

EDS

Engineering,
GM DAEWOO Auto & Technology
Standards

2C1B BASE COAT

EDS-M-8731

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VERSION: 9

1. SCOPE

This specification specifies the general requirements of Base coat of 2C1B top coat. Clear coat shall be specified to relevant specification separately.

2. GENERAL DESCRIPTION

Base coat of 2C1B top coat contains polyester and melamine (or acrylic) resin as the base and color pigment. It is applied to 2C1B Clear coat (refer to relevant specification) and wet on wet. Both the base coat and clear coat permit manual application with a general air spray gun and automatic application by the electrostatic BELL machine.

3. TEST CONDITIONS

3.1. Standard conditions of test place

3.1.1. The test shall basically be conducted at temperature of $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$ and relative humidity of $65\% \pm 5\%$.

3.1.2. When the above conditions cannot be met, temperature and relative humidity shall be entered on the test report.

3.2. Material condition of test piece

The test piece shall basically be the finished vehicle built to the determined coating spec, but the one built of the same material to the same spec may be used.

3.3. Baking condition

3.3.1. Test piece baking conditions shall basically be $135^{\circ}\text{C} \times 20$ minutes (effective time).

3.3.2. The baking time and temperature shall be based on the point when the temperature of the material to coat on reaches a designated point after the test piece is put into a dry oven.

4. REQUIREMENTS

4.1. Properties of delivered material

4.1.1. Color : According to color specifications by models.

4.1.2. Delivery Viscosity (EDS-T-7908, Ford Cup #4 at 20°C) : Specified value ± 2 Sec

4.1.3. Non-volatile (EDS-T-7937, $120^{\circ}\text{C} \times 2$ hours, Paint; about 2g) : Specified value ± 1.5 wt%

4.1.4. Dilution thinner : EDS-M-8716

4.1.5. Electric resistance (EDS-T-7913, based on diluted paint) : $500 \sim 3,000 \text{ k}\Omega$

4.1.6. Specific gravity (EDS-T-7965, 100 cc Specific gravity cup, 20°C) : Specified value ± 0.02

4.2. Material condition at coating

4.2.1. Dilution viscosity (EDS-T-7908, Ford Cup No. 4 at 20°C) : Add EDS-M-8716 base thinner to the undiluted paint to adjust to specified viscosity at 20°C.

4.2.2. Storage stability under undiluted solution (EDS-T-7963)

- (1) Check the paint condition after exposure to 50°C × 120 hours and subsequent exposure from room temperature to (20 ± 2)°C.
- (2) After storage, the paint shall be free from gel and seeding and the viscosity increase compared to the initial state shall less than 20 Sec.
- (3) No abnormalities in workability and external appearance.

4.2.3. Dilution stability

- (1) Fill up the paint diluted with specified viscosity into a mass cylinder capable of 500mℓ, and expose it at a room temperature for 72hours under sealing, and examine the condition of paint, and record the state of precipitation.
- (2) Get the mass cylinder upside down and back up repeatedly for 20 seconds for 10 times. After that, perform the sampling and coating on the upper area (250mℓ) and the lower area (250mℓ). There shall be no change in the appearances such as color and gloss between the upper and the lower area.

4.2.4. Coating method

- (1) Automatic application shall conform to the each plant's process.
- (2) Manual application with a general air spray gun.

4.2.5. Film composition of steel for top coat

- (1) Phosphate film + EDS-M-8773
- (2) Phosphate film + EDS-M-8773 + Primer surfacer (EDS-M-8740 or EDS-M-8766).
- (3) Phosphate film + EDS-M-8773 + Primer surfacer (EDS-M-8740 or EDS-M-8766) + Top coat (EDS-M-8731 + specified Clear coat)

4.2.6. Flash-off time

- (1) Base coat : Expose to 40 ~ 45°C for about 1.5 minutes or to room temperature for about 5 minutes.
- (2) Clear coat : shall conform to the relevant specification.

4.2.7. Drying method : Convection drying

4.2.8. Drying period and temperature: Maintain 20 minutes(effective time) at (135 ± 5)°C (based on body temperature).

4.2.9. Appearance after drying : After drying, the coated surface shall show no sign of defects, such as sagging and pinholes.

5. REQUIREMENTS AFTER DRYING

5.1. Dry film thickness (EDS-T-7970)

5.1.1. Base coat : 10 ~ 25 μm

5.1.2. Clear coat : shall conform to the relevant specification

5.2. Hiding power (EDS-T-7914)

5.2.1. For 2C1B metallic & mica color, the practical hiding force shall be less than 70% of the specified maximum film thickness.

5.2.2. For 2C1B solid color, the practical hiding force on the surfacer primer film shall be less than 70% of the specified maximum film thickness.

5.2.3. Hiding power with the black and white sheets shall conform to the base coat color characteristics as long as it does not affect work in the line.

5.3. Paint film composition of test piece

Condition A : Phosphate film + EDS-M-8773 + Relevant primer surfacer (EDS-M-8740 or EDS-M-8766) + Top coat (EDS-M-8731 + specified Clear coat) (Application by wet-on-wet).

5.4. Requirements after exposure to room temperature for 24 hours

5.4.1. Distinction of Image / Gloss (EDS-T-7907, ATI 1864 SQC S/N 620) : Distinction of image shall be more than 75 and gloss shall be more than 80, when measured under test piece condition A with an angle of 20° .

5.4.2. Adhesion (EDS-T-7910)

(1) Tape : 3M #610

(2) Cutter : Use a cutter to JIS K 5400 or equivalent cutter (NT cutter A type is recommended)

(3) Tape peel angle : 90°

(4) Cutter angle : about 30°

(5) Adhesion (Width 2mm) under test piece condition A shall be GT-0.

5.4.3. Hardness (EDS-T-7948, BUCH HOLTZ durometer, 30sec) : Hardness under test piece Condition A shall be more than 77.

5.4.4. Cupping (EDS-T-7974, Cupping Tester)

(1) Diameter of ball : 20mm, Velocity of ball : about 0.2mm/sec.

(2) Cupping under test piece Condition A shall be more than 4mm.

5.4.5. Bending (EDS-T-7912, Conical Bending Tester)

(1) Diameter of conical corn: ϕ 9.5 ~ 40.5mm, Length: 212mm

(2) Perform bending for 15 sec. at 180° at an even velocity.

(3) When tested under test piece *Condition A*, there shall be no sign of surface defects, such as cracks and peeling-off.

5.4.6. Overbaking (EDS-T-7919)

- (1) $135^{\circ}\text{C} \times 20$ minutes (effective time) $\times 3$ cycles (initial drying excluded)
- (2) Under test piece *Condition A*, there shall be no abnormalities in the film surface such as blistering, peeling-off, discoloration, etc.
- (3) Adhesion (Width 2mm) shall be GT-0 after exposure to room temperature for 24 hours.

5.5. Requirements after exposure to room temperature for 72 hours

5.5.1. Humidity (EDS-T-7951)

- (1) Test condition : $40^{\circ}\text{C} \pm 3^{\circ}\text{C}$, 98%RH min.
- (2) After test under test piece *Condition A* for 240 hours, there shall be no abnormalities in the film surface such as blistering, peeling-off, discoloration, etc. Blistering can be disregarded if it is minor and disappears after exposure to room temperature for 24 hours.
- (3) After exposure to room temperature for 24 hours, adhesion shall be less than GT-1.

5.5.2. Gasoline resistance (EDS-T-7909)

- (1) Unleaded gasoline (for commerce)
- (2) Use a 7~14ml (1~2sec/Drop) of gasoline for 7 minutes. The test piece shall be set at 30' from the horizon.
- (3) After exposure to room temperature for 24 hours immediately following test under test piece *Condition A*, there shall be no changes on the surface and shall be less than Rating 2.

5.5.3. Oil resistance (EDS-T-7930)

- (1) Humidity resistance chamber at $40 \pm 3^{\circ}\text{C}$, more than 98%RH for 48 hours.
- (2) Under test piece *Condition A*, there shall be Rating 0.

5.5.4. Acid resistance (EDS-T-7920) : Under test piece condition A, there shall be conform to the relevant specification for Clear coat.

5.5.5. Alkali resistance (EDS-T-7955)

- (1) Immerse a test piece in 0.1N NaOH at a room temperature for 7 hours.
- (2) Under test piece condition A, there shall be Rating 0.

5.5.6. Anti-chipping (EDS-T-7945)

- (1) Gravel Meter (Air pressure: $4 \pm 0.5\text{Bar}$)
- (2) Gravel : JIS #7, 50g
- (3) Test temperature : Normal and cold (-20°C)
- (4) Under test piece condition A, there shall be more than Rating 6.
- (5) After test under EDS-M-8740, more than Rating 6, and EDS-M-8766, more than Rating 8 shall be ensured.

5.5.7. Cold/hot cycle stability (EDS-T-7958)

- (1) Test piece : Under test piece condition A and 3 times of re-painting with non sanding.
- (2) (80℃ × 10 minutes) → (-40℃ × 10 minutes) → (20℃ × 10 minutes) as 1 cycle, conduct a total of 20 cycles.
- (3) After 20 cycles, the film surface shall show no sign of abnormality, such as crack and chalking etc.
- (4) Adhesion (Width 2mm) shall be less than GT-1 after exposure to room temperature for 24 hours.

5.5.8. W-O-M (EDS-T-7976)

- (1) Xenon light
- (2) Black panel temperature : 63℃ max.
- (3) Under test piece condition A, there shall be conform to the relevant specification for Clear coat.
- (4) After foreign matters on the film are removed by light polishing. Light polishing means that test piece is lightly cleaned by a cloth covered with #7000 compound.

5.5.9. Q.U.V (EDS-T-7921)

- (1) UVB-313 Lamp
- (2) Under test piece condition A, there shall be conform to the relevant specification for Clear coat.

6. ADDITIONAL REQUIREMENTS

6.1. Sandability

6.1.1. Sanding method : Dry & moisture sanding with sand paper #600 (primer surfacer coating planes), #800 (top coating planes, EDS-M-8731+specified Clear coat)

6.1.2. Test method and criterion

- (1) Prepare the test pieces, coated with nominal condition, for primer surfacer and top coat as follows. The film thickness and dry condition should be conducted under the specified conditions.
- (2) Sanding Method

Primer surfacer coating planes	Top coating planes
Non-Sanding condition	Non-Sanding condition
#600 Dry Sanding	#800 Dry Sanding
#600 Moisture Sanding	#800 Moisture Sanding

- (3) After removing the foreign matters on the test piece, coat with relevant top coating and dry it.
- (4) Criterion : No problems at sanding, no difference in gloss between the sanded surface and normal surface after top coating and no noticeable sanding marks.