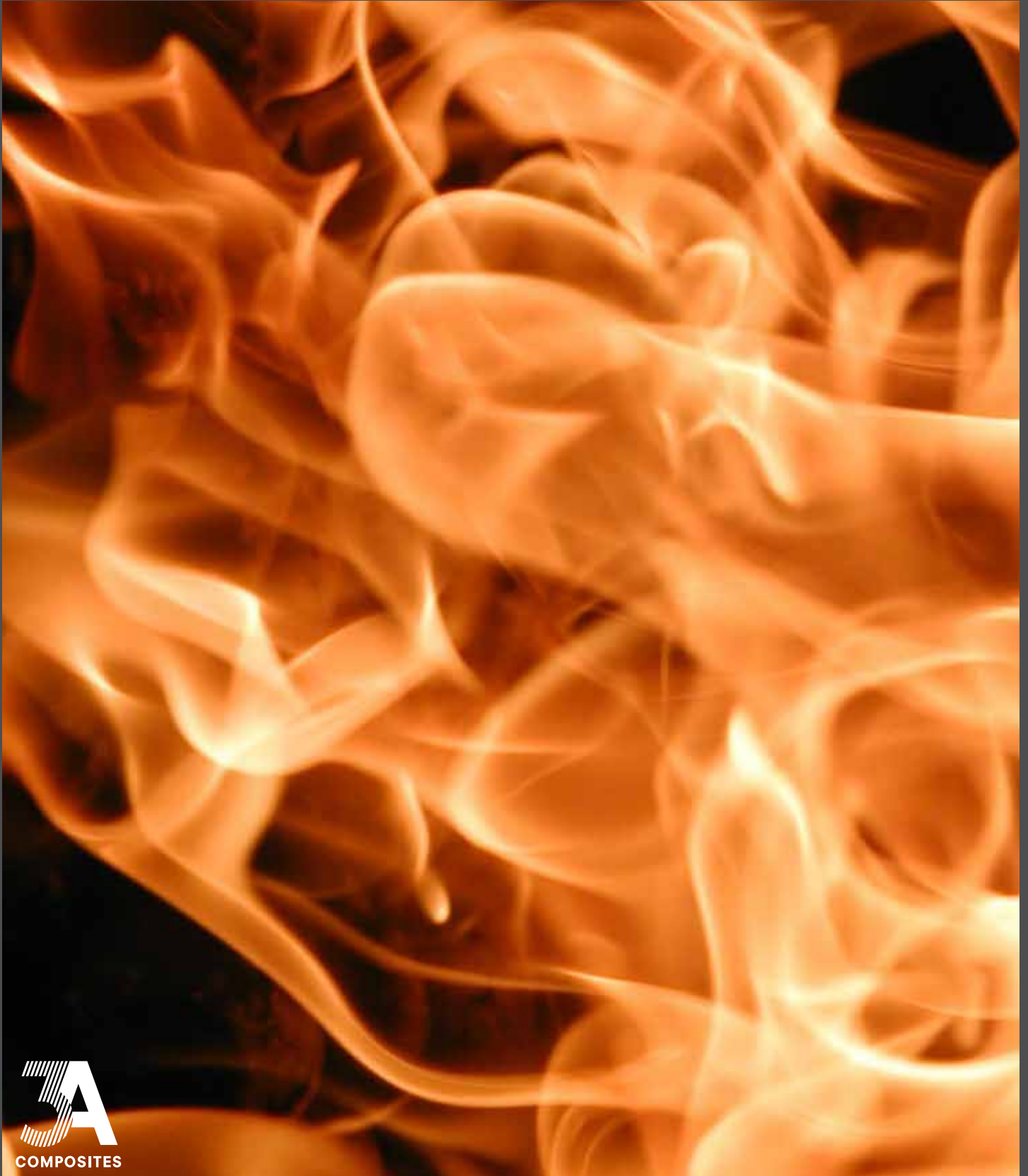


ALUCOBOND®

Fire Retardancy and ALUCOBOND®

Product information for ALUCOBOND®plus and ALUCOBOND®A2





UNDERSTANDING FIRE RETARDANCY

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.

FIRE BEHAVIOR IN A BUILDING.

Regular ACM

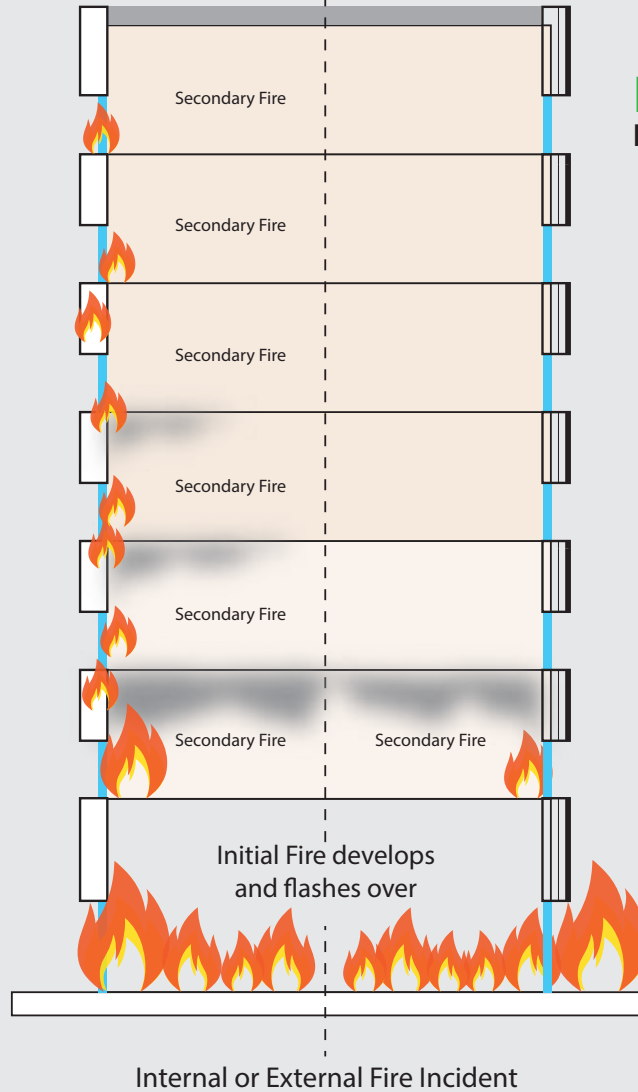
Rapid Fire Spread

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

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



Fire Retardant ACM

Restricted Fire Spread

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

	Fire Retardant ACM
	Regular ACM
	Glass



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. Its is hardly inflammable and offers all the proven product properties of the ALUCOBOND® family, such as flatness, formability, resistance to weather and easy processing.



TECHNICAL DATA SHEET

Panel Thickness	Standards	Units	3 mm	4 mm	6 mm*	
Thickness of Aluminium Layers		[mm]		0.50		
Weight		[kg/m ²]	5.9	7.6	10.8	
Technical Properties						
Section Modulus	W	DIN 53293	[cm ³ /m]	1.25	1.75	2.75
Rigidity (Poisson's ratio $\mu = 0.3$)	E-I	DIN 53293	[kNm ² /m]	1250	2400	5900
Alloy / Temper of Cover Sheets		EN 573-3		EN AW-5005A (AlMg1), H22 / H42		
Modulus of Elasticity		EN 1999 1-1	[N/mm ²]	70'000		
Tensile Strength of Aluminium		EN 485-2	[N/mm ²]	$R_m \geq 130$		
0.2% Proof Stress		EN 485-2	[N/mm ²]	$R_{p0.2} \geq 90$		
Elongation		EN 485-2	[%]	$A_{50} \geq 5$		
Linear Thermal Expansion		EN 1999 1-1		2,4 mm / m at 100°C temperature difference		
Core						
Mineral filled polymer						
Surface						
Lacquering				Coil Coating Fluorocarbon based (e.g. PVdF)		
Gloss (initial value)	EN 13523-2	[%]		30 – 80		
Pencil Hardness	EN 13523-4			HB - F		
Acoustical Properties						
Sound Absorption Factor	α_s	ISO 354		0.05		
Sound Transmission	R_w	ASTM E90	[dB]	STC: 30	OITC: 24	
Thermal Properties						
Thermal Resistance	R	ASTM C518	[m ² K/W]	0.007	0.009	0.0172
Temperature Resistance			[°C]	-50 to +80		

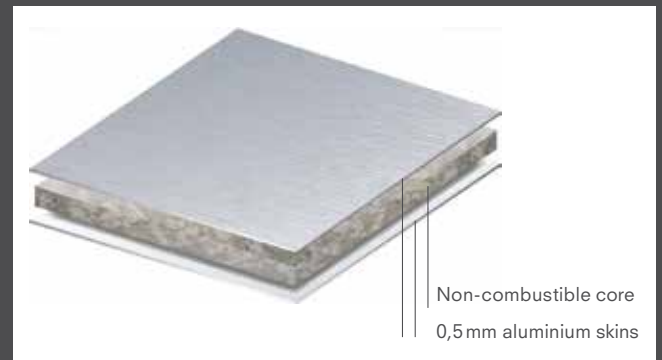
* Available on request

FIRE CLASSIFICATION

Country	ALUCOBOND® plus	
	Test accord. to ...	Classification
Australia	AS ISO 9705	Group 1 material
	AS 3837	BCA Group 3 material
	AS 1530-3	no ignition
China	GB 8624-2006	Class B, s1,d0, t0
EU	EN 13501-1	Class B, s1, d0
Germany	EN 1187 (method 1)/ DIN 4102-7	passed
Malaysia	BS 476, Part 6	Class 0
	BS 476, Part 7	Class 1
Approved for outdoor wall cladding of any type of building without height limit		
Singapore	EN 13501-1	Class B, s1, d0
	NFPA 285	passed
Approved for outdoor wall cladding of any type of building without height limit		
UAE	ASTM-E-84	Class A
	BS 476, Part 6&7	Class 0
UK	BS 476, Part 6&7	Class 0
USA	ASTM-E 84	Class A
	NFPA 285	passed

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

Panel Thickness	Standards	Units	3 mm	4 mm	6 mm*	
Thickness of Aluminium Layers		[mm]		0.50		
Weight		[kg/m ²]	5.9	7.6	10.8	
Technical Properties						
Section Modulus	W	DIN 53293	[cm ³ /m]	1.25	1.75	2.75
Rigidity (Poisson's ratio $\mu = 0,3$)	E-I	DIN 53293	[kNm ² /m]	1250	2400	5900
Alloy / Temper of Cover Sheets		EN 573-3 EN 515		EN AW-5005A (AlMg1), H22 / H42		
Modulus of Elasticity		EN 1999 1-1	[N/mm ²]	70'000		
Tensile Strength of Aluminium		EN 485-2	[N/mm ²]	R _m ≥ 130		
0.2% Proof Stress		EN 485-2	[N/mm ²]	R _{p0,2} ≥ 90		
Elongation		EN 485-2	[%]	A ₅₀ ≥ 5		
Linear Thermal Expansion		EN 1999 1-1		2,4 mm / m at 100°C temperature difference		
Core						
Mineral compound, polymer bonded						
Surface						
Lacquering				Coil Coating Fluorocarbon based (e.g. PVdF)		
Gloss (initial value)	EN 13523-2	[%]		30 – 80		
Pencil Hardness	EN 13523-4			HB - F		
Acoustical Properties						
Sound Absorption Factor	α_s	ISO 354		0.05		
Sound Transmission	R _w	ISO 717-1	[dB]	27	27	27
Thermal Properties						
Thermal Resistance	R	DIN 52612	[m ² K/W]	0.002	0.003	0.004
Temperature Resistance			[°C]	-50 to +80		

* Available on request

FIRE CLASSIFICATION

ALUCOBOND® A2		
Country	Test accord.to	Classification
Australia	AS ISO 9705	Group 1 material
	AS 3837	BCA Group 1 material
	AS 1530-3	no ignition
EU	EN 13501-1	Class A2, s1, d0
Germany	EN 1187 (method 1)/ DIN 4102-7	
Japan	JIS A 1231 JIS A 1231	QNC Class 2
Malaysia	BS 476, Part 6 BS 476, Part 7	Class 0 Class 1
		Approved for outdoor wall cladding of any type of building without height limit
Singapore	NFPA 285 EN 13501-1	passed Class A2, s1, d0
		Approved for outdoor wall cladding of any type of building without height limit
UAE	EN 13501-1	Class A2
UK	BS 6853	meets requirements of LUL limited combustible non combustible

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.



NFPA 285

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



BS 476 - Part 6&7

This test measures the speed and the distance of the flame spread in a specific time period.



BS 8414-1

This test assess the behaviour 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

COMMONLY ASKED TESTS	FLAME SPREAD	SMOKE EMISSION	BURNING DROPLETS	SELF EXTINGUISHING	WITH SYSTEM
ASTM E-84	✓	✓	✗	✗	✗
BS 476: part 6&7	✓	✗	✗	✗	✗
EN 13501-1	✓	✓	✓	✗	✗
NFPA 285	✓	✗	✗	✓	✓
BS 8414-1	✓	✓	✗	✓	✓

THIRD PARTY CERTIFICATIONS PROVIDE PEACE OF MIND

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.

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CERTIFICATE OF CONFORMITY

No. CLS1A 13 12 80739 003

Certificate Holder: Alucobond (Far East) Pte Ltd
6 Shenton Way
#40-05
QUE Downtown
Singapore 068809
SINGAPORE

Certification Mark: 

Product: Composite Panels
Brand Name: Alucobond Plus
Model(s): Fr

Product Details: Area Density: 7.6kg/m²
Thickness: 4mm
Former COC 012940
Use of Fire Rated Product in Singapore needs to comply with FSSD's requirements.
This certificate is for outside Singapore only.

Standard(s): NFPA 265,2006
Country of Origin: People's Republic of China
Test Report(s): SwRI Project No. 01.11811.01.112
Issued on: 2013-12-16
Valid until: 2015-05-15

Chang
Vice-President (Certification Department)
TUV SUD PSB

Products listed under Class 1A must have TUV SUD PSB PLUS mark as shown above affixed/printed on them. Failure to comply with this requirement may result in revocation of this certificate.

Page 1 of 1

This Certificate is part of a full report and should be read in conjunction with it. This Certificate remains the property of TUV SUD PSB Pte Ltd and shall be returned upon request. The use of this Certificate is subject to TUV SUD Group Testing and Certification Regulations, TUV SUD PSB Pte Ltd (PSB) General Terms and Conditions of Business and PSB Product Listing Scheme (PLS) Application Pack Sheet. The manufacturer is solely responsible for compliance of any product that has the same designation as the product type tested. Persons relying on this Certificate should verify its validity by checking TUV SUD PSB's website at www.tuv-sud.com.sg

TUV SUD PSB Pte Ltd • 1 Science Park Drive • Singapore 118221



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CERTIFICATE OF CONFORMITY

No. CLS1A 14 09 80739 011

Certificate Holder: Alucobond (Far East) Pte Ltd
6 Shenton Way
#40-05
QUE Downtown
Singapore 068809
SINGAPORE

Certification Mark: 

Product: Composite Panels
Brand Name: Alucobond®
Model(s): AZ

Product Details: Composite panel comprising of mineral filled core sandwiched between two skins of aluminium
Thickness: 3mm; Area Density: 3.15kg/m²
Thickness: 4mm; Area Density: 4.619kg/m²
(Classification: A2-s1, d0)
Use of Fire Rated Product in Singapore needs to comply with FSSD's requirements.
This certificate is for outside Singapore only.

Standard(s): EN 13501-1/A1.2009
Country of Origin: Germany, India, People's Republic of China
Test Report(s): See COC Appendix (1 eg)
Issued on: 2014-09-19
Valid until: 2017-09-18

Chang
Vice-President (Certification Department)
TUV SUD PSB

Products listed under Class 1A must have TUV SUD PSB PLUS mark as shown above affixed/printed on them. Failure to comply with this requirement may result in revocation of this certificate.

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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®

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