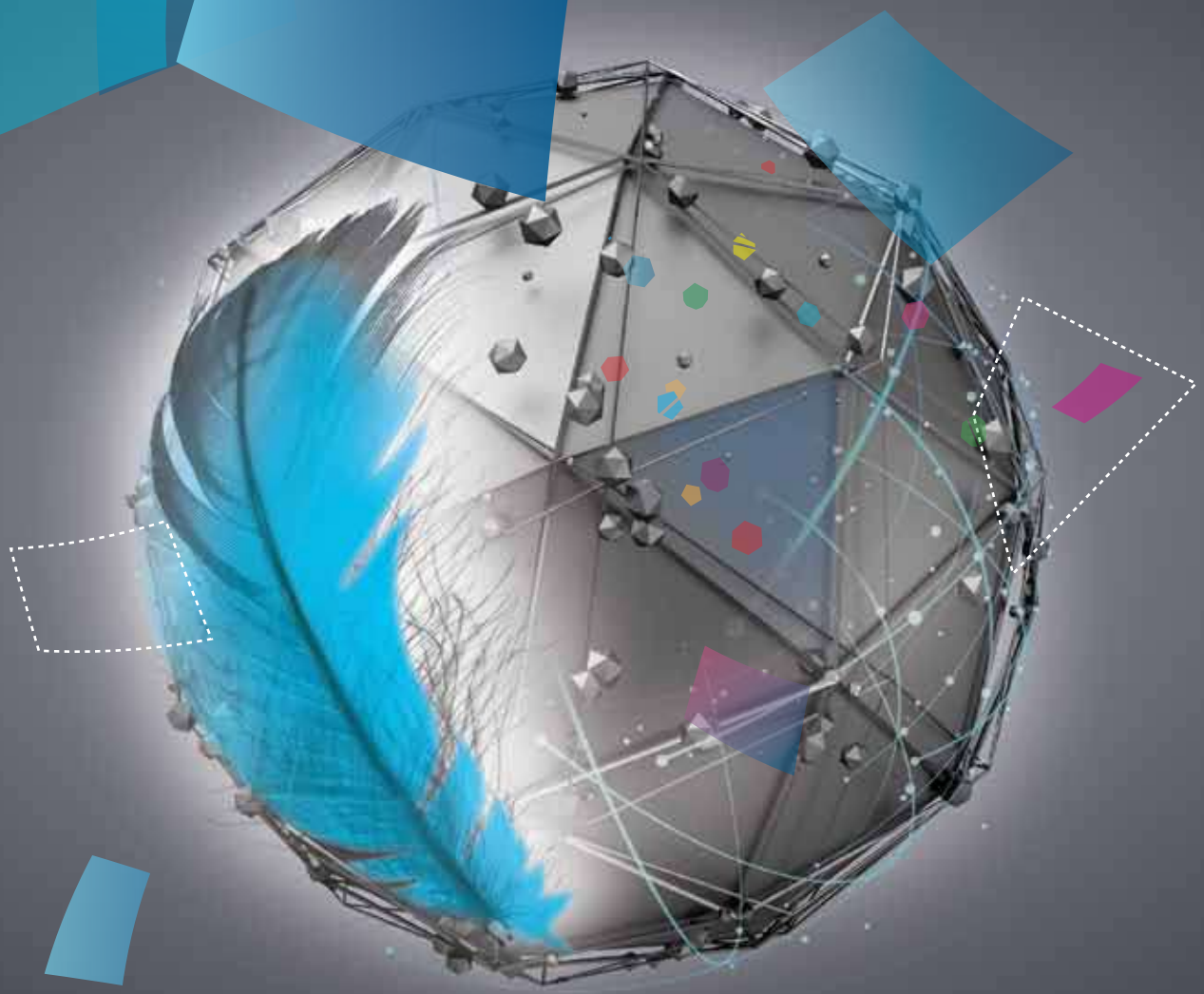
EN

etalbond®
COMPOSITE MATERIALS

bond with excellence



ELVAL COLOUR
Power to imagine

Elval Colour is a leading European coated aluminium manufacturer that produces and markets a full range of building envelope products of superior quality and latest technology, like façade, roofing, rain gutters and corrugated sheets. More than 98% of the company's sales revenue comes from exporting our goods to a total of 70 countries. With over 40 years of experience in coating and colour matching, Elval Colour is a reliable partner that offers value added services to our customers by assisting them in product specification and selection to best suit the needs of the specified project/application. . Customer orientation and dedication accompanies production and product delivery.

We are committed to our customers and to the excellence of our products from the early stages of production till final delivery.
Elval Colour takes great pride in its employees – for they are hardworking individuals, diligently pursuing perfection in all they do and our customers always remain their number one focus.
Elval Colour, as one of the leaders in the industry – aspiring always to superior product quality and excellent service – remains dedicated to our customers' specific needs and is always glad to respond in the most effective and efficient way to those needs.
Always applying cutting-edge technology and innovative applications, our R&D works tirelessly in various areas, thus allowing continuous improvements in our product quality while remaining respectful to our environment and the standards that are set worldwide.

Elval Colour is a member of the European Coil Coating Association(ECCA), the European Aluminium Association, and is ISO 9001-2008, ISO 14001-2004, and OHSAS 18001 certified.

etalbond®

But with high-quality, known for its unmatched resilience and unique appearance, **etalbond®** offers sustainable construction quality and high creative standards. Because of each its outstanding product properties, this façade material stands-out among its competitors.

etalbond® for rear-ventilated façades combines the features of energy-efficient construction, is cost-efficient and speaks volumes in its architectural quality. The technique of the rear-ventilated construction is suitable to those who want to create façades on both new and old buildings as well as roof constructions and interior applications.

Long lifespan, easy maintenance and a balanced combination of insulation, ventilation and moisture control are equally important to appearance and constitute a perfect building envelope.

The projects presented in the next pages, feature highly refined building envelopes, that are functional and emphasize the autonomy and the specific identity of the building.
etalbond® gives architects the power to imagine and the tools to create.

CONTENTS

THE COMPOSITE PANEL

etalbond® is an Aluminium Composite Material (ACM) for construction projects worldwide.

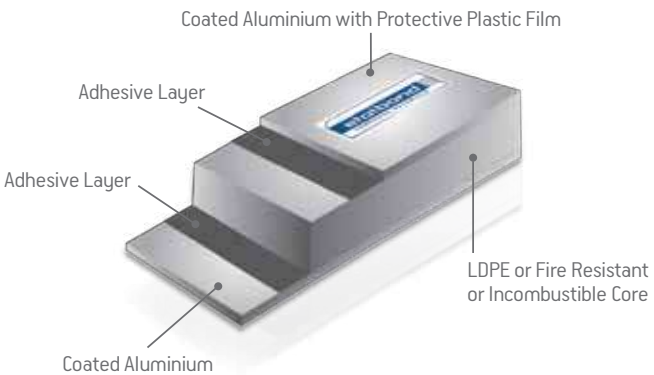
etalbond® panels are designed with a special aluminium alloy that presents the right balance between rigidity and flexibility. High wind load capacity and strong penetration resistance are complemented with soft bending for the most demanding façade formations. The strips are rolled and coated in the company's facilities with the outmost care and in strict compliance with the most rigid European and global norms. The panels are light, highly rigid, absolutely flat and are presented with the most durable coating qualities.

etalbond® is available in three different cores. **etalbond**® **PE** with low-density polyethylene, **etalbond**® **FR** with a fire-retardant core and **etalbond**® **A2** with an incombustible core, suitable for the most demanding applications, which complies with all fire safety requirements for external cladding.

Composition of **etalbond**® **PE, FR** & **A2**

> Protective plastic film
> High Quality Coating System
> Aluminium Alloy EN 3105, H44
> Adhesion Promoter
> Adhesive layer
> LD Polyethylene / Fire Retardant / Incombustible*
> Adhesive layer
> Aluminium Alloy EN 3105, H44
> High Quality Coating System or Primer Coating

** Please see page fire classification section or inquire for local certificates*



THE COMPOSITION **A2**

etalbond® A2 - THE NON-combustible aluminium panel

Nowdays, the need for innovative and sustainable materials is greater than ever before, so as to realize the creative visions of architects and designers. Contemporary buildings not only have to comply with the highest design standards, but also must meet the latest technical requirements in the fields of sustainability, energy efficiency, noise protection, fire protection, etc.

Thanks to its mineral-filled core, **etalbond® A2** is non-flammable and meets the strictest demands of fire regulations. **etalbond® A2** works ideally everywhere fire protection is necessary: High-rise buildings, buildings with high visitation/occupancy, such as airports, metro stations, shopping malls, hotels, and buildings of high sensitivity, such us schools, kindergartens, hospitals, and elderly care centers to name a few.

etalbond® A2 is a construction material, which allows the freedom of design in combination with superior technological features. Attractive and flexible it is easily installed and formed and is available in a wide array of highly durable and custom-made coatings, providing architects and designers with numerous possibilities to bring their ideas to life.

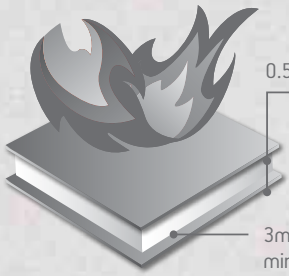
The advantages of **etalbond® A2**

- Lightweight combined with flexural strength and absolute flatness
- Simple and fast to process and fabricate - can be easily folded and bent with the use of simple tools
- Formable in the most intricate 2-D and 3-D shapes
- Easy to handle on site with pre-fabricated panels, shorter construction times and cost reduction
- Because of the exceptional high material quality used during the manufacturing process, it is weather-proof and easy to clean
- Noise and vibration-absorption - no extra sound-damping needed
- Ideal for back ventilated façades
- Large variety of colours and custom -made shades available - thus providing literally unlimited design options
- In case of fire, no toxic gas is produced
- Produced with Cr-free and Lead Free materials in an environmentally responsible manner
- Fully Recyclable, environmentally friendly - scrap can be recycled for the production of new material

Fire behaviour

etalbond® A2 composite panels are non-flammable and do not actively contribute to combustion. During the life cycle of **etalbond® A2**, there are no emissions of environmentally hazardous substances and there is no production of toxic fumes in the case of fire.

etalbond® A2 is classified as A2 for incombustibility, s1 lowest possible smoke emission and d0 for no droplets when the panel is exposed to fire according to the most strictest European Norm EN 13501-1.



YOUR PARTNER TO CUSTOMIZATION

Power to Imagine

Elval Colour's specialized personnel will assist you and guide you in identifying and implementing the optimum coating system for your construction project and your specific requirements.

Full optimization on cost-efficiency, quality, aesthetics and delivery time result in performance maximization, solid weathering resistance and the visual impact your project can have.

Applications

etalbond® in its application, is an absolutely flat panel with extreme strength and low weight. This very flexible material, can add a touch of architectural elegance and an attractive design in both low and high rising buildings, canopies, fascia, roof edges and building interiors.

You can use it for:

- *> Building Renovations*
- *> Internal Partitions*
- *> False Ceilings*
- *> Bus Terminals*
- *> Gas Stations*
- *> Column Covers*
- *> Curved Fascia*
- *> Building Entranceways*
- *> Toll Stations*
- *> Container Constructions*
- *> Machine Coverings*
- *> Equipment Enclosures*
- *> Architectural Claddings*
- *> Internal Wall Coverings*
- *> Internal Decoration*
- *> Signage*
- *> Exhibition Stands*

AN INSPIRING RANGE OF COLOURS AND SURFACES

In Architecture, colour is a major medium of expression and it can take different meanings for every investor, architect, building occupant or observer. That is why **etalbond®** is produced in a variety of coating surfaces to match imagination, feeling and inspiration – total freedom of expression!

Solid Colours

From vibrant colours to conservative shades, solid colours create a unified appearance without the need of special effects. The whole range of RAL and Pantone is at your disposal, dedicated to help bring forth all your visions and inspirations.

Gloss: from 5% to 80+%

Premium Metallic and Dual/Prismatic

Changing light conditions and perspectives give these elegant colours a glowing, vivid appearance.

Gloss: from 5% to 80+%

The "space effect" is created by colour and light. As an essential component of architecture, a colour combination creates individual space and supports perfectly the utilization of the building.

Textured

The elements of nature and their textures, inspired the **Ceramic/TX** line which creates a special structured effect. A specially developed coating enables aluminium to be used as a substitute for ceramic or stone material. The **Ceramic/TX** line offers the lower construction weight of the coil coated aluminium and tailor made natural looking finishes.

Gloss: <10%

Special Imitations

Corten (Oxidised Steel), Patinated Copper, Marble, Granite and Wood Imitations. Our cutting-edge technology and expert know-how give us the edge to match the aesthetic appeal of natural materials with a texture that is identical to the real thing.

FUNCTIONALITY MEETS AESTHETICS

Elval Colour produces a special treatment of coated aluminum products with significant anti-graffiti properties. This is achieved by a transparent coating which preserves the colour and the appearance of your building façade or corporate identity.

A permanent treatment of coated aluminium products that provides "Easy to Clean" surfaces with the help of nano-technology. These fluoropolymers react with the coating surface to create a low energy coating that can be cleaned very easily.

Phosphorescent Coatings

A specially developed, innovative, and highly durable polyurethane coating that glows intensively when it gets dark. Useful for highly crowded places, such as conference rooms, corridors, staircases. When the lights go out, the room is intensively lit for a short period of time avoiding outbreaks of panic. Phosphorescent Coatings have a cream white appearance in daylight and are also suitable for applications on the outside.

High Reflectivity Coatings

A certified innovative coating system offering more heat reflectivity than virtually any other roofing and cladding material available, letting the user realize significant energy savings in a wide variety of colours.

Anti-bacterial

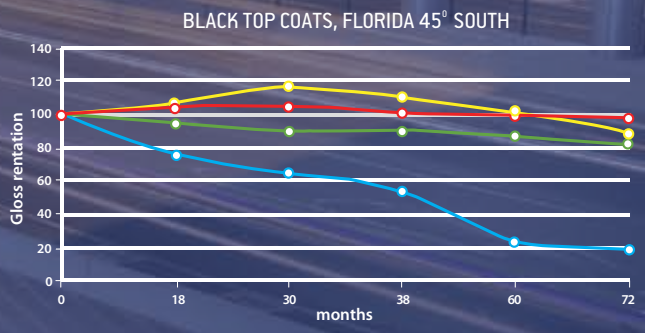
A certified coating based on silver Ions which capture the bacteria. The Anti-bacterial coating is applied on top of the aluminium and is suitable only for interior applications. It has been tested and certified successfully against a multitude of bacteria.

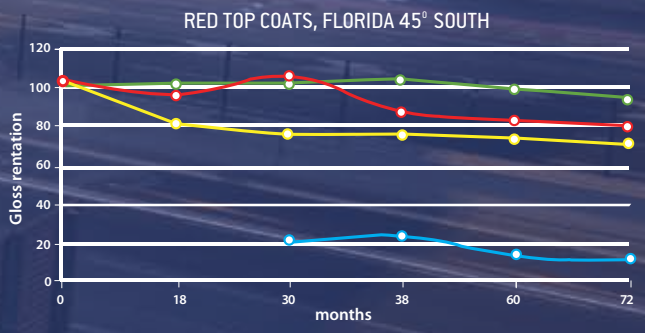
COATING QUALITY with RESPONSIBILITY, GLOBAL REACH and HIGH DEGREE OF CUSTOMISATION

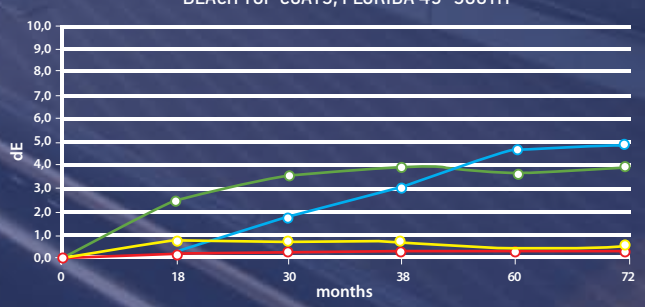
Our skilled personnel apply coatings and colours in modern lines to ensure consistent and superior quality.
We use coatings that are Chrome and Lead Free and provide a safe working environment for all our workers.
Our manufacturing facilities utilize cutting-edge technology thus ensuring environmental responsibility.
Our products come with extreme care in mind as to their quality, our environment, our responsibility and sustainability.
Our coatings can be designed to match the most vivid architectural imagination and adhere to the strictest durability criteria.
No matter where you are located, we will meet you and discuss with you how Elval Colour can be of the best service to you!

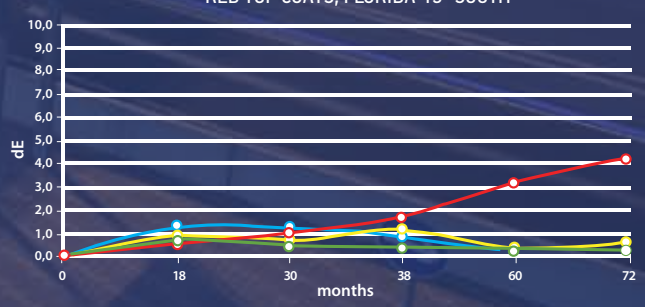
A Highly Weatherable and Sustainable Coating 80% PVDF

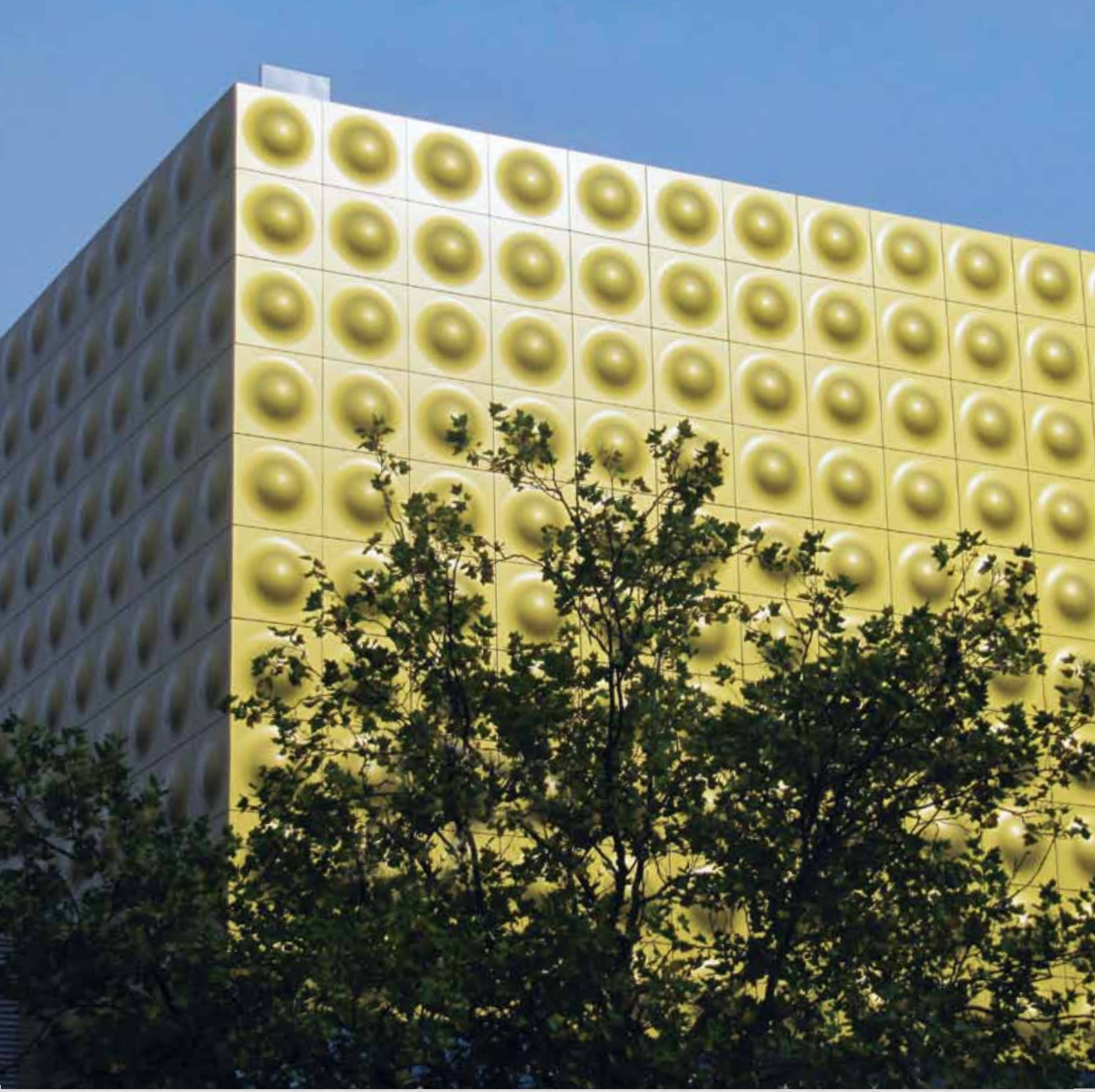
High-performance 80% polyvinylidene fluoride (PVDF) coatings offer the flexibility to select nearly any colour, while shielding the construction against aging, harsh weather and pollution. Tested under time, 80% PVDF coatings meet the most demanding, exterior architectural specifications and exhibit the best possible bending performance. The resin system incorporated into the paint coating present the key properties that determine the coating's characteristics and ultimate performance.
The PVDF bond, with every carbon-hydrogen (C-H) bond adjacent to four C-F bond, provides a chemically inert coating, with the ultimate resistance to ultraviolet (UV) light degradation. In the recent years, PVDF systems are used more and more, while exerting even higher degrees of UV resistance and better coating elongation properties. The PVDF offers the optimum combination of formability and durability compared to other PVDF systems which are cheaper and non-suitable alternatives like 60/40.











SHAPING ADVANTAGES

• **etalbond®** composite panels consist of advanced pre-painted aluminium for building and construction industry.

• **etalbond®** offers architects, constructors and designers, a lightweight, versatile, strong and aesthetically appealing solution for all kinds of buildings and environments.

• Should a parametric design of bold 3D formations is the scope of construction, **etalbond®** aluminum alloys and coatings are produced under the strictest and most demanding standards so as to sustain and cope with the most demanding formations.

• **etalbond® A2** is the only A2 panel in the world that can be curved with exceptional ease.

etalbond®
COMPOSITE MATERIALS

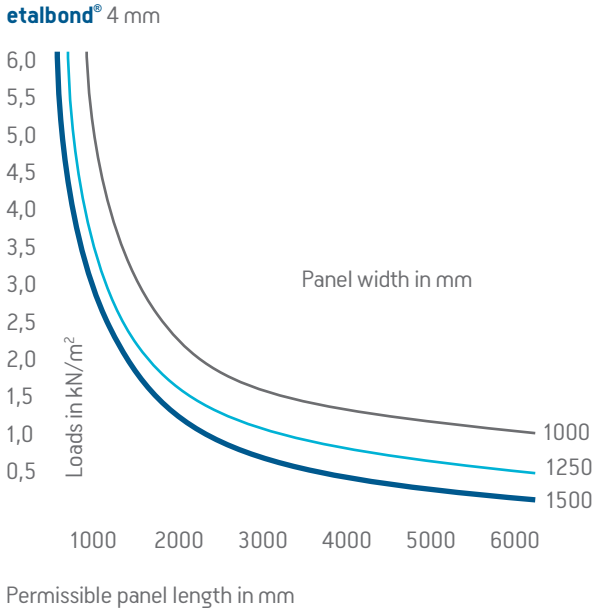
Comparison of thickness and weight with the same flexural rigidity

FLEXURAL RIGIDITY

Aluminium cover Sheets and a mineral core ensure an impressive weight/flexural rigidity ratio, even in large panel sizes. Thanks to its excellent flexural rigidity, **etalbond®** remains stable in terms of shape and flatness, even under extreme temperature fluctuations.

LOADING AND PANEL DIMENSIONS

This chart helps us to determine the maximum panel size of **etalbond**® panels supported on all 4-sides based on the characteristic stress of 79 N/mm².



etalbond®

	Standards	Unit	3mm	4mm	6mm
PANEL DIMENSIONS					
Thickness of Aluminium Layers		mm	0.5	0.5	0.5
Width		mm	standard: 1250, 1500 upon agreement: min 1000 - max 2000		
PANEL TOLERANCES					
Panel thickness		mm	±0.2		
Panel width		mm	-0.0 / +4.00		
Panel length		mm	≤4000mm: -0.0 / +4.00		
			4001 - 6000mm: -0.0 / +6.00		
			6001 - 8000mm: -0.0 / +10.00		
Diagonal difference		mm	3.00mm		
TECHNICAL PROPERTIES					
Section modulus (W)	DIN 53293	cm^3/m	1.05	1.54	2.53
Effective Stiffness ($ExJ_{eff,cal}$)		Nm^2/m	111	206	531
Alloy	EN 573-3		EN AW - 3105		
Temper of Aluminium sheets	EN 515 / EN 1396		H44 (Painted)		
Modulus of Elasticity (E)	EN 1999 1-1	N/mm^2	70000		
Tensile Strength (Rm)	EN 1396	N/mm^2	≥150		
Yield Strength (Rp0.2)	EN 1396	N/mm^2	≥120		
Elongation (A_{50})	EN 1396	%	≥3%		
Linear Thermal Expansion		mm/m	2.4 for temperature difference of 100°C		
SURFACE PREPARATION & PAINT CHARACTERISTICS					
Surface Preparation			With chemical preparation (Degreasing, Passivation)		
Lacquering			Coil Coating		
Visible Surface			PVDF, FEVE		
			or VHDPE		
Back Surface			Protective Primer		
TEMPERATURE BEHAVIOUR					
Excellent behaviour in temperatures			From -50 to +80		
SURFACE QUALITY					
Dents, marks, hits, grooves, stains etc		Acceptable when not visible at a distance ≥2m at an angle of 90°			

etalbond® PE

CORE: LDPE	Unit	3mm	4mm	6mm
PANEL DIMENSIONS				
Weight	kg/m^2	4.6	5.5	7.4
Length	mm	standard: 3200 upon agreement: 1000-13000		
ACOUSTICAL PROPERTIES				
Sound Transmission Loss (Rw)	dB	≥23	≥24	≥25

etalbond® FR

CORE: Fire Retardant core	Unit	3mm	4mm	6mm
PANEL DIMENSIONS				
Weight	kg/m^2	5.8	7.4	10.5
Length	mm	standard: 3200 upon agreement: 1000-13000		

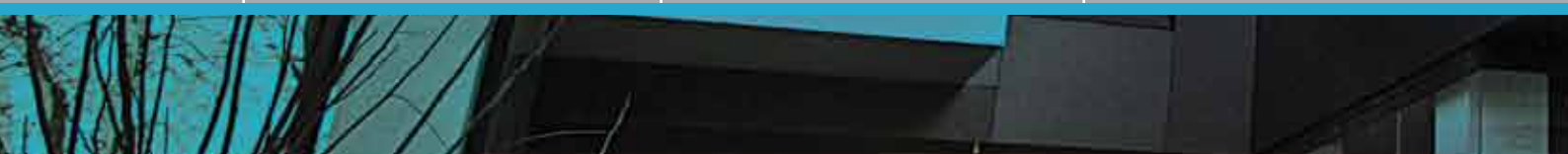
etalbond® A2

CORE: Mineral filled core	Unit	4mm
PANEL DIMENSIONS		
Weight	kg/m^2	7.4 (±0.3)
Length	mm	standard: 3200 upon agreement: 1000-13000

The company maintains the right to change the Technical specs of the product at any time without any further notice.

FIRE CLASSIFICATION

	etalbond® PE		etalbond® FR		etalbond® A2	
Country	Test according to	Classification	Test according to	Classification	Test according to	Classification
EU	EN 13501-1	Class E	EN 13501-1	**B, s1, d0**	EN 13501-1	**A2, s1, d0**
Austria			ONORM B3800-5	Passed	ONORM B3800-5	Passed
France	NF P 92-501	Class M1 (Building Regulations)	NF P 92-501	Class M1	NF P 92-501 NF EN ISO 1716	Class M0
Germany	DIN 4102	Class B2	DIN 4102	Class B1		
Hungary			MSZ 14800-6	Passed	MSZ 14800-6	Passed
United Kingdom	BS 476 part 6 BS 476 part 7	Class 0 (Building Regulations)	BS 476 part 6 BS 476 part 7	Class 0 (Building Regulations)	BS 476 part 6 BS 476 part 7 BS 8414-2 (SZ-20 system: BML 120)	Class 0 (Building Regulations) Passed, meets the classification Criteria of BR135
Italy	CSE RF 2/75/A, RF 3/77	Class 1				
Poland			PN-90/B-02867	NRO	PN-90/B-02867	NRO
Switzerland	VKF	Fire index, Panel: 5.2 Fire index, Core: 4.2	VKF	Fire index: 5.3	VKF	Fire index: 6q.3
Singapore			BS 476 part 7 (*) (top aluminium removed) BS 476 part 6 (*) (top aluminium removed) (*) material tested, etalbond® FR+	Class 0	BS 476 part 7 (top aluminium removed) BS 476 part 6 (top aluminium removed)	Class 0
USA / UAE			ASTM E84 - Panel ASTM E84 - Core ASTM D1929-16 - Panel ASTM D1929-16 - Core NFPA 285 Cassette System (Closed Joints)	Class A Self Ignition = 470° C Flash Ignition = 470° C Self Ignition = 470° C Flash Ignition = 470° C Passed	ASTM E84 - Panel ASTM E84 - Core ASTM D1929-16 - Panel ASTM D1929-16 - Core BS 8414-1 (cassette system) BS 8414-2 (rivet system) NFPA 285 Cassette System (Closed Joints)	Class A Self Ignition = 470° C Flash Ignition = 470° C Self Ignition = 530° C Flash Ignition = 530° C Meets the classification criteria of BR135 Passed
Ukraine			ГОСТ 30244-94 ГОСТ 30402-96 ГОСТ 30444-97 4.18 ГОСТ 12.1.044-89 4.20 ГОСТ 12.1.044-89	Г1 В1 РП1 Д2 Т1	ГОСТ 30244-94 ГОСТ 30402-96 ГОСТ 30444-97 4.18 ГОСТ 12.1.044-89 4.20 ГОСТ 12.1.044-89	Г1 В1 РП1 Д2 Т1




etalbond
COMPOSITE MATERIALS

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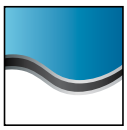
PROCESSING - ROUTING - FOLDING

Thanks to its adaptability **etalbond®** can be shaped by means of simple processing techniques. This routing and folding technique, enables a variety of shapes and sizes to be manufactured.
After having routed the material (on one side) the untouched outer cover sheet can be bent manually giving an exact and clean folding line which follows the routed groove. All standard machinery devices can be used for the following pictogram below.

CUTTING & SAWING

DRILLING

PUNCHING

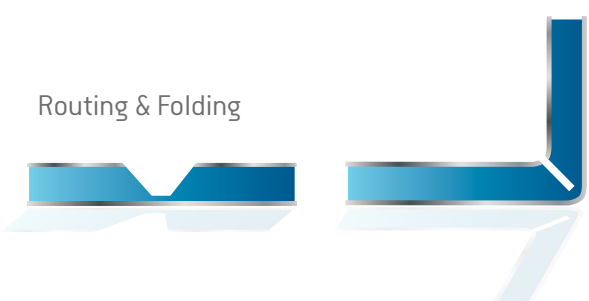


CONTOUR MILLING

JOINING
& FIXING TECHNIQUES

BENDING - FORMING

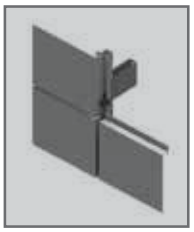
Routing & Folding



VFS SYSTEMS
AXONOMETRIC DEPICTIONS

Bravo W Suspended Cassette System

Bravo W is the optimal solution for large and flat façades, ensuring fast and secure installation of cassettes from aluminium composite materials (**etalbond**®). The system allows the movement of the façade material due to various thermal expansions without compromising the secure attachment of the cassettes.



Omega Cassette System

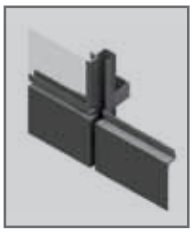
Omega cassette system is a simple and efficient cladding system, incorporating **etalbond**® cassettes using the hanging technique, secure and easy installation. Optimal for large and flat vertical layout.

Riveted Panel System (on T-profile)

The system is specially designed for mounting of composite material (**etalbond**®). The system offers easy, fast and secure mounting of **etalbond**® flat sheets while it exhibits optimal behavior as far as the thermal expansion of the composite panels is concerned.

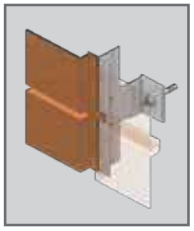
Riveted Panel System (on Omega profile)

Riveted Panel System is designed for installation of flat riveted **etalbond**® panels using screws or rivets, with Omega supporting profile, achieving easy and secure installation with optimal aesthetic results.



Horizontal Cassette System (SZ-20)

SZ-20 is the ideal solution for horizontal cassettes layout. The system utilizes horizontal profiles at the back of the cassette secure and easy installation, while achieving large spans between vertical supports. The system allows the movement of the façade material due to thermal expansion without compromising the integrity of the system.



Vario etalbond® Riveted Cassette System

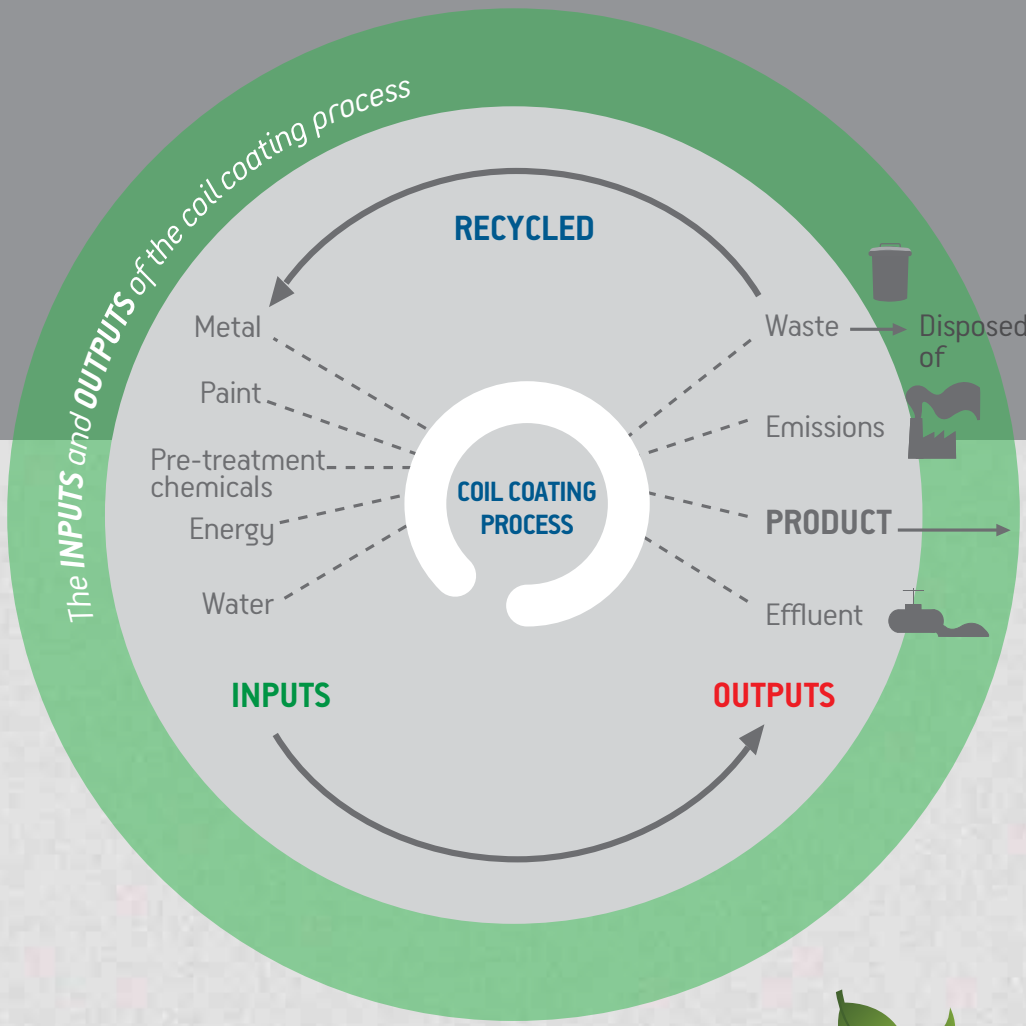
The system is specially designed for mounting of composite material (**etalbond**®), produced by Elval Colour. The system offers:

- Optimal solution for large and flat façades
- Assuring easy, fast and secure mounting of the composite panel
- Optimal behaviour to the thermal expansion of the composite panel

SUSTAINABILITY - RECYCLABILITY

- **etalbond**® is Fully Recyclable.
- **etalbond**® has low waste both during manufacturing process and in use.
- Elval Colour uses controlled processes with a focus on energy, emissions, resource usage and environment.
- Coil coating is the best technology available today, for applying paint to metal and the most environmental friendly as it helps minimizing environmental problems such as emission of volatile organic compounds (VOC), high usage of chemicals, water, and energy, and the disposal of waste.
- Emissions of volatile organics are very tightly controlled by the coil coating process to the extent that they are virtually eliminated.
- Pre-painted metal consistently out-performs post-painted metal in longevity, corrosion protection, and long-term aesthetics.
- **etalbond**® FR and A2 have been awarded with the Green Certificates by the Singapore Green Building Council SGBC.

- Water used in our processes is 100% re-utilized resulting in no water wastage.
- The continuous nature of the coil coating process and the efficiency of roller coating means that waste is very much reduced and wastage of paint is virtually eliminated, with most potential waste being re-used in paint formulation.
- Most coatings are produced without harsh heavy metals or hazardous solvents.



ENERGY LINE P.5346

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ELVAL COLOUR
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