

# Amodel® AS-1145 HS

## polyphthalamide

Amodel® AS-1145 HS is a 45% glass reinforced heat stabilized polyphthalamide (PPA) resin that provides excellent structural integrity in molded parts, even those with wall thicknesses greater than 0.125 inch (3 mm).

tensile strength, excellent creep resistance, and low moisture absorption.

- Black: AS-1145 HS BK 324
- Natural: AS-1145 HS NT

Key properties of this structural resin are high heat deflection temperature, high flexural modulus, high

### General

|                           |   |   |
|---------------------------|---|---|
| Material Status           | • Commercial: Active  |   |
| Availability              | • Africa & Middle East<br>• Asia Pacific<br>• Europe  | • Latin America<br>• North America  |
| Filler / Reinforcement    | • Glass Fiber, 45% Filler by Weight   |   |
| Additive                  | • Heat Stabilizer   |   |
| Features                  | • Chemical Resistant<br>• Creep Resistant<br>• Good Dimensional Stability<br>• Good Stiffness   | • Heat Stabilized<br>• High Heat Resistance<br>• High Strength<br>• Low Moisture Absorption   |
| Uses                      | • Automotive Applications<br>• Automotive Electronics<br>• Automotive Under the Hood<br>• Connectors<br>• Fuel Lines<br>• General Purpose<br>• Housings<br>• Industrial Applications  | • Industrial Parts<br>• Lawn & Garden Equipment<br>• Machine/Mechanical Parts<br>• Metal Replacement<br>• Power/Other Tools<br>• Thick-walled Parts<br>• Valves/Valve Parts |
| RoHS Compliance           | • RoHS Compliant  |   |
| Automotive Specifications | <ul style="list-style-type: none"> <li>• ASTM D4000 PA121 G45<sup>1</sup></li> <li>• ASTM D6779 PA121G45<sup>2</sup></li> <li>• BOSCH N28 BN05-OX1 BN0510-GF45-3Anf10SO Color: NT Natural</li> <li>• BOSCH N28 BN05-OX1 BN0510-GF45-3Asw01ISO Color: BK324 Black</li> <li>• DELPHI DCM4889 Color: BK324 Black</li> <li>• DELPHI DCM4889 Color: NT Natural</li> <li>• DELPHI M-6073 Color: BK324 Black</li> <li>• FORD WSK-M4D861-A2 Color: BK324 Black</li> <li>• FORD WSK-M4D861-A2 Color: NT Natural</li> <li>• ISO 1874 PA6T/6I/66, MH, 12-160, GF45 Color: BK324 Black</li> <li>• ISO 1874 PA6T/6I/66, MH, 12-160, GF45 Color: NT Natural</li> <li>• VALEO VMS-8108 Color: BK324 Black</li> </ul> |   |
| Appearance                | • Black   | • Natural Color   |
| Forms                     | • Pellets   |   |
| Processing Method         | • Injection Molding   |   |

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| Physical                          | Dry   | Conditioned | Unit              | Test method |
|-----------------------------------|-------|-------------|-------------------|-------------|
| Density                           | 1.56  | --          | g/cm <sup>3</sup> | ISO 1183/A  |
| Molding Shrinkage                 |       |             |                   | ASTM D955   |
| Flow                              | 0.20  | --          | %                 |             |
| Across Flow                       | 0.60  | --          | %                 |             |
| Water Absorption (24 hr)          | 0.12  | --          | %                 | ASTM D570   |
| Mechanical                        | Dry   | Conditioned | Unit              | Test method |
| Tensile Modulus                   |       |             |                   |             |
| --                                | 17200 | 17200       | MPa               | ASTM D638   |
| --                                | 16000 | --          | MPa               | ISO 527-1   |
| Tensile Strength                  |       |             |                   |             |
| Break                             | 259   | 228         | MPa               | ASTM D638   |
| Break                             | 263   | --          | MPa               | ISO 527-2   |
| Tensile Elongation                |       |             |                   |             |
| Break                             | 2.6   | 2.1         | %                 | ASTM D638   |
| Break                             | 2.7   | --          | %                 | ISO 527-2   |
| Flexural Modulus                  |       |             |                   |             |
| --                                | 13800 | 13800       | MPa               | ASTM D790   |
| --                                | 14800 | --          | MPa               | ISO 178     |
| Flexural Stress                   |       |             |                   |             |
| --                                | 376   | --          | MPa               | ISO 178     |
| Yield                             | 363   | 294         | MPa               | ASTM D790   |
| Compressive Strength              | 314   | 302         | MPa               | ASTM D695   |
| Shear Strength                    | 108   | 91.7        | MPa               | ASTM D732   |
| Poisson's Ratio                   | 0.41  | --          |                   | ASTM E132   |
| Impact                            | Dry   | Conditioned | Unit              | Test method |
| Charpy Notched Impact Strength    | 12    | --          | kJ/m <sup>2</sup> | ISO 179/1eA |
| Notched Izod Impact               |       |             |                   |             |
| --                                | 120   | 100         | J/m               | ASTM D256   |
| --                                | 14    | --          | kJ/m <sup>2</sup> | ISO 180/1A  |
| Unnotched Izod Impact             | 1300  | --          | J/m               | ASTM D4812  |
| Hardness                          | Dry   | Conditioned | Unit              | Test method |
| Rockwell Hardness (R-Scale)       | 125   | --          |                   | ASTM D785   |
| Thermal                           | Dry   | Conditioned | Unit              | Test method |
| Deflection Temperature Under Load |       |             |                   |             |
| 0.45 MPa, Annealed, 3.18 mm       | 301   | --          | °C                | ASTM D648   |
| 1.8 MPa, Unannealed               | 279   | --          | °C                | ISO 75-2/A  |
| 1.8 MPa, Annealed, 3.18 mm        | 287   | --          | °C                | ASTM D648   |
| Continuous Use Temperature        |       |             |                   | ASTM D3045  |
| -- <sup>3</sup>                   | 165   | --          | °C                |             |
| -- <sup>4</sup>                   | 185   | --          | °C                |             |

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| Thermal                   | Dry    | Conditioned | Unit     | Test method               |
|---------------------------|--------|-------------|----------|---------------------------|
| Melting Temperature       | 312    | --          | °C       | ISO 11357-3<br>ASTM D3418 |
| CLTE                      |        |             |          | ASTM E831                 |
| Flow : 0 to 100°C         | 1.4E-5 | --          | cm/cm/°C |                           |
| Flow : 160 to 249°C       | 1.1E-5 | --          | cm/cm/°C |                           |
| Transverse : 0 to 100°C   | 5.0E-5 | --          | cm/cm/°C |                           |
| Transverse : 160 to 249°C | 1.0E-4 | --          | cm/cm/°C |                           |

| Electrical                       | Dry     | Conditioned | Unit    | Test method |
|----------------------------------|---------|-------------|---------|-------------|
| Volume Resistivity               | 1.0E+16 | 2.0E+15     | ohms·cm | ASTM D257   |
| Dielectric Strength              | 22      | 22          | kV/mm   | ASTM D149   |
| Dielectric Constant              |         |             |         | ASTM D150   |
| 60 Hz                            | 4.60    | 4.90        |         |             |
| 1 MHz                            | 4.40    | 4.50        |         |             |
| Dissipation Factor               |         |             |         | ASTM D150   |
| 60 Hz                            | 5.0E-3  | 9.0E-3      |         |             |
| 1 MHz                            | 0.016   | 0.021       |         |             |
| Arc Resistance                   | 145     | 125         | sec     | ASTM D495   |
| Comparative Tracking Index (CTI) | 550     | 550         | V       | UL 746A     |

| Flammability                       | Dry | Conditioned | Unit | Test method |
|------------------------------------|-----|-------------|------|-------------|
| Flame Rating <sup>5</sup> (3.2 mm) | HB  | --          |      | UL 94       |

| Injection              | Dry            | Unit |
|------------------------|----------------|------|
| Drying Temperature     | 121            | °C   |
| Drying Time            | 4.0            | hr   |
| Suggested Max Moisture | 0.030 to 0.060 | %    |
| Hopper Temperature     | 79             | °C   |
| Rear Temperature       | 304 to 318     | °C   |
| Front Temperature      | 316 to 329     | °C   |
| Processing (Melt) Temp | 321 to 343     | °C   |
| Mold Temperature       | 135            | °C   |

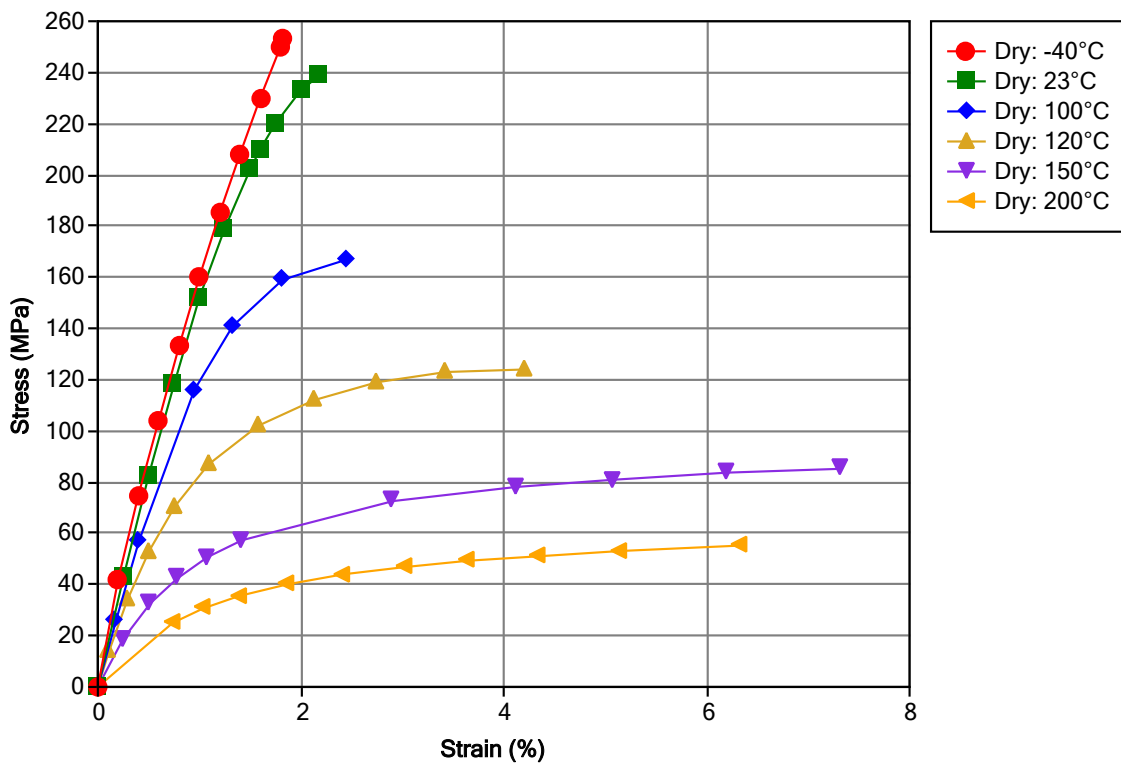
### Injection Notes

#### Storage:

- Amodel® compounds are shipped in moisture-resistant packages at moisture levels according to specifications. Sealed, undamaged bags should be preferably stored in a dry room at a maximum temperature of 50°C (122°F) and should be protected from possible damage. If only a portion of a package is used, the remaining material should be transferred into a sealable container. It is recommended that Amodel® resins be dried prior to molding following the recommendations found in this datasheet and/or in the Amodel® processing guide.

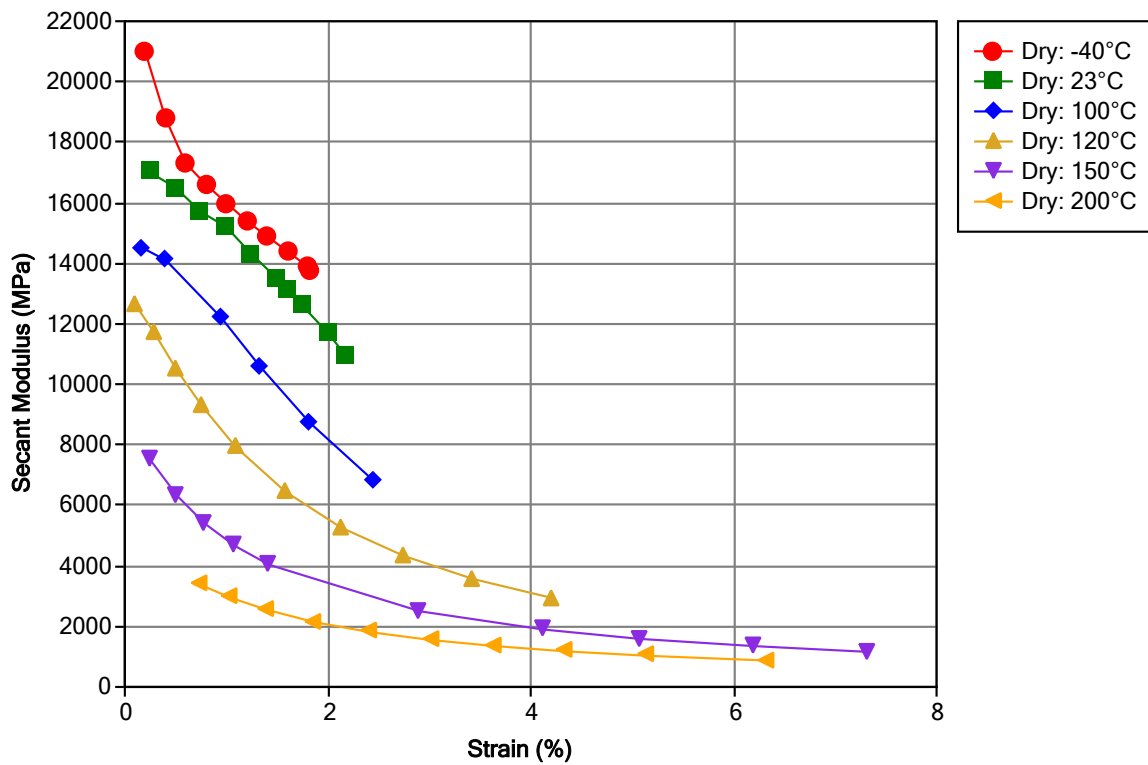
# Amodel® AS-1145 HS polyphthalamide

## Isothermal Stress vs. Strain (ISO 11403)



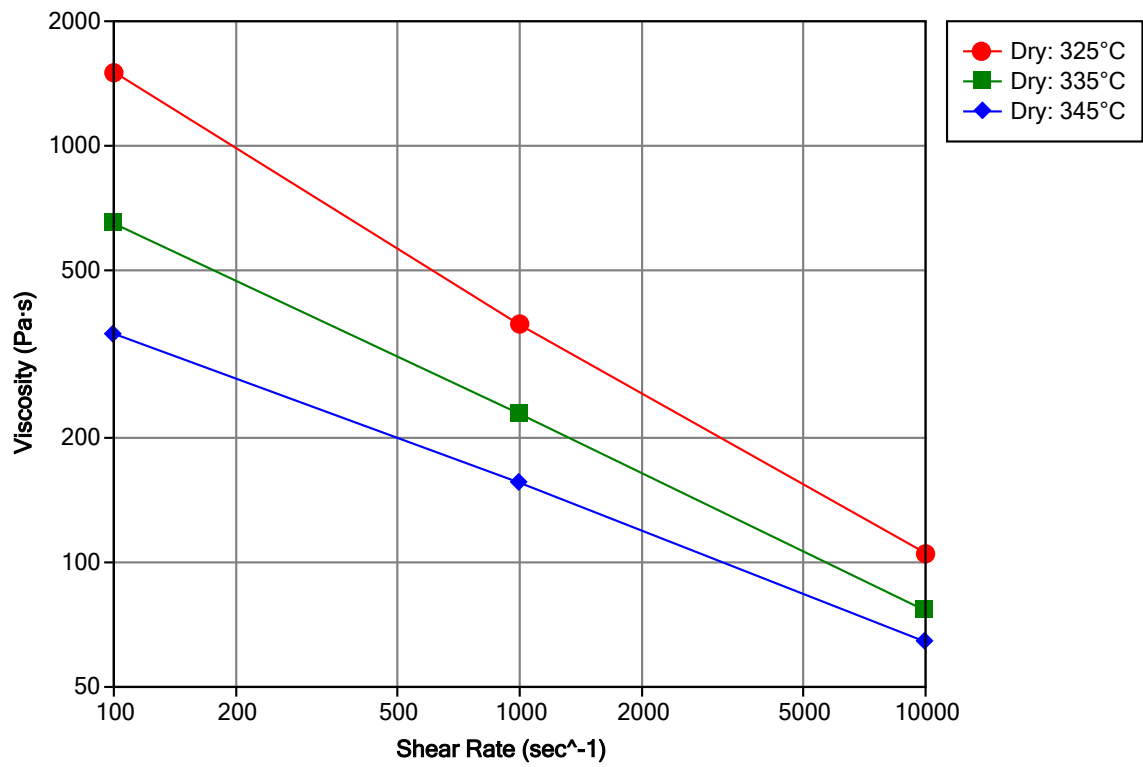
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## Secant Modulus vs. Strain (ISO 11403)



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## Viscosity vs. Shear Rate (ISO 11403)



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### Notes

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Typical properties: these are not to be construed as specifications.

<sup>1</sup> also represented as ASTM D5336 PPA0111 G45 GB156 KD220 KN135 PN085 YI265.

PPA0111 represents PPA polymer of Group 01 Class 1 and Grade 1 per ASTM D5336. G45 represents 45% glass filled and the other suffixes denote the mechanical properties of the compound.

<sup>2</sup> also represented as ASTM D5336 PPA0111 G45 GB156 KD220 KN135 PN085 YI265

PPA0111 represents PPA polymer of Group 01 Class 1 and Grade 1 per ASTM D5336. G45 represents 45% glass filled and the other suffixes denote the mechanical properties of the compound.

<sup>3</sup> 20000 hr

<sup>4</sup> 5000 hr

<sup>5</sup> These flammability ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions.

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