



Autodeposition Coating for Steel

1 Scope

This specification covers the requirements for a black, waterborne autodeposition coating suitable for use on underhood, chassis and interior steel components. Application is by immersion of thoroughly cleaned steel. Maximum corrosion protection is afforded by the coating's ability to form on any surface that can be wet.

Note: Grade A is obsolete. Grade A currently contains hexavalent chromium and is not to be specified for new applications.

1.1 Material Description. Five (5) grades of autodeposition coatings are available and are defined herein as Grades A, B, C, D and E.

- **Grade A;** is a low Volatile Organic Compound (VOC) waterborne material with a cure temperature of 180 °C to 200 °C. **Note:** Grade A is obsolete.
- **Grade B and Grade C;** are zero VOC, waterborne materials that oven cure in the range of 100 °C to 115 °C.
- **Grade D;** is a very low VOC, waterborne material with a cure temperature of 130 °C to 190 °C.
- **Grade E;** is a low VOC, two (2) coat, waterborne material with a cure temperature of 150 °C to 170 °C.

1.1.1 All grades are generally used without a topcoat. However, compatible topcoats may be used if acceptable performance is verified prior to production usage. Autodeposition should not be specified for aluminum substrates or aluminized steel. Coating of galvanized steel should be verified and tested on a case-by-case basis prior to approval.

- **Grade B and Grade C;** should not be used when components are exposed to service conditions in excess of 120 °C. Components should be evaluated under operating conditions when the service temperature is between 95 °C and 120 °C.
- **Grade C;** is intended for use at low film build in interior or similar applications that require only moderate corrosion resistance.
- **Grade D;** has improved resistance to fastener chatter.
- **Grade E;** has reduced gloss, is highly flexible, heat resistant, and rubber bondable. Grade E is also moderately Ultraviolet (UV) resistant.

Note: On engineering drawings, this standard requires the grade to be designated which defines the performance level for the coating, (see Section 8 Coding System).

1.2 Symbols. Not applicable.

1.3 Applicability. A black, waterborne autodeposition coating suitable for use on underhood, chassis and interior steel components.

1.4 Remarks. Volatile organic compound.

- **Grade A** must not exceed 240 g/L.
- **Grade B** is VOC free.
- **Grade C** is VOC free.
- **Grade D** must not exceed 25 g/L.
- **Grade E** has two (2) coats; the first is VOC free, and the second coat must not exceed 110 g/L.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

ASTM D523 ASTM D4060 ISO 2808 SAE J1960
 ASTM D3363

2.2 GM Standards/Specifications.

GMW3059 GMW14700 GMW15357 GMW16746
 GMW14270 GMW14872

2.3 Additional References.

Engineering Drawings

3 Requirements

3.1 Physical Requirements. The requirements listed in Table 1 shall be met for production parts coated by the specified grade of autodeposition coating.

Table 1: Autodeposition Coating Requirements

Quality Control Characteristic	Test Method	Requirements				
		Grade A Note 1	Grade B	Grade C	Grade D	Grade E
Color	Visual	Black	Black	Black	Black	Black
Film Thickness	ISO 2808	20 µm to 25 µm	20 µm to 25 µm	12.5 µm to 18 µm	15 µm to 25 µm	25 µm to 35 µm
Gloss	ASTM D523, 60 Degree	20 maximum	20 maximum	20 maximum	60 minimum	15 maximum at 85 degree
Cure (Pencil Hardness)	ASTM D3363	2 h minimum	4 h minimum	4 h minimum	2 h minimum	6 h minimum
Accelerated Corrosion Test Requirement	GMW14872	Seven (7)	Seven (7)	Seven (7)	Seven (7)	Seven (7)
Mandrel Bend Note 2	GMW16746	Not applicable	Not applicable	Not applicable	Not applicable	9 minimum
Heat Resistance Note 2	24 h exposure at 200 °C	Not applicable	Not applicable	Not applicable	Not applicable	< 3% weight loss
Abrasion Resistance Note 2	ASTM D4060	Not applicable	Not applicable	Not applicable	Not applicable	1000 cycles no wear through to base metal
UV Resistance Note 2 Xenon Arc	SAE J1960	Not applicable	Not applicable	Not applicable	Not applicable	2500 kJ no visible chalking

Note 1: Grade A is obsolete and is not to be specified for new applications.

Note 2: For initial material approval only.

3.2 Cyclic Corrosion Testing. Expose parts in gravelometer per GMW14700 Method C, then expose the same parts in cyclic corrosion per GMW14872, Underbody (UB), All, four (4) Salt Sprays (sp), Method 1/2. See exposure in Table 1. Performance requirement rating per GMW15357.

3.3 Appearance. Visual inspection shall be performed in a well-lit area. The cured coating shall present a uniform surface covering all areas of the work contacted by the coating bath. For example, no blisters, runouts, rinsing residues or other surface defects that could require serious repair are permitted (i.e., serious repair is a repair involving removal of the coating system to bare metal).