



POLYPROPYLENE (PP) SHEET, 30% CONTINUOUS GLASS FIBER REINFORCED

WSB-M4D619-A1

POLYPROPYLENE (PP) SHEET, 30% LONG GLASS FIBER REINFORCED

WSB-M4D619-A2

1. SCOPE

The materials defined by these specifications are sheets composed of homopolymer polypropylene matrix, with 30% by weight, continuous (WSB-M4D619-A1) or long (WSB-M4D619-A2) glass fiber reinforcement. The continuous reinforcement is arranged in a swirl pattern to give essentially isotropic properties. These sheets are specifically designed for thermo-plastic stamping.

2. APPLICATION

These specifications were released originally for material used to manufacture engine covers, load floors and battery trays.

3. REQUIREMENTS

Material specification requirements are to be used for initial qualification of materials.

3.0 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

Material suppliers and part producers must conform to the Company's Standard Requirements For Production Materials (WSS-M99P1111-A).

3.4 MOLDED TEST SPECIMEN

3.4.1 Preparation of Test Specimens

Unless otherwise specified all tests shall be carried out on test specimens machined from thermoformed test sheets.

The following dimensions are required:

- A. 150 min x 10 x 4.0 +/- 0.2 mm (Tensile Bar, ISO 3167)
- B. 120 x 10 x 4.0 +/- 0.2 mm

3.4.2 Glass Fiber Content 26 - 34%
(ISO 3451/1, Method A 1 h at 650 +/- 25 °C)

3.4.3 Density 1.01 - 1.19 g/cm³
(ISO 1183, Method A/ASTM D 792, Method A1)

3.4.4 Tensile Strength at Max Load min 48 MPa
(ISO R 527/ASTM D 638M, 150 min x 10 x 4.0
+/- 0.2 mm specimen, 5 mm/min test speed)

Date	Action	Revisions
2005 09 28	Revised	Inserted 3.0; Deleted 3.1, 3.2, 3.3, 3.6, 3.7 & 4
2000 10 26	Revised	Updated
1989 05 26	Released	NB00E100211051



ENGINEERING MATERIAL SPECIFICATION

WSB-M4D619-A1/A2

- 3.4.5 Flexural Modulus, min 2.5 GPa
(ISO 178/ASTM D 790M, Method I, Procedure A, 80 x 10 x 4.0 +/- 0.2 mm specimen, 64 mm support span)
- 3.4.6 Shear Modulus at 23 °C 975 - 1625 MPa
(ASTM D 4065, forced constant amplitude, fixed frequency of 1 Hz +/- 15%, strain level below 1%. Specimen approx. 60 x 10 x 4.0 +/- 0.2 mm cut from the center of specimen A.

Additionally, a Shear Modulus vs. Temperature curve shall be plotted for -50 to +140 °C temperature range, at 5 °C minimum intervals. The plotted curve must be within tolerance range shown on page 4.

- | | | A1 | A2 |
|---------|---|------|------|
| 3.4.7 | Impact Strength, Izod, kJ/m ² , min
(ISO 180, Method A/ASTM D 256, Method A, 63.5 x 10 x 4.0 +/- 0.2 mm specimen, 10 specimens for each test) | | |
| 3.4.7.1 | At 23 +/- 2 °C | 42.0 | 29.0 |
| 3.4.7.2 | At -40 +/- 2 °C | 42.0 | 42.0 |

The test specimens must be conditioned for minimum of 6 h at the above specified temperature prior to impact test. Low temperature testing shall be done within the cold box, if not possible, test can be conducted outside, but within 5 s.

- 3.4.8 Heat Deflection Temperature, min
(ISO 75/ASTM D 648, 120 x 10 x 4.0 +/- 0.2 mm specimen)
- | | | |
|---------|-------------|--------|
| 3.4.8.1 | At 1.82 Mpa | 120 °C |
| 3.4.8.2 | At 0.45 Mpa | 155 °C |
- 3.4.9 Heat Aging Performance
(ISO 188/ASTM D 573, 1000 h at 125 +/- 2 °C. Unaged property values shall be determined at the time of the aged properties determination)
- | | | |
|---------|--|---------|
| 3.4.9.1 | Tensile Strength Change
(Test Method per para 3.5.3) | +/- 15% |
| 3.4.9.2 | Impact Strength, Izod Change, max
(Test Method per para 3.5.6.1, specimens to be notched before heat aging) | -15% |

3.5 FLAMMABILITY (ISO 3795)

Burn Rate, max 100 mm/minute

The specimen size required for material approval is 355 x 100 x 3.2 +/- 0.1 mm with a smooth surface.