



THERMOPLASTIC POLYOLEFIN ELASTOMER MOLDING COMPOUND, 90% PCR AND/OR PIR CONTENT, NON_VISIBLE EXTERIOR / UNDERBODY

WRS-M4D911-B2

1. SCOPE

The material defined by this specification is an unfilled high impact modified injection molding compound based on 90% recycled thermoplastic polyolefin elastomer.

2. APPLICATION

This specification was released originally for materials containing post consumer and/or post industrial recycled content, used for underbody shields, wheel liners and/or other non visible applications.

2.1 LIMITATIONS

Material approved to WRS-M4D911-B2 does not contain UV stabilizers, therefore long term exposure to direct sunlight could cause chalking and loss of gloss, and must not be used for visible (mold-in-color or painted) 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 to establish specification limits.

3.1.2 Material approved to WRS-M4D911-B2 must contain 90% Post Consumer Recycled (PCR) and/or Post Industrial Recycled (PIR) content as defined by WRS-M99P42-A1. The remaining portion of the material can come from virgin sources.

3.1.3 Recycled Content and Type (PCR and/or PIR) REPORT % and Type

3.1.4 The use of regrind is permitted for economic and environmental reasons with compliance as indicated in WSS-M99P1111-A.

3.1.5 Performance Criteria

Parts using this specification shall meet the appropriate performance specification, WSS-M15P50-B or latest. Production level materials must be used in preparing test parts / panels. The use of improper sample prep materials can influence test results.

Parts must fulfill applicable SDS/CDS requirements.

Date	Action	Revisions	Rev. 1
2011 10 04	Revised	Editorial changes to 3.1.2 and the title	
2011 06 01	Activated		



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 1873-2. No annealing is allowed. See Tables 1 and 2 for the number of samples required.

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	Density (ISO 1183, Method A)	0.90 – 0.93 g/cm ³
3.3.2	Hardness, Durometer D (ISO 868, 15 s dwell)	53 – 62
3.3.3	Tensile Strength at Yield (ISO 527-1 & ISO 527-2, Specimen A, test speed: 50 mm/minute)	18 MPa min
3.3.4	Elongation at Yield (ISO 527-1 & ISO 527-2, Specimen A, 50 mm/minute test speed)	12 % min
3.3.5	Tensile Modulus (ISO 527-1 & ISO 527-2, Specimen A, 1 mm/minute test speed)	800 - 1100 MPa
3.3.6	Flexural Modulus (ISO 178, Specimen D, 64 mm support span, 2 mm/minute test speed)	800 - 1000 MPa
3.3.7	Impact Strength, Notched Izod (ISO 180/1A, Specimen D)	
3.3.7.1	At 23 +/- 2 °C	41 kJ/m ² , min Partial Break
3.3.7.2	At -40 +/- 2 °C	2.5 kJ/m ² , min Complete Break
3.3.7.3	At 0 +/- 2 °C	9.0 kJ/m ² , min Complete Break, Some partial breaks