



POLYPROPYLENE (PP) 15% GLASS FILLED BLOW MOLDABLE MOLDING COMPOUND

WSS-M4D994-A2

1. SCOPE

The material defined by this specification is a 15% glass filled blow moldable thermoplastic molding compound based on polypropylene.

2. APPLICATION

This specification was released originally for material used for ducts in the air induction system.

2.1 LIMITATIONS

This material has low impact resistance at low temperatures. This material does not contain UV stabilizers, long term exposure to direct sunlight will cause chalking and loss of gloss.

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 This specification is based on virgin materials, however materials with recycled content as defined by WRS-M99P42-A1 (post-consumer and/or postindustrial recyclates and repolymerised recycled materials) should be used whenever technically feasible and following all materials and PV testing required by Ford Materials Engineering.
- 3.1.3 The use of regrind is permitted, for economic / environmental reasons, with compliance as indicated in Ford Engineering CAD and Drafting Standard E-4
- 3.1.4 Performance Criteria:
Parts using this specification shall meet the appropriate performance specifications, WSS-M15P50-B.

Date	Action	Revisions	Rev. 1
2015 01 30	Revised	See Summary of Revisions	G. Kowalski, NA
2013 04 10		Released	G. Kowalski, NA



- 3.1.5 As specified in WSS-M99P1111-A, paragraph 3.2, Ford Materials Engineering may request a Control Plan and Certificate of Analysis (CoA) containing lot testing requirements which must include, but are not limited to:
- Melt Flow Rate
 - Filler Content
 - Impact Strength, Notched Charpy at 23°C
 - Flexural Modulus

3.2 SAMPLE PREPARATION

Unless otherwise specified all tests shall be carried out on test specimens cut (in accordance with the ISO methods specified) from blow molded parts. Specimens are tested with the as-molded thickness of the part and are not machined to meet the thickness requirements of the Standard Test Methods except where necessary for fixturing. Greater variation in test values can be anticipated when evaluating materials that are thinner than recommended by an applicable Industry Standard/Test Method. The test specimens A and D shall be molded using molding conditions defined in ISO 1873-2. 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	Melt Flow Rate (ISO 1133 230 °C, 2.16 kg)	0.5 – 1.3 g/10 minutes
3.3.2	Filler Content (ISO 3451-1, Method A, glass filler, 1 h at 600 +/- 25°C)	12 - 18 %
3.3.3	Density (ISO 1183, Method A)	0.99 – 1.01 g/cm ³
3.3.4	Tensile Strength at Break (ISO 527-1 and ISO 527-2, Specimen A, 50 mm/minute test speed)	38 MPa min
3.3.5	Tensile Modulus (ISO 527-1 and ISO 527-2, Specimen A, 1 mm/minute test speed)	2.2 GPa min
3.3.6	Flexural Modulus (ISO 178, Specimen D, 64 mm support span, 2 mm/minute test speed)	2.2 GPa min