



Material Name

Specification Number

ENAMEL, WATERBORNE, THERMOSET BASECOAT, BASECOAT/CLEARCOAT WET-ON-WET PROCESS WITH WSB-M33J5-A2, ETCH RESISTANT - EXTERIOR	WSB-M33J5-A1
ENAMEL, COMPLIANCE VOC, THERMOSET CLEARCOAT, BASECOAT/CLEARCOAT WET-ON-WET PROCESS WITH WSB-M33J5-A1, ETCH RESISTANT - EXTERIOR	WSB-M33J5-A2
ENAMEL, COMPLIANCE VOC, THERMOSET CLEARCOAT, WET-ON WET-WITH ESB-M36J1-A1 AND ESB-M36J1-A4	WSB-M33J5-A3
ENAMEL, WATERBORNE, THERMOSET BASECOAT, BASECOAT/CLEARCOAT WET-ON-WET PROCESS WITH WSB-M33J5-A5, ETCH RESISTANT, REDUCED VISCOSITY - EXTERIOR	WSB-M33J5-A4
ENAMEL, COMPLIANCE VOC, THERMOSET CLEARCOAT BASECOAT/CLEARCOAT WET-ON-WET PROCESS WITH WSB-M33J5-A4, ETCH RESISTANT, REDUCED VISCOSITY - EXTERIOR	WSB-M33J5-A5
ENAMEL, COMPLIANCE VOC, THERMOSET TINTED CLEARCOAT, BASECOAT/CLEARCOAT WET-ON-WET PROCESS WITH WSB-M33J5-A1, ETCH RESISTANT - EXTERIOR	WSB-M33J5-B1
ENAMEL, COMPLIANCE VOC, THERMOSET TINTED CLEARCOAT, ETCH RESISTANT, WET-ON-WET WITH WSB-M33J5-A1 AND ESB-M36J1-C1	WSB-M33J5-B2
ENAMEL, COMPLIANCE VOC, THERMOSET TINTED CLEARCOAT, BASECOAT/CLEARCOAT WET-ON-WET PROCESS WITH WSB-M33J5-A4, ETCH RESISTANT, REDUCED VISCOSITY - EXTERIOR	WSB-M33J5-B3

1. SCOPE

The materials defined by these specifications are coatings with low volatile organic compounds (VOC) content, which consist of a pigmented waterborne thermoset basecoat enamel over which is applied a clear or tinted clear high solids thermoset etch-resistant clearcoat in a wet-on-wet process. These materials are monobaked. Unique tricoat colors are also included in this specification. Tricoat colors consist of a pigmented basecoat followed by a non-hiding midcoat over which is applied a clear or tinted clear. Tricoat colors may be processed wet-on-wet-on-wet application and monobaked or in a wet on bake operation.

Date	Action	Changes
1996 06 07	Revised	Upd & Rev para 5.3.2-5.3.4 E.Nunez M.Perchard
1995 01 06	NB00E10090373005	Released N. Daniels

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2. APPLICATION

These specifications were released originally for materials used as the topcoat finish on automobile bodies, hoods, fenders and other exterior parts, and shall be satisfactory for use over specified primers, or over previously baked enamel, as in paint repair or two toning operations. The basecoat portion is used alone, without clearcoat, as an interior baking enamel for some applications.

WSB-M33J5-A1, -A2, -A3, -B1, and -B2

The materials defined by these specifications are supplied at normal viscosity and solids level as shown in this document.

WSB-M33J5-A4, -A5, and -B3

The materials defined by these specifications are supplied with reduced viscosities such that they are ready for use in the assembly plants. The reduced viscosities and associated reduced solids levels shall be agreed upon by the supplier, the affected assembly plant, Body and Assembly Paint Operations and NAAO Production Purchasing prior to delivery of the materials to the respective assembly plant. The materials shall meet all other requirements of the respective parent ("A1", "A2", "B2" and "B3", "C1", "C2", etc. level) specifications.

3. REQUIREMENTS

Test shall be made on the basis of comparison with approved production material applied and tested under identical conditions.

Note: For purposes of the specification, paint systems which utilize a standard basecoat/clearcoat, a basecoat/midcoat/clearcoat and/or a system with a tinted clearcoat shall be considered the "complete basecoat/clearcoat enamel system". For basecoat-only applications refer to para 3.9.

3.1 QUALITY SYSTEM REQUIREMENTS

Material suppliers and part producers must conform to Quality System Requirements, QS-9000. Material specification requirements are to be used for initial qualification of materials. A Control Plan for ongoing production verification is required. This plan must be reviewed and approved by the relevant Ford Materials activity and/or Ford Supplier Technical Assistance (STA) prior to production parts submission. Appropriate statistical tools must be used to analyze process/product data and assure consistent processing of the materials.

Part producers using this material in their products, must use Ford approved materials and must conform to a process control plan which has been approved by STA and/or the relevant Materials Activity.



3.2 COMPOSITION

The materials defined in this specification shall be non-bleeding, thermosetting resin systems. They shall contain suitable ultraviolet light absorbers to retain initial appearance and resistance properties over long-term, in addition to the following respective properties.

Basecoats shall contain non-bleeding pigments and provide good adhesion to primer and be compatible with the clearcoats.

Midcoat shall provide good adhesion to both baked and wet basecoat, and be compatible with the clearcoats.

Clearcoat and tinted clearcoats WSB-M33J5-A3 and -B2, formulated to be compatible with two-component urethane clearcoat, ESB-M36J1-A4 will be identical in performance to WSB-M33J5-A2. The clearcoat will be used only for cut-in at door openings, inside hood and trunk, prior to the two-component urethane clearcoat application.

3.2.1 Specific Composition

The supplier will furnish such data upon request.

3.2.2 Volatile Components

The proportions of solvents shall be so formulated that the enamel will level out satisfactorily without sagging, popping, or roughness after baking, and give satisfactory adhesion when the enamel is applied over a previously baked coat of the enamel.

3.2.5.1 Resistivity 0.05 to 4.00 megaohms

The resistivity at application viscosity shall be within specified limits.

3.3 PHYSICAL PROPERTIES

3.3.1 Volume Non-Volatile Content (at application viscosity)

The volume solids at application viscosity shall be calculated using the manufacturer's formula.

3.3.1.1 Pigmented Basecoat and Midcoat 22 % min
(Weighted average of all
basecoats used in the
production facility)

3.3.1.2 Pigment in Tinted Clearcoat 0.5 % max

3.3.1.3 Clearcoat/Tinted Clearcoat 49 % min



3.3.2 Viscosity (FLTM BI 111-01)

The viscosity of the materials defined in these specifications shall be within $\pm 15\%$ of that shown on the initial sample report, using a #4 Ford Cup at $26 \pm 1^\circ\text{C}$.

Note: At application viscosity, the enamels shall be in compliance with VOC requirements at the facilities where being implemented.

3.3.3 Viscosity Stability

3.3.3.1 Shelf Stability (90 days at room temperature)

3.3.3.2 Accelerated Shelf Stability

The basecoat materials identified in this specification shall be free of settling which cannot be dispersed by normal agitation, no more than a 15 s increase in viscosity on a #4 Ford cup is permitted. The clearcoats/tinted clearcoats shall not become turbid after testing, and no more than 12 s increase in viscosity on a #4 Ford Cup is not permitted.

3.4 TEST PANEL PREPARATION AND TESTING REQUIREMENTS

See Section 5.2

3.5 APPEARANCE

Note: Appearance panels should be sprayed out using standard plant processing parameters.

3.5.1 Color (FLTM BI 109-01 + X-Rite)

Shall match the Ford master panel after all the baking cycles in para 5.2.1.

3.5.2 Gloss, All Colors, min 90 (FLTM BI 110-01, 20 deg Glossmeter)

3.5.3 Gloss After Rebake (FLTM BI 110-01, 20 deg Glossmeter)

No more than 4 units decrease in gloss is permitted when rebaked per para 5.2.1.

3.5.4 Distinctness of Image, min 70 (FLTM BI 10-3)



3.5.5 General

The enamel shall cure to a presentable, serviceable, mar-resistant film showing no craters, pinholing, seediness, abnormal roughness or excessive metallic mottling. It shall have reasonable tolerance for ordinary cleaning (such as automatic car washes) and exhibit excellent polishing characteristics when wheel polished with a wide range of various compounds and cleaners.

3.6 FILM PROPERTIES

3.6.1 Dry Hiding
(FLTM BI 158-01)

3.6.1.1 Pigmented Basecoat 15-25 micrometre*

* When an exception to this hiding requirement is needed for special colors, concurrence must be obtained from all affected Ford activities.

The basecoat is required to provide complete visual hiding over a black and gray straight-line hiding chart.

3.6.1.1.1 Gloss of Black and Gray Stripes
(FLTM BI 110-01, 20 deg glossmeter)

Black Stripe 30 +/- 5

Gray Stripe 30 +/- 5

3.6.1.2 Pigmented Midcoat

The pigmentation of the midcoat shall be formulated so that hiding of the pigmented basecoat does not occur.

3.6.2 Ultraviolet Light Transmittance

There shall be a maximum light transmittance of 0.1 % when measured at 360 & 400 nm through a basecoat film thickness such that 80 % of dry hiding is obtained when applied directly over electrocoat primer. When applied over epoxy-free spray primer the maximum light transmittance shall be 5.0 %. The equipment used for this measurement is a Lambda 6 Integrating Sphere spectrophotometer. Nonfortified (W/O UV pkg) clearcoat is used for this evaluation.

3.6.3 Hardness, min (Clearcoat WSB-M33J5-A2, 7.5 KHN
-A5, -B1, and -B3)
(FLTM BI 112-02)



3.6.4 Adhesion

3.6.4.1 Scratch Test (FLTM BI 106-01, Part A)

No chipping or loss of adhesion between any layer of the basecoat/clearcoat system is permitted.

Scribe Test (FLTM BI 106-01, Part B)

Occurrence of flaking, chipping or peeling shall not exceed Grade 2 of test method. No delamination, peeling or loss of adhesion between any layer of the basecoat/clearcoat system is permitted.

3.6.5 Polishing

Shall be capable of being sanded and polished, or polished only, to minimize orange peel or to remove defects. No noticeable change in gloss or appearance except for a minimum of polishing lines is permitted. Deep polishing lines or swirl marks are not acceptable.

3.7 REPAIR REQUIREMENTS

3.7.1 Repair Color Match (FLTM BI 115-01 + X-Rite)

Conduct test as described in Method. There shall be a satisfactory color match of the repair film to both the rebaked original coating and to the panel prepared using only one standard bake.

3.7.2 Repair Adhesion, Catalyzed (FLTM BI 106-01, Part B)

Chipping, flaking or loss of adhesion shall not exceed Grade 2 of the Test Method. No delamination between any layer of the basecoat/clearcoat enamel system is permitted.

3.7.2.1 Hardness, min 7.5 KHN (Clearcoat WSB-M33J5-A2, -A5, -B1, and -B3) (FLTM BI 112-02)

3.7.3 Flash Primer Repair (Per ESB-M6J111-C)

Material shall perform over Flash Primer as defined in ESB-M6J111-C.



3.7.4 Polishing

The catalyzed repair film shall be capable of being sanded and polished, or polished only, to minimize orange peel or to remove defects. No noticeable change in gloss or appearance except for a minimum of polishing lines is permitted. Deep polishing lines or swirl marks are not acceptable.

3.8 RESISTANCE PROPERTIES FOR EXTERIOR APPLICATIONS

Note: The following requirements apply to both the standard film and catalyzed repair film.

3.8.1 Condensing Water Vapor (FLTM BI 4-2 Method A, 240 h)

Evaluate panels after 120 h, and continue testing to 240 h. After panels are removed from apparatus and wiped dry, an "X", 30 mm high by 20 mm wide, to be located at the center of panel and 50 mm from the bottom, is scribed. The scribed "X" is then tape-pulled with 3M brand 898-2 tape. Evaluate panels no less than 5 minutes and no more than 10 minutes after removal from test, as the effects from water exposure can change within a short time. Remove only as many panels as can be rated within the specified time.

There shall be no blistering, dulling, wrinkling or peeling of the paint film.

3.8.1.1 Adhesion/Water Immersion Test (FLTM BI 104-04, 240 h)

Evaluate panels after 120 h, and continue testing to 240 h.

There shall be blistering, dulling, wrinkling or peeling of the paint film.

3.8.2 Resistance to Fluids

3.8.2.1 Water and Soap Spotting (FLTM BI 113-01)

No spotting is permitted.

3.8.2.2 Xylene Resistance

Use an up-and-down motion, rub the surface of the test material 10 times (10 double rubs) with a small wad of cheesecloth which has been wetted with xylene. There shall be no softening, dulling or undesirable effects permitted.