

# ALITHANE™ ALP-B20

## ► Description

Alithane™ ALP-B20 is medical grade aliphatic polyether-based thermoplastic polyurethanes (TPU) loaded with 20% Barium Sulfate as radiopacifier. Due to the chemical structure, aliphatic-type TPU is more light- stable and bio-stable than aromatic-type TPU. It exhibits excellent radiopacity and can be color-matched while retaining the biocompatibility, hydrolytic resistance, good mechanical properties and chemical resistance of clear grade ALP. It can be injection molded and extruded.

## ► Biocompatibility

Alithane™ ALP-B20 pellets passed the USP Class VI test, Hemolysis test (ISO 10993-4), MEM Elution (ISO 10993-5), Skin Irritation test (ISO 10993-10:2010 & 10993-23:2021), Dermal Sensitization test (ISO 10993-10:2010, 2021).

## ► Storage

Alithane™ ALP-B20 TPU pellets should be stored in a cool and dry environment in their original containers until used. Storage temperature should not exceed 85°F/30°C. If only a portion of TPU pellets was used, the container with remaining TPU pellets should be tightly closed.

## ► Products and Properties

| Alithane™ ALP-B20                        | ASTM Test | ALP-75A-B20 | ALP-80A-B20 | ALP-85A-B20 | ALP-90A-B20 | ALP-95A-B20 | ALP-60D-B20 | ALP-65D-B20 | ALP-70D-B20 |
|--|-----------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Durometer (Shore hardness)               | D2240     | 75A         | 80A         | 85A         | 90A         | 95A         | 62D         | 65D         | 71D         |
| Specific Gravity                         | D792      | 1.21        | 1.23        | 1.23        | 1.26        | 1.27        | 1.28        | 1.28        | 1.29        |
| Flexural Modulus (psi)                   | D790      | 2,900       | 3,650       | 4,100       | 5,000       | 6,100       | 13,600      | 19,500      | 43,000      |
| Ultimate Tensile (psi)                   | D412      | 1,950       | 2,500       | 3,350       | 3,850       | 5,800       | 6,700       | 6,700       | 6,300       |
| Tensile Modulus at 100% Elongation (psi) | D412      | 650         | 750         | 1,000       | 1,250       | 1,950       | 2,200       | 2,500       | 3,000       |
| Tensile Modulus at 300% Elongation (psi) | D412      | 1,000       | 1,100       | 1,900       | 2,900       | 5,050       | 6,200       | 6,300       | 6,300       |
| Ultimate Elongation (%)                  | D412      | 700         | 645         | 500         | 435         | 350         | 310         | 310         | 300         |
| Mold Shrinkage (mm/mm)                   | D955      | 0.010-0.013 | 0.010-0.013 | 0.008-0.010 | 0.008-0.010 | 0.006-0.009 | 0.006-0.009 | 0.004-0.006 | 0.004-0.006 |

Note : These test results are based on small samples of Alithane™ ALP-B20 TPU and do not represent the results from larger test samples. The manufacturing parameters should be adjusted according to users' actual conditions. The mold shrinkage test (D955) was performed on Type A bar specimen molded by injection process.

## ► Processing Information

Alithane™ ALP-B20 TPU pellets are hygroscopic and are **necessarily dried before processing**. Depending on the climate, the pellets absorb moisture rapidly when exposed to the atmosphere. The moisture might cause severe polymer degradation during processing and form bubbles or streaks in the molded and extruded parts. To ensure the efficient and successful processing, the moisture content in TPU pellets is recommended to be **less than 0.05%**. A dehumidifying dryer is recommended for drying Alithane™ ALP-B20 TPU. For the best drying results, the dew point of the inlet air should not be higher than -40°F /-40°C. The recommended drying conditions are listed below **for a minimum of 5 hours**.



► **Processing Information :**

| Alithane™ ALP-B20                   | ALP-75A-B20 | ALP-80A-B20 | ALP-85A-B20 | ALP-90A-B20 | ALP-95A-B20 | ALP-60D-B20 | ALP-65D-B20 | ALP-70D-B20 |
|-------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Recommended Drying Temperature (°F) | 195-220     | 195-220     | 195-220     | 205-230     | 205-230     | 205-230     | 205-230     | 205-230     |
| Recommended Drying Temperature (°C) | 90-105      | 90-105      | 90-105      | 95-110      | 95-110      | 95-110      | 95-110      | 95-110      |

Note : Dry for a minimum of 5 hours at -40°F/ -40°C dew point

► **Recommended Extrusion Temperature Profile :**

| Alithane™ ALP-B20 | ALP-75A-B20 (°F / °C) | ALP-80A-B20 (°F / °C) | ALP-85A-B20 (°F / °C) | ALP-90A-B20 (°F / °C) | ALP-95A-B20 (°F / °C) | ALP-60D-B20 (°F / °C) | ALP-65D-B20 (°F / °C) | ALP-70D-B20 (°F / °C) |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Zone 1            | 330/165               | 340/170               | 350/175               | 350/175               | 355/180               | 355/180               | 355/180               | 365/185               |
| Zone 2            | 340/170               | 350/175               | 355/180               | 355/180               | 365/185               | 365/185               | 365/185               | 375/190               |
| Zone 3            | 340/170               | 350/175               | 355/180               | 355/180               | 365/185               | 365/185               | 365/185               | 375/190               |
| Zone 4            | 350/175               | 355/180               | 365/185               | 365/185               | 375/190               | 375/190               | 375/190               | 385/195               |
| Adapter 5         | 350/175               | 355/180               | 365/185               | 365/185               | 375/190               | 375/190               | 375/190               | 385/195               |
| Die               | 340-355/<br>170-180   | 350-365/<br>175-185   | 355-375/<br>180-190   | 355-375/<br>180-190   | 365-385/<br>185-195   | 365-385/<br>185-195   | 365-385/<br>185-195   | 375-390/<br>190-200   |

Screen Pack Recommendation : 50/200/100

► **Recommended Injection Molding Temperature Profile :**

| Alithane™ ALP-B20 | ALP-75A-B20 (°F / °C) | ALP-80A-B20 (°F / °C) | ALP-85A-B20 (°F / °C) | ALP-90A-B20 (°F / °C) | ALP-95A-B20 (°F / °C) | ALP-60D-B20 (°F / °C) | ALP-65D-B20 (°F / °C) | ALP-70D-B20 (°F / °C) |
|-------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Rear              | 310/155               | 320/160               | 330/165               | 330/165               | 340/170               | 340/170               | 340/170               | 350/175               |
| Front             | 320/160               | 330/165               | 340/170               | 340/170               | 350/175               | 350/175               | 350/175               | 355/180               |
| Nozzle            | 330/165               | 340/170               | 350/175               | 350/175               | 355/180               | 355/180               | 355/180               | 365/185               |
| Melt              | 365-385/<br>185-195   | 375-390/<br>190-200   | 385-400/<br>195-205   | 385-400/<br>195-205   | 390-410/<br>200-210   | 390-410/<br>200-210   | 390-410/<br>200-210   | 400-420/<br>205-215   |
| Mold              | 50-75/10-25           | 50-75/10-25           | 60-85/15-30           | 60-85/15-30           | 70-105/20-40          | 70-105/20-40          | 70-105/20-40          | 75-120/25-50          |

