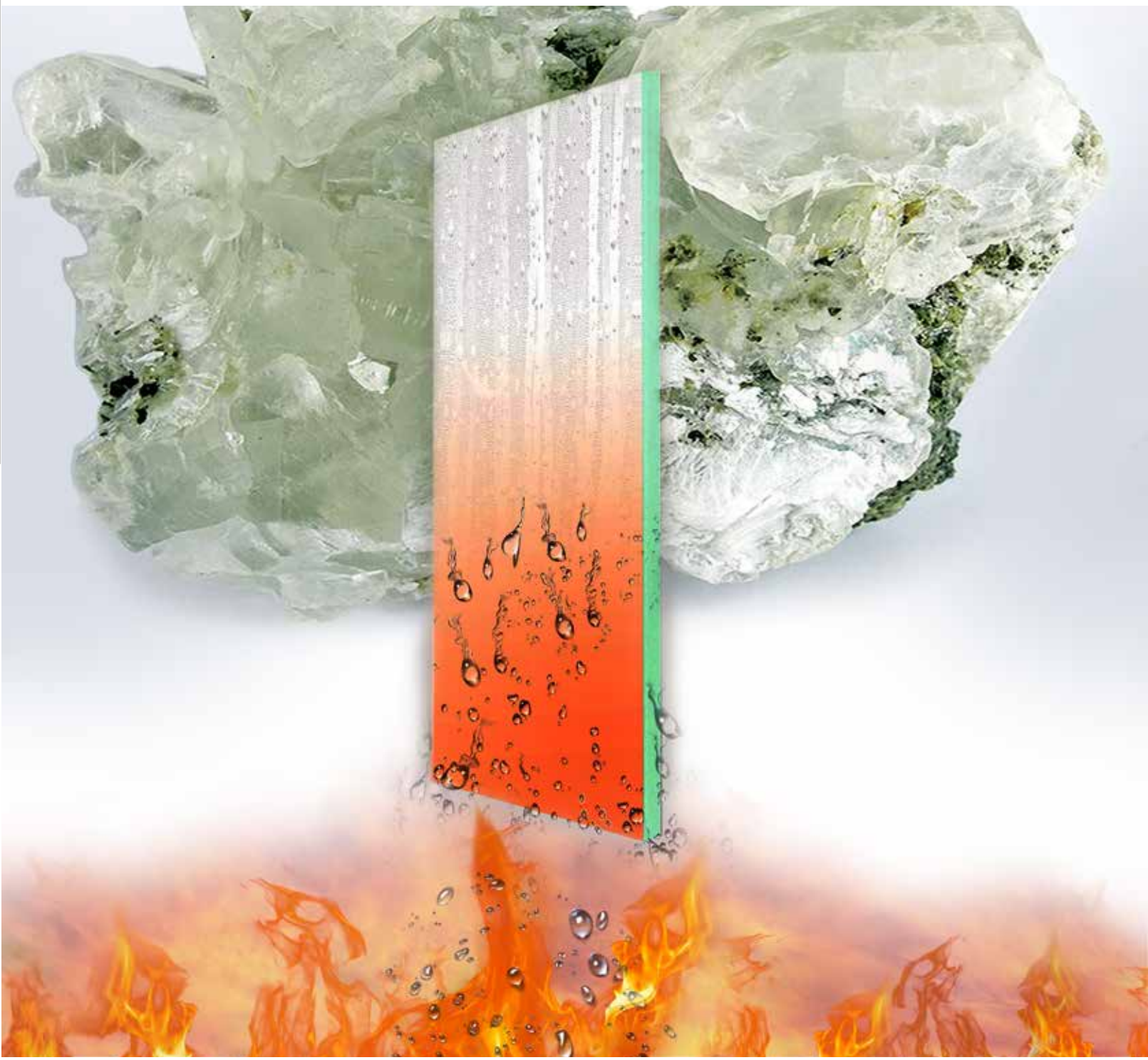
# Alubond A2

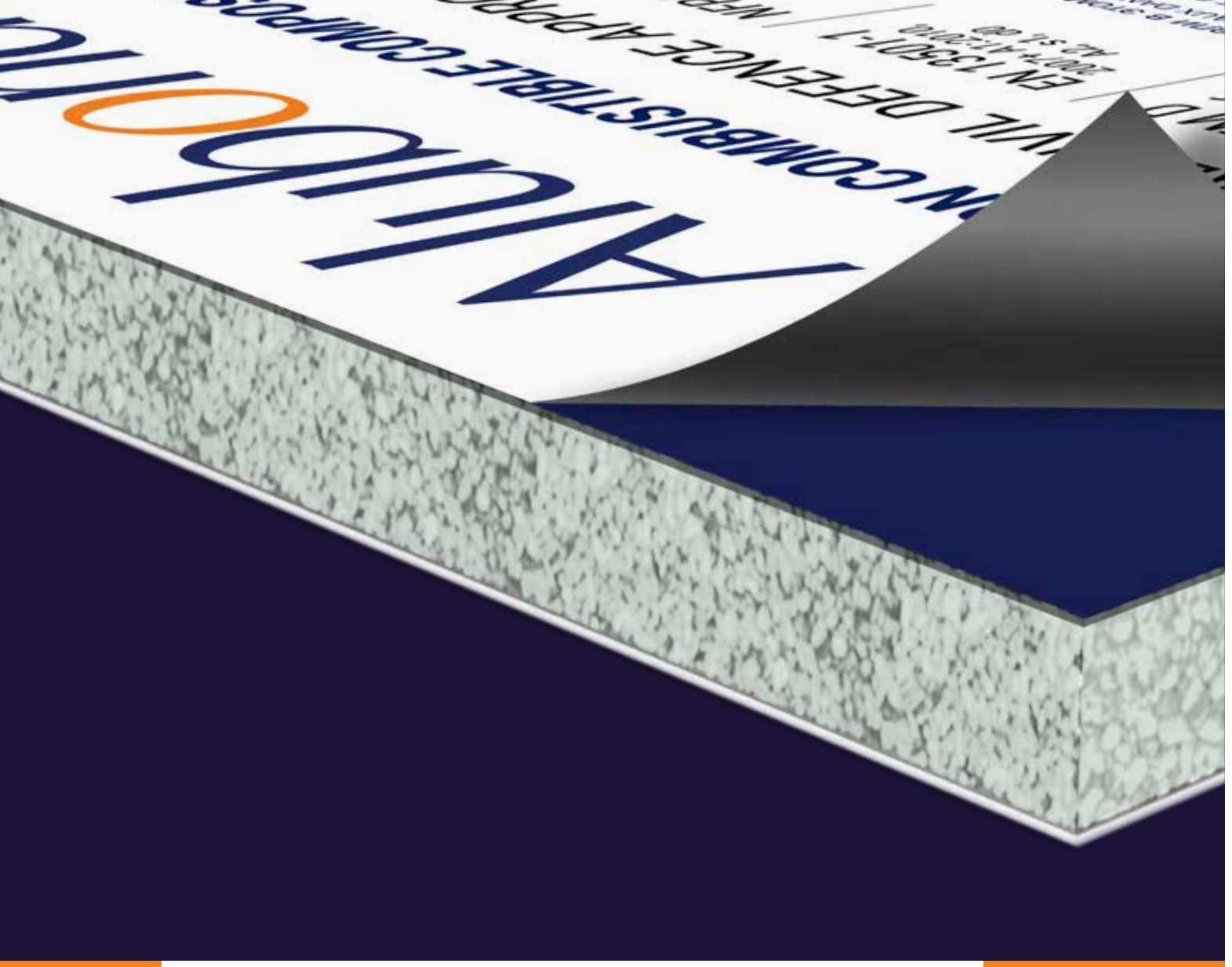
U.S.A

## NON COMBUSTIBLE COMPOSITE PANELS



## THE NEW CLADDING WONDER

## RELEASES WATER WHEN HEATED



# Alubond A2
U.S.A

## NON COMBUSTIBLE COMPOSITE PANELS

### ALUBOND U.S.A FR-A2, A QUALITY PRODUCT FROM ALUBOND U.S.A, THE WORLD'S LARGEST FIRE RETARDANT ACP PANEL.

Alubond U.S.A FR-A2 is a registered brand name of American Building Technologies located in Rockford Illinois with production bases in Europe, Middle East, Oman and India with an annual production capacity of 25,000,000 M2 (Twenty Five Million square meters) and the brand ownership is now fully transfered and the brand is now owned by Mulk Holdings.


# NO MORE FIRE

Alubond U.S.A FR-A2 is the new generation exterior fire retardant Panels with over 90% Stone core sandwiched between two layers of metal skins . Alubond U.S.A FR-A2 patented core formulation with a high percentage of Magnesium Hydroxide provides superior fire retardant capabilities making it an extremely safe cladding solution for buildings worldwide. Alubond U.S.A FR-A2 has passed stringent Fire test certifications all over the world achieving product classifications as per EN 13501 – 1 A2 S1 d0 (Over 90% Stone core content) and EN 13501 – 1 B S1 D0 (Over 70% Stone core content).

# SOLID MAGNESIUM HYDROXIDE IN A ROCK FORM

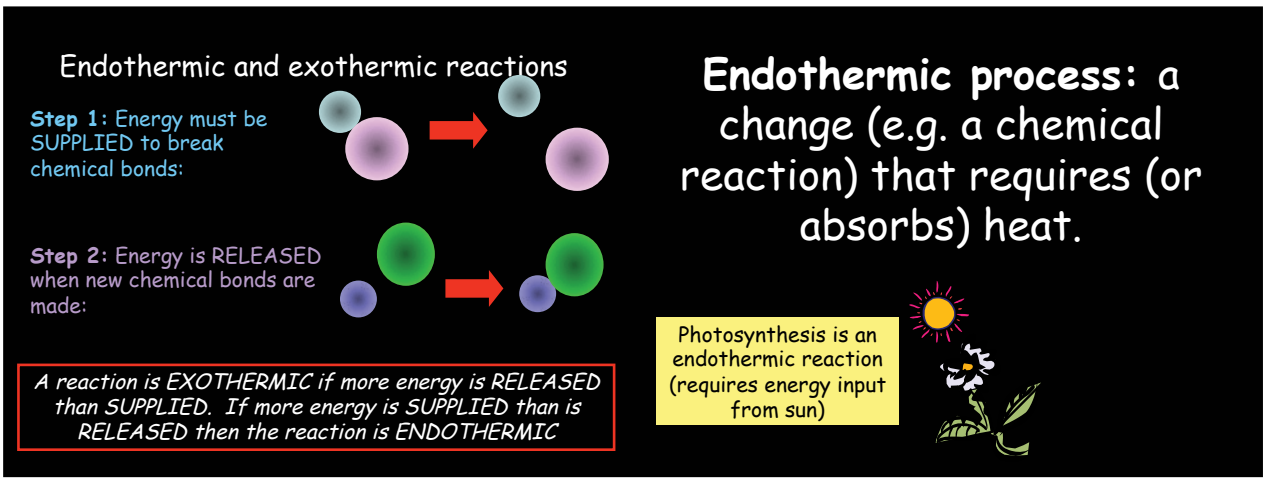
Alubond A2
U.S.A
NON COMBUSTIBLE COMPOSITE PANELS

## Advantages of Magnesium Hydroxide

- Filler and Flame Retardant/Smoke Suppressant in one product
- Environmentally Acceptable
- Halogen Free
- Non-Corrosive
- Reduces Smoke Density
- Non-Volatile
- Largely Inert
- ThermallyStableupto340°CandthereafterundergoesEndothermicDecomposition releasing Water

The solid mineral magnesium hydroxide, with the chemical formula $Mg(OH)_2$ is a common alteration product of periclase in marble; a low-temperature hydrothermal vein mineral in metamorphosed limestones and chlorite schists; and formed during serpentinization of dunites. It is often found in association with serpentine, calcite, aragonite, dolomite, magnesite, hydromagnesite, artinite, talc and chrysotile.

## What is Endothermic & Exothermic Reaction ?




LDPE (Low density Polyethylene) is a hydrocarbon material which exhibits exothermic reaction by releasing energy when exposed to heat.

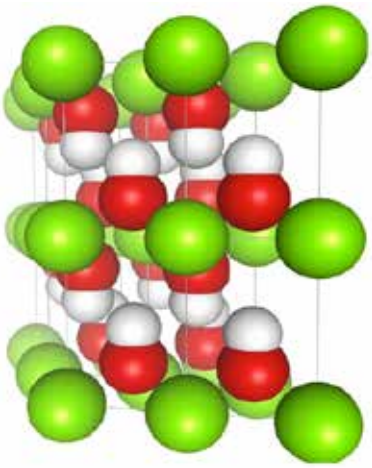
$Mg(OH)_2$ is a natural mineral which exhibits Endothermic reaction by absorbing heat when exposed to energy/heat.

# COMPARISON OF MAGNESIUM HYDROXIDE WITH ALUMINIUM TRIHYDRATE

Alubond A2
U.S.A
NON COMBUSTIBLE COMPOSITE PANELS

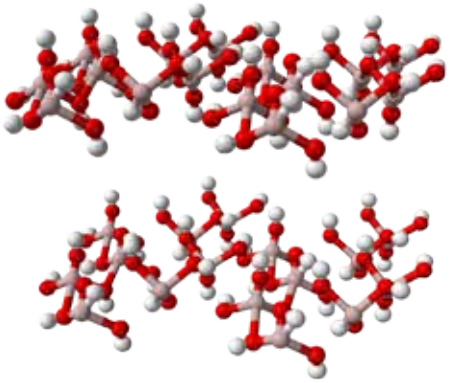
| | ATH | Magnesium Hydroxide |
|---|---|---|
| Molecular Formula | Al $(OH)_3$ | Mg $(OH)_2$ |
| Water Content Loss on Ignition (LOI) | 34% | 31% |
| Decomposition Temperature | Greater than 230° C | Greater than 330° C |
| Mohs hardness | 2.5–3.5 | 2.0-3.0 |
| Specific Gravity | 2.42 | 2.36 |
| pH | 10-8 | 10.5 |
| Electrical Conductivity us/cm | Less than 350DIN | 53208 |
| Color | White | White |
| Physical Properties | Powder | Powder |
| Refractive Index | 1.57 | 1.58 |
| Particle Morphology | Hexagonal Platelet | Hexagonal Platelet |

## Magnesium Hydroxide Structure :



GREEN : Magnesium
RED : Hydrogen
WHITE : Oxygen

## Aluminium Trihydrate Structure



RED : Alumina
PINK : Hydrogen
WHITE : Oxygen

Some MCM Manufacturers use Aluminium Hydroxide due to the easy availability of the mineral in proximity to production plants. Alubond U.S.A FR-A2 uses Magnesium Hydroxide as its prime core mineral based on the following data.

**Reactivity :** Magnesium Hydroxide is much more reactive than Alumina Trihydrate (ATH), whereas ATH releases the available water over a broad range (230° C to 430° C), Magnesium Hydroxide releases the available water over a much narrower range (330° C or 630° F to 430° C). In simple terms this compares to spraying a fine mist of water over a fire (ATH) as opposed to dousing the fire with a full bucket of water (Magnesium Hydroxide). The quick release of water enhances the flame retardant properties of Magnesium Hydroxide.

**Water Release :** Magnesium Hydroxide releases water at a higher temperature than ATH. The higher temperature release is at a more critical point that reduces the spread of the flame.

**Particle Shape** : Magnesium Hydroxide particles, if viewed under a microscope, are plate-like versus the spherical particles of ATH. These plate-like particles overlap one another similar to fish scales or roofing shingles. Pound for pound these plate-like particles offer much more exposed surface area than spherical ATH particles. Therefore more particles are directly exposed to the flame. Also, the plate-like particles provide more strength, flexibility and reinforcement in the finished product as opposed to spherical particles.

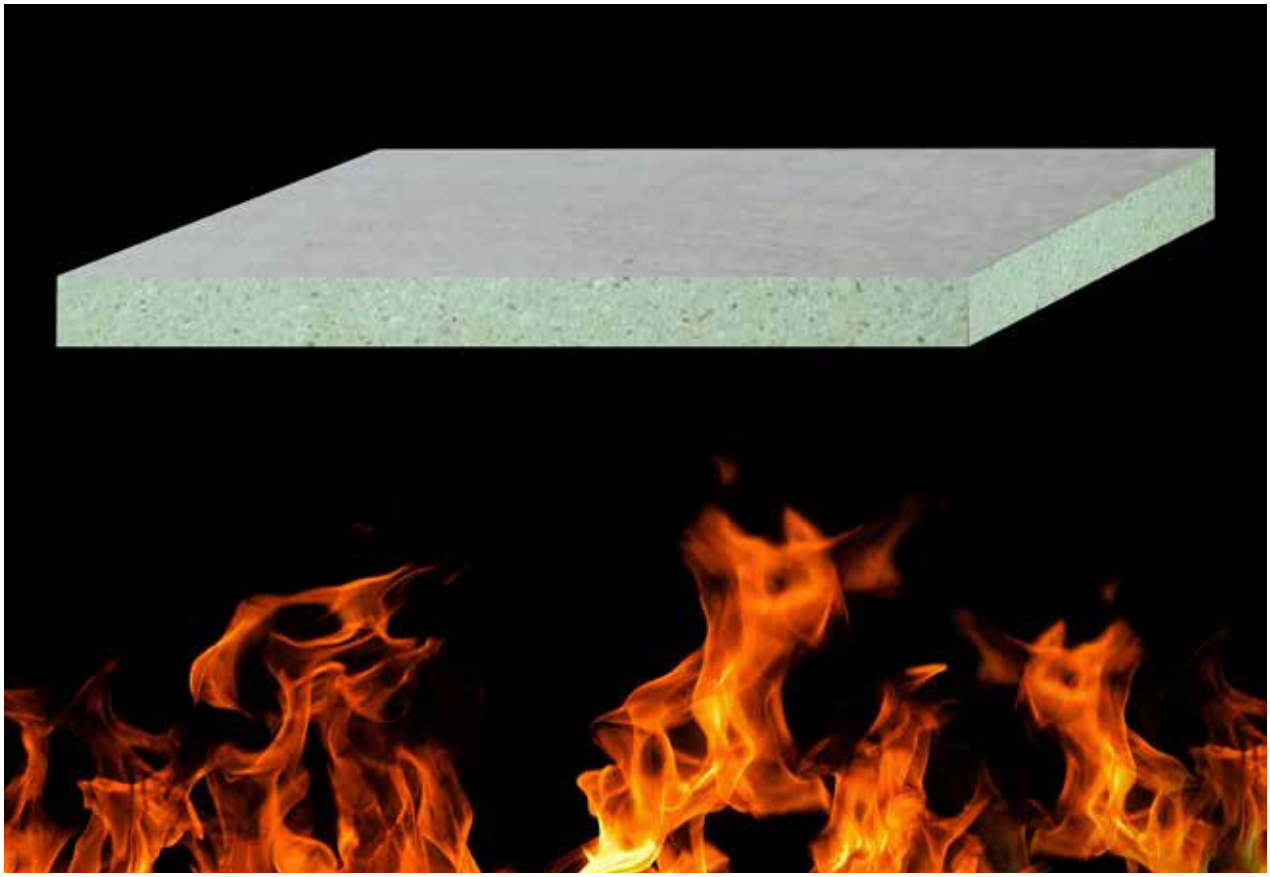
**Particle Integration :** Magnesium Hydroxide is a natural mix of particles. There is particle penetration and integration within Magnesium Hydroxide rather than having ATH and calcium carbonate particles mixed side by side. This allows a better distribution of the fire retardant and smoke suppressant properties.

**Stability**: Magnesium Hydroxide has stabilizing characteristics that tend to neutralize acid and toxic smoke. ATH does not provide these benefits.

**Char Ash:** Magnesium Hydroxide during the burning reaction forms a "Char-Ash" in front of the flame, which suppresses the flame.

# Physical Properties

- Physical properties such as viscosity cure rate, stress strain and durometer, suggest that magnesium hydroxide is virtually indistinguishable from ATH from a filler performance standpoint.
- Magnesium Hydroxide, because of its acid scavenging properties, can play a useful role in halogenated compounds by reducing acid gas emissions.
- By absorbing the heat, magnesium hydroxide prevents or delays ignition and retards combustion of polymeric materials.



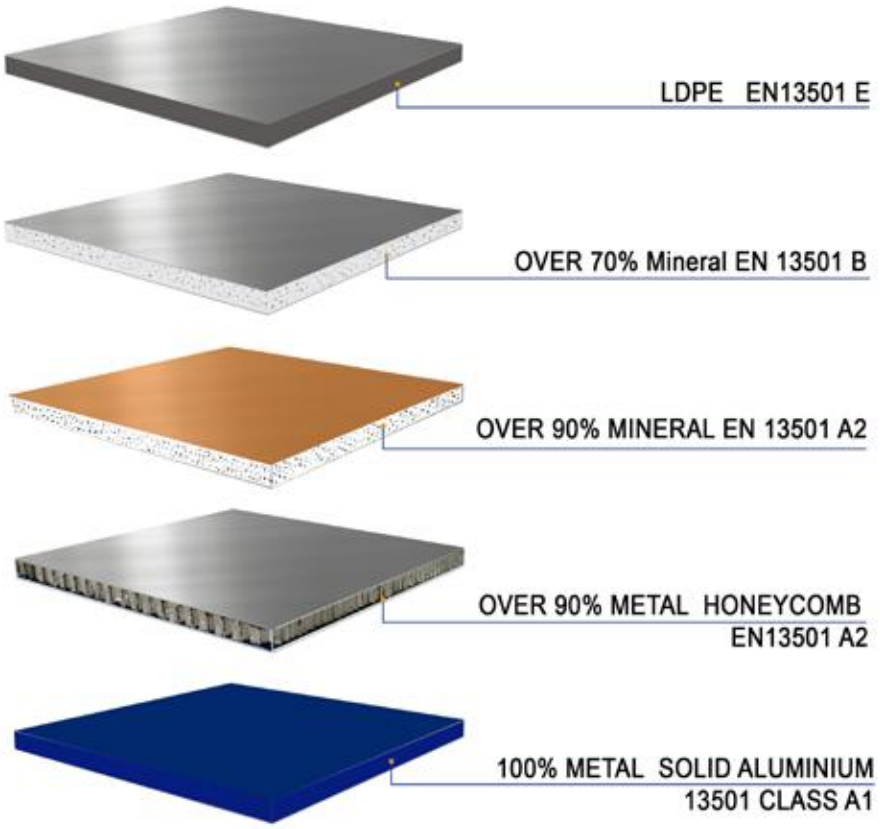
Alubond U.S.A FR-A2's formulated CORE exposed to a temperature over 332$^{0}$C

## Alubond U.S.A FR-A2 - Endothermic Reaction

+

Magnesium Oxide Mg0 (s) + Water ($H_2O$) (g)

# Different Types of Cores




| PERFORMANCE | LDPE EN 13501 E | OVER 70% MINERAL EN 13501 B | OVER 90% MINERAL EN 13501 A2 | OVER 90% METAL HONEYCOMB EN13501 A2 | 100% METAL SOLID ALUMINIUM 13501 CLASS A1 |
|---|---|---|---|---|---|
| Combustibilty Rating | Combustible | Low Combustibility | Non Combustible | Non Combustible | Non Combustible |
| NFPA 285/ BS 8414 Pass | No | Yes | Yes | Yes | Yes |
| ASTM E 84 Core Burning Class A Rating | No | Yes | Yes | Yes | Yes |
| ASTM D 1929 Ignition | No | Yes | Yes | Yes | Yes |
| EN 13501 | E | B | A2 | A2 | A1 |
| Direct Flame Over 1000°C Fire Penetration | 20 Seconds | 18 Minutes | 30+ Minutes | 55 Seconds | 30 Seconds |

# TECHNICAL DATA SHEET
# ALUBOND U.S.A FR-A2

Alubond A2 U.S.A
NON COMBUSTIBLE COMPOSITE PANELS

| Alubond A2 U.S.A NON COMBUSTIBLE COMPOSITE PANELS (A UAE CIVIL DEFENSE APPROVED PRODUCT*) | | | | EBI/TDS/001 Rev 1 date :07.05.2017<br>Alloy Series: 1). 1100 H16 /H18 2) 3105/3003 H16 3) 5005 H16/24 | | |
|---|---|---|---|---|---|---|
| **S.NO** | **PROPERTIES** | **STANDARD** | **UNIT/REF** | **3mm** | **4mm *** | **6mm** |
| | **PRINCIPAL PROPERTIES** | | | | | |
| 1 | **Skin thickness** | .... | mm | 0.5mm | | |
| 2 | **Weight** | .... | ±0.5 Kg/$m^2$ | 6.2 | 8.0 | 11.6 |
| 3 | **Standard Width** | ..... | mm | 1000, 1250, 1500 | | |
| | **PRODUCT TOLERANCES** | | | | | |
| 4 | **Width** | ..... | mm | ±2 | | |
| 5 | **Length** | .... | mm | ±3 | | |
| 6 | **Thickness** | ..... | mm | ±0.2 | | ± 0.3 |
| 7 | **Squareness** | ..... | mm | Max 5 | | |
| 8 | **Bow** | ..... | % | ±0.5 | | |
| | **MECHANICAL PROPERTIES** | | | | | |
| 9 | **Tensile strength** | ASTM E8 | MPa or N/mm2 | 56 | 43 | 25 |
| 10 | **0.2% proof stress** | ASTM E8 | MPa or N/mm2 | 47 | 41 | 22 |
| 11 | **Elongation** | ASTM E8 | %. | 4.8 | 3.8 | 2 |
| 12 | **Flexural elasticity, E** | ASTM C 393 | GPa or kN/mm2 | 45 | 38.5 | 26 |
| 13 | **Flexural rigidity, E×I,** | ASTM C 393 | kNmm2/mm | 110 | 203 | 395 |
| | **ACOUSTICAL PROPERTIES** | | | | | |
| 14 | **Sound Transmission Loss** | ASTM E413 | dB | 26 | 27 | |
| 15 | **Sound absorbtion factor** | ISO 354 | .. | 0.05 | | |
| | **THERMAL PREPORTIES** | | | | | |
| 16 | **Deflection Temprature** | ASTM D 648 | °C | 110 | | |
| 17 | **Thermal resistance R** | ASTM C518 | $M^2K/W$ | 0.031 | | |
| 18 | **Temperature resistance** | | °C | –50….+80 | | |
| 19 | **Linear Thermal Expansion** | EN 1999 1-1 | mm/m @100°C | 2.4 | | |
| | **CORE FIRE PERFOMANCES** | | | | | |
| 20 | **Core** | ..... | ..... | Excellent performance Non Combustible Mineral filled core | | |
| 21 | **Reaction to fire** | EN 13501-1 | TBW 0300154 & TBW 0300126.2 | A2, S1, d0 | | |
| 22 | **Surface Burning Charecterstics** | ASTM E84 | | Class A/ Class 1 | | |
| 23 | **Self Ignition Temp** | ASTM D 1929 | | Not Less than 343t8C | | |
| 24 | **Exterior Non Load Bearing Wall Assembly** | NFPA 285 | TBW 0300155& TBW 0300156 & TBW 0300137.2 | ..... | Passed Various Assembly Tests(Listings Referencce: MH-ATD-001 & MH-AED 003&MH-AED-004 Rev 0) | .... |
| 25 | **Fire Rating** | ASTM E119 | TBW0200165 | .... | 3 Hrs( Listing Reference :MH -AED-3HR-006 Rev0) | .... |
| | **COATING PERFORMANCES** | | | | | |
| 26 | **No. of Coats** | AAMA 2605-13 | ..... | Standard 2 Coat / 3 Coat/ 4 Coat | | |
| 27 | **Type/finish** | | ..... | Standard PVDF / FEVE / HDPE | | |
| 28 | **Gloss @60°c** | | % | 20-40 / 20-80 | | |
| 29 | **Adhesion (Dry Condition )** | | .... | No. Adhesion loss | | |
| 30 | **Pencil hardness** | | ..... | min HB | | |


**MEDICLINIC PARKVIEW HOSPITAL, DUBAI, UAE**
Architect: **Stantec International**

**ELITE-10, DUBAI, UAE**
Consultant: **Barjeel Engineering Consultant**

# PROJECT REFERENCES
# ALUBOND U.S.A FR-A2

Alubond A2
U.S.A
NON COMBUSTIBLE COMPOSITE PANELS


**RESIDENTIAL BUILDING, AL BARSHA, DUBAI, UAE**
Contractor: **Modern Building Contracting Co. LLC**

**WORLD TRADE CENTRE L.L.C., DUBAI, UAE**
Consultant: **WSP Middle East Ltd & Hopkins Architects Dubai Ltd.**
Contractor: **Al Futtaim Carillion LLC**

# PROJECT REFERENCES
# ALUBOND U.S.A FR-A2

Alubond A2
U.S.A
NON COMBUSTIBLE COMPOSITE PANELS

**MANARA TOWER, DUBAI, UAE**


**ALOFT CITY CENTRE, DEIRA, DUBAI, UAE**
Client: **Majid Al Futtaim**

**TIARA UNITED TOWERS, BUSINESS BAY, DUBAI, UAE**
Client: **Zabeel Investments**

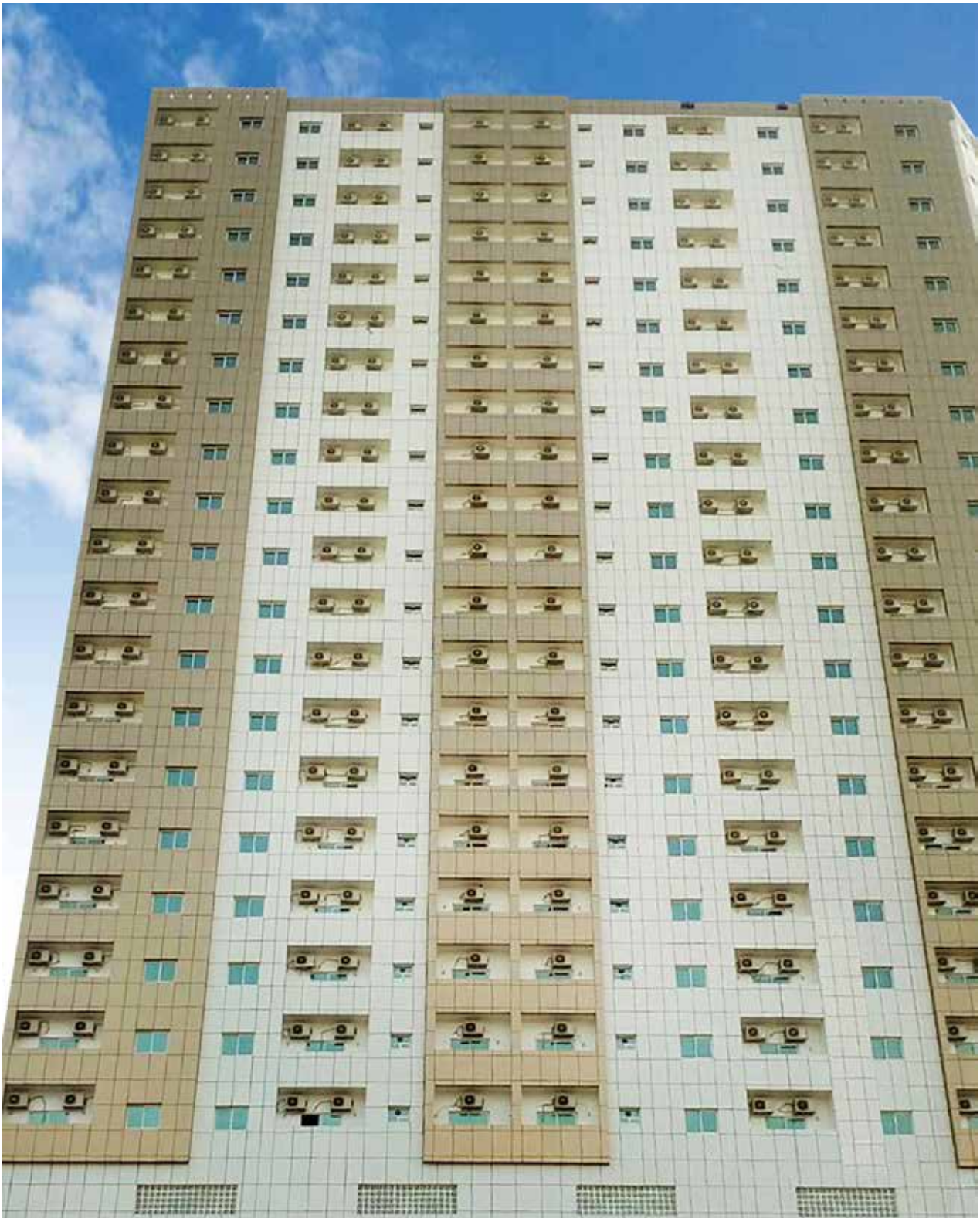
**NIGHT MARKET & BOARDWALK, DEIRA, DUBAI, UAE**
Client : **Nakheel PJSC**
Consultant: **AE7**

**RESIDENTIAL BUILDING, NAD AL HAMAR, DUBAI, UAE**
Contractor: **Naresco Contracting LLC**

**BAHWAN TOWER DOWNTOWN, DUBAI, UAE**
Consultant: **Arif & Bintoak Engineering Consultants**


**ISUZU TRAINING CENTER FACILITY JAFZA, DUBAI, UAE**
Consultant: **AWAJ Engineering Consultants**

**RESIDENTIAL BUILDING, AL RAWADA, AJMAN, UAE**
Consultant: **Nakheel Engineering Consultant**
Contractor: **INT. Contracting**



## AJMAN HADEEF TOWER, AJMAN, UAE

**RAWDHAT RESIDENTIAL BUILDING, ABU DHABI, UAE**
Client : **Emirates Land Group**
Engineering : **Sinergo**
Consultant : **JLA International**

**AL WAFRA, AL REEM ISLAND, ABU DHABI, UAE**
Consultant: **KEO International**
Contractor: **SEIDCO General Contracting**

**ARISTA LIFE, ISTANBUL**
Architect: **Murat Kader**


**GOZTEPE HILTON HOTEL, ISTANBUL**
Architect: **Gökhan Tunç**

**BUSINESS EDUCATION ACCELERATION CENTER**
**EDUCATIONAL BUILDING, OLOMOUC, CZECH REPUBLIC**
Architect: **Ing. Arch. Ladislav Opletal**

**CONTINENTAL AUTOMOTIVE, ROMANIA**
Architect: **Adrian Corduneanu**

**DUMANKAYA MIKS, ISTANBUL**
Architect: **Tago Architects**

# РОССИЙСКАЯ ФЕДЕРАЦИЯ
# СЕРТИФИКАТ СООТВЕТСТВИЯ
**(обязательная сертификация)**

№ C-RS.ПБ58.B.00550 (номер сертификата соответствия) ТР 1372258 (учетный номер бланка)

**ЗАЯВИТЕЛЬ** (наименование и место-нахождение заявителя) Alubond Europe d.o.o. Адрес: Nemanjina No. 130, 26320 Banatski Karlovac, Serbia, Сербия. Телефон ++ 381 13 651 041 (42, 43), факс ++ 381 13 652 852.

**ИЗГОТОВИТЕЛЬ** (наименование и место-нахождение изготовителя продукции) Alubond Europe d.o.o. Адрес: Nemanjina No. 130, 26320 Banatski Karlovac, Serbia, Сербия. Телефон ++ 381 13 651 041 (42, 43), факс ++ 381 13 652 852.

**ОРГАН ПО СЕРТИФИКАЦИИ** (наименование и местонахождение органа по сертификации, выдавшего сертификат соответствия) ОС "Альфа "Пожарная Безопасность" ООО "Альфа "Пожарная Безопасность". Россия, 301760 Тульская область, г. Донской, ул. Горноспасательная, д. 1А, тел./факс: +7 (495)648-78-98. ОГРН: 1107154016166. Аттестат рег. № ТРПБ. RU.ПБ58 выдан 28.12.2010г. МЧС России.

**ПОДТВЕРЖДАЕТ, ЧТО ПРОДУКЦИЯ** (информация об объекте сертификации, позволяющая идентифицировать объект) Огнестойкие алюминиевые композитные панели типа ALUBOND U.S.A FR A2, торговой марки ALUBOND U.S.A (толщиной от 3 мм до 6 мм), с толщиной алюминиевых покрывающих слоев от 0,3 мм до 0,5 мм, с огнестойким минеральным наполнителем, выпускаемые по GBT 17748-2008 и EN 13501-1. Серийный выпуск.

код ОК 005 (ОКП) 52 7500

код ЕКПС

код ТН ВЭД России 7606 11 100 0

**СООТВЕТСТВУЕТ ТРЕБОВАНИЯМ ТЕХНИЧЕСКОГО РЕГЛАМЕНТА (ТЕХНИЧЕСКИХ РЕГЛАМЕНТОВ)** (наименование технического регламента (технических регламентов), на соответствие требованиям которого (которых) проводилась сертификация) Технический регламент о требованиях пожарной безопасности (Федеральный закон от 22.07.2008 N 123-ФЗ)
Группа горючести – Г1(слабо горючие) по ГОСТ 30244-94; группа воспламеняемости – В1(трудновоспламеняемые) по ГОСТ 30402-96; группа дымообразующей способности – Д1 (с малой дымообразующей способностью) по ГОСТ 12.1.044-89, п. 4.18; группа по токсичности продуктов горения –Т1(малоопасные) по ГОСТ 12.1.044-89, п. 4.20
Класс пожарной опасности строительных материалов – КМ1

**ПРОВЕДЕННЫЕ ИССЛЕДОВАНИЯ (ИСПЫТАНИЯ) И ИЗМЕРЕНИЯ** Протокол сертификационных испытаний № 953-С/ТР от 26.12.2012 г. ИЛ "Альфа "Пожарная Безопасность" ООО "Альфа "Пожарная Безопасность" № ТРПБ.RU.ИН41 от 28.12.2010 г.

**ПРЕДСТАВЛЕННЫЕ ДОКУМЕНТЫ** (документы, представленные заявителем в орган по сертификации в качестве доказательств соответствия продукции требованиям технического регламента (технических регламентов)) Сертификат Системы Менеджмента Качества ГОСТ Р ИСО 9001-2008 № СДСГК RU.ОС05.К01473 от 22.11.2012 г.

**СРОК ДЕЙСТВИЯ СЕРТИФИКАТА СООТВЕТСТВИЯ** с 26.12.2012 по 25.12.2015

М.П. для сертификатов

Руководитель (заместитель руководителя) органа по сертификации (подпись, инициалы, фамилия) А.А.Гомзов

Эксперт (эксперты) (подпись, инициалы, фамилия) А.П.Губенко

**RUSSIAN GOST R CERTIFICATE**

THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS

UKAS PRODUCT CERTIFICATION 6762

In accordance with UKAS accreditation to ISO 17065
Certification is Hereby Granted

to

*Eurocon Building Industries FZE*

*(a subsidiary of Mulk Holdings F.Z.C Group, Sharjah UAE)*

*P.O Box 42642, Hamriyah Free Zone, Sharjah, United Arab Emirates*

for

**"Alubond® U.S.A. FR-A2"**

**4.0 mm thick Aluminium Composite Material**

**(ASTM E84-16, ASTM D1929-16 and EN 13501-1:2007+A1:2010)**

which, subject to limitations described on the following pages and continued listing on www.tbwcert.com, complies with Product Certification Scheme *SD03 Exterior Wall Assemblies, Cladding, Curtain Walls, Building Materials, Products and Assemblies*

In witness whereof, this Certificate is issued this 16th day of October 2017

THOMAS BELL-WRIGHT INTERNATIONAL CONSULTANTS 10034 CERTIFIED

Thomas F. Bell-Wright
Certification Director

Nick Purcell
Certification Manager

**Certificate Number: TBW0300154.1**

Initial registration: March 15, 2017 Issued: October 16, 2017 Expiration: March 14, 2020
File Name: RA011 Eurocon FR-A2 (UAE)_R1_final Save Date: 10/15/17 8:06 AM

This certificate and schedules are held in force by regular Factory Inspections by Thomas Bell-Wright International Consultants (TBWIC). Refer to www.tbwcert.com or contact TBWIC Fire Compliance Division to validate the current status of Certification. This certificate remains the property of THOMAS BELL-WRIGHT INTERNATIONAL CONSULTANTS, PO BOX 26385, DUBAI, UAE.
Tel: +971 4 333 2692, Email: certification@bell-wright.com. Web: www.bell-wright.com F 19 Scheme Certificate Issue 5, Dec 2016


**THOMAS BELL-WRIGHT LISTINGS: ASTM E84 - Class A, ASTM D1929 - Self ignition more than 450°C, EN 13501-1 : 2007-A2,S1,d0**

THOMAS BELL-WRIGHT
INTERNATIONAL CONSULTANTS

UKAS PRODUCT CERTIFICATION 6762

In accordance with UKAS accreditation to ISO 17065
Certification is Hereby Granted

to

*Eurocon Building Industries FZE*

*(a subsidiary of Mulk Holdings F.Z.C Group, Sharjah UAE)*

*PO Box. 42642, Hamriya Freezone, Sharjah UAE*

for

**"Alubond U.S.A. FR-A2"**
Aluminium Composite Material
Non-Load-Bearing Exterior Wall Cladding System
Test Method: NFPA 285-2012 Edition

which, subject to limitations described on the following pages and continued listing on www.tbwcert.com, complies with Product Certification *Scheme SD03 Exterior Wall Assemblies, Cladding, Curtain Walls, Building Materials, Products, and Assemblies*

In witness whereof this Certificate is issued this 15th day of March 2017

THOMAS BELL-WRIGHT INTERNATIONAL CONSULTANTS 100186 CERTIFIED

Thomas F. Bell-Wright
Certification Director

Nick Purcell
Certification Manager

**Certificate Number: TBW0300155**

Initial registration: March 15, 2017 Issued: March 15, 2017 Expiration: March 14, 2020
File Name: RA011 Eurocon FR-A2 (UAE) NFPA 285-MechSys Save Date: 3/15/17 2:27 PM

This certificate and schedules are held in force by regular Factory Inspections by Thomas Bell-Wright International Consultants (TBWIC). Refer to www.tbwcert.com or contact TBWIC Fire Compliance Division to validate the current status of Certification. This certificate remains the property of THOMAS BELL-WRIGHT INTERNATIONAL CONSULTANTS, PO BOX 26385, DUBAI, UAE.
Tel: +971 4 333 2692, Email: fire@bell-wright.com. Web: www.bell-wright.com F 19 Scheme Certificate Issue 5. Dec 2016


THOMAS BELL-WRIGHT INTERNATIONAL CONSULTANTS

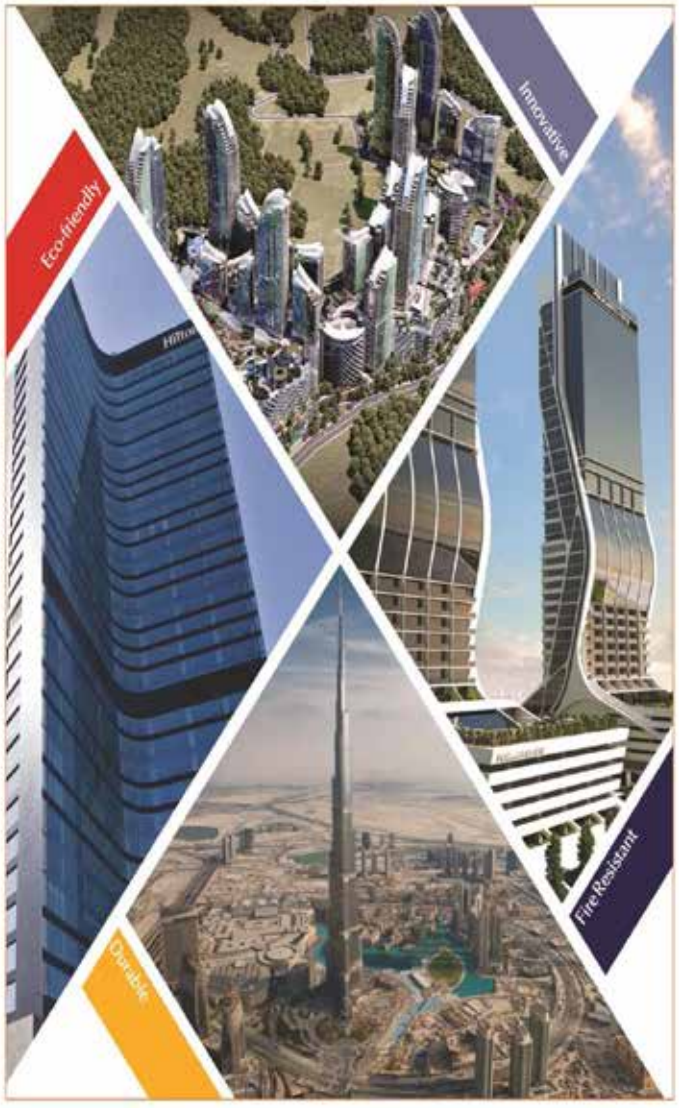
**THOMAS BELL-WRIGHT LISTINGS: NFPA 285 Passed**

# ENVIRONMENTAL PRODUCT DECLARATION ALUBOND U.S.A FR-A2

ENVIRONMENTAL PRODUCT DECLARATION

## ALUBOND U.S.A.® FIRE RATED A2

FIRE RATED ALUMINUM COMPOSITE PANELS
ALUBOND TURKEY




*World's Largest Aluminum Composite Panel brand*

Alubond® U.S.A
Fire Rated Metal Composites

Worldwide presence of more than 20 years, cooperation on numerous projects all over the globe, with an annual production capacity of more than 25 million m² located in 8 countries makes Alubond U.S.A.® the World's Largest Metal Composite Brand.

Great potential of shaping, variety of finishes and highest fire resistant products, wide range of colors and possibilities of individualization makes Alubond U.S.A.® an architect's dream material. The willingness to support sustainability and create eco-friendly products leads us toward constant improvements and innovations. Our 100 % recyclable panels meet LEED certification requirements. With special Alubond Green Series® and our environment-conscious production at all units, we are committed to keep on contributing to efforts to make the World more beautiful place.

UL CERTIFIED
ENVIRONMENTAL PRODUCT DECLARATION
UL.COM/EPD

**ENVIRONMENTAL CERTIFICATE**

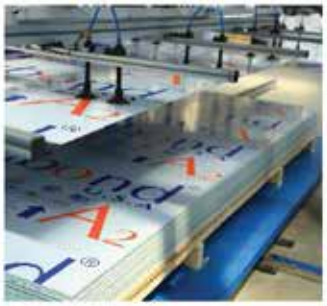
# ENVIRONMENTAL PRODUCT DECLARATION ALUBOND U.S.A FR-A2

Alubond A2 U.S.A
NON COMBUSTIBLE COMPOSITE PANELS

CERTIFIED
ENVIRONMENTAL PRODUCT DECLARATION

## EPD Transparency Summary

| | |
|---|---|
| COMPANY NAME | **Alubond U.S.A.®** |
| PRODUCT TYPE | **Cladding System** |
| PRODUCT NAME | Fire Rated A2 |
| PRODUCT DEFINITION | Fire Resistant Aluminum Composite Panel |
| PRODUCT CATEGORY RULE (PCR) | UL Product Category Rule (PCR) for preparing an Environmental Product Declaration (EPD) for Product Group/Cladding System Products, 2015 |
| CERTIFICATION PERIOD | **January 12, 2016 - January 12, 2021** |
| DECLARATION NUMBER | **4786995827.101.1** |



### LIFECYCLE IMPACT CATEGORIES

The environmental impacts listed below were assessed throughout the product's lifecycle—including raw material extraction, transportation, manufacturing, packaging, use, and disposal at end of life.

| | ATMOSPHERE | | | WATER | | EARTH | |
|---|---|---|---|---|---|---|---|
| | **Global Warming Potential** refers to long-term changes in global weather patterns—including temperature and precipitation—that are caused by increased concentrations of greenhouse gases in the atmosphere. | **Ozone Depletion Potential** is the destruction of the stratospheric ozone layer which shields the earth from ultraviolet radiation that's harmful to life, caused by human-made air pollution. | **Photochemical Ozone Creation Potential** happens when sunlight reacts with hydrocarbons, nitrogen oxides, and volatile organic compounds to produce a type of air pollution known as smog. | **Acidification Potential** is the result of human-made emissions and refers to the decrease in pH and increase in acidity of oceans, lakes, rivers, and streams—a phenomenon that pollutes groundwater and harms aquatic life. | **Eutrophication Potential** occurs when excessive nutrients cause increased algae growth in lakes, blocking the underwater penetration of sunlight needed to produce oxygen and resulting in the loss of aquatic life. | **Depletion of Abiotic Resources (Elements)** refers to the reduction of available non-renewable resources, such as metals and gases, that are found on the periodic table of elements, due to human activity. | **Depletion of Abiotic Resources (Fossil Fuels)** refers to the decreasing availability of non-renewable carbon-based compounds, such as oil and coal, due to human activity. |
| TRACI | **639.91** kg CO2 eq. | **0.69E-08** kg CFC-11 eq. | **53.47** kg O3 eq. | **3.58** kg SO2 eq. | **0.13** kg N eq. | | |
| CML | **640** kg CO2 eq. | **8.84E-8** kg R11 eq. | **0.25** kg Ethene eq. | **3.5** kg SO2 eq. | **0.3** kg Phosphate eq. | **5.55E-4** kg Sb eq. | **6320** MJ |

FUNCTIONAL UNIT: **The Functional Unit is 100 sq ft of fire rated aluminum composite panel produced in ALUBOND U.S.A. manufacturing plant located in Turkey**

**Environment**

## ENVIRONMENTAL CERTIFICATE

# ENVIRONMENTAL PRODUCT DECLARATION ALUBOND U.S.A FR-A2

Alubond A2 U.S.A
NON COMBUSTIBLE COMPOSITE PANELS

## Environment

### MATERIAL CONTENT

Material content measured to r%

| COMPONENT | MATERIAL | AVAILABILITY | MASS% | ORIGIN |
|---|---|---|---|---|
| Top Sheet & Bottom Sheet | Aluminum | Metal Production | 30 | Turkey |
| Core Material | Fire Rated Mineral Core | Mineral | 68 | Dubai |
| Top Sheet Coating | PVDF | Polyester Resins | 1 | Turkey |
| Bottom Sheet Coating | PE | Polyester Resins | 1 | Turkey |

### ADDITIONAL ENVIRONMENTAL INFORMATION

| | |
|---|---|
| PRE-CONSUMER RECYCLED CONTENT | % |
| POST-CONSUMER RECYCLED CONTENT | % |
| VOC EMISSIONS | |
| WATER CONSUMPTION | 2.30E+03 m3 |

### RECYCLING OR REUSE

All Alubond U.S.A.® FR-A2 composite panel waste generated during manufacturing and at the end-of-life are resulting as recyclable or reusable materials. The aluminum scrap occurs during sizing activities are collected and directed to regional recycling services. The fire-rated core leaving the manufacturing system as rate of waste can be taken into the manufacturing system to reuse for the same product productions.

### ENERGY

| | | |
|---|---|---|
| RENEWABLE ENERGY | 16.41 % | 1.44E+03 MJ |
| NON-RENEWABLE ENERGY | 83.59 % | 7.34E+03 MJ |

### STANDARDS

-TS/EN ISO 9001:2008
-ME 5063
-ASTM E119
-TSEK 300

### CERTIFICATIONS

### MANUFACTURER CONTACT INFO

| | |
|---|---|
| NAME | Alubond TURKEY \| Aluminum Composite Panel |
| PHONE | +90 262 746 1420 |
| EMAIL | iinfo@alubond.com.tr |
| WEBSITE | www.alubond.com.tr |

www.UL.com/environment | environment@ul.com

The information presented herein is a summary of content contained in the manufacturer's ISO 14025-compliant EPD certified by UL. Please visit www.ul.com/environment to download the full EPD.
UL, the UL logo, and UL certification mark are trademarks of UL LLC. All other marks are the property of their respective owners.

**ENVIRONMENTAL CERTIFICATE**

Alubond U.S.A

FR Euroclass B

# FIRE RETARDANT PANELS

# TECHNICAL DATA SHEET
# ALUBOND U.S.A FR EUROCLASS B

Alubond U.S.A FR Euroclass B

| Alubond U.S.A FR Euroclass B (A UAE CIVIL DEFENSE APPROVED PRODUCT*) | | | EBI/TDS/002 Rev 0 date :07.05.2017<br>Alloy Series:<br>1). 1100 H16 /H18 2) 3105/3003 H16<br>3) 5005 H16/24 | | |
|---|---|---|---|---|---|
| **S.NO** | **PROPERTIES** | **STANDARD** | **UNIT/REF** | **3mm** | **4mm*** | **6mm*** |
| | **PRINCIPAL PROPERTIES** | | | | | |
| 1 | **Skin thickness** | .... | mm | 0.5mm | | |
| 2 | **Weight** | .... | ±0.5 Kg/$m^2$ | 6 | 7.5 | 10.5 |
| 3 | **Standard Width** | ..... | mm | 1000, 1250, 1500 | | |
| | **PRODUCT TOLERANCES** | | | | | |
| 4 | **Width** | ..... | mm | ±2 | | |
| 5 | **Length** | .... | mm | ±3 | | |
| 6 | **Thickness** | ..... | mm | ±0.2 | | ± 0.3 |
| 7 | **Squareness** | ..... | mm | Max 5 | | |
| 8 | **Bow** | ..... | % | ±0.5 | | |
| | **MECHANICAL PROPERTIES** | | | | | |
| 9 | **Tensile strength** | ASTM E8 | MPa or N/mm2 | 60 | 45 | 28 |
| 10 | **0.2% proof stress** | ASTM E8 | MPa or N/mm2 | 50 | 44 | 25 |
| 11 | **Elongation** | ASTM E8 | %. | 6 | 5 | 2 |
| 12 | **Flexural elasticity, E** | ASTM C 393 | GPa or kN/mm2 | 48 | 38 | 28 |
| 13 | **Flexural rigidity, E×I,** | ASTM C 393 | kNmm2/mm | 70 | 135 | 345 |
| | **ACOUSTICAL PROPERTIES** | | | | | |
| 14 | **Sound Transmission Loss** | ASTM E413 | dB | 25 | 26 | |
| 15 | **Sound absorbtion factor** | ISO 354 | .. | 0.05 | | |
| | **THERMAL PREPORTIES** | | | | | |
| 16 | **Deflection Temprature** | ASTM D 648 | °C | 115 | 116 | 108 |
| 17 | **Thermal resistance R** | ASTM C518 | $M^2$ K/W | 0.03 | | 0.035 |
| 18 | **Temperature resistance** | | °C | –50….+80 | | |
| 19 | **Linear Thermal Expansion** | EN 1999 1-1 | mm/m @100°C | 2.4 | | |
| | **CORE FIRE PERFOMANCES** | | | | | |
| 20 | **Core** | ..... | ..... | Excellent performance fire Retardant Mineral filled core | | |
| 21 | **Reaction to fire** | EN 13501-1 | TBW 0300153 &TBW 0300116.2 | B, S1, d0 | | |
| 22 | **Surface Burning Charecterstics** | ASTM E84 | | Class A/ Class 1 | | |
| 23 | **Self Ignition Temp** | ASTM D 1929 | | Not Less than 343 C | | |
| 24 | **Exterior Non Load Bearing Wall Assembly** | NFPA 285 | TBW 0300129.2 &TBW 0300138 | Passed Various Assembly Tests (Listings : MH-AED-002 &MH-AED 005 Rev 0) | | |
| 25 | **Fire Rating** | ASTM E119 | 01.12694.01.307 | 1 Hrs 42 Mins | | |
| | **COATING PERFORMANCES** | | | | | |
| 26 | **No. of Coats** | AAMA 2605-13 | ..... | Standard 2 Coat / 3 Coat/ 4 Coat | | |
| 27 | **Type/finish** | | ..... | Standard PVDF / FEVE / HDPE | | |
| 28 | **Gloss @60°c** | | % | 20-40 / 20-80 | | |
| 29 | **Adhesion (Dry Condition)** | | .... | No. Adhesion loss | | |
| 30 | **Pencil hardness** | | ..... | min HB | | |

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

**RIBBON, MOTOR CITY, DUBAI, UAE**
Consultant: **Engineering Consulting Group**

**GREEN PLANET, DUBAI, UAE**
Consultant: **Rambool Middle East**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B


**ROVE HOTEL, DUBAI, UAE**
Consultant: **Arch Group**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

**THE ATRIA TOWER BUSINESS BAY, DUBAI, UAE**
Client : **Deyaar Development PJSC,** Consultant: **AK Design**
Contractor: **Al Rostamani Pegel**

**MARSA ALSEEF (PHASE 4), DUBAI, UAE**
Client : **Meraas Development,** Consultant: **WS Atkins & Partners Overseas**
Contractor: **Dutco Balfour Beatty,** Architect: **ATK Engineering Consultants**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

**AL JALILA CHILDREN'S SPECIALTY HOSPITAL, DUBAI, UAE**
Client : **Dubai Health Authority (DHA)**
Consultant: **Studio Altieri Int'l. Consultant/Eng'r. Adnan Saffarini**
Contractor: **Al Futtaim Carillion**

**W HOTEL, PALM JUMEIRAH, DUBAI, UAE**
Client: **Nakheel**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

**CITYWALK RESIDENTIAL BUILDINGS - PHASE 2, DUBAI, UAE**
Client : **Meraas Development LLC,** Consultant: **Hyder Consulting (ME) Ltd.**
Contractor: **Al Shafar General Contracting**

**PROPOSED COMMERCIAL & RESIDENTIAL BUILDING, AL BARSHA FIRST, DUBAI, UAE**
Client : **Abdul Wahid Hassan Al Rostamani (AW Rostamani)**
Consultant: **Eng. Adnan Saffarini,** Contractor: **Al Arif Contracting**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

Alubond U.S.A
FR Euroclass B

**SIT TOWER, DUBAI SILICON OASIS, DUBAI, UAE**
Contractor: **Beijing Emirates Intl. Construction Company.**
Consultant: **Eng. Adnan Saffarini**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

**DOME TOWER-JUMEIRAH LAKES TOWERS JLT, DUBAI, UAE**
Contractor: **Construction and Re-Construction Engineering Company.**
Consultant: **Qhc Architects & Engineers**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

Alubond U.S.A
FR Euroclass B


**NEW DEIRA FISH MARKET-MIXED USE, DUBAI, UAE**
Contractor: **Bhatia General Contracting Company LLC**
Consultant: **Hyder Consulting Middle East Limited.**

**BLUE WATERS, DUBAI, UAE**
Client: **MEERAS,** Contractor: **AFC/HLG,**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

**TAMWEEL TOWER, DUBAI, UAE**
Consultant: **ALEC**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

Alubond U.S.A
FR Euroclass B

**GERMAN SPORTS TOWER 1, DUBAI, UAE**
Consultant: **Barajeel Engineering Consultants**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

**RAYAN COMPLEX, AL ABBAR, AFTER SAHARA CENTER, SHARJAH, UAE**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

Alubond U.S.A
FR Euroclass B


**POST OFFICE TOWERS, ABU DHABI, UAE**
Consultant: **Arch Group Engineers**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

**AL SARAYA RESIDENTIAL TOWER, ABU DHABI, UAE**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

**AL MAFRAQ HOSPITAL, ABU DHABI, UAE**
Contractor: **Al Habtoor Leightoor Leighton Group**


**PREMIER INN HOTEL, ABU DHABI AIRPORT, UAE**
Consultant: **Dewan Architects & Engineers**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

Alubond U.S.A
FR Euroclass B


**ALOFT HOTEL, ABU DHABI, UAE**
Consultant: **ARUP**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

**BAYNUNAH TOWER, ABU DHABI, UAE**
Contractor: **Pivot Ben Cont W.I.I**
Consultant: **Arkan,** Subcontractor: **Arabian Ind Co**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

Alubond U.S.A
FR Euroclass B


**CENTRO HOTEL, ABU DHABI, UAE**
Contractor : **Polensky & Zoellner**
Consultant : **Ga - Architects & Engineering**
Subcontractor: **Arabian Ind Co**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

Alubond U.S.A
FR Euroclass B

**SHEIKHA FATIMA COMMERCIAL BUILDING, ABU DHABI, UAE**
Contractor : **Cgc,** Consultant: **Heberger**
Subcontractor: **Arabian Ind Co**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

Alubond U.S.A
FR Euroclass B

**SHOPPING MALL AT WORKERS VILLAGE, MUSSAFAH M24, ABUDHABI, UAE**
Consultant : **Acg-Architectural Consulting Group**
Contractor : **International Construction Contracting Co. LLC**
Subcontractor: **Arabian Ind Co**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

Alubond U.S.A
FR Euroclass B

**AL SARAYA RESIDENTIAL TOWER, ABU DHABI, UAE**
Contractor : **Arabian Construction Company**
Consultant : **Architect & Planning Group**
Subcontractor: **Arabian Ind Co./Reem Emirates**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

**ARZANAH HOSPITAL, ABUDHABI, UAE**
Client : **Mubadala,** Contractor: **Habtoor Leighton**
Subcontractor: **Folcra Beach**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

**CITY OF LIGHTS, REEM ISLAND, ABU DHABI, UAE**
Client: **Shaikh Tahnoun, Royal Group**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

Alubond U.S.A
FR Euroclass B

**FERRARI WORLD YAS MARINA, ABU DHABI, UAE**
Contractor: **SIXCO**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

Alubond U.S.A
FR Euroclass B

**MEENA TOWER, ABU DHABI, UAE**
Consultant: **Dewan Architects & Engineers**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B


**AMITY SCHOOL, ABU DHABI, UAE**
Consultant: **Dewan Architects & Engineers**

# PROJECT REFERENCES
# ALUBOND U.S.A FR EUROCLASS B

**LUSAIL SPORTS CLUB, QATAR**
Consultant: **KEO International Consultant**

# CERTIFICATION
# ALUBOND U.S.A FR EUROCLASS B

Alubond U.S.A
FR Euroclass B

Intertek

## Certificate of Compliance

Intertek US Intertek US Intertek

You have been awarded:

**Intertek Warnock Hersey Mark for Building Panels**

ASTM E84 (2014): NFPA 285 (2012): ASTM D1929 (2014)

Certificate number: WHI16 – 26553701

This is a certificate of conformity to certify that the bearer has successfully completed the requirements of the above scheme which include the testing of products, the initial assessment of their Factory Production Control and are subject to continuing annual assessments of their continued Factory Production Control compliance and testing of samples of products taken from production (as applicable to the scheme) and has been registered within the scheme for the products detailed in the accompanying schedule.

**Organization:**
**Eurocon Building Industries FZE (Group of Mulk Holdings International)**
P.O. Box 42642
Hamriya Free zone - Sharjah, United Arab Emirates

**Product: Eurocon - Alubond USA - FR Euroclass B Aluminium Composite Panel**

**SPEC ID 35247**

**For details related to results and allowable configurations, see Appendix A (page 2 of 2 of this certificate)**

**Certification body:** Intertek Testing Services NA, Inc.
**Initial registration:** December 04, 2016
**Date of expiry:** December 03, 2021
**Issue status:** 3

| Dustin Behling<br>Certification Coordination Manager | | 12/04/2016 |
|---|---|---|
| Name | Signature | Date |

www.intertek.com

Registered address:
Intertek Testing Services NA, Inc. 545 E. Algonquin Rd., Arlington Heights, IL 60005 USA





Intertek **LISTINGS: NFPA 285 - Passed, ASTM E84 - Class A, ASTM D1929 - Self ignition more than 450°C**

# CERTIFICATION
# ALUBOND U.S.A FR EUROCLASS B

Alubond U.S.A
FR Euroclass B

**Alubond Europe d.o.o.**
Nemanjina 130
26320 Banatski Karlovac
Serbia
Tel: +381 13 652 852 Fax: +381 13 652 852
e-mail: info@alubondeurope.com
website: www.alububond.com

BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

Agrément Certificate
**13/5004**
**Product Sheet 2**

## ALUBOND CLADDING

## ALUBOND U.S.A FR-B PVDF COATED COMPOSITE ALUMINIUM CLADDING SHEET

This Agrément Certificate Product Sheet(1) relates to Alubond U.S.A FR-B PVDF Coated Composite Aluminium Cladding Sheet, for use as external cladding or internal lining.

(1) Hereinafter referred to as 'Certificate'.


CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

**Strength and stability** — the product can resist the surface loadings normally encountered by claddings or linings in the UK (see section 6).

**Resistance to mechanical damage** — the product has satisfactory resistance to mechanical damage (see section 8).

**Properties in relation to fire** — the product is not classified as 'non-combustible', but can achieve a B-s1, d0 classification to BS EN 13501-1 : 2007 (see section 10).

**Weathertightness** — the product has adequate resistance to the passage of moisture (see section 12).

**Durability** — under normal conditions the product will perform effectively as an external cladding with an ultimate life of at least 30 years. The coating will retain a good appearance for at least 20 years in non-corrosive environments and at least 15 years in severe industrial environments (see section 14).



The BBA has awarded this Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

| Date of First issue: | Simon Wroe | Claire Curtis-Thomas |
|---|---|---|
| Originally certificated on | Head of Approvals — Materials | Chief Executive |

*The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk*



**BBA LISTINGS: BS EN 13501-1 : 2007, Class B, S1, d0**

certifire

Exova

## CERTIFICATE OF APPROVAL
## No CF 5061

This is to certify that, in accordance with
TS00 General Requirements for Certification of Fire Protection Products
The undermentioned products of

## EUROCON BUILDING INDUSTRIES (MULK HOLDINGS FZC)

P.B. 42642 Hamriyah Free Zone Sharjah UAE
Tel: +97165262202 Fax: +97165262203

Have been assessed against the requirements of the Technical Schedule(s) denoted below and are approved for use subject to the conditions appended hereto:

| CERTIFIED PRODUCT | TECHNICAL SCHEDULE |
|---|---|
| Alubond usa FR Euroclass B (4mm and 6mm products) | TS19 Class 0 / Class 1 (BS) |
| See annex 1 for further product information | |

Signed and sealed for and on behalf of Exova (UK) Limited trading as Warrington Certification

Paul Duggan
Certification Manager

warrington certifire certification

Issued: 1st March 2012
Reissued: 26th September 2017
Valid to: 25th September 2022

Page 1 of 6

This certificate is the property of Exova (UK) Limited trading as Warrington Certification
Reg. Office: Exova (UK) Limited, Lochend Industrial Estate, Newbridge, Midlothian EH28 8PL United Kingdom. Co. Reg. No. SC070429

**Exova LISTING: BS 476 Part 6-class 0, Part 7 - Class 1**

# CERTIFICATION
# ALUBOND U.S.A FR EUROCLASS B

إدارة السلامة الوقائية – قسم إعتماد الشركات

ترخيص وكيل - بإمارة دبي

رقم الترخيص: K25
سنة الترخيص: 2018
عدد التراخيص: ( 4 – 1 )

تم اصدار الترخيص استنادا إلى القرار الوزاري رقم(24) لسنة 2012 ، في شأن تنظيم خدمات الدفاع المدني

| | | | | | |
|---|---|---|---|---|---|
| اسم الشركة | بوروكون للتجارة | رقم الرخصة | 660724 | رقم السجل | 1084359 |
| اسم صاحب الترخيص | فاطمة اسماعيل احمد الحاج علي الفرامرزي | الجنسية | الامارات | | |
| أطراف الرخصة | *** | الجنسية | *** | | |
| رقم الهاتف | 06-5262202 | رقم الفاكس | 06-5262203 | ص.ب: | 49990 |
| عنوان الشركة | مكتب رقم 706 احمد محمد الكاظم – بردبي – مدخول رقم القطعة 127-975 | | | | |
| الموقع /البريد الالكتروني | ismail@mulkholdings.com | | | | |
| تأسست بتاريخ | 2014/04/03م | تاريخ الإصدار | 2018/02/11م | تاريخ الانتهاء | 2019/02/14م |
| عدد المعدات والأجهزة المعتمدة | 8 | | | | |
| عدد المهندسين المعتمدين | 0 | عدد الفنيين المعتمدين | 0 | | |

يعتمد/عن مدير الإدارة العامة للدفاع المدني/دبي

دولة الإمارات العربية المتحدة
وزارة الداخلية
الإدارة العامة للدفاع المدني-دبي
United Arab Emirates
Ministry of Interior
DCD General Directorate

Tel.: 009714 2611111
Fax : 009714 2612449
P.O. Box 11377 Dubai
United Arab Emirates

للطوارئ
Emergency
997
www.dcd.gov.ae

أن تكون دولة الإمارات العربية المتحدة من أفضل دول العالم في تحقيق الأمن والسلامة

## Dubai Civil Defense Approval

GOVERNMENT OF DUBAI

DUBAI MUNICIPALITY

**CERTIFICATE OF PRODUCT CONFORMITY**

*Dubai Central Laboratory Department (DCLD) of Dubai Municipality, hereby attests that the product(s)*

*Alubond USA – FR Euroclass B ALUMINIUM COMPOSITE PANEL 4 mm*
*Alubond USA – FR Euroclass B ALUMINIUM COMPOSITE PANEL 6 mm*

*(Details as per the attached Scope of Certification) manufactured by:*

***EUROCON BUILDING INDUSTRIES-FZE***
***HAMRIYA FREE ZONE – SHARJAH – UAE***

*have been assessed in accordance with DCLD Document Ref. No. RD-DP21-2001 (IC) "General Rules for DM third party product certification system through factory assessment" and TAR 122, and were found in conformity with the specification:*

*Accordingly, DCLD hereby authorizes the above manufacturer to affix the DCL Product Conformity Mark to the above-mentioned product(s).*

*for / ENGR. AMIN AHMED AMIN*
*Director, Dubai Central Laboratory Department*
*Dubai Municipality*

*Verify:*

*Certificate No: TAC – 122*
*Valid Until: 07 July 2018*

PRODUCT CONFORMITY

*Current Issue Date:08 July 2017*
*Original Issue Date: 08 July 2012*

*The attached Scope of Certification bearing the same Certificate No. forms an integral part of this Certificate.*
*This Certificate is an electronic document, subject to the Terms and Conditions of the Product Certification System and shall not be reproduced except in full.*

F-IC-2031 REV 11

## Dubai Central Laboratory Certification of Approval

# CERTIFICATION
# ALUBOND U.S.A FR EUROCLASS B

Alubond U.S.A
FR Euroclass B

**THOMAS BELL-WRIGHT**
**INTERNATIONAL CONSULTANTS**

In accordance with UKAS accreditation to ISO 17065
Certification is Hereby Granted

to

*Eurocon Building Industries FZE*
*(a subsidiary of Mulk Holdings F.Z.C Group, Sharjah UAE)*
*P.O Box 42642*
*Hamriyah Free Zone, Sharjah, U.A.E (United Arab Emirates)*

for

**"Alubond® USA FR-Euro Class B"**
**4-mm thick Aluminum Composite Material**

which, subject to limitations described on the following pages and continued listing on www.tbwcert.com, complies with Product Certification *Scheme SD03 Exterior Wall Assemblies, Cladding, Curtain Walls, Building Materials, Products and Assemblies*

In witness whereof this Certificate is issued this 27th day of February 2017

Thomas F. Bell-Wright
Certification Director

Nick J. Purcell
Certification Manager

**Certificate Number: TBW0300153**

Initial registration: February 27, 2017 Issued: February 27, 2017 Expiration: February 26, 2020
File Name: QL115 Eurocon Building Industries FR Euroclass B Save Date: 27/02/17 8:54 AM

This certificate and schedules are held in force by regular Factory Inspections by Thomas Bell-Wright International Consultants (TBWIC). Refer to www.tbwcert.com or contact TBWIC Fire Compliance Division to validate the current status of Certification. This certificate remains the property of THOMAS BELL-WRIGHT INTERNATIONAL CONSULTANTS, PO BOX 26385, DUBAI, UAE.
Tel: +971 4 821 5777, Email: certification@bell-wright.com. Web: www.bell-wright.com F 19 Scheme Certificate Issue 5. Dec 2016


**THOMAS BELL WRIGHT LISTINGS: ASTM E 84(CLASS A), ASTM D 1929(Self Ignition More than 450°c), EN 13501-1:2007(Class B, S1,d0))**

# CERTIFICATION
# ALUBOND U.S.A FR EUROCLASS B

Alubond U.S.A
FR Euroclass B

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to

*Eurocon Building Industries FZE*
*(a subsidiary of Mulk Holdings Group, Sharjah UAE)*
*PO Box 42642, Hamriyah Free Zone, Sharjah UAE*

for

**"Alubond® U.S.A. FR-Euroclass B"**
**4mm thick Aluminium Composite Material**
**Non-Load-Bearing Exterior Wall Cladding System**
**Test Method: NFPA 285-2012 Edition**
**(System Designation: A221H61-4)**

which, subject to limitations described on the following pages and continued listing on www.tbwcert.com, complies with Product Certification Scheme *SD03 Exterior Wall Assemblies, Cladding, Curtain Walls, Building Materials, Products, and Assemblies*

In witness whereof this Certificate is issued this 31st day of October 2017

Thomas F. Bell-Wright
Certification Director

Nick Purcell
Certification Manager

**Certificate number: TBW0300245**

Initial registration: October 31, 2017 Issued: October 31, 2017 Expiration: October 30, 2020
File Name: RD109 Eurocon Building Industries NFPA 285 4mm Save Date: 31/10/17 8:09 AM

This certificate and schedules are held in force by regular Factory Inspections by Thomas Bell-Wright International Consultants (TBWIC). Refer to www.tbwcert.com or contact TBWIC Fire Compliance Division to validate the current status of Certification. This certificate remains the property of THOMAS BELL-WRIGHT INTERNATIONAL CONSULTANTS, PO BOX 26385, DUBAI, UAE.
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THOMAS BELL-WRIGHT INTERNATIONAL CONSULTANTS

**THOMAS BELL WRIGHT LISTINGS: NFPA 285-Passed**

Alubond® U.S.A

Fire Rated Metal Composites

# FIRE PERFORMANCES

Alubond A2 U.S.A | Alubond U.S.A FR Euroclass B

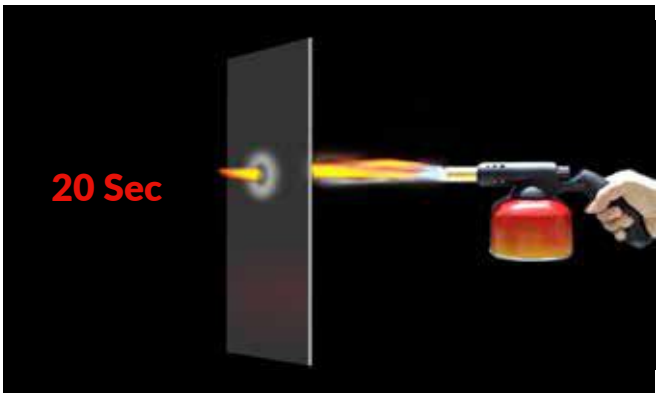
**NON COMBUSTIBLE COMPOSITE PANELS**

# ALUMINIUM PANEL FIRE TEST

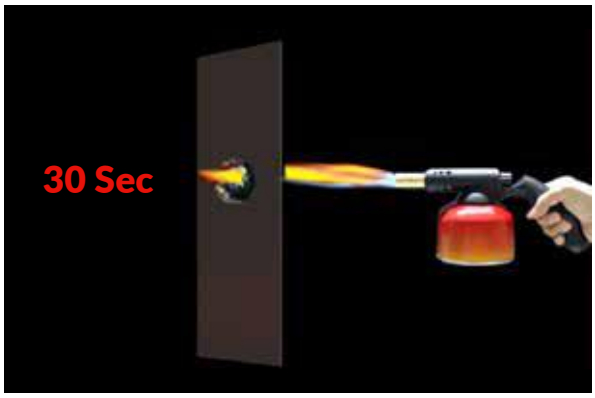
Alubond U.S.A
Fire Rated Metal Composites

A panel burning test was conducted with direct flame at a temperature of 1500 $^{0}$C on five different panels. The time the panels withstood fire was recorded as follows.

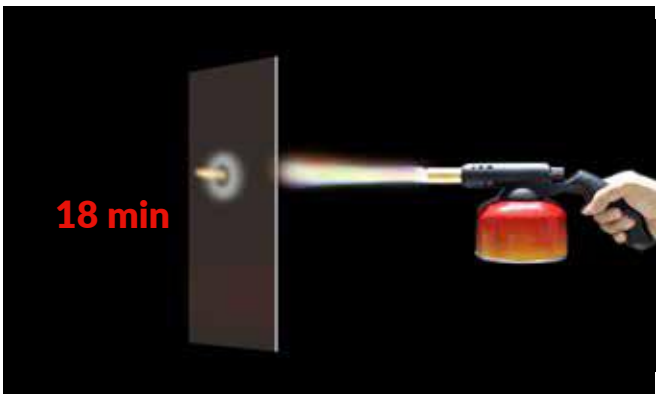
| Panels | Time withstood by Panel |
|---|---|
| LDPE Core - ACP | 20 Seconds |
| Solid Aluminium | 30 Seconds |
| B Core -ACP | 18 Minutes |
| A2 Core -ACP | 30 Minutes |
| Honeycomb Core A2 -ACP | 55 Seconds |



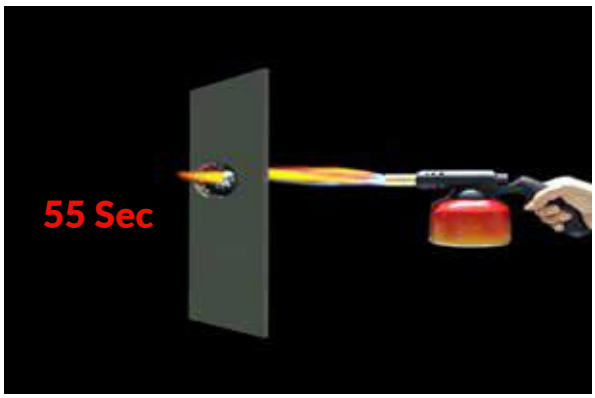

LDPE CORE - ALUMINIUM COMPOSITE PANEL FIRE PENETRATED IN 20 SECONDS




SOLID ALUMINIUM PANEL FIRE PENETRATED IN 30 SECONDS




B CORE - ACP PANEL - FIRE PENETRATED IN 18 MINUTES




HONEYCOMB PANEL - A2 - FIRE PENETRATED IN 2 MINUTES


A2 MINERAL CORE - ACP PANEL - FIRE PENETRATED IN 30 MINUTES

# EN 13501 - PART 1 (NON COMBUSTIBILITY TEST)

Alubond U.S.A
Fire Rated Metal Composites

A full classification serves as the standard of evaluation for the reaction to fire of construction and building materials.

EN13501- Part 1 test consists of EN 13823 and BS EN ISO 1716 tests.

EN 13501 - PART ONE : EN ISO 1182 (NON COMBUSTIBILITY TEST)

EN 13501 PART TWO : EN 13823 - SINGLE BURNING ITEM IN A ROOM

EN 13501 PART THREE : SMALL FLAME ATTACK

EN 13501 PART FOUR : EN ISO 9239-1 WIND OPPOSED HORIZONTAL SPREAD OF FLAME

# NFPA 285: 2012 STANDARD TEST ALUBOND U.S.A (FR-A2, FR-B) WITH ABTI SUBSTRUCTURE SYSTEM

Alubond (Alubond U.S.A A2 & Alubond U.S.A FR Euroclass B) undergoing the NFPA 285 Test in two International Third Party Laboratories Intek USA and Thomas Bell-Wright International Consultants, U.A.E

NFPA 285 PANEL FACES PRIOR TO FIRE TEST.

EXTERIOR FACE AT 25 MINUTES OF THE TEST.

END OF THE TEST

WALL CAVITY IN WALL ASSEMBLY AFTER FIRE TEST

# FIRE TEST FOR RUSSIAN GOST R CERTIFICATE

Alubond U.S.A Fire Rated Metal Composites

Alubond (Alubond U.S.A FR-A2 & Alubond U.S.A FR Euroclass B) has undergone the GOST R Certification in Russia

FULL FIRE IN BOTH FLOORS - TEMPERATURE 850 $^{0}$C

FIRE STOPPED AFTER 60 MINUTES ALL PANELS WITHOUT DAMAGE

ALUBOND PANELS – REMOVED FROM WALL ASSEMBLY

PANELS AFTER TEST ON THE GROUND TO CHECK CONDITION

# ASTM E84-15B: STANDARD TEST METHOD FOR SURFACE BURNING CHARACTERISTICS OF ALUBOND U.S.A (FR-A2, FR-B)

Alubond® U.S.A
Fire Rated Metal Composites


STEINER TUNNEL FIRE MACHINE

FIRE EXPOSED INSIDE TUNNEL

CORE BEFORE THE TEST FIRE SIDE

CORE AFTER THE TEST
(LOCATED NEAR THE FIRE END)

CORE AFTER THE TEST
(LOCATED NEAR THE EXHAUST END)

Alubond® U.S.A

Fire Rated Metal Composites

# OUR APPROVED SUBSTRUCTURE SYSTEMS

Alubond A2 U.S.A | Alubond U.S.A FR Euroclass B

**NON COMBUSTIBLE COMPOSITE PANELS**

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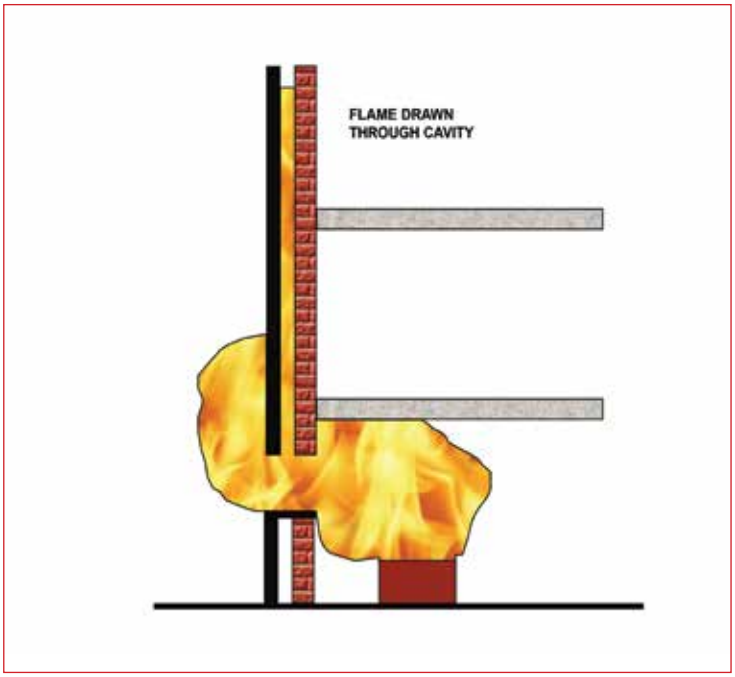
Information: For more Alubond USA approved systems, check the link:
www.tbwcert.com (Company Name: Eurocon building industries FZE)

# ALUBOND USA CIVIL DEFENCE APPROVED SYSTEMS

| S.NO | ALUBOND USA PRODUCTS REF | CERTIFIED SYSTEM REF .DETAILS | CHANGES OF ACCESSERIES INVOLVED IN SYSTEMS |
|---|---|---|---|
| 1 | **4mm Thick Alubond USA FR-A2 (Mechanical closed Joint)-TK** | TBW0300137.2 | Sealant-Dowcorning 700, GI "U"Channel, insulation 50mm thick and 75 kg/m3 Density Fujerah Rock wool |
| 2 | **4mm Thick Alubond USA FR-A2(Mechanical closed Joint)** | TBW0300155 | Sealant-INCA2460, mineral wool filler, Insulation 50mm thick and 50 kg/m3 Density Fujerah Rock wool |
| 3 | **4mm Thick Alubond USA FR-A2 (Open Joint)** | TBW0300156 | Special Aluminium Profiles with Insulation 50mm thick and 50 kg/m3 Density Fujairah Rock wool |
| 4 | **4mm Thick Alubond USA FR-A2 (Mechanical closed Joint)** | TBW0300165 (3hRS Fire rated Assembly ) | Sealant-INCA2460, mineral wool filler, Insulation 50mm thick and 50 kg/m3 Density Fujairah Rock wool |
| 5 | **4mm Thick Alubond USA FR-A2 (Mechanical closed Joint)** | TBW0300232 | Sealant-Tremco, Al "U" Channel, Insulation 50mm thick and 24 kg/m3 Density Knauf glass wool with Tube shape Runner |
| 6 | **6mm Thick Alubond USA FR-A2 (Mechanical closed Joint)** | TBW0300212 | Sealant-Ever build 825 weather, Al "U" Channel, Insulation 50mm thick and 36 kg/m3 Density Knauf glass wool |
| 7 | **4mm Thick Alubond USA FR-Euroclass B (Mechanical closed Joint)** | TBW0300245 | Sealant-ever build 825 weather, Al "U" Channel, Insulation 50mm thick and 36 kg/m3 Density Knauf glass wool |
| 8 | **4mm Thick Alubond USA FR-Euroclass B (Open Joint)** | TBW0300129.2 | Special Aluminum Profiles with Insulation 50mm thick and 50 kg/m3 Density Fujairah Rock wool |
| 9 | **6mm Thick Alubond USA FR-Euroclass B (Mechanical closed Joint)** | TBW0300138 | Sealant–Dow corning 700, GI "Channel, insulation 50mm thick and 75 kg/m3 Density Fujairah Rock wool |

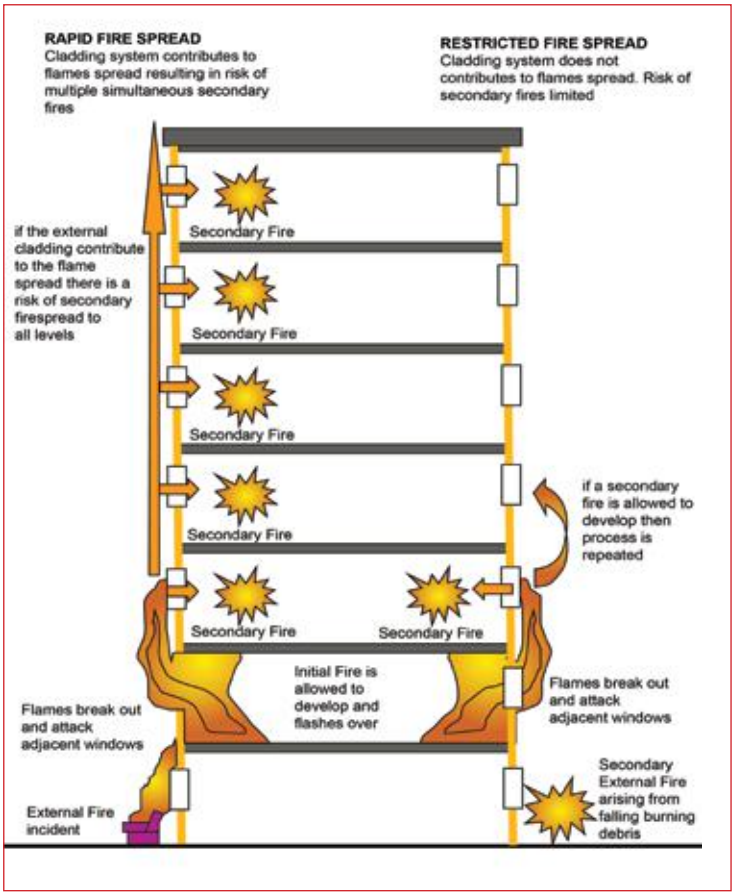
# TUNNEL EFFECT DUE TO CAVITY CREATED BY SEALED SILICONE JOINTS




Cavities

- Either Part of Silicone Joints System or Created by de lamination when fire burns the skin and core of ACP.
- Flames in cavities can extend 5 to 10 times original length regardless of materials present.

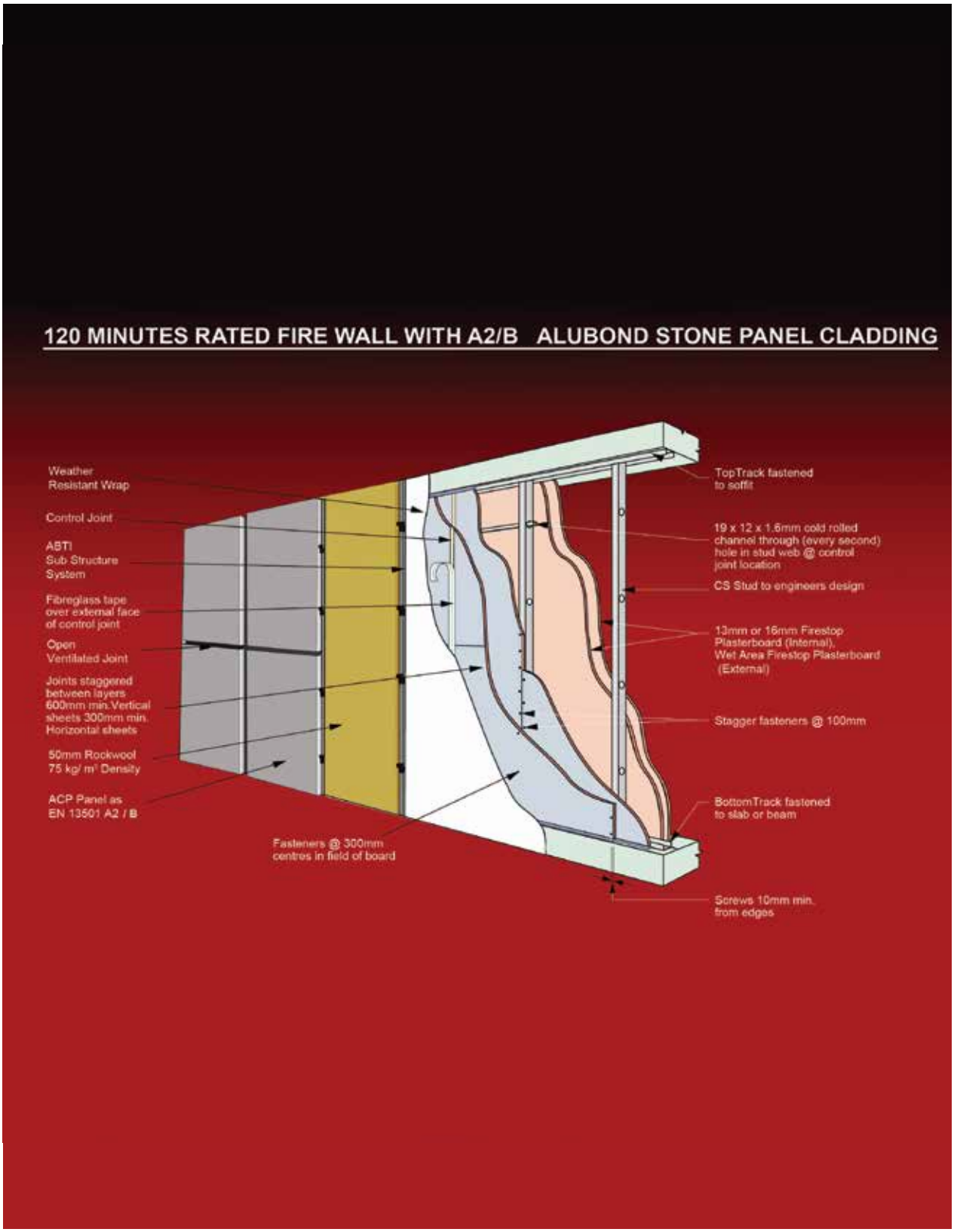
# EXTERNAL FIRE SPREAD



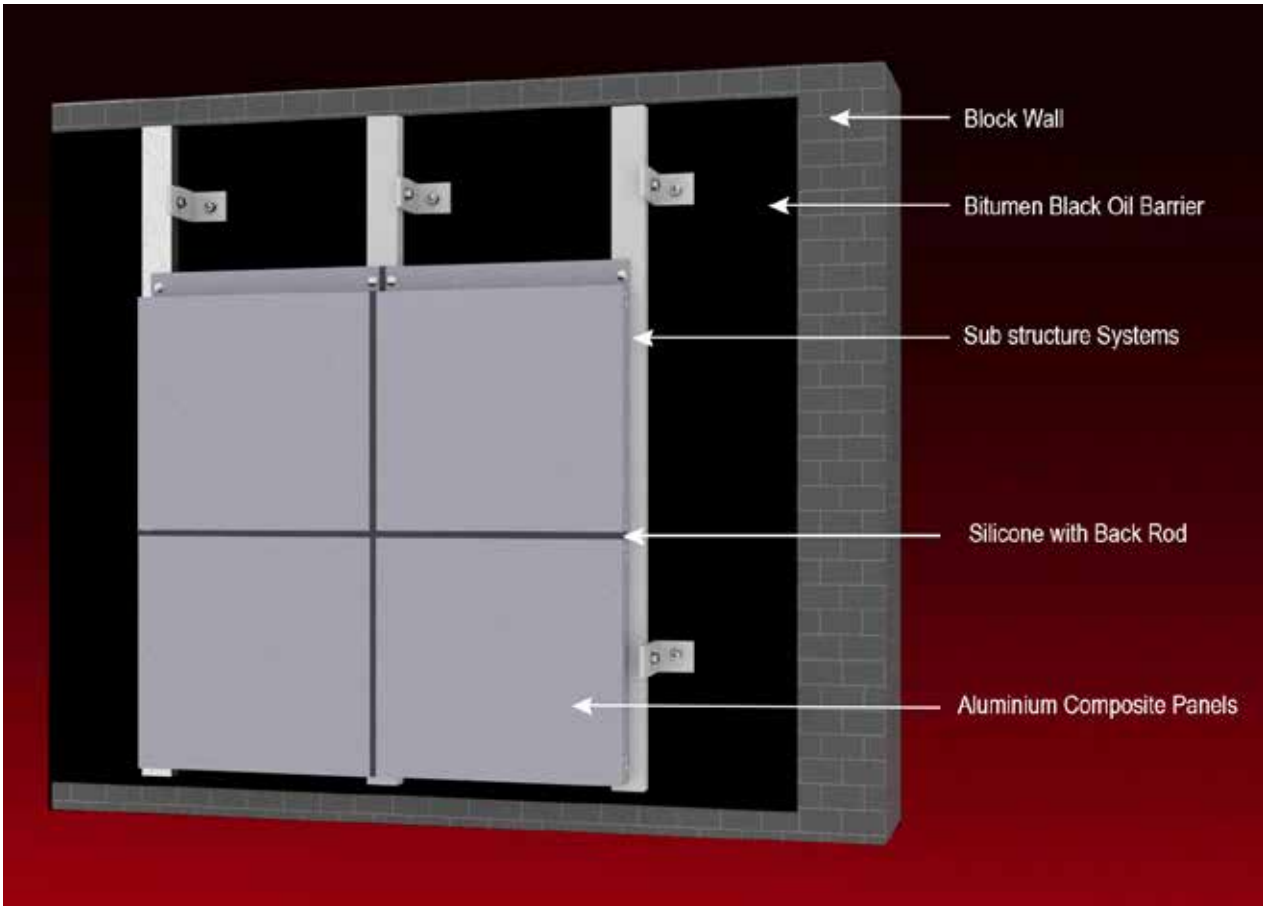

- Fires allowed to develop may flash over and break out through windows.
- Flames spread up over or through the cladding.
- Flames can extend over 2m above window opening. Regardless of cladding materials.
- If fire re-enters building secondary fires may then develop.

# 120 MINUTES RATED FIRE WALL WITH ALUBOND U.S.A FR-A2 ACP CLADDING

Alubond U.S.A
Fire Rated Metal Composites



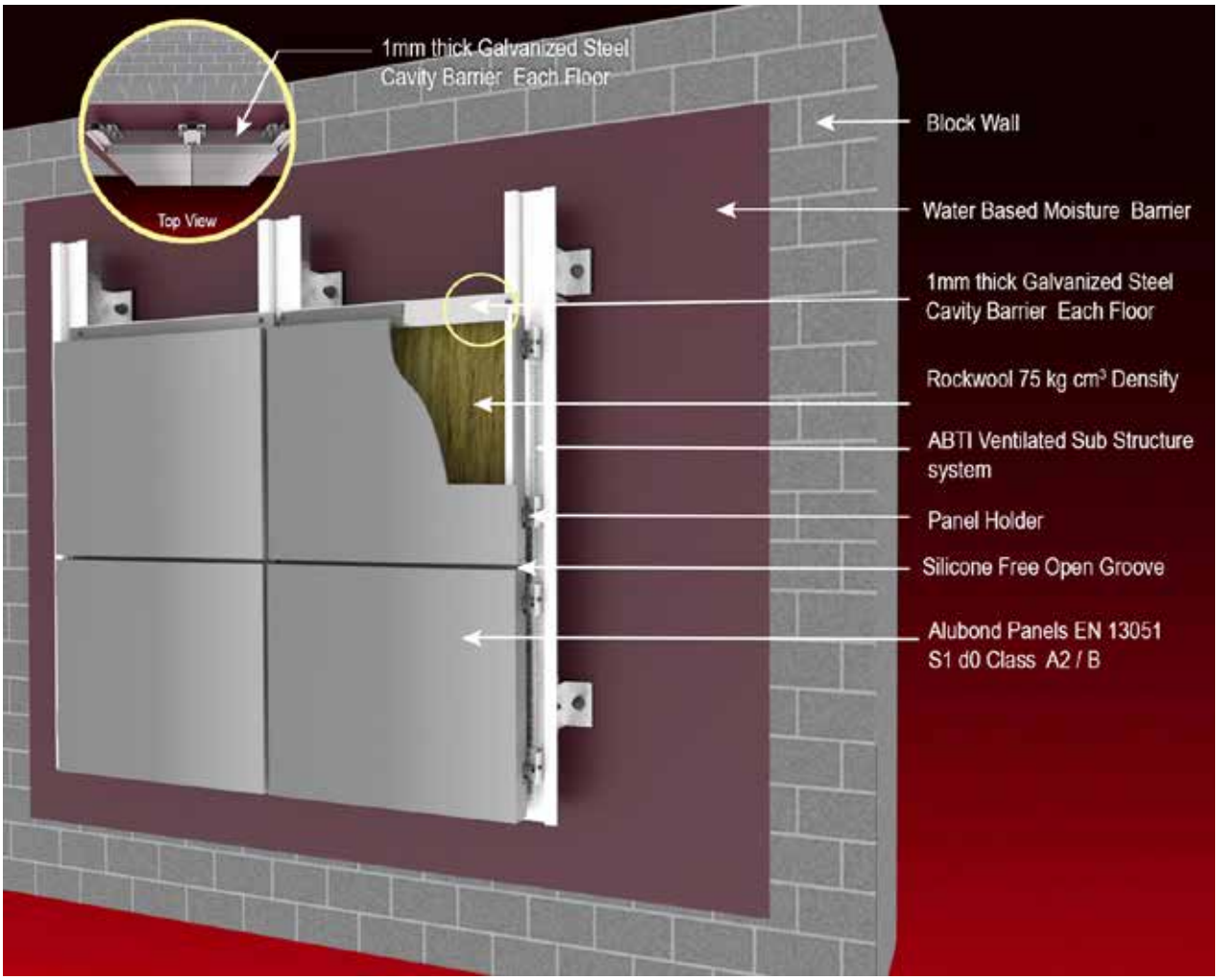
## High LDPE Core Panels with Insulation & Sealed Silicone System With ASTM E119 Fire Wall




Four primary reasons for spread of fire in a typical LDPE core ACP Cladded Buildings in UAE & Worldwide

- The foam backer rod is one of the first to ignite and burns the polyethylene sealant. Fire moves swiftly through the continuous sealant and backer rod aided by bitumen paint.
- The cavity caused due to sealed façade and lack of cavity barrier, creates a tunnel effect for fire to spread up the floors very quickly.
- The LDPE core of the aluminium composite panel and aluminium skin both melt and droplets contribute to further spread of fire
- The fire spreads both from the back of the facade and front of the façade aided by winds and cavities and further fuelled by droplets of LDPE and falling debris of burning panels .
- No wonder we see buildings engulfed in fire within minutes !

# Silicone Free Open Groove NFPA 285 Compliant Ventilated Substructure System Certified By Third Party



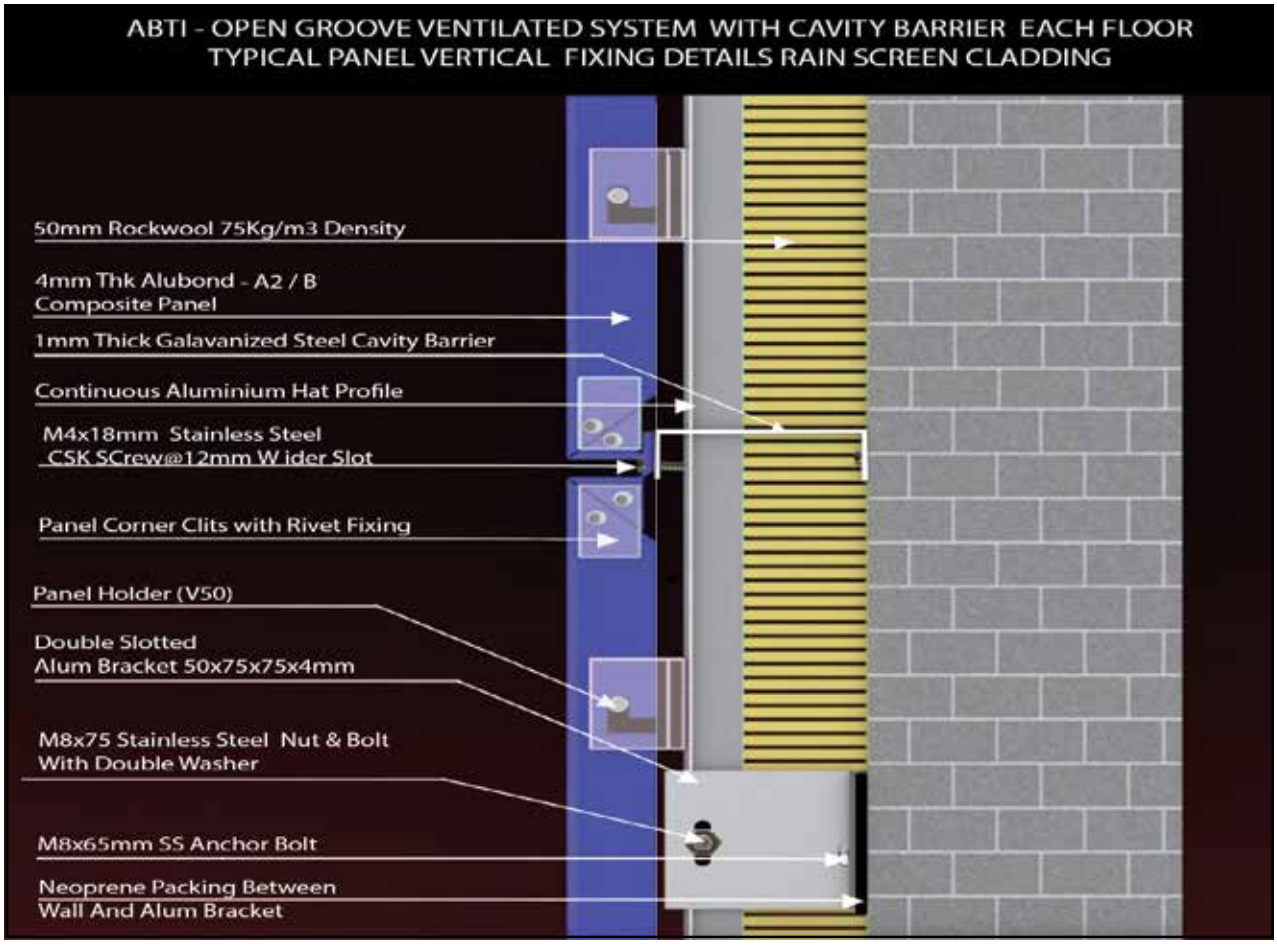

Usage of super fire retardant Alubond - Stone Panels instead of highly flammable LDPE core panels.

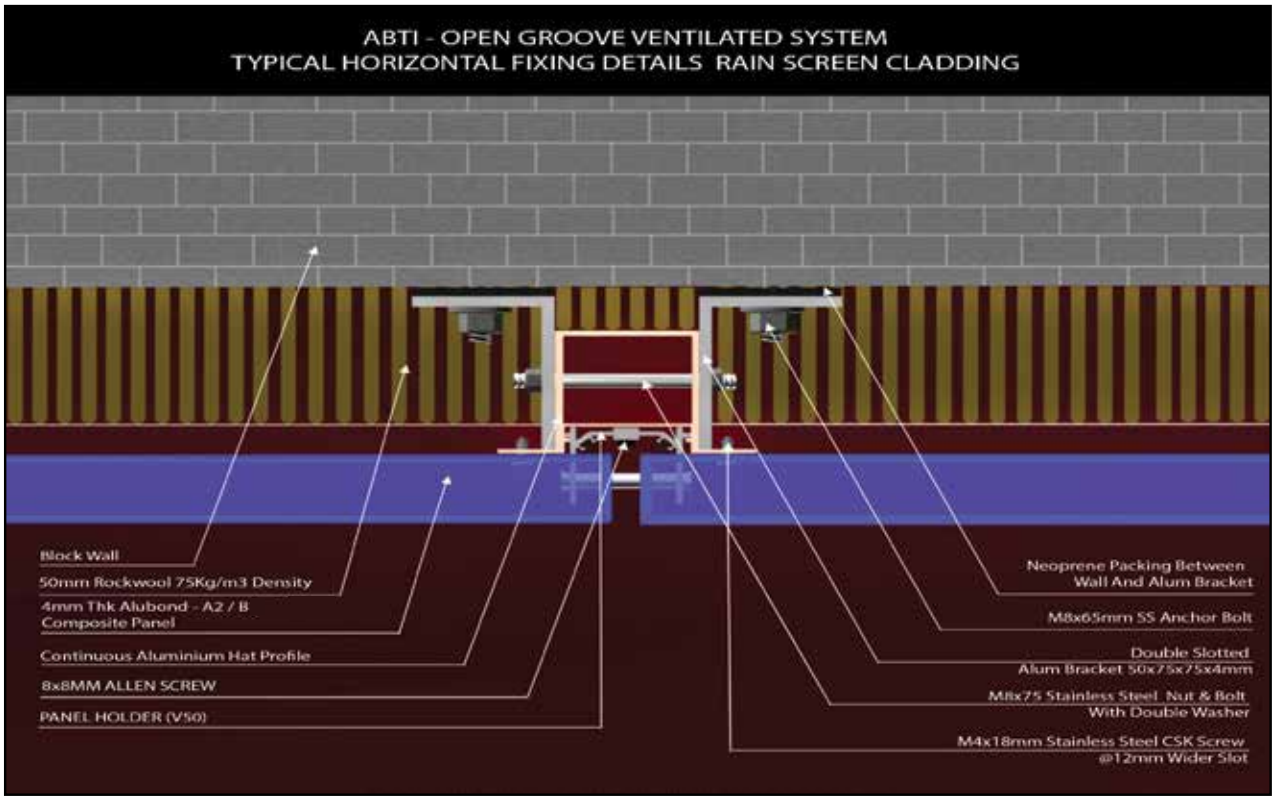
- Instead of Bitumen the wall is coated with fire rated moisture free paint
- ABTI system is silicon free open groove system thereby not using backer rods and sealants which aid propagation of fire.
- Cavity barrier is installed at regular intervals depending on the size of the building.

Use of Alubond U.S.A FR-A2 combined with ABTI Open Groove Ventilated substructure system provides the solution for a fire safe cladding.

# SILICONE FREE VENTILATED OPEN GROOVE SUBSTRUCTURE

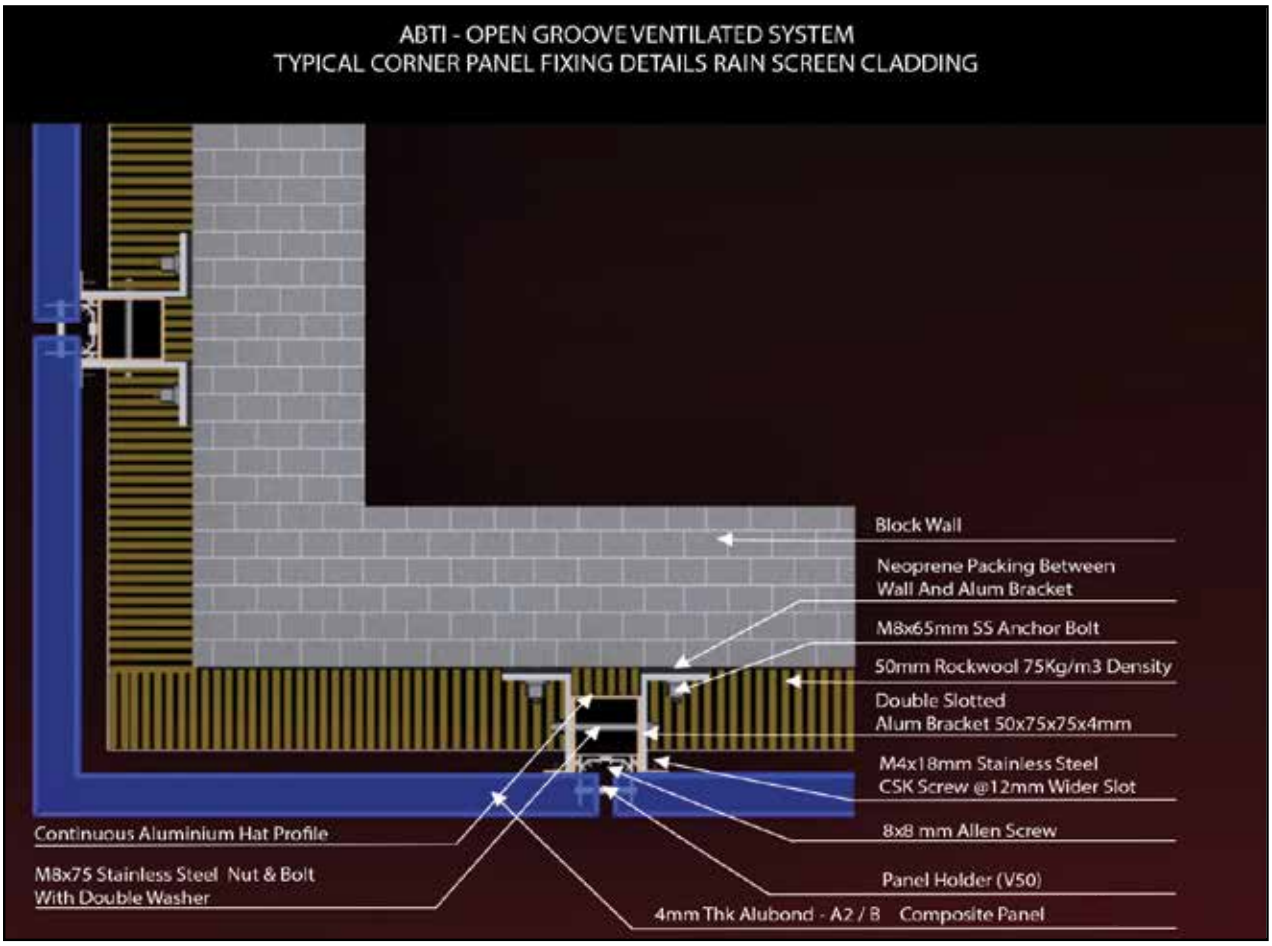
Alubond U.S.A
Fire Rated Metal Composites

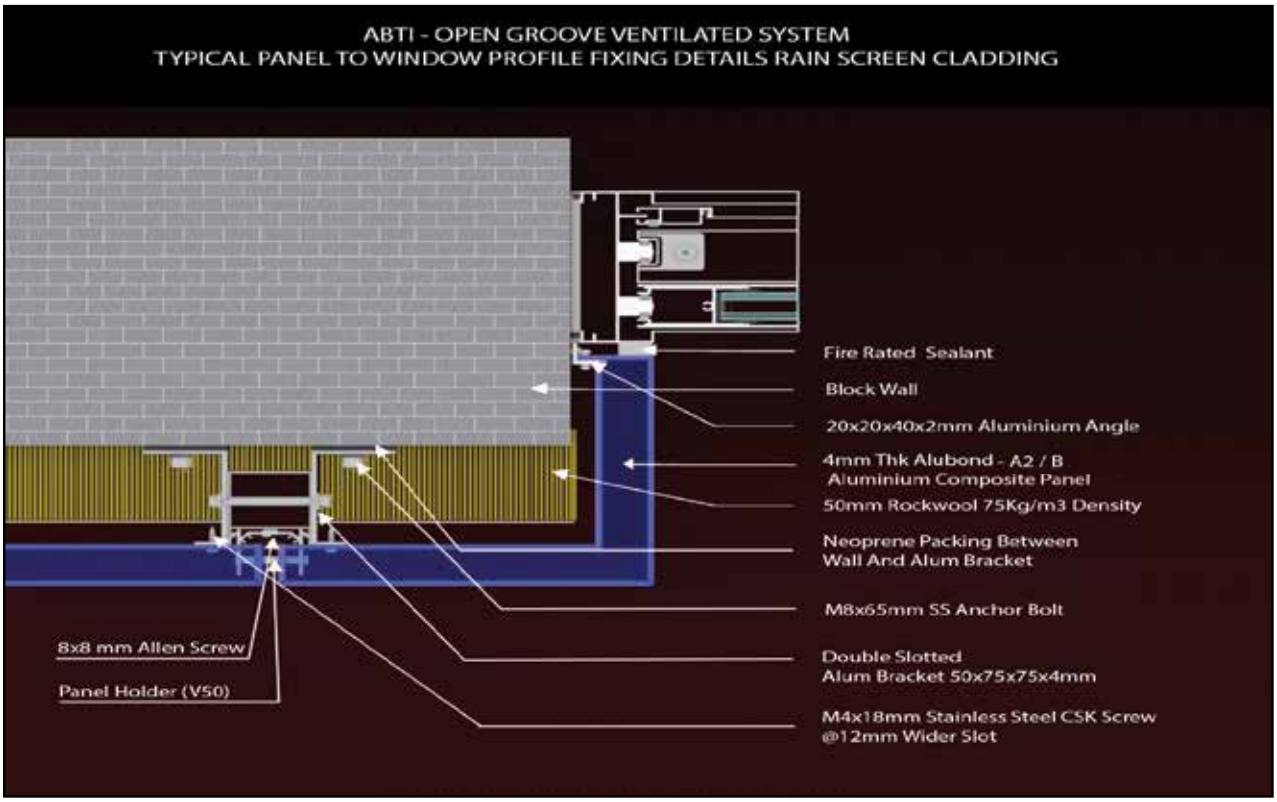


# SILICONE FREE VENTILATED OPEN GROOVE SUBSTRUCTURE

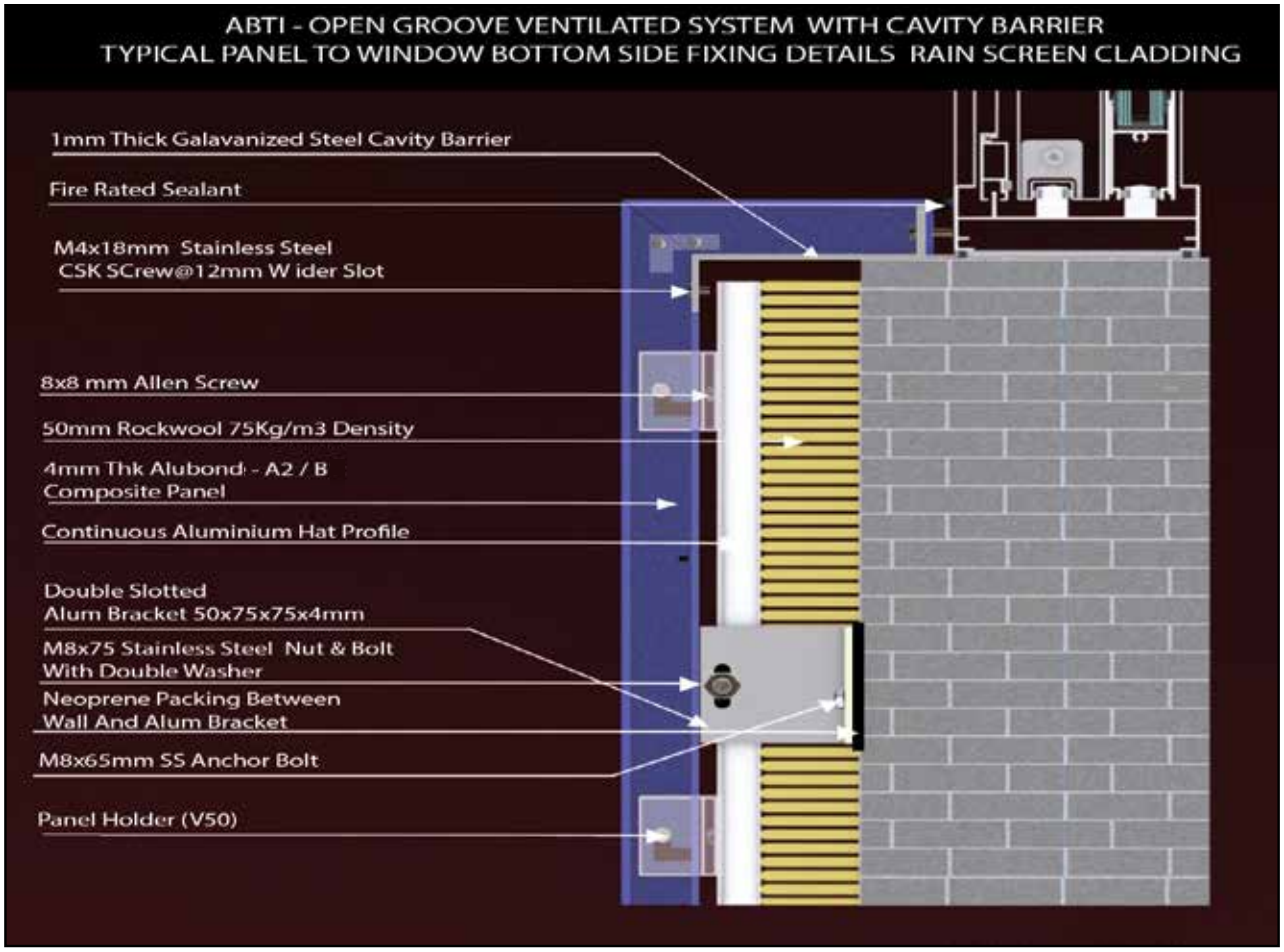
Alubond U.S.A
Fire Rated Metal Composites

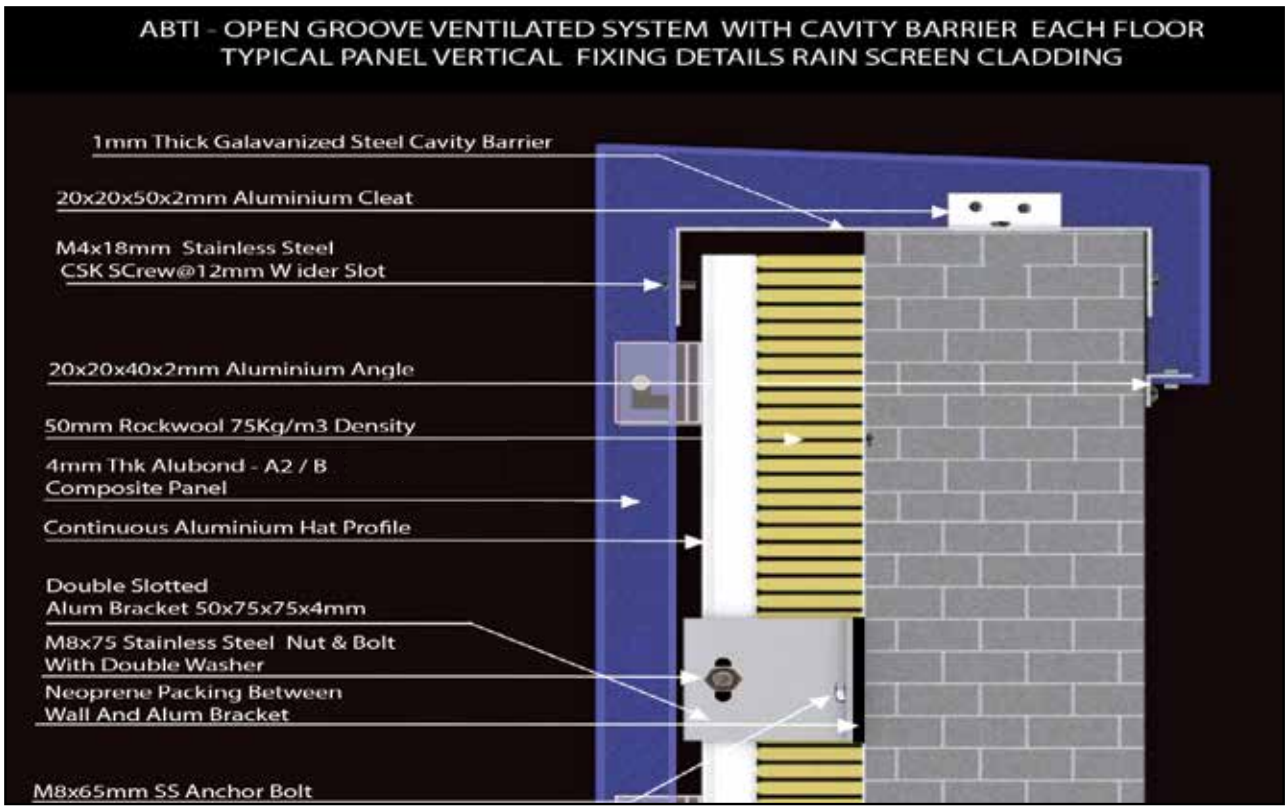


# SILICONE FREE VENTILATED OPEN GROOVE SUBSTRUCTURE

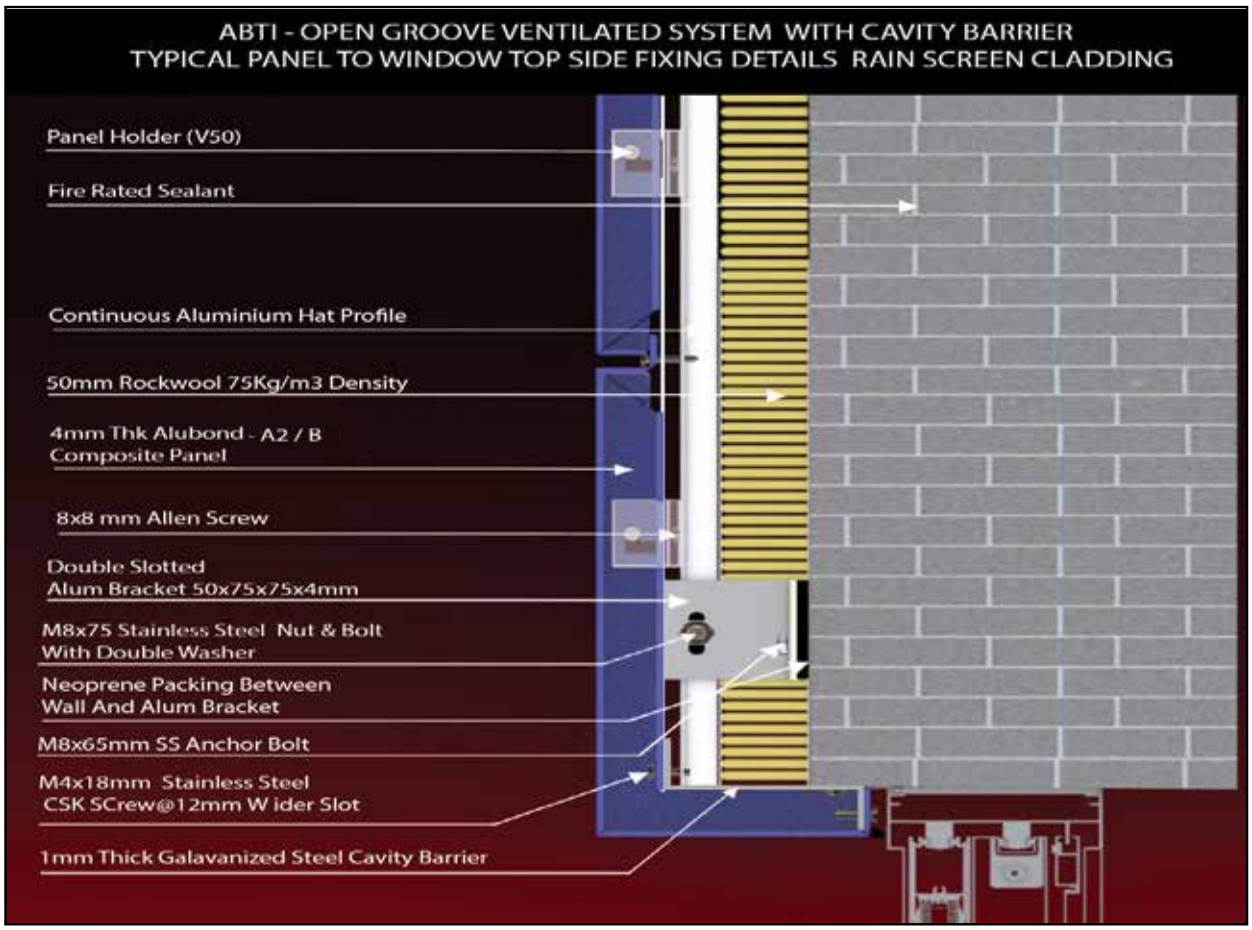
Alubond® U.S.A
Fire Rated Metal Composites

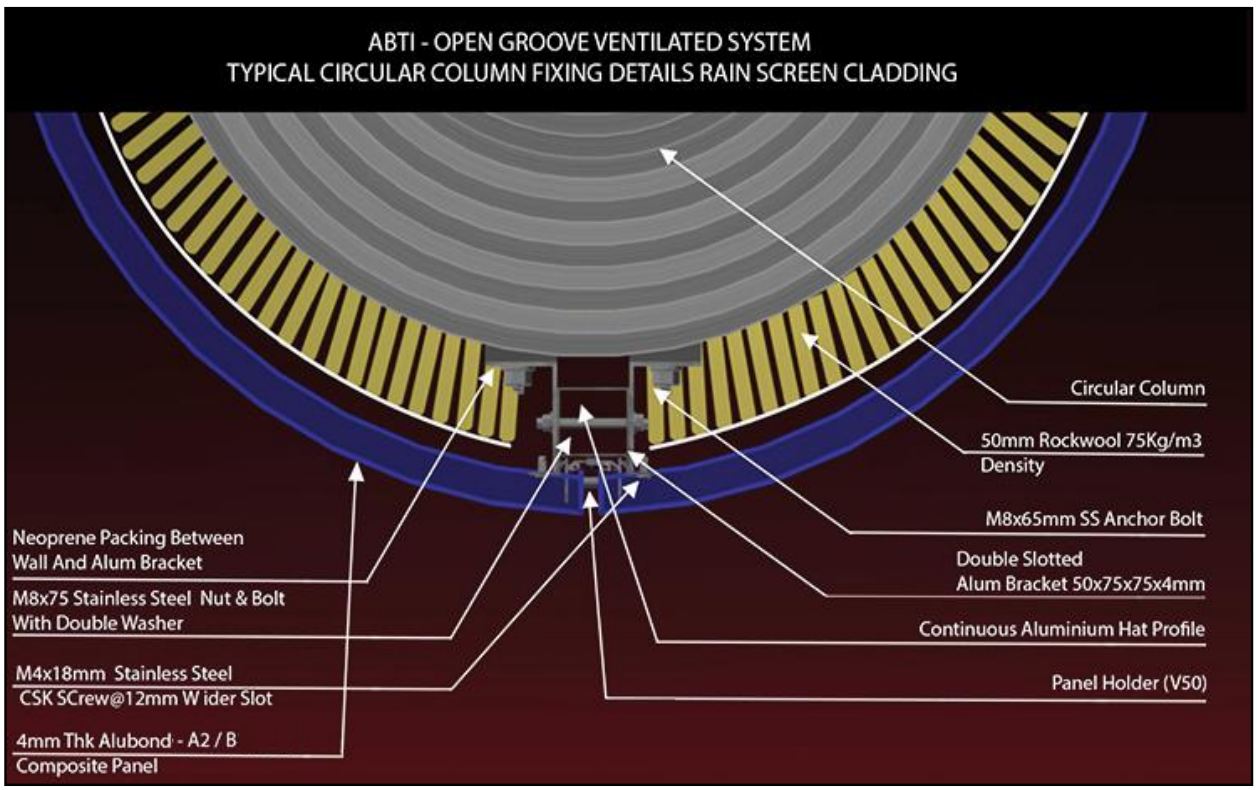


# SILICONE FREE VENTILATED OPEN GROOVE SUBSTRUCTURE

Alubond® U.S.A
Fire Rated Metal Composites




Alubond®
U.S.A
Fire Rated Metal Composites

Mulk
HOLDINGS
INTERNATIONAL

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