

TECHNICAL MANUAL EXCERPT



SUPERBOND Technical Manual Excerpt

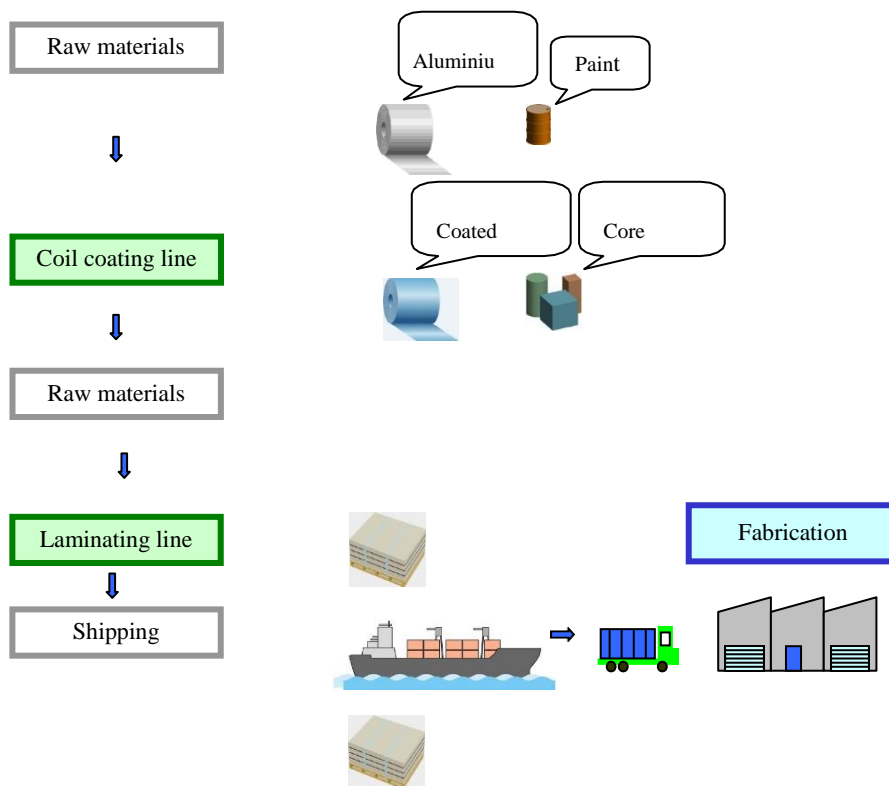
Material composition

SUPERBOND is an Aluminium Composite Material manufacturer for the construction industry in India. It is not only a reasonable alternative to solid aluminium sheet, but also an individual material characterized by its own unique features. Its lightweight, high rigidity, excellent flatness and long-lasting coating qualities are just what the construction industry has been looking for.

SUPERBOND FR is an aluminium composite material with a fire-retardant core suitable for exterior and interior cladding, soffit linings and roof covering in new buildings and retrofit applications.

The production process of SUPERBOND consists of two production lines:

Production process



Raw materials:

The main raw material required are:

- Plastic Polymers
- Color coated Aluminium coils
- Adhesive film
- Protective/Guard Film
- Packing materials

The main raw materials required are Polymers of ethylene both in primary form or secondary forms, recycled material of plastics (LDPE and HDPE). Aluminium color coated coils or mill finished coils which are washed with chemicals are used for lamination. The aluminium and plastic sheets are support or combined with hot melt glue film also known as Adhesive film. The sheets are protected with plastic guard film which has glue on one side and directions and its use on the front side.

Plant and Machinery:

The main plant and machinery consist of the following items

- Plastic Extruder
- Three roll calendaring system to make PE sheet
- Coil un-winders with stand
- Hot melt glue un-winders
- Compounding Line
- Air Cooling Unit
- Protective film unwinders
- Side trimming and Cross Cutting
- Off Line cutting and straightening machine
- PE recycled crushing, mixing and extruding machines
- PLC
- Weigh Scale
- D.G. Set
- Testing Equipment's for raw materials and finished product
- Tools and Dies
- Computers and UPS System for encoder.
- Overhead Crane and Fork lifter.

Manufacturing Process:

The PE granules are put in hot air dryer. PE is then loaded in the extruder to get the PE sheet with the help of three calendar roll system. Then adhesive film is pasted on the PE sheet which travel some distance and get shape of plastic sheet. Now, PE sheet is pre-heated and aluminium coils are pasted on both side of PE sheet which pass through firstly in hot pressing rolls and compounding rolls. Then these laminated sheets are gradually cooled through cold rollers and air blower's unit. Protective film is pasted once the sheet gains the normal room temperature. Then the sheet is cut from sides to get desired width and length. The sheets are stored in warehouse for dispatch. The side cuttings, cross cuttings and wastage generated during processing is taken for separation of PE and aluminium. PE is again re-extruded through PE granules making machine and aluminium cut pieces are sold as scrap.

SUPERBOND has a number of unique features:

Flatness: The continuous laminating process results in excellent flatness of the panel.

Color uniformity: The coil coating process ensures complete color consistency.

Rigidity: As one of the attributes of ACP, SUPERBOND are light and strong sheet materials.

Workability: SUPERBOND are easy to cut, bend, groove and shape with regular aluminium working and woodworking machines and tools.

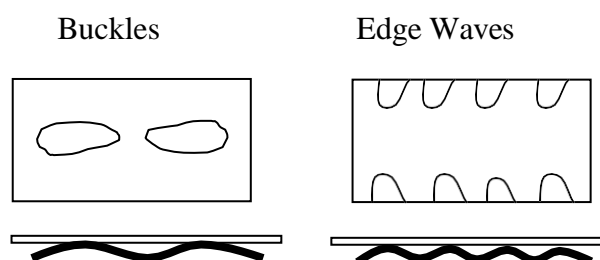
Fire safety: With the fire-retardant core, SUPERBOND FIREGUARD FR B1 GRADE has a tolerance of 2 hours of heat.

Flatness

SUPERBOND ACP'S are very flat. Generally speaking, ensuring the flatness of sheet materials is not easily realized. Solid aluminium sheet, for example, has a slight distortion stemming from its rolling process: buckles, edge waves and overall warping are common.

SUPEROND ACP's are extremely flat due to the thinness of the aluminium sheets (0.5mm) and our lamination process in which most of such distortions are eliminated

Distortions often found in aluminium sheets (Excerpt from ISO standard)



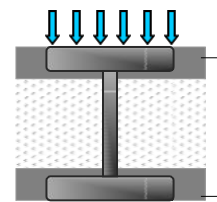
Rigidity

SUPERBOND ACP's are highly rigid compared to solid aluminium metal sheets. Two sheets of aluminium skin behave like a small H-section when pressure is applied on the panel. Consisting of 2 sheets of 0.5mm thick aluminium, SUPERBOND 4mm thick deliver the rigidity equivalent to an aluminium sheet of 3.3mm thick.

Rigidity of ACP

Aluminium 0.5mm, Polyethylene, fire-retardant core, high fire-retardant or non-combustible core Aluminium 0.5mm

Material	SUPERBOND	
	Thickness mm	Weight kg/m ²
0.25 PVDF	3	5.21
	4	6.38
0.50 PVDF	3	6.71
	4	7.73



Workability

The workability of SUPERBOND ACP's is one of its outstanding features. It can be cut with circular saws. It can be folded after grooving with a groove cutter or a router. It can be bent with a 3-roll bender and press brake. For joining, we can choose the most suitable method from several alternatives. For details, refer to Section 3 "Fabrication and installation."

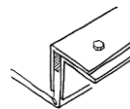
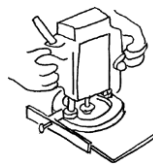
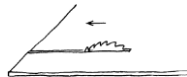
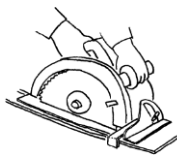
Tools and machines used for processing SUPERBOND ACP's

Hand circular

Table saw

Hand router

Folding jig

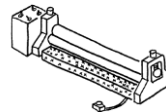
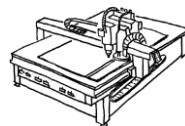
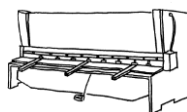
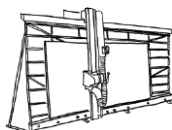


Panel saw

Square shear

CNC router

3-roll bender



Prevention from edge corrosion

The integrity of lamination between the aluminium skins and the core is strictly controlled to maintain the adequate value in superbond products. But, when Aluminium Composite Materials (ACPs) are used in a corrosive atmosphere, corrosion normally takes place at the cut edge and tends to penetrate inside, finally resulting in de-lamination between the aluminium skins and the core material. To protect from this type of corrosion, SUPERBOND feature a corrosion resistant behind aluminium skins.

Although protected by the primer, to enhance long-term durability we still recommend that the cut edge is not exposed to corrosive or outdoor atmosphere. If it is likely that the cut edge will be continuously exposed to moist conditions, a suitable corrosion protection will be necessary in the panel design or the fixing detail.

Thermal expansion/ contraction

SUPERBOND have the same linear thermal expansion coefficient as aluminium metal, so movement will not occur between aluminium accessories and SUPERBOND due to thermal expansion/contraction. But a certain amount of movement will occur with steel and concrete, because the thermal expansion of steel and concrete is smaller than that of SUPERBOND . This movement is normally very small (approx 1.0mm/m), but it should be relieved with a suitable method such as relieving with loose holes.

PVDF GOLD SERIES

- 10-year warranty*
- 2 Coat & 2 Bake KYNAR 500 PVDF coating
- Coating thickness 25 to 28 micron
- Custom Colors
- Corrosion resistance
- Durable and Beautiful
- Unbreakable
- Machinable
- Environment friendly
- 100% maintenance free & water proof
- Excellent sound & thermal insulation
- Easy to install
- Resistant to abrasion
- Convex & Concave bending properties
- Stain resistant
- Washable
- Uniform color

SUPERBOND FIREGAURD FR

A real 2-hour escape window A typical ACP-cladded facade in India has a frame structure comprising a non-load-bearing brick wall, followed by plaster, steel frame and an ACP envelope should contain fire and retain its structural integrity up to 2 hours. But that's not the only feature that contributes to fire protection. An authentic rating for resistance to fire also takes into account that smoke kills faster than fire, among other vital factors. This is where Super Bond's FR ACP stands above the rest.

The core secret FR Core is a non-halogenated FR material that produce water vapor when it heats up. It does not produce toxic gases like the halogenated materials.

Magnesium hydroxide (MDH) is the non-halogenated material that is mixed with PE to form the core of Super Bond's FR products. MDH has a better fire- resistance performance than aluminium trihydrate (ATH), the other non-halogenated material, owing to higher decomposition temperature. Furthermore, MDH is more environment-friendly than other similar materials. MDH delays the PE transformation from solid to plastic (the point of ignition up to 360°C, by releasing water molecules and bringing down the temperature continuously.

It has Factory Production Control certification from EXOVA Warringtonfire of the UK (ewcl5) for reaction to fire classifications of EN 13501-1 Class B— s1 and passes resistance to fire for a duration of time in accordance with ASTM E119-12. SUPERBOND fireguard (Fire-Retardant grade) is available for a complete range of ACPs.

HPL SERIES

It is here that SUPERBOND brought forward AHPL, which is an Aluminium based High Pressure Laminate (HPL). It is more durable and elegant in looks as compared to wood. It is also highly weather resistant. AHPL has overcome the shortcomings of wood as it is manufactured using aluminium coil with double layered Lumiflon coating that is resistant to dust. It has a polyethylene core that makes it resistant to water, fungus and termite. To top it all Super Bond HPL comes in a variety of colors, texture and sizes. SUPER BOND also offers customized sizes. AHPL has redefined the concept of high-end facade and exterior. SUPER BOND offers professionals service as it has a robust marketing network in India and abroad. Whether it is Villas, Housing Societies, Corporate Buildings or Resorts, AHPL is a perfect foil in place of wood.

Fixing Detail (with Rivets)

- Black Paint on Plastered Wall
- Fix aluminium section on wall, maintain gap of 400 - 700mm center with help of cleat vertically
- Pilot hole must be pre-drilled before fastening rivest tight.
- Size of rivets must be three times the thickness of panel and gouge of aluminium. Ensure rivets used are fully threaded.

Note: Majorly all ACP Series can be made as HPL

SAND & SKIN SERIES

Inspired by nature's pristine beauty The Sand Series ACP of Super Bond has a natural look and texture without the use of any natural material.

- Suitable for both exteriors and interiors
- Wide range of enchanting shades

TIMBER SERIES

Superior wood-like interiors and exteriors are now possible with Super Bond Timber Series. Take your pick from a range of realistic looks and give your designs that extra edge. These ACPs are super flexible and can bend, fold and turn easily. Straight and angular routing assists in bending the panels to cover angles, clad columns, create linear 'caps' or trays. Beside press brake or pyramid rollers can be used to bend the composite panel into a more desired shape.

MARBLE SERIES

Imagine a warm matte texture that oozes sophistication. The perfect match for your creation with low light reflectivity, the surface is completely opaque and smooth to touch. The subtle tactile effect accentuates facades greatly. The dry matte appearance hides dirt and is delightfully easy to maintain.

MIRROR SERIES

SHINE & STYLE Super Bond Mirror Series is like no other. It can jazz up interiors and offer wonderful reflections that outshine conventional mirrors. Furthermore, it comes with tints that complement your interiors.

Manufacturing unit:

KEYBOND INDUSTRIES LLP

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Road, Santacruz East, Mumbai- 400092.

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