Technical Description

PVDF coating is a polyvinyl di fluoride 3 coating lacquer system on an aluminum-pretreated substrate. The first layer is primer, to protect the chromate aluminum substrate, to increase the corrosion resistance and to offer adhesiveness to the PVDF topcoat or basecoat/topcoat (for the 3 coats system). The PVDF topcoat is containing 70% Kynar 500 ® or Hylar 5000®, fluorocarbon resins, which are responsible for the excellent protective properties of the system.

PVDF systems offer optimal protection for dirt collection, chalking, fading, UV degradation, Acids-salt deposits, detergents, pollutions, chemical staining. The systems also offer excellent adhesion on aluminum and good flexibility and workability for profiling.

An additional PVDF clear coat can be applied as a third coat providing the system with extra protection, particularly for aggressive environments.

Periodically cleaning of the surface is recommended so as to prevent the accumulation of concentrated salt deposits. The surface contamination has to be removed with conventional cleaning methods.

There are many available colors according RAL color chart, but for every selected color, check has to be done, to choose the most appropriate system in order to satisfy quality demands.

PERFORMANCE PROPERTIES				
ITEM	**TESTING**		**3 coats system**	**NORM**
Coating thickness	Dry film thickness		primer 5 μm Approx. + basecoat 17μm Approx. + clear coat 10μm Approx.	ECCA T1
Gloss	At 60° specular gloss topcoat		30±7 %	ECCA T2
Color difference topcoat	Cielab D65/10°		DE<=1 D65/10° or by sight as described in the norm (number 6 limitation of the norm)	ECCA T3
Pencil hardness			Min HB	ECCA T4
Adhesion to cracking on rapid deformation	Reverse impact resistance Measurement by 7,5 Nm/mm		No cracks	ECCA T5
Adhesion after indentation	Cross hatching in reverse impact test		Loss of adhesion: Gt<=1	ECCA T6
Resistance to cracking on bending	Bending on flat material Through 180°		≤ 1T no cracks	ECCA T7
Resistance to salt (acid) spray test	After 1000 hours		Creep age on scribe to bare metal maximum 2 mm	ECCA T8
Water immersion resistance	After 500 hours		No influence	ECCA T9
Resistance to accelerated weathering topcoat	After 2000 hours		DE<= 2,5, gloss retention >=70% max chalk = rating of 8	ECCA T10
Heat resistance	1/2 hour by 60 C continuous metal temp.		No influence	ECCA T13
Humidity resistance	After 1000 hours		No influence	ASTM D2247-94
Solvent resistance	RUB test		More than 80 MEK double rubs	D5402-93

Statements and methods described herein are based upon the best information and practices known by ELVAL industries. However, information's mentioned are suggestions only and are not to be construed as representations or warranties as to performance or results.
If warranty is requested the customer fulfils the attached questionnaire and send it back.

Technical Datasheet, PVDF sheets and coils

<table>
<tr><th colspan="2">SPECIFICATION</th><th>DESCRIPTION</th></tr>
<tr><td>1. Alloy</td><td></td><td>EN AW 5754 (AlMg 3)
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</td></tr>
<tr><td>2. Mechanical properties, after coating</td><td>2.1 Temper

2.2 Tensile strength

2.3 Yield strength

2.4 Elongation</td><td>H 42 (or according to customer’s request)

H42 : 220 – 270 N/mm², Typical 235-250

H42 : 140 N/mm² min, Typical 150-200

H42 : A_{50} > 8,0 % for thickness 0,7-1,5 mm,
A_{50} > 9,0 % for thickness over 1,5 mm,
Valid for thicknesses of bare Al 0,7-2,0 mm
Test according to EN 10002-1</td></tr>
<tr><td>3. Dimensions and Tolerances</td><td>3.1 Thickness

3.2 Widths

3.3 Lengths

3.4 Lateral curvature

3.5 Squareness</td><td>Thickness before paint Tolerances
≥ 0,70 - 1,00 mm ± 0,08 mm
> 1,00 - 1,20 mm ± 0,10 mm
> 1,20 - 1,50 mm ± 0,12 mm
> 1,50 - 2,00 mm ± 0,13 mm

Coils
Thickness Nominal width Tolerance
≥ 0,7-1,0 mm 500-1250 mm + 1,5/ -0 mm
> 1,0-2,0 mm 500-1250 mm + 2,0/ -0 mm
≥ 0,7-2,0 mm 1250-1600 mm + 2,5/ -0 mm
Sheets
Thickness Nominal width Tolerance
≥ 0,7-2,0 mm 500-1250 mm + 3,0/ -0 mm
≥ 0,7-2,0 mm 1250-1600 mm + 4,0/ -0 mm

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

Max 4,0 / 2000 mm

<table><tr><td></td><td colspan="2">Width</td></tr><tr><td>Length</td><td>up to 1 m</td><td>over 1 up to 1,6 m</td></tr><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></table></td></tr>
</table>

SPECIFICATION		DESCRIPTION
4. Coating	4.1 Chemical pre-treatment	Cleaning, Chemical passivation with Cr^{6+}, suitable for coil coating
	4.2 Coatings	
	4.2.a. Front side	2-coat system PVDF, (primer + base coat) 25 ± 3 mic 3-coat system PVDF, (primer + base coat + clear coat) 32 ± 3 mic
	4.2.b. Surface structure	According to the agreed reference samples
	4.2.c. Reverse side	Protection lacquer, about 5 (± 2) mic, transparent or according to customer's request
	6.3 Plastic protection	If agreed, White/Black ~ 70 mic
5. Colours	5.1 Gloss	according to customer's request, for example 30 (60 °) ± 7
	5.2 Colour deviation	according to ECCA T 3 (CIE - L* a* b* - system **or** CIE – L a b - system), in comparison with an agreed master sample
	5.2.a for "light" colours	dE* ≤ 0,8 and -0,70 < DL*, Da*, Db* < + 0,70 dE* ≤ 1,0 from delivery to delivery Metamerism index measured under following pairs of light sources D65, D65-A, D65-F2/CWF, D65-F11/TL 84 **MI** ≤ 0,50
	5.2.b for "dark" colours	dE* ≤ 1,0 and -0,90 < DL*, Da*, Db* < + 0,90 dE* ≤ 1,0 from delivery to delivery Metamerism index measured under following pairs of light sources, D65, D65-A, D65-F2/CWF, D65-F11/TL 84 **MI** ≤ 0,70
	5.2.c Metallic colours, pearlescent colours, special effect colours, High chroma colours (e.g. red, yellow, blue, green, orange, black etc.)	Visual comparison (as described in the norm ECCA T3, number 6 limitation of the norm)
	5.3. Colour measurement with	Customer - measuring device: …… ELVAL - measuring device: BYK Colour Guide 45/0 Or BYK Color view

SPECIFICATION		DESCRIPTION
6. Tests	6.1 Coating thickness	according to ECCA T1or according to EN 13523-1
	6.2 Gloss	according to ECCA T2 or according to EN 13523-2
	6.3 Colour Difference	according to ECCA T3 or according to EN 13523-3, 13523-15, 13523-22
	6.4 Pencil hardness	according to ECCA T4 or ASTM D3363 or EN 13523-4: min H (Random measurements)
	6.5 Impact resistance test (Resistance to rapid deformation)	according to ECCA T5 or according to EN 13523-5 (the type of the tape is: scotch – crystal clear 600). 1 kg of weight falls from specified height, Random measurements
	6.6 Workability (Resistance to cracking after bending)	according to ECCA T7 or according to EN 13523-7 T 1,5 without cracks for H42
	6.7 Salt-spray test (Resistance to salt spray fog)	according to ECCA T8 (acetic salt spray: 5% of NaCl, ~ 0,2% acetic acid) or according to EN 13523-8: 500 hours for acetic salt spray test, less than 2 mm of under creep corrosion Random measurements
	6.8 UVA-resistance	according to ECCA T10 or according to EN 13523-10: 1000 hours (DE ≤ 3) Random measurements
	6.9 MEK-test	According to EN 13523-11: over 80 double rubs for top surface (Test with hammer, weight 1 kg), 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.

SPECIFICATION		DESCRIPTION
7. Packaging	7.1 Coil-Inside-Diameter	400 or 500 mm, with or without carton core, depending on thickness of the strip and customer's requirement
	7.2 Coil-Outside-Diameter (OD)	min 800 mm, max 1750 mm, according to the agreement with the customer
	7.2.Coil Weight	max 8 tn (or according to the agreement with the customer)
	7.3 Coil axis	Eye to sky (vertical axis) or eye to the wall (Horizontal axis) (according to the agreement with the customer)
	7.4 Coil winding	clockwise or counter-clockwise, depending on the agreement with the customer
	7.5 Pallet weight	max 5,0 tn (according to the agreement with the customer) for coils max 2,0 tn for sheets
	7.6 Others	Pallets with wooden beams with height 80 mm min, suitable for unloading and handling with a fork lift
8. Test Certificate	Upon customer's request	According to EN 10204 / 3.1B
9. Notes	Handling of claims	Claims on the material can not 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.