

SPECIFICATION

1 Application

This specification will describe the quality requirements of Aluminium Painted Foil for conversion into composite panel.

2 Aluminium Alloy, Temper and Dimension

| Alloy | Temper | Dimension (mm) | | |
|-------|--------|----------------|-------|--------|
| | | Thickness | Width | Length |
| 3003 | H18 | 0.1 | 1,235 | Coil |
| | | 0.1 | 1,020 | Coil |
| | | 0.1 | 925 | Coil |

3 Quality of Bare Aluminium Foil

According to AA3003 H18

3.1 Chemical Composition

| Alloy | Si | Fe | Cu | Mn | Mg | Cr | Zn | Ni | Ti | Others | | Al |
|-------|------|------|-----------|---------|----|----|------|----|-------|------------|-------|----------|
| | | | | | | | | | | Individual | Total | |
| 3003 | ≤0.6 | ≤0.7 | 0.05-0.20 | 1.0-1.5 | - | - | ≤0.1 | - | ≤0.01 | ≤0.05 | ≤0.15 | Residual |

3.2 Mechanical Properties

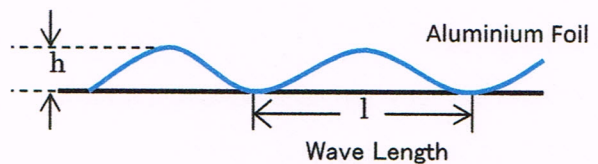
| Alloy | Temper | Tensile Strength (Mpa) | Yeild Strength (Mpa) | Elongation | Density |
|-------|--------|------------------------|----------------------|------------|---------|
| 3003 | H18 | ≥190 | ≥170 | ≥1% | 2.73 |

3.3 Size Tolerance

| Size (mm) | | Tolerance (mm) | |
|-----------|-------|----------------|--------|
| Thickness | Width | Thickness | Width |
| 0.1 | 1,235 | +/-0.010 | +/-1.0 |
| | 1,020 | | +/-1.0 |
| | 925 | | +/-1.0 |

3.4 Flatness

| Item | Limit |
|--|------------|
| Wave Height (h) (both Edges & Center) | 1.0mm max. |
| Wave Height against Wave Length ($\lambda = h/l$) | 0.6% max. |



4 Characteristics of Paints

| Color | Color Code | Gloss | Resin | Thickness |
|--------------|------------|------------|-------|----------------------|
| Luster White | | 85% +/- 5% | PET | 17 μ +/- 2 μ |
| Matte White | | 50% +/- 5% | PET | 17 μ +/- 2 μ |
| Grey-White | | 30% +/- 5% | EPOXY | 7 μ +/- 2 μ |

5 Paint Coating Film Characteristics

| No. | Test Contents | Requirements | Measuring Method | Standard | Remarks |
|-----|-----------------------|---|---|-----------------|-------------------------|
| 1 | Appearance | No Harmful Defects | Visual Check for Dirts, Dents, Lack of Color & etc. | JIS K5600-4-3 | Per Each Coil |
| 2 | Color Variance | PET $\Delta E \leq 1.0$ / EPOXY $\Delta E \leq 3.0$ | L* a* b* Color Figures | JIS K5600-4-6 | Per Each Coil |
| 3 | Film Thickness | As the above mentioned in 4 | Eddy Current Thickness Measurement | JIS K5600-1-7 | Per Each Coil |
| 4 | Gloss | As the above mentioned in 4 | Specular Gloss at 60° | JIS K5600-4-7 | Per Each Coil |
| 5 | Pencil Hardness | Cohesive failure $\geq 2H$ | Mitsubishi UNI 750g load at 45° angle 0.5-1mm/s | JIS K5600-5-4 | Per Each Coil |
| 6 | *T-Bend Flexibilities | No Peeling Off | $\leq 2T$ | ASTM D4145 | Per Each Coil |
| 7 | Impact Resistance | No Peeling Off | 15mm Φ 500g H50cm | JIS K5600-5-3 | Per Each Coil |
| 8 | Adhesion | No Peeling Off (100/100) | 1mm Cross-Cut Tape Test | JIS K5400 8.5.2 | Per Each Coil |
| 9 | MEK Rubbing Test | No Change ≥ 100 times | 1 kg Double Rubs | ASTM D4752 | Per Each Coil |
| 10 | Water Resistance | No Blister & No Peeling off | 50°C 250Hours Maceration | JIS K5600-6-2 | When changing the paint |
| 11 | Salt Spray Resistance | No Blister & No Peeling off | 35°C 5% NaCl ₂ 98%RH 1,000Hours | JIS K5600-7-1 | When changing the paint |
| 12 | Weather Resistance | Color Variance $\Delta E \leq 3.0$ & Gloss Maintaining GR $\geq 80\%$ | Sunshine CarbonArc Weather Meter 63°C 1,000Hours | JIS K5400 9.8.1 | When changing the paint |
| 13 | Acid Resistance | No Blister & NoPeeling off | 20°C 2% HCl 24Hours | JIS K5600-6-1 | When changing the paint |
| 14 | Alkali Resistance | No Blister & NoPeeling off | 20°C 2% NaOH 24Hours | JIS K5600-6-1 | When changing the paint |
| 15 | Coil Edge | No Cutting Powder on both Coil Edges | Visual Check by adhesive tape | - | Per Each Coil |
| 16 | Peeling-off Test | $\geq 50N/25mm$ (Tentative) | Details are as per attached | - | Per Each Coil |

*T-Bend Flexibilities Test is required only for Polyester Resin Coating.

6 Standard Color Samples

6.1 The Colortone of the product must be controlled by the colorimeter and visual check based on the standard color samples that approved by both parties.

6.2 The standard color sample must be reviewed regularly in every 2 years.

6.3 The final approved version must be used in case of delaying the review on the above rule.

7 Coil Conditions

| Item | Requirements |
|---------------------------|--|
| Core ID | 505mm +/- 3mm |
| Core Thickness | ≥ 20 mm |
| Core Density | ≥ 35 kg/sq.m |
| Coil Weight | 700kg - 1,200kg |
| Coil Joint | Not Acceptable |
| Taping Method of Coil End | Longitudinal & Lateral of the Coil End |
| Core Length | Extended 50mm in both sides |
| Telescoping | ≤ 2 mm |
| Winding Direction | Facing out in guarantee side |
| Core Cut | No Paper Powder |
| Winding Tension | ≥ 20 N/sq.mm |

8 Coil Numbering Method

Please confirm your coil numbering method:

9 Inspection Certificates

Certificates must be attached on the coil and showed in both of standard and actual figures.

- ① Chemical Composition
- ② Mechanical Properties
- ③ Coating Film Characteristics
- ④ Dimension.

10 Packing

10.1 It must be 1 coil on pallet with horizontal axis.

10.2 It must be export and seaworthy packing but not required the desiccant.

10.3 It must be showed

- ① Product Code
- ② Coil No.
- ③ Net/Gross Weight (Kg)
- ④ Coil Length (meters)
- ⑤ Production Date
- ⑥ Coil Winding Direction (By arrow on the outer coil wrapping)

11 Others

11.1 Both parties must cordially solved the problem that has not been described to this specification.

11.2 This specification must be reviewed regularly in every 3 years but the final approved version must be used in case of delaying the review on this rule.