

# Ultramid® 8350 HS

## Polyamide 6

### Product Description

Ultramid 8350 HS is a heat stabilized, impact modified type 6 graft copolymer developed for extrusion, tubing, and jacketing applications requiring a high level of toughness combined with a moderate level of flexibility. It is also available in non-heat stabilized (Ultramid 8350) and/or pigmented versions.

### Applications

Ultramid 8350 HS is generally recommended for applications such as automotive vacuum tubing, cable jacketing, and high pressure and hydraulic hoses.

| PHYSICAL                                               | ASTM Test Method | Property Value  |                 |
|--------------------------------------------------------|------------------|-----------------|-----------------|
| Specific Gravity                                       | D-792            | 1.07            |                 |
| Mold Shrinkage (1/8" bar, in/in)                       |                  | 0.014           |                 |
| Moisture, %                                            | D-570            |                 |                 |
| (24 Hour)                                              |                  | 1.1             |                 |
| (50% RH)                                               |                  | 1.9             |                 |
| (Saturation)                                           |                  | 6.7             |                 |
| MECHANICAL                                             | ASTM Test Method | Dry             | Conditioned     |
| Tensile Strength, Yield, MPa (psi)                     | D-638            |                 |                 |
| -40°C (-40°F)                                          |                  | 85 (12,300)     | 95 (13,800)     |
| 23°C (73°F)                                            |                  | 53 (7,680)      | 32 (4,640)      |
| 80°C (176°F)                                           |                  | 20 (2,900)      | -               |
| 121°C (250°F)                                          |                  | 14 (2,030)      | -               |
| Elongation, Yield, %                                   | D-638            |                 |                 |
| -40°C (-40°F)                                          |                  | 8               | -               |
| 23°C (73°F)                                            |                  | 5               | 9               |
| 80°C (176°F)                                           |                  | 37              | -               |
| 121°C (250°F)                                          |                  | 27              | -               |
| Elongation, Break, %                                   | D-638            |                 |                 |
| 23°C (73°F)                                            |                  | >100            | >100            |
| Flexural Modulus, MPa (psi)                            | D-790            |                 |                 |
| -40°C (-40°F)                                          |                  | 2,300 (334,000) | 2,760 (400,000) |
| 23°C (73°F)                                            |                  | 1,800 (261,000) | 620 (89,900)    |
| 65°C (149°F)                                           |                  | 270 (39,200)    | -               |
| 90°C (194°F)                                           |                  | 210 (30,400)    | -               |
| 121°C (250°F)                                          |                  | 165 (23,900)    | -               |
| Flexural Strength, MPa (psi)                           | D-790            |                 |                 |
| -40°C (-40°F)                                          |                  | 120 (17,400)    | 120 (17,400)    |
| 23°C (73°F)                                            |                  | 65 (9,430)      | 30 (4,350)      |
| 65°C (149°F)                                           |                  | 20 (2,900)      | -               |
| 90°C (194°F)                                           |                  | 10 (1,450)      | -               |
| 121°C (250°F)                                          |                  | 10 (1,450)      | -               |
| Rockwell Hardness, R Scale                             | D-785            | 78              | -               |
| IMPACT                                                 | ASTM Test Method | Dry             | Conditioned     |
| Notched Izod Impact, J/M (ft-lbs/in)                   | D-256            |                 |                 |
| -40°C (-40°F)                                          |                  | 190 (3.6)       | 155 (2.9)       |
| 23°C (73°F)                                            |                  | NB              | NB              |
| THERMAL                                                | ASTM Test Method | Dry             | Conditioned     |
| Melting Point, °C(°F)                                  | D-3418           | 220 (428)       | -               |
| Heat Deflection @ 264 psi (1.8 MPa) °C(°F)             | D-648            | 56 (132)        | -               |
| Heat Deflection @ 66 psi (.45 MPa) °C(°F)              | D-648            | 145 (293)       | -               |
| Coef. of Linear Thermal Expansion, mm/mm °C (in/in °F) | E-831            | 1.06 X10-4      | -               |
| UL RATINGS                                             | UL Test Method   | Property Value  |                 |
| Flammability Rating, 1.5mm                             | UL94             | HB              |                 |
| Relative Temperature Index, 1.5mm                      | UL746B           |                 |                 |
| Mechanical w/o Impact, °C                              |                  | 65              |                 |
| Mechanical w/ Impact, °C                               |                  | 65              |                 |
| Electrical, °C                                         |                  | 65              |                 |
| Flammability Rating, 3.0mm                             | UL94             | HB              |                 |
| Relative Temperature Index, 3.0mm                      | UL746B           |                 |                 |
| Mechanical w/o Impact, °C                              |                  | 65              |                 |
| Mechanical w/ Impact, °C                               |                  | 65              |                 |
| Electrical, °C                                         |                  | 65              |                 |
| ELECTRICAL                                             | ASTM Test Method | Dry             | Conditioned     |
| Volume Resistivity, 1.5 mm                             | D-257            | >1E13           | -               |

**Material Handling**

Max. Water content: 0.1%

Product is supplied in sealed containers and drying prior to molding is not required. If drying becomes necessary, a dehumidifying or desiccant dryer operating at 80°C (176°F) is recommended. Drying time is dependent on moisture level, however 2-4 hours is generally sufficient. Further information concerning safe handling procedures can be obtained from the Safety Data Sheet. Alternatively, please contact your BASF representative.

**Typical Profile**

Melt Temperature 240-250°C (464-482°F)

Typical Barrel Profile (°C):

Rear 245-260°C (473-500°F)  
Middle 240-255°C (464-491°F)  
Front 240-250°C (464-482°F)

Head 225-245°C (437-473°F)  
Flange 225-240°C (437-464°F)  
Die 225-240°C (437-464°F)

**Screw Parameters**

|                    |                         |
|--------------------|-------------------------|
| Metering Section   | 40%                     |
| Transition Section | 6 to 7 flights          |
| Feed Section       | balance of screw length |
| Compression Ratio  | 3.5:1 to 4.0:1          |
| L/D Ratio          | 20:1 to 24:1            |

**Tooling & Sizing**

Die to Finished Tube dia. 1.5-2.0:1

Selection of pin and die size will be dependent on the material viscosity. In general, the ratio of die size to finished tube diameter is about 1.5-2.0:1. The mandrel (pin) size is determined the same way in relation to the inner tube diameter.

Free (open tank) extrusion is recommended when producing tube diameters 1 cm and below. For larger diameters, a differential pressure vacuum tank is recommended.

Tooling draw ratio is generally higher with free extrusion versus sizing, however will depend on melt viscosity. The vacuum sizer entrance should be about 3-9% larger than the finished tube outer diameter. Selection will depend on melt viscosity and die swell of the extrudate.

**Quenching**

For diameters less than or equal to 1 cm (.39") O.D., open tank quenching with normal tap water is suggested. Depending upon line speed, quenching distance can vary from 7.5 to 12 meters (24.6-39.4 feet). A short air gap (die to quench water) is recommended for both tubing and cable jacketing for best flexibility.

**Note**

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