



TECHNICAL DATA SHEET

FIRE-RETARDANT CLADBOND®-FR (CLASS B-s1, d0)

PRODUCT COMPOSITION

CLADBOND® FR is composed of a modified mineral-filled fire retardant core with polymer adhesives sandwiched between two sheets of coated aluminum.

Skin : 0.5mm Coated Aluminum Sheet
Core Material : B-s1, d0 – Modified mineral-filled fire retardant core

DIMENSION, WEIGHT AND TOLERANCE (STANDARD)

Panel Thickness : 4 mm
Panel Size : Width: 1000 mm, 1250 mm, 1500 mm
Length: Based upon customer request
Tolerance : Width ± 2.0 mm
Length ± 3.0 mm
Thickness ± 0.2 mm
Diagonal/Squareness ≤ 5 mm
Warp/Bow ≤ 5 mm/m
Panel Weight : 7.5 ± 0.5 kg/m²

TECHNICAL PROPERTIES

A. Technical properties of aluminum alloy (3000 series):

| PROPERTY | STANDARD METHOD | UNIT | RESULT |
|-------------------|-----------------|-------------------|--------|
| Density | - | g/cm ³ | 2.71 |
| 0.2% Proof Stress | ASTM E8 | N/mm ² | 163 |
| Tensile Strength | ASTM E8 | N/mm ² | 180 |
| % Elongation | ASTM E8 | % | 12 |

B. Technical properties of aluminum composite panel:

| PROPERTY | STANDARD METHOD | UNIT | RESULT |
|------------------------------|------------------------|-------------------|--------------------|
| Bending Strength | ASTM C393/C393M-16 | MPa | 110 |
| Bending Elastic Module | ASTM C393/C393M-16 | MPa | 20,538 |
| Shear Strength | ASTM C393/C393M-16 | MPa | 26 |
| Shear Strength by Punch Tool | ASTM D732 | MPa | 26.01 |
| Tensile Strength | ASTM E8 | N/mm ² | 46.48 |
| 180 deg. Peel Strength | ISO 8510-2 / ASTM D903 | N/mm | 12.7 |
| Drum Peel Strength | ASTM D1781-98(2012) | N-mm/mm | 485 |
| Sound Transmission | ASTM E90, ASTM E413 | STC | 28 |
| Air Permeability | BS EN 14509:2013 | N/A | Impermeable to air |



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THERMAL PROPERTIES

| PROPERTY | STANDARD METHOD | UNIT | RESULT |
|-----------------------------|-----------------|--------|--------|
| Heat Deflection Temperature | ISO 75-2 | °C | 92 |
| Linear Thermal Expansion | ASTM D696 | um/m°C | 128 |
| Thermal Conductivity | ASTM C518 | W/mK | 0.4515 |
| Thermal Resistance | ASTM C518 | m²K/W | 0.236 |

COATING SURFACE PROPERTIES

COATING THICKNESS

| | |
|-------------|-------------|
| Primer | 5 um ± 2um |
| Top Coat | 20 um ± 5um |
| Bottom Coat | 7um ± 2um |

| PROPERTY | STANDARD METHOD | UNIT / SPECIFICATION | RESULT |
|------------------------|--|--|---|
| Gloss Deviation | ISO 2813 | ≤ 10 | 2 |
| Pencil Hardness | ISO 15184 | ≥HB | 4H |
| Coating Flexibility | ISO 17132 | no sign of any crack and deformation was observed after 180 degree bending | 2T |
| Adhesion | ISO 2409 | No film adhesion failure | Grade 0 (No removal of coating film) |
| Impact Resistance | ISO 6272 | No Cracks | No sign of cracks or debonding was observed |
| Abrasion Resistance | ASTM D 968 | L/um | 2 |
| Brush Resistance | ISO 11998 | Shall be resistant | Resistant |
| Acid Resistance | ISO 2812-1 | Shall be resistant | Resistant |
| Alkaline Resistance | ISO 2812-1 | Shall be resistant | Resistant |
| Oil Resistance | ISO 2812-1 | Shall be resistant | Resistant |
| Hot Water Resistance | ISO 2812-2 | Shall be resistant | Resistant |
| Humidity Resistance | AAMA 2605-05 Clause 7.8.1 | 4000 hours Exposure | No formation of Blisters |
| Salt Fog Resistance | ISO 11997-1 (2000 hours) | No cracking, no blistering, no flaking, no spot rusting | Passed |
| | AAMA 2605 Clause 7.8.2, ASTM D1654, ASTM B117 (4000 hours) | | Scribed: Rating 9 Inscribed: Rating 10 (No failure) |
| Accelerated Weathering | ISO 16474-2 | No change | No loss of film adhesion or no visible change in appearance |

*Above paint thickness and gloss effect may vary based on the type of paint finish



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FIRE TESTS

FIRE REACTION TESTS

ASTM E84-19a - "Standard Test Method for Surface Burning Characteristics of Building Materials"

ASTM E84-19a Test Result:

| | | |
|-----------------------------|---|---------|
| FLAME SPREAD INDEX (FSI) | 0 | CLASS A |
| SMOKE DEVELOPED INDEX (SDI) | 0 | CLASS A |

BS EN 13501-1:2018 - "Fire classification of construction products and building elements – Part 1: Classification using test data from reaction to fire tests"

Test Result for BS EN 13501-1:2018: Classified as **B-s1, d0**

ASTM D1929-16 - "Self-ignition Test"

Test Result for ASTM D1929-16:

Passed – 466°C (Aluminum Composite Panel)

Passed – 468°C (Core)

FIRE RESISTANCE TEST

NFPA 285:2019 - "Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components"

Test Result for NFPA 285:2019: The result of the fire performance evaluation conducted on the wall assembly described here in indicates that the test assembly has **met the acceptance criteria** stated in the standard.