



POLYETHYLENE (PE), MOLDING COMPOUND, HIGH DENSITY, 100% PCR RESIN, INTERIOR

WRS-M4D145-B2

1. SCOPE

The material defined by this specification is a polyethylene molding compound with high density and low melt flow rate. The material is 100% Post Consumer Recycled (PCR).

2. APPLICATION

This specification was released originally for materials used for Instrument Panel ducts.

2.1 LIMITATIONS

This material should not be used for fuel tank applications.

3. REQUIREMENTS

3.1 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

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

- 3.1.1 Many 4D resin specifications prior to 2011, identified certain requirements with the symbol (s), which indicated that the mean and +/- 3 sigma values were to be reported. The specification minimum, maximum or range was established using 3 sigma data. For 2011 and beyond, refer to Table 1 for number of samples required for each test.
- 3.1.2 The use of regrind is permitted, for economic / environmental reasons, with compliance as indicated in Ford Engineering CAD and Drafting Standard E-4.
- 3.1.3 Materials used in interior applications must meet the requirements outlined in WSS-M99P2222-D1/Latest, *Performance, and Vehicle Interior Environment Quality Material/Component Requirements*. Data must be included in material submission package.
- 3.1.4 Performance Criteria:
Parts using this specification shall meet the appropriate performance specifications, WSS-M15P4-F/Latest.

3.2 SAMPLE PREPARATION

Unless otherwise specified all tests shall be carried out on injection molded, one-end gated test specimens. The test specimens A and D shall be molded using molding conditions defined in ISO 294. No annealing is allowed. See Table 1 for the number of samples required.

Date	Action	Revisions	Rev. 0
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Documents

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Specimens shall be as follows:

Specimen A	150 minimum x 10 x 4.0 +/- 0.2 mm (ISO 527-2, Specimen Type 1A)
Specimen B	355 x 100 x 1.0 +/- 0.1 mm (ISO 3795)
Specimen C	145 x 60 x 3.2 +/- 0.2 mm
Specimen D	Center of Specimen A, 80 x 10 x 4.0 +/- 0.2 mm
Specimen E	100 mm diameter x 3.2 mm
Specimen F	80 mm diameter x 3.2 mm
Specimen G	90 mm x 200 mm
Specimen H	50 +/- 1 mm diameter x 3.2 +/- 0.2 mm
Specimen I	100 mm x 150 mm, min

3.3 MATERIAL PROPERTIES

3.3.1	Melt Flow Rate (ISO 1133 190 °C, 2.16kg)	0.6 g/10 minutes max
3.3.2	Density (ISO 1183, Method A)	0.95 - 0.98 g/cm ³
3.3.3	Tensile Strength at Yield (ISO 527-1 and ISO 527-2, Specimen A, 50 mm/minute test speed)	20 MPa min
3.3.4	Elongation at Yield (ISO 527-1 & ISO 527-2, Specimen A, 50 mm/minute test speed)	2.0 % min
3.3.5	Tensile Modulus (ISO 527-1 and ISO 527-2, Specimen A, 1 mm/minute test speed)	0.7 GPa min
3.3.6	Flexural Modulus (ISO 178, Specimen D, 64 mm support span, 2 mm/minute test speed)	0.7 GPa min
3.3.7	Impact Strength, Notched Charpy (ISO 179-1/1eA, Specimen D)	
3.3.7.1	At 23 +/- 2 °C	11 kJ/m ² min Report Break Type
3.3.7.2	At -40 +/- 2 °C	6 kJ/m ² min Report Break Type

The test specimen must be conditioned for minimum of 6 hours at the above specified temperature prior to impact test. Low temperature testing shall be done within the cold chamber, if not possible, test may be conducted outside, but within 5 seconds.

3.3.8	Heat Deflection Temperature (ISO 75-1 and ISO 75-2, Specimen D, flatwise, 0.34 +/- 0.1 mm deflection. At 1.80 MPa)	32 °C min
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