

# Technical Data Sheet

## PVDF + FEVE topcoat 3L / 4L (Protec) on steel substrate

Version 2021-1

PVDF + FEVE topcoat systems are used in product brands **EuraBuild / EuraBuild Performance / MetalMax / EuraMica / AnoMax / EuraDesign**

| Substrate & pre-treatment                                                                  |                                                                                                                          |                |           |           |                   |                                                                                                                            |
|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|----------------|-----------|-----------|-------------------|----------------------------------------------------------------------------------------------------------------------------|
| Width                                                                                      | ≤ 1600mm                                                                                                                 |                |           |           |                   |                                                                                                                            |
| Thickness aluminium                                                                        | 0,3-0,7mm                                                                                                                |                |           |           |                   |                                                                                                                            |
| Pre-treatment                                                                              | Chrome-free conversion                                                                                                   |                |           |           |                   |                                                                                                                            |
| Surface quality                                                                            | S220GD / Z275MC<br><b>EN-10346; EN-10143</b>                                                                             |                |           |           |                   |                                                                                                                            |
| Front side finish                                                                          |                                                                                                                          | <b>EN 1396</b> |           |           |                   | <b>AAMA 2605<sup>(1)</sup></b>                                                                                             |
| Resin chemistry                                                                            | PVDF 70:30 Basecoat<br>FEVE Topcoat                                                                                      |                |           |           |                   |                                                                                                                            |
| Film thickness (3L= 3 Layers)                                                              | <b>1L</b>                                                                                                                | <b>2L</b>      | <b>3L</b> | <b>4L</b> |                   |                                                                                                                            |
| Standard build-up                                                                          | -                                                                                                                        | -              | 32-36µm   | 39-60µm   |                   |                                                                                                                            |
| Protec <sup>(2)</sup> build-up                                                             | -                                                                                                                        | -              | 37-41µm   | 44-65µm   | <b>ASTM D7091</b> |                                                                                                                            |
|                                                                                            | <b>EN 13523-1</b>                                                                                                        |                |           |           |                   |                                                                                                                            |
| Colour match                                                                               | Solid colours: ΔE(cmc) ≤ 1<br>Metallic + pearlescent colours: Visual OK <sup>(3)</sup><br><b>EN 13523-3; EN 13523-22</b> |                |           |           |                   | Solid colours ΔE(cmc): ≤ 1<br>Metallic + pearlescent colours: Visual OK <sup>(3)</sup><br><b>ASTM D2244; ASTM D1729-16</b> |
| Specular gloss                                                                             | 10-90 gloss units (acc. to EN 1396 Table 3)<br><b>EN 13523-2</b>                                                         |                |           |           |                   | 10-90 gloss units<br><b>ASTM D523</b>                                                                                      |
| Pencil hardness                                                                            | ≥ F<br><b>EN 13523-4</b>                                                                                                 |                |           |           |                   |                                                                                                                            |
| Adhesion                                                                                   | ≤ GT1<br><b>ISO 2409</b>                                                                                                 |                |           |           |                   |                                                                                                                            |
| Adhesion + rapid deformation indentation                                                   | ≤ GT1<br><b>EN 13523-6</b>                                                                                               |                |           |           |                   | Class 5B<br><b>ASTM D3359</b>                                                                                              |
| Resistance to cracking on bending<br>(T-Bend test on non-embossed material) <sup>(4)</sup> | ≤ 1,5T<br><b>EN 13523-7</b>                                                                                              |                |           |           |                   | <b>ASTM D4145</b>                                                                                                          |
| Resistance to MEK solvent (rubbing test)                                                   | ≥ 100 double rubs<br><b>EN 13523-11</b>                                                                                  |                |           |           |                   |                                                                                                                            |
| Durability according to testing                                                            |                                                                                                                          |                |           |           |                   |                                                                                                                            |
| Colour and gloss retention on xenon exposure <sup>(5)</sup>                                | ΔE(cmc) ≤ 3<br>≥ 80% gloss retention<br><b>ISO 16474-2</b><br>2000 hours                                                 |                |           |           |                   |                                                                                                                            |
| Humidity resistance                                                                        | Blistering: < B2 (S2)<br><b>ISO 6270-1</b><br>1000 hours                                                                 |                |           |           |                   | Few blisters: size ≤ 8<br><b>ASTM D2247; ASTM D714</b><br>4000 hours                                                       |
| Filiform corrosion resistance                                                              | Class 3<br>Under creep longest filament: ≤ 2mm<br><b>ISO 4623-2</b><br>1000 hours                                        |                |           |           |                   |                                                                                                                            |
| Resistance to salt spray fog                                                               | Class 3<br>Under creep average: ≤ 2mm<br>Blistering: < B2 (S2)<br><b>EN 13523-8</b><br>1000 hours                        |                |           |           |                   | Scribe: rating ≥ 7<br>Blisters: rating ≥ 8<br><b>ASTM G85 Annex 5</b><br>2000 hours                                        |
| Resistance to fluorescent UV light and water condensation                                  | R <sub>UV4</sub><br>ΔE(cmc) ≤ 3<br>≥ 80% gloss retention<br><b>EN 13523-10</b><br>1000 hours                             |                |           |           |                   |                                                                                                                            |

| Durability according to outdoor exposure                        |                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                              |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Outdoor corrosion resistance                                    | Class 3<br>Under creep average: ≤ 2mm<br>Blistering: ≤ B2 (S2)<br><b>EN 13523-21</b><br>3 years 90° North Seaside Bohus-Malmö                                                                                                                                                                                                                                                                          |                                                                                              |
| Colour and gloss retention on natural weathering <sup>(5)</sup> | ΔE ≤ 3<br>≥ 80% gloss retention<br><b>EN 13523-21</b><br>2 years 45° South Florida                                                                                                                                                                                                                                                                                                                     | ΔE ≤ 5<br>≥ 50 % gloss retention<br><b>ASTM D2244</b><br>10 years 45° South Florida          |
| Resistance to chalking on natural weathering <sup>(5)</sup>     | ≤ 8 %<br><b>EN 13523-21</b><br>2 years 45° South Florida                                                                                                                                                                                                                                                                                                                                               | Whites: rating ≥ 6<br>Colours: rating ≥ 8<br><b>ASTM D4214</b><br>10 years 45° South Florida |
| Warranty indication (final warranty upon request)               |                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                              |
| Technical warranty <sup>(6)</sup>                               | Non coastal areas: 20 years<br>Coastal areas <sup>(7)</sup> : Not granted                                                                                                                                                                                                                                                                                                                              |                                                                                              |
| Aesthetical warranty <sup>(8)</sup>                             | Zone A: 10 years<br>Zone B: 7 years<br>Zone C: 5 years                                                                                                                                                                                                                                                                                                                                                 |                                                                                              |
| Notes for further processing                                    |                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                              |
| Heat resistance                                                 | Maximum 80°C for 30 minutes or up to 170°C for maximum 30 seconds (ACM processes)                                                                                                                                                                                                                                                                                                                      |                                                                                              |
| Stress whitening                                                | This paint system may show a light degree of "stress-whitening" after bending of the coated aluminium, mostly only visible in darker colour shades. Stress-whitening is white colouring in individual areas under tension where polymer chains reorganize due to stretching. This is only a visual deviation, which does not have any technical influence, quality constraints or impact on warranties |                                                                                              |

<sup>(1)</sup> AAMA 2605 specifications are applicable only to specific Euramax finishes

<sup>(2)</sup> Protec is a high build primer (10µm) that improves corrosion resistance in extreme environments (coastal, airports, chemical industry etc.)

<sup>(3)</sup> Metallic and pearlescent colours are batch and paint directional sensitive. Material for a building project must be ordered in one batch and should be installed in the same paint direction

<sup>(4)</sup> The minimum flexibility depends on the coated substrate

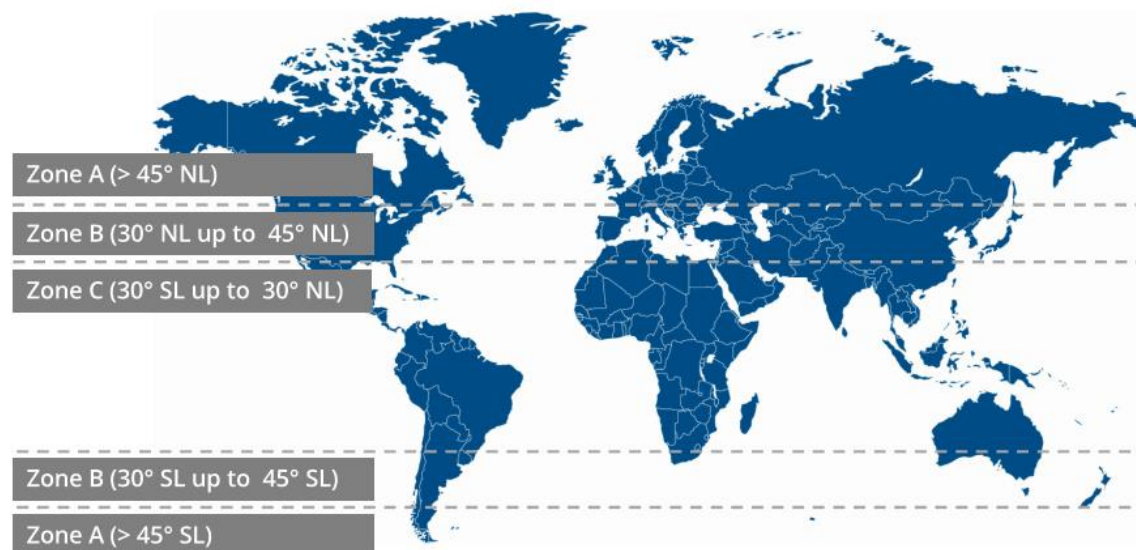
<sup>(5)</sup> Indicative values only. The UV durability performance will depend on the colour saturation/ type (e.g. light vs bright, solid finishes vs metallic)

<sup>(6)</sup> The original paint surface that is directly exposed to the elements will not peel, blister, chip, check or crack (except for the minor cracking that may occur on edges or break bends at the time of fabrication) over more than 5% of the total surface over the technical warranty period. The technical warranty value will be equivalent to a maximum of 100% of the purchase price according to Euramax Coated Products terms and conditions

<sup>(7)</sup> Coastal areas are located within 1500 meter from a salt water environment

<sup>(8)</sup> The aesthetical warranty conditions will depend on the colour and project location and is subject to a warranty value reduction over the warranty period of the product (see appendix A, B and C for more details on aesthetic warranty)

#### Appendix A: Geographical warranty zones depending on Northern Latitude (NL) and Southern Latitude (SL)



**Zone A:** All countries situated > 45° NL and > 45° SL (e.g. Scandinavia, Great Britain, the Netherlands, Belgium, France, Switzerland, Austria, Germany)

**Zone B:** All countries situated between 45° and 30° NL and between 45° and 30° SL (e.g. France, Portugal, Spain, Italy, Greece, Turkey)

**Zone C:** All countries situated < 30° NL and < 30° SL (e.g. Guadeloupe, Cameroon, Saudi Arabia, Oman)

#### Appendix B: Aesthetic performance overview per geographical zone

| Topcoat performance               | Test specification  | Zone A<br>10 years | Zone B<br>7 years | Zone C<br>5 years |
|-----------------------------------|---------------------|--------------------|-------------------|-------------------|
| Reduction in dry film thickness   | <b>EN 13523-1</b>   | ≤ 3µm              | ≤ 3µm             | ≤ 4µm             |
| Residual gloss                    | <b>EN 13523-2</b>   | ≥ 85%              | ≥ 80%             | ≥ 65%             |
| Colour diff. ΔE for solid colours | <b>EN 13523-3</b>   | ≤ 3                | ≤ 5               | ≤ 8               |
| Chalking %                        | <b>ASTM D659-80</b> | ≤ 10               | ≤ 20              | ≤ 50              |

#### Appendix C: Aesthetic warranty value reduction over warranty period

| Limited aesthetic warranty value over warranty period; % of full warranty refund |          |        |        |        |        |         |
|----------------------------------------------------------------------------------|----------|--------|--------|--------|--------|---------|
| <b>5 Year</b>                                                                    | Year 1-2 | Year 3 | Year 4 | Year 5 |        |         |
|                                                                                  | 100%     | 50%    | 25%    | 10%    |        |         |
| <b>7 Year</b>                                                                    | Year 1-3 | Year 4 | Year 5 | Year 6 | Year 7 |         |
|                                                                                  | 100%     | 80%    | 60%    | 40%    | 20%    |         |
| <b>10 Year</b>                                                                   | Year 1-5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 |
|                                                                                  | 100%     | 85%    | 70%    | 55%    | 40%    | 25%     |