



CSSBI S8-2018: Quality and Performance Specification for Prefinished Sheet Steel Used for Building Products

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1. SCOPE

- 1.1 The following specifications shall apply to hot-dipped metallic-coated sheet steel prefinished with colours of proven durability and suitable for exterior exposure as delivered from the coil coater. Proven paint systems for building products have been designed for vertical applications whose surfaces are no more than 30° to the vertical and non-vertical applications whose surfaces ranging from 5° up to 60° to the horizontal. It is not recommended for aggressive atmospheric exposure.
- 1.2 The prefinish system shall consist of a primer and topcoat continuously applied and cured within the paint manufacturer's specifications on cleaned, pretreated, metallic-coated substrate. The pretreatment specified shall be zinc phosphate for galvanized steel and metal oxide pretreatment for aluminum-zinc alloy-coated steel, applied in accordance with the pretreatment manufacturer's specifications.

2. BASE STEEL

The base steel furnished before painting shall conform to one of the following specifications:

- Zinc coated (galvanized) sheet steel to the requirements of ASTM A653/A653M *Standard Specification for Steel Sheet Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process*, with a minimum metallic coating designation Z275 (G90).
- Aluminum-zinc alloy coated sheet steel conforming to the requirements of ASTM A792/A792M *Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process*, with a minimum metallic coating designation AZM150 (AZ50).

3. PAINT QUALIFICATIONS TESTS

Paint properties are dependent on the paint system selected and are summarized in the following table.

Table 1: Performance Specification and Test Methods

Performance Specification/Test	Standard Paint Systems PVdF*, SMP*, SDPE*	Specialty Paint Systems	
		PU**	PVC**
Paint Film Thickness	22µm min	22µm min	100µm min
Solvent Resistance	100 double MEK rubs	30 min	Not Applicable
Film Hardness	HB min	HB min	Not Applicable
Flexibility (T-Bend)	3T min No Removal	1T min No Removal	0T No Removal
Adhesion (Boiling water test)	Not Applicable	Not Applicable	No Removal
Gloss tolerance	± 5 units	± 5 units	Reference Only

* Polyvinylidene (di)Fluoride, Silicon Modified Polyester, Super Durable Polyester

** Polyurethane, Polyvinyl Chloride

3.1 Film Thickness

- The exposed surface shall have a minimum dry film thickness as specified by the paint system.
- The unexposed or reverse side shall have a dry film thickness that can be customized to meet customer requirements (i.e. wash coat only, primer + wash coat, or full coat).
- Test Method: ASTM D5796.

3.2 Film Cure

- a) The baked film shall withstand a minimum double MEK rubs as specified by the paint system and in accordance with ASTM D5402.

3.3 Film Hardness (Pencil Method)

- a) The hardness of the paint film may be measured by means of Eagle/Berol turquoise T-2375 or equivalent pencils using a flat cylindrical head applied at a 45° angle to the paint film. A minimum hardness of HB shall be obtained.
b) Test Method: ASTM D3363.

3.4 Formability

- a) When using a representative sample at $20 \pm 1.5^\circ\text{C}$ using #610 Scotch brand cellophane tape, the paint system will show no loss of adhesion when subjected to a 180° bend and tape pull test as specified by the paint system.
b) This requirement does not apply to Grade 550 (Grade 80) material that is ordered as ASTM A653/A653M or ASTM A792/A792M.
c) Test Method: ASTM D4145.

3.5 Adhesion Test (Boil Test – PVC products only)

- a) The paint system will show no loss of adhesion on a sample that has been subjected to cross-hatch cutting, Olsen deformation and 30 min submersion in boiling water.

3.6 Gloss

- a) The specular gloss shall be within 5 units of the specified target of the paint system when measured with a Glossmeter at 60°. When other than the standard gloss is ordered, the gloss range shall be mutually agreed upon prior to purchase.
b) Test Method: ASTM D523.

4. EXTERIOR EXPOSURE (WEATHERING)

Each standard colour of proven durability shall successfully meet the following weathering standards for applications in Canada and the continental United States (in the absence of aggressive fumes and/or other chemicals not normally encountered in the atmosphere).

Table 2: Performance Criteria for Exterior Exposure

Performance Criteria	Standard Paint Systems	Specialty Paint Systems
Film Integrity	40 years minimum	20 years minimum
Chalking	30 years minimum	20 years minimum (Not Applicable to PVC)
Colour Change	30 years minimum	20 years minimum

4.1 Film Integrity

No evidence of cracking, chipping, peeling, crazing, spotting or loss of adhesion.

4.2 Chalking

Chalking limits are specific to the paint system used. The chalk rating in vertical applications shall not be worse than #8 (ASTM D4214 Method A) and in non-vertical applications shall not be worse than #6 (ASTMD4214 Method A). Not applicable to PVC paint systems.

4.3 Colour Change

Maximum Delta E colour change limits are specific to the paint system as measured by ASTM D2244, Hunter L, a&b, and shall not be greater than 10 colour variation units.

5. ACELERATED CORROSION TESTS

The following accelerated corrosion testing requirements represents the minimum performance.

5.1 Prohesion (Modified Cyclic Salt Spray)

- a) After 800 hours, the surface shall show only a few #8 field blisters, and typical average cut-edge corrosion of production samples shall not exceed 8 mm.
b) Test Method: ASTM G85, Method A5. The Prohesion test is a cyclic test incorporating corrosive salt and sulphates to mimic marine and industrial environments.

5.2 Humidity Resistance

- a) The humidity resistance test shall be conducted at 100% relative humidity at a temperature of 38°C.
- b) After 1000 hours of exposure, the surface should have no field blisters (per ASTM D714).
- c) Test Method: ASTM D2247.

6. COLOUR MATCH

Colour match problems can be minimized if the following procedures are followed:

- a) Orders for larger projects that could involve more than one production order should be discussed with the supplier on the basis of one lot.
- b) Attempt to ensure that each building is clad with material from the same production lot.
- c) When a different production lot must be used for one elevation, such as could happen with an addition to an existing building, attempt to minimize colour variation by inserting at an elevation change or break in the building structure.

7. SHIPPING AND STORAGE

It is important to keep prefinished steel dry in transit, storage and on site. The material is subject to wet storage stain and/or paint deterioration if moisture is allowed to remain between the laps or sheets. Prefinished steel must not be stored outside. Ideal storage consists of a clean dry warehouse where the steel can be used on a first in, first out basis. Plastic wrapping should not be used. Material that becomes wet should be used immediately and dried off in the process.

8. OTHER PREFINISHED SYSTEMS

There are other paint systems available for prefinished sheet steel building products to be used in applications where specific paint properties may be required. Consult the CSSBI sheet steel building products fabricator for information.