



**POLYCARBONATE/ACRYLONITRILE BUTADIENE STYRENE ABS BLEND
(PC+ABS) PLATING GRADE MOLDING COMPOUND, EXTERIOR**

WSS-M4D813-B1

**POLYCARBONATE/ACRYLONITRILE BUTADIENE STYRENE ABS BLEND
(PC+ABS) PLATING GRADE MOLDING COMPOUND, INTERIOR**

WSS-M4D813-B2

1. SCOPE

The material defined by this specification is a plateable grade high impact thermoplastic molding compound based on a polycarbonate + acrylonitrile/butadiene/styrene (PC+ABS) blend.

2. APPLICATION

WSS-M4D813-B1 - This specification was released originally for material used for exterior chromium plated components.

WSS-M4D813-B2 - This specification was released originally for material used for interior chromium plated components.

2.1 LIMITATIONS

This material should be evaluated for potential incompatibility due to susceptibility for stress cracking with other materials that they may come in contact with. Refer to the appropriate performance specification.

This material does not contain UV stabilizers, long term exposure to direct sunlight will cause chalking and loss of gloss.

3. REQUIREMENTS

3.1 APPROVED SOURCES

This specification requires the use of approved sources. Only the sources identified on the Ford Approved Source List (ASL) can be used when this specification is listed on the drawing, CAD file, or other documents. The list of approved sources is located within Ford at www.mats.ford.com or available externally through a Ford Materials Engineer.

3.2 CONDITIONING AND TEST CONDITIONS

All test values are based on material conditioned for not less than 24 h prior to testing in a controlled environment of 23 +/- 2 °C and 50 +/- 5% relative humidity. Testing of the material should occur in the conditioning environment or soon after removal.

3.3 INFRARED SPECTROPHOTOMETRY AND/OR THERMAL ANALYSIS

IR spectra and thermograms from initial material approval shall constitute the reference standard and shall be kept on file at the designated material laboratory. The material supplier shall ensure that all future material supplied to the specification shall produce IR spectra and thermograms that correspond to the reference standard when tested under the same conditions.

Date	Action	Revisions	Rev. 02
2016 01 20	Revised	see summary of revisions	M. Corley, EU
2012 10 09	Revised	Corrected specification typo in section 3.1.2	
2012 07 23	Activated		M. Granich, UK

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3.4 STANDARD REQUIREMENTS FOR PRODUCTION MATERIALS

- 3.4.1 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.
- 3.4.2 This specification is based on virgin material and does not allow the addition of recycled content (PIR/PCR).
- 3.4.3 For WSS-M4D813-B2 only: 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.
- 3.4.4 Materials requiring High Strain Rate, Creep or fiber oriented Tensile Modulus must test to the requirements of WSS-M99D68-A1/Latest, Thermoplastic Property Determination For CAE, High Strain Rate Tensile, Creep and Tensile Modulus. Data must be included in the material submission package.
- 3.4.5 Performance Criteria:
Parts using this specification shall meet the appropriate performance specifications, WSS-M1P83-E1/Latest. Parts must fulfill applicable SDS/CDS requirements.
- 3.4.6 Ford Materials Engineering may request a Control Plan and Certificate of Analysis (C of A) containing lot testing requirements which must include, but are not limited to:

Melt Flow Rate
Impact Strength, Notched Charpy at 23 °C
Flexural Modulus

3.5 SAMPLE PREPARATION

All tests shall be carried out on production materials manufactured from the production process unless correlation to a non-production process has been reviewed and approved by Ford Materials Engineering.

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 2580-2* 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
Specimen C	145 x 60 x 3.2 +/- 0.2 mm
Specimen D	80 x 10 x 4.0 +/- 0.2 mm (may be cut from the center of Specimen A)
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

**3.6 MATERIAL PROPERTIES**

- 3.6.1 Melt Flow Rate 10 g/10 minutes min
(ISO 1133 260 °C, 5.0 kg)

The material shall be dried for 4 h minimum at 105 °C in a mechanical convection oven immediately preceding the test.

- 3.6.2 Density 1.06 – 1.14 g/cm³
(ISO 1183, Method A)

- 3.6.3 Tensile Strength at Yield 42 MPa min
(ISO 527-1 and ISO 527-2, Specimen A,
50 mm/minute test speed)

- 3.6.4 Elongation at Yield 3.5 % min
(ISO 527-1 and ISO 527-2, Specimen A,
50 mm/minute test speed)

- 3.6.5 Tensile Modulus 1.7 GPa min
(ISO 527-1 and ISO 527-2, Specimen A
1 mm/minute test speed)

- 3.6.6 Flexural Modulus 1.8 GPa min
(ISO 178, Specimen D,
64 mm support span, 2 mm/minute test speed)

- 3.6.7. Impact Strength, Notched Charpy
(ISO 179-1/1eA, Specimen D)

3.6.7.1 At 23 +/- 2 °C 25 kJ/m² min
Report Break Type

3.6.7.2 At -40 +/- 2 °C 11 kJ/m² 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. Test specimens must be reviewed by Materials Engineering.

- 3.6.8 Heat Deflection Temperature 89 °C min
(ISO 75-1 and ISO 75-2, Specimen D, flatwise,
Bath – silicone oil, 0.34 +/- 0.1 mm deflection.
At 1.80 MPa)

All specimens dry as molded. If not tested immediately after molding, specimens must be stored in a sealed, moisture-proof container filled with silica gel.

- 3.6.9 Vicat Softening Temperature 107 °C min
(ISO 306, Method B50, Specimen D,
Bath - silicone oil)

All specimens dry as molded. If not tested immediately after molding, specimens must be stored in a sealed, moisture-proof container filled with silica gel.