



POLYPROPYLENE (PP), COPOLYMER, 10% RICE HULL FILLED, MOLDING COMPOUND, RECYCLED GRADE 25% PCR AND/OR PIR CONTENT

WRS-M4D1022-A1

POLYPROPYLENE (PP), COPOLYMER, 10% RICE HULL FILLED, MOLDING COMPOUND, RECYCLED GRADE 90% PCR AND/OR PIR CONTENT

WRS-M4D1022-A2

1. SCOPE

The materials defined by this specification are 10% rice hull filled injection molding compound based on a polypropylene.

2. APPLICATION

This specification was released originally for materials containing post-consumer or post-industrial recycled content and rice hulls for non-visual applications such as electrical module brackets.

2.1 LIMITATIONS

This material may not be used for visible applications as it is not UV stable. The material may not be used for underhood applications as it is not chemical resistant.

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 Material must be processed per Global Manufacturing Standard IMS01 - Control of Plastic Injection Molding Processes. Contact Materials Engineering for latest copy.
- 3.1.2 WRS-M4D1022-A1 must contain 25% and WRS-M4D1022-A2 must contain 90% Post-Consumer Recycled (PCR) and/or Post Industrial Recycled (PIR) content as defined by WRS-M99P42-A1.
- 3.1.3 The use of regrind is not permitted.
- 3.1.4 Materials used in interior applications must meet the requirements outlined in WSS-M99P2222-D1/Latest, *Performance, Vehicle Interior Environment Quality Material/Component Requirements*. Data must be included in material submission package.
- 3.1.5 Performance Criteria:
Interior applications using WSS-M4D1022-A1/A2 must comply with all the requirements of WSS-M15P4-F/Latest plus DV and PV testing.

Date	Action	Revisions	Rev. 01
2014 03 12	Released	WRS-M4D1022-A2 Released	M. Gramlich NA
2013 03 05	Activated	A1 released 2013 03 05, A2 released 2014	M. Gramlich NA



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 Table 1 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 – 1.00 g/cm ³
3.3.2	Tensile Strength at Yield (ISO 527-1 and ISO 527-2, Specimen A, 50 mm/minute test speed)	18 MPa min
3.3.3	Elongation at Yield (ISO 527-1 and ISO 527-2, Specimen A, 50 mm/minute test speed)	3.5 % min
3.3.4	Tensile Modulus (ISO 527-1 and ISO 527-2, Specimen A, 1 mm/minute test speed)	800 MPa min
3.3.5	Flexural Modulus (ISO 178, Specimen D, 64 mm support span, 2 mm/minute test speed)	750 MPa min
3.3.6	Impact Strength, Notched Charpy (ISO 179-1/1eA, Specimen D)	
3.3.6.1	At 23 +/- 2 °C	8 kJ/m ² min Report Break Type
3.3.7	Heat Deflection Temperature (ISO 75-1 and ISO 75-2, Specimen D, flatwise, 0.34 +/- 0.1 mm deflection. At 1.80 MPa)	50 °C min