National Standard of the People's Republic of China

GB 5237.5 - 200X
Replaces GB 5237.5-2004

Wrought aluminium alloy extruded profiles for architecture

Part 5: PVDF coating profiles

Draft for approval

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Issued by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China and the Standardisation Administration of the People's Republic of China (SAC)
Foreword

Sections 4.5.3.1 and 4.5.5 of this Standard are mandatory, whilst the rest are recommended.

GB 5237, “Wrought aluminium alloy extruded profiles for architecture” is divided into six parts:

- Part 1: Untreated profiles
- Part 2: Anodised profiles
- Part 3: Electrophoretic coating profiles
- Part 4: Powder coating profiles
- Part 5: PVDF coating profiles
- Part 6: Thermal barrier profiles

This is Part 5 of GB 5237.

This Part replaces Part 5 of GB 5237.5 – 2004 “Wrought aluminium alloy extruded profiles for architecture – Part 5: PVDF coating profiles”.

This Part has been revised with reference to AAMA2605-2005, “Performance requirements and test procedures for superior performing organic coatings on aluminium extrusions and panels.”

The main technical differences between this Part when compared to GB5237.5-2004 are:
- the duration of the neutral salt spray test for the coatings has been specified as 4000 hours, unanimous with AAMA2605;
- illumination with xenon lamp artificial accelerated ageing test for the artificial accelerated weatherability of the coating has been adopted, the duration of the test being 2000 hours;
- the duration of the heat-humidity test has been specified as 4000 hours, unanimous with AAMA2605.

This part is proposed by the China Non-ferrous Metals Industry Association.

This Part is under the jurisdiction of the National Technical Committee for Standardisation of Non-ferrous Metals.

Main organisations that participated in the drafting of this Part:
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Non-ferrous Metal Quality Supervision and Inspection Centre of South China;
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GuangDong Fenglu Aluminium Co., Ltd;
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This Part replaces the previously issued Standards:
- GB/T 5237.5-2000, GB/T 5237.5-2004
1 Scope
This Part sets the requirements for the testing methods, inspection rules, packaging, marking, transportation, storage and content of contracts (or orders) of PVDF coating profiles for architecture.

This Part applies to aluminium alloy extruded profiles with PVDF (Polyvinylidene Fluoride) coatings for architecture (hereafter referred to as PVDF coating profiles).

Other aluminium alloy materials that carry similar applications and similar surface treatments may refer to and adopt the content of this Part.

2 Normative References
The provisions of the following documents become provisions of this Part after being referenced. For dated reference documents, all later amendments (excluding corrigenda) and versions do not apply to this Part; however, the parties to the agreement are encouraged to study whether the latest versions of these documents are applicable. For undated reference documents, the latest versions apply to this Part.

GB/T 228-2002 Metallic materials – Tensile testing at ambient temperature;
GB/T 1732 Determination of impact resistance of films;
GB/T 1740 Determination of resistance to heat and humidity of paint films.
GB/T 1766, Paints and varnishes – Rating schemes of degradation of coats;
GB/T 1865 – 1997 Paints and varnishes – Artificial weathering and exposure to artificial radiation – Filtered xenon-arc radiation;
GB/T 3199 Wrought aluminium and aluminium alloy products – Packaging, marking, transporting and storing;
GB/T 4957, Non-conductive coatings on non-magnetic basic metals – Measurement of coating thickness – Eddy Current;
GB/T 5237.1 Wrought aluminium alloy extruded profiles for architecture - Part 1: Untreated profiles;
GB/T 5237.4-2008 Wrought aluminium alloy extruded profiles for architecture – Part 4: Powder coating profiles;
GB/T 6461, Methods for corrosion testing of metallic and other inorganic coating on metallic
substrates – Rating of test specimens and manufactured articles subjected to corrosion tests;

GB/T 6682 Water for analytical laboratory use – specification and test methods;

GB/T 6379 Paint and varnishes – determination of film hardness by pencil test;

GB/T 8013.3-2007 Anodic oxide coatings and organic polymer coatings on aluminium and its alloys – Part 3: Organic polymer coating;

GB/T 9276 Methods of exposure to natural weathering of coating;

GB/T 9286 Paints and varnishes – cross-cut test for films;

GB/T 9754 Paints and varnishes – Measurement of specular gloss of non-metallic paint films at 20°, 60° and 85°;

GB/T 9761 Paints and varnishes – Visual comparison of the colour of paints;

GB/T 10125 Corrosion tests in artificial atmospheres – salt spray tests;

GB/T 11186.2 Methods for measuring the colour of paint films – Part 2: Colour measurement;

GB/T 11186.3 Methods for measuring the colour of paint films – Part 3: Calculation of colour differences;

GB/T 16585 Rubber, vulcanised – Test method of resistance to artificial weathering (Fluorescent UV lamp);

GB/T 20975 (all parts), Chemical analysis methods of aluminium and aluminium alloys.

JC/T 480, Unslaked Lime for architecture.

3 Terms and definitions

The terms and definitions set out in GB/T 8013.3-2007 apply to this Part, as well as the following:

3.1 Film

Film refers to PVDF (polyvinylidene fluoride) painted on the surfaces of the metallic base, the film formed after the paint becomes solidified. Film is also referred to as coating.

3.2 Exposed surfaces

Exposed surfaces refers to PVDF coating profiles that have been processed, manufactured and mounted onto a building; the surface PVDF coating profiles which can still be seen either in an open or shut state.

3.3 Thickness of coating

Coating thickness refers to the thickness of the solidified PVDF paint covered on the metallic base.
3.4 Local thickness

Measure the coating thickness of any one inspection area on the exposed surface of the PVDF coating profile that is not greater than 1cm² several times (not less than 3 times); the local thickness is the average value of the measured coating thickness.

3.5 Minimum local thickness

The smallest value of the many measured local thicknesses of the exposed surfaces on the PVDF coating profiles.

3.6 Average thickness

The average thickness is the average value of several (not less than 5 different places) measured and calculated local thickness of the exposed surfaces on the PVDF coating profiles.

4 Requirements

4.1 Product classification

4.1.1 Alloy grades, states, specifications and coating types

The alloy grades, supply states and specifications of the PVDF coating profiles conform to the requirements set out in GB 5237.1. Coating types should conform to the requirements set out in Table 1.

<table>
<thead>
<tr>
<th>Two Coatings</th>
<th>Three Coatings</th>
<th>Four Coatings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undercoat and topcoat</td>
<td>Undercoat, topcoat and varnish</td>
<td>Undercoat, barrier coat, top coat and varnish</td>
</tr>
</tbody>
</table>

4.1.2 Markings

The arrangement of labelling of PVDF coating profiles should be presented in the following order: product name, alloy grade, supply state, profile specification (profile specification consists of the code name and the cut-length of the PVDF coating profile), colour code name (indicated as colour xxxx), and the serial number of this Part. An example of the label is shown below:

If the PVDF coating profile is made of 6063 aluminium alloy, its supply state is T5, its profile code is 421001, its cut-length is 6000mm, and its coating colour is grey (code number 8399), then the label should be:

PVDF coating profile 6063-T5 421001x6000 Colour 8399 GB5237.5-2008

4.2 Preliminary treatment

The preliminary treatments of the PVDF coating profiles should be carried out according to the provisions specified in Clause 5 of GB/T 8013.3-2007.

4.3 Chemical composition, mechanical properties

The chemical composition, mechanical properties of the PVDF coating profiles should conform to the requirements set out in GB 5237.1.
4.4 Dimension deviation

The allowable dimension deviations of the profiles after the PVDF coatings are removed should conform to the requirements set out in GB 5237.1. The installation and use of PVDF coating profiles should not be affected by the dimension deviations caused by the coatings.

4.5 Coating properties

4.5.1 Gloss

The 60° gloss value of the coating should be consistent with the contract, and the allowable deviation should be ± 5 gloss units.

4.5.2 Colour and chromaticism

The colour of the PVDF coatings should be primarily identical with the colour sample plate agreed between the suppliers and buyers. When measuring with a colorimeter, the chromaticism between single colour coating and the colour sample plate should be $\Delta E_{ab}^* \leq 1.5$ amongst the same batch of PVDF coating profiles (refers to delivery batch) should be $\Delta E_{ab}^* \leq 1.5$.

4.5.3 Coating thickness

4.5.3.1 Coating thickness on the exposed surface should conform to the requirements set out in Table 2:

<table>
<thead>
<tr>
<th>Coating type</th>
<th>Average Thickness/(\mu m)</th>
<th>Minimum Local Thickness/(\mu m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two coatings</td>
<td>• 30</td>
<td>• 25</td>
</tr>
<tr>
<td>Three coatings</td>
<td>• 40</td>
<td>• 34</td>
</tr>
<tr>
<td>Four coatings</td>
<td>• 65</td>
<td>• 55</td>
</tr>
</tbody>
</table>

Note: due to the complex shape of the extruded profiles’ cross-section, the coating thickness on certain surfaces (such as inner corners, transverse grooves) of the PVDF coating profiles are permitted to be smaller than the values specified in Table 2, but a show-through phenomenon is not permissible.

4.5.3.2 If spray painting is required on non-exposed surfaces, this request should be clearly indicated in the contract.

4.5.4 Hardness

After the Pencil Scratch Hardness Test, the hardness of the coating should not be lower than 1H.

4.5.5 Adherence

The dry adherence, wet adherence and boiling water adherence of the coating should all reach level 0.

4.5.6 Impact resistance

After the drop impact test, the coatings on the impact area are allowed to have tiny cracks, but
the coatings must not stick to the adhesive tape.

4.5.7 Wear resistance
After the Falling-sand Test, the abrasion coefficient should not be smaller than 1.6L/\( \mu \)m

4.5.8 Hydrochloric acid corrosion resistance
After the hydrochloric acid corrosion resistance test, a visual inspection should be carried out to check the test coating surface; no bubbles or any other noticeable changes should be apparent.

4.5.9 Nitric acid resistance
After the nitric acid resistance test, the colour change of single colour coatings should be \( E_{ab} \)• 5.

4.5.10 Mortar resistance
After the mortar resistance test, carry out a visual inspection to check the test coating surface; there should not be any coating falling off or other noticeable changes.

4.5.11 Solvent resistance
After the solvent resistance test, the coating should not become softened and there should be no other noticeable changes.

4.5.12 Detergent resistance
After the detergent resistance test, carry out a visual inspection to check the test coating surface; there should be no bubbles, the coating should not come off and there should be no other noticeable changes.

4.5.13 Salt spray corrosion resistance
After 4000 hours of neutral salt-spray test, the under coating corrosion width of unidirectional infiltration of both side of the cut-line should not exceed 2mm, and the surface coatings beyond 2.0mm from the cut line on both sides should not have any corrosion phenomenon.

4.5.14 Heat and humidity resistance
After 4000 hours of the heat-humidity test, the coating changes should not be greater than level 1.

4.5.15 Weatherability

4.5.15.1 Accelerated weatherability
After 2000 hours irradiated with a xenon lamp for the artificial accelerated ageing test, coating chalking should not occur (level 0), the gloss retention percentage (percentage of the after test gloss value compares to before test gloss value) should not be less than 85%, and the colour change degree should reach level 1 as a minimum.

4.5.15.2 Natural weatherability
If the buyer requests the natural weatherability test be carried out on the PVDF coatings, then the test conditions and the acceptance standard should be decided through consultations between the supplier and buyer, and should be clearly indicated in the contract.
4.5.16 Others

4.4.16.1 If the buyer has special requests regarding the impact resistance, wear resistance, salt spray corrosion resistance, heat-humidity resistance, and weatherability of the PVDF coatings, both the supplier and buyer may consult each other whilst referring to the requirements set out in GB/T 8013.3-2007 in order to decide on the specific property requirements. The agreed test results should be clearly indicated in the contract.

4.5.16.2 If the buyer requests further tests be carried out on other properties of the PVDF coatings, the supplier and the buyer should refer to the requirements set out in GB/T 8013.3-2007, and come to a decision through mutual consultation.

4.6 Appearance quality

The coatings on the exposed surface of the PVDF profiles should be smooth and even. Faults that may affect the use of the profiles such as flow marks, wrinkles, bubbles and coating falling off are not permissible.

5 Testing methods

5.1 Chemical composition

The reference analysis of chemical composition should be carried out in accordance with the methods set out in GB/T 20957.

5.2 Chemical properties

The mechanical properties reference test should be carried out in accordance with the methods specified in GB/T 228-2002. The elongation percentage after fracture should be decided in accordance with the requirements set out in Section 11.1 of GB/T 228-2002.

5.3 Dimension deviation

Dimension deviation should be measured according to the methods specified in GB 5237.1.

5.4 Properties of the coatings

5.4.1 Gloss

Use a gloss instrument to determine the gloss at a $60^0$ incident angle in accordance with the procedures set out in GB/T 9754.

5.4.2 Colour, chromaticism

5.4.2.1 Visual inspection method

Carry out the test according to the provisions of GB/T 9761.

5.4.2.2 Instrumental method

For the single colour coating reference test, use a colorimeter to carry out the measurement as according to the methods specified in GB/T 11186.2 and GB/T 11186.3.
5.4.3 Coating thickness

Measure the coating thickness according to the procedures specified in GB/T 4957. At least 5 suitable test spots should be measured (every spot should be about 1cm²) to determine the thickness of the test coating. In each test, measure the test spot 3 -5 times and record the readings. Determine the average value of the readings as the local thickness of the test spot, then record the average value of all the local thickness as the determined average thickness of the test coating.

5.4.4 Hardness of the coating

Carry out the pencil hardness test according to the test method specified in GB/T 6739. The test results may be evaluated on the basis of how scratched the paint coating surface becomes.

5.4.5 Adherence

5.4.5.1 Dry adherence

5.4.4.1.1 Draw squares according to the cross-cut test method specified in GB/T 9286. The interval of each square should be 1mm.

5.4.5.1.2 Cover the square drawing coating with adhesive tape, and the adhesive force for the tape should be greater than 10N/25mm. Press the tape down tightly to remove the air from underneath the tape, pull off the tape quickly at a vertical angle from the coating surface, then carry out the evaluation according to the provisions set out in GB/T 9286.

5.4.5.2 Wet adherence

According to the rule in 5.4.5.1.1, draw squares on the sample using the third grade water specified in GB/T 6682, with a temperature of 38°C± 5°C. Soak the sample for 24 hours. Take the sample out and wipe it dry. Carry out the test and evaluation within 5 minutes, as according to 5.4.5.1.

5.4.5.3 Boiling water adherence

5.4.5.3.1 Draw squares on the sample according to the provisions set out in 5.4.5.1.1.

5.4.5.3.2 Pour around 80mm of third grade water into a beaker as specified in GB/T 6682. Place 2 - 3 pieces of clean broken porcelain into the beaker, and heat the water from the bottom of the beaker bottom until the water boils.

5.4.5.3.3 Hang the sample in the water and allow it to boil for 20 minutes. The sample should be 10mm under the water surface, but should not touch the bottom of the beaker. During the test process, the water temperature should be kept at least at 95°C. Whenever necessary, add boiled third grade water into the beaker as specified in GB/T 6682, so as to maintain the depth of the water at least to 80mm.

5.4.5.3.4 Remove the sample and wipe it dry. According to 5.4.5.1.2, carry out the test and evaluation within 5 minutes.

5.4.6 Impact resistance

Use a punch ball with a diameter of 16mm± 0.3mm to carry out the drop impact test, as according to the test procedures specified in GB/T 1732: place an impact hammer (1000g± g) at
a suitable height and allow it to fall freely, then drop the hammer directly onto the coating surface of the standard sample plate (Frontal Impact), which will result in an indentation with a depth of 2.5mm ± 0.3mm. Cover the indentation with 20mm width adhesive tape\(^D\), then press down to remove the air under the tape and quickly pull off the tape at a vertical angle from the coating surface. Carry out a visual inspection to check the change in situation of the indenter and its surrounding area.

\(^D\) The suitable adhesive tapes on the market are Scotch Premium Cellophane tape 610 or Permacel P-99 adhesive tape. We list these product information here is just for the convenience purpose for people who use this part of standard, it doesn't mean that we give acceptance to these products.

5.4.7 Wear resistance

Carry out the wear resistance test according to the methods specified in Appendix A to GB 5237.4-2008.

5.4.8 Hydrochloric acid corrosion resistance

Use chemical hydrochloric acid (\(\bullet 1.19\text{g/ml}\)) and third grade water as specified in GB/T 6682 to mix the hydrochloric acid test solution (hydrochloric acid and water as 1:9). Drip 10 drops of this hydrochloric acid test solution onto the coating surface of the sample, cover up with a watch glass and then leave it in an environment with a temperature of \(18^\circ\text{C} \sim 27^\circ\text{C}\) for 15 minutes. Wash clean under tap water, air dry, then carry out a visual investigation to check the test coating surface.

5.4.9 Nitric acid resistance

Pour 100ml analytically pure nitric acid (\(\bullet 1.4\text{g/ml}\)) into a 200ml wide-opening bottle, in a temperature of \(23^\circ\text{C} \pm 2^\circ\text{C}\). Put the coating side of the sample on the bottle opening for 30 minutes, then remove the sample and rinse it clean under tap water and wipe dry. Leave for one hour then carry out a visual inspection to check test coating surface.

5.4.10 Mortar resistance

Take 75g lime powder as specified in JC/T 480 and 225g Standard Sand as specified in section A.5.2 in Appendix A to GB 5237.4-2008, then add about 100g third grade water as specified in GB/T 6682. Mix together into a lime and sand paste mortar. Put the paste mortar onto the surface of the sample and pile up to a cylinder with a diameter of 15mm and thickness of 6mm. Leave in an environment with a temperature of \(38^\circ\text{C} \pm 3^\circ\text{C}\) and relative humidity of \(95\% \pm 5\%\) for 24 hours. Remove the paste mortar from the sample and, using a wet cloth, clean the residue off the surface and allow it to dry in the air. Carry out a visual investigation to check the test coating surface.

5.4.11 Solvent resistance

Soak a piece of absorbent cotton in butanone solution until the cotton is saturated, then place onto the sample for 30 seconds. Next, take the cotton off, rinse the sample clean under tap water and wipe it dry, then leave it in an ambient temperature for 2 hours. Using a fingernail, carry out a scratch test. No noticeable scratch marks should be apparent.

5.4.12 Detergent resistance

5.4.12.1 Use detergent (composition see to Table 3) and third grade water as specified in GB/T 6682 to mix up the detergent test solution with a concentration of 30g/l. Soak at least 2 samples in detergent test solution at a temperature of \(38^\circ\text{C} \pm 1^\circ\text{C}\) for 72 hours, then remove the sample
and wipe it dry. Carry out a visual inspection to check the test coating surface.

| Table 5 |
|---|---|
| Composition | Content (Weight) % |
| Tetrasodium Pyrophosphate | 53 |
| Sodium Sulphate Anhydrous | 19 |
| Sodium Linear alkylarylsulfonate | 20 |
| Sodium Metasillicate Hydrated | 7 |
| Sodium Carbonate Anhydrous | 1 |
| Total | 100 |

5.4.12.2 Immediately cover the after-test coating surface with a piece of adhesive tape, the adhesive force of which should be greater than 10N/25mm. Press down tightly to remove the air underneath the tape, then pull the tape off quickly at a vertical angle from the coating surface. Carry out a visual inspection to check the test coating surface.

5.4.13 Salt spray corrosion resistance

5.4.13.1 On a piece of sample sized 150mm x 75mm, along the diagonal line to cut two cross lines as deep as reach to the metallic basis, the line segment should not run through the opposite corner, and the distances from each end point of the line segments to the corresponding opposite angle (corner) should be the same. According to the test methods specified in GB/T 10125 then carry out the 4000-hour neutral salt-spray test.

5.4.13.2 Measure the unidirectional infiltration corrosion width under the coating on both side of the cut cross line, then check both side areas beyond 2.0mm from the cross line for corrosion on the coating surface.

5.4.14 Heat-humidity resistance

Carry out the heat-humidity resistance test according to the provisions of GB/T 1740. The test temperature should be 47°C± 1°C.

5.4.15 Weatherability

5.4.15.1 Accelerated weatherability

Carry out the xenon lamp accelerated weatherability test according to method 1 as specified in GB/T 1865-1997. The gloss value measuring procedure should conform to the provisions of GB/T 9754, and the evaluations for the chalking degree and colour change degree should conform to GB/T 1766.

5.4.15.2 Natural weatherability

Carry out the test according to the provisions set out in GB/T 9276.
Note: among the atmospheric corrosion test stations in China, the only test station in which the atmospheric conditions are very near to the specified Florida Atmospheric in international Standards is the Qionghai Exposure Test Station.

5.4.16 Others

Tests on other properties should be performed according to test methods specified in GB/T 8013.3 – 2007 or in accordance with the method agreed between the suppliers and the buyers.

5.5 Appearance quality

The examination for appearance quality should be carried out under diffuse sunlight (diffuse sunlight refers to the 3 hours following sunrise to 3 hours before sunset), and according to the provisions set out in GB/T 9761. The required luminance level for artificial illumination should be above 1000lx and the light source should be a D65 standard light source. The background should be matt black or grey; a coloured background cannot be used.

6 Inspection rules

6.1 Examination, checking and acceptance

6.1.1 An examination of the PVDF coating profiles should be carried out by the suppliers so as to ensure that the quality of the PVDF coating profiles conform to the requirements set out in this Part (or purchase contract), and the quality certificate should also be completed by them.

6.1.2 Buyers may carry out examinations that are specified in this Part regarding the PVDF coating profiles they receive. If the examination results do not conform to the requirements set out in this Part or in the purchase contract, and result in a disagreement related to appearance quality and dimension deviation, the buyer should submit the problems within one month of the date on which the PVDF coating profiles were received. If the disagreement is related to other properties, then the buyer may submit the problems within three months of receiving the PVDF coating profiles, and both supplier and buyer should come to an agreement through consultation. If a negotiation is required, the suppliers should provide the agreed samples and the problem should be resolved between the supplier and buyer together.

6.2 Batch approval

PVDF coating profiles should be submitted for approval and acceptance in batches. PVDF coating profiles with the same alloy grades, same supply states, same specifications, same grades of coating thickness and the same surface treatments may constitute a batch. The quantity of each batch of PVDF coating profiles is unrestricted.

6.3 Inspection item

Inspections of chemical composition, mechanical properties, dimension deviation, coating thickness, gloss, appearance quality, hardness, adhesive force and impact resistance should be carried out on every batch of PVDF coating profiles. Inspections of other properties are not usually carried out (the suppliers carry out these types of inspections at least once every three years), but the supplier should ensure these properties conform to the requirements set out in this Part. If the buyer requests to carry out inspection on these properties, then these requests should be clearly indicated in the contract.
6.4 Sampling

PVDF coating profile sampling procedures should be carried out in accordance with the provisions set out in Table 5.

<table>
<thead>
<tr>
<th>Test Item</th>
<th>Sampling Rules</th>
<th>Requested Clause Number</th>
<th>The Clause Number of Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical composition, mechanics properties,</td>
<td>According to the rules in GB 5237.1</td>
<td>4.3, 4.4</td>
<td>5.1, 5.2, 5.3</td>
</tr>
<tr>
<td>dimension deviation,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coating colour and chromaticism</td>
<td>One by one inspection method</td>
<td>4.5.2</td>
<td>5.4.2</td>
</tr>
<tr>
<td>Coating thickness</td>
<td></td>
<td>4.5.3</td>
<td>5.4.3</td>
</tr>
<tr>
<td>Coating glossiness</td>
<td>Take 2 pieces of PVDF coating profiles per test item from each batch; when the paint coating has solidified and has been left for a further 24 hours, cut one sample from each piece profile.</td>
<td>4.5.1</td>
<td>5.4.1</td>
</tr>
<tr>
<td>Coating hardness</td>
<td></td>
<td>4.5.4</td>
<td>5.4.4</td>
</tr>
<tr>
<td>Coating adherence force</td>
<td></td>
<td>4.5.5</td>
<td>5.4.5</td>
</tr>
<tr>
<td>Coating impact resistance</td>
<td>Make two standard sample plates. Method for making standard sample plates: choose two pieces pure aluminium sample plates, one with state of H24, another with state of H14, both plates with the same dimension as 150mm x 75mm x 1.0mm, adopt the same technology and same production line as the batches of profiles the samples are representing to have the paint sprayed (the coating thickness should be appropriately kept in the range of 60•m ~ 80 • m), solidified, soon after leave it for 24 hours.</td>
<td>4.5.6</td>
<td>5.4.6</td>
</tr>
<tr>
<td>Coating wear resistance</td>
<td>Take 2 pieces of PVDF coating profiles per test item from each batch. When the paint coating solidifies leave for a further 24 hours, then cut one sample from each piece profile.</td>
<td>4.5.7</td>
<td>5.4.7</td>
</tr>
<tr>
<td>Hydrochloric acid resistance</td>
<td></td>
<td>4.5.8</td>
<td>5.4.8</td>
</tr>
<tr>
<td>Nitric acid resistance</td>
<td></td>
<td>4.5.9</td>
<td>5.4.9</td>
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<tr>
<td>Mortar resistance</td>
<td></td>
<td>4.5.10</td>
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<tr>
<td>Solvent resistance</td>
<td></td>
<td>4.5.11</td>
<td>5.4.11</td>
</tr>
<tr>
<td>Detergent resistance</td>
<td></td>
<td>4.5.12</td>
<td>5.4.12</td>
</tr>
<tr>
<td>Coating salt-spray resistance</td>
<td></td>
<td>4.5.13</td>
<td>5.4.13</td>
</tr>
</tbody>
</table>
6.5 Determination of the inspection results

6.5.1 If the inspection for chemical composition does not meet the required standard, then this batch is deemed as not qualified.

6.5.2 If any one of the samples fails to meet the required standard during the inspection for mechanical properties, re-sampling should take place using double the original number of test samples from this batch of profiles (including the original unqualified sample). If the repeated test results qualify, then this batch of PVDF coating profiles deemed to be qualified. If any of the repeated test results continues to fail to meet the required standard, then this batch is deemed as not qualified.

6.5.3 If the colour, chromaticism or appearance quality of the coating does not meet the required standard, then this single piece is not qualified, however individual inspections are allowed, and PVDF coating profiles that qualify should be delivered.

6.5.4 If dimension deviation does not meet the required standard, then the batch of PVDF coating profiles is deemed as not qualified. Individual testing is permitted, however, and qualified pieces should be delivered.

6.5.5 If the number of unqualified coating thickness exceeds the specified allowable unqualified upper limit numbers, as set out in Table 6, then the batch of profiles is deemed as not qualified. The supplier may, however, carry out individual inspection, and qualified pieces should be delivered.

6.5.6 With regard to other property test results of the coating, if any one sample fails to qualify, then the batch of PVDF coating profiles is deemed as not qualified.

<table>
<thead>
<tr>
<th>Quantity Range in Each Batch</th>
<th>Random Sampling</th>
<th>Upper Limit of Unqualified Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ~ 10</td>
<td>Entire Batch</td>
<td>0</td>
</tr>
<tr>
<td>11 ~ 200</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>201 ~ 300</td>
<td>15</td>
<td>1</td>
</tr>
<tr>
<td>301 ~ 500</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>501 ~ 800</td>
<td>30</td>
<td>3</td>
</tr>
<tr>
<td>Over 800</td>
<td>40</td>
<td>4</td>
</tr>
</tbody>
</table>

- 15 -
7 Labels, packaging, transportation, storage

7.1 The label (or quality certificate) on the qualified PVDF coating profiles should contain the following information:

a) the name and address of the supplier;
b) the examination stamp from department of quality control of supplier;
c) alloy grade and state;
d) the name and specification of the profile;
e) production date or batch number;
f) the colour or number of the coating
g) serial number of this Part;
h) the production license number and QS mark.

7.2 The package symbols of the PVDF coating profiles should conform to the requirements set out in GB/T 3199.

7.3 The profiles should be bundled up and packed in paper, and the exposed surfaces of the profiles should be protected by paper padding or bubble wrap.

7.4 The transportation and storage of PVDF coating profiles should conform to the provisions set out in GB/T 3199.

7.5 Quality certificate

A copy of the quality certificate should be attached to each batch of PVDF coating profiles, on which the following should be clearly indicated:

a) name of the supplier;
b) the name and specification of the PVDF coating profiles;
c) alloy grade and state;
d) the colour or number of the coating;
e) weight or quantity;
f) batch number or production date;
g) serial number of this part;
h) all analysed inspection results and the examination stamp from the department of quality control of the supplier;
i) production license number;
j) factory shipment date (or package date).

8 The contents of the contract (or order list)

The contract (or the order list) for purchasing materials listed in this Part should contain the following information:

a) product names
b) alloy grades, supply states;
c) profiles specifications;
d) dimension deviations, accuracy grades;
e) coating glossiness, colour and the colour number;
f) weight or quantity;
g) serial number of this part;
h) other requests.