



Fluoropolymer Painted Aluminum Sheet

1 Scope

1.1 Material Description. This standard covers the requirements for a coil coated aluminum sheet for exterior hardware applications. The coating systems indicated consist of:

- a urethane primer, a fluorocarbon color coat and, where indicated, a compatible fluorocarbon or urethane clear coat or,
- a proprietary aluminum oxide anodic layer and a clear fluorocarbon topcoat or,
- a proprietary aluminum oxide anodic layer, a fluorocarbon color coat and a clear fluorocarbon topcoat.

The organic coatings are applied by reverse roll coating. Various systems which correlate to coating thickness, color, and gloss are identified by codes, as shown in Table 1. Due to lower film builds, Code H and Code I may not be appropriate for some high wear applications. Some applications requiring high elongation may be inappropriate for this material as whitening of material may occur. Each part needs to be evaluated on an individual basis.

1.2 Symbols. Not applicable.

1.3 Applicability. Interior or exterior formed aluminum trim parts such as roof ditch moldings, side window division posts and pillar appliques.

2 References

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

2.1 External Standards/Specifications.

ASTM B244	ASTM D2794	ISO 4892-1	SAE J2527
ASTM D523	ASTM D3794	ISO 4892-2	
ASTM D1005	ASTM E8	ISO 7724-1	
ASTM D2248	ISO 2813	SAE J1545	

2.2 GM Standards/Specifications.

GMW3028	GMW14093	GMW14829	GMW15919
GMW3059	GMW14669	GMW14873	GMW16854
GMW3402	GMW14700	GMW15777	

2.3 Additional References.

- Aluminum Standards and Data Book published by the Aluminum Association.
- Compositional and mechanical requirements such as Aluminum Association (AA) or other equivalent regional standards.
- Master Plaque approved standard issued by the Finish and Textile Engineering Department of the appropriate vehicle group.
- TMC003 Material Safety Data Sheet guidance documents (available at www.gmsupplypower.com).

3 Requirements

3.1 Requirements on Delivery.

3.1.1 Chemical Requirements.

3.1.1.1 Base Metal.

3.1.1.1.1 Chemical Composition. The chemical composition of the aluminum shall conform to the alloy limits shown in the current Aluminum Standards and Data Book published by the Aluminum Association, unless otherwise specified.

3.1.2 Mechanical Requirements.

3.1.2.1 Mechanical Properties. When tested per the appropriate sections of ASTM E8, the mechanical properties of the uncoated aluminum substrate shall conform to the properties shown in the current Aluminum Standards and Data Book published by the Aluminum Association, unless otherwise specified.

3.1.3 Physical Requirements.

3.1.3.1 Coating Application.

3.1.3.1.1 First Surface Coating. The primary surface of the aluminum sheet product shall be coated with the layers shown in Table 1.

Table 1: First Surface Coating

Code	Gloss	Coating System	Coating Thickness (µm) ^{Note 1}				
			Anodic Coating	Primer	Color Coat	Clear	Total
A	30	Black Fluoropolymer	-	18	36	-	54
B	30	Metallic Fluoropolymer/Clearcoat	-	23	18	13	54
C	80	Black Fluoropolymer/Clearcoat	-	-	20	12	32
D	80	Metallic Fluoropolymer/Clearcoat	-	18	15	34	67
E	30	Black Hi-Build Fluoropolymer ^{Note 2}	-	36	36	-	72
F	30	Metallic Hi-Build Fluoropolymer ^{Note 2}	-	36	20	15	71
G	50	Metallic Fluoropolymer/Clearcoat	-	20	9	13	42
H	80	Bright Anodized Aluminum/Clear Fluoropolymer	0.3	-	-	15	15
I	80	Bright Anodized Aluminum/Black Fluoropolymer	0.3	-	10	15	25

Note 1: Primer, color coat and clear thickness variation $\pm 3 \mu\text{m}$, total film thickness variation $\pm 5 \mu\text{m}$.

Note 2: Code E and Code F typically used for high-wear applications such as rocker moldings.

3.1.3.1.2 Backcoat. An organic backside coating, typically epoxy or alkyd resin shall be applied by reverse roll coating during the manufacturing process. The color of the coating can be natural or tinted at the discretion of the using plant. The specific product used shall be approved as a part of the overall coating approval process.

3.1.3.1.3 Strippable Protective Coating. A strippable coating applied by reverse roll coating, spray, or lamination shall be applied over the coated aluminum strip. Its purpose is to provide a reasonable degree of protection during handling and forming operations. It must not change the gloss, leave a residue, or imprint upon removal and must present a smooth continuous surface. Coating type, thickness, and peel strength are to be determined by specific part forming and handling parameters. The variations in this coating are permissible, by agreement of the regional Materials Engineer, without requalification providing the requirements in Table 1 and Backcoat requirements are met.

3.1.3.2 Coating Properties. Coating thickness, Impact, Flexibility and Formability, and Durability shall be tested routinely on every lot of material. All of the tests shall be performed for initial coating system approval. Individual suppliers shall use all the tests to monitor their process periodically and report the results to Engineering.

3.1.3.3 Coating Thickness. First surface dry film thickness shall meet requirements in Table 1. Dry film thickness of the backcoat shall be $7 \mu\text{m}$ to $10 \mu\text{m}$. Thickness shall be measured per ASTM B244 (eddy current) or ASTM D1005, Method A (micrometer).

3.1.3.4 Impact. The material shall withstand a 3.4 J direct and reverse impact. Impact testing shall be performed per ASTM D2794, and evaluation shall be conducted per GMW14829 without scribe.