Surface Preparation & Paint Procedure

Revision Number	6
Date	25-05-94
Amendment Details	Paras 1.8, 4.1 and 4.2 amended
Revision Number	7
Date	12-04-95
Amendment Details	Para 2.1 revised
Revision Number	8
Date	23-04-96
Amendment Details	Minor alterations to paras 1.2 and 5.1
Revision Number	9
Date	16-04-02
Amendment Details	Minor alterations to paras 1.2, 2.3, 2.5.2, 3.1.2, 4.2 & 4.4
Revision Number	10
Date	14/06/02
Amendment Details	Para 4.2 amended
Revision Number	11
Date	03/01/03
Amendment Details	Para 2.1 & 4.1 amended
Revision Number	12
Date	29/03/11
Amendment Details	Complete revision of document to include 40-701, 40-703 and 40-704.
Revision Number	13
Date	03/11/2013
Amendment Details	Drying time deleted from reporting requirements. Paint report updated in line with latest form. Repairs section added. Reference to ISO 19840 added to section 5.4. Additional calibration requirements added in section 5.0. Reference to masking removed from 1.3. Reference to SIS 05590 changed to ISO 8501-1.
Revision Number	14
Date	07/02/14
Amendment Details	References to magnetic and steel removed from section 5.4.
Revision Number…….	15
Date……..	19/03/15
Amendment Details…	Attached SLQ-1000 example Paint report removed. Calibration added para 5.1. Minimum DFT readings increased to 5 per square metre para 5.5. Link to Datasheets added. General removed from title.
Revision Number…….	16
Date……..	08/05/15
Amendment Details …	Format change, contents and references added.
Revision Number…….	17
Date……..	18/06/20
Amendment Details …	Para 4.1 Ref ISO 8501-3 added & 4.6 defects highlighted during processes.
Revision Number…….	18
Date……..	28/06/2022
Amendment Details …	Terminology corrected, minor formatting changes, deletion of Sherwin weblink, Sulzer paint report number amended.

Issued by: G. Scarrott

Approved by: R. Connor

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1. Scope

This procedure covers the minimum requirements for surface preparation, painting, repairs, and inspection for equipment supplied to or by Sulzer Pumps UK unless stated otherwise within the project specific Inspection and Test Plan (ITP).

2. Reference Documents

LPE-279	Sulzer Paint Report
ISO 8501	Preparation of steel substrates before application of paints and related products -- Visual assessment of surface cleanliness
ISO 8503	Preparation of steel substrates before application of paints and related products -- Surface roughness characteristics of blast-cleaned steel substrates
ISO 19840	Paints and varnishes -- Corrosion protection of steel structures by protective paint systems - Measurement of, and acceptance criteria for, the thickness of dry films on rough surfaces.

3. General

3.1 Prior to starting work, the painting contractor shall notify Sulzer to arrange relevant inspection/witness stages. Minimum requirements:-

a) Immediately after surface preparation and prior to application of primer

b) Final inspection prior to shipment

3.2 Inspection records shall be maintained throughout the period of surface preparation and paint program. A paint report shall be issued; suppliers may use their own paint report format providing it contains the information required below. Otherwise, Sulzer document LPE-279, can be used, this can be downloaded from https://www.sulzer.com/q-documents and shall include the following details as a minimum:-

a) Air and Metal temperature

b) Relative Humidity & Dew Point

c) Surface Profiles

d) Materials used and Batch Nos

e) Individual coat Dry Film Thickness

f) Abrasive used, Type and Grade

g) Process Commencement Dates & Times

h) Final Colour

i) Job Number

j) Item Description

3.3 All open tapped holes and pipe ends etc. shall be plugged prior to work commencing.

3.4 Force drying is permitted provided it is in accordance with the paint manufacturer's recommendations. Manufacturer's recommended overcoat times shall be observed at all times.

3.5 Primer coats of paint shall be applied within 4 hours of surface preparation and before the onset of any visible surface deterioration.

3.6 No equipment shall be released for shipment before the full process cure time has elapsed, without specific permission from Sulzer Quality Department.

3.7 All paints shall be applied in accordance with manufacturer's instructions and data sheets.

4. Surface Preparation

4.1 Fabrications (not tooling) shall be prepared for paint to ISO 8501-3 P2 with dressed edges as a minimum, unless otherwise stated in the project specifications or ITP.

4.2 All surfaces to be painted shall be thoroughly degreased by solvent cleaning to remove oil, grease, dirt etc. and surface rinsed with clean water.

4.3 Surface profile shall be in accordance with that shown on the paint system document.

4.4 Surfaces to be painted shall be prepared by abrasive blasting, to ISO 8501-1 to the level detailed on the paint data sheet or other mechanical means as required.

4.5 Surface preparation shall not be carried out in an environment where: -

- 4.5.1 Metal surface temperature is less than 3°C above surrounding air dewpoint
- 4.5.2 Relative Humidity is in excess of 85%
- 4.5.3 Air temperature is below 5°C
- 4.5.4 Surface is likely to become damp after preparation and prior to painting
- 4.5.5 Any of the above conditions are likely to occur prior to painting

4.6 Any defects discovered during the blast, primer or any process shall be rectified with agreement ensuring coating quality is not compromised.

5. Painting

5.1 Painting shall not be carried out in an environment where: -

- 5.1.1 Metal surface temperature is less than 3°C above the surrounding air dewpoint
- 5.1.2 Relative humidity is in excess of 85%
- 5.1.3 Air or metal surface temperature is below 10°C
- 5.1.4 Any of the above conditions are likely to occur before the paint is dry

5.2 Paints shall be applied in accordance with the coating manufacturer's recommendations.

5.3 Colours between coats shall be contrasting.

5.4 Stripe coating shall be applied to material edges, welds and areas where it is difficult to achieve the minimum dry film thickness.

6. Repairs

6.1 After rubbing down to the first undamaged layer, any repairs required to the paint system must be carried out in accordance with the original paint procedure data sheet. Repairs larger than 0.25 m^2 are to have a separate paint report.

7. Inspection

7.1 Calibration

All equipment to be confirmed within calibration prior to use

7.2 Roughness Check

Total roughness (Rt) of the blast cleaned surface shall be measured and recorded. A minimum of one measurement shall be made per square metre of prepared surface using a method conforming to ISO 8503.

7.3 Humidity and Temperature Checks

Work records shall be maintained showing air temperatures, metal temperatures, humidity conditions and times of commencement of all phases of cleaning, surface preparation and painting operations.

7.4 Visual

A detailed visual inspection of each coat shall be carried out to ensure a good even coating has been applied to all required surfaces. Sags, runs, blisters, cracks, dry overspray and pinholes or other visible defects are not acceptable.

7.5 Dry Film Thickness Check (DFT)

Thickness checks shall be undertaken in accordance with ISO 19840 Table 1 below.

Area/length of inspection area	Minimum number of measurements	Maximum number of measurements allowed to be repeated
up to 1	5	1
above 1 to 3	10	2
above 3 to 10	15	3
above 10 to 30	20	4
above 30 to 100	30	6
above 100	add 10 for every additional 100m^2 or 100m or part thereof.	20% of the minimum number of measurements.

Table 1. Sampling Plan

The DFT of each coat shall be measured using a probe, e.g., Microtest or Elecometer.

The probe shall be calibrated for each thickness of coating using a substrate similar to that being painted and a calibration block whose thickness is as close as possible to the coating being checked.

Each coat's thickness and total thickness shall be checked. A minimum of five measurements shall be taken per square metre of painted surface, or basic surface on complex parts.

Excessive paint thickness shall be kept as low as practically possible.

8. Certification

8.1 Certification raised will be included within certification data book for client's approval/information.

9. Web Links to Coating Manufacturer's Product Datasheet search.

9.1 International
http://www.international-pc.com/products/product-datasheet-search.aspx

9.2 PPG
http://www.ppgpmc.com/product-search-results.aspx