

EN

ELVAL  **ENF**

solid architecture



 **ELVAL COLOUR**
Power to imagine

Contents

The company	03	Technical characteristics	08
Solid pre-painted aluminium sheets	04	Main advantages	09
Inspiring innovation - Specifications	04	Sustainability - Recyclability	10
Non combustible - Solid pre-painted aluminium	05	Liquid coating factsheet	12
Durability meets beauty	06	Installation techniques	14



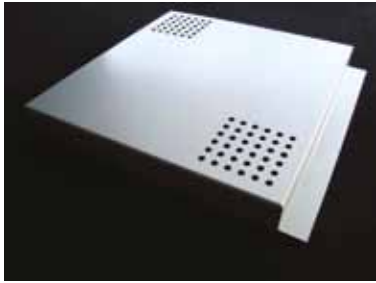
The company

Elval Colour is a leading European coated aluminium manufacturer that produces and sells 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 are exported 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 added value services to customers by assisting in product specification and selection to best suit the needs of the project/application. Customer orientation and dedication accompanies production and product delivery.

Elval Colour is proud to have employees who care about their work and are able to pursue their corporate goals and objectives with great energy and enthusiasm. A leader in product quality and service, Elval Colour never ceases to detect customers' needs and to respond effectively and efficiently to them. Continuous R&D in various fields allows steady improvement of technology, quality, and environmental standards.

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 accredited.





ELVAL COLOUR

Solid pre-painted aluminium sheets

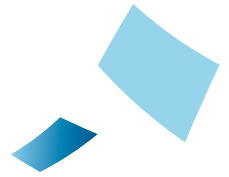
- Facades, Ventilated or non-Ventilated
- Roofing
- Corrugated sheets
- Perforated Coils and Sheets
- False Ceilings and Acoustic Panels
- Partitioning Panels
- Interior Decoration and Construction applications
- Outdoor sun blocking systems

ELVAL ENF™

Inspiring innovation - Specifications

- Solid pre-painted aluminium in alloy 5754 AlMg3 (min. Mg>2,6%) H42.
- Top side surface coated with 3 layers of PVDF [70/30] coating, thickness approximately 32µm and reverse side coated with transparent lacquer, thickness approximately 5µm.
- The top side surface is also protected with black & white, UV resistant plastic film, thickness 75µm, with printed arrows which assist to the correct sheet orientation during final installation.
- Maximum width for sheets or coils is 1550mm.
- Extremely flat, stress free surface.
- Low weight for thickness 2.0 mm = 5,4 Kg/m²
- ELVAL ENF™ aluminium has very good behavior to high wind loads, building movements and in extreme climate environments.
- ELVAL ENF™ sheets have very good formability and can be formed into complex shapes and designs, like concave or convex shapes, corners, closures and column cladding, allowing the panel to have versatile applications.
- ELVAL ENF™ is non-combustible and complies with the most stringent international specifications.

Non combustible - Solid Pre-painted aluminium



- The ELVAL ENF™ aluminium sheet is non-combustible and completely in line with international fire protection regulations for building and construction materials.
- ELVAL ENF™ aluminium sheets have been certified with the highest fire classification A1 (EN 13501-1).
- The non combustible ELVAL ENF™ is necessary in fire escape staircases as well as in other areas, that could possibly turn into a trap in case of fire. For this reason the use of ELVAL ENF™ is recommended in airports, shopping malls, public transportation facilities (metro or railway stations), schools, hospitals, etc and especially in high rise buildings, which should not be covered by smoke, in case of fire, in order to facilitate prompt and safe evacuation.



Durability Meets Beauty

- PVDF coatings are highly cross-linked painted systems with superior UV resistance and an easy to clean surface. ELVAL ENF™ facade materials can be provided with a dirt repellent layer that is easy to clean and requires very little maintenance. Minor dirt, if necessary, can be regularly cleaned, using warm water and neutral, environmentally friendly detergents.
- ELVAL ENF™ facade materials can be easily formed in any shape without harming the paint.
- ELVAL ENF™ solid aluminium pre-painted sheets are available in many colours and paint systems and provide superior benefits in for ability, rigidity, appearance, superior weather resistance.
- Coil coated aluminium can be drilled, stamped, punched, bent, edged and stud welded without any problem or any damage to the material or onto coating.

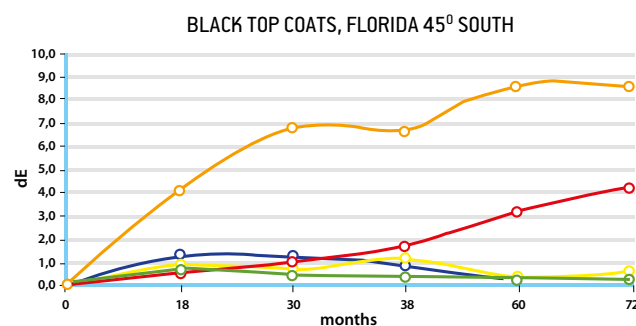
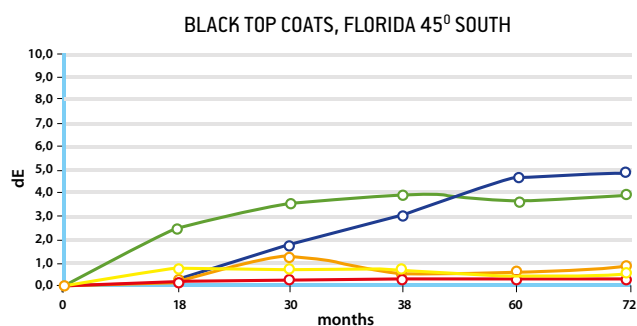
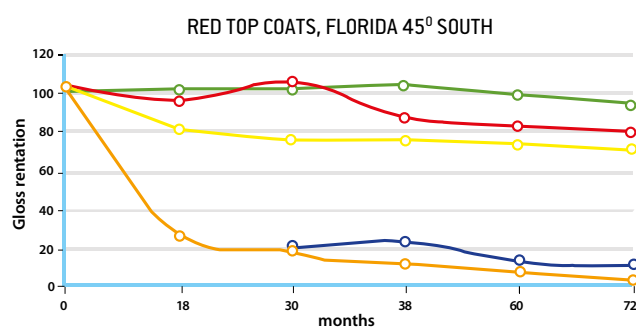
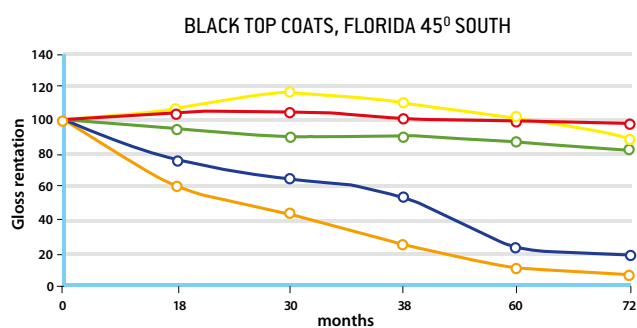




A Highly Weatherable and Sustainable Coating

70% PVDF

- High-performance 70% polyvinylidene fluoride (PVDF) coatings offer the flexibility to select nearly any colour, while shielding against aging, weathering, and pollution.
- Time-proven 70% PVDF coatings meet the most demanding, exterior, architectural specifications and exhibit the best possible bending performance.
- The resin system incorporated into the paint coating provides the key properties that determine the coating's characteristics and 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.
- The 70/30 PVDF offers the optimum combination of formability and durability compared to other PVDF systems (ex. 80/20, 60/40).





Technical Characteristics of solid pre-painted aluminium sheets

THICKNESS (mm)	2mm (solid material) (**)
WIDTH (mm)	900 up to 1550 (+5/-0)
LENGTH (mm)	2000-6000mm (+6/-0)
RECYCLING POTENTIAL	100%
ALLOY	EN AW 5754 AlMg3 (min.Mg>2,6%)
FIRE RESISTANCE	Non combustible – A1 (EN 13501-1)
TENSILE STRENGTH (Rm) N/mm ²	> 220
YIELD STRENGTH (Rp0.2) N/mm ²	> 140
ELONGATION A50 %	> 9
MODULUS OF ELASTICITY E (N/mm ²)	70000
THERMAL EXPANSION (mm/m/100°C)	2,4
WEIGHT(kg/m ²)	5,4
BENDING PERFORMANCE	2 x T, 90° (T=thickness)
PAINT DATA	
TOP SIDE THICKNESS OF PAINT (µm)	29-45
TOP SIDE PAINT SYSTEM	PVDF 2L,3L,4L (*)
BACK SIDE PAINT SYSTEM	Clear protection Lacquer
3L PVDF LACQUERING SYSTEM (***)	
1. PE protection film (optional)	
2. PVDF Clear paint (optional)	
3. PVDF paint	
4. Primer	
5. Passivation layer	
6. Aluminium	
7. Passivation layer	
8. Clear protection lacquer	

(*) Other lacquering systems available on request (Lumiflon, VHDPE, etc.).

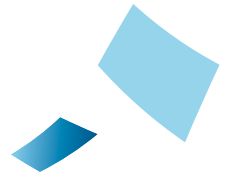
(**) Other thicknesses can be available on request (1,5/1,2/1,0 mm thickness, etc.).

(***) Warranty even for more than 15 years depending on project location and installation use.



ELVAL ENF™

Main advantages



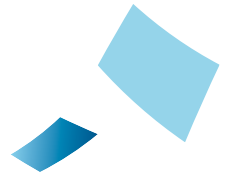
- Fire rating A1 - non combustible
- High energy performance. Buildings with low energy consumption for both heating in the winter and cooling in the summer
- Fully recyclable material
- Low maintenance cost
- Customized form and fixing systems
- Adaptation to architectural designs
- Maximum longevity, outstanding corrosion resistance
- Fast installation
- Robust, low weight construction with high earthquake resistance
- Durability
- Strength and stability
- Resistance to mechanical damage
- Weather tightness
- Wide choice of colours and high quality of long life coating
- Easy processing
- Mainly need a bending machine and punching machine
- A material which allows designers to unleash their own creativity
- Innovative design solutions are possible for just about any application
- Can be the catalyst to innovate in design, creating new visual interpretations of everyday items
- Is ideal for minimizing material handling, installation and transportation costs, especially for facade cladding



Sustainability - Recyclability

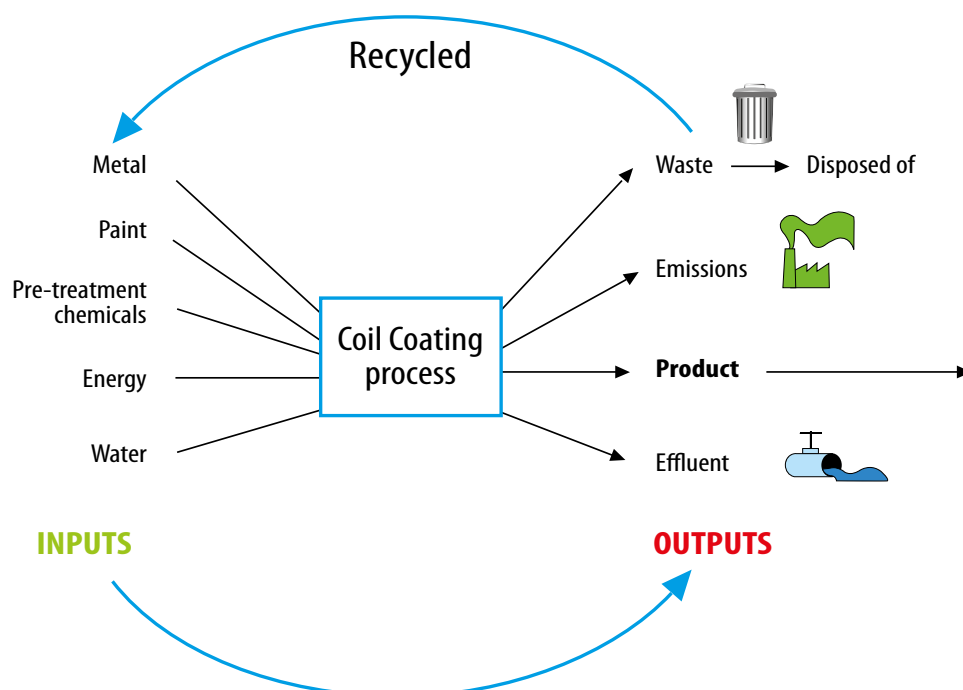
- ENF is Fully Recyclable.
- ENF has low waste in manufacture and in use.
- Controlled processes with a focus on energy, emissions and resource usage.
- Coil coating is the best available technology for applying paint to metal and the most environmental friendly as it helps minimizing environmental problems such as emission of volatile organic compounds (VOC), high usage of chemicals, water, and energy, and the disposal of waste.
- Pre-painted metal consistently out-performs post-painted metal in longevity, corrosion protection, and long-term aesthetics.
- Energy used to provide kinetic power, and the largest part, in heat to cure coatings.





- Emissions of volatile organics are very tightly controlled by the coil coating process to the extent that they are virtually eliminated.
- Water-used in rinsing, mostly at the cleaning/pre-treatment stages and for quenching. Our modern lines use a cascading rinse system to minimize water usage and discharges.
- 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 now produced without harmful heavy metals or hazardous solvents. Phthalate plasticizers responsible for endocrine disruption have been phased out.

The inputs and outputs of the coil coating process





Liquid coating factsheet

- Liquid coating is better than post-painting. Coil coating is one of the best available technologies for applying paint to metal. Pre-painting of metal helps to minimize environmental problems such as emissions of volatile organic compounds (VOC), high usage of chemicals, water, and energy, and the disposal of waste.

- Pre-painted metal is a product of higher and more uniform quality: produced from flat metal strip that is cleaned, treated and coated in a continuous process. This yields better and more efficient cleaning, pre-treatment, painting and curing operations, and hence, a product of higher, and more uniform quality than is usually obtained when post-painting formed parts.

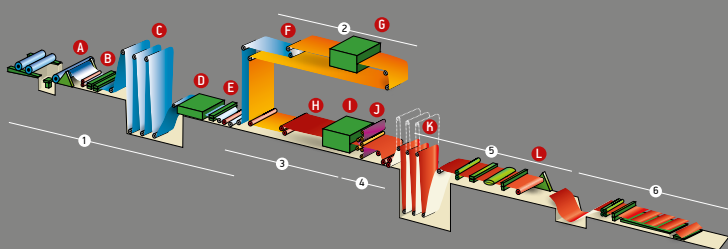
- Liquid coating offers competitive corrosion resistance vs. post finished products: a thorough pretreatment process and inherent characteristics of liquid coating compensate for higher coating thickness ensuring longevity and colour stability adapting to the most strict performance requirements against weathering.

- Pre-painted metal offers higher bending performance compared to post painted metal: the application method of the coating is such that even standard liquid coating systems offer superior bending compared to the much thicker post painted coatings.

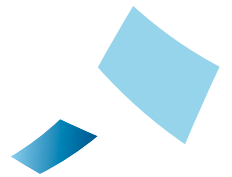
- Superior aesthetic Appearance: cut edges can be hidden, folded, roll formed or tucked away so that the bare edge can be kept out of sight.

- Higher cost savings: the use of pre-painted metal solves manufacturing issues by increasing productivity, reducing manufacturing cycle time, providing faster throughput, and producing better yields compared to the conventional post-painting process.

Coating Production Line

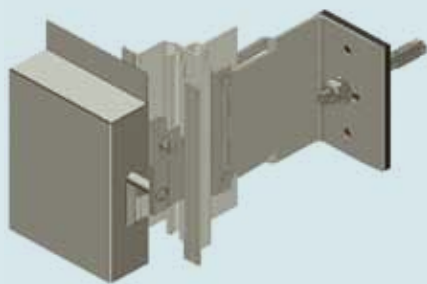


- | | |
|-----------------------------|---|
| 1 Cleaning and pretreatment | A Bare metal is uncoiled |
| 2 Primer coating | B Coil splicing |
| 3 Top coating | C Accumulator stack (entry) |
| 4 Online quality control | D Metal degreasing, cleaning, rinsing and chemical pretreatment |
| 5 Recoiling | E Drying oven |
| 6 Cut to length/sheets | F Primer unit - one or both sides |
| | G Curing oven |
| | H Coating unit - top coat applied one or both sides |
| | I Curing oven |
| | J Laminating - one or both sides, or embossing |
| | K Accumulator stack (exit) |
| | L Recoiling finished metal |

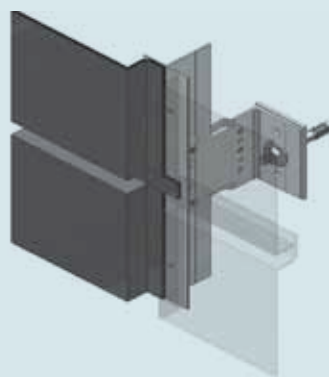




Installation techniques



- Hanging system
(cassettes with Bravo 2
- Ventilated facade system)



- Riveted system
(cassettes with Vario
- Ventilated facade system)

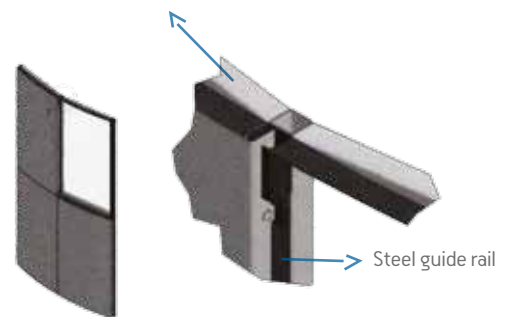


- Riveted system
(flat sheets with Vario
- Ventilated facade system)

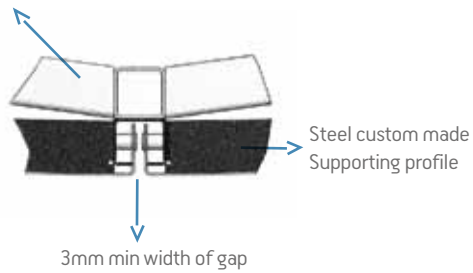
ELVAL ENF™ Curved Cassettes, hanging system



Steel custom made supporting profile welded upon the guide rail

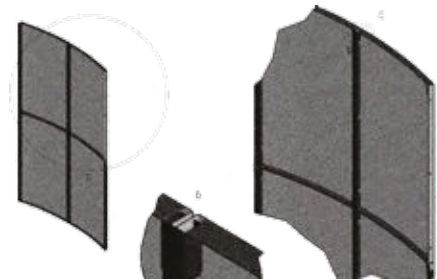


Steel hollow section



Steel custom made Supporting profile

3mm min width of gap



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Technical Datasheet, PVDF sheets and coils For Israel

SPECIFICATION		DESCRIPTION																	
1. Alloy		EN AW 5754 (AlMg3), Chemical analysis according to EN 573-3 Si (%) : 0,40 max, Fe (%) : 0,40 max, Mn (%) : 0,50 max, Cu (%) : 0,10 max, Mg (%) : 2,60-3,60, Cr (%) : 0,30 max, Zn (%) : 0,20 max, Ti (%) : 0,15 max, Mn (%) + Cr (%) : 0,10-0,60, Other elements: each 0,05 % max, Total others : 0,15 % max, Al (%) : Remainder																	
2. Mechanical properties, after coating Test longitudinal to rolling direction	2.1 Temper	5754 H 42 , 1,50-2,0 mm																	
	2.2 Tensile strength	220 – 270 N/mm ²																	
	2.3 Yield strength	140 N/mm ² min, target 200 N/mm ² max																	
	2.4 Elongation	A ₅₀ > 9,0 % Test according to EN 10002-1 and ISO 6892-1:2009																	
3. Dimensions and Tolerances	3.1 Thickness	Thickness before paint Tolerances ≥ 1,97 - 2,00 mm ± 0,13 mm 1,5 mm ± 0,12 mm																	
	3.2 Widths Coils	Nominal width Tolerance Up to 500 mm + 1,2/ -0 mm Over 500-1250 mm + 2,0/ -0 mm 1250-1540 mm + 2,5/ -0 mm																	
	Sheets	Nominal width Tolerance 500-1250 mm + 3,0/ -0 mm Over 1250-1540 mm + 4,0/ -0 mm																	
	3.3 Lengths	Nominal Length Tolerance > 1,0 up to 2,0 m + 4,0 / -0,0 mm > 2,0 up to 3,0 m + 6,0 / -0,0 mm > 3,0 up to 5,0 m + 8,0 / -0,0 mm > 5,0 up to 6,1 m + 0,2 % of nominal length / -0,0 mm																	
	3.4 Squareness	<table border="1"> <thead> <tr> <th></th><th colspan="2">Width</th></tr> <tr> <th>Length</th><th>up to 1 m</th><th>over 1 up to 1,54 m</th></tr> </thead> <tbody> <tr> <td>1-2 m</td><td>4 max</td><td>5 max</td></tr> <tr> <td>2-3 m</td><td>5 max</td><td>5 max</td></tr> <tr> <td>3-5 m</td><td>6 max</td><td>8 max</td></tr> <tr> <td>5-6,1 m</td><td>10 max</td><td>10 max</td></tr> </tbody> </table>		Width		Length	up to 1 m	over 1 up to 1,54 m	1-2 m	4 max	5 max	2-3 m	5 max	5 max	3-5 m	6 max	8 max	5-6,1 m	10 max
	Width																		
Length	up to 1 m	over 1 up to 1,54 m																	
1-2 m	4 max	5 max																	
2-3 m	5 max	5 max																	
3-5 m	6 max	8 max																	
5-6,1 m	10 max	10 max																	
4. Coating	4.1 Chemical pre-treatment	Cleaning and Chemical passivation suitable for coil coating																	
	4.2 Coatings																		
	4.2.a. Front side	PVDF 2 or 3 Layers, according to customer's order																	
	4.2.b. Surface structure	According to the agreed reference standard samples																	
	4.2.c. Reverse side	Clear (or grey) lacquer with thickness of 5 (± 2) µm																	
	4.3 Plastic film protection	Black & White film, with Elval logo, with nominal thickness of 70 µm. The plastic film must be removed within 9 months from the date of lamination or within 2 months if the product has been exposed to outdoor ageing, while avoiding the presence of stagnant water.																	

Technical Datasheet, PVDF sheets and coils For Israel

SPECIFICATION		DESCRIPTION
5. Colours	5.1 Gloss	According to agreement with the customer
	5.2 Colour deviation	
	5.2.a for “light” and “dark” colour shades	According to ECCA T 3 or EN 13523 – 3 (CIE - L* a* b* - system) in comparison with the respective Standard sample
	5.2.b for metallic colours, pearlescent colours, special effect colours, High chroma colours (e.g. red, yellow, blue, green, orange, black etc.)	Visual comparison with the respective Standard sample according to ECCA T 22 or EN 13523 – 22
	5.3. Colour measurement with	Customer - measuring device: ELVAL - measuring device: BYK Colour Guide 45/0
6. Tests	6.1 Coating thickness	According to ECCA T1 or according to EN 13523-1
	6.2 Gloss	According to ECCA T2 or according to EN 13523-2 at the angle of 60°
	6.3 Cross cut test	According to ISO 2409: Gt 0 (No paint peel off)
	6.4 Pencil hardness	According to ECCA T4 or according to EN 13523-4: min F
	6.5 Reverse Impact Resistance test (Resistance to rapid deformation)	According to ECCA T5 or according to EN 13523-5: No paint peel off after test with impact energy of 10 Nm / mm.
	6.6 Workability (Resistance to cracking after bending)	According to ECCA T7 or according to EN 13523-7 T 2,0 without cracks
	6.7 Salt-spray test (Resistance to salt spray fog)	According to ECCA T8 or according to EN 13523-8 Acetic Acid Salt Spray: Corrosion Resistance Index 3 (EN 1396 – 2015)
	6.8 UVA-resistance	According to ECCA T10 or according to EN 13523-10 artificial UV A radiation: RUV 4 (EN 1396 – 2015)
	6.9 MEK-test	According to ECCA T11 or according to EN 13523-11: over 80 double rubs for the top side, Over 10 double rubs for the backside
	6.10 Surface evaluation	The surface should be free from visible defects, which influences essentially the decorative appearance of the surface. Normally, the defect has to be visible from distance over or equal to 2 m, or else it is not rejectable.

Technical Datasheet, PVDF sheets and coils For Israel

SPECIFICATION		DESCRIPTION
7. Packaging	7.1 Coil-Inside-Diameter	500 mm, normally without carton core for thickness 1,97 mm (with exceptions) 500 mm, normally with carton core, for thickness 1,5 mm
	7.2 Coil-Outside-Diameter (OD)	according to maximum weight per coil, max 1350 mm
	7.3.Coil Weight	max 2,1 tn
	7.4 Coil axis	Eye to the wall / eye to side (Horizontal axis)
	7.5 Pallet weight	max 2,2 tn for coils, max 1,2 tn for sheets
	7.6 Others	For coils: 1 coil per pallet Pallets with wooden beams with height 80 mm min, suitable for unloading and handling with a fork lift Pallets fumigated and stamped according to ISPM-15
8. Test Certificate	Upon customer's request	According to EN 10204 / 3.1B
9. Notes	Handling of claims	Claims on the material cannot be accepted after 18 months from the date of the delivery
	Standards	Material is produced according to European Norms EN 1396, EN 485, EN 13523, EN 573

Deviations are acceptable only after written approval. If there is no particular specification given by the customer, then this Technical Data Sheet is valid as customer's specification.

Date



Date

Tuesday, 24 March 2020
ELVAL

Customer