

**ACRYLONITRILE STYRENE ACRYLATE (ASA), MOLDED IN COLOR,
MOLDING COMPOUND, LOW GLOSS, EXTERIOR****WSS-M4D833-B1****1. SCOPE**

The material defined by this specification is a molding compound based on acrylonitrile-styrene-acrylate (ASA). This material is a UV stabilized resin for parts that require good surface appearance and weather resistance for low gloss exterior applications.

2. APPLICATION

This specification was released originally for material used for low gloss exterior molded in color applications.

2.1 LIMITATIONS

This material is not suitable for exterior mold in color applications with any gloss level above 20 due to not meeting weatherability requirements.

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.

Molders not on the CMB program or regions without CMB are required to use materials as listed in the Ford Approved Source List (www.mats.ford.com), and are also encouraged to use the CMB 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.

Approval of new sources requires the completion of the latest version of the FMD template. Data should be submitted at the time as the specification data package. Only one FMD package is required per trade name approved, FMD is not required for each manufacturing site. FMD is required for new site approvals that do not have an existing FMD record.

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

Date	Action	Revisions	Rev 05
2017 07 26	Revised	See Summary of Revisions	M. Katz, NA
2016 10 26	Revised	See Summary of Revisions	S. Werne, EU
2013 02 18	Released		M. Gramlich, NA



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.

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 values. For 2011 and beyond, refer to Table 1 for number of samples required for each test.
- 3.4.2 This specification is based on virgin material and does not allow the addition of recycled content (PIR/PCR).
- 3.4.3 The use of regrind is permitted, for economic / environmental reasons. Part manufacturers using this specification must complete DV and PV testing with the allowable amount of regrind and the maximum allowable regrind content must be specified on the engineering drawing. Any changes to what is specified on the drawing (no specific amount implies zero regrind) must be approved by Materials and PD Engineering through the formal Ford Motor Company process (SREA) or Engineering Notice.
- 3.4.4 Performance Criteria:
Parts using this specification shall meet the appropriate performance specifications, WSS-M98P13-E/Latest. Parts must fulfill applicable SDS/CDS requirements.
- 3.4.5 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 6402-02. No annealing is allowed. See Table 1 and 2 for the number of specimens 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

**3.6 APPEARANCE****3.6.1 Accelerated Weathering Resistance**

3.6.1.1 Standard Practice for Xenon Arc Exposure Test with Enhanced Light and Water Exposure for Transportation Coatings Requirements per Table
(ASTM D7869, Use an ungrained, non-polished, tool to prepare specimens with gloss code G, ISO 105-A02/AATCC Evaluation Procedure 1)

or

3.6.1.2 Performance Based Standard for Accelerated Exposure of Automotive Exterior Materials Using Controlled Irradiance Xenon-Arc Apparatus Requirements per Table
(Boro/Boro, SAE J2527, Atlas Water Cooled, Rotary Drum Xenon-Arc Apparatus only. Modified Type "S" borosilicate inner and outer filters, 0.55 W/m² radiant exposure monitored at 340 nm, Specimen C, gloss code G, SO 105-A02/AATCC Evaluation Procedure 1)

Type	ASTM D7869 (preferred)	SAE J2527 Boro/Boro	Requirements
New Color	2250 h	3000 h	Fade Resistance: Rating 4 min There shall be no cracking, crazing, dulling, or other deterioration. Any non-uniformity of the surface may be cause for rejection and must be brought to Ford Materials Engineering for review. A&B Gloss Materials: Gloss Change 25% max (FLTM BI 110-01)
*New Material Supplier or New	2250 h	3000 h	Fade Resistance: Rating 4 min There shall be no cracking, crazing, dulling, or other deterioration. Any non-uniformity of the surface may be cause for rejection and must be brought to Ford Materials Engineering for review. A&B Gloss Materials: Gloss Change 25% max (FLTM BI 110-01)