Fire Retardancy and ALUCOBOND®
Product information for ALUCOBOND®plus and ALUCOBOND®A2
Fire protection for your building begins at the planning stage. Minimizing fire risk, particularly in places with significant human traffic such as major sporting arenas, mass transit terminals, hospitals, schools and high-rise buildings has become increasingly complex and challenging. Globally, architects and building owners are required to meet stringent regulations aimed at protecting inhabitants and visitors but also building structure and surrounding environment from fire hazards, but irrespective of the regulations it is imperative for the users to choose the right grade of building materials which can minimize the damage to human lives and the structure.

A lot depends on using the right kind of products and systems, and utmost care has to be taken in choosing the right grade of Fire Retardant (FR) Aluminium Composite Materials (ACM) so as to mitigate the risk caused by fire. (Illustration on Page 3 shows the fire propagation in case of fire in a building).

It is important to understand the difference between Fire Rating and Fire Retardancy. Any product could have some degree of Fire Rating but that does not necessarily make it Fire Retardant.

Usually, the products and systems have a reaction to fire and resistance to fire, in a certain way. It is essential to look at these both, and the factors that influence the performance of an Fire Retardant cladding solution in totality and not in isolation.

These performance criteria are:

- Lateral and Vertical spread of fire
- Smoke emission
- Droplets
- Self-extinction of fire on the ACM

Therefore, it is key to choose the right product and system in terms of performance in case of fire. But it is equally important to specify the right test methodology and standards to ensure selection of a ‘true’ Fire Retardant facade. The right test methodology has to be ideally a combination of product test like EN 13501-1 along with an intermediate-scale multi story test like NFPA 285 or BS 8414 which addresses most of the key performance criteria mentioned above.

A ‘true’ Fire Retardant ACM should have:

- Ideally recommended mix and density of non-combustible content in the core (not less than 70%).
- Appropriate certifications from a credible 3rd party authority. Not sufficient to have mere test reports from samples provided by the applicant.
- Should be fixed using the recommended systems.

There are simple methods to find out if the sample, that you have is a ‘true’ Fire Retardant ACM panel. Please see these videos to see how - http://alucobond.com.sg/videos/FR

WHY ALUCOBOND®plus and ALUCOBOND®A2

More than ever, buildings of the future not only have to comply with the highest demands on design, they also have to meet the latest technical requirements such as sustainability, energy efficiency and most importantly - fire protection.

Merging aesthetics and safety, ALUCOBOND® plus and ALUCOBOND®A2 set new standards for cladding materials with certified and proven fire retardancy characteristics. ALUCOBOND® plus and ALUCOBOND®A2 are the ‘true’ Fire Retardant Aluminium Composite Materials that you have been looking for.
Rapid Fire Spread

Fire spreads upwards due to a combustible cladding, thereby contributing to the fire

Fire breaks in & out through glass

Flames break out Smoke / Fumes builds up

Initial Fire develops and flashes over

Internal or External Fire Incident

While glass breakage/fallout allows fire to enter/exit, cladding allows/prevents spread

Fire Retardant ACM

Fire spread is restricted due to a FIRE RETARDANT or NON-COMBUSTIBLE cladding material and system

No Droplets falling down to avoid further spread and hazard to people

No Smoke / Toxic Fumes

Legend

<table>
<thead>
<tr>
<th>Fire Retardant ACM</th>
<th>Regular ACM</th>
<th>Glass</th>
</tr>
</thead>
</table>

Regular ACM

While glass breakage/fallout allows fire to enter/exit, cladding allows/prevents spread

Secondary Fire

Secondary Fire

Secondary Fire

Secondary Fire

Secondary Fire

Secondary Fire

Secondary Fire

Initial Fire develops and flashes over

Internal or External Fire Incident
ALUCOBOND®plus

ALUCOBOND®plus has been developed exclusively for the more stringent fire prevention regulations in architectural products. Thanks to its mineral-filled core, ALUCOBOND®plus meets the stricter requirements of most fire classifications. It is hardly inflammable and offers all the proven product properties of the ALUCOBOND® family, such as flatness, formability, resistance to weather and easy processing.

* Available on request
ALUCOBOND® A2

ALUCOBOND® A2 is the first non-combustible aluminium composite panel used in architecture that fulfils the respective standards worldwide. Thanks to its mineral core, ALUCOBOND® A2 meets the strict requirements of some of the toughest fire regulations while retaining the possibilities for the concept and design of buildings. ALUCOBOND® A2, just like all the products of the ALUCOBOND® family, allows simple processing, is impact-resistant, breakproof and weatherproof and, above all, non-combustible.

TECHNICAL DATA SHEET

<table>
<thead>
<tr>
<th>Panel Thickness</th>
<th>Standards</th>
<th>Units</th>
<th>3 mm</th>
<th>4 mm</th>
<th>6 mm*</th>
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</thead>
<tbody>
<tr>
<td>Thickness of Aluminium Layers</td>
<td>[mm]</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
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<tr>
<td>Weight</td>
<td>[kg/m²]</td>
<td>5.9</td>
<td>7.6</td>
<td>10.8</td>
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</table>

Technical Properties

- Section Modulus W: DIN 53239
- Rigidity (Poisson's ratio µ = 0.3): E-1 DIN 53239
- Alloy: EN 973-3
- Temper of Cover Sheets: EN 851
- Modulus of Elasticity: EN 1999-1-1
- Tensile Strength of Aluminium: EN 485-2
- 0.2% Proof Stress: EN 485-2
- Elongation: EN 485-2
- Linear Thermal Expansion: EN 1999-1-1

Core

- Mineral compound, polymer bonded

Surface

- Lacquering
- Gloss (initial value): EN 13523-2
- Pencil Hardness: EN 13523-4

Acoustical Properties

- Sound Absorption Factor $\alpha_w$: ISO 354
- Sound Transmission $R_w$: ISO 717-1

Thermal Properties

- Thermal Resistance $R$: DIN 52612
- Temperature Resistance $\Delta T$: -50 to +80

Technical Data

- En悬 3.1.1
- DIN 53293
- EN 485-2

FIRE CLASSIFICATION

<table>
<thead>
<tr>
<th>Country</th>
<th>Test accord.to</th>
<th>Classification</th>
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<tbody>
<tr>
<td>Australia</td>
<td>AS ISO 9705</td>
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</tr>
<tr>
<td></td>
<td>AS 3837</td>
<td>BCA Group 1 material</td>
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<td>AS 1550-3</td>
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<td>EU</td>
<td>EN 13501-1</td>
<td>Class A2, s1, d0</td>
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<td>Germany</td>
<td>EN 1187 (method 1)/ DIN 4102-7</td>
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</tr>
<tr>
<td>Japan</td>
<td>JIS A 1231</td>
<td>Class 2</td>
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<td>BS 476, Part 6</td>
<td>Class 0</td>
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<td>BS 476, Part 7</td>
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<td>Singapore</td>
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<td></td>
<td>Approved for outdoor wall cladding of any type of building without height limit</td>
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<td>UAE</td>
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<tr>
<td>UK</td>
<td>BS 6853</td>
<td>meets requirements of LUL limited combustible non combustible</td>
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* Available on request
LET’S UNDERSTAND SOME OF THE COMMONLY REQUESTED QUALIFICATION TESTS

**ASTM E-84**
This test measures the distance of the flame spread and the light obscuration of the smoke development during a specific time period.

**BS 476 - Part 6&7**
This test measures the speed and the distance of the flame spread in a specific time period.

**NFPA 285**
This test method evaluates the inclusion of combustible components within wall assemblies/panels that are required to be of noncombustible construction. It’s a simulation of the multistory flammability fire performance of entire exterior wall assemblies.

**BS 8414-1**
This test assess the behavior of a non-load bearing external cladding system.

The test measures fire spread and classifies based on 3 distinct ways: external fire spread, internal fire spreads and mechanical performances.

**EN 13501-1**
This test measures the spread of flame and contribution to fire as well the generation of smoke and the production of burning droplets.

### UNDERSTANDING THE PERFORMANCE CRITERIA WITH VARIOUS TEST METHODOLOGIES

<table>
<thead>
<tr>
<th>COMMONLY ASKED TESTS</th>
<th>FLAME SPREAD</th>
<th>SMOKE EMISSION</th>
<th>BURNING DROPLETS</th>
<th>SELF EXTINGUISHING</th>
<th>WITH SYSTEM</th>
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<td>X</td>
<td>✔</td>
<td>✔</td>
</tr>
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</table>
In order to ensure the true capability of the manufacturer and their products, one should insist on a Certification from a trusted third party.

Any reputed third party certification organization will:
- Investigate the manufacturing process, QA process, test reports / documentation.
- Inspect the manufacturing facilities periodically.
- Select production samples randomly for later testing.
- Awards certificate of conformity if they find everything in order.
- Renew certificate only if all of the above are consistently achieved at satisfactory levels.

ALUCOBOND® products from Germany, China and India are Class 1A Certified which means not only the products but also the processes are inspected on periodic intervals by TUV SUD, which is an internationally known and trusted independent certification organization.

All these certificates of conformity are listed in a directory of certified products given out by TUV SUD PSB Pte Ltd, and are available online at https://www.tuev-sued.de/industry_and_consumer_products/certificates
Create the difference.

ALUCOBOND®