56 \times 10^3 \pm 6.37 \times 10^2$	18
PUCNA	$1.69 \times 10^4 \pm 8.20 \times 10^3$	3
PUCO	$1.00 \times 10^4 \pm 3.13 \times 10^3$	17
PUDNA	$6.58 \times 10^3 \pm 9.37 \times 10^2$	9
PUDO	$1.06 \times 10^4 \pm 2.63 \times 10^3$	10
PUDFT	$4.77 \times 10^3 \pm 3.95 \times 10^2$	18
PUXO	$1.13 \times 10^3 \pm 1.41 \times 10^2$	18
PUXFT	$3.97 \times 10^3 \pm 7.52 \times 10^2$	15
PUXNA	$3.29 \times 10^3 \pm 1.02 \times 10^3$	7

4.1.4 Cell Wall Thickness

The thicknesses of the cell walls was measured from the SEM images and are summarized in Figure 27 and Table 14. Measurements were taken from the center of wall (Figure 14) for all samples. Of all the samples, the PUX series (PUXFT = $2.34 \times 10^1 \mu\text{m}$ and PUXO = $2.08 \times 10^1 \mu\text{m}$, Table 13) foams consist of the thickest cell walls while the PIA series has the thinnest (where the cell wall thickness of PIAO is $1.08 \times 10^1 \mu\text{m}$ and PIAFT is $1.20 \times 10^1 \mu\text{m}$, Table 13).

PUCO ($1.69 \times 10^1 \mu\text{m}$) and PUDO ($1.76 \times 10^1 \mu\text{m}$) have thicker cell walls than their non-aged counterparts (PUCNA = $1.27 \times 10^1 \mu\text{m}$ and PUDNA = $1.31 \times 10^1 \mu\text{m}$). The cell wall thickness of PUC and PUD sample series increase in thickness when oven aged or after freeze-thaw cycles. Meanwhile, when aged or after undergoing freeze thaw cycles PUX, PIA and PIB samples do not exhibit an increase in cell wall thickness.

Between not aged, oven aged and freezer thawed samples there appears to be no indication that cell wall thickness changes amongst the foam samples (Figure 27).

Figure 27 Cell Wall Thicknesses of Polyurethane and Polyisocyanurate Foams that Underwent Aging and Freeze-Thaw Cycling

Table 13 Averaged cell wall thickness measured from SEM images

Sample Name	Average Cell Wall Thickness (μm) and Standard Error	Number of Measurements (n)
PIAO	$1.08 \times 10^1 \pm 4.75 \times 10^{-1}$	34
PIAFT	$1.20 \times 10^1 \pm 4.86 \times 10^{-1}$	34
PIANA	$1.29 \times 10^1 \pm 4.32 \times 10^{-1}$	43
PIBO	$1.29 \times 10^1 \pm 4.23 \times 10^{-1}$	44
PIBFT	$1.44 \times 10^1 \pm 3.95 \times 10^{-1}$	39
PIBNA	$1.50 \times 10^1 \pm 5.18 \times 10^{-1}$	30
PUCNA	$1.27 \times 10^1 \pm 3.36 \times 10^{-1}$	33
PUCO	$1.69 \times 10^1 \pm 6.60 \times 10^{-1}$	33
PUDNA	$1.31 \times 10^1 \pm 3.76 \times 10^{-1}$	30
PUDO	$1.76 \times 10^1 \pm 8.16 \times 10^{-1}$	30
PUDFT	$1.89 \times 10^1 \pm 7.56 \times 10^{-1}$	29
PUXO	$2.03 \times 10^1 \pm 7.13 \times 10^{-1}$	36
PUXFT	$2.34 \times 10^1 \pm 1.73$	25
PUXNA	$1.64 \times 10^1 \pm 6.87 \times 10^{-1}$	25

4.1.5 Cell Strut thickness

The cell strut thicknesses measured are summarized in Figure 28 and Table 14. Overall, all samples possessed strut thicknesses in the narrow range of $2.24 \times 10^1 \mu\text{m}$ to $3.46 \times 10^1 \mu\text{m}$ (Figure 28). Of all samples, the PUX series samples possessed the thickest struts similarly to how the PUX samples possessed the thickest cell walls (Figure 28 and Figure 28 Cell Strut Thicknesses of Polyurethane and Polyisocyanurate Foams that Underwent Aging and Freeze-Thaw Cycling Table 14). PIBFT and PUCO possessed the thinnest struts but not by a large amount relative to other samples. There is no clear indication that aging, or freeze-thaw cycling reduces or increases cell strut thicknesses.

Figure 28 Cell Strut Thicknesses of Polyurethane and Polyisocyanurate Foams that Underwent Aging and Freeze-Thaw Cycling

Table 14 Average cell strut thickness measured from SEM images

Sample Name	Average Cell Strut Thickness (μm) and Standard Error	Number of Measurements (n)
PIAO	$2.50 \times 10^1 \pm 1.79$	19
PIAFT	$2.31 \times 10^1 \pm 7.94 \times 10^{-1}$	21
PIANA	$2.50 \times 10^1 \pm 1.79$	18
PIBO	$2.39 \times 10^1 \pm 7.64 \times 10^{-1}$	20
PIBFT	$2.24 \times 10^1 \pm 8.71 \times 10^{-1}$	40
PIBNA	$2.41 \times 10^1 \pm 7.64 \times 10^{-1}$	18
PUCNA	$2.74 \times 10^1 \pm 7.56 \times 10^{-1}$	31
PUCO	$2.28 \times 10^1 \pm 5.22 \times 10^{-1}$	9
PUDNA	$2.34 \times 10^1 \pm 1.17$	30
PUDO	$2.34 \times 10^1 \pm 8.03 \times 10^{-1}$	30
PUDFT	$2.46 \times 10^1 \pm 1.00$	37
PUXO	$2.60 \times 10^1 \pm 8.22 \times 10^{-1}$	30
PUXFT	$3.46 \times 10^1 \pm 1.51$	25
PUXNA	$2.83 \times 10^1 \pm 9.13 \times 10^{-1}$	31

4.2 GC-FID Results

Using the percentage of peak area from the GC-FID, the concentration of pentane mixture was determined for all PIA and PIB series samples. Comparing aged samples to not aged samples taken from the edge, there was a measured decrease in the concentration of pentanes (Figure 29). The decrease in pentane concentration was most noticeable with PIB samples.

Figure 29 Comparing not aged to oven aged samples

All samples except for the PIBNA samples showed an insignificant decrease in measured pentanes concentration between cold and room temperature samples. PIBNA sampled at room temperature resulted in a higher concentration of pentanes (Figure 30).

The concentrations measured at core and edges of the samples resulted in different pentane concentrations (Figure 32). All cuts from the edge of the samples resulted in higher concentrations of pentane blowing agent compared to cuts from the core.

Figure 30 Comparing cold and room temperature concentrations

Figure 31 Comparing cold and room temperature concentrations

Figure 32 Comparison of pentane blowing agent concentration at the core and edge of samples

The overall loss of pentane blowing agent for aged and not aged polyisocyanurate foams are tabulated Table 15 and correspond to the concentrations shown in Figures 28-30. The reduction in pentane concentration was calculated by subtracting the oven aged pentane concentration from the not aged pentane concentration that was measured for PIA and PIB. The error calculation is outlined in Appendix 1.

Table 15 Summary of pentane blowing agent dilution in aged and not aged PIA and PIB foams

Product	Location	Temperature before sampling	Reduction in Pentane Concentration
PIA	Edge	~-5°C	-11.84%±4.28%
	Edge	~23°C	-19.76%±2.73%
	Core	~23°C	-1.34%±3.22%
PIB	Edge	~-5°C	-67.85%±7.98%
	Edge	~23°C	-84.77%±1.68%
	Core	~23°C	-12.48%±7.20%

The differences in pentane blowing agent concentration between edge and core sampling locations are shown Table 16.

Table 16 Difference of pentane blowing agent concentration between edge and core location

Sample Name	Location		Percent difference
	Edge (%w/w)	Core (%w/w)	
PIANA	0.059	0.602	942.88%±3.39%
PIAO	0.048	0.599	1182.17%±2.51%
PIBNA	0.260	0.609	143.28%±2.57%
PIBO	0.040	0.531	1298.41%±7.09%

5 Discussion

The discussion is organized by the original research questions posed in Section 1.

5.1 *What are the microstructure changes that polyurethane and polyisocyanurate insulations undergo with oven aging and freeze thaw cycling?*

It should be noted that it was assumed that all foam samples within a type were prepared the same way and possessed the same properties (thermal conductivity, density etc.) before oven aging/ freeze-thaw cycling. It was also assumed that the cubes cut for SEM imaging were representative of the entire foam sample square. In other words, it was assumed that a single SEM image was sufficiently representative of an entire foam sample.

5.1.1 Appearance

The observation that the cell walls of open cell foams appear translucent is consistent with what was expected. Open cells are two dimensional and interconnected to other through struts forming a “mesh” like network. Closed cells are 3D and have typically possess a polyhedron geometry as discussed in literature (Chen et al., 2015; Schwartz and Bomberg, 1991).

It was found that PUC, PUD and PUB images resulted in white spots which is due to electron charging. This occurs when there is a buildup of electrons at edges and peaks that are not in the plane of the surrounding sample area. The change in surface topography results in an uneven interaction between the sample and microscope beam electrons. The sample electron build-up interacts with the electron beam of the microscope which causes a flash resulting in a bright white spot in the image (Microscopy Australia, 2014). The same microscope settings were used for all samples, so it is not clear why PUC, PUD and PUB images resulted in these artifacts. A further discussion on these charging artifacts is beyond the scope of this work however, the electron charging in the images could be avoided in future work.

It was observed that there are obvious differences between images at the 130x in the location where the cell walls were cut. Between not aged, oven aged or freeze thawed cycles, the breakage points appeared to become more brittle and edges were more jagged. Not aged foams had edges that were less jagged and appear more to have ripped. The cause of this could be due to loss in plasticity in the solid polymer.

5.1.2 Cell Aspect Ratio

It was observed that the open cell foams PUCO and PUDO exhibited the smallest aspect ratio which indicates the cells were more elongated opposed to being circular. In comparison to other foams studied, the aspect ratio was the lowest. This could mean that the cells of these products are more susceptible to elongation and deformation as they age. The causes of the elongation could be due to the effects of heat to the cell wall. The ability for cell walls to resist stress and strain decreases when an axial load is applied (Gibson and Ashby, 2001). This could be further tested by comparing the Young's modulus of the foams before and after aging.

PIAO and PUXO foams were observed to have smaller aspect ratios compared to their not aged or freeze-thaw cycled samples. This is an indication that after aging, the cells in these samples undergo elongation as they are oven aged or go through freeze-thaw cycles. As mentioned with the open cell foams, this could be due to a process weakening the cell walls and them becoming susceptible to bending and deformation. For example, if the cell walls are weakening as the foam ages, gravity could play a role in collapsing the previously spherical cell to an elongated, elliptical, shape. To confirm this, future SEM imaging should take into consideration the direction of the foam rises when blown, the orientation of the material during aging or freeze-thaw cycling and measurements should describe the direction of elongation. This would be important to assure that elongation is not observed due to the rise of the foam during production.

It was found that the PIB series foams do not undergo any cellular elongation during the aging or freeze-thaw cycling processes. This finding is inconsistent with the other foam samples previously mentioned. This could be due to the greater standard error (2.61×10^{-2} , Table 11) reported for the PIBNA measurements relative to the rest of the samples. To calculate aspect ratio, a smaller number of diameter measurements for PIBNA ($n=38$, Table 11) were performed relative to PIBO ($n=44$, Table 11) and PIBFT ($n=60$, Table 11) increasing the likelihood of error. The reason fewer measurements were taken is due to the lack of whole cells visible in the image. Further, the effect of sample handling prior to SEM imaging may affect the structural integrity of the cell structure thus influence the measurements taken.

5.1.3 Cell Cross Section Area

Open cell foams were observed to have the largest cell areas. This is to be expected due to the lower density of the foam polymer which results in the exothermic reaction expanding the cells to larger sizes (Marrucho et al., 2002).

The smallest cell areas were measured in the PUX series of foams. Compared to the other foams, this foam had the largest density (Table 5) which is consistent with the smaller cell sizes.

Overall, there was some indication that foams that have been freeze thawed have smaller cell sizes than foams that have been aged. Table 17 compares the not aged foam samples to their aged and freeze thawed counterparts. Almost all freeze thawed foams (except PUX) resulted in a decrease in cell cross section area while all foams showed larger cell areas in the aged foams. The differences observed in cell area measurement varied from -98% to 50%.

Table 17 Comparison of cell area for foam samples that have been not aged, oven aged, or freeze-thaw cycled

Sample	Treatment (Not aged, Oven Aged or Freeze-thawed)	Average Cell Area (μm^2)	Percent Difference Between Treated and Not Aged
PUC	NA	1.69×10^4	
	A	1.00×10^4	-51%
PUD	NA	6.58×10^3	
	A	1.06×10^4	47%
	FT	4.77×10^3	-32%
PIA	NA	4.41×10^3	
	A	7.35×10^3	50%
	FT	3.28×10^3	-29%
PUX	NA	3.29×10^3	
	A	1.13×10^3	-98%
	FT	3.97×10^3	19%
PIB	NA	3.56×10^3	
	A	5.09×10^3	36%
	FT	2.25×10^3	-45%

However, as shown in the results, Section 4.1.3, the cell area measurements performed resulted in the largest magnitudes of standard error compared to all other SEM image measurements. For this discussion, the magnitude of standard error is used to estimate inconsistency. In other words, it was observed in all samples that cell area measurements are inconsistent. Of the foams studied, foams in the PUX series had the most consistent cell cross section areas where the standard error of measurements was 1×10^2 to 1×10^3 (Table 12) which

although large, it was smaller than the standard errors observed in the other foam sample area measurements.

The reason for the inconsistency in cell area is partially due to the two-dimensional nature of SEM images. The cell cross section areas measured in Section 4.1.3 are only an approximation of cell size. In 3D, the cells are polyhedron in shape where their cross-sectional area would vary from the position of the slice during sample preparation. The SEM images provide a 2D representation of the cells, however, determining the cell cross section area through the center of the cell or determining the cell volume would require 3D imaging techniques like computer tomography (CT).

5.1.4 Cell Wall Thickness

It was observed that the PUX sample series possess the thickest cell walls. The thinnest cell walls observed are from the PIA series. PUX has a lower density (30kg/m^3) compared to PIA (32 kg/m^3 , Table 5). It would be expected that the lower density foams would have thinner cell walls however the measurements performed do not demonstrate this. Other factors that could be influencing the cell wall thickness are the polymer composition and pressure at which the foams are sprayed (Hilado, 1977; Marrucho et al., 2002).

A comparison between cell wall thickness before and after aging or freeze thaw cycling is shown in Table 18. For PUX, PUD foams, there seems to be a greater increase in cell wall thickness after freeze thaw cycling compared to the change observed in the aged samples. However, the opposite was observed for PUC, PIB, and PIA. The cell wall thickness measurement in PIA samples showed the cell wall to be thinner than the not aged sample.

The measurements of cell wall thicknesses taken were precise. The standard errors determined are low relative to the measured cell wall thicknesses (Table 18). However, the measurements collected in this study do not lead to a conclusive relationship between foam treatment (oven aging or freeze thaw cycling) and wall thickness.

Table 18 Comparison of cell wall thickness for foam samples that have been not aged, oven aged, or freeze-thaw cycled

Sample	Treatment (Not aged, Oven Aged or Freeze-thawed)	Average Cell Wall Thickness (μm) (smallest to largest)	Percent Difference Between Treated and Not Aged
PUX	NA	1.64×10^1	
	O	2.03×10^1	21%
	FT	2.34×10^1	35%
PUD	NA	1.31×10^1	
	O	1.76×10^1	29%
	FT	1.89×10^1	36%
PUC	NA	1.27×10^1	
	O	1.69×10^1	28%
PIB	NA	1.50×10^1	17%
	O	1.29×10^1	
	FT	1.44×10^1	11%
PIA	NA	1.29×10^1	
	O	1.08×10^1	-18%
	FT	1.20×10^1	-8%

5.1.5 Cell Strut Thicknesses

From the cell strut thickness measurements, the PUX samples had the thickest cells struts. This is consistent with PUX also possessing the thickest cell walls. The open cell wall, PUC possessed the thinnest cell struts. Again, this finding is not consistent with the known density of PUX relative to PIB. The thinner cell strut of PUCO is consistent with what would be expected for open cell foams. This is because open cell foam struts are connection points of fewer cell walls with less face compared to closed cell foams. Closed cell foams would be expected to have thicker struts as they connect multiple cell walls that are encapsulated with more faces.

5.1.6 SEM Imaging and Thermal Conductivity

This section will discuss the SEM findings in relation to the previously performed thermal conductivity analysis of the aged and freeze-thawed foams. The open cell foams PUC and PUD

were not found to have significant increases in their thermal conductivity when studied, but due to their open cell nature, have the highest average thermal conductivities.

Previously, it was found that of the aged foams studied, the highest average thermal conductivity measured for PIBO and the lowest for PUXO (Figure 10). After aging and freeze thaw cycling, it was also found that PIB and PIA series foams exhibit the largest increases in thermal conductivity.

From the cell aspect ratio measurements, it was observed that PIAO possessed the most elongated cells. From the perspective of heat transfer, it was discussed in Section 2.2 that the length of the mean free path is proportional to thermal conductivity. If a cell becomes more elongated, the diameter of the cell is larger in the elongated axis. The path of a gas particle transferring energy would be longer before reaching the opposite cell wall that would absorb it.

From the cross-section areas, it was found that the open cell foams (PUC and PUD) possess the largest areas, which is consistent with their higher thermal conductivity. Meanwhile, the smallest cell areas were observed for the PUX foams which is consistent with their lower average thermal conductivity relative to the other foams studied. Considering only cell cross section area, and neglecting foam type, a large cell cross section area would be proportional to longer paths energy would travel. Again, the thermal conductivity would be higher because gaseous conduction would allow for more energy be transferred through the material as less cell walls are in the path to absorb it.

When it comes to the radiative component of heat transfer through a foam, the cell wall thickness is a significant component. The thicker the cell wall, the less transmission of energy through radiation occurs (Van De Walle et al., 2018). The foam sample with the thickest cell walls measured was the PUX series. As mentioned, the PUX foam has the lowest average thermal conductivity.

5.2 Is there a detectable change in pentane blowing agent concentration in polyisocyanurate foams that have undergone accelerated oven aging?

In terms of the method used to analyze the samples in the GC-FID, the behavior of the pentane analyte in the column was as expected. The pentane peaks were at around the 5-minute mark which is consistent with the results of Svanstrom and Ramnas (1995).

The research objective of quantifying the amount of blowing agent using GC-FID was accomplished. It was expected that overall the aged PI samples would result in less pentane

quantified than not aged samples. It was attempted to further distinguish the change in pentane concentration by sampling the samples at freezing temperature and room temperature. The results are shown in Figure 30 (comparing NA to O) and Table 15. For samples PIANA, PIAO and PIBO, a higher concentration of pentanes was measured in the cold samples than at the room temperature samples. Only, PIBNA resulted in a higher concentration of pentanes at room temperature. The reason for more pentanes quantified at the cold sample could be because the cold temperature slowed down the potential vaporization of the pentane. The boiling point of pentane is 36.06°C (Table 5), however, its saturation vapor pressure at 20-25°C is 58kPa (Haynes, 2009). Comparatively, the saturation vapor pressure of water at 25°C is 2.4kPa (Haynes, 2009). For this reason, pentane is considered a volatile organic compound that readily volatilizes or evaporates.

Another research objective met was to measure a difference in concentration between ages and not aged samples taken from the edge. Overall, measurements of pentane concentrations from all aged samples (PIAO, PIBOA at cold and room temperatures) were lower than not aged samples (PIANA, PIBNA, Table 15). This result is consistent with literature that states that diffusion occurs in polyisocyanurate foam which dilutes the blowing agent. However, a limitation in the methodology is that there is no control (known foam) sample to serve as a reference. In other words, it is not clear if the sample preparation technique resulted in the full extraction of all the pentane into the hexane solvent. Because the foam samples were not grinded, it was assumed that the quantities that were measured represent the amount of blowing agent in the polymer. This assumption was based off the methodology of Svanstrom *et al.* that tested samples in solid form and in a powdered form (Svanstrom and Ramnas, 1995).

Another comparison in pentane concentration was done between samples cut from the core and from the edge (Figure 32, Table 16). Consistently, a significantly higher concentration of pentane was measured at the core than at the edge. This was a reasonable result as the core of the sample only had two faced surfaces through which air could have diffused in while the edge had an exposed foam surface. The PIA samples overall resulted in lower concentrations of pentane compared to PIB sample. This finding was contrary to what would be expected based off the permeability of the facers. The PIA samples are faced with an impermeable sheet of foil, while, the PIB samples are faced with relatively more permeable felt. The cause of this could have been due to differences in how the products were prepared. It is unknown if there are differences in the composition of the A and B components between the PIA and PIB product.

That aside, the differences in the core measurements are also consistent with the findings between aged and not aged samples. Cores from not aged samples resulted in higher concentrations than aged (PIANA core = 0.602%w/w and PIAO=0.599%w/w while the PIBNA core = 0.609% compared to PIBO = 0.531%w/w, Table 16). This result demonstrated that although the dilution of blowing agent/ infiltration of air at the core of the material would be slower due to the lower number of faces through which diffusion should occur, there still is a measured reduction in pentane concentration.

In relation to the thermal conductivity measurements performed by Belanger (2018), the results collected parallel the aging, freeze-thaw and temperature influence on thermal conductivity. The measurements of blowing agent concentration taken between cold and room temperature samples provide insight into the temperature dependency of thermal conductivity. As shown in Table 15, samples analyzed at room temperatures resulted in a higher apparent blowing dilution compared to the samples analyzed at the cold temperature. However, the seemingly parallel behavior in thermal conductivity and differences in blowing agent concentration are only a correlation and do not imply causation. To confirm a fixed relationship between blowing agent concentration and thermal conductivity would require further analysis. To start, the samples could be exposed to more temperature environments at a similar range in temperatures to the range used to measure thermal conductivity. In addition, there would have to be controls put in place to assure other factors are not affecting either the thermal conductivity at a given temperature. Also, factors that could affect the concentration of blowing agent measured in the foams such as moisture should be taken in to consideration.

Further, Belanger (2018) demonstrated the increase in thermal conductivity of PIA and PIB foams after oven aging. In this study, the blowing agent concentrations have also shown a decrease in oven aged samples as shown in Table 15.

Polyurethane samples studied in the SEM section were omitted from the GC-FID portion of this study. The reason for this was due to the gas state of the blowing agents at room temperature. If the polyurethane foams were prepared as per the methodology, the samples would be left for three days at room temperature, processed through the SPE at room temperature by which it is not expected that any halogenated blowing agent would be captured.

6 Conclusions and Contributions

The SEM images provided insight into how the polyurethane and polyisocyanurate foam microstructure changes after oven aging and freeze thaw cycling. It was observed that aged PIAO and PUXO foams have smaller aspect ratios compared to their not aged or freeze-thaw cycled samples. This is an indication that after oven aging or freeze-thaw cycles, the cells in these samples undergo elongation. However, the measurements of cross-section area were found to be inconsistent and not indicative of a conclusive microstructure change. For PUX and PUD foams, an increase in cell wall thickness was observed, however, this was not consistent in the other foams studied. Therefore, there was no final relationship between cell wall thickness and foam treatment. Similarly, significant changes in cell strut thickness was not observed. In relation to the thermal conductivity studies of Belanger (2018), the measured cell attributes did correlate to the findings. The PUX foam with the lowest average thermal conductivity and minimal oven aging effects possessed the thickest cell walls and smallest cell cross section areas. The PIA foam which had one of the steepest thermal conductivity curves after oven aging and freeze-thaw cycling also was shown to undergo cell elongation after such treatments.

The GC-FID experiments were successful in quantifying some of the pentane blowing agent in PIA and PIB. It was discussed that the measured concentrations overall are low compared to similar literature studies and further analysis would be required. A decrease in pentane concentration was observed for all oven aged samples. Between trials at room temperature and cold temperatures, an increase in pentane concentration was measured. This was discussed to be due to pentane evaporation during the sample preparation. A significant increase in pentane concentration was observed between samples cut from the core and the edge of a foam sample, which further supports that diffusion through faced insulation occurs at the exposed edges. Between the two products, the foil faced PIA experienced a smaller difference in pentane concentration compared to the felt faced PIB. This is due to the lower gas permeability of foil compared to a felt facer. The decreases in pentane concentration supports the observations of thermal conductivity increase made by Belanger (2018).

6.1 Future Work

Future SEM work could include:

- Increasing the sample size of images would improve the cell geometry measurement data.
- Slicing the foam samples with sharper blades to avoid artifacts in SEM images.
- Accounting for the foam rise direction during future imaging would differentiate elongated cells due to foam rise from cellular elongation for compression.
- Converting the 2D SEM images into 3D using MATLAB and develop a model of heat transfer equations that could use measured geometry from SEM images.

Future work with GC-FID could include:

- Developing a methodology, similar to Svanstrom *et al.* (1996) that would isolate the foam sample, grind it, and test the concentration of pentanes released in gas phase. This would involve the headspace sampling of the foam in the solvent in an airtight vial. The GC would inject the gas that is above the solution and foam studied.
- Obtaining foam samples with known concentration of pentane and use it as a reference. Having a reference sample would allow for a more robust method and allow for the determination of method accuracy.
- The polyurethane samples which contain halogenated blowing agents could be analyzed in the future. The method outlined in this work could be used as a starting point and refined in order to identify the given blowing agent in the GC spectra of peaks. Given the gas phase at room temperature, headspace GC in the gas phase should also be considered as it may not be possible to extract the halogenated blowing agent in liquid phase.

A1. Appendix 1

A1.1 SEM Statistic Formulas

For all measurements taken from the SEM images, the following calculations were performed:

The mean of the collected measurements was calculated with the following formula:

$$\bar{x} = \left(\sum_{i=1}^n x_i \right) \frac{1}{n} = \frac{x_1 + x_2 + \dots + x_n}{n} \quad (20)$$

The standard deviation of the sample of the collected measurements was calculated with the following formula:

$$s = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n - 1}} \quad (21)$$

The standard error of the collected measurements was approximated with the following formula:

$$SE = \sigma_{\bar{x}} \approx \frac{s}{\sqrt{n}} \quad (22)$$

Where:

n is the number of measurements

x_i is the ith measurement

The standard error was used in the error bars for all SEM figures.

A1.2 SEM Measurement Data

The measurements made off the SEM images are listed in the following pages.

SEM ANALYSIS

PIANA

Date 28-Jun-18

Cell Wall Thickness		Cell Aspect Ratio		Cell Area		Cell Strut Thickness			
N	Length (um)	N	Length	Aspect Ratio	N	Area (um2)	N	Length	
	1	27.876	1	161.53	0.2964341	25	2132.454	1	27.122
	2	27.283	2	47.883		26	180.901	2	11.248
	3	29.584	3	89.783	0.6343406	27	2656.837	3	36.632
	4	25.935	4	56.953		28	3608.284	4	29.98
	5	24.92	5	44.813	0.8114181	29	4829.364	5	12.885
	6	27.315	6	55.228		30	6534.755	6	17.287
	7	23.041	7	90.823	0.8176783	31	5084.113	7	20.302
	8	18.308	8	74.264		32	3277.968	8	17.003
	9	25.802	9	102.616	0.9666914	33	9275.172	9	19.526
	10	25.011	10	99.198		34	5435.038	10	28.158
	11	17.734	11	152.893	0.7371561	35	1136.355	11	34.316
	12	18.634	12	112.706		36	9136.062	12	40.044
	13	22.087	13	107.047	0.4873373	37	6847.324	13	24.259
	14	24.396	14	52.168		38	1599.484	14	25.88
	15	19.828	15	148.276	0.5365366	AVG	4409.57936	15	25.825
	16	23.041	16	76.523		STD DEV	2662.86742	16	22.059
	17	22.061	17	142.624	0.4022324	N	431.974137	17	28.761
	18	23.534	18	57.368		STD ER		18	28.087
	19	21.427	19	78.736	0.7595235			AVG	24.9652222
	20	15.152	20	103.665				STD DEV	7.57688355
	21	21.347	21	48.483	0.6563744			N	18
	22	23.012	22	31.823				STD ER	1.78588858
	23	15.32	23	50.217	0.7396698				
	24	19.672	24	37.144					
	25	18.471		AVG	0.6537827				
	26	9.836		STD DEV	0.1843779				
	27	16.8		N	24				
	28	14.356		STD ER	0.037636				
	29	16.192							
	30	14.074							
	31	14.455							
	32	18.159							
	33	20.429							
	34	13.386							
	35	22.033							
	36	28.087							
	37	19.73							
	38	14.276							
	39	18.733							
	40	19.86	Average	20.2586279					
	41	13.061	Std Dev P	4.67445895					
	42	19.86	min	9.836					
	43	17.003	max	29.584					
			median	19.86					

PIAO

Date 28-Jun-18

Cell Wall Thickness		Cell Aspect Ratio			Cell Area		Cell Strut Thickness		
N	Length (um)	N	Length	Aspect Ratio	N	Area (um2)	N	Length	
	2	21.833	1	117.116	0.70851976	1	10918.186	1	29.146
	3	13.987	2	82.979		2	5627.955	2	23.128
	4	15.246	3	109.889	0.79187294	3	4487.559	3	26.908
	5	18.205	4	138.771		4	281.051	4	21.643
	6	11.873	5	126.616	0.4354426	5	6314.389	5	24.63
	7	13.654	6	55.134		6	1242.175	6	32.353
	8	13.505	7	65.453	0.80027632	7	17503.795	7	31.73
	9	16.791	8	81.788		8	8106.522	8	30.965
	10	9.595	9	73.742	0.65583422	9	3976.926	9	28.137
	11	17.463	10	112.44		10	6383.206	10	28.178
	12	20.606	11	67.386	0.66038808	11	14598.447	11	28.626
	13	20.606	12	102.04		12	8750.163	12	33.983
	14	23.746	13	57.661	0.45431696	AVG	7349.19783	13	25.416
	15	19.193	14	126.918	STD DEV	4853.89573		14	18.409
	16	18.876	15	52.999	0.52100983	STD ER	1401.199	15	39.287
	17	18.723	16	27.613				16	27.471
	18	22.913	17	90.319	0.47895278			17	18.283
	19	29.866	18	188.576				18	64.334
	20	13.596	19	81.331	0.67533837			19	27.419
	21	13.909	20	120.43			AVG		29.4761053
	22	14.536	21	58.935	0.78696471		STD DEV		9.612932
	23	14.965	22	74.889			N		19
	24	18.471	23	107.736	0.75211628		STD ER		2.20535785
	25	15.056	24	81.03					
	26	11.873	25	24.8	0.35141914				
	27	13.654	26	70.571					
	28	15.848	27	81.055	0.81535994				
	29	17.533	28	66.089					
	30	15.099	29	74.733	0.50977142				
	31	15.289	30	146.601					
	32	29.4	31	63.671	0.49864145				
	33	26.778	32	31.749					
	34	17.663	33	51.507	0.95638369				
AVG		17.58639394	34	53.856					
STD DEV		4.756037024	35	65.721	0.82959064				
N		9.595	36	79.221					
STD ER		29.866	37	85.683	0.68387195				
			38	125.291					
			39	24.186	0.4090863				
			40	59.122					
			AVG		0.62744036				
			STD DEV		0.16777848				
			N		40				
			STD ER		0.02652811				

PIAFT

Date 28-Jun-18

Cell Wall Thickness		Cell Aspect Ratio			Cell Area		Cell Strut Thickness	
N	Length (um)	N	Length	Aspect Ratio	N	Area (um2)	N	Length
1	29.146	1	61.382	0.57257192	1	4818.641	1	27.876
2	23.128	2	107.204		2	1519.743	2	27.283
3	26.908	3	86.923	0.6812006	3	1887.626	3	29.584
4	21.643	4	59.212		4	3683.999	4	25.935
5	24.63	5	45.612	0.90963843	5	3670.225	5	24.92
6	32.353	6	50.143		6	3670.225	6	27.315
7	31.73	7	54.698	0.66075542	7	1969.697	7	23.041
8	30.965	8	36.142		8	3077.365	8	18.308
9	28.137	9	62.287	0.84901314	9	8663.338	9	25.802
10	28.178	10	73.364		10	723.714	10	25.011
11	28.626	11	62.883	0.57877328	11	2352.502	11	17.734
12	33.983	12	36.395		12	2764.004	12	18.634
13	25.416	13	116.824	0.8366346	13	3042.929	13	22.087
14	18.409	14	97.739		14	4527.663	14	24.396
15	39.287	15	105.749	0.40379578	15	6030.188	15	19.828
16	27.471	16	42.701		16	117.654	16	23.041
17	18.283	17	103.68	0.83327546	AVG	3282.46956	17	22.061
18	64.334	18	86.394		STD DEV	1962.11939	18	23.534
19	27.419	19	47.043	0.54681887	STD ER	490.529846	19	21.427
20	12.132	20	25.724				20	15.152
21	16.443	21	78.853	0.77778107			21	21.347
22	15.16	22	101.382				AVG	23.0626667
23	19.092	23	63.857	0.85792401			STD DEV	3.63724682
24	18.356	24	74.432				N	21
25	17.792	25	49.242	0.57440803			STD ER	0.79371233
26	16.287	26	28.285					
27	16.287	27	50.78	0.83780172				
28	17.568	28	60.611					
29	16.978	29	11.978	0.81433136				
30	15.361	30	14.709					
31	16.162	AVG		0.71564825				
32	14.285	STD DEV		0.14140461				
33	10.025	N		30				
34	12.33	STD ER		0.02581683				
AVG	23.3618824							
STD DEV	10.0789033							
N	34							
STD ER	1.72851765							

PIBNA

Date 28-Jun-18

Cell Wall Thickness			Cell Aspect Ratio			Cell Area			Cell Strut Thickness				
N	Length (um)		N	Length		Aspect Ratio		N	Area (um2)		N	Length	
	1	13.343	1	54.676	0.54881484			1	1334.366		1	21.218	
	2	11.214	2	30.007				2	2037.42		2	21.741	
	3	10.844	3	43.942	0.55359337			3	785.124		3	16.544	
	4	14.462	4	24.326				4	4099.518		4	22.615	
	5	11.35	5	83.408	0.77527336			5	317.378		5	28.395	
	6	15.336	6	64.664				6	3700.069		6	20.334	
	7	11.394	7	54.05	0.9840148			7	3383.264		7	22.09	
	8	14.707	8	53.186				8	3977.273		8	29.153	
	9	12.985	9	21.811	0.76974921			9	3564.624		9	35.472	
	10	12.545	10	16.789				10	4379.017		10	39.96	
	11	13.896	11	103.05	0.39725376			11	1152.433		11	36.213	
	12	15.194	12	40.937				12	376.492		12	21.314	
	13	8.835	13	104.95	0.61265364			13	11551.309		13	19.218	
	14	9.105	14	64.298				14	6307.392		14	19.613	
	15	11.45	15	82.073	0.94779038			15	4536.846		15	17.444	
	16	7.593	16	77.788				16	4912.19		16	23.001	
	17	18.104	17	22.928	0.96392836			17	1101.928		17	24.263	
	18	12.474	18	23.786				18	6512.856		18	15.665	
	19	13.42	19	42.941	0.68307678	AV			3557.19439	AV		24.1251667	
	20	6.468	20	29.332		STDEV			2703.46853	STDEV		6.79608559	
	21	11.077	21	77.91	0.96345761	STD ER			637.213643	N		18	
	22	14.681	22	80.865						STD ER		1.60185274	
	23	8.601	23	84.639	0.68100994								
	24	11.111	24	57.64									
	25	13.868	25	65.056	0.59912998								
	26	11.35	26	38.977									
	27	15.135	27	51.787	0.82093432								
	28	12.299	28	63.083									
	29	8.992	29	116.74	0.73750214								
	30	7.84	30	86.096									
average	11.9891		31	159.376	0.59849036								
sttd p	2.66406697		32	95.385									
MIN	6.468		33	44.473	0.90922582								
MAX	18.104		34	40.436									
			35	85.36	0.75037488								
			36	64.052									
			37	115.316	0.71892886								
			38	82.904									
			AV		0.73764223								
			STDEV		0.16094249								
			N		38								
			STD ER		0.02610832								

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Cell Wall Thickness			Cell Aspect Ratio			Cell Area			Cell Strut Thickness		
N	Length (um)	N	Length	Aspect Ratio	N	Area (um2)			N	Length	
	1	12.163	1	157.279	0.63038931	1	13290.863			1	29.507
	2	22.428	2	99.147		2	5492.998			2	27.315
	3	7.889	3	110.684	0.55037765	3	1600.092			3	21.427
	4	14.471	4	60.918		4	673.209			4	30.17
	5	15.689	5	47.973	0.95529491	5	26069.215			5	20.469
	6	12.747	6	50.218		6	4683.77			6	25.285
	7	18.384	7	36.78	0.60579119	7	10636.478			7	23.957
	8	16.443	8	22.281		8	4114.44			8	23.957
	9	17.935	9	12.332	0.91429419	9	1041.667			9	20.384
	10	19.723	10	13.488		10	1199.495			10	22.061
	11	13.896	11	192.777	0.83034283	11	4808.884			11	20.469
	12	16.659	12	160.071		12	1066.919			12	26.504
	13	13.969	13	102.721	0.61430477	13	2387.511			13	19.403
	14	19.252	14	63.102		14	847.681			14	20.954
	15	16.49	15	148.098	0.66264906	15	222.681			15	20.692
	16	15.194	16	98.137		16	2718.664			16	22.371
	17	15.419	17	76.09	0.79862006	17	10179.637			17	20.844
	18	11.35	18	60.767		18	1311.983			18	28.848
	19	18.104	19	58.072	0.56517771	19	4430.096			19	28.477
	20	18.252	20	32.821	AV	5093.48858				20	24.665
	21	15.851	21	56.387	0.48665473 STDEV	6130.71956			AV	23.88795	
	22	22.003	22	27.441	STD ER	1406.48353			STDEV	3.41618692	
	23	17.532	23	58.412	0.54192632				N	20	
	24	17.59	24	31.655					STD ER	0.76388262	
	25	13.257	25	104.02	0.55144203						
	26	15.016	26	57.361							
	27	17.706	27	111.428	0.65395592						
	28	8.144	28	72.869							
	29	11.823	29	108.627	0.83389029						
	30	14.462	30	90.583							
	31	12.945	31	42.969	0.85103214						
	32	10.702	32	36.568							
	33	11.66	33	50.537	0.44721689						
	34	19.645	34	22.601							
	35	8.601	35	69.516	0.6597474						
	36	13.112	36	45.863							
	37	14.681	37	45.511	0.59948144						
	38	11.517	38	27.283							
	39	16.674	39	38.405	0.73412316						
	40	14.15	40	28.194							
	41	9.271	41	118.264	0.95770405						
	42	14.471	42	123.487							
	43	18.911	43	88.182	0.44082693						
	44	14.222	44	38.873							
AV	15.0091591		AV	0.67660195							
STDEV	3.43274469		STDEV	0.15555759							
STD ER	8.10094361		N	44							
			STD ER	0.02345119							

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Cell Wall Thickness		Cell Aspect Ratio		Cell Area		Cell Strut Thickness			
N	Length (um)	N	Length	Aspect Ratio	N	Area (um2)	N	Length	
	1	12.901	1	37.758	0.78690609	1	884.986	1	31.324
	2	13.969	2	29.712		2	2849.518	2	21.384
	3	14.394	3	88.388	0.48118523	3	1475.551	3	16.348
	4	8.081	4	42.531		4	203.168	4	26.216
	5	6.585	5	86.158	0.62175306	5	2750.23	5	16.91
	6	12.132	6	53.569		6	6889.922	6	20.505
	7	11.517	7	49.683	0.70879375	7	351.814	7	19.869
	8	14.222	8	35.215		8	1852.043	8	21.129
	9	12.747	9	86.152	0.729896	9	3988.177	9	17.375
	10	12.163	10	62.882		10	631.887	10	24.727
	11	12.142	11	57.485	0.81869971	11	317.378	11	27.801
	12	16.94	12	70.215		12	206.612	12	19.844
	13	12.657	13	126.539	0.59866128	13	825.872	13	18.31
	14	14.285	14	75.754		14	825.872	14	20.14
	15	11.834	15	59.684	0.61007975	15	2221.074	15	26.856
	16	13.334	16	36.412		16	2221.648	16	45.8
	17	12.163	17	64.419	0.66807929	17	2279.614	17	22.379
	18	19.285	18	43.037		18	1252.296	18	15.524
	19	15.689	19	77.053	0.9593252	19	2944.789	19	18.872
	20	13.646	20	80.32		20	4942.034	20	24.037
	21	14.285	21	40.47	0.5376081	21	207.185	21	17.831
	22	12.381	22	21.757		22	9604.568	22	20.167
	23	12.216	23	24.468	0.5555828	23	894.743	23	17.279
	24	11.123	24	13.594		24	318.526	24	22.395
	25	10.412	25	18.538	1.30753048	25	3811.41	25	20.668
	26	15.419	26	24.239		26	826.446	26	21.387
	27	13.739	27	42.999	0.6706435	27	1792.929	27	18.876
	28	11.214	28	28.837		28	2122.36	28	20.249
	29	12.636	29	70.939	0.59625876	29	4803.145	29	24.813
	30	8.222	30	42.298		30	1504.821	30	20.758
	31	11.111	31	53.723	0.87072576	31	3859.619	31	24.197
	32	8.586	32	46.778	AVG	2247.10442	32	21.595	
	33	18.21	33	56.198	0.93102957	STD DEV	2069.65283	33	25.358
	34	7.693	34	52.322	STD ER	371.720621	34	15.52	
	35	14.568	35	149.094	0.5712973			35	32.029
	36	11.973	36	85.177				36	28.352
	37	14.356	37	68.78	0.7716342			37	19.733
	38	16.319	38	53.073				38	21.92
	39	15.73	39	35.285	1.24180247			39	26.295
	40	16.287	40	43.817				AV	22.4300513
AVERAGE	12.92915	41	71.218	0.70267348				STDEV	5.44035815
STD DEV	2.73406524	42	50.043					N	39
MIN	6.585	43	100.344	0.74409033				STD ER	0.87115451
MAX	19.285	44	74.665						

Cell Aspect Ration (Cont.)

45	117.963	0.87263803		
46	102.939			
47	42.981	0.77739001	56	57.451
48	33.413		57	34.862
49	65.614	0.59536075	58	24.071
50	39.064		59	50.74
51	89.371	0.60346197	60	40.158
52	53.932		AV	0.72120263
53	63.382	0.24983434	STDEV	0.21843136
54	15.835		N	60
55	94.069	0.61073255	STD ER	0.02819937

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Cell Wall Thickness			Cell Aspect Ratio			Cell Area		Cell Strut Thickness				
N	Length (um)		N	Length		Aspect Ratio	N	Area (um2)		N	Length	
	1	10.552		1	139.453	0.75094118		1	36966.827		1	28.436
	2	13.252		2	104.721			2	6746.442		2	25.313
	3	13.807		3	260.275	0.46287965		3	6902.548		3	27.151
	4	15.301		4	120.476		AVERAGE	16871.939			4	27.851
	5	13.648		5	103.125	0.78065455	STD DEV	14209.3745			5	24.598
	6	12.261		6	80.505		SE	8203.78619			6	25.378
	7	9.639		AV		0.66482512					7	32.657
	8	12.968		STDEV		0.14331132					8	26.282
	9	10.853		N		6					9	29.815
	10	8.41		STD ER		0.0585066					10	38.626
	11	12.643									11	23.369
	12	11.978									12	31.702
	13	12.546									13	31.043
	14	9.492									14	24.295
	15	13.301									15	29.798
	16	15.288									16	29.836
	17	14.498									17	29.319
	18	18.514									18	21.487
	19	12.321									19	22.884
	20	12.591									20	24.948
	21	12.103									21	32.863
	22	12.425									22	32.453
	23	11.52									23	31.305
	24	13.72									24	20.434
	25	11.043									25	20.707
	26	10.065									26	25.116
	27	14.85									27	25.658
	28	11.96									28	22.09
	29	14.061									29	25.871
	30	12.699									30	24.598
	31	14.218									31	32.422
	32	13.214								AV	27.3646774	
	33	13.083								STDEV	4.20654957	
AVERAGE	12.6916364									STD ER	0.75551861	
STD DEV	1.92775696											
MIN	8.41											
MAX	18.514											
N	33											
STANDARD EF	0.33557941											

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Cell Wall Thickness			Cell Aspect Ratio			Cell Area		Cell Strut Thickness	
N	Length (um)		N	Length	Aspect Ratio	N	Area (um2)	N	Length
	1	14.773	1	133.307	0.89424411	1	11326.331	1	21.91
	2	8.385	2	119.209		2	1853.191	2	21.928
	3	9.477	3	58.008	0.83672942	3	3227.158	3	29.643
	4	6.744	4	48.537		4	1206.382	4	24.374
	5	9.878	5	70.887	0.94056738	5	8833.219	5	21.617
	6	9.355	6	66.674		6	6693.641	6	19.298
	7	9.477	7	58.3	0.46852487	7	13996.212	7	23.581
	8	8.646	8	27.315		8	33989.325	8	23.93
	9	6.061	9	122.685	0.60036679	9	9268.251	9	20.824
10	8.333		10	73.656		AV	10043.7456	10	22.524
11	7.623		11	159.693	0.49020934	STD DEV	9402.11444	11	21.723
12	13.451		12	78.283		SE	3134.03815	12	22.637
13	15.618		13	329.014	0.50702098			13	21.433
14	9.679		14	166.817				14	21.811
15	11.249		15	179.595	0.47678387			15	24.768
16	9.856		16	85.628				16	23.435
17	10.304		AV		0.65180585			17	22.371
18	10.525		STDEV		0.19049375		AV	22.8121765	
19	10.853		N		16		STDEV	2.15404944	
20	11.262		STD ER		0.04762344		N	17	
21	14.374						STD ER	0.52243373	
22	13.657								
23	12.46								
24	14.753								
25	8.843								
26	11.3								
27	11.767								
28	7.809								
29	11.52								
30	6.35								
31	17.916								
32	11.185								
33	11.669								
AVERAGE	10.7621818								
STD DEV	2.73033246								
MIN	6.061								
MAX	17.916								

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Cell Wall Thickness		Cell Aspect Ratio		Cell Area		Cell Strut Thickness			
N	Length (um)	N	Length	Aspect Ratio	N	Area (um2)	N	Length	
	1	13.344	1	77.675	0.4555665	1	4886.938	1	24.481
	2	10.727	2	170.502		2	11153.007	2	29.855
	3	13.772	3	69.871	0.86357513	3	7887.397	3	18.841
	4	10.853	4	80.909		4	7887.397	4	17.995
	5	11.262	5	131.442	0.51875352	5	1385.445	5	31.827
	6	10.504	6	68.186		6	2936.18	6	50.698
	7	10.504	7	50.99	0.69022931	7	7774.334	7	22.371
	8	11.011	8	73.874		8	7747.934	8	18.138
	9	12.506	9	104.738	0.87848727	9	7535.009	9	16.546
10	12.08	10	92.011		AV	6577.07122	10	19	
11	16.389	11	92.011	0.53184945	STDEV	2811.89379	11	23.258	
12	17.903	12	48.936		STD ER	937.29793	12	26.311	
13	12.879	13	35.915	0.24307459			13	23.091	
14	15.95	14	147.753				14	22.087	
15	12.546	15	68.126	0.55978176			15	24.577	
16	17.51	16	121.701				16	27.545	
17	16.502	17	75.758	0.6005438			17	20.278	
18	12.367	18	126.149				18	15.34	
19	12.868	19	108.121	0.93082579			19	24.665	
20	11.669	20	116.156				20	25.455	
21	12.367		AV	0.62726871			21	24.677	
22	13.488		STDEV	0.19643535			22	26.475	
23	13.726		N	20			23	20.626	
24	11.669		STD ER	0.04392428			24	19.477	
25	13.258						25	21.334	
26	9.775						26	18.688	
27	14.753						27	21.243	
28	13.684						28	28.145	
29	13.214						29	21.387	
30	13.552						30	17.625	
AVERAGE	13.0877333					AV	23.4012		
STD DEV	2.06013402					STDEV	6.42583518		
MIN	9.775					STD ER	1.17319163		
MAX	17.903								
SE	0.37612729								

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Cell Wall Thickness		Cell Aspect Ratio			Cell Area		Cell Strut Thickness		
N	Length (um)	N	Length	Aspect Ratio	N	Area (um2)	N	Length	
	1	14.816	1	156.352	0.59288656	1	11787.76	1	23.788
	2	15.382	2	92.699		2	10938.94	2	22.384
	3	12.268	3	149.672	0.60992036	3	2252.066	3	23.776
	4	13.392	4	91.288		4	7749.082	4	21.928
	5	16.213	5	178.808	0.42716769	5	2120.638	5	21.236
	6	15.137	6	76.381		6	3186.983	6	20.909
	7	13.726	7	105.891	0.35194681	7	14214.3	7	21.439
	8	9.107	8	37.268		8	18875.12	8	20.762
	9	7.147	9	74.065	0.61142224	9	29899.56	9	25.777
	10	11.42	10	45.285		10	4841.024	10	26.073
	11	7.519	11	116.012	0.1927473	av	10586.55	11	21.266
	12	15.246	12	22.361	stdev	8326.894	12	28.066	
	13	16.288	13	161.163	0.43733984	SE	2633.195	13	24.431
	14	14.792	14	70.483				14	21.098
	15	13.969	15	221.492	0.41398786			15	17.261
	16	11.888	16	91.695				16	28.233
	17	14.424	17	246.179	0.52067804			17	19.495
	18	11.063	18	128.18				18	17.49
	19	12.929	19	86.944	0.90729665			19	22.325
	20	11.52	20	78.884				20	20.434
	21	12.494	21	167.066	0.68176649			21	24.763
	22	10.767	22	113.9				22	20.732
	23	11.742	23	64.106	0.6585343			23	23.823
	24	11.62	24	42.216				24	28.606
	25	13.149	AV	0.53380786				25	24.326
	26	13.871	STDEV	0.17632162				26	22.061
	27	13.684	N	24				27	37.404
	28	11.797	STD ER	0.0359915				28	32.121
	29	15.787						29	14.681
	30	15.326						30	24.248
AVERAGE	12.9494333					AV	23.3645333		
STD DEV	2.3149719					STDEV	4.39552535		
MIN	7.147					N	30		
MAX	16.288					STD ER	0.80250946		

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Cell Wall Thickness		Cell Aspect Ratio		Cell Area		Cell Strut Thickness	
N	Length (um)	N	Length	Aspect Ratio	Measuremen Area (um2)	N	Length
1	14.464	1	129.191	0.81980943	43 11408.976	1	19.569
2	15.981	2	105.912		44 5304.752	2	28.145
3	14.198	3	99.949	0.70833125	45 11417.585	3	24.925
4	17.609	4	70.797		46 2525.826	4	21.684
5	15.227	5	126.315	0.90249496	47 1508.838	5	24.563
6	17.18	6	139.962		48 9006.543	6	21.989
7	15.326	7	36.76	0.64928642	49 1320.592	7	19.569
8	15.424	8	56.616		50 1907.713	8	18.296
9	12.879	9	56.093	0.95537615	51 5510.79	9	22.233
10	14.394	10	58.713		52 2614.21	10	30.156
11	15.755	11	98.523	0.78662962	53 2714.073	11	25.927
12	13.578	12	125.247		54 2776.056	12	23.329
13	13.684	13	58.647	0.5272563	55 3282.254	13	26.841
14	16.358	14	30.922		56 3719.582	14	20.079
15	13.871	15	90.021	0.97092227	57 5820.133	15	30.665
16	12.292	16	92.717		58 7334.711	16	20.899
17	13.061	17	60.346	0.85341199	59 4126.492	17	18.939
18	11.539	18	51.5		60 3521.006	18	22.515
19	13.726	19	71.6	0.62641061	AVERAGE 4767.78511	19	19.244
20	13.689	20	44.851		STD DEV 3060.80399	20	21.377
21	15.859	21	99.315	0.6339123	SE 395.148096	21	29.963
22	10.178	22	62.957			22	36.578
23	11.669	23	79.488	0.62746578		23	41.501
24	18.202	24	49.876			24	24.694
25	13.52	25	81.037	0.7025186		25	22.178
26	13.451	26	56.93			26	20.398
27	15.859	27	63.606	0.93560249		27	24.911
28	12.733	28	67.984			28	21.347
29	12.145	29	61.341	0.97433169		29	31.167
30	10.164	30	62.957			AV	24.60968966
31	17.576	31	86.485	0.56918541		STDEV	5.397406664
32	14.234	32	49.226			N	29
33	13.344	33	96.618	0.85469581		STD ER	1.002273256
34	21.812	34	82.579				
35	11.364	35	96.085	0.90946522			
36	12.032	36	105.65				
37	18.071	37	129.46	0.54460065			
AVERAGE	14.3904865	38	70.504				
STD DEV	2.40459874	39	70.35	0.79107163			
MIN	10.164	40	88.93				
MAX	21.812	41	82.789	0.71064997			
		42	58.834				
		AV		0.76444898			
		STDEV		0.14368636			
		N		42			
		STD ER		0.02217129			

PUXNA

Date 9-Jul-18

Cell Wall Thickness		Cell Aspect Ratio			Cell Area		Cell Strut Thickness		
N	Length (um)	N	Length	Aspect Ratio	N	Area (um2)	N	Length	
	1	14.498	1	39.888	0.72451185	1	7261.249	1	21.236
	2	14.734	2	55.055		2	1301.079	2	22.245
	3	12.546	3	77.296	0.97086525	3	2323.232	3	25.258
	4	16.654	4	75.044		4	608.356	4	33.94
	5	19.348	5	28.79	0.95934688	5	4465.106	5	22.817
	6	11.669	6	30.01		6	6845.73	6	24.058
	7	23.987	7	62.299	0.8767717	7	249.656	7	20.707
	8	15.95	8	54.622		AVERAGE	3293.48686	8	26.092
	9	20.888	9	59.807	0.42249235	STD DEV	2702.38458	9	21.433
	10	16.654	10	25.268		SE	1021.40536	10	29.193
	11	15.823	11	101.069	0.82388269			11	37.058
	12	13.392	12	83.269				12	36.156
	13	17.641	13	22.022	0.93724457			13	32.828
	14	14.498	14	20.64				14	32.735
	15	12.957	AV	0.81644504				15	26.844
	16	17.379	STDEV	0.17976338				16	24.768
	17	12.103	N	14				17	24.67
	18	13.252	STD ER	0.04804379				18	27.892
	19	17.461						19	32.855
	20	17.515						20	35.053
	21	18.973						21	30.825
	22	25.449						22	27.519
	23	12.945						23	25.253
	24	18.561						24	20.559
	25	15.349						25	30.764
AVERAGE	16.40904							26	32.594
STD DEV	3.433158586							27	28.61
MIN	11.669							28	30.041
MAX	25.449							29	35.501
STANDARD EF	0.68663							30	35.314
								31	22.176
							AV	28.290129	
							STDEV	5.08453632	
							STD ER	0.91320968	

PUXO

Date 29-Jun-18

Cell Wall Thickness		Cell Aspect Ratio		Cell Area		Cell Strut Thickness			
N	Length (um)	N	Length	Aspect Ratio	N	Area (um2)	N	Length	
	1	16.825	1	45.399	0.6046609	1	1029.04	1	21.121
	2	23.427	2	27.451		2	583.104	2	28.46
	3	12.056	3	30.087	0.86824875	3	1989.784	3	27.275
	4	14.319	4	26.123		4	207.759	4	31.063
	5	16.667	5	36.366	0.76747511	5	1843.434	5	27.367
	6	25.682	6	27.91		6	519.399	6	30.887
	7	14.734	7	24.621	0.76983928	7	1411.272	7	30.778
	8	14.734	8	31.982		8	1225.321	8	27.814
	9	8.588	9	72.626	0.48818605	9	899.908	9	25.011
	10	14.734	10	35.455		10	599.174	10	25.092
	11	14.572	11	22.881	0.51955771	11	1832.53	11	18.198
	12	17.15	12	11.888		12	886.708	12	22.352
	13	19.885	13	49.714	0.99350284	13	1898.531	13	31.678
	14	20.303	14	49.391		14	1786.042	14	35.735
	15	18.107	15	15.914	0.82895564	15	1427.916	15	36.213
	16	14.709	16	13.192		16	94.123	16	20.899
	17	17.609	17	86.452	0.67754361	17	1495.638	17	22.505
	18	20.43	18	58.575		18	525.138	18	27.485
	19	19.244	19	40.266	0.74464809	AVERAGE	1125.26783	19	17.25
	20	25.072	20	29.984		STD DEV	598.075479	20	14.734
	21	17.346	21	31.291	0.6322947	SE	140.967742	21	23.84
	22	15.859	22	49.488				22	24.254
	23	18.323	23	43.864	0.62867044			23	22.601
	24	13.192	24	27.576				24	22.425
	25	15.932	25	56.582	0.55176558			25	22.806
	26	14.239	26	31.22				26	27.662
	27	15.461	27	55.588	0.72387925			27	24.396
	28	13.871	28	40.239				28	27.109
	29	15.023	29	71.346	0.39395341			29	17.995
	30	18.107	30	28.107				30	23.258
AVERAGE	16.8733333		31	44.201	0.6079048			31	25.919
STD DEV	3.61397088		32	26.87				32	29.233
MIN	8.588		33	11.834	0.87737248			33	31.111
MAX	25.682		34	13.488				34	30.871
			35	30.665	0.72721344			35	30.609
			36	22.3				36	29.732
			37	43.562	0.99129976			AVERAGE	25.9927222
			38	43.183				STD DEV	4.9331632
		AVERAGE		38.5914	0.69244985			N	36
		STD DEV		18.5806985	0.16995283			STANDARD EF	0.82219387
		N			38				
		STANDARD EF			0.02756999				

PUXFT

Measuremen 29-Jun-18

Cell Wall Thickness		Cell Aspect Ratio		Cell Area		Cell Strut Thickness			
N	Length (um)	N	Length	Aspect Ratio	N	Area (um2)	N	Length	
	1	16.667	1	86.087	0.48426592	1	2855.831	1	41.128
	2	16.667	2	41.689		2	6378.558	2	31.624
	3	11.858	3	97.413	0.85413651	3	4436.983	3	29.343
	4	17.441	4	83.204		4	830.464	4	42.754
	5	12.127	5	87.072	0.84826351	5	1337.236	5	34.968
	6	20.388	6	73.86		6	223.255	6	29.555
	7	13.938	7	39.775	0.67856694	7	3787.879	7	49.904
	8	19.646	8	26.99		8	6367.654	8	52.274
	9	17.948	9	103.171	0.67580037	9	1923.209	9	34.488
	10	20.108	10	69.723		10	7703.742	10	32.253
	11	17.807	11	23.134	0.54724648	11	1042.241	11	31.64
	12	21.855	12	12.66		12	3445.248	12	32.377
	13	23.118	13	122.87	0.45829739	13	7626.263	13	25.982
	14	15.909	14	56.311		14	10035.583	14	29.867
	15	17.23	15	148.135	0.59920343	15	1491.047	15	26.139
	16	18.327	16	88.763	AVERAGE	3965.67953	16	28.437	
	17	16.463	17	127.057	0.59500067	STD DEV	2911.4778	17	35.097
	18	17.967	18	75.599	SE	751.740337	18	24.375	
	19	24.735	19	101.868	0.73869125			19	25.336
	20	21.454	20	75.249				20	47.008
	21	21.737	21	49.226	0.64214033			21	39.953
	22	18.871	22	31.61				22	37.239
	23	24.019	23	62.944	1.28917768			23	33.204
	24	23.534	24	81.146				24	41.537
	25	14.153	25	104.651	0.80240036			25	27.338
	26	28.03	26	83.972			AVERAGE	34.5528	
AVERAGE	18.9229615		27	122.48	0.89843463		STD DEV	7.5529605	
STD DEV	3.85351018		28	136.326			N	25	
MIN	11.858		29	98.95	0.83345124		STANDARD EF	1.5105921	
MAX	24.735		30	82.47					
		AVERAGE	80.2312308	0.73897494					
		STD DEV	35.2598708	0.73056813					
		N		0.73056813					
		STANDARD EF		0.85473278					

A2. Appendix 2

A2.1 Method of quantitation

The concentration of pentanes in the analyzed foams were quantified using the areas under the peaks produced by the GC-FID. The outputted data from the machine is: retention time, peak width, peak area, peak height and area percentage. The area percentage output represents the area of a given peak at a certain time determined from the width and height. The sum of all peak areas in the retention time range for pentanes equaled the percentage of pentane in the sample by volume.

A2.2 Method blank

In order to account for noise that may arise from the FID, a method blank was run through. The blank consisted of 100% hexanes and was analyzed using the same Method 2 as the rest of the samples. Any signal at the retention time range of 5.0-5.7 minutes was subtracted from all samples to account for detector noise.

$$\Sigma \text{ sample peak areas from time} = 5.0 - 5.7 \text{ mins} - \Sigma \text{ blank peak areas from time} = 5.0 - 5.7 \text{ mins} \quad (23)$$

A2.3 Error Analysis

The error associated with the measurements in the GC-FID analysis was calculated from the standard deviation. The calculation for percent difference values in Tables 15 and 18 is as follows:

$$\frac{(\text{oven aged concentration} - \text{not aged concentration})}{\text{not aged concentration}} \times 100\% \quad (24)$$

The error associated with the percent difference calculated is the standard deviation between the measurements of oven aged and not aged sample concentrations.

A2.4 Foam Sample Concentrations Calculation

The final concentrations of each trial were determined by the following calculation steps:

1. The peak area percent was converted into a fraction:

$$\frac{\text{peak area percent } [\%v_{\text{pentanes}}/v_{\text{hexanes}}]}{100\%} = \text{peak area factor } v_{\text{pentanes}}/v_{\text{hexanes}} \quad (25)$$

2. The peak area factor $[v_{\text{pentanes}}/v_{\text{hexanes}}]$ was converted to a volume of pentanes using the known total volume of the sample (15mL):

$$\text{peak area factor } \frac{v_{\text{pentanes}}}{v_{\text{hexanes}}} \times 15\text{mL}_{\text{hexanes}} = v_{\text{pentanes}} \quad (26)$$

3. The volume of pentanes was converted to weight of hexanes using the density of pentane ($\rho = \frac{0.5g}{mL}$)

$$v_{pentanes} \times \rho \left[\frac{g}{mL} \right] = g_{pentanes} \quad (27)$$

4. The weight of pentanes in the sample was then divided by the weight of the initial foam cube sample to determine the proportion, or weight factor, of pentanes to the rest of the foam. The value was then multiplied by 100 to be expressed as a percentage of weight of pentanes in the foam sample.

$$\left(\frac{g_{pentanes}}{g_{foam\ sample}} \right) \times 100\% = \% \frac{w_{pentanes}}{w_{foam}} = \quad (28)$$

A2.5 Foam Sample Weights

The foam sample weights measured on an analytical balance are tabulated below:

Table 19 PIA sample weights

PIA	Cold Edge		Room Temperature Edge	
Trial #	NA Weight (g)	A Weight (g)	Weight (g)	Weight (g)
1	0.4917	0.5001	0.5014	0.5056
2	0.4654	0.4948	0.5008	0.5073
3	0.4960	0.5058	0.5088	0.5027

Table 20 PIB sample weights

PIB	Cold Edge		Room Temperature Edge	
Trial #	Weight (g)	Weight (g)	Weight (g)	Weight (g)
1	0.5045	0.4992	0.5018	0.4992
2	0.5071	0.5066	0.4999	0.5066
3	0.4965	0.4971	0.5085	0.4971

Table 21 PIA core pentane sample weight

PIA	Core	
Trial #	Weight (g)	Weight (g)
1	1.099	1.060
2	1.070	1.081
3	1.118	1.103

Table 22 PIB core pentane sample weight

PIB	Core	
Trial #	Weight (g)	Weight (g)
1	1.108	1.038
2	1.101	0.991
3	1.139	0.902

A2.6 Concentration of Pentane per Sample

The concentrations for each foam sample trial are in the following tables:

Table 23 PIA edge pentane loss

PIA	Cold Edge		Room Temperature Edge	
Trial #	NA Concentration (%w/w)	A Concentration (%w/w)	NA Concentration (%w/w)	A Concentration (%w/w)
1	0.091	0.133	0.115	0.087
2	0.133	0.111	0.078	0.096
3	0.123	0.061	0.122	0.070
Average (%w/w)	0.115	0.102	0.105	0.084

Standard Deviation	0.022	0.037	0.024	0.013
Percent difference	-11.8%		-19.8%	

Table 24 PIB edge pentane loss

PIB	Cold Edge		Room Temperature Edge	
Trial #	NA Concentration (%w/w)	A Concentration (%w/w)	NA Concentration (%w/w)	A Concentration (%w/w)
1	0.291	0.060	0.464	0.064
2	0.250	0.118	0.471	0.073
3	0.390	0.121	0.441	0.072
Average (%w/w)	0.310	0.100	0.459	0.070
Standard Deviation	0.072	0.034	0.016	0.005
Percent difference	-67.9%		-84.8%	

Table 25 PIA core pentane loss

PIA	Core	
Trial #	NA Concentration (%w/w)	A Concentration (%w/w)
1	1.099	1.060
2	1.070	1.081
3	1.118	1.103
Average (%w/w)	1.096	1.081
Standard Deviation	0.024	0.021
Percent difference	-1.3%	

Table 26 PIB core pentane loss

PIB	Core	
	NA Concentration (%w/w)	A Concentration (%w/w)
Trial #		
1	1.108	1.038
2	1.101	0.991
3	1.139	0.902
Average (%w/w)	1.116	0.977
Standard Deviation	0.020	0.069
Percent difference	-12.5%	

A2.7 GC-FID Data

The numbers retrieved from the GC-FID spectra are listed in the following pages.

Foam Samples from the Edge and Sampled at Room Temperature

Sample	Location	Sampling Temp.												
PIANA 1	EDGE	ROOM TEMP.												
#	Retention Time	Peak Type	Peak Width	Area	Height	Area %	#	Retention Time	Peak Type	Peak Width	Area	Height	Area %	
1	0.016666668	PB	0.008022267	2.741684198	5.311340809	9.90282E-07		35	2.885555506	VB	0.114984378	159.1252441	23.06476402	5.74752E-05
2	0.155000001	PP	0.014846654	3.221926928	3.465506315	1.16374E-06		36	3.221666574	BV	0.074687161	91.72863007	14.72292137	3.31319E-05
3	0.221000001	VV	6	11.21786022	7.883523464	4.05183E-06		37	3.346333265	VV	0.043357689	29.2820797	11.25601196	1.05765E-05
4	0.244259253	VV	0.014375122	53.43755341	61.9560585	1.93014E-05		38	3.428703785	VP	0.015426874	9.648695946	8.383791924	3.48506E-06
5	0.288809538	VV	0.032938015	66.23696136	24.97783089	2.39244E-05		39	3.462500095	VV	0.013835796	6.15265274	6.624427795	2.22231E-06
6	0.351666659	VV	0.058153283	111.6804123	23.62394524	4.03384E-05		40	3.523333311	VV	0.032845091	18.2632103	7.139223576	6.59657E-06
7	0.471666664	VV	0.043542471	58.85731506	17.36534691	2.12589E-05		41	3.637857199	VV	0.074832544	100.1252823	16.49140739	3.61647E-05
8	0.550000012	VV	0.045071892	63.020504	20.96377373	2.27627E-05		42	3.715833426	VV	0.026095418	33.10268402	16.72184372	1.19565E-05
9	0.675952375	VV	0.061365932	131.1414185	25.77207565	4.73676E-05		43	3.862999916	VV	0.06416969	129.2017517	25.47509956	4.6667E-05
10	0.736999989	VV	0.067104362	154.2689819	29.4546051	5.57211E-05		44	3.970555544	VV	0.077070653	186.9131012	29.4401722	6.7512E-05
11	0.827083349	VV	0.039629474	72.23305511	30.37850761	2.60902E-05		45	4.08772707	VV	0.095097989	263.427124	36.11502838	9.51485E-05
12	0.889999986	VV	0.037953224	82.09754944	27.40247345	2.96532E-05		46	4.142499924	VV	0.064785413	182.6437836	33.93852615	6.597E-05
13	0.911666691	VV	0.035196926	83.39764404	30.21942329	3.01228E-05		47	4.25555563	VV	0.05218152	114.7962646	27.23156548	4.14638E-05
14	1.001666665	VV	0.093306415	190.5578003	24.3484993	6.88285E-05		48	4.33833313	VV	0.021335488	30.86558723	20.77233124	1.11485E-05
15	1.129999995	VV	0.024929132	29.38855743	15.63520718	1.0615E-05		49	4.366111279	VV	0.020063974	29.91077995	21.7230854	1.08036E-05
16	1.150555611	VV	0.056675896	52.8947525	15.55474663	1.91053E-05		50	4.400714397	VV	0.028313594	38.95077515	21.32093239	1.40688E-05
17	1.236111164	VV	0.015975727	8.157096863	8.509886742	2.9463E-06		51	4.469761848	VV	0.075565122	126.8335571	20.39168167	4.58116E-05
18	1.296666622	VP	0.027354423	12.57645512	6.870955944	4.54255E-06		52	4.555666447	VV	0.044071879	63.4758873	18.03063393	2.29271E-05
19	1.346666694	VV	0.027365047	7.456246376	3.723062992	2.69316E-06		53	4.646666527	VV	0.023079347	18.72980499	12.7940712	6.76511E-06
20	1.408333302	VV	0.032875117	22.67095566	8.566590309	8.18863E-06		54	4.685476303	VV	0.050864015	52.13368607	12.44732666	1.88304E-05
21	1.453181863	VV	0.028573634	24.12828445	10.59308147	8.71501E-06		55	4.812666893	VP	0.044808883	48.04764557	13.40757751	1.73546E-05
22	1.542777777	VV	0.047699105	42.13421249	10.99721909	1.52187E-05		56	5.000237942	VP	0.047067814	29.08353233	8.262135506	1.05048E-05
23	1.597499967	VB	0.044014309	24.02071381	9.095797539	8.67615E-06		57	5.38166666	VV	0.139573753	5.42E+03	499.1435852	0.001955977
24	1.809444427	BP	0.089667276	21.56594086	2.903087139	7.7895E-06		58	5.613541603	VV	0.091912255	8.09E+03	1098.32019	0.002921316
25	2.180238008	VV	0.115561582	142.0544891	14.59386444	5.13093E-05		59	5.717679501	VV	0.075951725	7.84E+03	1366.332397	0.002832126
26	2.266666651	VV	0.032960344	45.00580597	19.47555542	1.62559E-05		60	6.348642826	VV	0.119820252	101466840	11402205	36.64927821
27	2.356666565	VV	0.060813002	114.0316467	23.01159286	4.11876E-05		61	6.510320187	VV	0.111792952	126705568	14962926	45.76537136
28	2.470833302	VV	0.073735945	160.458252	26.4648056	5.79567E-05		62	6.842407703	VV	0.087751061	45935604	6982514	16.59169371
29	2.512142897	VV	0.028637478	78.44756317	34.35841751	2.83348E-05		63	7.26890564	VV	0.06507846	2682999.25	578819.3125	0.969084934
30	2.552142859	VV	0.031664282	90.2275238	35.48558426	3.25897E-05		64	7.879333496	VV	0.043949388	225.4430389	62.69862366	8.14288E-05
31	2.622333288	VV	0.040032919	101.2461777	33.71701431	3.65696E-05		65	7.962618828	VV	0.021691129	65.85958099	43.43204117	2.37881E-05
32	2.652777672	VB	0.060644396	168.4584045	33.51297379	6.08463E-05		66	7.988333225	VV	0.023787832	68.25950623	36.55072021	2.4655E-05
33	2.755000114	BV	0.056864619	169.2966919	36.00003052	6.11491E-05		67	8.045666695	VV	0.039305821	77.43698883	24.21690559	2.79698E-05
34	2.839999914	VV	0.036025755	61.64979553	28.52116776	2.22676E-05		68	8.093333244	VB	0.047985662	52.0736351	18.08652496	1.88087E-05

Foam Samples from the Edge and Sampled at Room Temperature

69	8.286999702 BP	0.019616054	7.481837273	6.356899261	2.7024E-06	107	12.22071457 VV	0.132030949	1420.754028	128.4611511	0.000513169
70	8.322036743 VP	0.021860981	15.64618492	9.190826416	5.65132E-06	108	12.3320837 VV	0.05405695	621.9667969	139.3911743	0.000224651
71	8.395000458 VP	0.015920741	8.494459152	7.669995785	3.06815E-06	109	12.56611156 VV	0.163069084	2082.020996	152.7024841	0.000752015
72	8.420000076 VV	0.019801535	7.857721329	5.801551342	2.83817E-06	110	12.63000011 VV	0.040758073	483.0575256	153.3179169	0.000174478
73	8.442036629 VV	0.054999262	49.13835144	10.8167696	1.77485E-05	111	12.7543335 VV	0.079596914	1029.106201	165.3822174	0.000371708
74	8.561666489 VV	0.039310861	30.90582466	9.663887024	1.1163E-05	112	12.88254356 VV	0.093235023	1316.972046	176.0990601	0.000475683
75	8.636904716 VB	0.046540752	34.9005394	9.571362495	1.26059E-05	113	13.00192261 VV	0.072865024	2141.155518	385.1096497	0.000773374
76	8.832500458 BP	0.016187554	5.604836464	4.608952522	2.02444E-06	114	13.19123173 VV	0.105220027	1756.053467	219.7734985	0.000634277
77	8.868888855 VV	0.071015082	27.00494385	4.632173538	9.75404E-06	115	13.38598061 VV	0.152235165	3069.102539	239.931366	0.001108543
78	9.041110992 VV	0.026299387	24.89426613	11.95228195	8.99168E-06	116	13.63500023 VV	0.147452176	3207.158447	257.2450256	0.001158408
79	9.109999657 VV	0.044709675	34.61260605	12.90272808	1.25019E-05	117	13.71928596 VV	0.071785517	1628.565674	272.2618408	0.000588229
80	9.135666847 VP	0.06067444	69.75534058	13.86996174	2.51953E-05	118	13.8008337 VV	0.039864101	853.2543945	270.0360107	0.000308191
81	9.252333641 VV	0.097051546	65.19178009	11.19538784	2.35469E-05	119	13.82388878 VV	0.022379583	403.8405762	271.0924377	0.000145865
82	9.425476074 VP	0.06192394	46.60722733	12.54421329	1.68343E-05	120	13.84766674 VV	0.049183231	803.348938	272.22995	0.000290165
83	9.573571205 VV	0.016929524	9.173361778	7.683145523	3.31337E-06	121	13.94439411 VV	0.088135302	1807.294067	280.6283875	0.000652785
84	9.592843056 VV	0.029506102	30.32706261	12.86317158	1.0954E-05	122	14.03766632 VV	0.048320662	1146.805298	288.8428955	0.00041422
85	9.792499542 VV	0.033919886	25.59259415	9.35405159	9.24391E-06	123	14.07433319 VV	0.017660892	367.5023193	292.4465332	0.00013274
86	9.834393501 VV	0.028977346	37.77048492	18.37800026	1.36425E-05	124	14.10166645 VV	0.045086544	1084.523438	293.6595459	0.000391724
87	9.957820892 VV	0.050569236	588.0396729	169.1050568	0.000212397	125	14.17749977 VV	0.040888369	861.6316528	296.6318359	0.000311217
88	10.05416679 VV	0.028350543	48.94807434	22.52657318	1.76798E-05	126	14.33785725 VV	0.117696181	2667.222656	303.0063782	0.000963387
89	10.17000008 VV	0.073527664	192.3543243	33.23280716	6.94773E-05	127	14.35214329 VV	0.062995695	1583.37207	302.8520813	0.000571905
90	10.38166714 VV	0.118072279	576.9055786	57.9859848	0.000208375	128	14.48888874 VV	0.047625296	1165.428589	304.0039673	0.000420947
91	10.45314789 VV	0.017641624	60.12382889	44.84474564	2.17164E-05						
92	10.47666645 VV	0.021202959	75.80609131	48.58574677	2.73808E-05						
93	10.54083347 VV	0.047549356	153.4559631	45.2679863	5.54275E-05						
94	10.56633377 VV	0.026290957	95.07836151	47.6256752	3.43418E-05						
95	10.71199989 VV	0.101951227	573.7092285	67.64215851	0.000207221						
96	10.83547592 VV	0.056211568	817.2584229	206.3267212	0.000295189						
97	11.16738129 VV	0.181098431	1290.946045	86.50875092	0.000466283						
98	11.22642899 VV	0.039062072	254.4630127	87.15662384	9.19107E-05						
99	11.25944424 VV	0.023209557	150.3969879	86.82187653	5.43226E-05						
100	11.53033352 VV	0.176898703	1454.459473	99.87535858	0.000525343						
101	11.64999962 VV	0.084426388	771.7957764	109.2403107	0.000278768						
102	11.71000004 VV	0.038768429	337.0168152	109.9255142	0.000121729						
103	11.79500008 VV	0.073100924	673.7261963	110.5490341	0.000243346						
104	12.00966644 VV	0.136548921	1383.473267	122.6959686	0.000499703						
105	12.044487 VV	0.027454123	237.6575317	129.2372131	8.58406E-05						
106	12.07208347 VV	0.021116115	206.7828064	126.2006454	7.46888E-05						

Foam Samples from the Edge and Sampled at Room Temperature

Sample	Location	Sampling Temp.												
PIANA 2	EDGE	ROOM TEMP.												
#	Retention		Peak Type	Peak Width	Area	Height	Area %	#	Retention		Peak Width	Area	Height	Area %
	Time								Time	Peak Type				
1	0.102142856	BB		0.019416584	7.225996494	6.202598572	2.6128E-06	35	3.401666641	VV	0.041956455	199.5386047	58.26218796	7.21499E-05
2	0.273333341	BP		0.012180251	3.551365137	4.85945797	1.28411E-06	36	3.462777853	VV	0.054368723	248.859314	55.44069672	8.99834E-05
3	0.308333337	VV		0.027817076	13.51584435	6.107773304	4.88711E-06	37	3.535000086	VV	0.073259525	301.2960815	51.496418	0.000108944
4	0.386666656	VP		0.024786696	13.41501999	8.799193382	4.85065E-06	38	3.65745616	VV	0.067107417	409.1261597	101.6097717	0.000147933
5	0.435000002	VP		0.028372232	11.98937702	6.25221777	4.33516E-06	39	3.762777805	VV	0.043114532	169.7380524	48.16490173	6.13745E-05
6	0.476111114	VV		0.01727234	6.100494862	4.986739159	2.20584E-06	40	3.913095236	VV	0.072171599	180.9176941	30.51406097	6.54168E-05
7	0.626111109	VV		0.05825318	36.24946594	7.51798296	1.31072E-05	41	3.956666708	VV	0.032489978	73.9908371	28.31180763	2.67539E-05
8	0.676111102	VV		0.03629721	17.47402191	7.468294621	6.31832E-06	42	3.989444494	VV	0.033090305	52.32984924	26.35709	1.89216E-05
9	0.725000024	VV		0.013323336	7.364904404	7.588212967	2.66303E-06	43	4.021666527	VV	0.047467235	106.6176224	27.35755157	3.85512E-05
10	0.848888874	VV		0.066781625	52.41197586	9.438988686	1.89513E-05	44	4.127380848	VV	0.051251233	85.65127563	23.65054893	3.09701E-05
11	0.889999986	VP		0.046502329	33.88030243	9.524047852	1.22506E-05	45	4.173333168	VV	0.035757445	42.9525032	20.02030754	1.55309E-05
12	1.073888898	BP		0.006539121	2.244238615	5.720031261	8.1148E-07	46	4.217666626	VV	0.028836932	35.55650711	20.55032921	1.28566E-05
13	1.092407465	VP		0.061093431	30.27500153	6.080005169	1.09469E-05	47	4.38166666	VV	0.095635712	187.9928131	23.93444061	6.79751E-05
14	1.432777762	BV		0.018853586	5.759229183	4.238221169	2.08244E-06	48	4.433888912	VV	0.051228326	105.6304703	25.55252647	3.81942E-05
15	1.662222266	BV		0.037091479	15.75711918	5.23868084	5.69751E-06	49	4.525333405	VV	0.077203974	92.55384064	19.98037148	3.34659E-05
16	1.75666666	VV		0.016977048	8.743313789	6.810776234	3.16144E-06	50	4.591666698	VV	0.036226027	33.77289963	11.85869026	1.22117E-05
17	1.860333323	VV		0.055941742	45.59955978	11.33308697	1.6488E-05	51	4.655740738	VV	0.03626683	33.97044754	11.91342449	1.22832E-05
18	1.901666641	VV		0.039817933	48.28098679	14.89447403	1.74576E-05	52	4.90749979	BP	0.018758221	5.692421436	6.894016266	2.05829E-06
19	1.960333347	VV		0.045756992	43.32743073	15.7817173	1.56665E-05	53	5.092222214	VV	0.066434376	488.4798584	89.83979797	0.000176626
20	2.077666759	VV		0.05419673	67.02272034	15.27307987	2.42343E-05	54	5.114999771	VV	0.044279423	328.0036316	90.50996399	0.000118601
21	2.119285822	VV		0.030852869	46.14764023	18.65981293	1.66862E-05	55	5.385555744	VV	0.131864712	4050.889404	375.4855042	0.001464735
22	2.198333263	VV		0.037028361	56.46616745	18.8068161	2.04172E-05	56	5.616666794	VV	0.092391349	5318.131348	735.2041016	0.001922948
23	2.242777824	VV		0.043294981	78.46560669	22.16811752	2.83719E-05	57	5.714090824	VV	0.077669747	4991.032227	847.9528809	0.001804675
24	2.312333345	VP		0.018746678	10.7031765	7.456427574	3.87009E-06	58	6.346520424	VV	0.111894675	101437608	11390755	36.67816096
25	2.357222319	VP		0.012472727	4.79956007	5.34673214	1.73544E-06	59	6.508871555	VV	0.109803386	126350048	14919366	45.68608713
26	2.382333279	VP		0.018956343	6.932697773	5.407837391	2.50675E-06	60	6.841576576	VV	0.087836184	46022812	6988020.5	16.64108746
27	2.514047623	BV		0.041587409	13.00055218	5.210131168	4.70078E-06	61	7.267118454	VV	0.067571238	2708105.75	578960.0625	0.979206239
28	2.634523869	VP		0.045679618	38.0780983	11.19578552	1.37684E-05	62	8.038888931	VV	0.061184071	462.5914307	92.75563049	0.000167265
29	2.751666784	VV		0.047220547	21.07602692	5.560469151	7.62074E-06	63	8.138333321	VV	0.133427888	835.8912354	74.76978302	0.000302244
30	2.864047527	VV		0.038579874	39.12922287	14.01195049	1.41485E-05	64	8.403888702	VV	0.045589935	94.35160065	34.49285126	3.4116E-05
31	2.889444351	VV		0.019100146	18.58765793	13.46919537	6.72099E-06	65	8.454999924	VB	0.067659259	147.4963989	26.20790291	5.33323E-05
32	3.030333281	VV		0.085870363	196.579422	28.01290321	7.10799E-05	66	8.747666359	BP	0.025565699	10.13240433	6.605467796	3.66371E-06
33	3.169166565	VV		0.069590375	199.0499573	35.95349121	7.19732E-05	67	9.324999809	PP	0.037490197	20.57979393	7.624518871	7.44131E-06
34	3.361666679	VV		0.114230625	543.7960815	57.55466843	0.000196628	68	9.390832901	VV	0.011985745	4.464450359	5.796431065	1.61427E-06

Foam Samples from the Edge and Sampled at Room Temperature

69	9.433148384 VV	0.057455648	42.27933502	8.894656181	1.52875E-05	107	13.98064137 VV	0.093800545	2529.301514	352.1279602	0.000914554
70	9.596666336 VV	0.044809796	61.5928154	17.18694878	2.22709E-05	108	14.11100006 VV	0.042648081	543.9501343	160.060318	0.000196683
71	9.616110802 VV	0.034529883	45.15868759	16.709589	1.63286E-05	109	14.22055531 VV	0.073613778	1010.467346	169.3455811	0.000365368
72	9.713000298 VV	0.051465333	76.98883057	18.15823174	2.78379E-05	110	14.28574085 VV	0.069707528	1197.3302	222.7619781	0.000432935
73	9.821666718 VV	0.036252763	65.37295532	22.93597221	2.36378E-05	111	14.48728085 VBA	0.091574445	2108.073486	284.0814209	0.000762244
74	9.84366703 VV	0.029517585	54.78502655	25.04777145	1.98094E-05						
75	9.954761505 VV	0.05155886	596.5059204	163.5202637	0.000215687						
76	10.06227303 VV	0.030487068	183.3456116	75.08783722	6.62947E-05						
77	10.11633301 VP	0.057065383	254.6153564	59.33266068	9.20647E-05						
78	10.17249966 VV	0.047380351	185.6218414	47.72083282	6.71178E-05						
79	10.37749958 VV	0.102118738	488.1980591	61.16539001	0.000176524						
80	10.60099983 VV	0.13606967	613.8331299	53.81681824	0.000221952						
81	10.71611118 VV	0.073058859	415.741333	71.26648712	0.000150325						
82	10.83348465 VV	0.06533163	831.5137939	175.3245697	0.000300662						
83	10.95233345 VV	0.066565961	211.5646362	40.75315857	7.64983E-05						
84	11.10111141 VV	0.132122636	380.3154297	35.46131897	0.000137516						
85	11.28499985 VV	0.031745642	28.77295113	11.28516388	1.04038E-05						
86	11.36666679 VV	0.018154496	6.676001549	6.12887764	2.41393E-06						
87	11.41766644 VB	0.0361287	20.45335579	7.92010498	7.3956E-06						
88	11.59700012 BV	0.035673235	47.07568359	17.34007645	1.70218E-05						
89	11.74611092 VV	0.117821127	357.6338806	36.0244751	0.000129314						
90	12.11129665 VV	0.173706219	716.6009521	49.55564117	0.000259111						
91	12.15425968 VV	0.066305406	207.3143311	52.11096191	7.49614E-05						
92	12.2616663 VV	0.061067514	264.9356995	52.32853699	9.57964E-05						
93	12.31444454 VV	0.071353346	205.9544525	48.1067009	7.44697E-05						
94	12.38944435 VV	0.019205688	60.97218704	41.34343338	2.20465E-05						
95	12.41690445 VV	0.053056795	140.0760498	44.00191879	5.06492E-05						
96	12.49388885 VV	0.034916431	92.25820923	44.03762817	3.3359E-05						
97	12.68388844 VV	0.105464883	533.7288208	61.36937332	0.000192988						
98	12.80333328 VV	0.105802223	593.1011963	66.66055298	0.000214456						
99	13.00021172 VV	0.047625761	1681.87915	508.000946	0.00060814						
100	13.25366688 VV	0.177491754	1391.527954	94.6663208	0.000503153						
101	13.35388851 VV	0.036097642	239.4447174	96.00508881	8.65792E-05						
102	13.37722206 VV	0.022264564	144.3245392	98.67150879	5.21854E-05						
103	13.41749954 VV	0.067522295	508.4703064	101.3657074	0.000183854						
104	13.63083363 VV	0.120568261	1122.353516	117.3642426	0.000405824						
105	13.71833324 VV	0.073821656	782.9282227	130.8213348	0.000283094						
106	13.82055569 VV	0.069776505	847.1889648	148.0142059	0.00030633						

Foam Samples from the Edge and Sampled at Room Temperature

Sample	Location	Sampling Temp.											
PIANA 3	EDGE	ROOM TEMP.											
#	Retention Time	Peak Type	Peak Width	Area	Height	Area %	#	Retention Time	Peak Type	Peak Width	Area	Height	Area %
1	0.07	BV	0.01941943	8.66210556	6.15477562	3.16064E-06	35	3.409166574	VB	0.050437223	76.17434692	18.73424911	2.77946E-05
2	0.103333332	VB	0.065975875	54.7604599	9.986139297	1.99811E-05	36	3.560333252	BP	0.013028567	2.621981859	3.354144573	9.56711E-07
3	0.277777791	BV	0.019750103	11.22917461	9.527713776	4.09731E-06	37	3.597380877	VP	0.016154284	5.555046082	5.731241226	2.02693E-06
4	0.296333343	VV	0.017621599	7.831398487	7.407007217	2.85753E-06	38	3.744583368	PV	0.03826784	9.076759338	3.883532047	3.31194E-06
5	0.329444438	VV	0.058691122	35.16401291	7.236526489	1.28307E-05	39	3.837500095	VV	0.033014473	14.6020956	6.810369015	5.32803E-06
6	0.448333323	VV	0.063445777	39.73583984	7.544615746	1.44989E-05	40	3.938333273	VP	0.081385233	51.53091431	7.573122025	1.88027E-05
7	0.545833349	VV	0.034589529	19.0717144	6.827448368	6.95891E-06	41	4.104696751	VV	0.040495187	25.38610077	10.77174568	9.26291E-06
8	0.644047618	VP	0.043585811	19.88911438	7.605347633	7.25716E-06	42	4.150000095	VP	0.028344966	20.97298241	9.287724495	7.65264E-06
9	0.707000017	VV	0.023512235	15.40935898	8.356911659	5.62258E-06	43	4.277083397	VV	0.042594403	29.82156181	9.507416725	1.08813E-05
10	0.778999984	VP	0.08294639	44.11851883	6.519816875	1.6098E-05	44	4.376852036	VV	0.045646399	68.29759216	18.25592232	2.49205E-05
11	0.933148146	VV	0.023957945	18.03939247	9.584666252	6.58223E-06	45	4.436851978	VV	0.047088061	92.50973511	25.64338112	3.3755E-05
12	1.029444456	VP	0.122275591	28.82297707	2.86733222	1.0517E-05	46	4.489166737	VV	0.055103049	105.0585022	23.98452759	3.83339E-05
13	1.312916636	VV	0.072963826	93.36077881	15.34879303	3.40656E-05	47	4.58166647	VV	0.034137696	32.43448257	12.98669243	1.18347E-05
14	1.361666679	VV	0.035556193	36.43095779	13.46891975	1.3293E-05	48	5.125	PV	0.086043529	545.0324097	76.57082367	0.000198872
15	1.4155128	VV	0.058291677	95.0047226	19.69009399	3.46654E-05	49	5.385606289	VV	0.132560819	5067.595215	478.4845581	0.001849069
16	1.523888946	VB	0.061762493	85.94056702	18.30887985	3.13581E-05	50	5.612435818	VV	0.096560381	9515.333008	1282.48291	0.003471965
17	1.622916698	BV	0.030462164	54.53642273	22.35452843	1.98993E-05	51	5.713085175	VV	0.076549701	8129.861816	1425.226318	0.002966433
18	1.652222276	VV	0.017382313	26.21596146	22.85501099	9.56571E-06	52	6.347117424	VV	0.114219271	99931232	11295026	36.46301296
19	1.679444432	VV	0.025840433	44.55907059	21.80563736	1.62588E-05	53	6.509879112	VV	0.108994626	125708312	14814915	45.868581
20	1.723888874	VV	0.077984668	148.7314453	23.77485847	5.42693E-05	54	6.841425419	VV	0.089916691	45675884	6928084.5	16.66626456
21	1.854444504	VV	0.053149581	77.65939331	24.35246277	2.83364E-05	55	7.267402172	VV	0.065998375	2707945	574429.5625	0.988077818
22	1.910833359	VV	0.025996733	40.89292145	25.11400604	1.49211E-05	56	7.886333466	VV	0.053889565	322.1233826	72.42508698	0.000117537
23	1.95599997	VV	0.052484155	117.1064453	27.0627861	4.27299E-05	57	7.977499962	VB	0.129439324	393.0250549	50.60608292	0.000143407
24	2.06583333	VV	0.092505366	211.3326111	27.24200058	7.71113E-05	58	8.39214325	BV	0.03012559	22.43122101	9.304607391	8.18473E-06
25	2.168809414	VV	0.09738984	257.2009277	31.4569931	9.38477E-05	59	8.497857094	VV	0.031654298	25.69630432	12.15975475	9.37609E-06
26	2.376666784	VV	0.040358242	21.51915741	8.886726379	7.85193E-06	60	8.652777672	VV	0.131531566	761.5664063	70.77854156	0.000277881
27	2.426000118	VP	0.066530004	60.71621704	10.97715473	2.21542E-05	61	8.867500305	VV	0.085727833	99.79864502	19.40222549	3.64146E-05
28	2.619999886	VV	0.022333333	15.46524906	9.33247757	5.64298E-06	62	8.94999809	VV	0.093002886	94.65036774	16.96190643	3.45361E-05
29	2.660333395	VP	0.029021706	16.26517487	9.340809822	5.93485E-06	63	9.193333626	VP	0.015942873	7.822672844	8.340087891	2.85435E-06
30	2.805000067	VV	0.049795479	44.57801819	10.88129902	1.62657E-05	64	9.225667	VV	0.012023157	7.428493977	8.646553993	2.71052E-06
31	3.143722296	VV	0.063588843	354.2961426	67.11370087	0.000129276	65	9.25	VV	0.039182056	26.39751434	8.282785416	9.63195E-06
32	3.229444504	VV	0.042531677	129.7887726	37.35848999	4.73575E-05	66	9.352777481	VV	0.045085352	36.22352219	10.0416832	1.32173E-05
33	3.295833349	VP	0.043957207	110.1284561	37.83679581	4.01838E-05	67	9.39214325	VP	0.016864959	10.02312851	7.866587162	3.65725E-06
34	3.358333349	VV	0.05479284	108.8815689	24.06169128	3.97288E-05	68	9.450585365	VV	0.020085862	77.06060028	63.82571793	2.8118E-05

Foam Samples from the Edge and Sampled at Room Temperature

69	9.548333168 VV	0.037270028	45.99505615	15.21430492	1.67827E-05	107	13.08833313 VV	0.024345744	13.31817341	7.731920242	4.85955E-06
70	9.630000114 VV	0.047161542	103.1623688	31.53858185	3.7642E-05	108	13.17833328 VV	0.061542042	63.45968246	12.43428898	2.31552E-05
71	9.657083511 VV	0.040878799	73.36827087	29.91292381	2.67707E-05	109	13.37777805 VV	0.084063165	85.40090942	12.92892551	3.11612E-05
72	9.692777634 VV	0.062830828	160.2621765	31.25020027	5.84766E-05	110	13.49277782 VV	0.066972792	92.03316498	16.52569199	3.35812E-05
73	9.825833321 VV	0.033457406	56.45080948	21.62340355	2.05978E-05	111	13.54083347 VV	0.041535813	36.72108078	14.73470592	1.33988E-05
74	9.955416679 VP	0.045755506	509.6714172	157.4913788	0.000185969	112	13.61166668 VV	0.042686161	54.96183395	16.15730476	2.00545E-05
75	10.10666656 VV	0.02684366	16.03310585	7.844974518	5.85018E-06	113	13.82499981 VV	0.116597451	277.2578735	28.22641373	0.000101166
76	10.14433289 VV	0.051398367	32.19555664	10.43987751	1.17475E-05	114	13.98983288 VV	0.054810565	757.8693848	201.8191071	0.000276532
77	10.2033329 VV	0.029604083	20.07205009	8.80218029	7.32391E-06	115	14.1827774 VV	0.080036625	272.5291443	41.27266312	9.94407E-05
78	10.25166702 VV	0.018838171	7.617600918	5.98941803	2.77952E-06	116	14.29500008 VV	0.072715178	486.905426	86.44217682	0.000177663
79	10.37966633 VV	0.058446273	133.1315308	30.78921509	4.85772E-05	117	14.3708334 VV	0.034670394	107.2465439	51.55529785	3.91322E-05
80	10.50166702 VV	0.106240317	355.2849731	39.76380539	0.000129637	118	14.49574089 VBA	0.049918119	612.807373	204.604187	0.000223602
81	10.61722183 VV	0.027239414	47.1942482	27.20432472	1.72203E-05						
82	10.71351814 VV	0.06712646	283.681366	50.81830215	0.00010351						
83	10.8330698 VV	0.06019827	830.517334	193.0219727	0.00030304						
84	11.06388855 VV	0.105473183	528.2723389	60.14429474	0.000192757						
85	11.13083363 VV	0.065795466	331.0915527	69.23027039	0.000120809						
86	11.22733307 VV	0.143277079	891.4277344	76.87917328	0.000325265						
87	11.42416668 VV	0.027327614	87.59696198	53.42396164	3.19625E-05						
88	11.45750046 VV	0.032182444	117.9132385	54.6275177	4.30243E-05						
89	11.49433327 VV	0.15792565	700.5928345	54.51757431	0.000255633						
90	11.76277733 VV	0.02181318	38.49742889	29.41449928	1.4047E-05						
91	11.78625011 VB	0.07492879	191.6778107	30.66335297	6.99396E-05						
92	11.95916653 BV	0.03461412	42.90042496	15.34626675	1.56536E-05						
93	11.99944401 VV	0.037724625	25.26536369	11.16218853	9.21885E-06						
94	12.04333305 VV	0.015558522	10.87582874	10.97758579	3.96838E-06						
95	12.06833363 VV	0.015495255	14.51340294	12.54685688	5.29567E-06						
96	12.10249996 VP	0.019964525	9.872589111	6.789474487	3.60232E-06						
97	12.13583374 VV	0.033404421	24.25174141	9.305784225	8.849E-06						
98	12.30277824 VV	0.054729551	66.94885254	16.36449432	2.44284E-05						
99	12.35166645 VV	0.052329607	69.84456635	16.19033623	2.5485E-05						
100	12.4416666 VV	0.029046226	22.50491905	10.48291206	8.21162E-06						
101	12.50777817 VV	0.028401725	17.00195694	9.977068901	6.20369E-06						
102	12.54023838 VP	0.032519497	25.35317612	9.691740036	9.25089E-06						
103	12.7122221 VV	0.071161754	57.45908356	9.69258213	2.09657E-05						
104	12.82722187 VV	0.037633464	18.45670891	7.029184818	6.7345E-06						
105	12.89416695 VP	0.034215998	12.97764397	5.563118935	4.7353E-06						
106	13.00036621 VV	0.034194957	1573.263916	728.508667	0.000574054						

Foam Samples from the Edge and Sampled at Room Temperature

Sample	Location	Sampling Temp.											
PIAO 1	EDGE	ROOM TEMP.											
#	Retention Time	Peak Type	Peak Width	Area	Height	Area %	#	Retention Time	Peak Type	Peak Width	Area	Height	Area %
1	0.042777777	PV	0.014341227	4.393839836	4.519922256	1.60981E-06	35	3.181666613	VP	0.085732624	91.30025482	12.72108364	3.34506E-05
2	0.06277778	VB	0.022381211	6.415589809	3.861913204	2.35054E-06	36	3.466388941	BP	0.026776996	35.08116531	16.5185585	1.2853E-05
3	0.141000003	BP	0.046793096	28.96610451	7.897019386	1.06126E-05	37	3.572999954	VV	0.067242444	83.50405121	14.93221092	3.05942E-05
4	0.280555546	VV	0.088477761	52.24786377	9.841995239	1.91426E-05	38	3.63499999	VV	0.032606516	47.23654938	18.00574303	1.73065E-05
5	0.37166667	VV	0.015518922	7.375366211	6.364851952	2.70219E-06	39	3.719513893	VV	0.034373399	161.6252899	58.24622726	5.92163E-05
6	0.418333322	VP	0.04099049	26.95401764	8.501199722	9.87541E-06	40	3.789999962	VV	0.069209293	161.9851227	28.98093796	5.93481E-05
7	0.620833337	BP	0.015038989	4.987778187	4.462826252	1.82742E-06	41	3.921666622	VV	0.046366151	79.78084564	21.46320343	2.92301E-05
8	0.67900002	VV	0.02205639	12.17823792	7.08399868	4.46186E-06	42	3.971666574	VV	0.024664273	45.3494873	24.42165375	1.66151E-05
9	0.712777793	VV	0.016076326	8.985710144	8.680891991	3.29218E-06	43	4	VV	0.022259956	37.9967804	23.01644516	1.39213E-05
10	0.775952399	VV	0.05741005	63.29880524	13.32765484	2.31914E-05	44	4.039333344	VV	0.041501906	76.80331421	24.54772186	2.81392E-05
11	0.869761884	VB	0.038248107	39.9211235	12.84884834	1.46263E-05	45	4.115701675	VV	0.02269518	35.89842224	23.66830635	1.31525E-05
12	0.966666639	BV	0.023002518	13.49103737	9.775043488	4.94285E-06	46	4.145909309	VV	0.029928584	36.00579071	15.59931755	1.31918E-05
13	1.093571424	VV	0.070830666	87.21592712	15.00087261	3.19542E-05	47	4.231666565	VP	0.037333596	29.79288483	10.7499218	1.09155E-05
14	1.154999971	VV	0.062555455	89.33019257	17.21043396	3.27288E-05	48	4.346666813	VV	0.028368304	13.24526691	6.341356754	4.8528E-06
15	1.319499969	VP	0.03968155	68.60823822	21.24194717	2.51367E-05	49	4.480185032	VP	0.029745897	43.20258713	18.16593552	1.58286E-05
16	1.36651516	VV	0.029158054	49.34770203	22.00940514	1.808E-05	50	4.520294189	VV	0.015055699	16.05670357	17.77477837	5.88285E-06
17	1.512333274	VV	0.078663394	91.19665527	14.84664536	3.34126E-05	51	4.596000195	VV	0.042830884	68.38591766	19.54000473	2.50552E-05
18	1.556666613	VV	0.051705807	47.38969421	11.12304211	1.73626E-05	52	4.796176434	VV	0.058614112	104.4447937	23.60832214	3.82665E-05
19	1.636666656	VV	0.025188629	17.78388214	9.350672722	6.51566E-06	53	4.839166641	VV	0.013289371	12.27189064	12.68202305	4.49617E-06
20	1.66963768	VV	0.051619433	47.48437119	15.33155441	1.73973E-05	54	4.957221985	VV	0.062104192	59.41162109	11.53223419	2.17672E-05
21	1.835952401	VV	0.086299308	110.432724	15.65483093	4.04603E-05	55	5.017222404	VP	0.026724042	9.477383614	4.865748405	3.47232E-06
22	2.005952358	VV	0.036330167	38.90615845	13.22175789	1.42544E-05	56	5.387121201	VV	0.133131281	4709.129883	442.594696	0.001725331
23	2.050151587	VV	0.022279179	28.14587402	16.19239807	1.03121E-05	57	5.607888699	VV	0.102758951	6461.196777	803.9832153	0.002367253
24	2.089444399	VP	0.01504664	18.68299675	16.70685196	6.84507E-06	58	5.717941284	VV	0.071155995	4750.758789	891.7163696	0.001740583
25	2.127666712	VV	0.02350832	18.52369308	13.1327219	6.78671E-06	59	6.346323013	VV	0.111772396	100266120	11272471	36.7354932
26	2.192666769	VV	0.03860553	56.83802032	18.11502838	2.08243E-05	60	6.508019447	VV	0.109337866	124671720	14790878	45.67721502
27	2.262500048	VV	0.065024763	73.8214798	13.66527367	2.70467E-05	61	6.840725422	VV	0.089832388	45326324	6882606.5	16.60665504
28	2.369999886	VV	0.054263651	48.22096252	14.81070042	1.76672E-05	62	7.266866684	VV	0.068677895	2650229.75	565481.6875	0.970990968
29	2.438888788	VV	0.027326453	19.85560608	9.146512985	7.2747E-06	63	7.932777882	VB	0.055836901	90.55133057	27.02852058	3.31762E-05
30	2.646333218	VV	0.105913989	126.7672806	14.37075424	4.6445E-05	64	8.418889046	BP	0.045519318	23.47687721	6.293685436	8.60146E-06
31	2.825416565	VV	0.0604675	96.51177979	19.25806236	3.536E-05	65	8.65653801	BV	0.015340464	8.897837639	9.667066574	3.25999E-06
32	2.907083273	VV	0.057791453	79.75540161	18.3196125	2.92208E-05	66	8.708889008	VV	0.046527524	26.81906891	7.188305378	9.82597E-06
33	3.010555506	VV	0.057181332	60.64429855	15.65949345	2.22189E-05	67	8.813333511	VP	0.048876312	21.14454651	7.210223198	7.74694E-06
34	3.031666756	VV	0.05410156	68.12301636	15.25421715	2.49589E-05	68	8.909444809	VV	0.035275146	13.85939789	4.859272003	5.07781E-06

Foam Samples from the Edge and Sampled at Room Temperature

69	8.985666275 VP	0.071840405	23.2305336	5.389384747	8.5112E-06	107	13.48333359 VV	0.029073054	15.46121216	6.918284416	5.66468E-06
70	9.100832939 VP	0.020555247	6.639391422	4.412331104	2.43254E-06	108	13.50309563 VV	0.028875507	22.80667686	10.2830019	8.35591E-06
71	9.137857437 VP	0.032592736	17.59838676	7.180653095	6.4477E-06	109	13.71722221 VV	0.088315375	419.2297974	58.00857162	0.000153597
72	9.374333382 BP	0.015313921	9.738976479	10.59926319	3.56817E-06	110	13.84722233 VV	0.032586318	24.42208481	12.49097157	8.94776E-06
73	9.405416489 VV	0.019018976	17.32787895	11.87842178	6.34859E-06	111	13.91269207 VP	0.026208064	20.70080566	10.40627003	7.58436E-06
74	9.513094902 VV	0.042139962	40.90380478	12.84899139	1.49863E-05	112	14.10944462 VV	0.058035024	62.2109642	12.95251656	2.27928E-05
75	9.556041718 VV	0.058519501	79.12298584	16.33244324	2.89891E-05	113	14.1964283 VV	0.043108039	52.01972198	15.13154888	1.9059E-05
76	9.717222214 VV	0.034527123	28.68344688	11.33331585	1.0509E-05	114	14.23429871 VV	0.041155536	58.85809708	19.53256607	2.15644E-05
77	9.825666428 VV	0.048875377	77.39624786	19.26291275	2.83564E-05	115	14.35166645 VP	0.01963941	9.427820206	6.235539436	3.45416E-06
78	9.953888893 VP	0.048694357	490.0108337	144.0202942	0.00017953	116	14.48119068 VBA	0.006042011	1.275567412	14.28164101	4.67342E-07
79	10.17409134 VV	0.080397516	66.94320679	12.72045135	2.45266E-05						
80	10.26366711 VV	0.036546953	21.30730247	7.19557476	7.80657E-06						
81	10.37833309 VV	0.055034097	91.59037018	22.71871758	3.35569E-05						
82	10.70976162 VV	0.115869477	387.2107544	40.02373886	0.000141866						
83	10.83255577 VV	0.056868181	630.0577393	156.837204	0.000230841						
84	10.99055576 VB	0.082380101	182.7255554	27.54969597	6.6947E-05						
85	11.12071419 BV	0.042256359	70.87425995	24.13760185	2.59669E-05						
86	11.17712116 VV	0.066785291	143.7037354	25.87846184	5.26502E-05						
87	11.27611065 VV	0.038339682	69.35077667	24.26815033	2.54087E-05						
88	11.31388855 VV	0.040833861	63.76091003	19.66168022	2.33607E-05						
89	11.44766712 VV	0.067850672	95.15943146	20.24028778	3.48645E-05						
90	11.46666622 VV	0.017534023	24.66831398	18.52688026	9.03797E-06						
91	11.51000023 VV	0.038935944	67.24262238	21.8304348	2.46363E-05						
92	11.8241663 VV	0.13769494	552.3487549	47.48937988	0.000202369						
93	11.93966675 VV	0.093330733	440.5383911	56.27475357	0.000161404						
94	12.0237875 VV	0.077661939	318.6350098	54.94090652	0.000116741						
95	12.10900021 VV	0.033986725	132.370697	48.28017807	4.8498E-05						
96	12.15944481 VV	0.058733989	224.0614166	46.07555389	8.20916E-05						
97	12.24233341 VB	0.078468204	294.1633911	44.88017654	0.000107776						
98	12.39611149 BV	0.025727479	58.86570358	31.60820198	2.15672E-05						
99	12.44547653 VV	0.044107873	116.5185699	32.2833519	4.26901E-05						
100	12.5343008 VV	0.04070434	230.4341431	90.50524139	8.44264E-05						
101	12.60458374 VV	0.033569537	117.5984421	49.76441193	4.30857E-05						
102	12.6366663 VV	0.080800928	318.2837219	47.72835159	0.000116613						
103	12.99855518 VV	0.050136633	719.9118042	204.1725464	0.000263761						
104	13.14166641 VV	0.087481603	219.8974304	30.36720467	8.0566E-05						
105	13.28045464 VV	0.091933466	211.6690216	29.42177963	7.75513E-05						
106	13.41388893 VP	0.024811162	12.79246616	8.593219757	4.6869E-06						

Foam Samples from the Edge and Sampled at Room Temperature

Sample	Location	Sampling Temp.												
PIAO 2	EDGE	ROOM TEMP.												
#	Retention		Peak Type	Peak Width	Area	Height	Area %	#	Retention		Peak Width	Area	Height	Area %
	Time								Time	Peak Type				
1	0.036111113	BP		0.053303443	27.54414177	8.612371445	9.89042E-06	35	2.83766675	VV	0.014654003	8.408798218	9.563710213	3.01939E-06
2	0.153461546	VV		0.069530651	117.1027756	20.53488159	4.20487E-05	36	2.866904736	VV	0.022751167	19.71900749	11.64766979	7.08061E-06
3	0.211666673	VV		0.046797156	64.15065765	16.70696259	2.30349E-05	37	3.055476189	VV	0.106441781	135.5826111	15.14525223	4.86844E-05
4	0.314803928	VV		0.02942637	59.21289444	29.35267448	2.12619E-05	38	3.119999886	VV	0.026925821	27.24258995	13.86341763	9.78214E-06
5	0.390416652	VP		0.046487462	48.35761642	12.68159962	1.7364E-05	39	3.259242535	VV	0.088147849	124.3914719	16.84584999	4.46659E-05
6	0.484090894	VV		0.040285636	70.32389832	22.00433159	2.52516E-05	40	3.345000029	VB	0.040757671	42.06478882	12.66216183	1.51044E-05
7	0.573000014	VV		0.055282418	79.35755157	17.70840263	2.84953E-05	41	3.442500114	BP	0.021363268	17.16975594	10.90839672	6.16523E-06
8	0.602500021	VV		0.061343167	71.7547226	19.49544144	2.57653E-05	42	3.687333345	VV	0.090839669	217.1517029	28.51695251	7.79738E-05
9	0.681666672	VV		0.03437613	34.78616714	12.93463039	1.24909E-05	43	3.732777834	VV	0.029947164	68.96975708	31.01098824	2.47653E-05
10	0.732777774	VV		0.024774451	19.00323486	11.21165943	6.82359E-06	44	3.757083416	VV	0.01766444	40.57482147	30.21958733	1.45694E-05
11	0.769444466	VV		0.01593429	14.10165787	12.71962738	5.06356E-06	45	3.793333292	VV	0.025951155	59.59483337	29.02879333	2.1399E-05
12	0.796666682	VV		0.018546607	8.614287376	6.46443367	3.09318E-06	46	3.81916666	VV	0.017934043	45.84843063	33.5695343	1.6463E-05
13	1.182575703	BV		0.083802521	224.9551849	38.14507294	8.07758E-05	47	3.866666555	VV	0.031600762	72.95027161	31.99481583	2.61946E-05
14	1.327380896	VV		0.123277463	191.122757	25.8391037	6.86275E-05	48	3.933333397	VV	0.04748369	118.871994	31.17637062	4.2684E-05
15	1.345555544	VV		0.027613429	64.74195862	29.48932838	2.32472E-05	49	3.963333368	VV	0.046203528	104.3520279	27.54170227	3.74702E-05
16	1.395555496	VV		0.017010869	47.83218765	37.1758728	1.71754E-05	50	4.048999786	VV	0.056034755	133.6269531	28.85144997	4.79821E-05
17	1.430999994	VV		0.034192067	48.91241837	23.84199142	1.75632E-05	51	4.10583353	VV	0.056921642	122.5914536	27.02549553	4.40196E-05
18	1.477424264	VV		0.028419575	57.87903214	33.94317245	2.07829E-05	52	4.198750019	VV	0.01800398	31.27301788	22.79757118	1.12294E-05
19	1.518076897	VV		0.022483928	42.54981613	32.05998611	1.52786E-05	53	4.235000134	VV	0.025792738	39.52632523	20.23190308	1.41929E-05
20	1.539999962	VV		0.021833552	34.04650879	25.98944092	1.22253E-05	54	4.264047623	VV	0.015355819	21.77044106	20.55618477	7.81723E-06
21	1.563888907	VV		0.021078158	39.90954971	25.75546837	1.43305E-05	55	4.346666813	VV	0.050807349	92.95516205	23.16894531	3.33779E-05
22	1.593502402	VV		0.047617521	303.9985046	77.74752808	0.000109158	56	4.40083313	VV	0.042109404	67.80513763	26.83689499	2.43471E-05
23	1.72240746	VP		0.015444186	45.22732162	42.40149689	1.624E-05	57	4.467777729	VV	0.055237856	110.8219147	27.37047005	3.97934E-05
24	1.809999943	VV		0.060985841	139.1278534	30.63381386	4.99574E-05	58	4.511666775	VV	0.113088675	167.7193146	24.71796417	6.02239E-05
25	1.833095193	VV		0.056237996	100.6441193	29.82684517	3.61388E-05	59	4.721111298	VV	0.043671682	39.37947845	12.52812004	1.41402E-05
26	1.913750052	VV		0.028043916	45.43583679	27.00278854	1.63149E-05	60	4.739666462	VV	0.012656054	9.584295273	10.49326324	3.44148E-06
27	1.941666722	VV		0.040040944	80.70386505	26.12431908	2.89788E-05	61	4.804523945	VV	0.040228233	24.32441139	8.540472031	8.73429E-06
28	2.006999969	VB		0.120993271	235.7117767	23.70802116	8.46383E-05	62	4.842618942	VP	0.011387317	5.805968285	7.215724945	2.08478E-06
29	2.33214283	PP		0.043691207	23.46451569	6.566196918	8.42553E-06	63	5.094333172	VV	0.11771477	755.4749146	81.07337952	0.000271272
30	2.413333416	VV		0.01012963	4.888440609	7.999266624	1.75532E-06	64	5.386764526	VV	0.123654157	4944.07959	478.0683289	0.001775297
31	2.544333322	VV		0.072108574	52.10633469	9.482463837	1.87101E-05	65	5.604649067	VV	0.107226603	8187.120117	972.4086914	0.002939792
32	2.625	VV		0.027266666	19.9315052	9.582454681	7.15691E-06	66	5.713240623	VV	0.068970799	5004.229492	957.5515137	0.001796895
33	2.720666647	VP		0.051536642	33.46360016	9.399138451	1.2016E-05	67	6.344583035	VV	0.113493197	102445832	11438079	36.78576418
34	2.779999971	VV		0.037774332	26.54122162	9.168133736	9.5303E-06	68	6.507427216	VV	0.10999275	127158720	14986132	45.65955096

Foam Samples from the Edge and Sampled at Room Temperature

69	6.838995457 VV	0.09083011	46150100	7007901.5	16.57135934	107	11.41222191 VV	0.049232014	56.84786987	19.2448864	2.04127E-05
70	7.26350069 VV	0.066283882	2703032.25	580934.4375	0.970592019	108	11.50833321 VV	0.05803939	94.53829956	19.6816349	3.39464E-05
71	8.050555229 VV	0.017147211	62.94395065	51.90748215	2.26016E-05	109	11.52880955 VV	0.021716686	32.80363846	19.41041756	1.1779E-05
72	8.073800087 VV	0.022757025	181.2940979	107.055481	6.50982E-05	110	11.97249985 VV	0.247799143	787.5540161	37.38064194	0.000282791
73	8.159166336 VV	0.080334216	413.9206543	61.64706421	0.000148629	111	12.17500019 VV	0.12367624	328.4811401	31.49571419	0.000117949
74	8.244444847 VV	0.095624432	383.8298645	48.34593964	0.000137824	112	12.34560585 VV	0.073987424	158.3795013	25.66782761	5.68702E-05
75	8.416110992 VV	0.045619454	92.06602478	33.63551331	3.30586E-05	113	12.56033325 VV	0.087119974	160.5832825	24.61209106	5.76615E-05
76	8.470555305 VV	0.051504489	98.28085327	25.76391602	3.52902E-05	114	12.60750008 VV	0.047981385	65.68525696	22.81623077	2.3586E-05
77	8.527500153 VV	0.038525593	58.31655121	19.15125847	2.094E-05	115	12.68966675 VV	0.09289901	217.9253845	28.59945107	7.82516E-05
78	8.593333244 VP	0.023041418	12.98225021	9.390517235	4.6616E-06	116	12.86071396 VP	0.026736924	23.86648369	14.87735558	8.56986E-06
79	8.699242592 BP	0.005231488	2.055196285	7.419890881	7.3797E-07	117	12.99544621 VV	0.034319475	1616.848999	716.7026978	0.00058057
80	8.842082977 BP	0.040588874	32.66732407	9.876390457	1.173E-05	118	13.16357136 VV	0.079056777	289.4822693	43.82863235	0.000103946
81	8.962222099 VB	0.041810069	24.566679	7.199466705	8.82129E-06	119	13.30900002 VV	0.072835945	253.7165375	41.78706741	9.11033E-05
82	9.217082977 BP	0.028194029	13.92613602	6.448813438	5.00053E-06	120	13.3320837 VB	0.056361206	206.0956268	44.23097229	7.40038E-05
83	9.275370598 VV	0.047846429	39.50205231	10.27634335	1.41842E-05	121	13.43249989 BV	0.021238986	52.70732117	31.96211624	1.89259E-05
84	9.412618637 VP	0.013341937	5.027198792	6.27994585	1.80514E-06	122	13.53537083 VV	0.072712138	250.442276	41.32001495	8.99276E-05
85	9.43351841 VV	0.038785111	22.52757645	7.344443321	8.0891E-06	123	13.71033287 VV	0.087648146	625.7184448	85.23300171	0.00022468
86	9.512083054 VP	0.008558401	5.683171272	10.10972977	2.04069E-06	124	13.80666637 VV	0.051078815	178.3452759	45.15512848	6.40394E-05
87	9.537221909 VV	0.008694752	4.400454044	8.435076714	1.58009E-06	125	13.87966633 VV	0.027579362	59.74475098	36.10474396	2.14529E-05
88	9.57333374 VV	0.024981357	15.17944622	9.848731041	5.45056E-06	126	13.98444462 VV	0.06092459	1009.32666	226.7803802	0.000362424
89	9.610833168 VV	0.041887719	28.72389793	11.42892551	1.0314E-05	127	14.11999989 VV	0.053225502	289.5209656	65.93873596	0.00010396
90	9.711667061 VV	0.06214606	46.37827301	8.996097565	1.66533E-05	128	14.28583336 VV	0.092354231	864.3873291	111.6109161	0.00031038
91	9.822619438 VP	0.0362515	54.37092972	18.5196991	1.95233E-05	129	14.39703751 VV	0.042486899	432.8413086	124.72715	0.000155423
92	9.950294495 VP	0.048299082	526.7487183	164.7601318	0.000189142	130	14.49625015 VBA	0.045148544	520.62677	159.219162	0.000186944
93	10.06870365 VV	0.05737501	50.57057953	10.6544466	1.81586E-05						
94	10.18759251 VV	0.019026641	11.38520145	9.973035812	4.08814E-06						
95	10.24833298 VV	0.026320716	11.69054031	5.607961178	4.19778E-06						
96	10.27404785 VP	0.016988847	8.18914032	6.829724789	2.94052E-06						
97	10.36833286 VV	0.052263916	99.09906006	23.46861267	3.5584E-05						
98	10.53888893 VV	0.076120891	84.68386841	14.9420023	3.04079E-05						
99	10.70611095 VV	0.060232624	142.8934937	29.12833023	5.13095E-05						
100	10.82999992 VV	0.050170679	596.8809814	169.1400757	0.000214325						
101	10.96722221 VV	0.036621008	46.2996254	17.08238792	1.66251E-05						
102	11.02250004 VV	0.032818791	54.36421967	20.57995224	1.95208E-05						
103	11.10708332 VV	0.061151009	126.6295166	24.975811	4.54695E-05						
104	11.16899967 VV	0.023109291	32.84763718	19.05698395	1.17948E-05						
105	11.30033302 VV	0.083519571	114.044754	20.30724716	4.09507E-05						
106	11.34416676 VV	0.031462383	41.99251938	17.21263885	1.50785E-05						

Foam Samples from the Edge and Sampled at Room Temperature

Sample	Location	Sampling Temp.											
PIAO 3	EDGE	ROOM TEMP.											
#	Retention Time	Peak Type	Peak Width	Area	Height	Area %	#	Retention Time	Peak Type	Peak Width	Area	Height	Area %
1	0.016333334	BP	0.02686299	17.06510162	8.007598877	6.1923E-06	35	3.549999952	BV	0.027115973	16.53515053	7.999266624	6E-06
2	0.097499996	VP	0.014155039	5.599486828	5.374507427	2.03185E-06	36	3.591111183	VP	0.028164383	13.70541	8.110367775	4.97319E-06
3	0.1675926	VV	0.03363755	18.36884308	11.49846268	6.66538E-06	37	3.692333221	VV	0.030065704	18.73161507	8.074259758	6.79702E-06
4	0.209666669	VV	0.025778947	20.29512024	10.87180233	7.36435E-06	38	3.730555534	VP	0.017236363	6.066110611	5.34673214	2.20117E-06
5	0.291666657	VV	0.050860815	53.47266769	12.76785469	1.94033E-05	39	3.752777815	VV	0.027056307	12.72380066	6.43833971	4.617E-06
6	0.358333319	VP	0.050259411	26.83462906	6.487246037	9.7373E-06	40	3.801666737	VV	0.0265467	13.47286892	6.97146225	4.88881E-06
7	0.451000005	VV	0.013296485	6.131950855	7.695319653	2.22506E-06	41	3.859285831	VV	0.024586808	13.86058617	7.159348965	5.0295E-06
8	0.678333342	BP	0.038251933	16.76151848	5.394224167	6.08214E-06	42	3.907500029	VV	0.018813197	10.06346226	8.915250778	3.65166E-06
9	0.790555537	VV	0.037863448	14.3031168	4.927722931	5.19008E-06	43	3.944999933	VV	0.013014809	5.980078697	6.966441631	2.16995E-06
10	0.913888872	VP	0.050902478	33.39250946	10.27846432	1.21169E-05	44	3.967666626	VV	0.01342057	5.800374508	6.493985653	2.10474E-06
11	1.012037039	VV	0.062624477	83.5271759	16.07409668	3.03089E-05	45	4.100833416	VV	0.065119751	40.4294548	7.978332043	1.46704E-05
12	1.086666703	VV	0.045703433	42.84264374	11.70469952	1.5546E-05	46	4.119999886	VV	0.01493091	6.387704372	6.246230602	2.31786E-06
13	1.162500024	VV	0.031327039	25.81092644	10.26791382	9.36584E-06	47	4.150000095	VV	0.017936213	11.41057491	8.353513718	4.14048E-06
14	1.224166632	VV	0.026863972	18.57592392	11.52468204	6.74052E-06	48	4.366333485	VV	0.09797442	156.2613373	18.99515343	5.67015E-05
15	1.298333287	VV	0.063995101	52.32128143	10.17441273	1.89855E-05	49	4.403888702	VV	0.026149992	22.43844414	14.30111599	8.14209E-06
16	1.404166698	VV	0.042764861	42.50802994	12.47148895	1.54246E-05	50	4.432333469	VP	0.042444907	42.25856018	12.49886417	1.53341E-05
17	1.48633337	VV	0.037737358	24.65704727	8.281157494	8.94714E-06	51	4.586666584	BB	0.008527612	2.528918028	4.519882679	9.17652E-07
18	1.516111135	VV	0.040790744	31.79586029	9.56289196	1.15376E-05	52	4.646111012	BP	0.015938569	5.06579113	4.240098	1.83819E-06
19	1.609761953	VP	0.015678406	8.819662094	9.375594139	3.20033E-06	53	4.723666668	VV	0.047866177	22.80420113	5.800549507	8.27481E-06
20	1.851111054	PP	0.009179275	3.421908379	6.213105679	1.24168E-06	54	5.079999924	VV	0.123059317	1014.589294	101.1185989	0.000368157
21	1.912500024	VV	0.038174298	17.96902466	7.440774918	6.5203E-06	55	5.378333569	VV	0.141760096	5012.642578	457.7393799	0.001818904
22	1.942333341	VV	0.017441873	11.65137863	8.802867889	4.22786E-06	56	5.604791641	VV	0.103243187	4906.63916	594.7861938	0.001780439
23	2.032618999	VV	0.051082402	58.20045471	13.83398628	2.11188E-05	57	5.714565277	VV	0.069552675	3040.824951	585.8748779	0.001103404
24	2.105555534	VV	0.038819641	53.51493454	16.95673561	1.94186E-05	58	6.344976425	VV	0.11448548	101596424	11344079	36.86561313
25	2.20566678	VP	0.063610129	125.6545486	23.79429817	4.55954E-05	59	6.507068634	VV	0.109543718	125651352	14875961	45.59426356
26	2.481666565	VP	0.125886798	111.6369019	10.51306915	4.05089E-05	60	6.83880043	VV	0.087430604	45641764	6966937	16.56172086
27	2.632499933	VP	0.033136468	16.6590786	6.24206686	6.04497E-06	61	7.264736176	VV	0.067879535	2657682.5	564988.3125	0.964375428
28	2.719074011	VP	0.015257016	7.052686691	6.206626415	2.55916E-06	62	7.922777653	VV	0.160358772	1436.672852	149.3186035	0.000521316
29	2.871249914	VV	0.074286491	50.5897789	10.12608719	1.83572E-05	63	8.123000145	VV	0.052317217	338.5449524	107.8500748	0.000122846
30	3.067380905	VV	0.076516986	69.50325775	11.02971363	2.52202E-05	64	8.166250229	VV	0.047080874	408.1992188	105.6395721	0.000148121
31	3.147500038	VV	0.043465711	28.83344269	10.05178642	1.04626E-05	65	8.236666679	VV	0.03407187	270.3349609	101.5036316	9.80946E-05
32	3.202619076	VV	0.031832282	31.91593552	12.48153114	1.15811E-05	66	8.299285889	VB	0.116316415	930.2360229	94.93608856	0.000337549
33	3.27033329	VV	0.045361087	34.5021286	10.49305153	1.25196E-05	67	8.639444351	BV	0.19739984	1963.881104	117.2567215	0.00071262
34	3.322618961	VV	0.019384384	11.48053741	7.704592705	4.16587E-06	68	8.825555801	VV	0.040443499	205.9450531	64.16847229	7.47299E-05

Foam Samples from the Edge and Sampled at Room Temperature

69	8.87566618 VV	0.033843894	164.9559326	60.43500519	5.98565E-05	107	13.18500042 VV	0.119791307	695.3181763	68.86794281	0.000252305
70	8.925833702 VV	0.017267449	67.22518921	51.370327	2.43936E-05	108	13.32633305 VV	0.078781992	485.1122742	76.70764923	0.000176029
71	8.951666832 VB	0.067557313	259.8757019	46.96421051	9.42994E-05	109	13.35833359 VV	0.04798802	297.8260498	75.55526733	0.00010807
72	9.07722187 BV	0.025284583	50.9171257	33.56269455	1.8476E-05	110	13.42541695 VV	0.019327771	108.166687	72.82787323	3.92497E-05
73	9.103333473 VV	0.025343515	57.56335068	33.01162338	2.08876E-05	111	13.47433376 VV	0.053273544	215.2888336	67.35327148	7.81204E-05
74	9.138333321 VV	0.062681593	169.2576447	32.54154205	6.14174E-05	112	13.61071396 VV	0.108575404	590.74823	69.91665649	0.000214361
75	9.219166756 VB	0.080992594	180.5811615	26.67060471	6.55263E-05	113	13.71666622 VV	0.0561953	336.4952087	73.79932404	0.000122102
76	9.380000114 BP	0.056592096	58.12944031	12.65441895	2.1093E-05	114	13.81233311 VV	0.077134274	579.7376709	92.48203278	0.000210366
77	9.632333755 BV	0.111909062	269.7826233	28.63698196	9.78942E-05	115	13.9753027 VV	0.077633679	1616.080078	287.2651367	0.000586416
78	9.819848061 VV	0.035966106	54.16735077	22.84211922	1.96553E-05	116	14.10083294 VV	0.040180109	251.059021	88.27643585	9.11001E-05
79	9.835833549 VV	0.018242413	23.03017807	17.62748528	8.35681E-06	117	14.17083359 VV	0.068581097	441.0543518	90.94263458	0.000160042
80	9.952407837 VP	0.048011269	533.4278564	163.7231598	0.000193561	118	14.27999973 VV	0.073079124	881.7286987	146.7888489	0.000319947
81	10.10833359 VV	0.033774093	21.22890091	8.048019409	7.70319E-06	119	14.48166656 VBA	0.06587778	1684.663818	358.1488037	0.000611303
82	10.19462967 VV	0.048427269	51.30547333	14.80594254	1.86169E-05						
83	10.37250042 VV	0.076903149	303.0744019	47.84461975	0.000109975						
84	10.52222252 VV	0.096317038	505.1872864	62.48978806	0.000183314						
85	10.59111118 VV	0.027849864	86.52877045	51.78287888	3.13981E-05						
86	10.7080307 VV	0.095260143	547.5535278	69.24034882	0.000198687						
87	10.82999992 VV	0.073197857	1061.186157	192.8492126	0.000385066						
88	11.08833313 VV	0.096658677	369.9496765	46.08307266	0.000134241						
89	11.18999958 VV	0.114829347	418.894928	43.31415176	0.000152002						
90	11.40333366 VV	0.035703968	61.02632904	23.1883316	2.21442E-05						
91	11.46611118 VV	0.046999626	99.74045563	25.85885239	3.61922E-05						
92	11.54722214 VV	0.047328919	58.07172775	20.44969749	2.10721E-05						
93	11.56633377 VV	0.068082497	123.2868118	21.76591873	4.47363E-05						
94	11.77083302 VV	0.066047542	127.3798981	24.34330368	4.62215E-05						
95	11.90452385 VV	0.176762804	451.6150513	31.03649521	0.000163875						
96	12.17458344 VV	0.080727488	208.6638031	34.91321945	7.57164E-05						
97	12.20083332 VV	0.014353391	29.92827797	34.75168991	1.08599E-05						
98	12.2616663 VV	0.044901546	140.4026337	40.04813385	5.0947E-05						
99	12.3283329 VV	0.064917758	237.5569916	44.04953766	8.62007E-05						
100	12.39416695 VV	0.057666525	161.356369	46.63490677	5.85503E-05						
101	12.53666687 VV	0.089736231	375.5005188	50.50760651	0.000136255						
102	12.59899998 VV	0.067181394	289.8440247	51.87851334	0.000105174						
103	12.67300034 VV	0.048119802	149.4627228	51.76757431	5.42345E-05						
104	12.83076954 VV	0.075198486	614.1155396	119.0176315	0.00022284						
105	12.9416666 VV	0.049119759	281.6279602	74.47138214	0.000102192						
106	12.99650574 VV	0.042439613	679.1100464	223.5619965	0.000246424						

Foam Samples from the Edge and Sampled at Room Temperature

Sample	Location	Sampling Temp.											
PIBNA 1	EDGE	ROOM TEMP.											
#	Retention Time	Peak Type	Peak Width	Area	Height	Area %	#	Retention Time	Peak Type	Peak Width	Area	Height	Area %
1	0.031666666	BP	0.055427033	24.54320526	5.678251266	8.86371E-06	35	2.858939409	VV	0.029992046	30.96697998	13.89969254	1.11836E-05
2	0.12833333	VV	0.035879657	26.58946609	9.156246185	9.60271E-06	36	2.987083435	VV	0.067551695	85.86283112	17.40579605	3.10091E-05
3	0.195416674	VB	0.062228445	42.81671143	8.578767776	1.54631E-05	37	3.089999914	VV	0.026457867	26.83483505	13.34618759	9.69133E-06
4	0.361111104	BV	0.042129245	22.24780846	8.801411629	8.03474E-06	38	3.216481447	VV	0.070305027	97.89724731	18.35589027	3.53553E-05
5	0.439444453	VV	0.02782183	12.68301487	5.961224556	4.58044E-06	39	3.255277872	VV	0.085439608	158.6921539	22.18860435	5.73112E-05
6	0.499000013	VV	0.039851852	30.88331032	10.33819675	1.11534E-05	40	3.436904669	VV	0.036153559	63.05171585	26.12825584	2.2771E-05
7	0.550555527	VP	0.014322232	8.758906364	10.19266891	3.16326E-06	41	3.546666622	VV	0.073459707	176.1198273	30.013731	6.36052E-05
8	0.574583352	VV	0.054746363	40.23398972	12.24860287	1.45304E-05	42	3.592333317	VV	0.033874873	82.34055328	32.15544128	2.97371E-05
9	0.724523783	VV	0.049206473	25.16407204	7.529222488	9.08794E-06	43	3.863634586	BV	0.03536129	272.4888	95.29116058	9.84086E-05
10	0.805666685	VV	0.022490423	10.81740379	6.475131512	3.90668E-06	44	3.965952396	VP	0.060638096	237.3623352	47.22573853	8.57228E-05
11	0.854333341	VV	0.025806408	10.35374069	6.68680191	3.73923E-06	45	4.037222385	VV	0.046698678	143.9535828	40.27606201	5.19884E-05
12	0.922500014	VV	0.020475669	11.00615025	6.949955463	3.97484E-06	46	4.085000038	VV	0.068367809	196.2947693	35.03414917	7.08913E-05
13	0.962333322	VV	0.039860684	14.57132721	4.490114689	5.2624E-06	47	4.196111202	VV	0.023550585	45.14088058	27.28640556	1.63025E-05
14	1.023571372	VB	0.056679223	25.00861168	7.353844643	9.03179E-06	48	4.284090996	VV	0.057702806	135.3053741	29.95215797	4.88652E-05
15	1.146666646	BP	0.038154177	15.27236462	5.216860294	5.51557E-06	49	4.393750191	VV	0.100265451	243.4462128	30.45292664	8.79199E-05
16	1.186666608	VV	0.021937935	7.432651997	5.119530678	2.68428E-06	50	4.472499847	VV	0.066513628	152.736496	28.0558033	5.51604E-05
17	1.249666691	VV	0.034029152	18.04933167	6.786377907	6.51847E-06	51	4.61277771	VV	0.034482695	39.73810196	14.27255917	1.43513E-05
18	1.276111126	VB	0.03512162	20.54579544	7.702071667	7.42006E-06	52	4.657222271	VV	0.013015173	10.07241821	12.89830303	3.63763E-06
19	1.459166646	BV	0.051554102	32.68566895	7.695281982	1.18043E-05	53	4.686999798	VV	0.0246782	15.71842384	10.61559296	5.67667E-06
20	1.529999971	VP	0.083182864	32.50835419	6.513432026	1.17403E-05	54	4.709166527	VV	0.019341821	14.7998848	9.956585884	5.34494E-06
21	1.69749999	VB	0.028510634	9.310824394	4.258078575	3.36258E-06	55	4.755666733	VP	0.018703438	8.084777832	7.204360008	2.9198E-06
22	1.850833297	BP	0.02652891	14.65337944	9.205918312	5.29203E-06	56	5.13785696	VV	0.100186862	758.3102417	94.93776703	0.000273862
23	1.943666697	VB	0.053697191	34.79681015	8.007598877	1.25668E-05	57	5.382500172	VV	0.130516633	4363.55127	418.9393311	0.001575885
24	2.046999931	BP	0.012265001	5.892793179	8.007598877	2.12817E-06	58	5.712145329	VV	0.139631152	81642.0625	7347.699707	0.029484809
25	2.077500105	VB	0.019394491	7.196485519	6.184303761	2.59899E-06	59	6.348181248	VV	0.113654509	101640888	11440027	36.70733027
26	2.217777729	BB	0.0487919	46.69059372	12.72959518	1.68622E-05	60	6.509949207	VV	0.114593707	126487368	14967343	45.68056895
27	2.352999926	BP	0.014333185	5.503021717	5.205623627	1.9874E-06	61	6.843027592	VV	0.088530615	45962464	7006722	16.59921887
28	2.389444351	VV	0.022480328	8.20689106	5.228177071	2.9639E-06	62	7.268458843	VV	0.067413017	2701512	579229.8125	0.975643712
29	2.449761868	VV	0.023792354	10.12777996	7.094562054	3.65762E-06	63	7.942618847	VV	0.141413599	1537.149414	129.5639191	0.000555137
30	2.50666666	VV	0.033034392	12.89276886	5.008113384	4.65619E-06	64	8.201666832	VV	0.077711999	502.2724304	77.39651489	0.000181394
31	2.537222147	VV	0.02922556	15.14046478	8.634260178	5.46794E-06	65	8.335000038	VV	0.043289125	196.7578583	65.04860687	7.10586E-05
32	2.623888969	VV	0.087374352	87.2821579	12.82897854	3.15217E-05	66	8.401666641	VV	0.086174712	398.4112854	60.2286911	0.000143885
33	2.749444485	VV	0.03645429	18.59135246	8.499846458	6.71422E-06	67	8.484259605	VV	0.033370733	135.9251404	60.13459396	4.9089E-05
34	2.797857046	VV	0.03661279	27.07136345	10.665411	9.77675E-06	68	8.666851997	VV	0.163427144	1330.922974	96.78807068	0.000480659

Foam Samples from the Edge and Sampled at Room Temperature

69	8.882333755	VV	0.029846573	44.26850891	19.23768616	1.59875E-05	107	12.49611092	VV	0.053338394	60.18712234	13.94925499	2.17364E-05
70	8.947221756	VV	0.029367814	27.55783463	11.74767113	9.95244E-06	108	12.52499962	VV	0.031388581	35.26526642	13.99959183	1.2736E-05
71	8.986602783	VB	0.004658969	88.07930756	386.462616	3.18096E-05	109	12.5625	VV	0.031467728	40.27080154	16.50381088	1.45437E-05
72	9.162500381	BP	0.036077555	17.10471916	7.901828289	6.17732E-06	110	12.71425915	VV	0.07923054	120.7222366	21.59151268	4.35985E-05
73	9.218333244	VP	0.048534244	29.57506561	7.41480732	1.0681E-05	111	12.89833355	VV	0.11266803	333.4145203	35.79558945	0.000120412
74	9.340000153	VP	0.050198413	15.3319273	5.090442181	5.53708E-06	112	13.00083351	VV	0.038215812	427.7301331	165.1514435	0.000154474
75	9.542575836	BP	0.020805744	10.97593021	6.809224129	3.96393E-06	113	13.13966656	VV	0.05651354	108.6645203	23.25574112	3.92439E-05
76	9.639915466	VV	0.03755179	182.8403778	60.00085449	6.60323E-05	114	13.19833374	VV	0.040433925	66.68902588	21.95744896	2.40846E-05
77	9.723333359	VV	0.015085333	34.52635956	33.33027649	1.24691E-05	115	13.22500038	VV	0.017213559	26.76693344	20.52648544	9.66681E-06
78	9.743000031	VV	0.05641849	112.8548355	33.3386116	4.07572E-05	116	13.25166702	VV	0.021396777	34.38137817	21.80360603	1.24167E-05
79	9.81388855	VV	0.015308404	28.14556694	26.67811012	1.01647E-05	117	13.28583336	VV	0.020061638	29.7094841	20.31520271	1.07295E-05
80	9.832262039	VP	0.018516218	43.19604111	32.47916412	1.56001E-05	118	13.31433296	VV	0.039362509	41.61915588	17.62216377	1.50306E-05
81	9.956666946	VV	0.047948327	539.9540405	166.0010834	0.000195003	119	13.41642857	VV	0.044584446	78.88632965	22.67717361	2.84896E-05
82	10.17666626	VV	0.069218971	91.57746887	16.39576149	3.3073E-05	120	13.45666695	VV	0.02288731	29.40103912	17.24778938	1.06181E-05
83	10.21033287	VV	0.038354233	41.90747452	18.21071243	1.51348E-05	121	13.4829998	VV	0.028645959	36.43828964	21.20036507	1.31596E-05
84	10.27166653	VV	0.035166964	57.47027588	20.84395027	2.07552E-05	122	13.63866711	VV	0.076380201	211.2194519	33.13014603	7.62813E-05
85	10.2929163	VV	0.018078811	35.07011032	25.44661331	1.26655E-05	123	13.7130003	VV	0.062170815	196.2341919	38.0483284	7.08694E-05
86	10.37833309	VV	0.062236276	217.4578552	42.11761475	7.85343E-05	124	13.82766628	VV	0.071654283	293.9318542	53.87233353	0.000106153
87	10.52458286	VV	0.11155846	411.5206604	46.36100769	0.00014862	125	13.99122238	VV	0.065239593	1055.999512	240.4389496	0.000381371
88	10.71388912	VV	0.076540433	269.9273987	44.01920319	9.74835E-05	126	14.17981434	VV	0.067931883	314.9341125	55.72768784	0.000113738
89	10.83388901	VV	0.055353966	698.3869629	179.650177	0.000252221	127	14.29749966	VV	0.086754762	724.8643188	110.1788406	0.000261783
90	10.91166687	VV	0.036375273	87.64759827	29.74682808	3.16537E-05	128	14.49433327	VBA	0.041586787	1031.652344	328.9697266	0.000372578
91	10.95944405	VV	0.01705387	27.72572517	27.09621811	1.00131E-05							
92	10.99833298	VV	0.034634802	69.44326782	24.82538414	2.50792E-05							
93	11.11166668	VV	0.079877101	215.6183014	32.72166824	7.787E-05							
94	11.17000008	VV	0.038421199	56.13023758	19.02469254	2.02713E-05							
95	11.24277782	VV	0.047385018	82.4455719	21.19344711	2.9775E-05							
96	11.46055603	VV	0.071378432	58.51699448	10.28494072	2.11333E-05							
97	11.58699989	VV	0.063759834	85.32049561	16.38262939	3.08133E-05							
98	11.63833332	VV	0.042725887	57.52767944	16.47984314	2.0776E-05							
99	11.71954536	VV	0.056969672	72.58039093	15.68976021	2.62122E-05							
100	11.81233311	VB	0.026903892	17.13700867	8.028133392	6.18898E-06							
101	11.98547649	BP	0.022541095	14.53334045	8.254459381	5.24868E-06							
102	12.06388855	VV	0.033665884	19.29808426	8.443159103	6.96945E-06							
103	12.1111908	VP	0.031943876	17.40225601	9.07959938	6.28478E-06							
104	12.17651558	VV	0.015796937	10.17745495	9.278546333	3.67556E-06							
105	12.26375008	VV	0.043075133	24.27083588	9.112100601	8.76535E-06							
106	12.33458328	VV	0.060818519	60.5661087	13.12939548	2.18733E-05							

Foam Samples from the Edge and Sampled at Room Temperature

Sample	Location	Sampling Temp.											
PIBNA 2	EDGE	ROOM TEMP.											
#	Retention Time	Peak Type	Peak Width	Area	Height	Area %	#	Retention Time	Peak Type	Peak Width	Area	Height	Area %
1	0.068750001	BP	0.037958115	13.95547771	6.127577305	5.08447E-06	35	3.276111126	VV	0.072358049	126.5035553	21.91088867	4.60897E-05
2	0.144999996	VV	0.046347897	28.00216675	7.366571426	1.02022E-05	36	3.382499933	VV	0.06308575	97.3447876	18.90113831	3.54662E-05
3	0.270238101	VP	0.021186817	11.58277512	9.111620903	4.22001E-06	37	3.496111155	VP	0.02750865	28.44616127	13.01017094	1.03639E-05
4	0.310000002	VV	0.033155382	24.38955498	9.133086205	8.88598E-06	38	3.596666574	VV	0.033488002	15.8237133	5.862867355	5.76514E-06
5	0.474999994	VV	0.102675684	137.3429565	15.91580486	5.00389E-05	39	3.670555592	VV	0.031015173	24.74116516	11.09533024	9.01408E-06
6	0.58880955	VV	0.041886356	66.07529449	20.3471241	2.40736E-05	40	3.791666746	VV	0.065892518	85.56987	15.62491417	3.11761E-05
7	0.614333332	VV	0.018512396	24.96024323	20.06579971	9.0939E-06	41	3.900833368	VV	0.068212546	78.39482117	15.9861145	2.8562E-05
8	0.653750002	VV	0.041882019	78.95536041	23.69079399	2.87662E-05	42	3.932619095	VB	0.054317765	68.76202393	15.33367443	2.50524E-05
9	0.709999979	VV	0.022027165	35.86780548	23.21261978	1.30679E-05	43	4.143333435	BV	0.023104323	13.55387592	9.819012642	4.93816E-06
10	0.737666667	VV	0.021706579	30.03669739	23.06266785	1.09434E-05	44	4.206110954	VV	0.024534432	16.64388084	8.616973877	6.06395E-06
11	0.771666646	VV	0.025384108	39.26651382	22.75290108	1.43062E-05	45	4.247499943	VV	0.025841251	20.17234802	11.86135101	7.3495E-06
12	0.812333345	VV	0.086796552	158.6302948	23.78879929	5.77946E-05	46	4.38708353	VV	0.060046006	107.8944244	23.72974777	3.93098E-05
13	0.949999988	VV	0.034435641	55.07050323	22.59450531	2.00641E-05	47	4.406851768	VV	0.022058321	38.10512161	23.32628059	1.3883E-05
14	0.977222204	VV	0.048260108	64.86433411	22.40094948	2.36324E-05	48	4.475833416	VV	0.083867371	90.63883972	18.01233673	3.30229E-05
15	1.069000006	VV	0.063347138	107.4998932	20.44374657	3.9166E-05	49	4.61833334	VP	0.032860257	23.40006065	8.846352577	8.52547E-06
16	1.129999995	VV	0.016739676	25.01255417	19.79779816	9.11296E-06	50	4.766666889	VP	0.037456855	35.53620911	11.69277763	1.29471E-05
17	1.183750033	VV	0.03055759	42.63175583	18.04840279	1.55323E-05	51	4.877222061	VP	0.038297482	18.90139198	6.247364521	6.88645E-06
18	1.20966661	VV	0.047343291	74.4604187	19.15839958	2.71286E-05	52	5.08833313	VV	0.112344645	897.2245483	95.73052216	0.000326891
19	1.284999967	VV	0.023925086	27.47763252	14.62125969	1.00111E-05	53	5.37624979	VV	0.132502362	4809.569824	473.5065918	0.001752297
20	1.326666713	VV	0.076983288	94.50333405	15.53237247	3.44309E-05	54	5.712584972	VV	0.139379486	81417.00781	7341.697266	0.029663098
21	1.460000038	VV	0.028348174	20.03968811	11.78188038	7.30117E-06	55	6.348530293	VV	0.115353964	100443936	11338181	36.59528148
22	1.51366663	VP	0.059636757	40.62649536	11.35387421	1.48017E-05	56	6.510191441	VV	0.110826008	125784616	14849201	45.82778824
23	1.619666696	VV	0.043280728	25.56366539	7.592597961	9.31375E-06	57	6.842836857	VV	0.088571616	45484952	6930215	16.57177813
24	2.014333248	BV	0.015896918	6.763966084	7.0914855	2.46435E-06	58	7.26913929	VV	0.067758754	2658928.25	566499.9375	0.968741684
25	2.319999933	PP	0.017583329	4.932878017	3.946303606	1.79722E-06	59	7.913095474	VB	0.108569063	390.8250732	59.99638367	0.000142391
26	2.350555658	VB	0.041394599	10.37365246	4.176733494	3.77949E-06	60	8.16055584	BV	0.059280239	26.54320717	5.601834774	9.67063E-06
27	2.50333333	BP	0.023153288	6.558128834	3.796477318	2.38936E-06	61	8.241666794	VV	0.036376055	22.86482048	8.23930645	8.33046E-06
28	2.532777786	VV	0.017693195	4.710679054	4.013520718	1.71627E-06	62	8.299545288	VP	0.06408523	46.84981537	12.18424606	1.7069E-05
29	2.563333273	VP	0.014277778	5.155082703	5.332844257	1.87818E-06	63	8.675000191	VV	0.116133913	680.9553833	69.60665131	0.000248096
30	2.603333235	VV	0.04544957	22.45778656	6.172206402	8.18217E-06	64	8.855667114	VV	0.11118792	63.49151993	9.517148972	2.31322E-05
31	2.69416666	VV	0.030412143	13.58167648	7.443121433	4.94829E-06	65	9.112667084	VP	0.038820483	22.14950752	7.018129826	8.06985E-06
32	3.005000114	VV	0.105955206	101.7340088	11.75666714	3.70653E-05	66	9.196389198	VV	0.014169739	11.54988384	11.07243443	4.20803E-06
33	3.137500048	VV	0.063697606	82.80330658	16.18219948	3.01682E-05	67	9.223666191	VV	0.029035719	17.60327721	7.888070107	6.4135E-06
34	3.220000029	VV	0.051694591	97.10312653	22.79664421	3.53781E-05	68	9.296333313	VP	0.017265111	9.693277359	7.408280849	3.5316E-06

Foam Samples from the Edge and Sampled at Room Temperature

69	9.344444275 VP	0.04655043	24.01446533	8.598010063	8.74932E-06	107	13.4327774 VP	0.054551944	169.6511688	37.66299438	6.18099E-05
70	9.404999733 VV	0.015367847	8.500275612	8.018362999	3.09695E-06	108	13.6009264 VV	0.094674535	256.6925659	33.77234268	9.35222E-05
71	9.701666832 BV	0.072970442	183.4698486	30.59122467	6.68446E-05	109	13.79791641 VV	0.08047419	305.7791138	45.45982361	0.000111406
72	9.779999733 VV	0.020413242	23.51929283	19.20264435	8.56891E-06	110	13.97880936 VV	0.063639954	1106.161621	240.5896912	0.000403014
73	9.801190376 VV	0.019562975	22.57736969	19.23477936	8.22573E-06	111	14.10750008 VV	0.033020206	46.3101387	18.61754227	1.68724E-05
74	9.819999695 VP	0.032235451	52.65021896	20.3156414	1.91823E-05	112	14.1716671 VV	0.052178178	101.2471771	24.51767731	3.68879E-05
75	9.957221985 VV	0.053065084	570.0314331	170.2381134	0.000207683	113	14.28499985 VV	0.042547673	211.9730988	60.99041748	7.72293E-05
76	10.19766712 VV	0.088578947	183.1387177	24.96663666	6.67239E-05	114	14.49018478 VBA	0.036145583	217.8759918	74.44261932	7.93799E-05
77	10.29249954 VV	0.052794963	129.4872742	29.740839	4.71768E-05						
78	10.38416672 VV	0.055131581	236.4518738	57.31382751	8.61478E-05						
79	10.51611137 VV	0.124537028	705.3030396	67.15142059	0.000256967						
80	10.71833324 VV	0.081245579	385.7634277	62.29548264	0.000140547						
81	10.83452415 VV	0.054282837	714.7738647	188.3128815	0.000260417						
82	10.89928532 VV	0.073226482	190.9623413	31.72441483	6.95743E-05						
83	11.22766685 VV	0.172639027	478.7675476	33.92647171	0.000174432						
84	11.40777779 VV	0.081239648	76.20186615	15.63314342	2.7763E-05						
85	11.45499992 VV	0.026722757	29.68972588	14.01057911	1.0817E-05						
86	11.50374985 VV	0.031872194	48.67687988	19.01088715	1.77347E-05						
87	11.57944489 VV	0.040708717	61.00604248	19.93174744	2.22267E-05						
88	11.63685226 VV	0.057173319	80.89237976	19.59060478	2.9472E-05						
89	11.70981503 VV	0.063480005	73.07731628	19.18643951	2.66247E-05						
90	11.79500008 VV	0.049468677	57.65546036	14.79363632	2.10059E-05						
91	11.88416672 VV	0.023194958	19.84999466	14.29971409	7.23206E-06						
92	11.92333317 VV	0.032117665	32.69802856	12.66622162	1.1913E-05						
93	11.96388912 VV	0.024654577	23.11865997	12.45545959	8.42295E-06						
94	12.05722237 VV	0.10172125	89.22235107	14.61876678	3.25069E-05						
95	12.33300018 VV	0.074196182	204.644455	33.06987381	7.45592E-05						
96	12.35499954 VB	0.075867116	228.8307953	37.14762115	8.33712E-05						
97	12.57777786 BV	0.093032092	195.2970123	26.48389626	7.11536E-05						
98	12.64500046 VV	0.030300511	57.31010818	23.6256485	2.08801E-05						
99	12.68309498 VV	0.069237098	85.00592041	20.46251678	3.09707E-05						
100	12.80611134 VV	0.039319895	59.12621307	18.48359489	2.15418E-05						
101	12.90499973 VV	0.059238795	202.7421875	42.05860519	7.38662E-05						
102	13.00157928 VV	0.036912568	661.0834351	266.7573547	0.000240856						
103	13.16541672 VV	0.079767734	164.2346344	24.63837624	5.98365E-05						
104	13.26766682 VV	0.057065666	110.7076035	25.29270363	4.03347E-05						
105	13.32055569 VV	0.015816301	24.46691322	22.27220917	8.91416E-06						
106	13.34353542 VV	0.023829198	136.2767792	72.83345032	4.96505E-05						

Foam Samples from the Edge and Sampled at Room Temperature

Sample	Location	Sampling Temp.											
PIBNA 3	EDGE	ROOM TEMP.											
#	Retention Time	Peak Type	Peak Width	Area	Height	Area %	#	Retention Time	Peak Type	Peak Width	Area	Height	Area %
1	0.274166673	BV	0.020766485	18.65316772	12.24892139	6.77897E-06	35	2.862619162	VV	0.021864474	17.53857994	10.3006382	6.3739E-06
2	0.319999993	VV	0.018125525	16.68671417	12.8708477	6.06432E-06	36	3.017916679	VV	0.079187259	129.0946198	21.15693092	4.69158E-05
3	0.349444449	VV	0.017838756	18.14521408	13.36558151	6.59437E-06	37	3.04928565	VV	0.019560019	32.4505806	21.55977631	1.17932E-05
4	0.395833343	VV	0.047117386	44.13624954	11.41296005	1.60401E-05	38	3.090833426	VV	0.042489722	60.33997726	17.82657242	2.19289E-05
5	0.456666678	VV	0.014758121	8.53692627	9.640936852	3.1025E-06	39	3.160555601	VV	0.027232254	39.70096588	24.083395	1.44282E-05
6	0.54928571	VV	0.081455715	80.40903473	16.45250511	2.92224E-05	40	3.283333302	VV	0.071989395	141.3571777	23.56309891	5.13723E-05
7	0.589444458	VV	0.02474043	27.99868011	14.36433983	1.01753E-05	41	3.337500095	VV	0.034217682	45.63850021	22.22949028	1.6586E-05
8	0.656666696	VV	0.039462388	57.96365738	18.05124283	2.10653E-05	42	3.448333263	VV	0.080149807	158.2427979	23.62342262	5.75089E-05
9	0.720555544	VV	0.063852586	83.24532318	21.72851944	3.02532E-05	43	3.492222309	VV	0.059093427	93.04714966	19.70380211	3.38154E-05
10	0.773000002	VV	0.029118521	49.23834991	21.18284416	1.78943E-05	44	3.590555668	VV	0.027508862	30.07761383	17.1099453	1.09309E-05
11	0.85082221	VV	0.05679895	374.9956055	84.46018219	0.000136282	45	3.630000114	VV	0.026219491	34.68552017	17.42778969	1.26055E-05
12	0.99777776	VV	0.052260309	119.3932266	38.07645035	4.33901E-05	46	3.66291666	VV	0.061766997	56.62675095	15.27966785	2.05794E-05
13	1.065303087	VV	0.036468852	100.3880539	33.9783287	3.64832E-05	47	3.75309515	VV	0.022037156	16.0032196	11.64197826	5.81592E-06
14	1.295555592	BV	0.145088509	441.4369812	35.99239731	0.000160428	48	3.775000095	VV	0.020021655	13.18943977	8.538438797	4.79333E-06
15	1.493571401	VV	0.01754494	36.90471268	29.60170174	1.3412E-05	49	3.83214283	VP	0.038253102	26.24089432	8.444622993	9.53651E-06
16	1.544999957	VB	0.077760898	185.796463	29.38718987	6.75225E-05	50	3.913666725	VV	0.014790127	7.500686169	7.422142982	2.72591E-06
17	1.713333368	BV	0.104593828	256.1541443	30.31087303	9.3092E-05	51	3.957333326	VV	0.027866775	20.27967262	11.33841515	7.37007E-06
18	1.838999987	VV	0.02751321	52.22160721	28.31990623	1.89785E-05	52	4.156333447	VV	0.101200521	142.9885712	17.89904213	5.19652E-05
19	1.929999948	VV	0.094723262	235.6110687	29.64515877	8.56262E-05	53	4.210999966	VV	0.024446225	27.54212379	18.77735329	1.00094E-05
20	2.009166718	VV	0.027153606	52.94223022	25.57213974	1.92404E-05	54	4.287666798	VV	0.138738647	291.2131042	25.59530449	0.000105833
21	2.048333406	VV	0.029170582	59.43785095	27.54968262	2.1601E-05	55	4.484166622	VV	0.045628674	40.65597153	14.85029984	1.47753E-05
22	2.082083225	VV	0.020965187	45.7979393	28.17316246	1.6644E-05	56	4.556111336	VV	0.035760507	30.10704041	11.0592947	1.09416E-05
23	2.115666628	VV	0.025045322	48.5488472	24.57779694	1.76437E-05	57	4.815999985	BP	0.04585737	28.82113457	7.666819572	1.04742E-05
24	2.167500019	VV	0.084701672	168.7816315	25.34204102	6.13389E-05	58	5.060184956	VV	0.116493352	997.2142944	103.4209213	0.000362409
25	2.297222137	VV	0.015963335	7.003602982	7.312176704	2.54526E-06	59	5.382777691	VV	0.122780815	4269.364258	419.3375244	0.00155158
26	2.329666615	VP	0.011853168	6.592490673	7.805854321	2.39585E-06	60	5.711789608	VV	0.138534918	77980.71875	7023.395996	0.028339892
27	2.380000114	VV	0.019851852	11.55449581	7.999266624	4.19916E-06	61	6.347309589	VV	0.113685608	100774456	11339105	36.62363234
28	2.411666632	VV	0.021416426	11.16342068	6.707718372	4.05703E-06	62	6.509522438	VV	0.110398501	125833144	14919468	45.73050538
29	2.437222242	VV	0.012072997	7.279332638	9.360253334	2.64547E-06	63	6.841732025	VV	0.087522946	45751832	6975312	16.6272123
30	2.540555477	VV	0.074149743	99.11091614	16.02630806	3.60191E-05	64	7.267874241	VV	0.065688014	2698384.75	575650	0.980651793
31	2.62833333	VP	0.052504867	64.20744324	14.83197308	2.33344E-05	65	8.042222023	VB	0.09937641	352.4338989	59.10757446	0.000128082
32	2.730000019	VP	0.015416667	5.066202164	5.332844257	1.84117E-06	66	8.190555573	BV	0.070297889	147.2336731	34.90708923	5.35079E-05
33	2.787222147	VV	0.032461267	13.43989754	5.509200096	4.88435E-06	67	8.271666527	VB	0.042685393	70.45256042	20.71156311	2.5604E-05
34	2.836111069	VV	0.01788719	8.126806259	6.934352398	2.95346E-06	68	8.619999886	BV	0.140102029	731.4140625	64.59525299	0.000265812

Foam Samples from the Edge and Sampled at Room Temperature

69	8.876000404 VV	0.059863649	53.34885025	14.85287857	1.93881E-05	107	13.57092571 VV	0.075062014	512.6622314	87.87661743	0.000186313
70	8.920833588 VP	0.027327783	13.08395576	7.979641914	4.75499E-06	108	13.61291695 VV	0.080863886	418.0276489	86.15870667	0.00015192
71	9.141666412 BV	0.042693481	20.05171585	6.045893669	7.28723E-06	109	13.78499985 VV	0.109815083	855.5093384	94.32437897	0.000310911
72	9.242500305 VV	0.023482015	11.86804008	7.199477673	4.3131E-06	110	13.9714098 VV	0.077458702	1690.88208	301.3649292	0.000614503
73	9.279999733 VV	0.018151706	13.3135376	9.616606712	4.83843E-06	111	14.10166645 VV	0.037665676	165.8527527	57.47541809	6.02745E-05
74	9.306333542 VB	0.072865166	49.62798691	11.35155678	1.80359E-05	112	14.16023827 VV	0.047269113	231.5974579	61.03511047	8.41676E-05
75	9.488333702 PV	0.02612672	10.39750576	5.482251167	3.77868E-06	113	14.28217983 VV	0.075781316	668.7623901	115.1088257	0.000243043
76	9.521666527 VV	0.015382873	4.958280563	5.081898689	1.80195E-06	114	14.39009762 VV	0.036440898	208.6062622	72.77734375	7.58121E-05
77	9.642878532 VP	0.100386165	284.666748	33.75588608	0.000103454	115	14.48266697 VBA	0.055367798	641.9733887	161.527832	0.000233307
78	9.954999924 VV	0.050456852	509.5718689	150.6710358	0.00018519						
79	10.37833309 VV	0.104873709	500.1115417	57.84098434	0.000181751						
80	10.48916626 VV	0.096443526	473.4772949	61.07569885	0.000172072						
81	10.58055592 VV	0.022634225	53.03295898	35.08619308	1.92733E-05						
82	10.60722256 VV	0.038589615	90.20232391	29.56930923	3.27815E-05						
83	10.71166706 VV	0.068089671	246.9729462	44.95812225	8.97553E-05						
84	10.83151531 VV	0.049181387	586.2548218	166.0857086	0.000213058						
85	10.91333294 VV	0.016260378	38.43265152	31.4424305	1.39673E-05						
86	11.06685162 VV	0.077549636	270.8480835	42.38645172	9.84321E-05						
87	11.21833324 VV	0.134311274	545.8114014	48.12741852	0.00019836						
88	11.31875038 VV	0.034814831	111.0949554	39.49761963	4.03743E-05						
89	11.3708334 VV	0.034869071	81.57762146	38.99234772	2.96471E-05						
90	11.47000027 VV	0.077286914	247.5909882	44.93234253	8.998E-05						
91	11.55555534 VV	0.077229746	295.2414551	45.78619003	0.000107297						
92	11.6376667 VV	0.036426384	121.8161697	42.51697159	4.42706E-05						
93	11.6833334 VV	0.060109526	202.6041718	42.12681198	7.36308E-05						
94	11.80541706 VV	0.069776066	256.4152222	44.13815689	9.31869E-05						
95	11.89333344 VV	0.092656247	295.1660767	40.67749786	0.00010727						
96	12.35452366 BV	0.230781645	909.1104126	46.97586441	0.000330391						
97	12.5735445 VV	0.04235081	295.227356	85.35935974	0.000107292						
98	12.65722179 VV	0.014368287	32.83368683	38.08583069	1.19325E-05						
99	12.71233368 VV	0.044907451	143.8005066	39.0997963	5.22602E-05						
100	12.88791656 VV	0.095044248	595.3001709	77.9968338	0.000216345						
101	13.00030899 VV	0.037089389	1315.64209	546.4396973	0.000478133						
102	13.26055527 VV	0.121062547	713.5448608	69.91862488	0.000259318						
103	13.33233356 VV	0.051119801	296.7900696	73.48399353	0.00010786						
104	13.37583351 VV	0.032533262	198.4230957	75.81686401	7.21113E-05						
105	13.39685154 VV	0.016600667	91.28130341	78.30119324	3.31736E-05						
106	13.47099972 VV	0.060091462	334.2323914	84.60087585	0.000121467						

Foam Samples from the Edge and Sampled at Room Temperature

Sample	Location	Sampling Temp.												
PIBO 1	EDGE	ROOM TEMP.												
#	Retention Time	Peak Type	Peak Width	Area	Height	Area %	#	Retention Time	Peak Type	Peak Width	Area	Height	Area %	
	1	0.056333333	BV	0.015771616	10.56798363	11.16772461	3.80441E-06	35	3.041666746	VV	0.025791124	15.77379322	8.44507122	5.67847E-06
	2	0.084166668	VV	0.020056352	9.204018593	7.64846468	3.31339E-06	36	3.184666634	VV	0.059706714	99.71179962	22.0712738	3.58957E-05
	3	0.14033334	VV	0.028705454	21.74081612	9.867278099	7.82657E-06	37	3.314047575	VV	0.081838593	163.4142609	26.17430687	5.88282E-05
	4	0.170555562	VV	0.065639041	46.13528442	11.71439171	1.66084E-05	38	3.508333445	VV	0.11887905	314.7626953	31.96606636	0.000113313
	5	0.245666668	VV	0.028975995	27.81002998	12.99048805	1.00114E-05	39	3.587222338	VV	0.049806073	132.570755	34.51895142	4.77247E-05
	6	0.303095251	VP	0.036068503	24.22635078	11.19460201	8.72134E-06	40	3.653571367	VV	0.066097014	208.8955078	38.62487411	7.52012E-05
	7	0.443888903	VV	0.087367624	54.96317673	8.182422638	1.97864E-05	41	3.718333244	VV	0.058057554	181.3107452	37.73429108	6.52708E-05
	8	0.544444442	VV	0.033970732	28.34264374	13.90542221	1.02032E-05	42	3.797222137	VV	0.024292607	68.8338623	36.02367783	2.47798E-05
	9	0.595666647	VV	0.035455976	31.42617226	12.03831577	1.13132E-05	43	3.908333302	VV	0.067711398	221.7263184	39.36618423	7.98202E-05
	10	0.617380977	VV	0.014307123	10.69766998	11.03783417	3.8511E-06	44	3.97018528	VV	0.041020658	142.698822	47.53821564	5.13707E-05
	11	0.65192306	VV	0.047251824	51.46543884	13.26863861	1.85273E-05	45	4.332333565	VV	0.207197294	1237.542358	70.36151886	0.000445508
	12	0.745000005	VV	0.024030115	11.61099434	6.441315174	4.17989E-06	46	4.375666618	VV	0.050145295	298.1192932	72.24088287	0.000107321
	13	0.796967208	VP	0.017533131	75.43600464	56.65867996	2.71565E-05	47	4.435666561	VV	0.076777965	424.6541443	67.15146637	0.000152873
	14	0.859761894	VP	0.060426459	72.52668762	20.00411797	2.61092E-05	48	4.556666851	VV	0.029438071	127.5001602	54.21306229	4.58993E-05
	15	1.021111131	VP	0.052653059	34.39684677	10.88789082	1.23827E-05	49	4.595833302	VV	0.080896854	353.0755615	52.21012878	0.000127105
	16	1.296666622	BP	0.049206324	31.6036644	8.735880852	1.13771E-05	50	4.726110935	VV	0.054339401	193.5812836	43.15006256	6.96881E-05
	17	1.368666649	VP	0.023866355	21.14768982	11.28322792	7.61304E-06	51	4.837222099	VV	0.039701544	108.1804962	42.49293518	3.89443E-05
	18	1.431666613	VV	0.038849879	26.07914162	8.256652832	9.38834E-06	52	5.064166546	VV	0.143654689	1501.901367	123.6964493	0.000540676
	19	1.504999995	VP	0.043959178	27.28041077	7.585264206	9.82079E-06	53	5.386333466	VV	0.143806145	4684.571289	408.4516296	0.001686418
	20	1.849242449	BV	0.021376431	15.7042923	9.455649376	5.65345E-06	54	5.603750229	VV	0.112854615	3899.206055	433.8458252	0.001403691
	21	1.909444451	VV	0.018851075	10.97844124	8.080323219	3.95217E-06	55	5.717777729	VV	0.062365934	1885.570068	420.0883179	0.000678794
	22	1.94266665	VV	0.09510161	62.53373337	10.95910835	2.25118E-05	56	6.345115662	VV	0.116289988	102281528	11441985	36.82074664
	23	2.060833216	VV	0.040343825	45.17116547	14.91058064	1.62614E-05	57	6.507074356	VV	0.109881841	126696392	14948393	45.60995363
	24	2.125555515	VP	0.083145991	133.6922913	19.22144699	4.81284E-05	58	6.839389324	VV	0.089621067	46064556	7013995.5	16.58296839
	25	2.304333448	VP	0.028842604	14.93196392	6.741048813	5.37542E-06	59	7.265007019	VV	0.066732869	2702394.75	576033	0.972846166
	26	2.401666641	VP	0.037307493	16.26517487	5.374507427	5.85537E-06	60	7.767380714	VV	0.099828593	1397.493652	233.3155365	0.000503089
	27	2.430555582	VP	0.017127274	6.932697773	5.34673214	2.49573E-06	61	7.876111031	VV	0.301577896	3532.998291	195.2507324	0.001271859
	28	2.514523745	VV	0.030324474	17.61612892	8.81140995	6.3417E-06	62	8.283333778	VV	0.037767317	308.1809998	113.1806335	0.000110943
	29	2.564166784	VV	0.0330359	17.51259995	8.160827637	6.30443E-06	63	8.345555305	VV	0.079150766	678.1826172	108.1619644	0.000244142
	30	2.597777843	VV	0.0263249	19.24494362	10.52873993	6.92807E-06	64	8.436666489	VV	0.017994992	140.1763	109.0624313	5.04626E-05
	31	2.636111021	VP	0.03070314	16.03891945	8.706448555	5.77392E-06	65	8.611000061	VV	0.176182017	2356.921875	160.6326599	0.000848478
	32	2.853333235	VV	0.079535611	68.82233429	10.49089718	2.47756E-05	66	8.768333435	VV	0.038045801	293.7653503	95.08076477	0.000105754
	33	2.903888941	VV	0.035077184	28.15161324	10.91975498	1.01344E-05	67	8.837499619	VV	0.07413125	524.5130615	92.5329361	0.000188822
	34	2.946212053	VV	0.049345005	38.00846481	12.83766079	1.36828E-05	68	8.922333717	VV	0.020207653	109.727951	78.98487854	3.95014E-05

Foam Samples from the Edge and Sampled at Room Temperature

69	8.942777634 VV	0.05839473	379.8437195	78.58021545	0.000136741	107	12.35416698 BV	0.095658615	109.7805099	14.12742233	3.95203E-05
70	9.034999847 VV	0.043645456	225.5185852	66.36447906	8.11854E-05	108	12.41222191 VV	0.032530531	41.22042465	15.75160789	1.48391E-05
71	9.104999542 VV	0.026103189	126.4269638	63.84318542	4.5513E-05	109	12.52119064 VV	0.063418418	94.24377441	20.20475388	3.39272E-05
72	9.162500381 VV	0.072654314	355.0835266	58.63253021	0.000127828	110	12.56444454 VV	0.023600016	35.90073013	20.33211327	1.29241E-05
73	9.270454407 VV	0.078832693	242.5981598	51.28966522	8.73339E-05	111	12.58196926 VV	0.095502146	175.7404022	21.92788887	6.32655E-05
74	9.337082863 VV	0.025058273	88.37006378	51.39944077	3.18127E-05	112	12.80099964 VV	0.03777064	45.70158386	18.53226471	1.64523E-05
75	9.370333672 VV	0.029510098	78.1137619	44.11696625	2.81205E-05	113	12.87966633 VV	0.038439315	75.29497528	24.10696983	2.71057E-05
76	9.392777443 VV	0.017376017	66.45415497	50.42258453	2.39231E-05	114	12.90999985 VV	0.028433252	38.23707581	17.53999901	1.37651E-05
77	9.416666985 VV	0.022231204	77.9139328	47.266716	2.80486E-05	115	12.99719524 VV	0.036083341	611.3607178	263.3553162	0.000220086
78	9.492917061 VV	0.067789681	159.5900421	39.23656082	5.74515E-05	116	13.15547657 VV	0.083067305	182.7235565	26.62478447	6.57794E-05
79	9.527423859 VV	0.015674297	35.12651825	37.35044861	1.26453E-05	117	13.25166702 VV	0.040123817	61.98530197	18.96876717	2.23143E-05
80	9.550714493 VV	0.024478037	60.1271286	40.93950653	2.16454E-05	118	13.4041357 VP	0.069671057	481.3624268	88.20169067	0.000173288
81	9.617381096 VV	0.057034958	250.302536	53.06075287	9.01074E-05	119	13.62166691 VV	0.069002189	183.0110321	31.86655045	6.58829E-05
82	9.670999527 VV	0.055591218	247.0110779	54.79614258	8.89225E-05	120	13.71500015 VV	0.050718244	141.5159912	35.33993912	5.09449E-05
83	9.776110649 VV	0.061519284	171.0427246	34.09984207	6.15744E-05	121	13.80055523 VV	0.062763445	225.2287292	43.96782303	8.1081E-05
84	9.952842712 VV	0.047939282	579.3395386	173.5769348	0.000208559	122	13.97555542 VV	0.063882641	1017.578003	224.4922485	0.000366322
85	10.16547585 BP	0.028805228	26.32165146	12.48350048	9.47564E-06	123	14.10388851 VV	0.041704658	117.7710419	39.59109879	4.23969E-05
86	10.20371819 VV	0.018573901	27.22140121	30.03461075	9.79954E-06	124	14.16388893 VV	0.053559545	174.4781342	41.91921997	6.28111E-05
87	10.260952 VV	0.032394726	38.00324249	15.08335781	1.36809E-05	125	14.27833366 VV	0.062025938	408.9229126	86.70033264	0.00014721
88	10.27949238 VP	0.013605325	24.94796944	25.0798378	8.98112E-06	126	14.36092567 VV	0.060473617	213.474411	44.89584351	7.68495E-05
89	10.38208294 VV	0.056389861	176.3575134	37.82881927	6.34877E-05	127	14.48966694 VBA	0.051771086	418.5565491	134.7459106	0.000150678
90	10.42687511 VV	0.019721214	57.3204689	42.53735352	2.0635E-05						
91	10.45685196 VV	0.025392393	93.84281158	46.80294418	3.37829E-05						
92	10.50133324 VV	0.072114833	202.5486298	46.81159973	7.29163E-05						
93	10.58679485 VV	0.022315381	49.32960129	36.84275055	1.77584E-05						
94	10.82916641 VV	0.067803495	868.1829834	172.248291	0.000312541						
95	10.90233326 VV	0.016486678	34.41108704	29.76735115	1.23878E-05						
96	10.96388912 VV	0.049235694	73.2318573	24.7895546	2.6363E-05						
97	10.99033356 VV	0.02058647	31.83599854	23.82964134	1.14608E-05						
98	11.02690506 VV	0.034099359	69.31551361	25.19305611	2.49532E-05						
99	11.10595226 VV	0.04671526	106.4054413	27.76226425	3.83053E-05						
100	11.21249962 VV	0.103519663	243.668045	28.00239563	8.77191E-05						
101	11.46796322 VV	0.070165999	106.4660492	19.06061363	3.83271E-05						
102	11.56785679 VV	0.063106224	106.2619629	22.09599495	3.82537E-05						
103	11.61750031 VV	0.026865449	36.705513	21.55657387	1.32138E-05						
104	11.78261948 VV	0.154328197	268.9759216	22.36223602	9.68297E-05						
105	11.87261868 VV	0.034881022	54.00419235	19.16147423	1.94412E-05						
106	11.95833302 VV	0.031736366	33.29673767	13.51813126	1.19866E-05						

Foam Samples from the Edge and Sampled at Room Temperature

Sample	Location	Sampling Temp.												
PIBO 2	EDGE	ROOM TEMP.												
Retention	1 Time	Peak Type	Peak Width	Area	Height	Area %	#	Retention						
								Time	Peak Type	Peak Width	Area	Height	Area %	
1	0.206333339	BV	0.039097674	28.10787964	9.617233276	1.01454E-05		35	2.966666698	BV	0.022766922	10.319067	6.414963245	3.72462E-06
2	0.300333321	VV	0.035468873	34.84537888	12.52058887	1.25773E-05		36	3.017777681	VP	0.02741015	18.3427124	8.766776085	6.62072E-06
3	0.322916657	VV	0.019684955	21.10556412	13.92322254	7.61796E-06		37	3.058333397	VV	0.051041	48.55278778	11.55052185	1.75249E-05
4	0.356111109	VV	0.024121245	21.48957443	11.33352566	7.75656E-06		38	3.192777872	VB	0.015070977	5.744531155	6.352752686	2.07346E-06
5	0.405000001	VV	0.059371173	49.91939926	10.1513176	1.80182E-05		39	3.34766674	PV	0.014985457	6.624952793	7.368202209	2.39125E-06
6	0.495666653	VV	0.029370263	27.73323441	11.82138348	1.00102E-05		40	3.446666718	VV	0.05225753	37.62376022	8.733893394	1.35801E-05
7	0.566666663	VV	0.025096742	20.8210144	10.51714706	7.51525E-06		41	3.49333334	VV	0.022242248	9.154811859	6.194443226	3.30439E-06
8	0.623333335	VV	0.031832855	22.2506237	9.326768875	8.03126E-06		42	3.681111097	VV	0.085109696	86.59570313	13.45076942	3.12563E-05
9	0.691111088	VV	0.038969103	23.85905838	9.608708382	8.61182E-06		43	3.794333322	VV	0.067697257	97.76740265	18.48736382	3.52887E-05
10	0.731666684	VV	0.028961318	28.53950691	12.34957886	1.03012E-05		44	3.929444551	VV	0.075174026	139.9068451	22.93317795	5.04987E-05
11	0.777222216	VV	0.033363581	32.80416107	15.08916378	1.18405E-05		45	3.994583368	VV	0.037378255	72.73416901	25.42269707	2.62531E-05
12	0.815666676	VV	0.078396842	59.04681015	12.5529747	2.13127E-05		46	4.03249979	VV	0.07939899	148.4084625	22.96359825	5.35673E-05
13	0.932777762	VV	0.024981989	16.55700111	8.787423134	5.97617E-06		47	4.153571606	VV	0.021786002	25.87972641	19.79843521	9.34117E-06
14	0.990714312	VV	0.049305428	49.42359543	14.30597973	1.78392E-05		48	4.214583397	VV	0.044037003	45.41083145	17.06972122	1.63908E-05
15	1.105370402	VV	0.055426959	67.63048553	14.76824284	2.44109E-05		49	4.232999802	VV	0.023031257	24.78344154	13.74811554	8.94547E-06
16	1.206060648	VV	0.046829458	190.9777222	49.7010994	6.89325E-05		50	4.279444218	VV	0.029519301	39.07748032	16.56669807	1.41048E-05
17	1.335000038	VV	0.109541312	252.6675415	27.41074944	9.11992E-05		51	4.320000172	VV	0.016971938	23.30112648	18.15706635	8.41043E-06
18	1.532948732	VV	0.055599134	69.28207397	16.9812088	2.5007E-05		52	4.380238056	VB	0.063848205	107.4698486	20.60561752	3.87907E-05
19	1.625	VV	0.026328722	17.6590538	9.226783752	6.37395E-06		53	4.583666801	BV	0.014692741	6.750281334	7.481733322	2.43648E-06
20	1.671666622	VP	0.022470899	18.09837914	10.84427357	6.53253E-06		54	4.606666565	VB	0.064621508	22.53985405	5.813300133	8.13566E-06
21	1.761666656	VP	0.090999998	61.59435272	8.16591835	2.22322E-05		55	4.719166756	BP	0.020832945	9.987902641	6.922468662	3.60509E-06
22	1.903571486	VV	0.021456359	10.21843052	6.459292889	3.6883E-06		56	5.076666832	VV	0.130358309	1126.288452	103.9902496	0.000406529
23	1.960555553	VP	0.022513822	9.617845535	5.750190735	3.47152E-06		57	5.38166666	VV	0.139226183	5843.303711	519.4990234	0.002109113
24	2.026333332	VB	0.017547855	5.179698944	4.153864384	1.86959E-06		58	5.600263119	VV	0.111686096	5247.878906	590.4866333	0.001894198
25	2.132222176	BB	0.047725957	24.18314934	6.170166016	8.7288E-06		59	5.713840485	VV	0.066616423	2236.182617	452.8013916	0.00080714
26	2.216249943	BP	0.037388787	42.37425232	18.88902092	1.52948E-05		60	6.343057156	VV	0.113430478	102281968	11426641	36.91820269
27	2.285000086	VV	0.022114323	11.22022724	6.848405838	4.04989E-06		61	6.506161213	VV	0.109725572	126111016	14902878	45.51918722
28	2.376666784	VV	0.067067556	41.27302933	7.400287628	1.48973E-05		62	6.837536812	VV	0.091172539	45923220	6942507.5	16.57577359
29	2.496481419	VP	0.02397396	9.634382248	8.043613434	3.47749E-06		63	7.262982845	VV	0.066900961	2692780.75	572226.3125	0.971946742
30	2.5602777	VV	0.035100065	13.46404362	6.258171082	4.85978E-06		64	8.098333359	VV	0.055777572	669.0512085	145.1459656	0.000241491
31	2.623888969	VP	0.028034968	12.00028896	7.134119511	4.33145E-06		65	8.252333641	VV	0.103239968	1134.111328	133.3263245	0.000409352
32	2.74444437	VP	0.031060085	19.65153122	8.797663689	7.09313E-06		66	8.325606346	VV	0.051109452	523.5585327	126.9642944	0.000188976
33	2.801333427	VV	0.061925802	41.01267242	11.03812122	1.48033E-05		67	8.386666298	VV	0.014484426	115.9890518	117.8296204	4.18657E-05
34	2.900333405	VB	0.035882577	17.02278519	6.039647102	6.1443E-06		68	8.409166336	VV	0.02284555	207.6003723	116.1880798	7.49324E-05

Foam Samples from the Edge and Sampled at Room Temperature

69	8.553472519 VV	0.247274503	3740.290283	177.909729	0.00135004	107	13.80233288 VV	0.105383292	687.4107666	78.33106232	0.000248118
70	8.992500305 VV	0.075041108	545.6650391	87.15766144	0.000196955	108	13.97404766 VV	0.079249814	1657.233154	287.500946	0.000598171
71	9.057222366 VV	0.028330937	139.5745087	82.10959625	5.03788E-05	109	14.06083298 VV	0.028888194	231.0850067	133.3214874	8.34091E-05
72	9.095000267 VV	0.034262799	218.7570038	79.1055069	7.89593E-05	110	14.10333347 VV	0.01723736	114.5312271	93.85151672	4.13395E-05
73	9.166110992 VV	0.103099629	650.4043579	75.05517578	0.00023476	111	14.16309547 VV	0.062788047	486.6791687	101.7767029	0.000175665
74	9.293333054 VB	0.1240694	633.6781006	61.06341171	0.000228723	112	14.28299999 VV	0.080696218	970.7333984	149.6141052	0.000350382
75	9.508333206 BV	0.032777991	121.164444	45.92844391	4.37337E-05	113	14.35055542 VV	0.029942909	246.3769531	102.866806	8.89286E-05
76	9.638333321 VV	0.144594058	780.5528564	63.86275864	0.000281737	114	14.48666668 VBA	0.078956828	979.0383301	206.6611176	0.000353379
77	9.817667007 VV	0.052920178	166.2593231	39.65014267	6.00105E-05						
78	9.950640678 VV	0.060035411	699.7835083	173.5743561	0.000252584						
79	10.10388851 VV	0.109769687	236.9658966	27.1652813	8.55317E-05						
80	10.28083324 VV	0.043605484	84.9682312	24.41286087	3.06689E-05						
81	10.37583351 VV	0.068915121	261.1419067	46.9329071	9.4258E-05						
82	10.52208328 VV	0.098323748	376.9671326	46.13698196	0.000136065						
83	10.61966705 VV	0.029054573	51.82286835	24.44172859	1.87052E-05						
84	10.69880962 VV	0.06303703	212.8422852	40.68284607	7.68244E-05						
85	10.82880974 VV	0.050160438	559.7219849	158.6496582	0.000202029						
86	10.91699982 VV	0.024771664	31.88494301	19.8166256	1.15087E-05						
87	11.09166622 VV	0.127667576	285.9702454	26.548769	0.00010322						
88	11.22666645 VP	0.085951611	142.7657013	20.32418442	5.15306E-05						
89	11.583148 PV	0.06650015	58.45018387	10.57236099	2.10973E-05						
90	11.73388863 VV	0.042505663	39.66243362	11.71296406	1.4316E-05						
91	11.77083302 VV	0.060906634	52.46870041	14.357687	1.89383E-05						
92	12.13000011 VV	0.146456182	474.8811646	39.16605377	0.000171406						
93	12.31277752 VV	0.163718686	825.4397583	60.29432297	0.000297939						
94	12.49318218 VB	0.119039118	521.8164673	52.01559067	0.000188347						
95	12.67045498 BV	0.028213797	87.70285797	51.80849457	3.16559E-05						
96	12.70833302 VV	0.039015528	147.8479004	46.59915161	5.3365E-05						
97	12.78766632 VV	0.042391282	157.0384827	51.76742554	5.66823E-05						
98	12.87333298 VV	0.083274521	603.6140747	88.83262634	0.000217872						
99	12.99555016 VV	0.037245359	1694.244995	675.8744507	0.00061153						
100	13.15071392 VV	0.060563199	307.2657776	64.51693726	0.000110906						
101	13.17666626 VV	0.03769888	170.6966858	59.09577179	6.16122E-05						
102	13.27333355 VV	0.063600302	272.8425293	53.63347626	9.84812E-05						
103	13.36499977 VV	0.049850244	225.45224	54.96891785	8.13759E-05						
104	13.42590904 VV	0.075978957	356.3054504	56.19026184	0.000128607						
105	13.5172224 VV	0.033582967	104.7537613	51.98754501	3.78104E-05						
106	13.59000015 VV	0.080326512	375.1336365	55.87582779	0.000135403						

Foam Samples from the Edge and Sampled at Room Temperature

Sample	Location	Sampling Temp.													
PIBO 3	EDGE	ROOM TEMP.													
#	Retention		Peak Type	Peak Width	Area	Height	Area %	#	Retention		Peak Type	Peak Width	Area	Height	Area %
	Time	Time							Time	Time					
1	0.026111111	BV		0.02552508	16.29112816	9.260045052	5.87398E-06	35	3.068333387	VV		0.048751686	26.99312782	7.03704977	9.73273E-06
2		0.103	VV	0.014297435	6.361120224	7.20694685	2.29359E-06	36	3.090555668	VP		0.022588037	10.39525223	6.191429615	3.74815E-06
3	0.225555554	VP		0.068874381	58.55344391	10.21502495	2.11122E-05	37	3.144444466	VV		0.026307968	12.80432796	8.111818314	4.61677E-06
4	0.494333327	BP		0.020946769	9.821145058	7.814367771	3.54114E-06	38	3.245630741	VV		0.018151606	49.61408234	35.8373642	1.7889E-05
5	0.529444456	VV		0.02142071	13.60077667	8.17043972	4.90394E-06	39	3.456111193	BV		0.033308323	21.55058098	8.030562401	7.77035E-06
6	0.611666679	VV		0.034920502	27.65922356	10.78494358	9.9729E-06	40	3.517380953	VV		0.027810084	13.10986042	7.856778622	4.72693E-06
7	0.683333337	VV		0.047181435	36.90722656	13.03734112	1.33074E-05	41	3.537857056	VP		0.054753393	31.7218647	9.655982018	1.14377E-05
8	0.763333321	VV		0.029804131	29.56814194	12.86971951	1.06612E-05	42	3.698333263	BV		0.036444221	24.4777565	8.290906906	8.82578E-06
9	0.798888862	VV		0.046521246	46.42541885	12.16564941	1.67393E-05	43	3.773888826	VV		0.018732756	10.11907196	8.01315403	3.64857E-06
10	0.866666675	VV		0.05495974	40.27219772	9.04242897	1.45207E-05	44	3.873888969	VV		0.063109457	45.75136185	9.346364975	1.64963E-05
11	0.973333359	VV		0.048257522	35.93449402	9.263338089	1.29567E-05	45	3.913666725	VV		0.049430765	37.17436981	9.340809822	1.34037E-05
12	1.05250001	VV		0.044180319	28.17173195	7.792027473	1.01577E-05	46	3.984166622	VV		0.015525926	8.732532501	9.374140739	3.14863E-06
13	1.177083373	VV		0.048318628	39.60867691	10.91957092	1.42814E-05	47	4.009166718	VV		0.0244	17.99835014	9.374140739	6.48954E-06
14	1.28791666	VV		0.062296815	66.51856995	14.03426075	2.39842E-05	48	4.058333397	VV		0.024565926	18.13167191	9.374140739	6.53761E-06
15	1.329166651	VV		0.019278502	23.43358803	15.82265949	8.44929E-06	49	4.241111279	VV		0.111326426	193.5822449	21.44247818	6.97986E-05
16	1.349444389	VV		0.024685953	33.88025284	17.42354012	1.2216E-05	50	4.333000183	VV		0.032207228	69.06033325	26.67255402	2.49006E-05
17	1.414166689	VV		0.086949982	130.391861	19.76918411	4.70145E-05	51	4.377500057	VV		0.032587104	67.72712708	26.70588493	2.44199E-05
18	1.593181849	VP		0.014962411	11.44281864	10.29897499	4.12586E-06	52	4.409583569	VV		0.055038415	92.52484894	28.01826477	3.33611E-05
19	1.703666687	VV		0.063897796	45.82751465	9.077662468	1.65237E-05	53	4.479583263	VV		0.034177884	57.0614357	21.35220909	2.05743E-05
20	1.768333316	VV		0.02129682	16.6220665	10.04953766	5.99331E-06	54	4.537222385	VV		0.025421193	28.21074677	14.67920971	1.01718E-05
21	1.799166679	VV		0.034619626	28.83329582	10.31245518	1.03962E-05	55	4.651666641	VV		0.063537113	76.31300354	14.70698452	2.75157E-05
22	1.899166703	VV		0.036617633	22.60445404	8.904109001	8.15034E-06	56	4.676111221	VV		0.024166828	38.02318192	20.01205444	1.37098E-05
23	1.938333392	VV		0.02904683	19.4542675	9.438518524	7.01449E-06	57	4.726666451	VV		0.032568749	52.23521042	21.33137703	1.88341E-05
24	2.046250105	VV		0.074972756	108.8321152	17.39975357	3.92409E-05	58	5.101666451	VV		0.155964345	1441.667847	112.1563873	0.000519812
25	2.146389008	VP		0.077533364	146.6573029	22.65226555	5.28792E-05	59	5.383666515	VV		0.145454898	5676.212891	499.9624939	0.002046634
26	2.491111104	VV		0.093726501	128.66716	17.51053429	4.63926E-05	60	5.603888988	VV		0.111337118	5368.307617	611.9994507	0.001935614
27	2.518809557	VV		0.052488104	75.29991913	17.40011978	2.71504E-05	61	5.716481686	VV		0.068529494	2676.935547	515.9619751	0.000965205
28	2.605952263	VV		0.032033719	43.34872818	16.83891296	1.563E-05	62	6.34565258	VV		0.113263108	102264648	11443046	36.87287274
29	2.682083368	VV		0.012951985	10.54478264	11.23289204	3.80206E-06	63	6.508396149	VV		0.109575137	126308232	14948962	45.54210526
30	2.724999905	VP		0.039710056	17.38401604	5.524740219	6.26804E-06	64	6.840175629	VV		0.089276865	45991540	6943448.5	16.58285864
31	2.831666708	VV		0.043547429	23.98813057	6.902078152	8.64924E-06	65	7.26592207	VV		0.0691313	2696372.25	570595.625	0.972212712
32	2.897222281	VV		0.03220338	18.14507294	7.248904228	6.54245E-06	66	7.798809528	VV		0.040776316	967.4668579	298.7880859	0.000348833
33	2.930999994	VV		0.027593959	14.66888618	8.859962463	5.28906E-06	67	7.861000061	VV		0.071500339	1651.581909	285.4571533	0.0005955
34	2.970925808	VV		0.008815026	4.714746952	8.914223671	1.69996E-06	68	7.959762096	VV		0.081594676	1331.561279	271.986969	0.000480112

Foam Samples from the Edge and Sampled at Room Temperature

69	8.055725098 VV	0.145802051	3093.179688	250.9498138	0.001115287	107	12.89738083 VV	0.092995644	1300.236328	166.7049561	0.000468817
70	8.293420792 VV	0.035945527	448.5685425	207.985321	0.000161737	108	12.99795437 VV	0.056443181	1931.022949	465.052063	0.000696256
71	8.32722187 VV	0.035670221	527.1712036	182.6638031	0.000190079	109	13.1833334 VV	0.118509114	1689.578369	170.6510162	0.0006092
72	8.399108887 VV	0.055363383	862.1784058	188.4953156	0.00031087	110	13.23791695 VV	0.023737578	257.7097168	169.5052948	9.29207E-05
73	8.623095512 VV	0.203760058	3907.406494	229.3539734	0.001408867	111	13.27166653 VV	0.054673743	721.4449463	169.4427948	0.000260127
74	8.938333511 VV	0.161877036	1866.964233	136.2375031	0.000673159	112	13.33333302 VV	0.02258561	273.0543213	162.6517487	9.84534E-05
75	9.0625 VV	0.01788721	154.9191284	121.4055328	5.58581E-05	113	13.37583351 VV	0.032331064	429.9034424	165.3598328	0.000155007
76	9.092778206 VV	0.051105518	372.0992126	121.3499832	0.000134165	114	13.40166664 VV	0.020784186	266.3755798	165.443161	9.60452E-05
77	9.142222404 VV	0.031385429	295.7862244	117.4336777	0.00010665	115	13.42833328 VV	0.022538625	276.9346008	165.3598328	9.98524E-05
78	9.199999809 VV	0.032107692	302.6922607	121.3222122	0.00010914	116	13.55277824 VV	0.095758639	1392.969482	173.3313293	0.000502254
79	9.265000343 VV	0.044174615	410.5623474	113.5729218	0.000148034	117	13.60124969 VB	0.082793713	868.5299072	174.8381348	0.00031316
80	9.291666985 VB	0.111486025	1020.639771	110.7815094	0.000368005	118	13.71416664 BV	0.047349863	653.1401367	168.0262604	0.000235498
81	9.469444275 BV	0.055447452	461.5576782	102.6711426	0.000166421	119	13.81000042 VV	0.077584557	1174.692261	181.3167114	0.000423551
82	9.696000099 VV	0.15561524	1693.489136	132.0545654	0.00061061	120	13.9852562 VV	0.107371412	2926.69458	365.6876221	0.001055258
83	9.756333351 VV	0.023298992	214.2025909	117.3309097	7.72336E-05	121	14.07611084 VV	0.016546192	201.1519318	161.332428	7.2528E-05
84	9.819999695 VV	0.06041288	587.4127808	117.3225784	0.000211799	122	14.10416698 VV	0.020856937	255.2032623	166.7347107	9.20169E-05
85	9.953611374 VV	0.068015754	1389.099365	261.3232727	0.000500858	123	14.1744442 VV	0.064130999	929.6881104	177.4281769	0.000335211
86	10.03499985 VV	0.028705761	237.4182281	112.1147232	8.56043E-05	124	14.28766632 VV	0.10186965	1705.376953	221.388031	0.000614896
87	10.06071472 VV	0.022002671	149.6751709	113.3765106	5.39674E-05	125	14.39000034 VV	0.034277778	486.8887024	175.9838715	0.000175554
88	10.27642822 VV	0.158537403	1737.085205	131.9938507	0.000626329	126	14.4911108 VBA	0.066874631	1514.794434	377.5209351	0.000546179
89	10.3708334 VV	0.067287937	846.3985596	156.027359	0.00030518						
90	10.51566696 VV	0.145458117	2050.135742	166.7263794	0.000739204						
91	10.70756435 VV	0.091035649	1163.559937	165.4752197	0.000419537						
92	10.83142853 VV	0.072815493	1562.945557	285.7357178	0.000563541						
93	10.90642834 VV	0.049153872	408.9402771	138.6599121	0.000147449						
94	10.98888874 VV	0.043147568	463.7574768	134.7654266	0.000167214						
95	11.10499954 VV	0.099596195	1172.092529	140.1121521	0.000422613						
96	11.23166656 VV	0.118686371	1390.854248	141.48703	0.000501491						
97	11.42099953 VV	0.073799171	845.5628662	137.3957367	0.000304879						
98	11.50566673 VV	0.111394279	1351.520508	144.1367798	0.000487309						
99	11.625 VV	0.053260341	626.4018555	145.4033356	0.000225857						
100	11.67433357 VV	0.016051963	162.6591644	145.3950043	5.86489E-05						
101	11.76055527 VV	0.067707613	815.4585571	149.3335266	0.000294024						
102	12.1875 VV	0.276550978	3897.509277	168.0679169	0.001405299						
103	12.31499958 VV	0.180722997	2861.858887	186.8162079	0.001031881						
104	12.50666714 VV	0.112443984	1650.889282	175.9838715	0.00059525						
105	12.64055538 VV	0.053001128	699.4406128	159.9992218	0.000252193						
106	12.73944473 VV	0.04951366	611.3217163	153.3331604	0.00022042						

Foam Samples from the Core and Sampled at Room Temperature

Sample	Location	Sampling Temp.											
PIANA 1	CORE	ROOM TEMP.											
Peak Number	Retention Time	Peak Type	Peak Width	Area	Height	Area %	Peak Number	Retention Time	Peak Type	Peak Width	Area	Height	Area %
1	0.183666661	BP	0.011237085	4.51696396	6.397641659	1.69931E-06	35	3.407222271	VV	0.029884627	20.07976913	11.19849396	7.55412E-06
2	0.221000001	VV	0.020319773	9.73298931	7.983184338	3.6616E-06	36	3.562999964	VV	0.074352004	100.7172775	16.24053192	3.78904E-05
3	0.308333337	VV	0.046643049	44.9440269	11.74532223	1.69082E-05	37	3.656333447	VV	0.15239732	129.8606873	14.20198727	4.88543E-05
4	0.341666669	VV	0.069167525	75.1439362	13.05212975	2.82696E-05	38	3.806666613	VV	0.055471964	61.20064926	13.87177658	2.3024E-05
5	0.471666664	VV	0.022892706	9.90065861	7.208015442	3.72468E-06	39	3.86611104	VV	0.064271949	75.02607727	14.28556252	2.82252E-05
6	0.49666667	VB	0.031042857	10.4182606	4.334307671	3.91941E-06	40	4.000833511	VV	0.078891113	89.871315	15.21965027	3.38101E-05
7	0.642222226	BV	0.041420676	19.2656498	5.701726437	7.24784E-06	41	4.08166647	VV	0.049004398	51.80888367	13.13867855	1.94908E-05
8	0.805000007	VV	0.045185868	17.7218952	5.020058155	6.66708E-06	42	4.219285488	VV	0.041505937	47.52469254	14.03472042	1.78791E-05
9	0.872222245	VV	0.069801107	56.4030876	9.705387115	2.12192E-05	43	4.261666775	VV	0.022243947	13.26564026	8.975079536	4.99061E-06
10	0.963	VV	0.038384326	18.9670181	8.235573769	7.1355E-06	44	4.304999828	VV	0.043265831	43.09212112	12.18299389	1.62115E-05
11	1.033888936	VV	0.021239847	11.2756147	7.63051033	4.24195E-06	45	4.389999866	VV	0.016344931	8.767205238	7.130327702	3.29827E-06
12	1.056666613	VV	0.00575247	142.551804	604.2225342	5.36288E-05	46	4.429999828	VV	0.026220119	9.543400764	6.066207409	3.59028E-06
13	1.129999995	VP	0.030520231	15.6557646	6.404246807	5.88979E-06	47	4.485000134	VP	0.024278989	7.358006954	3.853110552	2.76812E-06
14	1.245000005	VV	0.035341144	19.2453995	6.734311581	7.24023E-06	48	4.531000137	VV	0.024715459	10.06574345	5.407837391	3.78679E-06
15	1.280833364	VP	0.020845808	10.9918289	8.788201332	4.13519E-06	49	4.586666584	VV	0.015083333	3.799651623	3.999633312	1.42945E-06
16	1.353666663	VV	0.0318342	17.7317085	8.007598877	6.67077E-06	50	4.610000134	VP	0.01175	3.999633312	5.332844257	1.50468E-06
17	1.389999986	VV	0.043677777	23.2423134	6.666055679	8.74389E-06	51	4.66166687	VP	0.028609646	5.332844257	2.33811903	2.00625E-06
18	1.465000033	VP	0.032258693	13.6876335	5.457832813	5.14936E-06	52	4.800833225	BV	0.026205296	8.44877243	5.37345171	3.17848E-06
19	1.6973809	VV	0.086048327	74.8239365	12.11611652	2.81492E-05	53	4.83833313	VV	0.014877106	8.369851112	7.583090782	3.14878E-06
20	1.726999998	VB	0.062450923	61.4365196	11.85688114	2.31128E-05	54	4.875	VV	0.039436422	31.49742889	9.815841675	1.18495E-05
21	1.859166622	BV	0.030587122	27.9586334	12.26849842	1.05182E-05	55	4.949999809	VP	0.025277171	5.034385204	3.319454432	1.89396E-06
22	1.883888841	VV	0.037832666	28.0522785	9.395679474	1.05534E-05	56	5.28000021	VV	0.102468051	1.96E+04	2401.106201	0.00739176
23	1.972499967	VV	0.040060218	17.9069557	7.450016022	6.7367E-06	57	5.353433132	VV	0.044510718	1.07E+04	3415.115723	0.004020723
24	1.996111155	VV	0.016786508	7.94770622	7.251646996	2.98997E-06	58	5.568348408	VV	0.120011121	1.32E+05	13964.23242	0.049537272
25	2.226666689	BP	0.012993834	6.50694227	6.905173302	2.44795E-06	59	5.677685738	VV	0.068476506	3.16E+04	6406.10498	0.011873064
26	2.327222109	VV	0.058033947	35.7804871	7.449751854	1.34608E-05	60	6.16877985	VV	0.0997224	37488436	4768356.5	14.10335775
27	2.398888826	VV	0.01331717	8.03355217	8.281644821	3.02227E-06	61	6.306591511	VV	0.090343907	72279776	10627962	27.192053
28	2.441111088	VV	0.036881708	17.5461502	7.929021358	6.60096E-06	62	6.465540409	VV	0.10612157	111202400	13783889	41.83496024
29	2.573888779	VV	0.060124855	35.3029289	8.056111336	1.32812E-05	63	6.800605297	VV	0.087155767	44254296	6779527.5	16.64871184
30	2.681666613	VV	0.065091029	32.0892677	5.93388319	1.20722E-05	64	7.22076273	VV	0.066766672	386195.9375	82269.36719	0.145289056
31	2.802777767	VB	0.036311243	23.6842632	8.824830055	8.91015E-06	65	7.916110992	VB	0.030553903	49.50892258	20.96269608	1.86255E-05
32	2.980392218	PV	0.023098815	30.3779335	27.05658531	1.14283E-05	66	8.039999962	BV	0.013443506	3.784891129	4.228183746	1.4239E-06
33	3.060555458	VV	0.058220554	26.3636074	7.547050476	9.91814E-06	67	8.069444656	VP	0.050958052	19.14633942	6.262124062	7.20296E-06
34	3.183333397	VV	0.141667992	137.20578	12.34486771	5.16176E-05	68	8.548333168	BV	0.048614737	20.29334831	5.078989029	7.63447E-06

Foam Samples from the Core and Sampled at Room Temperature

69	8.622221947 VP	0.05962598	37.866024	7.801547527	1.42454E-05	107	12.58388901 VV	0.048295245	63.69791794	21.98212242	2.39635E-05
70	8.896111488 BV	0.015107075	12.2245846	11.7799015	4.59896E-06	108	12.64249992 VV	0.03733157	75.04735565	24.78102493	2.82332E-05
71	8.959666252 VV	0.074970484	178.930817	29.00530815	6.73148E-05	109	12.69683361 VP	0.025718316	54.49583435	35.31583786	2.05016E-05
72	9.128333092 VV	0.018347345	7.54912853	6.138638973	2.84002E-06	110	12.77833366 VV	0.065922074	77.09385681	14.52516556	2.90031E-05
73	9.16166687 VP	0.013171884	7.95611763	8.308479309	2.99314E-06	111	12.94860363 VV	0.038252831	595.7646484	229.75	0.00022413
74	9.30300045 BP	0.058991488	34.93013	7.690257549	1.31409E-05	112	13.01333332 VV	0.020219225	26.33755875	17.84467697	9.90834E-06
75	9.582406998 BP	0.04054033	41.6645927	12.61242294	1.56745E-05	113	13.04166698 VV	0.017370421	21.70674706	16.47615242	8.1662E-06
76	9.774999619 VP	0.043646857	38.9678574	10.91619015	1.46599E-05	114	13.09833336 VV	0.07424967	114.5889435	19.03028297	4.3109E-05
77	9.909545898 VV	0.052841965	570.54718	171.3709412	0.000214643	115	13.21388912 VB	0.067821383	79.2699585	15.99436283	2.98218E-05
78	10.02916622 VV	0.073340893	63.4513397	14.41927338	2.38707E-05	116	13.35166645 BV	0.117796004	72.80560303	10.30108547	2.73899E-05
79	10.08333302 VV	0.017053798	17.9829731	13.9367733	6.76529E-06	117	13.5 VV	0.024525722	10.80614185	5.856790543	4.06533E-06
80	10.25666714 VV	0.090957932	164.797287	21.85857391	6.19977E-05	118	13.56916714 VV	0.046598177	47.31201935	12.37659359	1.7799E-05
81	10.32233334 VV	0.055885062	184.10585	41.39730453	6.92616E-05	119	13.66749954 VV	0.058056992	113.5208969	25.4415493	4.27072E-05
82	10.51249981 VV	0.090721816	269.305939	35.81666183	0.000101314	120	13.74944401 VV	0.036231138	58.30693436	19.87218666	2.19354E-05
83	10.53666687 VV	0.02566449	54.785965	35.57831955	2.06108E-05	121	13.85416698 VV	0.083097599	91.08335876	18.26834869	3.42661E-05
84	10.66566658 VV	0.082535289	318.945526	50.60197449	0.000119989	122	13.90166664 VB	0.044040151	56.2381897	16.80608749	2.11571E-05
85	10.78522205 VV	0.051295836	688.856079	190.0105438	0.000259151	123	13.99222183 BV	0.046026234	77.84768677	20.62913322	2.92867E-05
86	10.86888885 VV	0.049788397	101.418678	27.65277672	3.81543E-05	124	14.03738117 VV	0.030972259	44.15990067	17.78248787	1.66132E-05
87	10.92666626 VV	0.01381657	24.7186031	24.40502739	9.29928E-06	125	14.12931156 VV	0.006441166	142.6136017	374.6370544	5.3652E-05
88	10.96583366 VV	0.03781357	69.9737396	22.7947197	2.63245E-05	126	14.17333317 VP	0.01617096	8.324908257	8.02708149	3.13188E-06
89	11.01083374 VV	0.085652508	108.411797	21.09527588	4.07851E-05	127	14.30166626 VP	0.082880072	71.1077652	10.25704575	2.67511E-05
90	11.09749985 VV	0.106502041	130.294189	20.38993645	4.90174E-05	128	14.46500015 VBA	0.030635493	22.66458893	9.234002113	8.52654E-06
91	11.28611088 VP	0.028144965	11.8433514	5.495034218	4.45553E-06						
92	11.4163847 VV	0.005803213	109.804276	336.8335571	4.1309E-05						
93	11.51000023 VV	0.039382242	22.3940754	7.384048939	8.42478E-06						
94	11.57642841 VV	0.040186454	38.5470047	12.09351921	1.45016E-05						
95	11.63777733 VV	0.040485982	21.7434998	8.951041222	8.18003E-06						
96	11.67343712 VV	0.009459231	15.7820158	28.50548363	5.93728E-06						
97	11.70499992 VV	0.015551815	11.2708015	9.702958107	4.24014E-06						
98	11.7327776 VV	0.014820762	8.0588789	7.953824043	3.03179E-06						
99	11.89999962 VV	0.104364082	90.8585281	10.3553524	3.41815E-05						
100	11.97500038 VV	0.020268179	10.4522724	7.061727047	3.9322E-06						
101	11.99666691 VB	0.02992985	16.2148037	6.773137093	6.1001E-06						
102	12.1833334 BP	0.046053953	14.9669962	4.152164936	5.63067E-06						
103	12.29633331 VV	0.06481386	28.8080978	5.71454525	1.08378E-05						
104	12.42000008 VV	0.021734498	9.98867321	6.220316887	3.75779E-06						
105	12.44999981 VV	0.061344229	33.0225487	8.971924782	1.24233E-05						
106	12.54712963 VV	0.01570145	40.789917	61.79126358	1.53454E-05						

Foam Samples from the Core and Sampled at Room Temperature

Sample	Location	Sampling Temp.											
PIANA2	CORE	ROOM TEMP.											
#	Retention Time	Type	Peak Width	Area	Height	Area %	#	Time	Type	Peak Width	Area	Height	Area %
1	0.06899998	BP	0.041543052	15.01195717	4.543996811	5.61712E-06	36	3.417381048	VV	0.046356879	34.07687759	9.386044502	1.28E-05
2	0.180555552	VV	0.02739037	12.7454977	7.755461693	4.76907E-06	37	3.562618971	VV	0.083581001	83.24570465	12.05246639	3.11E-05
3	0.219444439	VV	0.025973106	17.39840508	8.835609436	6.51008E-06	38	3.701190472	VV	0.051216476	40.98671722	10.8144846	1.53E-05
4	0.270000011	VP	0.019628083	5.746140003	4.879182339	2.15007E-06	39	3.817263365	VV	0.031586837	152.6336212	72.42597198	5.71E-05
5	0.295555562	VP	0.032517049	18.14500237	6.936833858	6.78943E-06	40	3.921111107	VV	0.034259383	49.5573616	24.10890007	1.85E-05
6	0.417222232	VV	0.034334294	26.06645584	9.405142784	9.75346E-06	41	4.043148041	VV	0.110417694	817.7472534	87.99655914	3.06E-04
7	0.449999988	VV	0.039479196	33.34386444	11.28250599	1.24765E-05	42	4.239444256	VB	0.067992598	109.7677155	20.01205444	4.11E-05
8	0.521666646	VV	0.034451667	34.43321991	12.37905216	1.28841E-05	43	4.489444256	PP	0.018241921	3.507075548	2.872918367	1.31E-06
9	0.569999993	VV	0.035904452	35.09746552	12.44422531	1.31326E-05	44	4.58833313	VP	0.049221307	13.34544277	3.2971735	4.99E-06
10	0.638333321	VV	0.027931711	14.68168736	6.870220661	5.49354E-06	45	4.746666431	VV	0.031583603	18.20269966	7.429603577	6.81E-06
11	0.693666637	VB	0.027370274	9.078660011	5.528296947	3.39702E-06	46	5.275285721	VV	0.110369541	20698.14453	2405.892822	7.74E-03
12	1.030333281	PP	0.027568696	10.03108025	4.965453625	3.7534E-06	47	5.34871912	VV	0.045151457	11084.67578	3480.919434	4.15E-03
13	1.110000014	VB	0.043309394	24.95985413	7.049202919	9.33939E-06	48	5.564016342	VV	0.119832069	131559.6875	13974.63477	4.92E-02
14	1.233333349	BV	0.033845741	15.78914928	7.775054455	5.90793E-06	49	5.673469067	VV	0.066532098	31421.48047	6371.816406	1.18E-02
15	1.297380924	VV	0.033486482	20.65966415	10.28258896	7.73036E-06	50	6.164659977	VV	0.099193774	37744848	4828800.5	1.41E+01
16	1.356999993	VP	0.050281577	27.28554344	7.188798904	1.02096E-05	51	6.302608013	VV	0.088930942	73053352	10662818	2.73E+01
17	1.457000017	VV	0.011886699	4.236194134	5.561375141	1.58508E-06	52	6.46167469	VV	0.104856044	111350280	13841267	4.17E+01
18	1.502916694	VV	0.138489947	93.89611053	8.025899887	3.51337E-05	53	6.796212196	VV	0.08591079	44501004	6839322.5	1.67E+01
19	1.75	VV	0.060387932	30.15961075	6.026281834	1.1285E-05	54	7.216136932	VV	0.067266345	392364.6563	82827.76563	1.47E-01
20	1.900416613	VV	0.029134253	28.79010201	12.37861729	1.07726E-05	55	7.892499924	VB	0.070331961	638.0186768	151.192215	2.39E-04
21	2.00666666	VV	0.055228621	104.6898727	22.945961	3.91725E-05	56	7.983333111	BV	0.129742354	1095.538086	140.7325287	4.10E-04
22	2.109814882	VV	0.144400164	321.6507263	28.13033867	0.000120354	57	8.106111526	VV	0.018700015	184.1209564	128.6272888	6.89E-05
23	2.305000067	VV	0.091157682	246.269928	32.96495438	9.21484E-05	58	8.204999924	VV	0.105785742	1100.9198	124.9595947	4.12E-04
24	2.420833349	VV	0.055269379	134.0665283	31.74607658	5.01646E-05	59	8.285416603	VV	0.109815247	1047.151123	113.3120117	3.92E-04
25	2.470000029	VV	0.04440479	80.55738831	30.23599625	3.01427E-05	60	8.467380524	VV	0.057423741	331.9257202	96.33812714	1.24E-04
26	2.610555649	VV	0.086236462	99.36845398	15.00973225	3.71813E-05	61	8.512999535	VV	0.043235514	307.2210693	89.08164215	1.15E-04
27	2.671666622	VV	0.024289683	24.10437012	13.86013126	9.01929E-06	62	8.573333374	VV	0.075333238	387.29953	85.68584442	1.45E-04
28	2.70071435	VV	0.014453242	14.95584106	17.2462368	5.59613E-06	63	8.656666756	VV	0.043976016	253.6452179	74.02424622	9.49E-05
29	2.722333431	VB	0.071155034	64.5860672	15.12801456	2.41666E-05	64	8.717778206	VV	0.033183299	140.8403778	70.73858643	5.27E-05
30	2.833148241	BP	0.074394733	67.36308289	15.09136391	2.52057E-05	65	8.751667023	VV	0.024665872	136.6702881	70.34746552	5.11E-05
31	2.990000001	VP	0.027662504	9.310257912	4.23262167	3.48368E-06	66	8.795000076	VV	0.057022735	293.1702576	65.74663544	1.10E-04
32	3.055555582	VV	0.053632684	23.52578926	5.643684864	8.8028E-06	67	8.953332901	VV	0.158570379	1028.695923	77.14484406	3.85E-04
33	3.166110992	VV	0.030140871	12.23390675	6.764849186	4.57764E-06	68	9.300757408	VV	0.109396115	337.2400513	38.42398834	1.26E-04
34	3.231666565	VV	0.061550055	32.50442886	6.368060112	1.21624E-05	69	9.373332977	VV	0.081984393	112.1380539	22.79662514	4.20E-05
35	3.359166622	VP	0.053187188	32.47330475	7.548843861	1.21508E-05	99						

Foam Samples from the Core and Sampled at Room Temperature

70	9.503666878 VV	0.031220332	43.19862747	17.247715	1.61639E-05	108	13.65833378 VV	0.038970947	68.81712341	21.71614456	2.57498E-05
71	9.556428909 VV	0.062721983	105.5257339	20.61441231	3.94853E-05	109	13.74166679 VV	0.043818194	87.99259186	24.54864883	3.29248E-05
72	9.666110992 VV	0.024631957	19.38513184	9.992944717	7.25346E-06	110	13.91131592 VV	0.053963058	786.2877197	223.9421997	0.00029421
73	9.777000427 VP	0.044498052	48.53211212	13.98111629	1.81596E-05	111	14.04083347 VV	0.023497377	30.38779259	16.4915123	1.13704E-05
74	9.905303001 VV	0.045927949	565.1089478	173.8279419	0.000211451	112	14.08500004 VV	0.048586264	46.72902298	11.95912743	1.74849E-05
75	10.1376667 VV	0.098466679	235.8230896	28.81915855	8.82395E-05	113	14.22166634 VP	0.04405842	163.6806488	54.4692955	6.12455E-05
76	10.24388885 VV	0.065082259	197.4134979	36.51038361	7.38675E-05	114	14.31833363 VV	0.024593672	14.42796898	7.450152397	5.39861E-06
77	10.32611084 VV	0.089791313	396.7398376	53.95221329	0.000148451	115	14.41444397 VBA	0.046677183	469.9665222	145.5242157	0.00017585
78	10.4327774 VV	0.019242555	34.29122925	29.70086479	1.2831E-05						
79	10.50277805 VV	0.070954658	149.0593109	30.00665283	5.57745E-05						
80	10.65083313 VV	0.086056247	295.1610413	42.48340988	0.000110442						
81	10.78062534 VV	0.049686182	618.8496704	181.9250946	0.000231559						
82	10.86166668 VV	0.027836131	38.61810684	18.14068985	1.445E-05						
83	10.93000031 VV	0.037651557	47.74551392	15.62431049	1.78653E-05						
84	11.00333309 VV	0.033737615	35.90939713	13.20020294	1.34365E-05						
85	11.03023815 VP	0.071162254	105.9753571	18.13876724	3.96535E-05						
86	11.44611073 PV	0.03901609	29.91145706	9.427440643	1.11922E-05						
87	11.50366688 VV	0.042916678	32.417099	10.2446785	1.21297E-05						
88	11.54388905 VV	0.085509665	67.94364166	9.492024422	2.54229E-05						
89	11.69611073 VV	0.047406383	34.26287842	9.001714706	1.28204E-05						
90	11.78166676 VV	0.038433511	22.63599205	7.669464588	8.46986E-06						
91	11.85333347 VV	0.011175166	6.739025116	8.568996429	2.52159E-06						
92	11.87928581 VP	0.044458173	32.7300415	8.99356842	1.22468E-05						
93	12.19366646 VP	0.018307852	7.46598196	5.341176987	2.7936E-06						
94	12.29333305 BV	0.025656467	7.91877079	3.905302286	2.96302E-06						
95	12.37166691 VV	0.036072787	8.347661972	2.944698572	3.1235E-06						
96	12.42888927 VP	0.017380876	8.522960663	6.464816093	3.18909E-06						
97	12.51000023 VV	0.030488413	16.56815147	7.03187561	6.19941E-06						
98	12.57309532 VP	0.032279503	17.89535522	7.653334141	6.69602E-06						
99	12.73700047 VV	0.08409705	71.94199371	10.47882843	2.6919E-05						
100	12.9452343 VV	0.034334898	1004.792847	445.1349487	0.00037597						
101	13.02388859 VV	0.03518546	21.89651108	10.37195015	8.19316E-06						
102	13.10166645 VV	0.041542519	61.036129	18.00816345	2.28383E-05						
103	13.18117142 VV	0.016418081	50.94769669	70.60870361	1.90634E-05						
104	13.22333336 VV	0.091389045	146.9476166	26.79891205	5.49844E-05						
105	13.3159523 VP	0.038947817	52.21538162	22.34416199	1.95378E-05						
106	13.56999969 VV	0.102829695	97.80909729	11.90764618	3.65979E-05						
107	13.58888912 VV	0.01858812	14.84381866	10.43987465	5.55421E-06						

Foam Samples from the Core and Sampled at Room Temperature

Sample	Location	Sampling Temp.											
PIANA 3	CORE	ROOM TEMP.											
Peak		Peak											
Number	Retention Time	Type	Peak Width	Area	Height	Area %	Peak Number	Retention Time	Peak Type	Peak Width	Area	Height	Area %
1	0.103333332	BP	0.03227848	11.9989	6.19551	4.454E-06	37	4.467121	VV	0.19425	689.868	42.9825	0.000256
2	0.193333328	VB	0.03548712	21.64389	7.540574	8.035E-06	38	4.681667	VV	0.03422	86.51891	34.54453	3.21E-05
3	0.300000012	BP	0.01379183	4.798131	5.187091	1.781E-06	39	4.791667	VV	0.095562	331.2444	41.30431	0.000123
4	0.346666664	VV	0.03798771	13.00327	5.705032	4.827E-06	40	4.853333	VV	0.017071	45.88581	41.27163	1.7E-05
5	0.40625	VV	0.0110184	5.917243	7.654854	2.197E-06	41	4.877778	VV	0.029081	81.2093	46.54198	3.01E-05
6	0.431666672	VP	0.012693	3.921839	5.263406	1.456E-06	42	4.908864	VP	0.038429	256.3177	82.08802	9.52E-05
7	0.648333311	BP	0.03253367	7.196562	2.749748	2.672E-06	43	5.27225	VV	0.112059	22103.1	2526.677	0.008205
8	0.725000024	VV	0.05237392	31.70599	7.34315	1.177E-05	44	5.345635	VV	0.044291	11475.8	3590.262	0.00426
9	0.962878764	BV	0.05108624	41.38144	13.50052	1.536E-05	45	5.561403	VV	0.119224	133146.8	14092.97	0.049428
10	1.044333339	VV	0.07941799	57.6646	12.1015	2.141E-05	46	5.67141	VV	0.068031	32797.76	6593.675	0.012175
11	1.182777762	VV	0.05111204	37.41649	10.12538	1.389E-05	47	6.162358	VV	0.099332	38399648	4905118	14.25505
12	1.230000019	VV	0.01142051	7.415936	10.82254	2.753E-06	48	6.300003	VV	0.089128	73647432	10723100	27.34004
13	1.262037039	VP	0.04941756	42.91552	11.53176	1.593E-05	49	6.459752	VV	0.106283	1.12E+08	13832382	41.49764
14	1.414999962	VV	0.02042918	8.621431	5.457833	3.201E-06	50	6.793974	VV	0.0915	44932292	6852398	16.68016
15	1.458333373	VP	0.01469841	4.444037	4.082959	1.65E-06	51	7.213517	VV	0.068715	393110.1	83821.51	0.145934
16	1.516761065	VV	0.00745023	28.25746	74.0794	1.049E-05	52	8.089666	VP	0.032158	23.14479	8.953728	8.59E-06
17	1.721666694	VV	0.08905189	111.3231	15.27032	4.133E-05	53	8.511666	PV	0.14774	863.6448	70.09795	0.000321
18	2.304333448	VV	0.25909913	1680.374	76.54993	0.0006238	54	8.866667	VV	0.014135	6.793499	8.01028	2.52E-06
19	2.361666679	VV	0.06829263	432.2094	78.42956	0.0001604	55	8.947667	VV	0.087073	221.1445	30.32707	8.21E-05
20	2.451666594	VV	0.09618275	646.2776	80.05613	0.0002399	56	9.217222	VP	0.016218	5.98344	5.713418	2.22E-06
21	2.599999905	VV	0.02668208	99.52551	47.04348	3.695E-05	57	9.298333	VV	0.072374	72.73105	12.41009	2.7E-05
22	2.760999918	VV	0.11048732	429.4389	48.88528	0.0001594	58	9.46375	VV	0.028786	28.47669	13.4039	1.06E-05
23	2.79928565	VV	0.02534009	102.0281	50.99931	3.788E-05	59	9.584333	VV	0.119731	403.4679	42.89677	0.00015
24	2.857000113	VV	0.05225077	153.0544	48.82045	5.682E-05	60	9.749	VV	0.073558	76.59544	17.35492	2.84E-05
25	2.883333445	VV	0.08782656	255.2956	48.44692	9.477E-05	61	9.902333	VV	0.053661	589.2718	165.0197	0.000219
26	3.008333445	VV	0.03190699	76.51633	30.88148	2.841E-05	62	10.04976	VV	0.080745	185.5417	28.2057	6.89E-05
27	3.09766674	VV	0.08165227	199.221	29.5509	7.396E-05	63	10.14767	VV	0.033902	88.83762	35.86026	3.3E-05
28	3.161666632	VV	0.02988421	57.60398	25.96357	2.138E-05	64	10.3275	VV	0.217394	1448.849	79.96102	0.000538
29	3.368999958	BV	0.05185166	80.22879	25.78792	2.978E-05	65	10.65833	VV	0.087155	613.6595	85.07335	0.000228
30	3.662499905	BV	0.11070771	214.8598	23.05907	7.976E-05	66	10.77856	VV	0.075443	1149.42	208.0896	0.000427
31	3.766666651	VV	0.03272397	46.16884	17.53147	1.714E-05	67	10.91778	VV	0.058986	285.115	61.61502	0.000106
32	3.837222338	VB	0.04877378	44.0763	11.23402	1.636E-05	68	11.101	VV	0.170129	1131.928	80.45996	0.00042
33	3.995833397	BB	0.0353932	16.0576	5.967491	5.961E-06	69	11.31396	VP	0.050167	404.3036	120.4307	0.00015
34	4.094166756	BV	0.03975026	27.11258	10.63229	1.006E-05	70	11.38611	VV	0.050523	236.3925	58.03368	8.78E-05
35	4.126666546	VV	0.02183491	17.50694	12.13239	6.499E-06	71	11.485	VV	0.044464	169.6774	52.83964	6.3E-05
36	4.163571358	VV	0.1006411	99.96966	16.55547	3.711E-05	72	11.525	VV	0.037871	159.2655	54.85768	5.91E-05

Foam Samples from the Core and Sampled at Room Temperature

73	11.62944412	VV	0.14645535	658.9383	53.21792	0.0002446
74	11.80388927	VB	0.0825868	191.6881	38.68416	7.116E-05
75	11.91699982	BV	0.07202649	135.648	31.38846	5.036E-05
76	12.00374985	VV	0.03994382	67.5023	28.16552	2.506E-05
77	12.08749962	VV	0.07501903	126.997	22.44249	4.714E-05
78	12.12333298	VV	0.02627299	38.26174	19.18047	1.42E-05
79	12.23111153	VV	0.08345547	122.5506	18.94835	4.549E-05
80	12.31611156	VB	0.0853236	53.11407	10.37502	1.972E-05
81	12.8633337	PV	0.02136618	3.654697	2.850843	1.357E-06
82	12.94344997	VP	0.03254936	565.8431	268.9073	0.0002101
83	13.08055592	VV	0.03102995	12.84656	5.757852	4.769E-06
84	13.14388847	VV	0.04037253	15.64645	6.052804	5.808E-06
85	13.19277763	VV	0.01616928	7.614692	6.269767	2.827E-06
86	13.22388935	VP	0.04006629	15.3709	6.393947	5.706E-06
87	13.30500031	VP	0.03396437	9.199157	3.357598	3.415E-06
88	13.65833378	BV	0.07483962	139.9798	23.05344	5.196E-05
89	13.78499985	VV	0.05822005	141.0611	29.80282	5.237E-05
90	13.95187473	VV	0.05763581	884.2078	226.0452	0.0003282
91	14.03966713	VV	0.02678235	51.78785	32.2276	1.923E-05
92	14.10111141	VV	0.0628685	152.2231	29.66395	5.651E-05
93	14.25625038	VV	0.05687955	279.7225	62.90395	0.0001038
94	14.35333347	VV	0.03498824	46.92903	18.88716	1.742E-05
95	14.44990158	VBA	0.04635429	652.9401	209.5388	0.0002424

Foam Samples from the Core and Sampled at Room Temperature

Sample	Location	Sampling Temp.													
PIAO 1	CORE	ROOM TEMP.													
#	Retention		Peak Type	Peak Width	Area	Height	Area %	#	Retention		Peak Type	Peak Width	Area	Height	Area %
	Time								Time						
1	0.085833333	BV		0.065783545	168.8963165	31.89291	6.26553E-05		50	4.363749981	VV	0.074234225	134.4685516	21.71823502	4.98837E-05
2	0.193888888	VV		0.047551632	92.75974274	32.51193619	3.4411E-05		51	4.473888874	VV	0.069064736	160.3635406	29.20339775	5.94899E-05
3	0.219761908	VB		0.02980911	77.04498291	32.32243347	2.85813E-05		52	4.538333416	VB	0.145381451	364.9573059	29.69585991	0.000135388
4	0.308333337	BV		0.070374809	127.2523499	22.4516449	4.72067E-05		53	4.781666756	BV	0.045438617	55.40603256	14.88085365	2.05539E-05
5	0.400555551	VV		0.031700358	53.0026474	23.15939903	1.96623E-05		54	4.902143002	VP	0.046652578	38.97585678	10.18347263	1.44588E-05
6	0.419999987	VV		0.020431727	26.58529472	21.68628311	9.86232E-06		55	5.269705772	VV	0.1073412	18992.65234	2253.185059	0.007045687
7	0.449000001	VV		0.058086008	104.2300186	22.90654182	3.86661E-05		56	5.344847202	VV	0.043666553	10695.88477	3403.246582	0.003967843
8	0.603888869	VV		0.101048261	184.8323669	23.17482948	6.85671E-05		57	5.558742046	VV	0.122653969	129636.4688	13668.06348	0.048091125
9	0.696111083	VV		0.02538446	47.92549896	23.91035843	1.77789E-05		58	5.668777943	VV	0.067119196	30726.8125	6275.989258	0.011398698
10	0.762777805	VV		0.08046934	162.6274109	24.81151199	6.03297E-05		59	6.159841061	VV	0.099143818	38304560	4903092	14.2098085
11	0.841000021	VV		0.052501518	76.7540741	24.36566734	2.84734E-05		60	6.297523499	VV	0.089076459	73622872	10726417	27.31181125
12	0.939166665	VV		0.043605555	77.83360291	22.36291885	2.88739E-05		61	6.457087517	VV	0.108467661	112056752	13838903	41.56959347
13	0.977500021	VV		0.057425976	71.60309601	20.78127289	2.65625E-05		62	6.791329861	VV	0.088404246	44970368	6866821.5	16.68261736
14	1.036333323	VV		0.029375425	43.02986145	19.03343964	1.59627E-05		63	7.210937977	VV	0.067894772	400436.5938	83581.35156	0.148549606
15	1.084166646	VV		0.030717721	42.95469666	18.75676727	1.59349E-05		64	8.133094788	VV	0.066810653	503.0664673	125.495575	0.000186622
16	1.131666666	VV		0.037239034	40.12034225	13.28273296	1.48834E-05		65	8.190555573	VV	0.074938133	547.0943604	121.6768799	0.000202955
17	1.356111169	BV		0.025550583	18.12958717	8.981172562	6.72552E-06		66	8.262499809	VV	0.079804413	703.6729126	106.8886185	0.000261041
18	1.43083334	VV		0.027318407	11.83309746	7.219245434	4.38971E-06		67	8.386111259	VB	0.079892077	423.4434509	88.33655548	0.000157084
19	1.497777782	VP		0.007718928	1.920502901	4.146739006	7.12447E-07		68	8.632778168	BV	0.185231343	2069.443359	133.9584198	0.0007677
20	1.53981483	VB		0.02496372	20.31877136	10.32290745	7.53764E-06		69	8.807222366	VV	0.021008303	88.73842621	70.39949036	3.29192E-05
21	1.726666689	BP		0.084921062	19.82264709	3.89040637	7.35359E-06		70	8.829444885	VV	0.051660795	216.8491974	69.95930481	8.04444E-05
22	1.891666651	VV		0.026445538	7.00556469	3.486018896	2.59885E-06		71	8.951666832	VV	0.103010528	671.9331665	80.80792999	0.000249266
23	1.925555587	VV		0.053705141	36.75378418	8.803878784	1.36345E-05		72	9.039166451	VV	0.064236403	288.8026123	55.0223969	0.000107137
24	2.058333397	VV		0.043868084	65.07635498	19.04340553	2.41413E-05		73	9.163594246	VV	0.111012243	669.5275269	100.5185699	0.000248374
25	2.191296339	VV		0.106591843	267.4267883	30.71092224	9.92071E-05		74	9.421667099	VV	0.077847309	194.4931641	29.91651344	7.2151E-05
26	2.274166584	VV		0.048010755	103.8337555	26.91343117	3.85191E-05		75	9.661000252	VV	0.119961411	435.8635559	45.01603317	0.000161692
27	2.362777771	VV		0.039856758	78.72698975	28.83160782	2.92053E-05		76	9.736110687	VV	0.032455966	88.98632813	34.08769989	3.30112E-05
28	2.39388895	VV		0.061090715	100.0582581	27.29772758	3.71185E-05		77	9.76595211	VV	0.042763155	131.0847473	37.51726532	4.86284E-05
29	2.484999895	VP		0.087517731	176.961853	24.14183426	6.56474E-05		78	9.89944458	VV	0.056349408	649.1959839	170.779129	0.000240832
30	2.678333282	VV		0.029115433	13.31287766	5.947322845	4.93867E-06		79	10.11722183	VV	0.058035459	95.37963104	20.98147964	3.53829E-05
31	2.819444418	VV		0.063302428	64.99939728	12.85245895	2.41128E-05		80	10.31999969	VV	0.097931914	467.1062012	56.80666733	0.000173282
32	2.840333223	VV		0.022129869	28.47943687	16.50582504	1.0565E-05		81	10.47000027	VV	0.137448192	822.0112305	72.40666199	0.000304941
33	2.900000095	VV		0.026498443	28.5182724	14.15894604	1.05794E-05		82	10.65055561	VV	0.061946984	273.6045837	58.0933342	0.000101499
34	2.933333397	VV		0.029571885	35.29636002	14.93517208	1.30939E-05		83	10.77484131	VV	0.059187114	745.128418	188.2162323	0.00027642
35	2.962916613	VV		0.023712097	31.87602806	17.12810135	1.1825E-05		84	10.87611103	VV	0.02607034	66.28020477	32.12539291	2.45879E-05
36	3.018333435	VV		0.021988889	14.08990288	8.223678589	5.22692E-06		85	11.20374966	BV	0.182168171	674.4035034	45.43583679	0.000250183
37	3.086111069	VV		0.019927885	12.20326138	8.41046524	4.52703E-06		86	11.37722206	VV	0.072884887	119.1526947	27.24677849	4.4202E-05
38	3.244166613	VV		0.069882222	92.88830566	16.44900322	3.44587E-05		87	11.49333286	VV	0.047638796	62.96458817	16.83334351	2.33579E-05
39	3.277666569	VV		0.031783957	38.13618469	17.25577545	1.41473E-05		88	11.58749962	VV	0.064660393	114.2493896	21.61694908	4.2383E-05
40	3.320833445	VV		0.042184927	45.14047241	17.83436012	1.67457E-05		89	11.62666702	VV	0.016697539	19.69552231	16.7753582	7.30643E-06
41	3.371000051	VV		0.025732996	31.62533951	19.69585037	1.1732E-05		90	11.70621204	VV	0.074534625	120.5245972	20.51693344	4.47109E-05
42	3.65233326	VV		0.149358988	475.6683044	37.65948486	0.000176458		91	11.81999969	VV	0.070402242	94.00906372	18.15781021	3.48745E-05
43	3.748333216	VV		0.079092324	229.4960785	34.73048782	8.5136E-05		92	11.96233368	VV	0.090436056	126.8377914	16.73270226	4.70529E-05
44	3.810333252	VV		0.037943549	111.7924271	36.28592682	4.14715E-05		93	12.06833363	VV	0.035900127	20.07771873	7.834082127	7.44821E-06
45	3.872499943	VV		0.026701303	68.96524048	33.94726944	2.5584E-05		94	12.1091671	VB	0.022916958	12.47499847	6.958069324	4.62784E-06
46	3.898809433	VV		0.0259372	71.70488739	34.94799042	2.66003E-05		95	12.28633308	PP	0.084355198	89.64379883	13.01526737	3.32551E-05
47	3.983333349	VV		0.042535987	126.6952438	37.38647461	4.7E-05		96	12.49666691	BP	0.030667247	11.26618004	5.328473091	4.1794E-06
48	4.03666687	VV		0.067265458	168.9862976	31.1624527	6.26887E-05		97	12.57388878	VV	0.021893069	10.42458725	6.797055721	3.8672E-06
49	4.11833334	VV		0.078176469	179.6004944	27.50638199	6.66262E-05		98	12.66499996	VV	0.049345497	40.13050842	10.32493401	1.48872E-05

Foam Samples from the Core and Sampled at Room Temperature

99	12.80404758 VV	0.07985533	198.7403564	30.16885567	7.37265E-05
100	12.94089699 VV	0.035220951	629.1012573	279.9103088	0.000233377
101	12.99966621 VV	0.020210041	13.51164341	9.159527779	5.0124E-06
102	13.13055515 VP	0.07125444	43.3170166	8.983561516	1.60693E-05
103	13.36833286 VV	0.10856133	109.9042358	12.03265858	4.07711E-05
104	13.45833302 VV	0.038185533	21.88155174	7.255390644	8.11738E-06
105	13.56499958 VP	0.034411807	27.68848038	10.62193584	1.02716E-05
106	13.65499973 VV	0.032553293	42.5331955	16.2411499	1.57785E-05
107	13.68916702 VV	0.021534977	13.091465	8.240299225	4.85653E-06
108	13.78166676 VV	0.047259089	76.3554306	22.12701225	2.83255E-05
109	13.94555569 VV	0.052667141	655.6281128	183.5737915	0.000243218
110	14.02999973 VV	0.024083557	29.68051147	15.68011189	1.10106E-05
111	14.10499954 VP	0.049252525	48.54143524	11.98489952	1.80074E-05
112	14.25 VV	0.042265236	148.0459595	47.62695694	5.49205E-05
113	14.36666679 VV	0.043395992	35.39453888	10.22220898	1.31303E-05
114	14.44479179 VBA	0.046907667	493.4783936	155.9905701	0.000183065

Foam Samples from the Core and Sampled at Room Temperature

Sample	Location	Sampling Temp.												
PIAO 2	CORE	ROOM TEMP.												
#	Retention Time	Peak Type	Peak Width	Area	Height	Area %	#	Retention Time	Peak Type	Peak Width	Area	Height	Area %	
1	0.03444444	BV	0.016985949	5.185954094	6.058792591	1.91432E-06	35	3.232222319	VV	0.05379812	45.8519783	10.32739735	1.69256E-05	
2	0.057222221	VV	0.01600517	6.817187309	6.624967098	2.51646E-06	36	3.321666718	VV	0.03059407	28.10177231	11.46580505	1.03734E-05	
3	0.083750002	VV	0.019709392	10.33291626	8.737726212	3.81424E-06	37	3.366666555	VV	0.033002134	29.69083214	11.17319965	1.09599E-05	
4	0.126428574	VV	0.014724134	7.626472473	8.632620811	2.8152E-06	38	3.42750001	VV	0.035310771	23.39958191	11.04459095	8.63761E-06	
5	0.149444446	VV	0.015081934	4.119630337	3.978034735	1.5207E-06	39	3.513000011	VV	0.039300818	50.11003876	16.10479164	1.84974E-05	
6	0.189444438	VV	0.018009664	10.73560333	7.823318481	3.96289E-06	40	3.555000067	VV	0.043781389	67.07219696	18.72864914	2.47587E-05	
7	0.221666664	VV	0.031548798	10.86837292	4.776023865	4.0119E-06	41	3.611666679	VV	0.054317132	77.29555511	17.23682976	2.85325E-05	
8	0.25642857	VV	0.0228118	9.69858551	7.085941792	3.58009E-06	42	3.679444551	VV	0.026290514	33.89305115	16.97768211	1.25111E-05	
9	0.310000002	VV	0.02671263	12.14181709	5.973800659	4.48197E-06	43	3.758333445	VV	0.054986961	74.69316864	18.15952301	2.75719E-05	
10	0.347592592	VP	0.019197321	9.810908318	8.517601967	3.62155E-06	44	3.799444437	VV	0.050324205	74.45384979	17.97501564	2.74835E-05	
11	0.431666672	VV	0.085714288	58.59462738	8.16591835	2.16293E-05	45	3.901666641	VV	0.038263615	34.86674118	11.21726704	1.28705E-05	
12	0.557083309	VP	0.020939395	12.33220291	8.020097733	4.55225E-06	46	3.940555573	VV	0.013511673	11.04724884	12.26109028	4.07793E-06	
13	0.625833333	VV	0.029216142	10.96523666	4.700436592	4.04765E-06	47	3.994999886	VV	0.047796965	43.00738907	10.95602894	1.58755E-05	
14	0.704444468	VV	0.027619002	11.76493835	6.996156693	4.34285E-06	48	4.099999905	VV	0.059327759	61.09658051	13.12024307	2.25529E-05	
15	1.010555506	VV	0.124414913	167.9457092	16.00594711	6.19947E-05	49	4.162333488	VV	0.036142126	49.80965424	17.02039909	1.83865E-05	
16	1.057222247	VB	0.100855365	143.3686676	17.63352585	5.29224E-05	50	4.228333473	VV	0.087541692	131.7198944	18.17720985	4.86224E-05	
17	1.343888879	BV	0.037622686	17.87901115	7.920314789	6.59977E-06	51	4.351666451	VV	0.027074929	33.96036148	16.45712852	1.2536E-05	
18	1.482916713	VP	0.066302411	54.2577858	9.844226837	2.00285E-05	52	4.565740585	VV	0.14590016	393.8408203	31.93053818	0.00014538	
19	1.794516921	VB	0.016797582	40.43222809	53.6180687	1.4925E-05	53	4.655833244	VV	0.045867227	88.756073	23.60503769	3.2763E-05	
20	2.007499933	PV	0.051592208	36.94596481	9.251252174	1.36381E-05	54	4.725833416	VV	0.119586088	158.3982086	22.07589722	5.84703E-05	
21	2.069444418	VV	0.01789988	16.57798004	12.16422844	6.11951E-06	55	4.900000095	VV	0.044952344	77.48026276	21.54674339	2.86007E-05	
22	2.104166746	VV	0.021978747	22.38433456	13.07141876	8.26284E-06	56	5.272407532	VV	0.105236165	1.66E+04	1990.120117	0.006122738	
23	2.161666632	VV	0.02939349	39.13885498	17.30047607	1.44475E-05	57	5.560100079	VV	0.127958015	1.42E+05	14034.47168	0.052379589	
24	2.23633337	VV	0.08827161	160.9917145	21.77120209	5.94277E-05	58	5.670000076	VV	0.066888012	3.50E+04	7044.081055	0.012901837	
25	2.408333302	VV	0.120123692	308.1767578	30.43754578	0.000113759	59	6.161026001	VV	0.098575376	38177368	4917480.5	14.09260778	
26	2.533888817	VV	0.027322693	63.88265991	29.43200874	2.35813E-05	60	6.298260212	VV	0.0890797	73970760	10776667	27.30520627	
27	2.566111088	VP	0.057750877	151.0438995	31.60809135	5.57556E-05	61	6.458517551	VV	0.106241316	112950880	13982829	41.69413802	
28	2.731666565	VV	0.047182906	20.97585487	5.41617012	7.74292E-06	62	6.792298317	VV	0.086145177	45133688	6915207.5	16.66042989	
29	2.792777777	VV	0.013941908	5.599486828	6.693830967	2.06697E-06	63	7.212115765	VV	0.069147199	408000.4375	84777.24219	0.150607295	
30	2.817222118	VB	0.032993939	13.28767109	5.34673214	4.90495E-06	64	8.041666985	VV	0.05328789	851.9663086	210.1934967	0.000314491	
31	2.894166708	BV	0.03329879	16.06519318	8.040929794	5.93023E-06	65	8.108809471	VV	0.099405415	1709.018555	204.6965332	0.000630859	
32	2.977222204	VV	0.036531858	28.86401939	10.67957687	1.06547E-05	66	8.247221947	VV	0.05189772	811.0393066	193.5085144	0.000299383	
33	3.016428471	VP	0.03396612	31.86374474	12.00485134	1.1762E-05	67	8.348333359	VV	0.066628516	1026.923096	185.3789978	0.000379073	
34	3.161250114	VV	0.040978771	22.22925568	9.269218445	8.2056E-06	68	8.410833359	VV	0.032625988	459.8277893	181.0794525	0.000169739	

Foam Samples from the Core and Sampled at Room Temperature

69	8.647666931 VV	0.250593275	4696.711426	223.1126404	0.001733721	107	12.67944431 VV	0.07751698	901.9418945	145.1060944	0.000332938
70	8.904166222 VV	0.042634636	587.8356323	173.0325623	0.000216991	108	12.87433338 VV	0.103145853	1565.39917	189.950882	0.000577844
71	8.961667061 VV	0.087240681	1243.98877	180.8708801	0.0004592	109	12.94237137 VV	0.050834265	1815.115479	494.3786621	0.000670023
72	9.045000076 VV	0.020544242	222.2456512	156.7231598	8.20387E-05	110	13.08944416 VV	0.084392652	1157.997314	163.9705658	0.000427457
73	9.068333626 VV	0.025293492	294.1781006	153.9497681	0.000108591	111	13.18458366 VV	0.048962388	551.697998	165.1971893	0.000203651
74	9.100000381 VV	0.039547399	481.7296143	153.7778015	0.000177823	112	13.22958374 VV	0.10188432	1423.24707	166.237793	0.00052537
75	9.154999733 VV	0.034779616	391.4490356	148.3743439	0.000144498	113	13.3633337 VB	0.05076462	615.8706665	160.5097504	0.000227339
76	9.194999695 VV	0.095895104	1194.579346	148.4290314	0.000440961	114	13.56055546 BV	0.131209224	1845.625244	171.97052	0.000681285
77	9.353888512 VV	0.033598002	371.4507141	146.4150085	0.000137116	115	13.65699959 VV	0.067232013	1017.277771	187.6935425	0.000375513
78	9.379444122 VV	0.024278028	254.3620453	146.3434753	9.3894E-05	116	13.86083317 VV	0.127280921	2362.969238	221.8198395	0.000872255
79	9.422499657 VV	0.027462956	303.8666687	144.9175262	0.000112168	117	13.95858955 VV	0.071142554	1875.049438	369.8787842	0.000692147
80	9.45111084 VV	0.086036175	748.0340576	144.9068909	0.000276126	118	14.03055573 VV	0.045960553	667.734314	181.3345642	0.000246484
81	9.648030281 VV	0.196752161	2494.231689	152.5506592	0.000920709	119	14.11166668 VV	0.068941846	1032.319092	179.913208	0.000381065
82	9.900111198 VV	0.069837183	1636.914795	330.1913757	0.000604243	120	14.26023769 VV	0.098192155	1691.068726	214.0001526	0.000624233
83	10.23679066 VV	0.14454101	2442.830811	199.9402924	0.000901735	121	14.37277794 VV	0.046727184	561.6934204	173.6967468	0.000207341
84	10.32499981 VV	0.081650771	1226.972168	189.2204895	0.000452919	122	14.45527744 VBA	0.066835314	1548.125488	317.7859497	0.000571468
85	10.47416687 VV	0.141421184	2238.344727	187.3031006	0.000826252						
86	10.65166664 VV	0.079141542	1238.516724	194.8888855	0.00045718						
87	10.7765789 VV	0.085840397	2435.94458	379.7327881	0.000899193						
88	10.9327774 VV	0.051831428	698.4283447	173.9927826	0.000257814						
89	10.95583344 VV	0.021840716	298.1026306	175.2892456	0.00011004						
90	10.98250008 VB	0.041424058	572.6766968	173.8813934	0.000211395						
91	11.11166668 BV	0.086368792	1284.956909	177.686142	0.000474323						
92	11.20899963 VV	0.114493266	1645.111084	170.6143341	0.000607268						
93	11.33500004 VV	0.059092861	766.6755981	162.3540497	0.000283007						
94	11.41722202 VV	0.041855816	403.4179077	160.6379395	0.000148916						
95	11.45916653 VV	0.052752562	710.3823853	163.2980499	0.000262227						
96	11.56166649 VV	0.087091997	1104.317871	155.0535583	0.000407643						
97	11.66250038 VV	0.041582216	476.5510254	151.9799194	0.000175912						
98	11.71944427 VV	0.040923432	369.4733276	150.4734344	0.000136386						
99	11.7966671 VV	0.077763565	1005.434753	156.8955688	0.000371141						
100	11.85880947 VV	0.084921919	738.1660156	144.871521	0.000272483						
101	11.98999977 VV	0.050861355	527.5317993	147.0219421	0.000194731						
102	12.12452412 VV	0.098275639	1156.513184	149.4606323	0.00042691						
103	12.25033379 VV	0.221914709	3095.608643	164.9748993	0.001142698						
104	12.49366665 VV	0.024147395	245.5573883	149.620163	9.06439E-05						
105	12.59722233 VV	0.088878877	937.3110962	148.0165405	0.000345994						
106	12.62416649 VV	0.021339461	205.3475342	146.6217957	7.5801E-05						

Foam Samples from the Core and Sampled at Room Temperature

Sample	Location	Sampling Temp.												
PIAO 3	CORE	ROOM TEMP.												
#	Retention	Peak Type	Peak Width	Area	Height	Area %	#	Retention	Peak Type	Peak Width	Area	Height	Area %	
	Time							Time						
1	0.039666668	BB	0.062196992	20.0514946	5.373114586	7.45143E-06		48	4.224444389	VV	0.044160377	18.31653023	6.912882328	6.80669E-06
2	0.210999995	BV	0.046187837	48.62776184	13.77406311	1.80708E-05		49	4.361111164	VV	0.054604795	70.53820801	16.59004402	2.6213E-05
3	0.241190478	VV	0.028423583	21.44335747	12.57368851	7.96867E-06		50	4.467000008	VV	0.101256691	164.1802521	20.32148933	6.10118E-05
4	0.277500004	VV	0.021744497	18.00169563	11.20434284	6.6897E-06		51	4.556333542	VB	0.023661751	20.91846466	11.26634407	7.77361E-06
5	0.36722222	VV	0.051477492	49.88788986	14.03231812	1.85391E-05		52	4.746666431	BV	0.038190503	22.62203026	7.499855042	8.40668E-06
6	0.40625	VB	0.048913158	50.24924088	12.76847744	1.86734E-05		53	4.809444427	VP	0.020165808	11.45328236	9.465925217	4.25621E-06
7	0.52366668	BV	0.02050853	7.776239872	6.319517136	2.88977E-06		54	5.270035267	VV	0.108698696	21827.4082	2528.862061	0.008111387
8	0.557222247	VV	0.020602986	8.546895027	6.390685558	3.17615E-06		55	5.343144894	VV	0.045873094	11809.52539	3637.880859	0.004388594
9	0.630833328	VV	0.044335525	25.26743317	7.895609379	9.38975E-06		56	5.558770657	VV	0.12080422	133788.6719	14215.00781	0.049717843
10	0.686249971	VV	0.025402952	20.44985008	10.64956093	7.59947E-06		57	5.66871357	VV	0.068151399	33098.02344	6640.314941	0.012299714
11	0.719444454	VB	0.036558107	23.81873703	8.041102409	8.85139E-06		58	6.15913868	VV	0.100051612	38348164	4913644.5	14.2507432
12	0.798333347	BV	0.026121831	19.75856209	9.55634594	7.34257E-06		59	6.297800541	VV	0.096066788	73493488	10708860	27.31126384
13	0.876666665	VV	0.038535506	53.81229401	17.66712189	1.99974E-05		60	6.456675529	VV	0.104949497	111786864	13881714	41.54164701
14	0.927222252	VV	0.031529386	55.6518898	24.47369385	2.06811E-05		61	6.791315556	VV	0.086484462	44862080	6843101	16.67141044
15	1.021666646	VV	0.096258916	221.4393768	27.40811729	8.22901E-05		62	7.210871696	VV	0.067345977	392759.625	82791.84375	0.145955268
16	1.106333375	VV	0.028267721	61.81999207	27.45701599	2.29732E-05		63	8.178333282	VB	0.082601532	178.6069336	25.85245705	6.6373E-05
17	1.168333292	VV	0.053900614	117.643959	26.44502068	4.37182E-05		64	8.439444542	PV	0.011541405	1.958673358	2.394950151	7.27872E-07
18	1.248999953	VV	0.053405073	134.2512512	30.46906662	4.98897E-05		65	8.488888741	VV	0.016179062	9.022183418	7.986820698	3.35278E-06
19	1.423256397	VV	0.09032882	646.5838623	85.40223694	0.00024028		66	8.635000229	VV	0.120427981	521.9782104	53.68821335	0.000193975
20	1.600555539	VV	0.049070135	100.078392	28.4289608	3.71906E-05		67	8.853666306	VV	0.012454104	6.011236191	7.418057442	2.23386E-06
21	1.661000013	VV	0.04875686	106.9731827	27.2750473	3.97528E-05		68	8.936904907	VP	0.077722482	206.0744629	32.17508316	7.65803E-05
22	1.730833292	VV	0.040687118	67.50504303	23.3786335	2.50859E-05		69	9.306666374	VV	0.072512724	79.68730927	14.41088295	2.9613E-05
23	1.823750019	VV	0.067786157	121.0650024	24.87270164	4.49895E-05		70	9.41166687	VV	0.029461173	16.90794754	7.183210373	6.28324E-06
24	1.910238147	VV	0.037810512	72.72724152	23.69372749	2.70265E-05		71	9.481666565	VV	0.021244753	8.84899044	5.364487171	3.28842E-06
25	1.977499962	VV	0.051575977	93.21313477	23.86096001	3.46394E-05		72	9.578332901	VV	0.035900082	36.75472641	13.58407593	1.36586E-05
26	2.029999971	VV	0.030951958	72.59860229	29.25479889	2.69787E-05		73	9.645000458	VV	0.071951866	126.3768616	21.07730293	4.69635E-05
27	2.075999975	VV	0.084887631	199.4858704	28.07819557	7.41319E-05		74	9.731666565	VP	0.055111971	58.38085556	13.07012558	2.16952E-05
28	2.238333225	VV	0.04804673	61.02196121	16.53837204	2.26767E-05		75	9.900613785	VV	0.044762481	490.9701843	151.6845703	0.000182452
29	2.38499999	VV	0.040900227	38.45780563	11.53397942	1.42915E-05		76	10.32250023	VV	0.135172695	516.4215698	45.24139404	0.00019191
30	2.439444542	VB	0.0464915	16.93640327	6.07150507	6.29382E-06		77	10.48250008	VV	0.128503203	625.3046265	57.6682663	0.000232372
31	2.683333397	PV	0.052852239	28.69604683	7.999266624	1.06639E-05		78	10.65333366	VV	0.072893791	314.2142944	53.99364853	0.000116767
32	2.787222147	VV	0.062023856	26.03286362	6.995390415	9.6742E-06		79	10.77638912	VV	0.052818775	616.4709473	167.9674683	0.00022909
33	2.887222229	VP	0.040884607	27.66353607	8.519060135	1.02802E-05		80	10.87333298	VV	0.061711177	97.72224426	19.41866875	3.6315E-05
34	3.021666765	PP	0.010422903	1.399871707	2.200195074	5.20213E-07		81	10.94833374	VV	0.047434304	80.13647461	20.57752609	2.97799E-05
35	3.295000076	VV	0.10388916	102.9426041	12.02329731	3.8255E-05		82	11.08583355	VV	0.067591317	172.1880493	31.59017181	6.39876E-05
36	3.336999893	VV	0.0342554	32.98896027	12.31375122	1.22592E-05		83	11.24633312	VV	0.048840962	246.5345001	61.40428543	9.16159E-05
37	3.380238056	VV	0.01738134	13.51412964	12.73407078	5.02205E-06		84	11.36666679	VV	0.065449148	54.82449341	13.961092	2.03736E-05
38	3.398999929	VV	0.013951862	10.3962698	11.07481098	3.86341E-06		85	11.43083286	VV	0.025315106	29.92246056	14.97292709	1.11196E-05
39	3.443000078	VV	0.025630577	22.1420269	11.41480637	8.2283E-06		86	11.47000027	VV	0.023500016	25.84700966	14.70966911	9.60513E-06
40	3.533888817	VV	0.069131061	57.87456894	10.86740398	2.1507E-05		87	11.55636406	VV	0.034643367	56.53569031	22.25061226	2.10095E-05
41	3.599999905	VV	0.013353958	7.188921928	8.100357056	2.67151E-06		88	11.84333324	PP	0.011115196	2.866403818	4.120834351	1.0652E-06
42	3.620833397	VV	0.015348169	8.153295517	7.70331049	3.02988E-06		89	12.03388882	BV	0.02184215	12.644557	8.758966446	4.6989E-06
43	3.651666641	VP	0.051822171	33.59635162	8.553882599	1.24849E-05		90	12.06499958	VP	0.057387352	35.99556351	7.582023621	1.33765E-05
44	3.924333334	VV	0.06881614	53.98781967	9.569961548	2.00627E-05		91	12.19333363	VV	0.013566189	7.057260513	7.118568897	2.62258E-06
45	3.977777719	VV	0.030927375	18.39793777	9.509986877	6.83694E-06		92	12.34083366	VV	0.154397815	325.3336792	27.03432274	0.000120899
46	4.086666584	VV	0.076074384	54.97776413	9.153234482	2.04305E-05		93	12.55666637	VV	0.013257645	6.893343449	8.665872574	2.56167E-06
47	4.13166666	VV	0.030933682	16.51260376	6.658227444	6.13633E-06		94	12.58916664	VP	0.032206871	12.01684475	5.56183815	4.46564E-06

Foam Samples from the Core and Sampled at Room Temperature

95	12.66366673 VV	0.029371116	14.12076759	6.759734631	5.24749E-06
96	12.76988888 VV	0.027341604	284.1240234	148.3680573	0.000105585
97	12.8623333 VV	0.051503282	124.8886261	30.03990555	4.64105E-05
98	12.9417429 VV	0.035869811	662.104187	277.1654663	0.000246048
99	13.13611126 VV	0.071671568	108.759285	18.75024223	4.04166E-05
100	13.18916702 VV	0.021005323	23.67768097	16.24430084	8.79898E-06
101	13.21416664 VV	0.01483266	13.33174229	14.98016644	4.95427E-06
102	13.23944473 VV	0.02916508	26.2874794	15.02223396	9.76881E-06
103	13.26233292 VV	0.043716554	49.39253235	13.81337166	1.8355E-05
104	13.43999958 VV	0.082486115	116.5110626	19.56212044	4.32972E-05
105	13.48083305 VV	0.030321423	38.4672966	17.05018425	1.4295E-05
106	13.55309486 VV	0.04308103	72.88025665	21.21376801	2.70834E-05
107	13.65738106 VV	0.039432954	38.83073044	13.55026054	1.44301E-05
108	13.77124977 VV	0.057357494	179.0015106	40.66302109	6.65196E-05
109	13.93962955 VV	0.060762268	1185.43396	283.6222229	0.000440525
110	14.04611111 VP	0.019991836	12.21172237	7.918597221	4.53806E-06
111	14.11833286 VV	0.033978403	39.1803894	14.29416466	1.456E-05
112	14.15833378 VV	0.020485947	14.63044643	11.02215767	5.43689E-06
113	14.24611092 VV	0.043393407	241.912384	69.87059021	8.98982E-05
114	14.34566689 VP	0.023771631	18.55462837	9.942786217	6.89517E-06
115	14.44578457 VBA	0.045405805	384.4980774	130.3794708	0.000142885

Foam Samples from the Core and Sampled at Room Temperature

Sample PIBNA 1	Location CORE	Sampling Temp. ROOM TEMP.													
#	Retention		Peak Type	Peak Width	Area	Height	Area %	#	Retention		Peak Type	Peak Width	Area	Height	Area %
	Time								Time						
1	0.026111111	BV	0.024502954	54.04362869	29.3219738	2.01916E-05		48	4.645370483	VV	0.084390827	165.111969	23.38010788	6.16886E-05	
2	0.066111111	VV	0.099761292	198.375946	23.91851234	7.41166E-05		49	4.759444237	VV	0.026238237	33.8414917	16.28903008	1.26437E-05	
3	0.296111107	VV	0.033379935	9.70857048	4.84750843	3.62728E-06		50	5.269561291	VV	0.108686693	20481.89844	2373.257813	0.007652381	
4	0.332777768	VV	0.016013777	6.822178841	6.115986824	2.54888E-06		51	5.34218502	VV	0.045672469	11221.58301	3475.17627	0.004192572	
5	0.361190468	VV	0.010522835	4.756708145	7.53394556	1.77719E-06		52	5.55777216	VV	0.118650615	130543.4297	13889.63281	0.048773215	
6	0.410833329	VV	0.032596085	20.2365303	10.00559425	7.56071E-06		53	5.667391777	VV	0.067117028	33950.70703	6815.413574	0.012684554	
7	0.455000013	VV	0.042983461	44.68027878	12.71903133	1.66933E-05		54	6.158033848	VV	0.099300109	38032408	4859922	14.20954549	
8	0.509444416	VV	0.015020764	12.84863377	12.47014999	4.80047E-06		55	6.296123505	VV	0.089050315	73042584	10645349	27.28993441	
9	0.544166684	VV	0.061925597	56.11591339	15.10304832	2.09658E-05		56	6.455699921	VV	0.105001815	111416840	13828064	41.62720005	
10	0.613333344	VV	0.026450872	21.98950005	10.93964291	8.21565E-06		57	6.789519787	VV	0.088170446	44541960	6822281	16.64162329	
11	0.670000017	VV	0.020681627	10.14207935	8.173179626	3.78925E-06		58	7.209640503	VV	0.069209591	399039.6563	82823.28906	0.149087908	
12	0.68900001	VV	0.017828166	11.14478779	8.214630127	4.16388E-06		59	8.156666756	VV	0.119440034	1592.611328	159.571106	0.000595026	
13	0.740833342	VP	0.022700479	10.88688087	8.089791298	4.06752E-06		60	8.354999542	VV	0.032733332	322.3279419	135.594696	0.000120427	
14	0.80314815	VV	0.027856477	18.5761013	8.381697655	6.94034E-06		61	8.54777813	VV	0.212034747	3422.775391	195.713623	0.001278806	
15	0.864523828	VV	0.045339171	38.35020447	12.66071224	1.43283E-05		62	8.771666527	VV	0.093931362	628.1307373	111.4520721	0.00023468	
16	0.929166675	VV	0.051059544	53.0895195	12.62502003	1.98351E-05		63	8.946110725	VV	0.156019315	1358.309448	103.5617142	0.000507487	
17	0.999444425	VV	0.03813602	30.64006615	9.892274857	1.14476E-05		64	9.162917137	VV	0.094499469	554.7421265	69.96788025	0.000207261	
18	1.583888888	BP	0.034130435	15.59856987	6.707718372	5.82789E-06		65	9.294333458	VV	0.075045012	413.1798706	66.90860748	0.000154371	
19	1.643888831	VV	0.009702094	3.050718069	5.310535908	1.1398E-06		66	9.381667137	VV	0.04095247	174.5524902	55.1098671	6.52157E-05	
20	1.686666608	VV	0.022014694	9.343082428	6.406381607	3.49073E-06		67	9.575555801	VV	0.160043061	1035.867798	76.46729279	0.000387018	
21	1.83099997	VV	0.074375138	107.0638733	19.10632324	4.00009E-05		68	9.751667023	VV	0.059684731	240.9054718	48.72283936	9.00063E-05	
22	1.875833392	VV	0.035504159	54.14271164	18.85333061	2.02286E-05		69	9.898809433	VV	0.060030814	1011.085571	245.5923004	0.000377759	
23	1.929999948	VV	0.072704911	104.3184357	17.21306801	3.89751E-05		70	10.31833363	VV	0.16221346	1368.674072	99.6661911	0.00051136	
24	2.065000057	VV	0.038849819	31.48733902	9.968903542	1.17642E-05		71	10.4622221	VV	0.153342202	1251.209717	96.45324707	0.000467473	
25	2.127500057	VV	0.037242699	30.27377319	10.95423222	1.13108E-05		72	10.65333366	VV	0.05891243	410.9756165	85.75402069	0.000153547	
26	2.174999952	VV	0.034261402	29.99341202	10.84649467	1.1206E-05		73	10.77574062	VV	0.060347311	1095.416992	258.9779663	0.000409266	
27	2.251666784	VV	0.052344561	33.31853485	7.721117496	1.24484E-05		74	10.87233353	VV	0.043594897	194.7318573	58.86455917	7.27551E-05	
28	2.707000017	PV	0.048125841	42.58269501	10.77049446	1.59096E-05		75	10.9505558	VV	0.047679693	216.1913605	57.74382401	8.07727E-05	
29	2.751666784	VV	0.025698239	20.01685905	10.28846455	7.47863E-06		76	11.08100033	VV	0.081092693	455.4150391	68.03678131	0.000170151	
30	2.822142839	VV	0.04012214	46.54728317	14.24504471	1.73908E-05		77	11.13735294	VV	0.145061791	933.6699219	80.65061188	0.000348835	
31	2.861666679	VP	0.05457174	48.21997452	10.90842342	1.80158E-05		78	11.39366627	VV	0.023243904	75.8911438	43.73645782	2.83542E-05	
32	3.156111002	VV	0.04282435	15.96873951	4.678091526	5.96619E-06		79	11.4505558	VV	0.05199616	174.8665771	41.63816452	6.53331E-05	
33	3.461111069	VV	0.10255415	129.1731415	16.64219666	4.82613E-05		80	11.48666668	VV	0.039644033	128.4260406	39.80189133	4.79821E-05	
34	3.586111069	VV	0.107225336	194.3258057	21.54551888	7.26034E-05		81	11.54749966	VV	0.055285215	129.4320374	39.01948547	4.8358E-05	
35	3.796666758	VV	0.062006503	60.43854904	16.24521637	2.25809E-05		82	11.60583305	VV	0.06364999	135.8145294	35.56285858	5.07426E-05	
36	3.758333445	VV	0.051795281	67.9557724	16.58777428	2.53894E-05		83	11.67500019	VV	0.051330566	132.5685577	32.00114059	4.95298E-05	
37	3.828333378	VV	0.038392179	57.36221313	18.3892765	2.14315E-05		84	11.77722263	VV	0.067040987	165.0609283	30.54696274	6.16695E-05	
38	3.930000067	VV	0.049118243	73.41812134	18.1786232	2.74302E-05		85	11.96071434	VV	0.118347399	244.9292297	25.43457031	9.15097E-05	
39	3.959166765	VV	0.016048457	21.46425629	17.82518387	8.01941E-06		86	12.27933311	VV	0.165206864	479.2898254	35.79685593	0.000179071	
40	3.987666607	VV	0.096090212	116.1088638	20.13886452	4.33802E-05		87	12.4127779	VV	0.028383605	40.5970192	17.9517498	1.51677E-05	
41	4.097000122	VV	0.020708606	34.29008484	22.59076691	1.28114E-05		88	12.4729166	VV	0.055756934	66.64502716	14.46372128	2.48997E-05	
42	4.157000065	VV	0.035883449	63.15982437	23.11119652	2.35976E-05		89	12.56166649	VP	0.05539836	23.27484894	5.283046246	8.69587E-06	
43	4.240833282	VV	0.06969431	119.9088364	28.67494583	4.48E-05		90	12.85388851	BV	0.080982253	179.6399231	27.5827446	6.71165E-05	
44	4.409444332	VV	0.11734686	333.8457031	34.36236954	0.00012473		91	12.94078159	VV	0.034844313	868.1239624	391.8894348	0.000324346	
45	4.4375	VV	0.020343475	41.51300812	34.01009369	1.551E-05		92	13.09166622	VP	0.071323834	48.43959045	8.394182205	1.80978E-05	
46	4.464166641	VV	0.028875925	58.29851151	33.64885712	2.17813E-05		93	13.20666695	VV	0.021787941	8.459073067	6.470760822	3.16045E-06	
47	4.503333569	VV	0.068275146	174.8839417	31.74341774	6.53396E-05		94	13.24166679	VB	0.020310236	7.06254673	4.759980202	2.63869E-06	

Foam Samples from the Core and Sampled at Room Temperature

95	13.36833286 BV	0.02909746	14.04933262	6.801915169	5.24907E-06
96	13.54785728 VV	0.103037469	185.9804077	23.3214798	6.94854E-05
97	13.65999985 VV	0.037102323	96.25084686	32.92815399	3.59609E-05
98	13.68738079 VV	0.009287634	41.50815582	74.48641968	1.55081E-05
99	13.74766636 VP	0.04878033	206.863739	55.12544632	7.72878E-05
100	13.92099953 VV	0.067044832	1074.507202	208.7759552	0.000401454
101	14.10944462 VV	0.073926516	117.9326553	20.25543213	4.40616E-05
102	14.22500038 VV	0.048332952	166.9581909	48.29414749	6.23784E-05
103	14.30666637 VP	0.023810975	14.58819771	9.047677994	5.4504E-06
104	14.4260416 VBA	0.046014991	460.8644104	149.292038	0.000172187

Foam Samples from the Core and Sampled at Room Temperature

Sample	Location	Sampling Temp.											
PIBNA 2	CORE	ROOM TEMP.											
Retention			Retention										
Peak Number	Time	Peak Type	Peak Width	Area	Height	Area %	Peak Number	Time	Peak Type	Peak Width	Area	Height	Area %
1	0.108888887	VV	0.025894588	11.53369236	5.631390095	4.35387E-06	48	5.272863388	VV	0.111399941	19426.04102	2235.081787	0.007333162
2	0.344999999	BP	0.024807921	9.895246506	6.138081074	3.73537E-06	49	5.346413136	VV	0.044131335	10661.95801	3349.987305	0.004024796
3	0.390333325	VV	0.025658939	12.80310535	8.458580971	4.83306E-06	50	5.561384678	VV	0.118539765	128261.7813	13660.67773	0.048417708
4	0.417666674	VV	0.019268908	12.62072277	10.31906414	4.76421E-06	51	5.670529842	VV	0.067922182	33936.34766	6835.447266	0.012810676
5	0.44083333	VV	0.01678938	12.61861801	10.67613029	4.76342E-06	52	6.161468506	VV	0.098765589	37475776	4816994.5	14.1467797
6	0.547777772	VV	0.134230167	204.5944519	19.21381187	7.72326E-05	53	6.299161911	VV	0.092286922	72560736	10543958	27.39104718
7	0.683888912	VV	0.020011226	25.38657188	17.4106617	9.58321E-06	54	6.458939075	VV	0.109011896	110154952	13669985	41.58253697
8	0.711666644	VV	0.018839959	26.27472115	20.65628433	9.91848E-06	55	6.792921066	VV	0.086406402	44106944	6734789	16.64998801
9	0.735000014	VV	0.037246902	55.94869995	19.63295364	2.11201E-05	56	7.213595867	VV	0.069533363	394092.75	81328.0625	0.148766588
10	0.807500005	VV	0.034306064	54.17346954	20.85469627	2.045E-05	57	8.134166718	VB	0.124026567	1517.443481	147.4965668	0.000572822
11	0.856666684	VV	0.041676167	66.48816681	21.64157295	2.50987E-05	58	8.493888855	BV	0.243810028	3114.652344	152.1611481	0.001175754
12	0.937222242	VV	0.060338229	126.2065582	25.67937469	4.76419E-05	59	8.738333702	VV	0.084211238	666.6212769	94.60079956	0.000251644
13	1.023888946	VV	0.068694115	111.860878	27.13985062	4.22265E-05	60	8.96870327	VV	0.138178021	1162.043335	99.55477905	0.000438661
14	1.062777758	VV	0.03640845	85.94923401	29.14229012	3.24451E-05	61	9.109285355	VV	0.032748755	176.3190765	66.89884186	6.65589E-05
15	1.125666618	VV	0.057258055	124.3289871	26.24965668	4.69331E-05	62	9.156428337	VV	0.020861192	77.9061203	62.2416687	2.94089E-05
16	1.199666619	VV	0.069609225	143.5069122	24.76359367	5.41726E-05	63	9.179444313	VV	0.073342942	260.8899841	59.28540802	9.84837E-05
17	1.326666713	VV	0.023730427	32.76974106	21.56257439	1.23703E-05	64	9.305000305	VV	0.118353136	585.8652954	61.93838501	0.000221159
18	1.350555539	VV	0.082177542	101.7973557	20.64581871	3.84276E-05	65	9.573888779	VV	0.151903972	816.7242432	64.86175537	0.000308306
19	1.443095207	VV	0.184482217	245.7007294	22.19732666	9.27499E-05	66	9.719583511	VV	0.035075329	118.1426468	42.97167969	4.45978E-05
20	1.653888941	VV	0.084167406	169.9246826	24.42427063	6.41451E-05	67	9.772777557	VV	0.040020555	125.6903839	39.61009598	4.7447E-05
21	1.794999957	VB	0.108337082	204.5486298	22.87202835	7.72153E-05	68	9.903611183	VV	0.055961344	885.9946289	229.8998108	0.000334455
22	1.968333364	BV	0.112103909	231.6249084	24.54309273	8.74364E-05	69	9.999666214	VV	0.032506574	102.8564758	39.33552933	3.88274E-05
23	2.326666594	BV	0.023207532	48.0625	27.7485218	1.81432E-05	70	10.07166672	VV	0.064276628	226.1416321	43.77018356	8.53665E-05
24	2.346666574	VV	0.022125585	46.04166031	28.08555412	1.73803E-05	71	10.32166672	VV	0.121910401	882.5403442	87.32312012	0.000333151
25	2.38499999	VP	0.036798038	87.57958984	30.23139763	3.30605E-05	72	10.39611149	VV	0.129768655	793.7660522	74.22219849	0.00029964
26	2.575000048	VV	0.051010281	39.72969055	9.457466125	1.49976E-05	73	10.65833378	VV	0.081819698	428.6776123	66.8438797	0.000161822
27	2.674444437	VV	0.046633027	39.06308365	12.11000061	1.4746E-05	74	10.77999973	VV	0.057469007	919.302063	235.8791351	0.000347029
28	2.792999983	VV	0.10445451	113.722908	13.34044361	4.29294E-05	75	11.07299995	BV	0.108985573	477.8881531	52.11320877	0.000180399
29	2.969444513	VP	0.043079585	28.26407623	8.027041435	1.06694E-05	76	11.21749973	VV	0.041288733	123.2096176	39.61134338	4.65106E-05
30	3.090507269	VV	0.015849203	28.05967903	55.96709442	1.05923E-05	77	11.25277805	VV	0.018598245	51.87292862	36.46073151	1.95816E-05
31	3.113333225	VB	0.064426586	89.06909943	16.91677094	3.36228E-05	78	11.33250046	VV	0.051387925	155.7425232	36.79028702	5.87914E-05
32	3.235357046	BV	0.07382711	95.05387115	15.65730762	3.5882E-05	79	11.39033318	VV	0.039585192	117.0995865	37.3419342	4.42041E-05
33	3.519761801	VP	0.027661387	17.12966156	8.103601456	6.4663E-06	80	11.41944408	VV	0.042120941	121.8756943	38.30406952	4.6007E-05
34	3.613888979	VV	0.058721937	29.24748993	7.303222656	1.10407E-05	81	11.5741663	VV	0.083703093	293.7364502	42.99613953	0.000110883
35	3.736111164	VV	0.030106781	14.80719757	6.146226406	5.58959E-06	82	11.67666626	VV	0.085689202	275.9787292	44.29477692	0.00010418
36	3.810555458	VP	0.012404274	2.207737207	2.738853931	8.33402E-07	83	11.71722221	VV	0.032639518	107.8827057	42.46464157	4.07248E-05
37	3.830333233	VV	0.017441984	4.618309021	3.730808258	1.74337E-06	84	11.76722224	VV	0.06505318	163.2226563	41.81775284	6.16151E-05
38	3.911666632	VV	0.04352127	21.90902328	6.156008244	8.27047E-06	85	11.83699989	VV	0.027378831	67.18032837	40.89554214	2.536E-05
39	3.967222214	VV	0.013923149	3.029706478	3.626701832	1.14369E-06	86	11.88099957	VV	0.04658306	112.8976059	40.39294052	4.26179E-05
40	3.986999989	VP	0.018987693	6.239678383	4.553267956	2.35542E-06	87	11.96416664	VV	0.085735559	275.9194336	41.95004272	0.000104157
41	4.079999924	VV	0.026127851	18.95137215	9.163657188	7.15398E-06	88	12.2541666	BB	0.155538857	531.8442383	43.53093338	0.000200767
42	4.217083454	VV	0.075066343	95.14276123	15.40245819	3.59156E-05	89	12.57436752	BV	0.014252461	37.38269043	43.71489716	1.41116E-05
43	4.25	VV	0.014606525	15.88466835	15.96697807	5.99632E-06	90	12.64249992	VV	0.019760292	12.08188248	10.24362564	4.56081E-06
44	4.284047604	VV	0.034649625	40.01329422	19.24662209	1.51047E-05	91	12.66666698	VV	0.026036793	12.21672916	6.46775198	4.61171E-06
45	4.335833549	VB	0.069685064	128.2116699	22.09945297	4.83988E-05	92	12.81833363	VV	0.059754677	99.86971283	20.17406654	3.76999E-05
46	4.662222385	BP	0.036463268	17.24224663	6.393473148	6.5088E-06	93	12.84000015	VV	0.050587807	65.87619019	21.70357895	2.48677E-05
47	4.761666775	VV	0.046203498	32.44260406	8.562603951	1.22468E-05	94	12.94539261	VV	0.03394011	497.3188477	223.6711121	0.000187734

Foam Samples from the Core and Sampled at Room Temperature

95	13.02999973 VP	0.026477564	7.631235123	3.7921772	2.88072E-06
96	13.12699986 VV	0.044024084	52.91598129	15.04855347	1.99753E-05
97	13.22166634 VV	0.04965182	44.31350708	11.57827187	1.6728E-05
98	13.25611115 VV	0.043019962	26.7278595	10.35482883	1.00895E-05
99	13.31611156 VP	0.011300861	5.67521286	7.976379871	2.14234E-06
100	13.38722229 VV	0.037282318	27.46414948	9.346364975	1.03675E-05
101	13.47249985 VV	0.05278261	58.39464569	13.41543674	2.20435E-05
102	13.55261898 VV	0.037506673	44.79589462	14.71888828	1.69101E-05
103	13.65966702 VV	0.039052479	58.39464569	20.00649834	2.20435E-05
104	13.7076664 VV	0.016272927	15.69379902	16.07352638	5.92427E-06
105	13.77499962 VV	0.04846048	96.56257629	24.24777603	3.64515E-05
106	13.93575764 VV	0.060797524	1077.14563	262.9152832	0.000406613
107	14.04071426 VV	0.03087797	35.17137909	14.71888828	1.32769E-05
108	14.1091671 VP	0.037918467	50.509655	17.37340736	1.9067E-05
109	14.23799992 VV	0.040550165	195.1744995	65.9052124	7.36767E-05
110	14.35000038 VP	0.030391976	11.63321304	5.56415844	4.39144E-06
111	14.43972206 VV	0.048727669	563.8400879	179.1056976	0.000212845
112	14.49250031 VBA	0.005741145	7.507536888	21.7945385	2.83403E-06

Foam Samples from the Core and Sampled at Room Temperature

Sample PIBNA 3	Location CORE	Sampling Temp. ROOM TEMP.											
#	Retention Time	Peak Type	Peak Width	Area	Height	Area %	#	Retention Time	Peak Type	Peak Width	Area	Height	Area %
1	0.026111111	BP	0.044958096	24.26444244	8.995206833	9.17306E-06	48	3.954999924	VV	0.079753928	182.4885864	27.38168526	6.8989E-05
2	0.3092857	PV	0.031079076	10.92725658	4.707866192	4.131E-06	49	4.025000095	VV	0.083321474	213.4099731	30.61655045	8.06787E-05
3	0.379166663	VV	0.049238209	20.70989037	5.11482954	7.82928E-06	50	4.179583549	VV	0.044759799	94.88926697	25.88977051	3.58725E-05
4	0.475833327	VV	0.020982778	16.79566002	11.53812122	6.34952E-06	51	4.241666794	VV	0.042156257	96.3457489	27.99149704	3.64231E-05
5	0.49666667	VV	0.025640806	21.65279198	10.68558788	8.18574E-06	52	4.313666821	VV	0.067247964	157.0180664	30.91882324	5.936E-05
6	0.538333356	VV	0.043209482	41.72846222	11.81359386	1.57753E-05	53	4.372333527	VV	0.037137531	83.15029144	27.60827827	3.14346E-05
7	0.607500017	VV	0.027735554	22.47594833	13.5060997	8.49693E-06	54	4.436110973	VV	0.050453026	76.42276764	18.78908539	2.88913E-05
8	0.642142832	VV	0.021347912	26.22751236	15.81502151	9.91519E-06	55	4.536333561	VV	0.031571668	34.35996246	13.55575466	1.29896E-05
9	0.702142835	VV	0.039816003	51.81705475	15.98614979	1.95892E-05	56	4.614523888	VV	0.083617404	73.99063873	11.41567993	2.79718E-05
10	0.765666664	VV	0.066349983	81.84554291	14.83861446	3.09413E-05	57	5.272250175	VV	0.111118428	21238.70898	2426.446777	0.008029199
11	0.852999985	VV	0.028025145	34.86267471	15.62839317	1.31797E-05	58	5.344999979	VV	0.044982079	11544.00293	3545.883545	0.004364159
12	0.90785712	VV	0.057880163	59.53873062	17.14425278	2.25084E-05	59	5.561052799	VV	0.120048076	130871.5	13874.24609	0.049475385
13	0.97966665	VB	0.0679726	95.79994202	17.47101021	3.62167E-05	60	5.670199394	VV	0.067658179	33761.20703	6831.308105	0.012763273
14	1.148703694	BV	0.064251527	81.43356323	15.26160526	3.07856E-05	61	6.161063194	VV	0.098787993	37726148	4847980	14.26220153
15	1.206904769	VV	0.028941091	27.79475594	12.50032902	1.05077E-05	62	6.298871994	VV	0.090099782	72385144	10543016	27.36487996
16	1.265833378	VV	0.024641862	24.60906219	12.68030548	9.30335E-06	63	6.458339691	VV	0.104053378	109728352	13611037	41.48231274
17	1.318333387	VV	0.044335175	48.82258987	14.12159061	1.84572E-05	64	6.792450428	VV	0.087199025	44063984	6746540.5	16.65819208
18	1.410714269	VV	0.041433118	49.08869934	17.65792274	1.85578E-05	65	7.213006496	VV	0.070416003	392027.7813	81070.21875	0.148204349
19	1.445000052	VV	0.04810917	55.81175613	15.83921909	2.10994E-05	66	8.025666237	VV	0.060441528	686.0071411	139.331543	0.000259342
20	1.492777824	VV	0.024280308	33.45730591	18.342556	1.26484E-05	67	8.118332863	VV	0.025949262	236.1450653	131.5094452	8.92736E-05
21	1.541666627	VV	0.023887035	36.9192009	19.67941475	1.39571E-05	68	8.143333435	VV	0.018320626	144.1813812	131.1648865	5.45071E-05
22	1.576666713	VV	0.02569215	35.51081848	19.09874725	1.34247E-05	69	8.163332939	VV	0.098596163	1095.034424	132.2557831	0.000413973
23	1.61500001	VV	0.04177678	82.88161469	24.3094635	3.1333E-05	70	8.542778015	VV	0.225576892	3238.709473	169.0020142	0.00122438
24	1.842777729	BV	0.077781372	156.6033783	25.81243515	5.92032E-05	71	8.749583244	VV	0.107706092	593.5266113	91.84355164	0.00022438
25	2.002333403	VV	0.099482916	233.3573761	28.51298332	8.82197E-05	72	8.963666916	VV	0.187992737	1533.499023	97.23656464	0.000579732
26	2.079444408	VV	0.030749857	53.6263504	29.06590843	2.02732E-05	73	9.300000191	VV	0.078252457	381.6453857	62.48948669	0.000144279
27	2.140333414	VV	0.040794048	91.17957306	30.57309341	3.447E-05	74	9.350000381	VV	0.060623743	200.8500366	55.21765137	7.59305E-05
28	2.160555601	VV	0.028446939	64.89505005	29.75245476	2.45333E-05	75	9.420000076	VV	0.027037054	98.28443146	47.70350266	3.7156E-05
29	2.214999914	VV	0.027963953	72.83660889	32.72846603	2.75356E-05	76	9.470833778	VV	0.034928747	93.18192291	44.46286392	3.5227E-05
30	2.252333403	VV	0.049654588	131.178009	32.1146431	4.95913E-05	77	9.583889008	VV	0.159052774	914.866394	68.3963623	0.000345861
31	2.319444418	VV	0.016817939	35.21979523	29.73653603	1.33147E-05	78	9.901666641	VV	0.055791318	752.4122925	195.9786835	0.000284446
32	2.338888884	VP	0.064093433	161.3787079	30.32126617	6.10085E-05	79	10.234999966	VV	0.148997366	544.3577881	43.20376968	0.000205792
33	2.482222319	VV	0.027906023	14.5406189	6.548305511	5.49702E-06	80	10.319666686	VV	0.063463807	404.9763184	78.14134979	0.000153099
34	2.538333416	VV	0.018590627	8.919780731	7.132257462	3.37208E-06	81	10.44071388	VV	0.133805811	957.4382935	86.05249786	0.000361955
35	2.653333426	VV	0.09572991	109.1546936	15.02977467	4.12654E-05	82	10.65566635	VV	0.063510768	398.5697327	78.13679504	0.000150678
36	2.7603333	VV	0.064566165	66.54460907	12.40852356	2.51569E-05	83	10.699000036	VV	0.01406604	54.64753342	57.61361694	2.06593E-05
37	2.869666576	VV	0.017648917	7.221125603	5.751037121	2.72991E-06	84	10.779999973	VV	0.0616601	951.8700562	219.2090149	0.00035985
38	3.046666622	VV	0.087015867	83.51780701	11.59750462	3.15735E-05	85	10.87611103	VV	0.028833546	112.1043625	48.74064255	4.23806E-05
39	3.244259357	VV	0.098406188	135.6875916	17.31854248	5.12961E-05	86	10.92233372	VV	0.052039552	206.9138489	48.24173737	7.82229E-05
40	3.316666603	VV	0.040052075	53.05510712	17.65876198	2.00572E-05	87	10.994999989	VV	0.02046955	68.72524261	43.41169739	2.59813E-05
41	3.400555611	VV	0.057350278	91.73878479	19.33659363	3.46814E-05	88	11.07277775	VV	0.061836831	249.6445923	50.35753632	9.4377E-05
42	3.453333378	VV	0.02600874	37.73416138	20.00259399	1.42652E-05	89	11.13333321	VV	0.118656345	491.8036194	49.60997772	0.000185924
43	3.617666721	VV	0.103413209	240.8898468	30.08548355	9.10673E-05	90	11.32958317	VV	0.039561216	89.59011078	28.58816147	3.38691E-05
44	3.692777872	VV	0.071205497	167.7124329	29.11436081	6.34029E-05	91	11.399999962	VV	0.049527533	94.57540894	23.71455574	3.57538E-05
45	3.759285688	VV	0.029219335	61.60701752	32.34788895	2.32903E-05	92	11.484999966	VV	0.025657548	43.46535492	21.43484116	1.64319E-05
46	3.783333302	VV	0.038738914	87.3531189	29.33654594	3.30235E-05	93	11.56583309	VV	0.061343301	144.7370911	28.45476151	5.47172E-05
47	3.832499981	VV	0.027816026	63.78222656	28.82418633	2.41126E-05	94	11.6916666	VV	0.068994842	177.8512573	30.97150803	6.72359E-05

Foam Samples from the Core and Sampled at Room Temperature

95	11.72999954	VV	0.042833772	103.7342606	30.3820858	3.92163E-05
96	11.88888931	VV	0.094642952	237.4414368	29.90135956	8.97637E-05
97	11.97777748	VV	0.048077445	106.4298935	28.82441521	4.02353E-05
98	12.03277779	VV	0.03738289	79.0688858	29.39405251	2.98916E-05
99	12.06833363	VV	0.062192194	135.8174591	26.32462692	5.13452E-05
100	12.25500011	VV	0.164313868	618.612915	46.76929474	0.000233864
101	12.48309517	VB	0.046605151	69.50932312	18.59739304	2.62777E-05
102	12.82111073	PV	0.05298597	100.0480576	25.94647598	3.78227E-05
103	12.84277821	VV	0.033682168	70.17749786	25.84222031	2.65303E-05
104	12.94428062	VV	0.033994161	754.098999	338.4537659	0.000285084
105	13.09583378	VV	0.055992335	63.81357193	13.78884029	2.41244E-05
106	13.23250008	VV	0.079104453	126.0807343	19.07726097	4.76643E-05
107	13.55055523	VV	0.17462416	708.5328979	49.60995865	0.000267858
108	13.67249966	VV	0.055713922	236.1278076	58.97223663	8.92671E-05
109	13.76500034	VV	0.063114204	351.9728394	67.19141388	0.000133062
110	13.85685158	VV	0.055233132	437.0126343	101.496376	0.000165211
111	13.9301281	VV	0.055145659	1068.488525	276.1217957	0.000403937
112	14.04916668	VV	0.037080176	72.56443024	28.1442852	2.74327E-05
113	14.08500004	VV	0.058533229	143.7922516	29.67416191	5.436E-05
114	14.23433304	VP	0.051213514	230.1840515	66.7805481	8.70201E-05
115	14.43583298	VBA	0.047634263	433.874115	134.5014954	0.000164024

Foam Samples from the Core and Sampled at Room Temperature

Sample	Location	Sampling Temp.											
PIBO 1	CORE	ROOM TEMP.											
	Retention												
Peak Number	Time	Peak Type	Peak Width	Area	Height	Area %							
1	0.056333333	BV	0.015771616	10.56798363	11.16772461	3.80441E-06	48	4.556666851	VV	0.029438071	127.5001602	54.21306229	4.58993E-05
2	0.084166668	VV	0.020056352	9.204018593	7.64846468	3.31339E-06	49	4.595833302	VV	0.080896854	353.0755615	52.21012878	0.000127105
3	0.14033334	VV	0.028705454	21.74081612	9.867278099	7.82657E-06	50	4.726110935	VV	0.054339401	193.5812836	43.15006256	6.96881E-05
4	0.170555562	VV	0.065639041	46.13528442	11.71439171	1.66084E-05	51	4.837222099	VV	0.039701544	108.1804962	42.49293518	3.89443E-05
5	0.245666668	VV	0.028975995	27.81002998	12.99048805	1.00114E-05	52	5.064166546	VV	0.143654689	1501.901367	123.6964493	0.000540676
6	0.303095251	VP	0.036068503	24.22635078	11.19460201	8.72134E-06	53	5.386333466	VV	0.143806145	4684.571289	408.4516296	0.001686418
7	0.443888903	VV	0.087367624	54.96317673	8.182422638	1.97864E-05	54	5.603750229	VV	0.112854615	3899.206055	433.8458252	0.001403691
8	0.544444442	VV	0.033970732	28.34264374	13.90542221	1.02032E-05	55	5.717777729	VV	0.062365934	1885.570068	420.0883179	0.000678794
9	0.595666647	VV	0.035455976	31.42617226	12.03831577	1.13132E-05	56	6.345115662	VV	0.116289988	102281528	11441985	36.82074664
10	0.617380977	VV	0.014307123	10.69766998	11.03783417	3.8511E-06	57	6.507074356	VV	0.109881841	126696392	14948393	45.60995363
11	0.65192306	VV	0.047251824	51.46543884	13.26863861	1.85273E-05	58	6.839389324	VV	0.089621067	46064556	7013995.5	16.58296839
12	0.745000005	VV	0.024030115	11.61099434	6.441315174	4.17989E-06	59	7.265007019	VV	0.066732869	2702394.75	576033	0.972846166
13	0.796967208	VP	0.017533131	75.43600464	56.65867996	2.71565E-05	60	7.767380714	VV	0.099828593	1397.493652	233.3155365	0.000503089
14	0.859761894	VP	0.060426459	72.52668762	20.00411797	2.61092E-05	61	7.876111031	VV	0.301577896	3532.998291	195.2507324	0.001271859
15	1.021111131	VP	0.052653059	34.39684677	10.88789082	1.23827E-05	62	8.283333778	VV	0.037767317	308.1809998	113.1806335	0.000110943
16	1.296666622	BP	0.049206324	31.6036644	8.735880852	1.13771E-05	63	8.345555305	VV	0.079150766	678.1826172	108.1619644	0.000244142
17	1.368666649	VP	0.023866355	21.14768982	11.28322792	7.61304E-06	64	8.436666489	VV	0.017994992	140.1763	109.0624313	5.04626E-05
18	1.431666613	VV	0.038849879	26.07914162	8.256652832	9.38834E-06	65	8.611000061	VV	0.176182017	2356.921875	160.6326599	0.000848478
19	1.504999995	VP	0.043959178	27.28041077	7.585264206	9.82079E-06	66	8.768333435	VV	0.038045801	293.7653503	95.08076477	0.000105754
20	1.849242449	BV	0.021376431	15.7042923	9.455649376	5.65345E-06	67	8.837499619	VV	0.07413125	524.5130615	92.5329361	0.000188822
21	1.909444451	VV	0.018851075	10.97844124	8.080323219	3.95217E-06	68	8.922333717	VV	0.020207653	109.727951	78.98487854	3.95014E-05
22	1.94266665	VV	0.09510161	62.53373337	10.95910835	2.25118E-05	69	8.942777634	VV	0.05839473	379.8437195	78.58021545	0.000136741
23	2.060833216	VV	0.040343825	45.17116547	14.91058064	1.62614E-05	70	9.034999847	VV	0.043645456	225.5185852	66.36447906	8.11854E-05
24	2.125555515	VP	0.083145991	133.6922913	19.22144699	4.81284E-05	71	9.104999542	VV	0.026103189	126.4269638	63.84318542	4.5513E-05
25	2.304333448	VP	0.028842604	14.93196392	6.741048813	5.37542E-06	72	9.162500381	VV	0.072654314	355.0835266	58.63253021	0.000127828
26	2.401666641	VP	0.037307493	16.26517487	5.374507427	5.85537E-06	73	9.270454407	VV	0.078832693	242.5981598	51.28966522	8.73339E-05
27	2.430555582	VP	0.017127274	6.932697773	5.34673214	2.49573E-06	74	9.337082863	VV	0.025058273	88.37006378	51.39944077	3.18127E-05
28	2.514523745	VV	0.030324474	17.61612892	8.81140995	6.3417E-06	75	9.370333672	VV	0.029510098	78.1137619	44.11696625	2.81205E-05
29	2.564166784	VV	0.0330359	17.51259995	8.160827637	6.30443E-06	76	9.392777443	VV	0.017376017	66.45415497	50.42258453	2.39231E-05
30	2.597777843	VV	0.0263249	19.24494362	10.52873993	6.92807E-06	77	9.416666985	VV	0.022231204	77.9139328	47.266716	2.80486E-05
31	2.636111021	VP	0.03070314	16.03891945	8.706448555	5.77392E-06	78	9.492917061	VV	0.067789681	159.5900421	39.23656082	5.74515E-05
32	2.853333235	VV	0.079535611	68.82233429	10.49089718	2.47756E-05	79	9.527423859	VV	0.015674297	35.12651825	37.35044861	1.26453E-05
33	2.903888941	VV	0.035077184	28.15161324	10.91975498	1.01344E-05	80	9.550714493	VV	0.024478037	60.1271286	40.93950653	2.16454E-05
34	2.946212053	VV	0.049345005	38.00846481	12.83766079	1.36828E-05	81	9.617381096	VV	0.057034958	250.302536	53.06075287	9.01074E-05
35	3.041666746	VV	0.025791124	15.77379322	8.44507122	5.67847E-06	82	9.670999527	VV	0.055591218	247.0110779	54.79614258	8.89225E-05
36	3.184666634	VV	0.059706714	99.71179962	22.0712738	3.58957E-05	83	9.776110649	VV	0.061519284	171.0427246	34.09984207	6.15744E-05
37	3.314047575	VV	0.081838593	163.4142609	26.17430687	5.88282E-05	84	9.952842712	VV	0.047939282	579.3395386	173.5769348	0.000208559
38	3.508333445	VV	0.11887905	314.7626953	31.96606636	0.000113313	85	10.16547585	BP	0.028805228	26.32165146	12.48350048	9.47564E-06
39	3.587222338	VV	0.049806073	132.570755	34.51895142	4.77247E-05	86	10.20371819	VV	0.018573901	27.22140121	30.03461075	9.79954E-06
40	3.653571367	VV	0.066097014	208.8955078	38.62487411	7.52012E-05	87	10.260952	VV	0.032394726	38.00324249	15.08335781	1.36809E-05
41	3.718333244	VV	0.058057554	181.3107452	37.73429108	6.52708E-05	88	10.27949238	VP	0.013605325	24.94796944	25.0798378	8.98112E-06
42	3.797222137	VV	0.024292607	68.8338623	36.02367783	2.47798E-05	89	10.38208294	VV	0.056389861	176.3575134	37.82881927	6.34877E-05
43	3.908333302	VV	0.067711398	221.7263184	39.36618423	7.98202E-05	90	10.42687511	VV	0.019721214	57.3204689	42.53735352	2.0635E-05
44	3.97018528	VV	0.041020658	142.698822	47.53821564	5.13707E-05	91	10.45685196	VV	0.025392393	93.84281158	46.80294418	3.37829E-05
45	4.332333565	VV	0.207197294	1237.542358	70.36151886	0.000445508	92	10.50133324	VV	0.072114833	202.5486298	46.81159973	7.29163E-05
46	4.375666618	VV	0.050145295	298.1192932	72.24088287	0.000107321	93	10.58679485	VV	0.022315381	49.32960129	36.84275055	1.77584E-05
47	4.435666561	VV	0.076777965	424.6541443	67.15146637	0.000152873	94	10.82916641	VV	0.067803495	868.1829834	172.248291	0.000312541

Foam Samples from the Core and Sampled at Room Temperature

95	10.90233326 VV	0.016486678	34.41108704	29.76735115	1.23878E-05
96	10.96388912 VV	0.049235694	73.2318573	24.7895546	2.6363E-05
97	10.99033356 VV	0.02058647	31.83599854	23.82964134	1.14608E-05
98	11.02690506 VV	0.034099359	69.31551361	25.19305611	2.49532E-05
99	11.10595226 VV	0.04671526	106.4054413	27.76226425	3.83053E-05
100	11.21249962 VV	0.103519663	243.668045	28.00239563	8.77191E-05
101	11.46796322 VV	0.070165999	106.4660492	19.06061363	3.83271E-05
102	11.56785679 VV	0.063106224	106.2619629	22.09599495	3.82537E-05
103	11.61750031 VV	0.026865449	36.705513	21.55657387	1.32138E-05
104	11.78261948 VV	0.154328197	268.9759216	22.36223602	9.68297E-05
105	11.87261868 VV	0.034881022	54.00419235	19.16147423	1.94412E-05
106	11.95833302 VV	0.031736366	33.29673767	13.51813126	1.19866E-05
107	12.35416698 BV	0.095658615	109.7805099	14.12742233	3.95203E-05
108	12.41222191 VV	0.032530531	41.22042465	15.75160789	1.48391E-05
109	12.52119064 VV	0.063418418	94.24377441	20.20475388	3.39272E-05
110	12.56444454 VV	0.023600016	35.90073013	20.33211327	1.29241E-05
111	12.58196926 VV	0.095502146	175.7404022	21.92788887	6.32655E-05
112	12.80099964 VV	0.03777064	45.70158386	18.53226471	1.64523E-05
113	12.87966633 VV	0.038439315	75.29497528	24.10696983	2.71057E-05
114	12.90999985 VV	0.028433252	38.23707581	17.53999901	1.37651E-05
115	12.99719524 VV	0.036083341	611.3607178	263.3553162	0.000220086
116	13.15547657 VV	0.083067305	182.7235565	26.62478447	6.57794E-05
117	13.25166702 VV	0.040123817	61.98530197	18.96876717	2.23143E-05
118	13.4041357 VP	0.069671057	481.3624268	88.20169067	0.000173288
119	13.62166691 VV	0.069002189	183.0110321	31.86655045	6.58829E-05
120	13.71500015 VV	0.050718244	141.5159912	35.33993912	5.09449E-05
121	13.80055523 VV	0.062763445	225.2287292	43.96782303	8.1081E-05
122	13.97555542 VV	0.063882641	1017.578003	224.4922485	0.000366322
123	14.10388851 VV	0.041704658	117.7710419	39.59109879	4.23969E-05
124	14.16388893 VV	0.053559545	174.4781342	41.91921997	6.28111E-05
125	14.27833366 VV	0.062025938	408.9229126	86.70033264	0.00014721
126	14.36092567 VV	0.060473617	213.474411	44.89584351	7.68495E-05
127	14.48966694 VBA	0.051771086	418.5565491	134.7459106	0.000150678

Foam Samples from the Core and Sampled at Room Temperature

Sample	Location	Sampling Temp.											
PIBO 2	CORE	ROOM TEMP.											
#	Retention Time	Peak Type	Peak Width	Area	Height	Area %							
1	0.206333339	BV	0.039097674	28.10787964	9.617233276	1.01454E-05	36	3.017777681	VP	0.02741015	18.3427124	8.766776085	6.62072E-06
2	0.300333321	VV	0.035468873	34.84537888	12.52058887	1.25773E-05	37	3.058333397	VV	0.051041	48.55278778	11.55052185	1.75249E-05
3	0.322916657	VV	0.019684955	21.10556412	13.92322254	7.61796E-06	38	3.192777872	VB	0.015070977	5.744531155	6.352752686	2.07346E-06
4	0.356111109	VV	0.024121245	21.48957443	11.33352566	7.75656E-06	39	3.34766674	PV	0.014985457	6.624952793	7.368202209	2.39125E-06
5	0.405000001	VV	0.059371173	49.91939926	10.1513176	1.80182E-05	40	3.446666718	VV	0.05225753	37.62376022	8.733893394	1.35801E-05
6	0.495666653	VV	0.029370263	27.73323441	11.82138348	1.00102E-05	41	3.49333334	VV	0.022242248	9.154811859	6.194443226	3.30439E-06
7	0.566666663	VV	0.025096742	20.8210144	10.51714706	7.51525E-06	42	3.681111097	VV	0.085109696	86.59570313	13.45076942	3.12563E-05
8	0.623333335	VV	0.031832855	22.2506237	9.326768875	8.03126E-06	43	3.794333322	VV	0.067697257	97.76740265	18.48736382	3.52887E-05
9	0.691111088	VV	0.038969103	23.85905838	9.608708382	8.61182E-06	44	3.929444551	VV	0.075174026	139.9068451	22.93317795	5.04987E-05
10	0.731666684	VV	0.028961318	28.53950691	12.34957886	1.03012E-05	45	3.994583368	VV	0.037378255	72.73416901	25.42269707	2.62531E-05
11	0.777222216	VV	0.033363581	32.80416107	15.08916378	1.18405E-05	46	4.03249979	VV	0.07939899	148.4084625	22.96359825	5.35673E-05
12	0.815666676	VV	0.078396842	59.04681015	12.5529747	2.13127E-05	47	4.153571606	VV	0.021786002	25.87972641	19.79843521	9.34117E-06
13	0.932777762	VV	0.024981989	16.55700111	8.787423134	5.97617E-06	48	4.214583397	VV	0.044037003	45.41083145	17.06972122	1.63908E-05
14	0.990714312	VV	0.049305428	49.42359543	14.30597973	1.78392E-05	49	4.232999802	VV	0.023031257	24.78344154	13.74811554	8.94547E-06
15	1.105370402	VV	0.055426959	67.63048553	14.76824284	2.44109E-05	50	4.279444218	VV	0.029519301	39.07748032	16.56669807	1.41048E-05
16	1.206060648	VV	0.046829458	190.9777222	49.7010994	6.89325E-05	51	4.320000172	VV	0.016971938	23.30112648	18.15706635	8.41043E-06
17	1.335000038	VV	0.109541312	252.6675415	27.41074944	9.11992E-05	52	4.380238056	VB	0.063848205	107.4698486	20.60561752	3.87907E-05
18	1.532948732	VV	0.055599134	69.28207397	16.9812088	2.5007E-05	53	4.583666801	BV	0.014692741	6.750281334	7.481733322	2.43648E-06
19	1.625	VV	0.026328722	17.6590538	9.226783752	6.37395E-06	54	4.606666565	VB	0.064621508	22.53985405	5.813300133	8.13566E-06
20	1.671666622	VP	0.022470899	18.09837914	10.84427357	6.53253E-06	55	4.719166756	BP	0.020832945	9.987902641	6.922468662	3.60509E-06
21	1.761666656	VP	0.090999998	61.59435272	8.16591835	2.22322E-05	56	5.076666832	VV	0.130358309	1126.288452	103.9902496	0.000406529
22	1.903571486	VV	0.021456359	10.21843052	6.459292889	3.6883E-06	57	5.381666666	VV	0.139226183	5843.303711	519.4990234	0.002109113
23	1.960555553	VP	0.022513822	9.617845535	5.750190735	3.47152E-06	58	5.600263119	VV	0.111686096	5247.878906	590.4866333	0.001894198
24	2.026333332	VB	0.017547855	5.179698944	4.153864384	1.86959E-06	59	5.713840485	VV	0.066616423	2236.182617	452.8013916	0.00080714
25	2.132222176	BB	0.047725957	24.18314934	6.170166016	8.7288E-06	60	6.343057156	VV	0.113430478	102281968	11426641	36.91820269
26	2.216249943	BP	0.037388787	42.37425232	18.88902092	1.52948E-05	61	6.506161213	VV	0.109725572	126111016	14902878	45.51918722
27	2.285000086	VV	0.022114323	11.22022724	6.848405838	4.04989E-06	62	6.837536812	VV	0.091172539	45923220	6942507.5	16.57577359
28	2.376666784	VV	0.067067556	41.27302933	7.400287628	1.48973E-05	63	7.262982845	VV	0.066900961	2692780.75	572226.3125	0.971946742
29	2.496481419	VP	0.02397396	9.634382248	8.043613434	3.47749E-06	64	8.098333359	VV	0.055777572	669.0512085	145.1459656	0.000241491
30	2.5602777	VV	0.035100065	13.46404362	6.258171082	4.85978E-06	65	8.252333641	VV	0.103239968	1134.111328	133.3263245	0.000409352
31	2.623888969	VP	0.028034968	12.00028896	7.134119511	4.33145E-06	66	8.325606346	VV	0.051109452	523.5585327	126.9642944	0.000188976
32	2.74444437	VP	0.031060085	19.65153122	8.797663689	7.09313E-06	67	8.386666298	VV	0.014484426	115.9890518	117.8296204	4.18657E-05
33	2.801333427	VV	0.061925802	41.01267242	11.03812122	1.48033E-05	68	8.409166336	VV	0.02284555	207.6003723	116.1880798	7.49324E-05
34	2.900333405	VB	0.035882577	17.02278519	6.039647102	6.1443E-06	69	8.553472519	VV	0.247274503	3740.290283	177.909729	0.00135004
35	2.966666698	BV	0.022766922	10.319067	6.414963245	3.72462E-06	70	8.992500305	VV	0.075041108	545.6650391	87.15766144	0.000196955

Foam Samples from the Core and Sampled at Room Temperature

71	9.057222366 VV	0.028330937	139.5745087	82.10959625	5.03788E-05	109	14.06083298 VV	0.028888194	231.0850067	133.3214874	8.34091E-05
72	9.095000267 VV	0.034262799	218.7570038	79.1055069	7.89593E-05	110	14.10333347 VV	0.01723736	114.5312271	93.85151672	4.13395E-05
73	9.166110992 VV	0.103099629	650.4043579	75.05517578	0.00023476	111	14.16309547 VV	0.062788047	486.6791687	101.7767029	0.000175665
74	9.293333054 VB	0.1240694	633.6781006	61.06341171	0.000228723	112	14.28299999 VV	0.080696218	970.7333984	149.6141052	0.000350382
75	9.508333206 BV	0.032777991	121.164444	45.92844391	4.37337E-05	113	14.35055542 VV	0.029942909	246.3769531	102.866806	8.89286E-05
76	9.638333321 VV	0.144594058	780.5528564	63.86275864	0.000281737	114	14.48666668 VBA	0.078956828	979.0383301	206.6611176	0.000353379
77	9.817667007 VV	0.052920178	166.2593231	39.65014267	6.00105E-05						
78	9.950640678 VV	0.060035411	699.7835083	173.5743561	0.000252584						
79	10.10388851 VV	0.109769687	236.9658966	27.1652813	8.55317E-05						
80	10.28083324 VV	0.043605484	84.9682312	24.41286087	3.06689E-05						
81	10.37583351 VV	0.068915121	261.1419067	46.9329071	9.4258E-05						
82	10.52208328 VV	0.098323748	376.9671326	46.13698196	0.000136065						
83	10.61966705 VV	0.029054573	51.82286835	24.44172859	1.87052E-05						
84	10.69880962 VV	0.06303703	212.8422852	40.68284607	7.68244E-05						
85	10.82880974 VV	0.050160438	559.7219849	158.6496582	0.000202029						
86	10.91699982 VV	0.024771664	31.88494301	19.8166256	1.15087E-05						
87	11.09166622 VV	0.127667576	285.9702454	26.548769	0.00010322						
88	11.22666645 VP	0.085951611	142.7657013	20.32418442	5.15306E-05						
89	11.583148 PV	0.06650015	58.45018387	10.57236099	2.10973E-05						
90	11.73388863 VV	0.042505663	39.66243362	11.71296406	1.4316E-05						
91	11.77083302 VV	0.060906634	52.46870041	14.357687	1.89383E-05						
92	12.13000011 VV	0.146456182	474.8811646	39.16605377	0.000171406						
93	12.31277752 VV	0.163718686	825.4397583	60.29432297	0.000297939						
94	12.49318218 VB	0.119039118	521.8164673	52.01559067	0.000188347						
95	12.67045498 BV	0.028213797	87.70285797	51.80849457	3.16559E-05						
96	12.70833302 VV	0.039015528	147.8479004	46.59915161	5.3365E-05						
97	12.78766632 VV	0.042391282	157.0384827	51.76742554	5.66823E-05						
98	12.87333298 VV	0.083274521	603.6140747	88.83262634	0.000217872						
99	12.99555016 VV	0.037245359	1694.244995	675.8744507	0.00061153						
100	13.15071392 VV	0.060563199	307.2657776	64.51693726	0.000110906						
101	13.17666626 VV	0.03769888	170.6966858	59.09577179	6.16122E-05						
102	13.27333355 VV	0.063600302	272.8425293	53.63347626	9.84812E-05						
103	13.36499977 VV	0.049850244	225.45224	54.96891785	8.13759E-05						
104	13.42590904 VV	0.075978957	356.3054504	56.19026184	0.000128607						
105	13.5172224 VV	0.033582967	104.7537613	51.98754501	3.78104E-05						
106	13.59000015 VV	0.080326512	375.1336365	55.87582779	0.000135403						
107	13.80233288 VV	0.105383292	687.4107666	78.33106232	0.000248118						
108	13.97404766 VV	0.079249814	1657.233154	287.500946	0.000598171						

Foam Samples from the Core and Sampled at Room Temperature

Sample Location Sampling Temp.
PIBO 3 CORE ROOM TEMP.

#	Retention						#	Retention Peak					
	Time	Peak Type	Peak Width	Area	Height	Area %		Time	Type	Peak Width	Area	Height	Area %
1	0.0261111	BV	0.025525	16.29113	9.260045	5.87E-06	31	2.831667	VV	0.043547	23.98813	6.902078	8.65E-06
2	0.103	VV	0.014297	6.36112	7.206947	2.29E-06	32	2.897222	VV	0.032203	18.14507	7.248904	6.54E-06
3	0.2255556	VP	0.068874	58.55344	10.21502	2.11E-05	33	2.931	VV	0.027594	14.66889	8.859962	5.29E-06
4	0.4943333	BP	0.020947	9.821145	7.814368	3.54E-06	34	2.970926	VV	0.008815	4.714747	8.914224	1.7E-06
5	0.5294445	VV	0.021421	13.60078	8.17044	4.9E-06	35	3.068333	VV	0.048752	26.99313	7.03705	9.73E-06
6	0.6116667	VV	0.034921	27.65922	10.78494	9.97E-06	36	3.090556	VP	0.022588	10.39525	6.19143	3.75E-06
7	0.6833333	VV	0.047181	36.90723	13.03734	1.33E-05	37	3.144444	VV	0.026308	12.80433	8.111818	4.62E-06
8	0.7633333	VV	0.029804	29.56814	12.86972	1.07E-05	38	3.245631	VV	0.018152	49.61408	35.83736	1.79E-05
9	0.7988889	VV	0.046521	46.42542	12.16565	1.67E-05	39	3.456111	BV	0.033308	21.55058	8.030562	7.77E-06
10	0.8666667	VV	0.05496	40.2722	9.042429	1.45E-05	40	3.517381	VV	0.02781	13.10986	7.856779	4.73E-06
11	0.9733334	VV	0.048258	35.93449	9.263338	1.3E-05	41	3.537857	VP	0.054753	31.72186	9.655982	1.14E-05
12	1.0525	VV	0.04418	28.17173	7.792027	1.02E-05	42	3.698333	BV	0.036444	24.47776	8.290907	8.83E-06
13	1.1770834	VV	0.048319	39.60868	10.91957	1.43E-05	43	3.773889	VV	0.018733	10.11907	8.013154	3.65E-06
14	1.2879167	VV	0.062297	66.51857	14.03426	2.4E-05	44	3.873889	VV	0.063109	45.75136	9.346365	1.65E-05
15	1.3291667	VV	0.019279	23.43359	15.82266	8.45E-06	45	3.913667	VV	0.049431	37.17437	9.34081	1.34E-05
16	1.3494444	VV	0.024686	33.88025	17.42354	1.22E-05	46	3.984167	VV	0.015526	8.732533	9.374141	3.15E-06
17	1.4141667	VV	0.08695	130.3919	19.76918	4.7E-05	47	4.009167	VV	0.0244	17.99835	9.374141	6.49E-06
18	1.5931818	VP	0.014962	11.44282	10.29897	4.13E-06	48	4.058333	VV	0.024566	18.13167	9.374141	6.54E-06
19	1.7036667	VV	0.063898	45.82751	9.077662	1.65E-05	49	4.241111	VV	0.111326	193.5822	21.44248	6.98E-05
20	1.7683333	VV	0.021297	16.62207	10.04954	5.99E-06	50	4.333	VV	0.032207	69.06033	26.67255	2.49E-05
21	1.7991667	VV	0.03462	28.8333	10.31246	1.04E-05	51	4.3775	VV	0.032587	67.72713	26.70588	2.44E-05
22	1.8991667	VV	0.036618	22.60445	8.904109	8.15E-06	52	4.409584	VV	0.055038	92.52485	28.01826	3.34E-05
23	1.9383334	VV	0.029047	19.45427	9.438519	7.01E-06	53	4.479583	VV	0.034178	57.06144	21.35221	2.06E-05
24	2.0462501	VV	0.074973	108.8321	17.39975	3.92E-05	54	4.537222	VV	0.025421	28.21075	14.67921	1.02E-05
25	2.146389	VP	0.077533	146.6573	22.65227	5.29E-05	55	4.651667	VV	0.063537	76.313	14.70698	2.75E-05
26	2.491111	VV	0.093727	128.6672	17.51053	4.64E-05	56	4.676111	VV	0.024167	38.02318	20.01205	1.37E-05
27	2.5188096	VV	0.052488	75.29992	17.40012	2.72E-05	57	4.726666	VV	0.032569	52.23521	21.33138	1.88E-05
28	2.6059523	VV	0.032034	43.34873	16.83891	1.56E-05	58	5.101666	VV	0.155964	1441.668	112.1564	0.00052
29	2.6820834	VV	0.012952	10.54478	11.23289	3.8E-06	59	5.383667	VV	0.145455	5676.213	499.9625	0.002047
30	2.7249999	VP	0.03971	17.38402	5.52474	6.27E-06	60	5.603889	VV	0.111337	5368.308	611.9995	0.001936

Foam Samples from the Core and Sampled at Room Temperature

61	5.7164817 VV	0.068529	2676.936	515.962	0.000965	94	10.98889 VV	0.043148	463.7575	134.7654	0.000167
62	6.3456526 VV	0.113263	1.02E+08	11443046	36.87287	95	11.105 VV	0.099596	1172.093	140.1122	0.000423
63	6.5083961 VV	0.109575	1.26E+08	14948962	45.54211	96	11.23167 VV	0.118686	1390.854	141.487	0.000501
64	6.8401756 VV	0.089277	45991540	6943449	16.58286	97	11.421 VV	0.073799	845.5629	137.3957	0.000305
65	7.2659221 VV	0.069131	2696372	570595.6	0.972213	98	11.50567 VV	0.111394	1351.521	144.1368	0.000487
66	7.7988095 VV	0.040776	967.4669	298.7881	0.000349	99	11.625 VV	0.05326	626.4019	145.4033	0.000226
67	7.8610001 VV	0.0715	1651.582	285.4572	0.000595	100	11.67433 VV	0.016052	162.6592	145.395	5.86E-05
68	7.9597621 VV	0.081595	1331.561	271.987	0.00048	101	11.76056 VV	0.067708	815.4586	149.3335	0.000294
69	8.0557251 VV	0.145802	3093.18	250.9498	0.001115	102	12.1875 VV	0.276551	3897.509	168.0679	0.001405
70	8.2934208 VV	0.035946	448.5685	207.9853	0.000162	103	12.315 VV	0.180723	2861.859	186.8162	0.001032
71	8.3272219 VV	0.03567	527.1712	182.6638	0.00019	104	12.50667 VV	0.112444	1650.889	175.9839	0.000595
72	8.3991089 VV	0.055363	862.1784	188.4953	0.000311	105	12.64056 VV	0.053001	699.4406	159.9992	0.000252
73	8.6230955 VV	0.20376	3907.406	229.354	0.001409	106	12.73944 VV	0.049514	611.3217	153.3332	0.00022
74	8.9383335 VV	0.161877	1866.964	136.2375	0.000673	107	12.89738 VV	0.092996	1300.236	166.705	0.000469
75	9.0625 VV	0.017887	154.9191	121.4055	5.59E-05	108	12.99795 VV	0.056443	1931.023	465.0521	0.000696
76	9.0927782 VV	0.051106	372.0992	121.35	0.000134	109	13.18333 VV	0.118509	1689.578	170.651	0.000609
77	9.1422224 VV	0.031385	295.7862	117.4337	0.000107	110	13.23792 VV	0.023738	257.7097	169.5053	9.29E-05
78	9.1999998 VV	0.032108	302.6923	121.3222	0.000109	111	13.27167 VV	0.054674	721.4449	169.4428	0.00026
79	9.2650003 VV	0.044175	410.5623	113.5729	0.000148	112	13.33333 VV	0.022586	273.0543	162.6517	9.85E-05
80	9.291667 VB	0.111486	1020.64	110.7815	0.000368	113	13.37583 VV	0.032331	429.9034	165.3598	0.000155
81	9.4694443 BV	0.055447	461.5577	102.6711	0.000166	114	13.40167 VV	0.020784	266.3756	165.4432	9.6E-05
82	9.6960001 VV	0.155615	1693.489	132.0546	0.000611	115	13.42833 VV	0.022539	276.9346	165.3598	9.99E-05
83	9.7563334 VV	0.023299	214.2026	117.3309	7.72E-05	116	13.55278 VV	0.095759	1392.969	173.3313	0.000502
84	9.8199997 VV	0.060413	587.4128	117.3226	0.000212	117	13.60125 VB	0.082794	868.5299	174.8381	0.000313
85	9.9536114 VV	0.068016	1389.099	261.3233	0.000501	118	13.71417 BV	0.04735	653.1401	168.0263	0.000235
86	10.035 VV	0.028706	237.4182	112.1147	8.56E-05	119	13.81 VV	0.077585	1174.692	181.3167	0.000424
87	10.060715 VV	0.022003	149.6752	113.3765	5.4E-05	120	13.98526 VV	0.107371	2926.695	365.6876	0.001055
88	10.276428 VV	0.158537	1737.085	131.9939	0.000626	121	14.07611 VV	0.016546	201.1519	161.3324	7.25E-05
89	10.370833 VV	0.067288	846.3986	156.0274	0.000305	122	14.10417 VV	0.020857	255.2033	166.7347	9.2E-05
90	10.515667 VV	0.145458	2050.136	166.7264	0.000739	123	14.17444 VV	0.064131	929.6881	177.4282	0.000335
91	10.707564 VV	0.091036	1163.56	165.4752	0.00042	124	14.28767 VV	0.10187	1705.377	221.388	0.000615
92	10.831429 VV	0.072815	1562.946	285.7357	0.000564	125	14.39 VV	0.034278	486.8887	175.9839	0.000176
93	10.906428 VV	0.049154	408.9403	138.6599	0.000147	126	14.49111 VBA	0.066875	1514.794	377.5209	0.000546

Foam Samples from the Edge and Sampled Cold

Sample	Location	Sampling Temp.											
PIANA 1	EDGE	COLD											
Peak Number	Retention Time	Peak Type	Peak Width	Area	Height	Area %	Peak Number	Retention Time	Peak Type	Peak Width	Area	Height	Area %
1	0.224523813	BB	0.091221295	89.2867203	12.51696968	3.08877E-05	31	3.754444361	VV	0.130957916	555.2529297	53.55541229	0.000192083
2	0.460000008	BP	0.042451967	21.9509468	6.330826283	7.59368E-06	32	4.166522503	VP	0.149481684	1474.397705	116.6335068	0.000510051
3	0.61833334	VV	0.031136414	14.7568331	6.118869781	5.10496E-06	33	4.33833313	VB	0.025647266	106.1926422	54.70479965	3.67361E-05
4	0.726666689	VV	0.054247532	31.9302254	7.413683414	1.10459E-05	34	4.514540195	BP	0.017074252	16.91564178	21.74825668	5.85177E-06
5	0.785666645	VP	0.045603506	24.0350304	6.906021595	8.31465E-06	35	4.550000191	VV	0.009017475	1.615369081	2.685577631	5.58819E-07
6	0.912500024	VP	0.042146783	13.0987988	4.475364685	4.53138E-06	36	4.682499886	VV	0.114761375	93.73239899	9.697865486	3.24257E-05
7	1.205000043	PP	0.023466058	9.00872517	4.896185398	3.11647E-06	37	4.942500114	VP	0.101860717	72.10354614	8.962301254	2.49434E-05
8	1.242619038	VV	0.049993057	33.6169853	8.171977043	1.16294E-05	38	5.399285793	VV	0.132948563	4895.95166	472.262207	0.001693699
9	1.37833333	VP	0.0399018	21.3002033	6.556478977	7.36856E-06	39	5.62439394	VV	0.090190202	5936.932617	832.600647	0.002053814
10	1.487380981	VV	0.048820563	22.5603657	6.293656826	7.8045E-06	40	5.721078396	VV	0.080186792	6381.083008	1076.014038	0.002207463
11	1.539999962	VV	0.012025586	5.63234615	7.280491829	1.94845E-06	41	6.356213093	VV	0.113849252	105359136	11951375	36.4477956
12	1.559999943	VV	0.014623727	5.81450701	5.835986614	2.01146E-06	42	6.518360138	VV	0.110888332	132640336	15648667	45.88541666
13	1.61833334	VV	0.030724378	17.3648815	7.052904129	6.00718E-06	43	6.850275993	VV	0.088272125	48241068	7379006	16.68844917
14	1.717222214	VV	0.047084648	24.3773594	6.308189869	8.43307E-06	44	7.277281284	VV	0.066702396	2796883.75	607613.625	0.967550144
15	1.945000052	BV	0.01841251	7.22383261	5.468158245	2.499E-06	45	8.056333542	VV	0.017318383	64.54186249	49.15586853	2.23275E-05
16	2.065740824	VV	0.063228399	49.2404594	10.03823471	1.70342E-05	46	8.085000038	VV	0.049368829	172.9373779	44.47112274	5.98257E-05
17	2.354333401	VV	0.103514843	154.562195	19.28277397	5.3469E-05	47	8.156428337	VV	0.039118562	103.8792038	33.55405045	3.59358E-05
18	2.415952444	VV	0.050527886	86.8058853	20.86914253	3.00295E-05	48	8.238333702	VV	0.029533872	58.59840393	24.8293457	2.02715E-05
19	2.575833321	VV	0.134951532	291.384064	25.56932449	0.000100801	49	8.268888474	VB	0.032838482	55.8278389	21.12051964	1.9313E-05
20	2.774333239	VV	0.06670735	121.909325	23.82077789	4.21731E-05	50	8.467222214	BP	0.019411797	4.538059711	3.225974083	1.56989E-06
21	2.867222309	VV	0.067363858	118.859207	24.17359734	4.1118E-05	51	8.503333092	VP	0.073595993	29.84170914	6.758001328	1.03234E-05
22	2.949166775	VV	0.058975898	133.199631	27.27461433	4.60789E-05	52	8.718889236	BV	0.012295057	4.060353756	5.096342564	1.40463E-06
23	2.986428499	VV	0.033715621	58.0512123	28.69649696	2.00822E-05	53	8.752333641	VP	0.033818655	16.64250946	6.102163315	5.75729E-06
24	3.070454597	VV	0.059805654	141.300201	33.09869766	4.88812E-05	54	8.850832939	VV	0.041140392	18.41359901	6.113343716	6.36998E-06
25	3.161111116	VV	0.085610032	226.260025	33.57968903	7.82721E-05	55	9.010926247	VV	0.062813506	84.06828308	17.26344109	2.90825E-05
26	3.299666643	VV	0.06252715	183.799622	35.42755508	6.35834E-05	56	9.168333054	VV	0.015920728	9.948420525	8.3375597	3.44154E-06
27	3.403666735	VV	0.058996309	201.394852	41.22383881	6.96703E-05	57	9.227222443	VV	0.094646461	73.46097565	12.93603134	2.5413E-05
28	3.436111212	VV	0.031695828	101.799332	41.38785934	3.52163E-05	58	9.331666946	VV	0.106793478	135.7334442	15.40522671	4.69554E-05
29	3.50333333	VV	0.044352733	152.389008	42.99284744	5.27172E-05	59	9.502778053	VV	0.044324446	38.28496933	10.80856514	1.32442E-05
30	3.708333254	VV	0.120804898	533.436279	53.2804985	0.000184536	60	9.607962608	VP	0.056045357	36.30160141	10.7953043	1.25581E-05
61	9.752778053	VV	0.0238054	13.4888897	7.563920021	4.66633E-06	95	13.61222267	VV	0.043031972	57.44559479	16.74158478	1.98727E-05
62	9.842499733	VP	0.053206857	63.7484741	15.42793369	2.20531E-05	96	13.76333332	VV	0.058652874	1019.115967	249.5061798	0.000352552
63	9.963222504	VV	0.047136389	511.18634	160.5929108	0.000176839	97	14.10111141	VV	0.086523212	723.1682129	111.7135086	0.000250172
64	10.20166683	VV	0.079246953	145.759537	22.59929276	5.04239E-05	98	14.23976231	VV	0.048603822	339.0374451	84.87366486	0.000117286

Foam Samples from the Edge and Sampled Cold

65	10.22999954 VV	0.04557642	95.4696579	26.78952789	3.30266E-05
66	10.29166698 VV	0.023560509	37.1714172	22.17051506	1.2859E-05
67	10.38233376 VV	0.061086167	162.63678	32.11291885	5.62623E-05
68	10.48083305 VV	0.020329718	14.0954103	11.55566978	4.87615E-06
69	10.54583359 VV	0.060295392	64.7640991	13.42172337	2.24044E-05
70	10.71166706 VV	0.060166329	187.108124	37.52906799	6.47279E-05
71	10.83814812 VV	0.061380263	1369.68848	311.0085144	0.000473828
72	11.01000023 VV	0.028916925	25.3132915	11.85225487	8.75685E-06
73	11.03499985 VV	0.032949496	32.2065392	12.14051914	1.11415E-05
74	11.0820837 VV	0.034619108	31.5867615	11.29743481	1.09271E-05
75	11.14249992 VV	0.024018297	24.4971066	12.98009491	8.4745E-06
76	11.18214321 VV	0.08130987	109.302322	16.07862473	3.78119E-05
77	11.35666656 VV	0.016352538	8.23607445	6.694811821	2.84918E-06
78	11.48055553 VV	0.081960872	340.969299	53.06735229	0.000117954
79	11.66416645 VV	0.019583667	10.8774281	9.257227898	3.76292E-06
80	11.85999966 VV	0.086394466	358.8909	50.81725693	0.000124154
81	11.96333313 VV	0.046417005	32.4956284	11.66800404	1.12415E-05
82	12.02416706 VV	0.033843689	19.3760471	9.541930199	6.70292E-06
83	12.14722252 VP	0.055457067	44.6673584	10.53679943	1.54522E-05
84	12.22166634 VP	0.037689358	16.9184494	5.689984322	5.85275E-06
85	12.31233311 VV	0.057613689	302.177063	63.39085007	0.000104535
86	12.45899963 VV	0.047259208	72.8983536	19.66011238	2.52184E-05
87	12.58944416 VV	0.062434729	185.216736	37.62291336	6.40736E-05
88	12.72111113 VV	0.015351563	8.14095688	7.689539433	2.81627E-06
89	12.78277779 VP	0.043143399	44.8439865	12.71600914	1.55133E-05
90	13.00361156 VV	0.036810182	161.829819	55.8415947	5.59832E-05
91	13.06700039 VV	0.058580682	44.4476433	12.64570618	1.53762E-05
92	13.24966621 VV	0.093812227	172.728928	21.94882774	5.97536E-05
93	13.40833378 VV	0.061048973	203.030914	40.11405945	7.02362E-05
94	13.52999973 VV	0.05098236	85.5540009	20.3773365	2.95964E-05
99	14.29100037 VV	0.042947009	264.772736	75.43933868	9.15951E-05
100	14.37433338 VV	0.019111436	24.9311829	16.99821281	8.62466E-06
101	14.40002918 VV	0.003813582	162.638168	710.7848511	5.62628E-05
102	14.46833324 VBA	0.047688793	255.910477	71.61690521	8.85293E-05

Foam Samples from the Edge and Sampled Cold

Sample	Location	Sampling Temp.												
PIANA2	EDGE	COLD												
#	Retention Time	Type	Peak Width	Area	Height	Area %	#	Time	Type	Peak Width	Area	Height	Area %	
1	0.163888887	BP	0.022757016	8.496216774	6.222415447	2.94964E-06	31	3.608333349	VV	0.039100155	45.94249344	14.84746456	1.595E-05	
2	0.405000001	BV	0.071348004	45.26208115	7.958907127	1.57137E-05	32	3.748333216	VV	0.08986748	140.7291107	18.68540573	4.886E-05	
3	0.496333331	VV	0.022391707	17.74025536	10.1496973	6.15889E-06	33	3.840333223	VV	0.020993706	26.48588181	16.26864815	9.195E-06	
4	0.541666687	VV	0.027287465	20.72641182	9.562371254	7.1956E-06	34	3.895555496	VV	0.088204071	141.4274902	19.14048004	4.91E-05	
5	0.605555534	VP	0.026711363	15.81747627	7.467707157	5.49136E-06	35	4.053333282	VV	0.027097253	26.72383308	15.51346684	9.278E-06	
6	0.726666689	BP	0.051139116	12.93296909	3.13434577	4.48994E-06	36	4.087500095	VV	0.027486438	23.37434196	12.12733841	8.115E-06	
7	0.901250005	VV	0.051445186	55.64619827	14.28546524	1.93187E-05	37	4.226110935	VV	0.094476663	77.66321564	10.3578577	2.696E-05	
8	0.975909114	VV	0.044576779	69.95934296	19.16989517	2.42878E-05	38	4.274333477	VV	0.016704308	10.68778896	10.66370487	3.71E-06	
9	1.299444437	VV	0.16349858	316.7335815	22.88085175	0.000109961	39	4.310555458	VP	0.025381139	13.06510353	7.129003048	4.536E-06	
10	1.340000033	VV	0.027943682	49.26993942	24.00699806	1.71051E-05	40	4.351666451	VP	0.020400815	7.548808098	5.061224461	2.621E-06	
11	1.370333314	VV	0.034247901	43.57242203	21.2044239	1.51271E-05	41	4.481666565	VV	0.040443074	26.62051582	8.294528961	9.242E-06	
12	1.412333369	VV	0.035274148	54.60181427	19.73781586	1.89561E-05	42	4.598888874	VV	0.071793132	77.30329132	13.10990906	2.684E-05	
13	1.499166608	VV	0.050712395	74.97949982	17.95766449	2.60307E-05	43	4.626111031	VV	0.023986859	19.09390068	10.61436462	6.629E-06	
14	1.558333278	VV	0.082466103	91.36260986	13.75952911	3.17184E-05	44	4.666428566	VP	0.018403552	12.69485092	9.028934479	4.407E-06	
15	1.809000015	VV	0.077811882	80.25524139	12.51554108	2.78622E-05	45	4.858333111	BP	0.018024391	8.799193382	6.832706928	3.055E-06	
16	1.900833368	VV	0.058227971	43.5916748	9.378361702	1.51337E-05	46	4.910833359	VP	0.02215323	6.643835545	4.798508167	2.307E-06	
17	1.962222219	VB	0.026771052	12.56447506	7.82217741	4.36201E-06	47	4.964523792	VV	0.010217013	3.818869829	6.2295928	1.326E-06	
18	2.1272223	BV	0.029168734	16.51633835	8.316837311	5.73398E-06	48	5.395370483	VV	0.154767647	6763.018555	545.024292	0.0023479	
19	2.218333244	VV	0.086301357	137.2173767	19.21780777	4.76378E-05	49	5.617063522	VV	0.098849803	9786.629883	1314.652954	0.0033976	
20	2.345000029	VP	0.054635964	119.08918	26.39590263	4.13442E-05	50	5.719138145	VV	0.076935768	8669.592773	1511.079102	0.0030098	
21	2.529666662	VV	0.047125876	48.74274826	12.60175896	1.6922E-05	51	6.350898266	VV	0.112451121	105246352	11869123	36.538422	
22	2.724166632	VP	0.13337329	215.1663818	19.40334511	7.46994E-05	52	6.512866497	VV	0.109503791	131738936	15602995	45.735864	
23	2.841666698	VB	0.017382154	5.407113552	4.101050854	1.87719E-06	53	6.845255375	VV	0.088635571	48183692	7335276.5	16.727954	
24	3.015000105	BV	0.048036791	31.15688896	8.071113586	1.08168E-05	54	7.272528172	VV	0.0667983	2826616	601792.1875	0.9813175	
25	3.037222147	VV	0.016947286	11.28955078	10.17289829	3.9194E-06	55	8.166666985	VV	0.080332443	788.49823	118.9558487	0.0002737	
26	3.093333244	VV	0.028827	26.61634254	11.57505512	9.24041E-06	56	8.289999962	VV	0.091956586	615.4647217	111.5498734	0.0002137	
27	3.16785717	VV	0.046172455	31.57192039	11.39637661	1.09608E-05	57	8.375	VV	0.029167021	221.660553	98.82821655	7.695E-05	
28	3.268333435	VV	0.055028934	53.25616837	11.71665859	1.8489E-05	58	8.416110992	VV	0.031144816	218.9239655	90.7489624	7.6E-05	
29	3.476111174	VV	0.134768948	226.8088531	20.39088249	7.87413E-05	59	8.453000069	VV	0.035764296	263.5528564	91.06611633	9.15E-05	
30	3.549666643	VV	0.047844611	53.81433487	18.74621964	1.86827E-05	60	8.517857552	VV	0.081073619	402.4862976	82.74090576	0.0001397	
61	8.600000381	VV	0.027545536	128.3462067	77.65699005	4.4558E-05	95	12.58033371	VV	0.038055003	131.4967499	42.5496788	4.565E-05	
62	8.625833511	VV	0.021533158	122.2952728	76.98516083	4.24573E-05	96	12.71366692	VV	0.125580251	561.000061	54.27921295	0.0001948	
63	8.667222023	VB	0.078946449	500.0261841	75.81427002	0.000173594	97	12.83976173	VV	0.052712902	158.2097168	50.02245331	5.493E-05	
64	8.771666527	BV	0.06936156	398.8733215	69.08275604	0.000138477	98	13.0007143	VV	0.093477316	863.2197266	115.1258087	0.0002997	
65	8.913888931	VV	0.060022417	242.3508606	54.35015869	8.41371E-05	99	13.14772701	VV	0.043068558	235.7352142	72.24450684	8.184E-05	

Foam Samples from the Edge and Sampled Cold

66	8.981190681 VV	0.06097335	248.8340302	59.27843857	8.63878E-05	100	13.18708324 VV	0.095690444	621.0318604	77.33308411	0.0002156
67	9.022333145 VV	0.076969139	351.2597351	55.4018898	0.000121947	101	13.42240715 VV	0.117442489	1199.505249	122.2817459	0.0004164
68	9.216111183 VV	0.034410171	37.14601135	17.99177933	1.2896E-05	102	13.65766621 VV	0.093061201	493.1074524	68.43727875	0.0001712
69	9.252083778 VV	0.054808158	80.58930206	18.50506973	2.79782E-05	103	13.70111084 VV	0.056801274	320.9992981	73.71846008	0.0001114
70	9.62899971 BB	0.017351886	7.36302042	5.985408783	2.55622E-06	104	13.82472229 VV	0.084236071	600.1802979	88.37014771	0.0002084
71	9.72966671 BV	0.023136787	17.5417881	9.682370186	6.08999E-06	105	14.00520802 VV	0.070882723	1475.924194	297.4828491	0.0005124
72	9.839666367 VP	0.053711411	67.21451569	17.93969536	2.33349E-05	106	14.14166641 VV	0.099842675	1314.946411	156.7929535	0.0004565
73	9.958921432 VV	0.051907334	584.206604	170.7892456	0.000202819	107	14.30633354 VV	0.089352868	1127.677124	161.7181396	0.0003915
74	10.11388874 VV	0.050982051	43.50309753	14.22170353	1.5103E-05	108	14.42000008 VV	0.057048108	461.4533691	101.4856644	0.0001602
75	10.30055523 VV	0.084768206	115.6234436	16.49712372	4.0141E-05						
76	10.37666702 VV	0.071268052	211.4638519	38.99406052	7.3414E-05						
77	10.46333313 VV	0.016611988	21.78704453	20.15401459	7.56382E-06						
78	10.61699963 VV	0.089771047	232.6433716	33.19234467	8.07669E-05						
79	10.71388912 VV	0.065911986	256.9998474	47.65914917	8.92228E-05						
80	10.83616638 VV	0.053693652	743.6759644	194.1264496	0.000258182						
81	10.95633316 VV	0.059775583	167.5822754	33.84001541	5.81796E-05						
82	11.14900017 VV	0.128798068	442.2454834	44.17479324	0.000153535						
83	11.26000023 VV	0.062958591	156.9721375	30.54344177	5.44961E-05						
84	11.37566662 VV	0.050224688	153.1511993	37.05081177	5.31696E-05						
85	11.43214321 VV	0.052258104	159.4353027	37.01052094	5.53512E-05						
86	11.52766705 VV	0.074138902	232.1787567	38.07694626	8.06056E-05						
87	11.64750004 VV	0.105102517	188.2002411	29.84391594	6.53376E-05						
88	11.7507143 VV	0.060638249	83.46096802	22.93958282	2.89752E-05						
89	11.84500027 VV	0.032019094	44.88973618	17.4460144	1.55844E-05						
90	12.13055515 VV	0.162295312	504.295166	38.13105774	0.000175076						
91	12.28388882 VV	0.134996071	488.074707	44.48733902	0.000169445						
92	12.41166687 VV	0.027471857	72.94591522	36.25770569	2.53247E-05						
93	12.44499969 VV	0.036600452	111.90905	38.85678482	3.88515E-05						
94	12.47999954 VV	0.057682984	190.54776	41.41083527	6.61525E-05						

Foam Samples from the Edge and Sampled Cold

Sample	Location	Sampling Temp.											
PIANA 3	EDGE	COLD											
Peak		Peak											
Number	Retention Time	Type	Peak Width	Area	Height	Area %	Peak Number	Retention Time	Peak Type	Peak Width	Area	Height	Area %
1	0.296333343	PV	0.016932543	6.573347569	6.426882744	2.26313E-06	36	4.421923161	VV	0.032677319	144.6953278	55.02802658	4.9817E-05
2	0.316111118	VP	0.03739164	12.52490139	5.582755089	4.31219E-06	37	4.483333111	VV	0.051483888	61.10293198	19.78059959	2.10371E-05
3	0.383333325	VP	0.024694348	17.8583622	9.180592537	6.14844E-06	38	4.570833206	VV	0.072909854	80.35643768	14.2238493	2.76659E-05
4	0.42750001	VV	0.014318841	5.932789326	6.707718372	2.0426E-06	39	4.84499979	BP	0.018229784	5.894697666	4.515590191	2.02948E-06
5	0.449999988	VV	0.015833333	6.332752705	6.666055679	2.1803E-06	40	5.132500172	VV	0.100119978	897.2496338	110.0495682	0.000308913
6	0.490555555	VP	0.022265561	9.33247757	6.693830967	3.21307E-06	41	5.390714169	VV	0.128833845	5295.350586	498.8869934	0.001823132
7	0.606333315	VV	0.037850406	16.36322784	5.477821827	5.63368E-06	42	5.616795063	VV	0.090832621	9604.174805	1336.576416	0.003306613
8	0.63277775	VV	0.017519414	7.024877548	5.644642353	2.41859E-06	43	5.714382648	VV	0.077835567	8742.87793	1503.639404	0.003010078
9	0.765476167	VP	0.062931195	62.13738632	11.8976202	2.13932E-05	44	6.348088741	VV	0.112731904	106598568	11989078	36.70073342
10	1.090999961	VV	0.104114227	221.9026031	26.38622284	7.63987E-05	45	6.509395123	VV	0.114145249	132512912	15593122	45.62276163
11	1.119444489	VV	0.021256413	32.95387268	22.27936172	1.13457E-05	46	6.842537403	VV	0.089624815	48492480	7383321	16.69543611
12	1.142333388	VV	0.023097886	40.91318893	22.62409401	1.4086E-05	47	7.269002914	VV	0.065153815	2812214.5	605851.4375	0.96821502
13	1.188333392	VV	0.054608434	79.35889435	17.93996811	2.73224E-05	48	7.922083378	VV	0.016079066	35.39118958	29.32702827	1.21848E-05
14	1.27642858	VP	0.024318416	28.83440018	15.07281399	9.92737E-06	49	7.949999809	VB	0.064580709	105.4875565	27.22369957	3.63182E-05
15	1.486851811	PV	0.027798625	28.18524361	12.74594498	9.70387E-06	50	8.3125	BV	0.032909065	18.84428596	7.112800121	6.48788E-06
16	1.601666689	VV	0.153994709	276.191803	21.48234367	9.50898E-05	51	8.401666641	VP	0.014226193	4.782920837	4.564032555	1.64671E-06
17	1.87833333	VV	0.025901807	11.09465885	6.503815651	3.81977E-06	52	8.442777634	VB	0.039892614	10.8110714	4.516738892	3.72213E-06
18	1.913888931	VB	0.01652929	4.787545204	4.827335358	1.6483E-06	53	8.709666252	BV	0.1313131	916.272583	82.66638947	0.000315463
19	2.150555611	BV	0.08407221	119.7689438	17.67124557	4.12352E-05	54	8.961667061	VP	0.112278678	239.3817444	26.27796173	8.24165E-05
20	2.248333216	VP	0.062316693	120.7698669	23.35973167	4.15798E-05	55	9.309286118	VB	0.031229895	11.85106564	4.730172157	4.08019E-06
21	2.70738101	VV	0.17177178	158.8303375	11.52578354	5.46836E-05	56	9.480555534	BP	0.022163607	12.24146557	9.205379486	4.2146E-06
22	2.83433342	VV	0.041494343	29.2343235	8.635847092	1.00651E-05	57	9.529166222	VP	0.019580156	6.666055679	4.423774719	2.29505E-06
23	2.973333359	VV	0.071532622	94.83679199	15.91237545	3.26513E-05	58	9.713666916	VV	0.081570648	170.6510162	25.33934402	5.87533E-05
24	3.037222147	VV	0.033515386	33.70562363	13.79017735	1.16045E-05	59	9.819999695	VP	0.041999999	60.79442596	18.66495514	2.09309E-05
25	3.094166756	VV	0.05885477	42.0719223	11.91405106	1.44849E-05	60	9.955277443	VV	0.048968062	534.7427368	152.281189	0.000184106
26	3.28595233	VV	0.083723158	93.49806976	13.51298523	3.21904E-05	61	10.1091671	VV	0.033623409	24.70466423	9.114169121	8.50555E-06
27	3.319999933	VV	0.060502261	54.15651703	10.98784637	1.86455E-05	62	10.19722176	VV	0.034928482	29.3860569	11.45521927	1.01173E-05
28	3.438333273	VV	0.01945699	8.651026726	5.781559944	2.97845E-06	63	10.29333305	VV	0.041224632	31.80349159	12.29870987	1.09496E-05
29	3.656904697	VV	0.092059098	82.91471863	13.06170845	2.85466E-05	64	10.30916691	VV	0.015408495	13.84289932	12.04463959	4.76596E-06
30	3.721666574	VV	0.054401491	41.70436478	9.848912239	1.43584E-05	65	10.37899971	VV	0.047407519	130.1439819	33.43821716	4.48072E-05
31	3.784523726	VB	0.061525188	32.99358368	8.937689781	1.13593E-05	66	10.55500031	VV	0.124651641	541.758667	51.53227615	0.000186522
32	3.896111012	BP	0.027832413	12.53526878	6.4051404	4.31576E-06	67	10.70833302	VV	0.049314264	208.8643494	51.50139999	7.19097E-05
33	4.124166489	VV	0.069313094	50.81589127	9.363814354	1.74954E-05	68	10.83303928	VV	0.056330096	697.1658325	175.5576172	0.000240027
34	4.225833416	VV	0.075842738	44.0293541	9.908345222	1.51588E-05	69	10.9883337	VV	0.067038245	167.8343201	30.10639572	5.77835E-05
35	4.294555664	VV	0.033646144	223.5436859	97.87567902	7.69637E-05	70	11.01222229	VV	0.040688496	107.1540985	32.31273651	3.6892E-05

Foam Samples from the Edge and Sampled Cold

76	11.53666687 VV	0.082512408	104.3264847	21.07288933	3.59185E-05
77	11.62131786 VV	0.03995518	251.4403839	104.8843536	8.65682E-05
78	11.84086704 VV	0.0708469	192.1546021	35.67087173	6.61568E-05
79	11.94722176 VV	0.054510698	47.14351273	12.08523846	1.6231E-05
80	12.08083344 VV	0.059545372	59.53673935	12.28385735	2.04979E-05
81	12.32999992 VV	0.160713971	639.1862793	47.58460999	0.000220065
82	12.53433323 VV	0.055502661	132.0758667	30.51097107	4.54723E-05
83	12.56611156 VV	0.025226118	56.87915421	29.85632133	1.95829E-05
84	12.62899971 VV	0.043151595	120.1942978	34.07563782	4.13816E-05
85	12.68537045 VV	0.05159172	169.3514099	39.84064865	5.83059E-05
86	12.73999977 VV	0.031189304	102.9145126	42.59308243	3.54324E-05
87	12.80722237 VV	0.055301517	195.5935059	45.36492157	6.73407E-05
88	12.88642883 VV	0.038503189	128.8998413	41.19726563	4.43788E-05
89	12.99757576 VV	0.065171339	728.1966553	146.0449066	0.00025071
90	13.13000011 VV	0.060483523	147.6957703	29.97584724	5.08501E-05
91	13.22722244 VV	0.078446008	101.2972946	21.52165794	3.48756E-05
92	13.47277737 VV	0.097928405	533.7749634	64.91690063	0.000183773
93	13.61642838 VV	0.043551549	50.09423447	15.56347847	1.72469E-05
94	13.71966648 VV	0.0375049	52.16318512	17.63721848	1.79592E-05
95	13.81388855 VP	0.049863473	124.8779678	33.21464157	4.29941E-05
96	13.98666668 VV	0.046263214	783.8795166	245.4232788	0.000269881
97	14.14299965 VV	0.076730303	445.6412048	77.91283417	0.000153429
98	14.28690434 VV	0.053132489	317.5565491	80.30840302	0.000109331
99	14.3791666 VP	0.024875365	18.11259651	9.237607002	6.23597E-06
100	14.4893589 VBA	0.034358632	275.1357422	126.5808487	9.47263E-05

Foam Samples from the Edge and Sampled Cold

Sample	Location	Sampling Temp.											
PIAO 1	EDGE	COLD											
#	Retention	Peak Type	Peak Width	Area	Height	Area %	#	Retention	Peak Type	Peak Width	Area	Height	Area %
	Time							Time					
1	0.017916666	PV	0.009457803	4.739513874	8.352034569	1.61073E-06	48	4.351666451	VV	0.026831215	39.60025024	20.23558044	1.34582E-05
2	0.052999999	VV	0.073290437	60.91614532	9.968915939	2.07024E-05	49	4.381666666	VV	0.022889262	39.20872116	21.89809608	1.33251E-05
3	0.209999993	VV	0.038317472	22.98740959	9.998662949	7.8123E-06	50	4.416999817	VV	0.021420898	32.53479385	20.60554314	1.1057E-05
4	0.294	VV	0.029126242	16.99381828	10.36592674	5.77537E-06	51	4.442777634	VV	0.026361091	40.62061691	19.45344734	1.3805E-05
5	0.317222208	VP	0.040207915	18.13271523	7.51622963	6.16242E-06	52	4.485000134	VV	0.025269564	39.76189423	19.93543053	1.35131E-05
6	0.425000012	VV	0.027859243	13.88577843	6.789852619	4.7191E-06	53	4.522777557	VV	0.023627266	30.6927433	17.35964394	1.0431E-05
7	0.552333355	VV	0.094026506	123.275116	17.11614227	4.18952E-05	54	4.582333565	VP	0.074196003	77.14082336	12.46573544	2.62164E-05
8	0.649999976	VV	0.052505609	77.13948059	18.55374336	2.62159E-05	55	5.083333492	VV	0.126062736	1291.192627	121.4217453	0.000438813
9	0.739761889	VV	0.076035604	104.5778427	17.17553902	3.55409E-05	56	5.397916794	VV	0.122322425	5616.999512	583.4244995	0.001908943
10	0.857895613	VV	0.03165523	200.4032135	105.5134888	6.81072E-05	57	5.605990887	VV	0.108834796	13057.96094	1557.144165	0.004437762
11	0.929166675	VV	0.026112979	46.97920609	22.73011208	1.59659E-05	58	5.71282053	VV	0.071142495	7504.292969	1386.547852	0.002550342
12	0.965833306	VV	0.071112163	78.78797913	18.4656601	2.67762E-05	59	6.34608078	VV	0.113044299	107855240	12093994	36.65471749
13	1.066666722	VV	0.046030764	40.58812714	14.69601536	1.37939E-05	60	6.508952141	VV	0.110424958	134294224	15758276	45.64003419
14	1.143666625	VV	0.016672708	8.951946259	8.948702812	3.04233E-06	61	6.840841293	VV	0.087602355	49173868	7489262	16.71179109
15	1.193888903	VP	0.04650436	14.18787956	5.084784985	4.82177E-06	62	7.266695976	VV	0.065957539	2873149.25	621230.625	0.976442814
16	1.220000029	VP	0.065483049	27.76715088	7.067261696	9.4367E-06	63	7.942407608	VV	0.132488951	1818.315918	162.570755	0.000617957
17	1.46875	BV	0.042850815	30.30609894	8.655179977	1.02996E-05	64	8.178333282	VV	0.050360303	428.5928345	103.3957443	0.000145658
18	1.587222219	VV	0.048864659	54.59080887	13.59004307	1.85527E-05	65	8.249444008	VV	0.120327182	971.5480957	96.60785675	0.000330182
19	1.642333388	VV	0.028095447	33.29374695	16.12034988	1.13149E-05	66	8.643888474	VV	0.222709075	2266.138672	120.8833389	0.00077015
20	1.681666613	VV	0.053002022	72.95770264	17.02277565	2.47948E-05	67	8.999444008	VV	0.043363702	96.60141754	27.92153549	3.28301E-05
21	1.778333306	VV	0.037188966	50.50032806	18.89035225	1.71626E-05	68	9.099444389	VV	0.03444716	40.27434921	14.94148827	1.36873E-05
22	1.839285731	VV	0.049893964	82.75523376	20.15864944	2.81245E-05	69	9.123332977	VB	0.028745487	23.05446434	10.05660343	7.83508E-06
23	1.899761915	VV	0.026291585	52.79723358	25.35724831	1.79432E-05	70	9.358333588	BV	0.061260652	49.10242462	9.666812897	1.66875E-05
24	2.049000025	VV	0.149826512	442.6007385	35.16854858	0.000150418	71	9.425000191	VV	0.066351801	66.11096954	12.17478561	2.24679E-05
25	2.216111183	VP	0.062017802	108.7280579	29.21958351	3.69513E-05	72	9.661000252	VV	0.133660808	364.3149719	33.03524399	0.000123813
26	2.343095303	VV	0.051939227	33.02169037	7.714437962	1.12225E-05	73	9.95233345	VP	0.050981559	520.8392944	159.9844513	0.000177008
27	2.641666651	VV	0.094051443	109.825798	13.91940117	3.73244E-05	74	10.04166698	VV	0.015487179	2.666422129	2.70808506	9.06186E-07
28	2.675666571	VV	0.030190242	21.3755703	8.846381187	7.26451E-06	75	10.08785725	VV	0.02440439	11.59704208	7.920052052	3.94127E-06
29	2.744999886	VV	0.021899153	11.03348064	6.811095715	3.74974E-06	76	10.14333344	VV	0.02426031	10.51175213	6.053071022	3.57243E-06
30	2.803888798	VV	0.031001665	20.24246216	9.082574844	6.87942E-06	77	10.19333363	VV	0.03165954	14.50630951	5.706099033	4.92998E-06
31	2.831111193	VV	0.01546488	8.968050003	8.393763542	3.0478E-06	78	10.27633381	VV	0.04616807	49.73725128	13.13772392	1.69033E-05
32	2.880185127	VV	0.025714858	14.71414185	9.53673172	5.00062E-06	79	10.37166691	VV	0.057993125	181.2952576	39.1737175	6.16134E-05
33	2.954999924	VV	0.037230432	33.73114014	11.49649525	1.14636E-05	80	10.51555538	VV	0.114853919	498.9119263	51.57675552	0.000169556
34	3.039509773	VV	0.092255943	162.3950043	20.99150848	5.51901E-05	81	10.70777798	VV	0.050165676	143.8318024	35.57751846	4.88814E-05
35	3.224583387	VV	0.066613786	79.03116608	19.77347755	2.68588E-05	82	10.83033371	VV	0.052528135	583.6331787	163.9624176	0.000198348
36	3.301666737	VV	0.023953961	26.46575546	14.7355032	8.99442E-06	83	10.97954559	VV	0.015873702	12.9685812	13.6164217	4.40739E-06
37	3.323666573	VV	0.029077679	37.40289688	16.73335838	1.27114E-05	84	11.01500034	VV	0.021857595	12.86049271	9.461654663	4.37065E-06
38	3.37166667	VV	0.028223209	25.55427551	14.04750919	8.68465E-06	85	11.10648155	VV	0.055636246	82.76747131	20.70536423	2.81286E-05
39	3.499166727	VV	0.08913134	110.5173874	15.69887257	3.75595E-05	86	11.18666649	VV	0.032353211	37.26544952	14.81145	1.26647E-05
40	3.556999922	VV	0.032291844	27.11670494	13.99564171	9.21564E-06	87	11.22233295	VV	0.060658369	96.99158478	19.97178078	3.29627E-05
41	3.606428623	VV	0.025723021	22.30594635	13.89925385	7.5807E-06	88	11.37833309	VV	0.057390742	74.08869171	16.18947411	2.51791E-05
42	3.662499905	VV	0.051631421	35.37857437	8.316305161	1.20234E-05	89	11.4845829	VV	0.064935826	146.1444702	28.93008995	4.96674E-05
43	3.782500029	VP	0.048702475	24.75735664	6.184593201	8.41381E-06	90	11.54749966	VV	0.071433581	110.0701752	25.68124008	3.74075E-05
44	3.831666708	VV	0.018059688	8.442271233	6.13294363	2.86911E-06	91	11.614048	VV	0.032602664	49.35653687	25.23134041	1.67739E-05
45	4.196111202	PV	0.069943607	64.68692017	11.10745811	2.19839E-05	92	11.6366663	VV	0.026102761	37.09870529	23.68759918	1.2608E-05
46	4.276666641	VV	0.044727486	57.28594971	15.6418314	1.94687E-05	93	11.65999985	VV	0.023267949	42.88653946	23.52567863	1.4575E-05
47	4.315000057	VV	0.027845271	41.50597382	18.73597527	1.41058E-05	94	11.76766682	VV	0.063851863	143.8494263	29.51958084	4.88874E-05
95	11.84166622	VV	0.052335635	136.606308	32.97236633	4.64258E-05							
96	12.13083363	VV	0.175818264	656.1833496	44.29782104	0.000223005							

Foam Samples from the Edge and Sampled Cold

97	12.16083336 VV	0.023852814	78.80511475	44.08963776	2.6782E-05
98	12.30333328 VV	0.180376783	999.2449341	65.72369385	0.000339594
99	12.55388927 VV	0.066556811	252.1489258	52.01385117	8.56931E-05
100	12.59083366 VV	0.044019036	129.6931305	49.10494232	4.40763E-05
101	12.71633339 VV	0.118313529	459.890686	48.2007103	0.000156294
102	12.8908329 VV	0.072214402	321.7130127	55.0223732	0.000109335
103	12.92566681 VV	0.039679572	185.643158	57.4804039	6.3091E-05
104	12.99690437 VV	0.047834825	404.5596313	115.5842514	0.00013749
105	13.1916666 VV	0.104135819	540.6539917	67.72506714	0.000183742
106	13.22333336 VV	0.098910704	391.7187805	66.00545502	0.000133126
107	13.45595264 VV	0.13125059	1245.684326	112.4403763	0.000423347
108	13.61833286 VV	0.043037627	218.2831879	62.05615234	7.41838E-05
109	13.71033287 VV	0.061986707	330.1605835	65.30070496	0.000112205
110	13.79722214 VV	0.083450168	480.0023193	71.38323975	0.000163129
111	13.97674561 VV	0.07111381	1328.760376	271.4265442	0.000451581
112	14.10214329 VV	0.085372537	467.2814941	65.38864899	0.000158806
113	14.27742386 VV	0.075523332	818.0950928	133.4451599	0.00027803
114	14.47769642 VBA	0.051276021	1096.67688	265.0293884	0.000372707

Foam Samples from the Edge and Sampled Cold

Sample	Location	Sampling Temp.												
PIAO 2	EDGE	COLD												
	Retention	Peak												
#	Time	Type	Peak Width	Area	Height	Area %	#	Retention	Peak Type	Peak Width	Area	Height	Area %	
1	0.071666665	BV	0.026107771	8.503202438	4.293102264	2.91384E-06	35	3.04309535	VV	0.046572242	112.3859329	30.09184647	3.85119E-05	
2	0.144999996	VV	0.029287098	16.64818954	7.388753414	5.70493E-06	36	3.088888884	VV	0.036258817	81.891716	28.72631836	2.80623E-05	
3	0.189999998	VV	0.067198791	35.5563736	8.818703651	1.21843E-05	37	3.160714388	VV	0.030607827	55.16735458	29.78638649	1.89045E-05	
4	0.273571432	VV	0.019930063	13.62520027	10.64702034	4.66903E-06	38	3.304518938	VV	0.068007015	690.954895	130.0036774	0.000236774	
5	0.342500001	VV	0.033467997	26.30626106	9.752967834	9.01452E-06	39	3.421666622	VV	0.029956829	116.5309982	52.98894501	3.99324E-05	
6	0.402500004	VV	0.048471536	51.03467178	12.81223965	1.74884E-05	40	3.444333315	VV	0.087762572	394.4179993	54.28744507	0.000135158	
7	0.502777755	VV	0.043282144	37.73182678	10.66331768	1.29298E-05	41	3.577222109	VV	0.040582597	156.2187805	48.49458313	5.35324E-05	
8	0.597000003	VV	0.026095185	18.70397568	9.876046181	6.4094E-06	42	3.684999943	VV	0.105114587	451.4082336	51.07356262	0.000154687	
9	0.639999986	VP	0.028511634	16.9363327	7.452975273	5.80367E-06	43	3.887380838	VV	0.080437675	329.3566589	50.26963806	0.000112863	
10	0.819999993	BB	0.08034879	25.88231277	3.903879166	8.86924E-06	44	3.922333241	VV	0.029440539	118.0401306	50.18614197	4.04495E-05	
11	0.963333309	BV	0.054027483	30.20673561	7.044365883	1.03511E-05	45	3.963666677	VV	0.041449204	178.0686188	52.6618309	6.10198E-05	
12	1.054999948	VV	0.025952695	16.362257	7.969583035	5.60695E-06	46	4.025833313	VV	0.028640321	106.3987579	52.50854492	3.64603E-05	
13	1.183333278	VV	0.057933502	50.78086853	11.86464787	1.74014E-05	47	4.098888874	VV	0.048596095	209.1180115	52.35868073	7.16597E-05	
14	1.220000029	VV	0.015395164	16.07561874	14.00123978	5.50873E-06	48	4.217222214	VV	0.073857456	350.7182007	58.57230759	0.000120183	
15	1.289166689	VV	0.0444711	76.20362854	20.93287659	2.61131E-05	49	4.288333416	VV	0.051002171	262.0814514	65.05267334	8.9809E-05	
16	1.316666722	VV	0.023121294	41.25042725	22.78529739	1.41355E-05	50	4.346666813	VV	0.042193007	234.0749817	71.50196075	8.02119E-05	
17	1.355833292	VV	0.052169856	94.20343018	22.35190582	3.22812E-05	51	4.412619114	VV	0.150308907	957.9549561	75.35717773	0.000328268	
18	1.477380991	VV	0.056260254	98.246315	22.36054039	3.36666E-05	52	4.619999886	VV	0.086812377	431.1483459	60.01576614	0.000147744	
19	1.560238123	VV	0.043562714	101.7871017	30.79441261	3.488E-05	53	4.733095169	VV	0.049846061	233.8269958	57.01580048	8.01269E-05	
20	1.660555601	VV	0.07544627	204.454422	34.34743881	7.00616E-05	54	4.816666603	VV	0.028891727	110.7741089	54.09255981	3.79596E-05	
21	1.716666698	VV	0.057800435	170.0814362	36.8822937	5.82828E-05	55	4.850555542	VV	0.028523302	106.2006683	52.67150879	3.63924E-05	
22	1.789999962	VV	0.025925582	73.01308441	37.15584183	2.50198E-05	56	5.09499979	VV	0.149306625	2026.471191	162.7053528	0.000694423	
23	1.843888879	VV	0.039941665	88.71182251	37.01724243	3.03994E-05	57	5.387666702	VV	0.138308257	6529.833496	593.7371826	0.002237616	
24	1.877777815	VV	0.104567528	245.8812561	39.19018555	8.42576E-05	58	5.606269836	VV	0.107011385	8855.855469	1065.012329	0.003034688	
25	1.972777724	VV	0.061535932	186.5893707	37.18871307	6.39397E-05	59	5.712179661	VV	0.076680407	5915.505859	1050.758301	0.002027101	
26	2.067380905	VV	0.020179836	44.3401947	36.6208725	1.51943E-05	60	6.343673229	VV	0.115430675	107486560	12008060	36.83305158	
27	2.100555658	VV	0.05674303	162.2677765	37.30806351	5.56053E-05	61	6.506584167	VV	0.110934436	132688712	15647079	45.46922121	
28	2.205833435	VP	0.109348826	333.8903809	36.97608948	0.000114416	62	6.838790417	VV	0.089796104	48702536	7398763.5	16.6891844	
29	2.483888865	VV	0.042290628	30.69330406	9.11384201	1.05179E-05	63	7.264576912	VV	0.065611281	2840474.25	606813.625	0.973362014	
30	2.593888998	VV	0.0627755	83.56715393	18.13000488	2.86364E-05	64	8.346333504	VV	0.072782747	1034.188965	236.8209991	0.000354392	
31	2.616666555	VV	0.035309188	38.2056427	18.03385353	1.30922E-05	65	8.416428566	VV	0.030315116	423.0933533	232.6085815	0.000144984	
32	2.654999971	VV	0.029074606	41.87382889	18.04377174	1.43492E-05	66	8.608333588	VV	0.312666386	7140.664551	270.7730103	0.002446934	
33	2.712222338	VV	0.041383751	60.28452682	17.85811234	2.06581E-05	67	8.984333038	VB	0.130261928	1471.778198	188.3101044	0.000504343	
34	2.97966671	VV	0.110119827	272.8727112	30.28462982	9.35069E-05	68	9.132778168	BV	0.146362171	2125.89624	171.8048553	0.000728493	

Foam Samples from the Edge and Sampled Cold

69	9.335475922 VV	0.114531107	1498.265869	155.3327637	0.00051342	107	13.71785736 VV	0.047152814	807.1934204	228.8362732	0.000276606
70	9.664073944 VV	0.180142075	4012.443359	264.2615662	0.001374968	108	13.79611111 VV	0.077207878	1549.061035	253.7974701	0.000530826
71	9.951363564 VV	0.095992215	2187.664551	300.2951965	0.00074966	109	13.97142887 VV	0.110693812	4104.522949	480.3317261	0.001406521
72	10.05928612 VV	0.139560297	1315.197388	157.0644073	0.000450686	110	14.15833378 VV	0.097969018	1926.492554	234.1979523	0.000660163
73	10.20233345 VB	0.060445562	764.7524414	152.6567993	0.000262062	111	14.27981472 VV	0.080642134	1800.286377	277.6672363	0.000616915
74	10.29333305 BV	0.026766228	286.8072205	146.9757843	9.82819E-05	112	14.47809505 VBA	0.08430206	2677.418457	414.8166504	0.000917487
75	10.37119007 VV	0.082148224	1147.668579	173.5550995	0.000393278						
76	10.50111103 VV	0.115709618	1580.756958	174.4606018	0.000541687						
77	10.63749981 VV	0.050294723	576.3769531	155.316803	0.00019751						
78	10.71055603 VV	0.073974937	1027.143311	173.7346802	0.000351977						
79	10.82916641 VV	0.084181525	1856.849731	288.145874	0.000636298						
80	10.94444466 VV	0.051543187	469.4504395	151.7984161	0.000160869						
81	11.11166668 VV	0.135809034	1860.485474	165.9339905	0.000637543						
82	11.20416641 VV	0.118606925	1640.00415	166.9478607	0.00056199						
83	11.38500023 VV	0.042288445	514.7940674	149.073288	0.000176408						
84	11.4463892 VV	0.110053435	1440.450684	155.5272827	0.000493608						
85	11.58944416 VV	0.039952405	495.8691101	152.4314423	0.000169922						
86	11.62333298 VV	0.018405462	212.3090973	150.982605	7.27532E-05						
87	11.64999962 VV	0.026211649	297.5786743	149.5693512	0.000101973						
88	11.94083309 VV	0.210612133	2846.818359	164.7365112	0.000975536						
89	12.04366684 VV	0.077201135	968.8129272	165.7277069	0.000331989						
90	12.11299992 VV	0.069649778	946.4034424	168.1859894	0.00032431						
91	12.33444405 VV	0.132329315	2132.669678	196.9546661	0.000730814						
92	12.37833309 VV	0.082230598	1337.322754	196.9201355	0.000458268						
93	12.51277733 VV	0.033173915	462.9291992	178.990387	0.000158635						
94	12.57666683 VV	0.053267065	787.5455933	182.7843475	0.000269873						
95	12.64700031 VV	0.049321923	628.8626709	186.5811768	0.000215496						
96	12.7383337 VV	0.07081119	1026.942017	187.7568817	0.000351908						
97	12.87870407 VV	0.124610536	2236.08374	212.7683563	0.000766252						
98	12.9958334 VV	0.074544735	1446.508423	253.6027985	0.000495684						
99	13.05388927 VV	0.01598784	196.9990997	205.3634796	6.75068E-05						
100	13.07750034 VV	0.018374179	268.8115845	203.9871674	9.21152E-05						
101	13.15166664 VV	0.087440021	1505	210.4305878	0.000515727						
102	13.25500011 VV	0.104785576	1817.431763	206.2874146	0.00062279						
103	13.42777824 VV	0.073445201	1186.547974	208.3379822	0.000406601						
104	13.47388935 VV	0.033857562	422.7785034	208.1162262	0.000144876						
105	13.54166698 VV	0.046618752	801.2629395	209.5098419	0.000274573						
106	13.61666679 VV	0.088018119	1572.543335	220.9919739	0.000538873						

Foam Samples from the Edge and Sampled Cold

Sample PIAO 3	Location EDGE	Sampling Temp. COLD												
#	Retention		Peak Type	Peak Width	Area	Height	Area %	#	Retention					
	Time								Time	Peak Type	Peak Width	Area	Height	Area %
1		0.07	BV	0.026902068	10.99955177	6.139492989	3.80693E-06	48	5.388000011	VV	0.135461941	5299.84375	488.9337463	0.001834268
2	0.135000005		VV	0.097361818	96.81677246	11.970191	3.35081E-05	49	5.601666451	VV	0.1083517	4588.495605	538.817627	0.001588071
3	0.250714272		VV	0.079035215	77.69953156	16.38500214	2.68917E-05	50	5.71515131	VV	0.066891246	2071.585205	424.8192139	0.000716972
4	0.357499987		VV	0.039336469	29.78555489	12.6199913	1.03087E-05	51	6.343751907	VV	0.113506749	106013192	11949178	36.69100079
5	0.423888892		VP	0.020330124	15.87739563	13.01631355	5.49514E-06	52	6.505647659	VV	0.109834075	131909592	15570998	45.65370453
6	0.470999986		VP	0.032460045	21.59802055	10.74068165	7.47504E-06	53	6.838357449	VV	0.087337576	48200880	7366538	16.68224956
7	0.500384629		VP	0.010450548	8.532550812	13.36095428	2.9531E-06	54	7.264585495	VV	0.067531936	2784960.25	595819.75	0.963870409
8	0.536666691		VV	0.047311045	24.47569656	6.444212437	8.471E-06	55	7.936110973	VB	0.11794012	698.4822388	70.28593445	0.000241744
9	0.61388886		VV	0.016535698	8.993419647	8.42596817	3.11261E-06	56	8.626667023	BP	0.111215509	563.8395386	60.23071289	0.000195144
10	0.679166675		VV	0.047372971	40.95103073	10.52966213	1.41731E-05	57	8.805666924	VB	0.071012981	34.55062103	5.926671505	1.19579E-05
11	0.752499998		VP	0.033019435	15.09545422	5.866653919	5.22451E-06	58	8.971666336	BP	0.066422552	37.43801498	6.997100353	1.29572E-05
12	0.927777767		VP	0.059330538	45.88150787	10.4281826	1.58795E-05	59	9.083889008	VV	0.015430982	5.433331966	5.868423462	1.88047E-06
13	1.256999969		PP	0.04000517	16.34534073	5.958276272	5.6571E-06	60	9.147000313	VP	0.081008472	31.99656868	6.582967758	1.1074E-05
14	1.308333278		VV	0.019749336	7.941236019	5.219786644	2.74845E-06	61	9.317667007	VV	0.017051471	5.848005772	6.1735425	2.02399E-06
15	1.337222219		VV	0.024551183	7.150802612	4.854350567	2.47488E-06	62	9.342618942	VV	0.07957875	46.0777359	7.112761497	1.59474E-05
16	1.582222223		VV	0.179781601	240.3614807	15.77338314	8.31887E-05	63	9.496999741	VP	0.02084106	11.26846313	9.011428833	3.9E-06
17	1.865555525		VV	0.040183954	29.03297997	8.870692253	1.00483E-05	64	9.633889198	VV	0.053567041	127.5246048	31.27768707	4.41361E-05
18	1.992777824		VV	0.083542496	89.58036041	12.81668091	3.10036E-05	65	9.668333054	VV	0.0657029	191.4193115	35.05688858	6.62499E-05
19	2.103095293		VV	0.019230532	13.45891285	11.66453552	4.65811E-06	66	9.804333687	VP	0.050555576	63.90986633	15.67881489	2.21191E-05
20	2.136666775		VP	0.037888154	26.60292244	8.64818573	9.20723E-06	67	9.950555801	VP	0.050399624	499.9541626	148.0419769	0.000173033
21	2.283333302		BV	0.017543765	11.96545982	8.980901718	4.14123E-06	68	10.0583334	VV	0.029458143	16.12653923	6.851991177	5.58137E-06
22	2.306111097		VP	0.025857419	29.79064178	14.56810856	1.03105E-05	69	10.125	VV	0.015908463	6.871928215	5.764296055	2.37836E-06
23	2.403333426		VV	0.009418015	3.784635067	6.697510242	1.30986E-06	70	10.15299988	VV	0.027685808	13.86429024	6.552349567	4.79841E-06
24	2.490555525		VV	0.035249062	23.53840256	8.259321213	8.1466E-06	71	10.38000011	VV	0.065420255	250.4408722	46.07061768	8.66772E-05
25	2.604166746		VV	0.062272739	84.16408539	16.56603622	2.91291E-05	72	10.43833351	VV	0.025444806	91.04563141	45.30636597	3.15108E-05
26	2.678999901		VV	0.041977488	60.52689362	18.11679268	2.09483E-05	73	10.48766708	VV	0.043053824	166.2266693	55.32381439	5.75308E-05
27	2.70404768		VV	0.042392537	62.86357117	18.15702629	2.1757E-05	74	10.51833344	VV	0.066525385	289.6288147	52.3670311	0.00010024
28	2.788333416		VB	0.044149127	26.59677887	7.728579998	9.2051E-06	75	10.7046299	VV	0.069903433	232.6091461	41.81247711	8.05057E-05
29	2.887000084		BP	0.065551512	31.05754089	7.896471977	1.0749E-05	76	10.82907391	VV	0.04766139	477.671875	147.9721985	0.000165321
30	3.12833333		VV	0.07628262	38.93296432	6.556014538	1.34746E-05	77	10.89833355	VV	0.01748902	9.629971504	8.328971863	3.33292E-06
31	3.194259167		VV	0.037254248	23.80337906	9.179078102	8.23831E-06	78	10.96700001	VV	0.04799949	28.87694168	8.638514519	9.99426E-06
32	3.242037058		VP	0.033698972	29.71232414	10.93549061	1.02834E-05	79	11.0879631	VV	0.05653128	94.14442444	20.51794052	3.25832E-05
33	3.630000114		VV	0.14895907	199.4619598	15.83472347	6.90335E-05	80	11.12833309	VV	0.026981708	41.90857315	21.2748909	1.45045E-05
34	3.672619104		VV	0.03991745	55.66815948	17.12831116	1.92667E-05	81	11.21666622	VV	0.082752332	176.690506	26.51224899	6.11523E-05
35	3.843888998		VV	0.087405927	96.64482117	14.02288342	3.34486E-05	82	11.32055569	VV	0.03237826	46.39613342	18.42478752	1.60576E-05
36	3.872499943		VV	0.021900995	19.05199623	11.75987244	6.59387E-06	83	11.45944405	VV	0.099107593	229.9305115	28.50484657	7.95786E-05
37	3.909166574		VB	0.037464984	30.21225166	10.53268814	1.04564E-05	84	11.55958366	VV	0.075251453	195.4428711	31.12793922	6.76425E-05
38	4.038333416		BP	0.05881511	29.37142944	6.251317501	1.01654E-05	85	11.66388893	VV	0.053171087	98.94019318	31.01315689	3.4243E-05
39	4.247222424		VP	0.054709461	31.04052353	7.003350258	1.07431E-05	86	11.70499992	VV	0.096834883	227.3857269	27.97318459	7.86978E-05
40	4.267666817		VV	0.010883961	6.018660545	8.906398773	2.08305E-06	87	11.92000008	VP	0.029494822	13.9201088	6.129547596	4.81773E-06
41	4.304333321		VV	0.022936998	16.94966507	9.918548584	5.86625E-06	88	11.99127102	VV	0.030582987	165.3937531	90.13386536	5.72425E-05
42	4.456904888		VV	0.089111097	110.4553146	14.96491623	3.82284E-05	89	12.32499981	VV	0.122535624	219.6196136	21.61568642	7.601E-05
43	4.653888702		VV	0.078571595	63.59895325	10.08524799	2.20115E-05	90	12.56433296	VV	0.073330007	134.533783	22.97029877	4.65619E-05
44	4.695000172		VV	0.029898396	23.2348175	9.716432571	8.04153E-06	91	12.58595276	VV	0.034007143	65.2926178	23.7992878	2.25977E-05
45	4.732777596		VB	0.022629902	21.01893806	11.88667488	7.27462E-06	92	12.66166687	VV	0.030356547	43.89521027	19.43011665	1.51921E-05
46	4.802333355		BP	0.017514683	9.905491829	7.448689938	3.42828E-06	93	12.88000011	VV	0.119446643	562.1552734	55.8421936	0.000194561
47	5.108859539		VV	0.109279528	880.0521851	100.3844681	0.000304585	94	12.99166679	VV	0.067492202	286.063385	56.09820938	9.90061E-05

Foam Samples from the Edge and Sampled Cold

95	13.17749977 VV	0.097794585	230.0787506	29.24194336	7.96299E-05
96	13.25666714 VV	0.077720553	212.6569366	32.7651825	7.36002E-05
97	13.44444466 VV	0.065193124	189.2580719	36.68210983	6.55019E-05
98	13.5783329 VV	0.126437172	534.7470093	50.954422	0.000185075
99	13.80966663 VV	0.10337662	634.5443726	73.75240326	0.000219615
100	13.97599983 VV	0.08095254	1571.405396	262.0785828	0.000543861
101	14.16055584 VV	0.09479297	506.1025085	67.25514984	0.000175161
102	14.28166676 VV	0.069024429	535.5808105	100.7416306	0.000185364
103	14.39633369 VV	0.046749178	172.4430847	45.98568726	5.96823E-05
104	14.4822731 VBA	0.04855087	613.1707153	185.5641327	0.000212217

Foam Samples from the Edge and Sampled Cold

Sample PIBNA 1	Location EDGE	Sampling Temp. COLD											
#	Retention Time	Peak Type	Peak Width	Area	Height	Area %	#	Retention Time	Peak Type	Peak Width	Area	Height	Area %
1	0.056666669	BV	0.022819737	13.38581753	7.500952721	6.56353E-06	48	4.712777615	BP	0.013755875	5.965535164	5.920266151	2.92511E-06
2	0.111666664	VV	0.036668934	26.18459892	9.073260307	1.28392E-05	49	4.870714188	VP	0.024473155	8.677907944	4.714829445	4.25508E-06
3	0.230833337	VV	0.065206096	108.3737793	21.72213554	5.31394E-05	50	5.074166775	VV	0.06389945	45.63076401	10.06360054	2.23743E-05
4	0.453750014	VV	0.166830018	630.0124512	46.57000732	0.000308917	51	5.384394169	VV	0.12997584	4.44E+03	417.9048157	0.00217751
5	0.547500014	VV	0.08649125	227.6469574	43.86705017	0.000111623	52	5.72541666	VV	0.137722597	3.55E+04	3246.647705	0.017428045
6	0.643888891	VB	0.093738548	306.5651855	39.85571289	0.00015032	53	6.361194611	VV	0.11297527	73810232	8528022	36.19171124
7	0.828333318	BB	0.039393231	93.80786896	29.26800156	4.59972E-05	54	6.524264336	VV	0.108844839	95767760	11419003	46.95824714
8	0.926333308	BV	0.050453324	71.7832489	23.71275902	3.51978E-05	55	6.856901646	VV	0.086714059	32433238	5064479	15.90313907
9	0.959666669	VB	0.054533135	104.9486465	23.30721092	5.146E-05	56	7.282445908	VV	0.064988777	1877800.875	405782.0625	0.920750758
10	1.071111083	BV	0.081709579	154.7590332	25.17825699	7.58837E-05	57	7.776666641	VV	0.101265557	714.4367676	84.82215118	0.000350313
11	1.163666725	VB	0.057663515	117.0652542	24.98487854	5.74011E-05	58	7.966666698	VV	0.052248467	225.1581116	53.33860779	0.000110403
12	1.259166718	BV	0.026767557	44.60263824	21.00990868	2.18702E-05	59	8.042333603	VV	0.062806688	242.0078735	46.43280411	0.000118665
13	1.292333364	VB	0.126572311	204.4222412	19.29984283	0.000100235	60	8.125	VV	0.084599249	270.9945374	39.22621155	0.000132878
14	1.53034246	BV	0.024037084	121.3657837	67.30657959	5.95098E-05	61	8.289761543	VV	0.06735836	152.8429565	27.28293419	7.49442E-05
15	1.598888874	VB	0.077518322	123.4129715	26.53415108	6.05137E-05	62	8.383000374	VV	0.025019355	27.43975258	18.27901649	1.34547E-05
16	1.74333334	BV	0.071336024	73.23704529	17.11081314	3.59107E-05	63	8.434523582	VV	0.051328592	56.65422058	16.38951111	2.77795E-05
17	1.82433331	VP	0.030037556	32.6330719	18.10681915	1.60011E-05	64	8.488333702	VB	0.035577402	31.1152935	11.49593449	1.52569E-05
18	1.858333349	VV	0.066462658	52.15761948	9.588403702	2.55747E-05	65	8.624166489	BP	0.019864962	4.050763607	3.398583174	1.98623E-06
19	2.006666666	VV	0.043292601	22.63638687	7.932428837	1.10994E-05	66	8.740433693	VV	0.01607685	49.52487183	57.33837128	2.42838E-05
20	2.074166775	VV	0.027190274	11.80452919	7.176527023	5.78817E-06	67	8.795000076	VP	0.054475158	76.82276154	17.07980728	3.76689E-05
21	2.10611105	VP	0.037968367	18.71085358	6.06903553	9.17458E-06	68	9.340555191	PV	0.021349829	6.997222424	5.462356567	3.43098E-06
22	2.237499952	VP	0.032519381	13.59875298	5.374507427	6.66794E-06	69	9.413332939	VP	0.03829341	16.36063576	5.910619736	8.02219E-06
23	2.391111135	VV	0.072261207	63.4274292	11.88519573	3.11007E-05	70	9.530555725	VV	0.02204865	6.26644516	4.736832142	3.07265E-06
24	2.515000105	VV	0.036763135	19.10727882	6.412489891	9.36896E-06	71	9.571000099	VP	0.0388055	18.01323318	7.736546516	8.83251E-06
25	2.61833334	VV	0.035777669	21.70868492	8.228953362	1.06445E-05	72	9.636666298	VV	0.018429039	8.206059456	6.205011368	4.02371E-06
26	2.742777824	VV	0.058680765	50.54947281	10.78521538	2.47862E-05	73	9.658333778	VB	0.016764751	10.97638607	8.673213959	5.3821E-06
27	2.881111145	VV	0.047586329	45.43895721	11.88976955	2.22803E-05	74	9.736666679	BP	0.021975242	12.39382172	7.238690376	6.07712E-06
28	2.997857094	VV	0.062898979	78.4225769	16.07990265	3.84533E-05	75	9.850000381	VP	0.056082763	55.92376328	13.85738277	2.74214E-05
29	3.045000076	VV	0.041480191	55.83382797	16.49927902	2.73773E-05	76	9.969102859	VV	0.045878492	409.4930115	126.1248398	0.000200789
30	3.10944438	VV	0.027130531	28.01026917	13.54244804	1.37344E-05	77	10.16404724	VV	0.103276916	90.75515747	10.97755001	4.45004E-05
31	3.132333279	VV	0.04763262	45.09045792	15.77716351	2.21094E-05	78	10.392333303	VV	0.064901479	139.8564148	26.35895348	6.85764E-05
32	3.222333431	VV	0.063412204	69.29058838	13.83940601	3.39756E-05	79	10.72277737	VV	0.110816769	336.4441528	36.74686432	0.00016497
33	3.289666653	VV	0.017879052	18.58696556	13.65622616	9.11383E-06	80	10.84761906	VV	0.054367069	564.4603882	145.1575165	0.000276774
34	3.419814825	VV	0.068671077	63.35912323	12.18356133	3.10672E-05	81	10.96366692	VV	0.0222422	26.65628815	19.97426033	1.30705E-05
35	3.466249943	VV	0.03980197	32.44984436	11.1999836	1.59113E-05	82	11.01217937	VV	0.079838999	149.9090576	22.4686718	7.35056E-05
36	3.663749933	VV	0.078586563	98.49947357	16.280159	4.82977E-05	83	11.16642857	VV	0.07095895	131.233429	22.20243645	6.43483E-05
37	3.736111164	VV	0.072939858	112.2759857	18.72875595	5.50528E-05	84	11.26900005	VV	0.054688729	96.54029083	21.37655258	4.7337E-05
38	3.870833397	VV	0.076635882	109.875946	17.17519951	5.3876E-05	85	11.37416649	VV	0.041803449	61.17992783	21.75886536	2.99986E-05
39	3.953000069	VV	0.024722083	33.58703613	18.03919029	1.64689E-05	86	11.39611149	VV	0.030551335	41.92774582	22.87283897	2.05586E-05
40	4.021666527	VV	0.056848258	84.4770813	17.96895599	4.1422E-05	87	11.43166637	VB	0.099957772	191.076828	22.75704765	9.36916E-05
41	4.10722208	VV	0.061796542	74.22813416	17.39066315	3.63966E-05	88	11.59277821	BV	0.026258249	38.44694138	18.49052238	1.88519E-05
42	4.142499924	VV	0.043925673	55.07479095	15.32567406	2.70051E-05	89	11.64277744	VV	0.071675763	115.8690491	19.40137482	5.68146E-05
43	4.213333313	VB	0.045998566	34.29389954	12.42571354	1.68155E-05	90	11.7973814	VV	0.084606498	126.4546661	18.07827187	6.20051E-05
44	4.284444332	BV	0.020134639	11.68518066	9.672534943	5.72965E-06	91	11.88166714	VB	0.0446545	58.94642258	16.12276077	2.89035E-05
45	4.315000057	VP	0.022408491	11.20213223	6.403782845	5.49279E-06	92	11.98566628	BV	0.046540745	67.91879272	17.79013634	3.33029E-05
46	4.375	VB	0.041503184	17.42516518	5.146258354	8.54416E-06	93	12.23566628	VV	0.115782194	202.4449158	20.9417572	9.92657E-05
47	4.609583378	BP	0.011906395	2.318105698	3.244903088	1.13665E-06	94	12.30666637	VV	0.053389363	89.18534851	20.24729729	4.37307E-05

Foam Samples from the Edge and Sampled Cold

95	12.35944462 VV	0.019894131	25.22645187	21.13391495	1.23694E-05
96	12.44595242 VV	0.073590964	149.8406372	24.41845512	7.34721E-05
97	12.51566696 VV	0.040657967	83.38471985	25.16484261	4.08864E-05
98	12.56277752 VV	0.029506085	56.10057831	24.69269943	2.75081E-05
99	12.6376667 VV	0.049990866	80.28582001	26.76682854	3.93669E-05
100	12.71766663 VV	0.061226536	106.2256851	27.40204811	5.20861E-05
101	12.75333309 VV	0.094654359	161.0018311	28.34907913	7.89448E-05
102	12.84388924 VV	0.015262531	28.98113823	27.57287979	1.42105E-05
103	12.90416622 VV	0.048454039	99.89324188	31.11603355	4.89811E-05
104	12.97416687 VV	0.056531414	132.2696228	31.79683876	6.48564E-05
105	13.02033329 VV	0.04304906	119.7241592	34.02713013	5.87049E-05
106	13.1833334 VV	0.085359298	277.1698608	39.26269913	0.000135906
107	13.38333321 VV	0.132354453	464.0879211	42.85056305	0.000227558
108	13.63500023 VV	0.18792367	735.5293579	46.15429306	0.000360656
109	13.72547626 VV	0.07100673	307.6503296	52.01309967	0.000150852
110	13.86166668 VV	0.081192285	281.4849243	41.46856689	0.000138022
111	13.94722176 VV	0.029168217	97.0708313	43.27742767	4.75972E-05
112	14.11595249 VV	0.105186917	429.0601196	48.51100922	0.000210383
113	14.15055561 VV	0.021473374	56.90846252	44.16978836	2.79042E-05
114	14.19499969 VV	0.047765378	173.5348816	45.22632599	8.50902E-05
115	14.23611069 VV	0.016317023	49.56594849	43.42332458	2.43039E-05
116	14.4333334 VV	0.15349856	640.9685669	49.68796158	0.000314289

Foam Samples from the Edge and Sampled Cold

Sample	Location	Sampling Temp.											
PIBNA 2	EDGE	COLD											
Retention	Retention												
Peak Number	Time	Peak Type	Peak Width	Area	Height	Area %	Peak Number	Time	Peak Type	Peak Width	Area	Height	Area %
1	0.192083329	PP	0.042854916	20.0912323	5.737319469	9.87058E-06	48	6.522984028	VV	0.109608613	95074936	11363829	46.7091643
2	0.324999988	VV	0.038455859	29.98828697	9.596902847	1.47329E-05	49	6.8551898	VV	0.088073537	32471170	5046123	15.95269246
3	0.496666667	VV	0.083543494	89.96465302	13.53547001	4.41985E-05	50	7.281401634	VV	0.06614963	1894322.5	400735.7813	0.930657696
4	0.560333312	VV	0.031327952	40.88694	16.26483536	2.00873E-05	51	7.972142696	VV	0.054074556	517.4251099	115.92276	0.000254205
5	0.623000026	VV	0.028651843	32.94878769	14.98537636	1.61873E-05	52	8.055000305	VV	0.050521325	417.934845	104.8101425	0.000205326
6	0.89785713	BV	0.087344907	153.5860748	22.02765465	7.5455E-05	53	8.13722229	VV	0.038305171	211.7624969	92.13834381	0.000104036
7	0.941666663	VV	0.032971479	49.44931412	20.62488937	2.42938E-05	54	8.170714378	VV	0.241808191	1287.68811	88.75409698	0.000632626
8	0.985000014	VV	0.027912322	45.25289917	22.07859421	2.22322E-05	55	8.479999542	VV	0.05456949	176.2684784	53.83608627	8.65986E-05
9	1.029999971	VV	0.037776008	58.01419449	21.99220467	2.85017E-05	56	8.530333519	VV	0.035360929	139.3359528	48.72724533	6.84541E-05
10	1.061666608	VV	0.058880128	96.11203766	20.81114578	4.72187E-05	57	8.587222099	VV	0.088879406	217.5962372	40.8036499	0.000106902
11	1.159999967	VV	0.050195068	54.52413177	18.1040802	2.6787E-05	58	8.688333511	VB	0.078012347	211.4868317	33.33695602	0.000103901
12	1.211666703	VV	0.077363364	88.01717377	14.19042683	4.32418E-05	59	8.836904526	BV	0.022566546	43.47057343	25.91958237	2.13566E-05
13	1.348749995	VV	0.03420883	32.54216766	11.78740788	1.59876E-05	60	8.873332977	VV	0.029745735	50.19246292	21.10518074	2.46589E-05
14	1.416111112	VB	0.051090073	37.89123917	9.005169868	1.86155E-05	61	8.916666985	VV	0.057546351	69.54956818	20.14305878	3.41689E-05
15	1.547500014	BV	0.038033046	23.54327583	9.145644188	1.15665E-05	62	8.966666222	VB	0.063726626	86.59272766	16.36649513	4.2542E-05
16	1.599285722	VV	0.032169152	20.348032	7.868756294	9.99674E-06	63	9.44833374	BP	0.020297142	7.035601616	4.486056805	3.45651E-06
17	1.670833349	VV	0.020883434	11.64430618	9.293096542	5.72071E-06	64	9.553333282	VV	0.039166942	20.52906227	7.939343929	1.00857E-05
18	1.705952406	VP	0.043812968	28.52928734	7.960250378	1.40161E-05	65	9.62250042	VV	0.049611147	30.31381798	7.927642345	1.48928E-05
19	1.837666631	VP	0.015613765	5.066202164	5.407837391	2.48896E-06	66	9.674166679	VV	0.009618093	35.73573303	61.92449188	1.75565E-05
20	1.863666654	VP	0.025542084	7.765954494	5.067424297	3.81532E-06	67	9.705833435	VV	0.080870308	115.7830658	23.86188126	5.68828E-05
21	2.099999905	BV	0.047252584	40.50159836	11.7388401	1.98979E-05	68	9.824999809	VV	0.056464851	42.69864273	9.146281242	2.09773E-05
22	2.183333397	VV	0.04651339	61.902565	16.98750877	3.0412E-05	69	9.969285965	VV	0.048750229	335.0274658	98.33034515	0.000164595
23	2.267777681	VP	0.102379307	197.7952576	23.69714355	9.71744E-05	70	10.17388916	VV	0.065866128	80.80033875	15.48760605	3.96962E-05
24	2.504333258	VP	0.065124273	27.85485268	7.128640652	1.36848E-05	71	10.26083374	VV	0.051241111	82.02463531	19.43404579	4.02977E-05
25	2.599444389	VP	0.038506225	15.46524906	6.693830967	7.59789E-06	72	10.38166714	VV	0.093442678	261.3474121	34.08946609	0.000128397
26	2.843333244	VV	0.074621089	48.60440063	8.029490471	2.38788E-05	73	10.53277779	VV	0.056856439	76.30704498	16.53003502	3.74887E-05
27	3.031296253	VV	0.093712717	120.6407013	16.23147011	5.92693E-05	74	10.56928539	VB	0.085003793	77.56597137	15.20833492	3.81072E-05
28	3.056794882	VV	0.036342509	45.73856735	20.97569656	2.24708E-05	75	10.72000027	BV	0.046403755	67.38552094	17.70491028	3.31057E-05
29	3.105476141	VV	0.047340225	58.65060043	15.091609	2.88143E-05	76	10.84799957	VV	0.049548965	323.5601196	100.5318832	0.000158961
30	3.259666681	VV	0.061348878	64.82949066	12.74403286	3.18499E-05	77	10.93666649	VV	0.016783429	11.26910877	9.538476944	5.53638E-06
31	3.414444447	VV	0.069165193	76.85384369	15.96412563	3.77574E-05	78	11.03233337	VV	0.052748118	47.29523468	10.8728714	2.32356E-05
32	3.536666632	VV	0.119517438	91.57641602	12.77029991	4.49904E-05	79	11.11499977	VP	0.069933444	91.50769806	16.19193077	4.49566E-05
33	3.573888779	VV	0.029880622	32.46401978	13.58459187	1.59492E-05	80	11.22055531	VV	0.025778772	5.805196762	3.753215075	2.85202E-06
34	3.72129631	VV	0.072031751	84.7532959	15.68715	4.16383E-05	81	11.28388882	VV	0.032710493	9.410364151	4.11027956	4.6232E-06
35	3.819444418	VV	0.062586822	87.05542755	16.76349068	4.27693E-05	82	11.33055592	VP	0.024436982	8.275618553	4.724224567	0.06571E-06
36	4.020833492	BV	0.032012969	29.30270767	15.2556448	1.43961E-05	83	11.4533329	VV	0.037049666	18.76082802	6.622648716	9.21697E-06
37	4.130000114	VV	0.0785686	95.50892639	14.94289684	4.69224E-05	84	11.48750019	VV	0.042721316	24.23914337	9.456303596	1.19084E-05
38	4.337222099	VV	0.113652483	278.1073914	29.32230759	0.000136631	85	11.60944462	VV	0.06382779	62.52523804	11.79827213	3.07179E-05
39	4.38722229	VV	0.043527264	103.2740555	31.27301979	5.07373E-05	86	11.72958374	VV	0.051612988	54.76335144	12.87779236	2.69046E-05
40	4.467057705	VP	0.044358008	300.1216431	88.9633255	0.000147446	87	11.86722183	VV	0.06181081	73.96035004	14.67197514	3.63358E-05
41	4.607222208	VV	0.04775029	64.99276733	19.56756783	3.19302E-05	88	11.90100002	VV	0.050380412	48.98670959	16.20560646	2.40666E-05
42	4.654166698	VV	0.01698368	14.43742943	14.16794395	7.09293E-06	89	11.9794445	VV	0.028338086	33.19738388	14.70504761	1.63095E-05
43	4.675476074	VP	0.048113372	53.88653183	13.63327408	2.64738E-05	90	12.0043335	VP	0.05532109	41.66749573	12.55322933	2.04707E-05
44	5.116666794	BV	0.107899413	879.7855835	97.84768677	0.000432228	91	13.02166653	BV	0.102781348	250.3509674	29.56794167	0.000122994
45	5.38166666	VV	0.137957469	4947.413086	454.6390381	0.002430604	92	13.07685184	VV	0.017111681	33.90558624	28.03104591	1.66574E-05
46	5.724285603	VV	0.142252862	29395.61719	2612.886963	0.014441711	93	13.28916645	VV	0.126817554	442.9260559	41.40018845	0.000217604
47	6.359705925	VV	0.109083414	74056440	8547315	36.38303184	94	13.64666653	VV	0.231229961	1148.132446	58.69026947	0.000564064

Foam Samples from the Edge and Sampled Cold

95	13.7383337 VV	0.046294194	237.2329102	65.43965149	0.00011655
96	13.81111145 VV	0.067167521	426.9989319	80.13275146	0.000209779
97	13.98333359 VV	0.077096328	1473.033081	260.0051575	0.000723683
98	14.10642815 VB	0.076808743	478.9560852	74.69475555	0.000235305
99	14.28958321 BV	0.076665632	789.1790771	126.7048721	0.000387714
100	14.38833332 VV	0.061310902	379.7724304	80.10497284	0.000186578
101	14.49499989 VBA	0.045039818	453.8279419	123.0177078	0.00022296

Foam Samples from the Edge and Sampled Cold

Sample PIBNA 3	Location EDGE	Sampling Temp. COLD												
#	Retention Time	Peak Type	Peak Width	Area	Height	Area %	#	Retention Time	Peak Type	Peak Width	Area	Height	Area %	
1	0.052499998	BV	0.019430373	8.931173325	5.977900028	4.42143E-06	48	4.860555649	VV	0.035287891	31.05923271	11.58140469	1.53761E-05	
2	0.117777778	VV	0.037511528	17.44495583	7.397789001	8.63623E-06	49	4.891666889	VV	0.018349687	12.59754467	9.574876785	6.23649E-06	
3	0.159166664	VV	0.022297667	14.23955727	8.184594154	7.04938E-06	50	4.914999962	VP	0.048160318	35.55199051	9.184461594	1.76002E-05	
4	0.310238093	VP	0.145144075	86.57265472	9.941001892	4.28583E-05	51	5.030000021	VV	0.014307426	6.621693134	6.832066536	3.27811E-06	
5	0.521000028	VP	0.059972059	28.15297508	6.846722603	1.39373E-05	52	5.386111259	VV	0.146100849	4379.432617	359.5571899	0.002168064	
6	0.576666653	VV	0.051489316	28.20472336	6.649012566	1.39629E-05	53	5.722868919	VV	0.139245808	47770.41406	4312.10498	0.023649023	
7	0.648333311	VV	0.026554978	13.75555897	8.633384705	6.80977E-06	54	6.358492374	VV	0.112138651	73407224	8467758	36.34067528	
8	0.716666639	VV	0.044916101	36.09115982	10.54871368	1.78671E-05	55	6.521728992	VV	0.108196579	94514672	11344753	46.79004078	
9	0.78458333	VV	0.039486419	23.88287735	10.08062935	1.18234E-05	56	6.853643417	VV	0.088209681	32150342	4987221	15.91621472	
10	0.88166666	VV	0.021627966	9.988776054	5.883733273	4.90045E-06	57	7.280245304	VV	0.067203522	1864420	394024.9688	0.922992018	
11	1.136666656	VV	0.097770084	116.9653168	14.24854851	5.79044E-05	58	7.8688097	VB	0.057712678	140.9217987	29.51011658	6.97642E-05	
12	1.192777753	VV	0.045977443	31.13448524	11.28614521	1.54133E-05	59	8.148333549	PP	0.0192568	5.943631649	4.545013905	2.94243E-06	
13	1.271111131	VV	0.038635459	25.58234024	10.42276478	1.26647E-05	60	8.1875	VV	0.077173986	30.08313942	6.496822357	1.48928E-05	
14	1.299999952	VB	0.053514291	30.39308167	9.46572113	1.50463E-05	61	8.289166451	VB	0.017558867	6.743853569	5.05681324	3.33858E-06	
15	1.399999976	BP	0.054995161	23.19392204	5.204248905	1.14823E-05	62	8.671667099	BV	0.123030931	630.1884155	60.74643707	0.000311978	
16	1.549074054	BP	0.03130874	16.26178932	8.656682968	8.05049E-06	63	9.013889313	VP	0.029401122	8.477031708	4.805390358	4.1966E-06	
17	1.659166694	VV	0.027994296	18.47733307	8.624723434	9.14731E-06	64	9.090000153	VV	0.027504764	11.4185648	5.919483662	5.65283E-06	
18	1.699583292	VV	0.021459727	12.57261276	8.911477089	6.22415E-06	65	9.194167137	VV	0.034920204	9.804334641	4.781895161	4.85369E-06	
19	1.730185151	VP	0.013861268	8.527378082	9.159710884	4.22153E-06	66	9.278333664	VV	0.089508861	61.10452652	8.435637474	3.02502E-05	
20	1.761666656	VV	0.018115602	6.147634983	5.081073284	3.04342E-06	67	9.390832901	VV	0.048638023	29.61599922	10.14843941	1.46616E-05	
21	1.804999948	VP	0.041984696	23.00207329	6.71150589	1.13873E-05	68	9.489999771	VV	0.059152257	26.32490349	7.417272568	1.30323E-05	
22	2.026212215	BV	0.040055241	19.53476524	5.988809586	9.6708E-06	69	9.54766655	VV	0.019528788	12.82675838	9.053628922	6.34996E-06	
23	2.11500001	VV	0.076169737	28.11135101	4.421827316	1.39167E-05	70	9.681666374	VP	0.106593542	293.4290771	32.72993088	0.000145264	
24	2.199444532	VV	0.022952532	7.391565323	5.367284298	3.65924E-06	71	9.82722187	VV	0.059929449	64.34584808	17.89488792	3.18548E-05	
25	2.231666565	VV	0.021571595	6.396329403	4.9419384	3.16654E-06	72	9.969721794	VP	0.0484755	365.9431152	110.9624634	0.000181162	
26	2.303571463	VP	0.034542631	34.03871155	12.20301628	1.68511E-05	73	10.08416653	VV	0.111298569	50.07671738	5.394608498	2.47908E-05	
27	2.356149435	VB	0.035910156	124.3569031	42.78454208	6.15636E-05	74	10.22416687	VV	0.043507475	21.40125656	8.198306084	1.05948E-05	
28	2.554166555	BP	0.040506963	17.66861153	7.269783497	8.74695E-06	75	10.399999962	VV	0.063424543	143.4494019	29.66043282	7.10155E-05	
29	2.75888896	BP	0.006067508	1.215119362	3.485277176	6.01552E-07	76	10.51071453	VV	0.127230287	452.1264038	43.15467072	0.000223828	
30	2.829074144	BB	0.026816348	13.17526245	6.193957329	6.52249E-06	77	10.71833324	VV	0.045302171	92.07172394	24.80637932	4.55806E-05	
31	2.960555553	BP	0.045904711	8.999429703	3.267431498	4.45522E-06	78	10.84766674	VV	0.049170494	413.2106018	114.3166656	0.000204562	
32	3.289000034	VV	0.104123652	115.2439728	13.16553974	5.70522E-05	79	10.95392036	VV	0.038056385	208.0349426	69.23345184	0.000102989	
33	3.504444361	VV	0.083953224	137.4530945	20.0569706	6.8047E-05	80	11.11999989	VV	0.024030481	34.68388748	18.3675251	1.71705E-05	
34	3.52699995	VV	0.015867895	21.41479111	19.41570473	1.06015E-05	81	11.16595268	VV	0.037521392	51.07061386	22.46578217	2.52828E-05	
35	3.600185156	VV	0.057149012	115.013176	24.33081436	5.69379E-05	82	11.25500011	VP	0.097317606	162.378479	19.87477112	8.03864E-05	
36	3.650333405	VV	0.01629715	26.37083435	23.13726807	1.3055E-05	83	11.53499985	BB	0.017424975	3.824303627	3.093029737	1.89324E-06	
37	3.688333273	VV	0.031556681	63.47454453	25.05478668	3.14234E-05	84	11.63351822	BP	0.021649363	9.993754387	7.450387001	4.94747E-06	
38	3.781666756	VV	0.086237788	174.7433319	24.20139694	8.65077E-05	85	11.72999954	VP	0.029833334	12.26554203	5.332844257	6.07213E-06	
39	3.913571358	VV	0.057948172	100.6797867	23.5163269	4.98421E-05	86	11.84749985	VV	0.04906721	37.45524979	9.696139336	1.85424E-05	
40	3.969000101	VV	0.040843606	66.48773193	22.26205254	3.29151E-05	87	11.93458366	VV	0.04451558	37.42320251	11.6379385	1.85266E-05	
41	4.006999969	VV	0.02972992	37.16740036	19.95495796	1.83999E-05	88	12.14791679	VV	0.10519053	153.703125	18.8380394	7.60916E-05	
42	4.195555687	BV	0.028640391	34.18838882	15.55610275	1.69252E-05	89	12.21433353	VV	0.039080016	46.56820297	18.06168175	2.30539E-05	
43	4.222142696	VV	0.055293567	74.4233551	16.2922554	3.68437E-05	90	12.30633354	VV	0.069286369	165.1913147	29.07433319	8.17789E-05	
44	4.429999828	VV	0.076051489	96.35573578	15.18065739	4.77015E-05	91	12.36499977	VV	0.097476207	234.4315948	28.64624977	0.000116057	
45	4.554999828	VV	0.084037095	133.2218475	18.94575691	6.59523E-05	92	12.55249977	VV	0.037490707	43.30515671	14.64820194	2.14385E-05	
46	4.595476151	VV	0.045329943	67.01862335	18.04488754	3.3178E-05	93	12.63566685	VP	0.01936857	10.69534206	7.184183121	5.29479E-06	
47	4.806333542	VV	0.08084558	77.9703064	11.5371542	3.85997E-05	94	12.83699989	BP	0.019608364	7.116498947	4.715135574	3.52306E-06	

Foam Samples from the Edge and Sampled Cold

95	12.91666698 BV	0.046538234	6.790056229	1.819488764	3.36146E-06
96	13.02944469 VP	0.050080922	26.09581757	7.790277004	1.29189E-05
97	13.0961113 VP	0.013264249	4.266275406	5.360619545	2.11204E-06
98	13.26366711 PV	0.017890008	5.353843689	4.845731258	2.65045E-06
99	13.28666687 VV	0.029197244	12.35623455	5.982263565	6.11703E-06
100	13.39333344 VV	0.035524007	28.21386147	10.44162083	1.39674E-05
101	13.57633305 VV	0.105122358	173.3963928	19.61706352	8.58409E-05
102	13.63500023 VV	0.035561129	66.89097595	23.25293541	3.31148E-05
103	13.74214268 VV	0.061351463	134.2987366	26.39898872	6.64854E-05
104	13.85166645 VV	0.07731466	217.4606018	33.68587875	0.000107655
105	14.01138878 VV	0.061631072	782.8066406	180.3782349	0.000387533
106	14.12595272 VV	0.057532586	144.3805084	41.82571793	7.14764E-05
107	14.17233372 VV	0.046543751	153.2335205	40.13412094	7.58591E-05
108	14.31309509 VV	0.079351045	408.2608643	61.57697678	0.000202112
109	14.43416691 VV	0.055534292	86.49272156	25.95775223	4.28187E-05

Foam Samples from the Edge and Sampled Cold

Sample	Location	Sampling Temp.											
PIBO 1	EDGE	COLD											
Retention													
Peak Number	Time	Peak Type											
Peak Width	Area	Height											
Area %													
1	0.056333333	BV	0.015771616	10.56798363	11.16772461	3.80441E-06	48	4.556666851	VV	0.029438071	127.5001602	54.21306229	4.58993E-05
2	0.084166668	VV	0.020056352	9.204018593	7.64846468	3.31339E-06	49	4.595833302	VV	0.080896854	353.0755615	52.21012878	0.000127105
3	0.14033334	VV	0.028705454	21.74081612	9.867278099	7.82657E-06	50	4.726110935	VV	0.054339401	193.5812836	43.15006256	6.96881E-05
4	0.170555562	VV	0.065639041	46.13528442	11.71439171	1.66084E-05	51	4.837222099	VV	0.039701544	108.1804962	42.49293518	3.89443E-05
5	0.245666668	VV	0.028975995	27.81002998	12.99048805	1.00114E-05	52	5.064166546	VV	0.143654689	1501.901367	123.6964493	0.000540676
6	0.303095251	VP	0.036068503	24.22635078	11.19460201	8.72134E-06	53	5.386333466	VV	0.143806145	4684.571289	408.4516296	0.001686418
7	0.443888903	VV	0.087367624	54.96317673	8.182422638	1.97864E-05	54	5.603750229	VV	0.112854615	3899.206055	433.8458252	0.001403691
8	0.544444442	VV	0.033970732	28.34264374	13.90542221	1.02032E-05	55	5.717777729	VV	0.062365934	1885.570068	420.0883179	0.000678794
9	0.595666647	VV	0.035455976	31.42617226	12.03831577	1.13132E-05	56	6.345115662	VV	0.116289988	102281528	11441985	36.82074664
10	0.617380977	VV	0.014307123	10.69766998	11.03783417	3.8511E-06	57	6.507074356	VV	0.109881841	126696392	14948393	45.60995363
11	0.65192306	VV	0.047251824	51.46543884	13.26863861	1.85273E-05	58	6.839389324	VV	0.089621067	46064556	7013995.5	16.58296839
12	0.745000005	VV	0.024030115	11.61099434	6.441315174	4.17989E-06	59	7.265007019	VV	0.066732869	2702394.75	576033	0.972846166
13	0.796967208	VP	0.017533131	75.43600464	56.65867996	2.71565E-05	60	7.767380714	VV	0.099828593	1397.493652	233.3155365	0.000503089
14	0.859761894	VP	0.060426459	72.52668762	20.00411797	2.61092E-05	61	7.876111031	VV	0.301577896	3532.998291	195.2507324	0.001271859
15	1.021111131	VP	0.052653059	34.39684677	10.88789082	1.23827E-05	62	8.283333778	VV	0.037767317	308.1809998	113.1806335	0.000110943
16	1.296666622	BP	0.049206324	31.6036644	8.735880852	1.13771E-05	63	8.345555305	VV	0.079150766	678.1826172	108.1619644	0.000244142
17	1.368666649	VP	0.023866355	21.14768982	11.28322792	7.61304E-06	64	8.436666489	VV	0.017994992	140.1763	109.0624313	5.04626E-05
18	1.431666613	VV	0.038849879	26.07914162	8.256652832	9.38834E-06	65	8.611000061	VV	0.176182017	2356.921875	160.6326599	0.000848478
19	1.504999995	VP	0.043959178	27.28041077	7.585264206	9.82079E-06	66	8.768333435	VV	0.038045801	293.7653503	95.08076477	0.000105754
20	1.849242449	BV	0.021376431	15.7042923	9.455649376	5.65345E-06	67	8.837499619	VV	0.07413125	524.5130615	92.5329361	0.000188822
21	1.909444451	VV	0.018851075	10.97844124	8.080323219	3.95217E-06	68	8.922333717	VV	0.020207653	109.727951	78.98487854	3.95014E-05
22	1.94266665	VV	0.09510161	62.53373337	10.95910835	2.25118E-05	69	8.942777634	VV	0.05839473	379.8437195	78.58021545	0.000136741
23	2.060833216	VV	0.040343825	45.17116547	14.91058064	1.62614E-05	70	9.034999847	VV	0.043645456	225.5185852	66.36447906	8.11854E-05
24	2.125555515	VP	0.083145991	133.6922913	19.22144699	4.81284E-05	71	9.104999542	VV	0.026103189	126.4269638	63.84318542	4.5513E-05
25	2.304333448	VP	0.028842604	14.93196392	6.741048813	5.37542E-06	72	9.162500381	VV	0.072654314	355.0835266	58.63253021	0.000127828
26	2.401666641	VP	0.037307493	16.26517487	5.374507427	5.85537E-06	73	9.270454407	VV	0.078832693	242.5981598	51.28966522	8.73339E-05
27	2.430555582	VP	0.017127274	6.932697773	5.34673214	2.49573E-06	74	9.337082863	VV	0.025058273	88.37006378	51.39944077	3.18127E-05
28	2.514523745	VV	0.030324474	17.61612892	8.81140995	6.3417E-06	75	9.370333672	VV	0.029510098	78.1137619	44.11696625	2.81205E-05
29	2.564166784	VV	0.0330359	17.51259995	8.160827637	6.30443E-06	76	9.392777443	VV	0.017376017	66.45415497	50.42258453	2.39231E-05
30	2.597777843	VV	0.0263249	19.24494362	10.52873993	6.92807E-06	77	9.416666985	VV	0.022231204	77.9139328	47.266716	2.80486E-05
31	2.636111021	VP	0.03070314	16.03891945	8.706448555	5.77392E-06	78	9.492917061	VV	0.067789681	159.5900421	39.23656082	5.74515E-05
32	2.853333235	VV	0.079535611	68.82233429	10.49089718	2.47756E-05	79	9.527423859	VV	0.015674297	35.12651825	37.35044861	1.26453E-05
33	2.903888941	VV	0.035077184	28.15161324	10.91975498	1.01344E-05	80	9.550714493	VV	0.024478037	60.1271286	40.93950653	2.16454E-05
34	2.946212053	VV	0.049345005	38.00846481	12.83766079	1.36828E-05	81	9.617381096	VV	0.057034958	250.302536	53.06075287	9.01074E-05
35	3.041666746	VV	0.025791124	15.77379322	8.44507122	5.67847E-06	82	9.670999527	VV	0.055591218	247.0110779	54.89225E-05	8.89225E-05
36	3.184666634	VV	0.059706714	99.71179962	22.0712738	3.58957E-05	83	9.776110649	VV	0.061519284	171.0427246	34.09984207	6.15744E-05
37	3.314047575	VV	0.081838593	163.4142609	26.17430687	5.88282E-05	84	9.952842712	VV	0.047939282	579.3395386	173.5769348	0.000208559
38	3.508333445	VV	0.11887905	314.7626953	31.96606636	0.000113313	85	10.16547585	BP	0.028805228	26.32165146	12.48350048	9.47564E-06
39	3.587222338	VV	0.049806073	132.570755	34.51895142	4.77247E-05	86	10.20371819	VV	0.018573901	27.22140121	30.03461075	9.79954E-06
40	3.653571367	VV	0.066097014	208.8955078	38.62487411	7.52012E-05	87	10.260952	VV	0.032394726	38.00324249	15.08335781	1.36809E-05
41	3.718333244	VV	0.058057554	181.3107452	37.73429108	6.52708E-05	88	10.27949238	VP	0.013605325	24.94796944	25.0798378	8.98112E-06
42	3.797222137	VV	0.024292607	68.8338623	36.02367783	2.47798E-05	89	10.38208294	VV	0.056389861	176.3575134	37.82881927	6.34877E-05
43	3.908333302	VV	0.067711398	221.7263184	39.36618423	7.98202E-05	90	10.42687511	VV	0.019721214	57.3204689	42.53735352	2.0635E-05
44	3.97018528	VV	0.041020658	142.698822	47.53821564	5.13707E-05	91	10.45685196	VV	0.025392393	93.84281158	46.80294418	3.37829E-05
45	4.332333565	VV	0.207197294	1237.542358	70.36151886	0.000445508	92	10.50133324	VV	0.072114833	202.5486298	46.81159973	7.29163E-05
46	4.375666618	VV	0.050145295	298.1192932	72.24088287	0.000107321	93	10.58679485	VV	0.022315381	49.32960129	36.84275055	1.77584E-05
47	4.435666561	VV	0.076777965	424.6541443	67.15146637	0.000152873	94	10.82916641	VV	0.067803495	868.1829834	172.248291	0.000312541

Foam Samples from the Edge and Sampled Cold

95	10.90233326 VV	0.016486678	34.41108704	29.76735115	1.23878E-05
96	10.96388912 VV	0.049235694	73.2318573	24.7895546	2.6363E-05
97	10.99033356 VV	0.02058647	31.83599854	23.82964134	1.14608E-05
98	11.02690506 VV	0.034099359	69.31551361	25.19305611	2.49532E-05
99	11.10595226 VV	0.04671526	106.4054413	27.76226425	3.83053E-05
100	11.21249962 VV	0.103519663	243.668045	28.00239563	8.77191E-05
101	11.46796322 VV	0.070165999	106.4660492	19.06061363	3.83271E-05
102	11.56785679 VV	0.063106224	106.2619629	22.09599495	3.82537E-05
103	11.61750031 VV	0.026865449	36.705513	21.55657387	1.32138E-05
104	11.78261948 VV	0.154328197	268.9759216	22.36223602	9.68297E-05
105	11.87261868 VV	0.034881022	54.00419235	19.16147423	1.94412E-05
106	11.95833302 VV	0.031736366	33.29673767	13.51813126	1.19866E-05
107	12.35416698 BV	0.095658615	109.7805099	14.12742233	3.95203E-05
108	12.41222191 VV	0.032530531	41.22042465	15.75160789	1.48391E-05
109	12.52119064 VV	0.063418418	94.24377441	20.20475388	3.39272E-05
110	12.56444454 VV	0.023600016	35.90073013	20.33211327	1.29241E-05
111	12.58196926 VV	0.095502146	175.7404022	21.92788887	6.32655E-05
112	12.80099964 VV	0.03777064	45.70158386	18.53226471	1.64523E-05
113	12.87966633 VV	0.038439315	75.29497528	24.10696983	2.71057E-05
114	12.90999985 VV	0.028433252	38.23707581	17.53999901	1.37651E-05
115	12.99719524 VV	0.036083341	611.3607178	263.3553162	0.000220086
116	13.15547657 VV	0.083067305	182.7235565	26.62478447	6.57794E-05
117	13.25166702 VV	0.040123817	61.98530197	18.96876717	2.23143E-05
118	13.4041357 VP	0.069671057	481.3624268	88.20169067	0.000173288
119	13.62166691 VV	0.069002189	183.0110321	31.86655045	6.58829E-05
120	13.71500015 VV	0.050718244	141.5159912	35.33993912	5.09449E-05
121	13.80055523 VV	0.062763445	225.2287292	43.96782303	8.1081E-05
122	13.97555542 VV	0.063882641	1017.578003	224.4922485	0.000366322
123	14.10388851 VV	0.041704658	117.7710419	39.59109879	4.23969E-05
124	14.16388893 VV	0.053559545	174.4781342	41.91921997	6.28111E-05
125	14.27833366 VV	0.062025938	408.9229126	86.70033264	0.00014721
126	14.36092567 VV	0.060473617	213.474411	44.89584351	7.68495E-05
127	14.48966694 VBA	0.051771086	418.5565491	134.7459106	0.000150678

Foam Samples from the Edge and Sampled Cold

Sample	Location	Sampling Temp.											
PIBO 2	EDGE	COLD											
#	Retention Time	Peak Type	Peak Width	Area	Height	Area %							
1	0.206333339	BV	0.039097674	28.10787964	9.617233276	1.01454E-05	36	3.017777681	VP	0.02741015	18.3427124	8.766776085	6.62072E-06
2	0.300333321	VV	0.035468873	34.84537888	12.52058887	1.25773E-05	37	3.058333397	VV	0.051041	48.55278778	11.55052185	1.75249E-05
3	0.322916657	VV	0.019684955	21.10556412	13.92322254	7.61796E-06	38	3.192777872	VB	0.015070977	5.744531155	6.352752686	2.07346E-06
4	0.356111109	VV	0.024121245	21.48957443	11.33352566	7.75656E-06	39	3.34766674	PV	0.014985457	6.624952793	7.368202209	2.39125E-06
5	0.405000001	VV	0.059371173	49.91939926	10.1513176	1.80182E-05	40	3.446666718	VV	0.05225753	37.62376022	8.733893394	1.35801E-05
6	0.495666653	VV	0.029370263	27.73323441	11.82138348	1.00102E-05	41	3.49333334	VV	0.022242248	9.154811859	6.194443226	3.30439E-06
7	0.566666663	VV	0.025096742	20.8210144	10.51714706	7.51525E-06	42	3.681111097	VV	0.085109696	86.59570313	13.45076942	3.12563E-05
8	0.623333335	VV	0.031832855	22.2506237	9.326768875	8.03126E-06	43	3.794333322	VV	0.067697257	97.76740265	18.48736382	3.52887E-05
9	0.691111088	VV	0.038969103	23.85905838	9.608708382	8.61182E-06	44	3.929444551	VV	0.075174026	139.9068451	22.93317795	5.04987E-05
10	0.731666684	VV	0.028961318	28.53950691	12.34957886	1.03012E-05	45	3.994583368	VV	0.037378255	72.73416901	25.42269707	2.62531E-05
11	0.777222216	VV	0.033363581	32.80416107	15.08916378	1.18405E-05	46	4.03249979	VV	0.07939899	148.4084625	22.96359825	5.35673E-05
12	0.815666676	VV	0.078396842	59.04681015	12.5529747	2.13127E-05	47	4.153571606	VV	0.021786002	25.87972641	19.79843521	9.34117E-06
13	0.932777762	VV	0.024981989	16.55700111	8.787423134	5.97617E-06	48	4.214583397	VV	0.044037003	45.41083145	17.06972122	1.63908E-05
14	0.990714312	VV	0.049305428	49.42359543	14.30597973	1.78392E-05	49	4.232999802	VV	0.023031257	24.78344154	13.74811554	8.94547E-06
15	1.105370402	VV	0.055426959	67.63048553	14.76824284	2.44109E-05	50	4.279444218	VV	0.029519301	39.07748032	16.56669807	1.41048E-05
16	1.206060648	VV	0.046829458	190.9777222	49.7010994	6.89325E-05	51	4.320000172	VV	0.016971938	23.30112648	18.15706635	8.41043E-06
17	1.335000038	VV	0.109541312	252.6675415	27.41074944	9.11992E-05	52	4.380238056	VB	0.063848205	107.4698486	20.60561752	3.87907E-05
18	1.532948732	VV	0.055599134	69.28207397	16.9812088	2.5007E-05	53	4.583666801	BV	0.014692741	6.750281334	7.481733322	2.43648E-06
19	1.625	VV	0.026328722	17.6590538	9.226783752	6.37395E-06	54	4.606666565	VB	0.064621508	22.53985405	5.813300133	8.13566E-06
20	1.671666622	VP	0.022470899	18.09837914	10.84427357	6.53253E-06	55	4.719166756	BP	0.020832945	9.987902641	6.922468662	3.60509E-06
21	1.761666656	VP	0.090999998	61.59435272	8.16591835	2.22322E-05	56	5.076666832	VV	0.130358309	1126.288452	103.9902496	0.000406529
22	1.903571486	VV	0.021456359	10.21843052	6.459292889	3.6883E-06	57	5.38166666	VV	0.139226183	5843.303711	519.4990234	0.002109113
23	1.960555553	VP	0.022513822	9.617845535	5.750190735	3.47152E-06	58	5.600263119	VV	0.111686096	5247.878906	590.4866333	0.001894198
24	2.026333332	VB	0.017547855	5.179698944	4.153864384	1.86959E-06	59	5.713840485	VV	0.066616423	2236.182617	452.8013916	0.00080714
25	2.132222176	BB	0.047725957	24.18314934	6.170166016	8.7288E-06	60	6.343057156	VV	0.113430478	102281968	11426641	36.91820269
26	2.216249943	BP	0.037388787	42.37425232	18.88902092	1.52948E-05	61	6.506161213	VV	0.109725572	126111016	14902878	45.51918722
27	2.285000086	VV	0.022114323	11.22022724	6.848405838	4.04989E-06	62	6.837536812	VV	0.091172539	45923220	6942507.5	16.57577359
28	2.376666784	VV	0.067067556	41.27302933	7.400287628	1.48973E-05	63	7.262982845	VV	0.066900961	2692780.75	572226.3125	0.971946742
29	2.496481419	VP	0.02397396	9.634382248	8.043613434	3.47749E-06	64	8.098333359	VV	0.055777572	669.0512085	145.1459656	0.000241491
30	2.5602777	VV	0.035100065	13.46404362	6.258171082	4.85978E-06	65	8.252333641	VV	0.103239968	1134.111328	133.3263245	0.000409352
31	2.623888969	VP	0.028034968	12.00028896	7.134119511	4.33145E-06	66	8.325606346	VV	0.051109452	523.5585327	126.9642944	0.000188976
32	2.74444437	VP	0.031060085	19.65153122	8.797663689	7.09313E-06	67	8.386666298	VV	0.014484426	115.9890518	117.8296204	4.18657E-05
33	2.801333427	VV	0.061925802	41.01267242	11.03812122	1.48033E-05	68	8.409166336	VV	0.02284555	207.6003723	116.1880798	7.49324E-05
34	2.900333405	VB	0.035882577	17.02278519	6.039647102	6.1443E-06	69	8.553472519	VV	0.247274503	3740.290283	177.909729	0.00135004
35	2.966666698	BV	0.022766922	10.319067	6.414963245	3.72462E-06	70	8.992500305	VV	0.075041108	545.6650391	87.15766144	0.000196955

Foam Samples from the Edge and Sampled Cold

71	9.057222366 VV	0.028330937	139.5745087	82.10959625	5.03788E-05	109	14.06083298 VV	0.028888194	231.0850067	133.3214874	8.34091E-05
72	9.095000267 VV	0.034262799	218.7570038	79.1055069	7.89593E-05	110	14.10333347 VV	0.01723736	114.5312271	93.85151672	4.13395E-05
73	9.166110992 VV	0.103099629	650.4043579	75.05517578	0.00023476	111	14.16309547 VV	0.062788047	486.6791687	101.7767029	0.000175665
74	9.293333054 VB	0.1240694	633.6781006	61.06341171	0.000228723	112	14.28299999 VV	0.080696218	970.7333984	149.6141052	0.000350382
75	9.508333206 BV	0.032777991	121.164444	45.92844391	4.37337E-05	113	14.35055542 VV	0.029942909	246.3769531	102.866806	8.89286E-05
76	9.638333321 VV	0.144594058	780.5528564	63.86275864	0.000281737	114	14.48666668 VBA	0.078956828	979.0383301	206.6611176	0.000353379
77	9.817667007 VV	0.052920178	166.2593231	39.65014267	6.00105E-05						
78	9.950640678 VV	0.060035411	699.7835083	173.5743561	0.000252584						
79	10.10388851 VV	0.109769687	236.9658966	27.1652813	8.55317E-05						
80	10.28083324 VV	0.043605484	84.9682312	24.41286087	3.06689E-05						
81	10.37583351 VV	0.068915121	261.1419067	46.9329071	9.4258E-05						
82	10.52208328 VV	0.098323748	376.9671326	46.13698196	0.000136065						
83	10.61966705 VV	0.029054573	51.82286835	24.44172859	1.87052E-05						
84	10.69880962 VV	0.06303703	212.8422852	40.68284607	7.68244E-05						
85	10.82880974 VV	0.050160438	559.7219849	158.6496582	0.000202029						
86	10.91699982 VV	0.024771664	31.88494301	19.8166256	1.15087E-05						
87	11.09166622 VV	0.127667576	285.9702454	26.548769	0.00010322						
88	11.22666645 VP	0.085951611	142.7657013	20.32418442	5.15306E-05						
89	11.583148 PV	0.06650015	58.45018387	10.57236099	2.10973E-05						
90	11.73388863 VV	0.042505663	39.66243362	11.71296406	1.4316E-05						
91	11.77083302 VV	0.060906634	52.46870041	14.357687	1.89383E-05						
92	12.13000011 VV	0.146456182	474.8811646	39.16605377	0.000171406						
93	12.31277752 VV	0.163718686	825.4397583	60.29432297	0.000297939						
94	12.49318218 VB	0.119039118	521.8164673	52.01559067	0.000188347						
95	12.67045498 BV	0.028213797	87.70285797	51.80849457	3.16559E-05						
96	12.70833302 VV	0.039015528	147.8479004	46.59915161	5.3365E-05						
97	12.78766632 VV	0.042391282	157.0384827	51.76742554	5.66823E-05						
98	12.87333298 VV	0.083274521	603.6140747	88.83262634	0.000217872						
99	12.99555016 VV	0.037245359	1694.244995	675.8744507	0.00061153						
100	13.15071392 VV	0.060563199	307.2657776	64.51693726	0.000110906						
101	13.17666626 VV	0.03769888	170.6966858	59.09577179	6.16122E-05						
102	13.27333355 VV	0.063600302	272.8425293	53.63347626	9.84812E-05						
103	13.36499977 VV	0.049850244	225.45224	54.96891785	8.13759E-05						
104	13.42590904 VV	0.075978957	356.3054504	56.19026184	0.000128607						
105	13.5172224 VV	0.033582967	104.7537613	51.98754501	3.78104E-05						
106	13.59000015 VV	0.080326512	375.1336365	55.87582779	0.000135403						
107	13.80233288 VV	0.105383292	687.4107666	78.33106232	0.000248118						
108	13.97404766 VV	0.079249814	1657.233154	287.500946	0.000598171						

Foam Samples from the Edge and Sampled Cold

Sample Location Sampling Temp.
PIBO 3 EDGE COLD

#	Retention						#	Retention Peak					
	Time	Peak Type	Peak Width	Area	Height	Area %		Time	Type	Peak Width	Area	Height	Area %
1	0.0261111	BV	0.025525	16.29113	9.260045	5.87E-06	31	2.831667	VV	0.043547	23.98813	6.902078	8.65E-06
2	0.103	VV	0.014297	6.36112	7.206947	2.29E-06	32	2.897222	VV	0.032203	18.14507	7.248904	6.54E-06
3	0.2255556	VP	0.068874	58.55344	10.21502	2.11E-05	33	2.931	VV	0.027594	14.66889	8.859962	5.29E-06
4	0.4943333	BP	0.020947	9.821145	7.814368	3.54E-06	34	2.970926	VV	0.008815	4.714747	8.914224	1.7E-06
5	0.5294445	VV	0.021421	13.60078	8.17044	4.9E-06	35	3.068333	VV	0.048752	26.99313	7.03705	9.73E-06
6	0.6116667	VV	0.034921	27.65922	10.78494	9.97E-06	36	3.090556	VP	0.022588	10.39525	6.19143	3.75E-06
7	0.6833333	VV	0.047181	36.90723	13.03734	1.33E-05	37	3.144444	VV	0.026308	12.80433	8.111818	4.62E-06
8	0.7633333	VV	0.029804	29.56814	12.86972	1.07E-05	38	3.245631	VV	0.018152	49.61408	35.83736	1.79E-05
9	0.7988889	VV	0.046521	46.42542	12.16565	1.67E-05	39	3.456111	BV	0.033308	21.55058	8.030562	7.77E-06
10	0.8666667	VV	0.05496	40.2722	9.042429	1.45E-05	40	3.517381	VV	0.02781	13.10986	7.856779	4.73E-06
11	0.9733334	VV	0.048258	35.93449	9.263338	1.3E-05	41	3.537857	VP	0.054753	31.72186	9.655982	1.14E-05
12	1.0525	VV	0.04418	28.17173	7.792027	1.02E-05	42	3.698333	BV	0.036444	24.47776	8.290907	8.83E-06
13	1.1770834	VV	0.048319	39.60868	10.91957	1.43E-05	43	3.773889	VV	0.018733	10.11907	8.013154	3.65E-06
14	1.2879167	VV	0.062297	66.51857	14.03426	2.4E-05	44	3.873889	VV	0.063109	45.75136	9.346365	1.65E-05
15	1.3291667	VV	0.019279	23.43359	15.82266	8.45E-06	45	3.913667	VV	0.049431	37.17437	9.34081	1.34E-05
16	1.3494444	VV	0.024686	33.88025	17.42354	1.22E-05	46	3.984167	VV	0.015526	8.732533	9.374141	3.15E-06
17	1.4141667	VV	0.08695	130.3919	19.76918	4.7E-05	47	4.009167	VV	0.0244	17.99835	9.374141	6.49E-06
18	1.5931818	VP	0.014962	11.44282	10.29897	4.13E-06	48	4.058333	VV	0.024566	18.13167	9.374141	6.54E-06
19	1.7036667	VV	0.063898	45.82751	9.077662	1.65E-05	49	4.241111	VV	0.111326	193.5822	21.44248	6.98E-05
20	1.7683333	VV	0.021297	16.62207	10.04954	5.99E-06	50	4.333	VV	0.032207	69.06033	26.67255	2.49E-05
21	1.7991667	VV	0.03462	28.8333	10.31246	1.04E-05	51	4.3775	VV	0.032587	67.72713	26.70588	2.44E-05
22	1.8991667	VV	0.036618	22.60445	8.904109	8.15E-06	52	4.409584	VV	0.055038	92.52485	28.01826	3.34E-05
23	1.9383334	VV	0.029047	19.45427	9.438519	7.01E-06	53	4.479583	VV	0.034178	57.06144	21.35221	2.06E-05
24	2.0462501	VV	0.074973	108.8321	17.39975	3.92E-05	54	4.537222	VV	0.025421	28.21075	14.67921	1.02E-05
25	2.146389	VP	0.077533	146.6573	22.65227	5.29E-05	55	4.651667	VV	0.063537	76.313	14.70698	2.75E-05
26	2.491111	VV	0.093727	128.6672	17.51053	4.64E-05	56	4.676111	VV	0.024167	38.02318	20.01205	1.37E-05
27	2.5188096	VV	0.052488	75.29992	17.40012	2.72E-05	57	4.726666	VV	0.032569	52.23521	21.33138	1.88E-05
28	2.6059523	VV	0.032034	43.34873	16.83891	1.56E-05	58	5.101666	VV	0.155964	1441.668	112.1564	0.00052
29	2.6820834	VV	0.012952	10.54478	11.23289	3.8E-06	59	5.383667	VV	0.145455	5676.213	499.9625	0.002047
30	2.7249999	VP	0.03971	17.38402	5.52474	6.27E-06	60	5.603889	VV	0.111337	5368.308	611.9995	0.001936

Foam Samples from the Edge and Sampled Cold

61	5.7164817 VV	0.068529	2676.936	515.962	0.000965	94	10.98889 VV	0.043148	463.7575	134.7654	0.000167
62	6.3456526 VV	0.113263	1.02E+08	11443046	36.87287	95	11.105 VV	0.099596	1172.093	140.1122	0.000423
63	6.5083961 VV	0.109575	1.26E+08	14948962	45.54211	96	11.23167 VV	0.118686	1390.854	141.487	0.000501
64	6.8401756 VV	0.089277	45991540	6943449	16.58286	97	11.421 VV	0.073799	845.5629	137.3957	0.000305
65	7.2659221 VV	0.069131	2696372	570595.6	0.972213	98	11.50567 VV	0.111394	1351.521	144.1368	0.000487
66	7.7988095 VV	0.040776	967.4669	298.7881	0.000349	99	11.625 VV	0.05326	626.4019	145.4033	0.000226
67	7.8610001 VV	0.0715	1651.582	285.4572	0.000595	100	11.67433 VV	0.016052	162.6592	145.395	5.86E-05
68	7.9597621 VV	0.081595	1331.561	271.987	0.00048	101	11.76056 VV	0.067708	815.4586	149.3335	0.000294
69	8.0557251 VV	0.145802	3093.18	250.9498	0.001115	102	12.1875 VV	0.276551	3897.509	168.0679	0.001405
70	8.2934208 VV	0.035946	448.5685	207.9853	0.000162	103	12.315 VV	0.180723	2861.859	186.8162	0.001032
71	8.3272219 VV	0.03567	527.1712	182.6638	0.00019	104	12.50667 VV	0.112444	1650.889	175.9839	0.000595
72	8.3991089 VV	0.055363	862.1784	188.4953	0.000311	105	12.64056 VV	0.053001	699.4406	159.9992	0.000252
73	8.6230955 VV	0.20376	3907.406	229.354	0.001409	106	12.73944 VV	0.049514	611.3217	153.3332	0.00022
74	8.9383335 VV	0.161877	1866.964	136.2375	0.000673	107	12.89738 VV	0.092996	1300.236	166.705	0.000469
75	9.0625 VV	0.017887	154.9191	121.4055	5.59E-05	108	12.99795 VV	0.056443	1931.023	465.0521	0.000696
76	9.0927782 VV	0.051106	372.0992	121.35	0.000134	109	13.18333 VV	0.118509	1689.578	170.651	0.000609
77	9.1422224 VV	0.031385	295.7862	117.4337	0.000107	110	13.23792 VV	0.023738	257.7097	169.5053	9.29E-05
78	9.1999998 VV	0.032108	302.6923	121.3222	0.000109	111	13.27167 VV	0.054674	721.4449	169.4428	0.00026
79	9.2650003 VV	0.044175	410.5623	113.5729	0.000148	112	13.33333 VV	0.022586	273.0543	162.6517	9.85E-05
80	9.291667 VB	0.111486	1020.64	110.7815	0.000368	113	13.37583 VV	0.032331	429.9034	165.3598	0.000155
81	9.4694443 BV	0.055447	461.5577	102.6711	0.000166	114	13.40167 VV	0.020784	266.3756	165.4432	9.6E-05
82	9.6960001 VV	0.155615	1693.489	132.0546	0.000611	115	13.42833 VV	0.022539	276.9346	165.3598	9.99E-05
83	9.7563334 VV	0.023299	214.2026	117.3309	7.72E-05	116	13.55278 VV	0.095759	1392.969	173.3313	0.000502
84	9.8199997 VV	0.060413	587.4128	117.3226	0.000212	117	13.60125 VB	0.082794	868.5299	174.8381	0.000313
85	9.9536114 VV	0.068016	1389.099	261.3233	0.000501	118	13.71417 BV	0.04735	653.1401	168.0263	0.000235
86	10.035 VV	0.028706	237.4182	112.1147	8.56E-05	119	13.81 VV	0.077585	1174.692	181.3167	0.000424
87	10.060715 VV	0.022003	149.6752	113.3765	5.4E-05	120	13.98526 VV	0.107371	2926.695	365.6876	0.001055
88	10.276428 VV	0.158537	1737.085	131.9939	0.000626	121	14.07611 VV	0.016546	201.1519	161.3324	7.25E-05
89	10.370833 VV	0.067288	846.3986	156.0274	0.000305	122	14.10417 VV	0.020857	255.2033	166.7347	9.2E-05
90	10.515667 VV	0.145458	2050.136	166.7264	0.000739	123	14.17444 VV	0.064131	929.6881	177.4282	0.000335
91	10.707564 VV	0.091036	1163.56	165.4752	0.00042	124	14.28767 VV	0.10187	1705.377	221.388	0.000615
92	10.831429 VV	0.072815	1562.946	285.7357	0.000564	125	14.39 VV	0.034278	486.8887	175.9839	0.000176
93	10.906428 VV	0.049154	408.9403	138.6599	0.000147	126	14.49111 VBA	0.066875	1514.794	377.5209	0.000546

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