



Tecophilic™ HP Series TPU Extrusion Processable Thermoplastic Polyurethane

Type: Medical Grade hydrophilic aliphatic polyether-based Thermoplastic Polyurethanes (TPUs)

Features: This series of hydrophilic TPU is specially formulated to absorb equilibrium water contents of up to 100% of the weight of dry resin

Process: Designed for extrusion, but can also be injection molded

| Products & Properties | ASTM Test | HP-60D-20 | HP-60D-35 | HP-60D-60 | HP-93A-100 |
|----------------------------|-----------------|-----------|-----------|-----------|------------|
| Durometer (Shore Hardness) | D2240 | 43D | 42D | 41D | 83A |
| Specific Gravity | D792 | 1.12 | 1.12 | 1.15 | 1.13 |
| Flexural Modulus (psi) | D790 | 4300 | 4000 | 4000 | 2900 |
| Ultimate Tensile (psi) | D412 | | | | |
| Dry | | 8900 | 7800 | 8300 | 2200 |
| Wet | | 5100 | 4900 | 3100 | 1400 |
| Ultimate Elongation (%) | D412 | | | | |
| Dry | | 430 | 450 | 500 | 1040 |
| Wet | | 390 | 390 | 300 | 620 |
| Water Absorption (%) | Lubrizol Method | 20 | 35 | 60 | 100 |

Note: These test results are based on a small samples of Tecophilic™ polyurethanes and do not necessarily represent average results from larger test samples. This information should not be used for establishing engineering or manufacturing guidelines or specifications.



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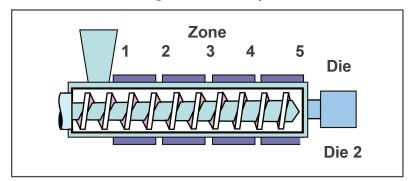


Handling Conditions: Properties of all thermoplastic polyurethane products in the molten state are adversely affected by moisture. For best results, always dry the material at least two hours at 65.5°C (150°F) or overnight at 54.4°C (130°F) in a machine mounted dehumidifying dryer (a desiccant dryer delivering air at 1 liter/sec/ kg at -40°C dew point (1 cfm/lb at -40°F dew point)). A dehumidifying dryer hopper or one shot loader is also recommended. Depending on the applied processing technique, **the maximum moisture level should be 0.05%.** Never exceed 500°F (260°C) melt temperature!

Processing Conditions: Tecophilic™ TPUs can be processed on any conventional extruder or molder. Please refer to Lubrizol's processing guides for medical TPUs for further recommendations regarding equipment and process design at Lubrizol Life Science Health's (LLS Health)

Resource Hub and by contacting our technical solutions team.

Recommended Starting Extrusion Temperature Profile:



| | HP-93A-100 | HP-60D-20 | HP-60D-35 | HP-60D-60 |
|-----------|------------|-----------|-----------|-----------|
| | °F/°C | °F/°C | °F/°C | °F/°C |
| Zone 1 | 350/177 | 350/177 | 350/177 | 350/177 |
| Zone 2 | 360/183 | 360/183 | 360/183 | 360/183 |
| Zone 3 | 370/188 | 370/188 | 370/188 | 370/188 |
| Zone 4 | 380/193 | 380/193 | 380/193 | 380/193 |
| Adapter 5 | 370/188 | 380/193 | 380/193 | 380/193 |
| Die | 370/188 | 380/193 | 380/193 | 380/193 |

Screen Pack Recommendation: 100/500/250

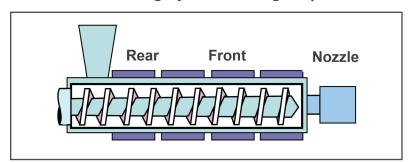


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Recommended Starting Injection Molding Temperature Profile:



| | HP-93A-100 | HP-60D-20 | HP-60D-35 | HP-60D-60 |
|--------|--------------|--------------|--------------|--------------|
| | °F/°C | °F/°C | °F/°C | °F/°C |
| Rear | 350/177 | 374/190 | 374/190 | 374/190 |
| Front | 370/188 | 383/195 | 383/195 | 383/195 |
| Nozzle | 380/193 | 392/200 | 392/200 | 392/200 |
| Melt | <430/<221 | <450/<232 | <450/<232 | <450/<232 |
| Mold | 90-130/32-54 | 90-130/32-54 | 90-130/32-54 | 90-130/32-54 |

For further information refer to Lubrizol Advanced Materials processing guides.

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