

Spray Painting Specification

Product: Ductile Iron & Carbon Steel Butterfly Valves

Material: EN-GJS-400-15 / QT400-18L (-40°C) / ASTM A216 Gr. WCB

Manufacturer: Coreline Ltd.

1. Introduction

1.1 This painting specification is issued by Coreline Ltd. and applies to the surface painting of ductile iron (DI) and carbon steel (CS) butterfly valve bodies.

1.2 The process utilizes electrostatic spraying techniques to ensure compliance with ISO 12944-2 and ISO 12944-5 requirements for corrosion categories C3, C4, and C5.

1.3 Coreline standard painting category is C3.

2. Surface Pre-treatment

2.1 Shot Blasting

2.1.1 Before shot blasting, mechanical polishing must be performed to refine edges and corners, ensuring a smooth and even surface.



2.1.2 Valve body surfaces must undergo shot blasting to remove mill scale, rust, and contaminants, meeting the Sa 2½ standard defined in ISO 8501-1.



2.2 Roughness Control

The surface roughness must be 40-70 µm to ensure good adhesion of the oil-based paint. Inspections should be conducted following ISO 8503 standards.

2.3 Drying and Environmental Requirements

2.3.1 After surface pre-treatment, the surface must remain dry to avoid recontamination or moisture exposure.

2.3.2 Relative humidity must not exceed 85%, and the surface temperature must be at least 3°C above the dew point.

3. Painting

3.1 Coating and Thickness Requirements

The required primer and topcoat thickness for corrosion categories C3, C4, and C5 are as follows:

| Corrosion Category | Primer | Topcoat | Total Thickness |
|--------------------|-------------------------|-----------------------|-----------------|
| C3 | Penguard EXA II - 70µm | Futura Classic - 50µm | 120µm |
| C4 | Penguard EXA II - 130µm | Futura Classic - 50µm | 180µm |
| C5 | Penguard EXA II - 190µm | Futura Classic - 50µm | 240µm |

3.2 Paint Types

3.2.1 **Penguard EXA II Primer** - A two-component amine-cured pure epoxy paint, fast-drying with high solids content, suitable for atmospheric and submerged environments.

3.2.2 **Futura Classic Topcoat** - A two-component polyurethane paint designed for atmospheric environments, providing excellent weather resistance and decorative properties.

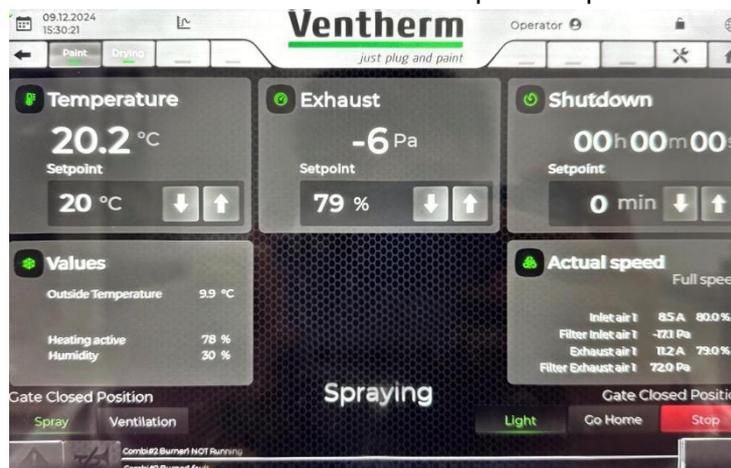
4. Painting Process

4.1 Painting Environment

4.1.1 Temperature: Constant at 20°C.

4.1.2 Relative humidity: Not exceeding 75%.

4.1.3 Surface temperature must be at least 3°C above the dew point to prevent condensation.



4.2 Painting Sequence and Curing Requirements

4.2.1 Primer:



- Apply an even layer across the entire surface, with additional coating on corners, edges, and weld areas.
- Allow the surface to dry after spraying; once the conveyor chain completes one rotation, proceed to the next coating.

4.2.2 Topcoat:

- Ensure the primer is fully cured before applying the topcoat as the final protective layer.
- Cure the topcoat at 50°C for 2 hours after application to ensure complete hardening.

4.2.3 Drying times for each layer must strictly follow the technical data sheet (TDS) provided by the paint supplier to ensure the painting quality meets the specification requirements.



5. Inspection and Quality Control

5.1 Thickness Measurement

- 5.1.1 Use a dry film thickness gauge to measure at least five points on each valve body.
- 5.1.2 The results must comply with the thickness range specified in this specification.

5.2 Visual Inspection

- 5.2.1 The painted surface must be free of bubbles, cracks, peeling, or other defects.
- 5.2.2 Color should be uniform, with no noticeable color variation.

5.3 Adhesion Testing

- 5.3.1 Conduct adhesion testing using the ISO 2409 cross-cut method.
- 5.3.2 The adhesion results for C3, C4, and C5 categories must meet grade 1 or better.

6. Health and Safety

- 6.1 Operators must wear protective equipment, including gas masks, protective gloves, and goggles.
- 6.2 Painting facilities must be equipped with effective ventilation systems, and VOC concentrations must comply with national standards.

7. Documentation Management

- 7.1 Detailed records of environmental conditions, thickness measurements, and inspection results must be maintained throughout the painting process.
- 7.2 All records must be kept for at least three years to ensure traceability.

This painting specification is issued by Coreline Ltd. to ensure the durability of products in C3, C4, and C5 environments, complying with ISO 12944-2 and ISO 12944-5.