

# NORYL™ HNA055 resin

Polyphenylene Ether + PS

SABIC Innovative Plastics

## Message:

>PPE+PS-HI< Autoclavable engineering thermoplastic. Biocompatible per ISO10993 (color dependent).

| General Information                        |                                  |           |                     |
|--------------------------------------------|----------------------------------|-----------|---------------------|
| Features                                   | High pressure heating resistance |           |                     |
|                                            | Biocompatibility                 |           |                     |
| Agency Ratings                             | ISO 10993                        |           |                     |
| RoHS Compliance                            | RoHS compliance                  |           |                     |
| Processing Method                          | Injection molding                |           |                     |
| Part Marking Code (ISO 11469)              | >PPE+PS-HI                       |           |                     |
| Physical                                   | Nominal Value                    | Unit      | Test Method         |
| Specific Gravity                           | 1.08                             | g/cm³     | ASTM D792, ISO 1183 |
| Melt Mass-Flow Rate (MFR) (300°C/5.0 kg)   | 6.2                              | g/10 min  | ASTM D1238          |
| Melt Volume-Flow Rate (MVR) (300°C/5.0 kg) | 5.70                             | cm³/10min | ISO 1133            |
| Molding Shrinkage - Flow (3.20 mm)         | 0.60 - 0.80                      | %         | Internal method     |
| Water Absorption                           |                                  |           | ISO 62              |
| Saturated, 23°C                            | 0.23                             | %         | ISO 62              |
| Equilibrium, 23°C, 50% RH                  | 0.060                            | %         | ISO 62              |
| Mechanical                                 | Nominal Value                    | Unit      | Test Method         |
| Tensile Modulus                            |                                  |           |                     |
| -- <sup>1</sup>                            | 3250                             | MPa       | ASTM D638           |
| --                                         | 2410                             | MPa       | ISO 527-2/1         |
| Tensile Strength                           |                                  |           |                     |
| Yield <sup>2</sup>                         | 67.9                             | MPa       | ASTM D638           |
| Yield                                      | 61.8                             | MPa       | ISO 527-2/50        |
| Fracture <sup>3</sup>                      | 55.5                             | MPa       | ASTM D638           |
| Fracture                                   | 57.6                             | MPa       | ISO 527-2/50        |
| Tensile Elongation                         |                                  |           |                     |
| Yield <sup>4</sup>                         | 4.8                              | %         | ASTM D638           |
| Yield                                      | 3.8                              | %         | ISO 527-2/50        |
| Fracture <sup>5</sup>                      | 16                               | %         | ASTM D638           |
| Fracture                                   | 13                               | %         | ISO 527-2/50        |
| Flexural Modulus                           |                                  |           |                     |
| 50.0mm span <sup>6</sup>                   | 2540                             | MPa       | ASTM D790           |
| -- <sup>7</sup>                            | 2490                             | MPa       | ISO 178             |

|                                                    |                  |                   |                                          |
|----------------------------------------------------|------------------|-------------------|------------------------------------------|
| Flexural Stress                                    |                  |                   |                                          |
| --                                                 | 107              | MPa               | ISO 178                                  |
| Yield, 50.0mm span <sup>8</sup>                    | 101              | MPa               | ASTM D790                                |
| Impact                                             | Nominal Value    | Unit              | Test Method                              |
| Charpy Notched Impact Strength <sup>9</sup> (23°C) | 27               | kJ/m <sup>2</sup> | ISO 179/1eA                              |
| Notched Izod Impact                                |                  |                   |                                          |
| -30°C                                              | 140              | J/m               | ASTM D256                                |
| 23°C                                               | 290              | J/m               | ASTM D256                                |
| -30°C <sup>10</sup>                                | 15               | kJ/m <sup>2</sup> | ISO 180/1A                               |
| 23°C <sup>11</sup>                                 | 25               | kJ/m <sup>2</sup> | ISO 180/1A                               |
| Instrumented Dart Impact (23°C, Total Energy)      | 54.0             | J                 | ASTM D3763                               |
| Thermal                                            | Nominal Value    | Unit              | Test Method                              |
| Deflection Temperature Under Load                  |                  |                   |                                          |
| 1.8 MPa, unannealed, 3.20mm                        | 147              | °C                | ASTM D648                                |
| 1.8 MPa, unannealed, 64.0mm span <sup>12</sup>     | 148              | °C                | ISO 75-2/Af                              |
| Vicat Softening Temperature                        |                  |                   |                                          |
| --                                                 | 168              | °C                | ASTM D1525, ISO 306/B50 10 <sup>13</sup> |
| --                                                 | 169              | °C                | ISO 306/B120                             |
| Linear thermal expansion coefficient               |                  |                   | ASTM E831, ISO 11359-2                   |
| Flow: -40 to 40°C                                  | 8.7E-5           | cm/cm/°C          | ASTM E831, ISO 11359-2                   |
| Lateral: -40 to 40°C                               | 9.3E-5           | cm/cm/°C          | ASTM E831, ISO 11359-2                   |
| Injection                                          | Nominal Value    | Unit              |                                          |
| Drying Temperature                                 | 104 - 110        | °C                |                                          |
| Drying Time                                        | 3.0 - 4.0        | hr                |                                          |
| Drying Time, Maximum                               | 8.0              | hr                |                                          |
| Suggested Max Moisture                             | 0.020            | %                 |                                          |
| Suggested Shot Size                                | 30 - 70          | %                 |                                          |
| Rear Temperature                                   | 260 - 304        | °C                |                                          |
| Middle Temperature                                 | 271 - 310        | °C                |                                          |
| Front Temperature                                  | 282 - 316        | °C                |                                          |
| Nozzle Temperature                                 | 293 - 316        | °C                |                                          |
| Processing (Melt) Temp                             | 293 - 316        | °C                |                                          |
| Mold Temperature                                   | 76.7 - 104       | °C                |                                          |
| Back Pressure                                      | 0.345 - 0.689    | MPa               |                                          |
| Screw Speed                                        | 20 - 100         | rpm               |                                          |
| NOTE                                               |                  |                   |                                          |
| 1.                                                 | 5.0 mm/min       |                   |                                          |
| 2.                                                 | Type 1, 50mm/min |                   |                                          |
| 3.                                                 | Type 1, 50mm/min |                   |                                          |
| 4.                                                 | Type 1, 50mm/min |                   |                                          |
| 5.                                                 | Type 1, 50mm/min |                   |                                          |

|     |                           |
|-----|---------------------------|
| 6.  | 1.3 mm/min                |
| 7.  | 2.0 mm/min                |
| 8.  | 1.3 mm/min                |
| 9.  | 80*10*4 sp=62mm           |
| 10. | 80*10*4                   |
| 11. | 80*10*4                   |
| 12. | 80*10*4 mm                |
| 13. | 标准 B (120°C/h), 载荷2 (50N) |

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