

Application Guide for Jotun Durasol Powder Coatings

Contents

1.0	Introduction.....	3
2.0	General overview.....	3
3.0	Scope.....	3
4.0	Safety Considerations.....	4
5.0	Surface preparation and pre-treatment.....	4
6.0	Drying.....	5
7.0	Powder Coating Application.....	5
8.0	Curing.....	6
9.0	Final inspection and quality control.....	7
10.0	Packing.....	7
11.0	Repair Procedure.....	8

1.0 Introduction

This document provides guidelines for the factory application of Jotun Durasol Powder Coatings for the aesthetic and corrosion protection of architectural aluminum and claddings.

2.0 General overview

Jotun Durasol Powder Coatings are designed to withstand the most stringent weather conditions and meet industry requirements for high performance and long lasting attractive finishes. It provides outstanding gloss retention and colour stability properties and ensures highest corrosion resistance levels.

The critical steps that must be controlled are:

- 1) Surface preparation and pre-treatment
- 2) Drying
- 3) Powder Coating Application
- 4) Curing
- 5) Final inspection and quality control
- 6) Packing

3.0 Scope

The AG (Application Guide) offers product details and recommended practices for the use of the product.

The data and information provided are not definite instructions. They are guidelines to assist in smooth and safe use, and optimum service of the product. Adherence to the guidelines does not relieve the applicator of responsibility for ensuring that the work meets specification requirements. Jotun's liability is in accordance with general product liability rules.

The AG must be read in conjunction with the relevant specification, TDS (Technical Data Sheet) and SDS (Safety Data Sheet).

4.0 Safety Considerations

Safety is of utmost importance in any powder coating application plant. Proper maintenance of equipment and good housekeeping must always be on the list of the daily, weekly and monthly routines of any powder coating application plant. Suitable PPE (Personal Protective Equipment) should always be worn in the powder application line.

Please refer to relevant Jotun product SDS for further information.

5.0 Surface preparation and pre-treatment

Proper attention should be given to the cleaning and preparation of the aluminum components.

The aluminum or aluminum alloy shall be suitable for pretreatment and the coating process. It should allow the coating properties to perform as specified in the relevant TDS for Jotun Durasol as well as other properties specified for these systems. The substrate shall be bare, clean, free from corrosion and not exposed beforehand to any anodic or organic coating.

There shall be no sharp edges. The edge radius shall allow the coating to completely cover the whole object's surface to ensure adequate film thickness and prevent holidays.

5.1 Handling

5.1.1. Components or objects must be carefully handled. Avoid contamination with dust, oil, fat, finger marks, etc.

5.1.2 Care should be taken to secure a proper treatment of the total area.

5.2 Pre-treatment

5.2.1 Chrome pre-treatment

It is recommended that the following pre-treatment is performed. Moreover, always follow the chemical supplier's recommendation.

- a) Degreasing / etching – alkaline or acidic. Etching degree must be ≥ 2 g/m².
- b) Rinse
- c) Acid wash.

- d) Rinse
- e) Chromating.
- f) Rinse
- g) Rinse, using demineralized water (the last running water from the object should be tested at 20°C. The readings should be taken from the open sections and conductivity readings should be below 30 μ Siemens/cm).

The chemical deposition of the chromate conversion layer should be:

Yellow chromate = 0.6 – 1.2 g/m²

Green chromate = 0.6 – 1.5 g/m²

5.2.2 Chrome-free or nano-technology pre-treatment

Suitable chrome-free or nano-technology pretreatments are also recommended. Due to the variety of chrome-free pretreatments available only those approved by Qualicoat and GSB should be used.

Detailed advice should be sought from the pretreatment supplier.

6.0 Drying

Pre-treated aluminum components should be dried in an oven. Maximum object temperatures in the drying oven must not exceed 100°C. Perform the process as per the chemical supplier's written instructions.

7.0 Powder Coating Application

Pre-treated aluminum components should never be handled with bare hands.

Pre-treated aluminum components are to be immediately transferred to the coating process in a clean and dry state to avoid deterioration of the pre-treatment integrity. Pre-treated components should be powder coated within 16 hours.

A single coat application should be taken in one operation to a minimum film thickness of 50 microns for exposed areas. The coating thickness should not exceed 90 microns if the

coated aluminum component is to be treated mechanically after coating (e.g. sawing, milling, drilling, etc.).

Jotun Durasol have high chargeability during corona application. It is recommended to start the corona application at 40 kV and 5 μ A application current. Adjustments on spraying application parameters may be needed to achieve the final coating requirements.

It is advisable to quality assure the reclaim powder prior to use. Sieving equipment is recommended to break any agglomeration and remove any foreign matter in the reclaim powder. It is recommended that reclaiming is done automatically. Virgin to reclaim ratio needs to be closely monitored. Normally, the ratio of reclaim to virgin should not exceed 30%.

For the application of Jotun's Metallic and Special Effect powder coatings, please refer to Jotun's AG for Metallic Powder Coatings.

For optimum powder coating application process, it is recommended that grounding measurements are conducted on a regular basis. Resistance to ground should always be < 1.0 mega-ohm.

8.0 Curing

Objects once powder coated, should be cured as soon as possible otherwise, the risk of airborne contamination will be high.

The powder coating must be cured as specified by Jotun for Jotun Durasol.

It is recommended to conduct a weekly oven test. The temperature is best obtained by measuring it at the thickest wall of the object whilst the oven is fully loaded.

The air temperature in the curing zone must not deviate from the adjusted nominal temperature by more than $\pm 10^{\circ}\text{C}$.

8.1 Post Cure Handling

Coated aluminum components should be cooled to below 40°C before handling.

Precaution should be taken to avoid damages on the finished coating during stacking, packaging, storing and transportation.

9.0 Final inspection and quality control

Thorough inspection and coordination with the other application steps are essential for a quality coating. Inspection should be considered as part of the process control operation and not just a decision point for approving or rejecting coatings. If each processing step is done correctly, a high coating quality is assured.

Regular quality control tests after the curing process include, but not limited to, film thickness, visual color assessment, adhesion and other mechanical properties and physical appearance of the coating. Cure test can be carried out using the MEK (Methyl Ethyl Ketone) test.

Jotun guarantees that the gloss measured during powder coating production lies within the TDS range. However, some variation of measured gloss on the powder coated object is possible due to differences in application lines such as oven types (batch vs. conveyor), profile heat up rates, oven temperature stability etc.. For more information on permissible specular gloss variations please refer to the respective AAMA and Qualicoat standards.

10.0 Packing

Special care must be taken when loading and unloading the coated components and objects.

To prevent any damage during transportation each coated object, or component, should be packed individually and isolated from other objects or components by crepe paper, with a weight of 150 grams/m² or other suitable cellulose based packaging. Additionally, polyolefin packaging can also be used.

It is the responsibility of the powder coating applicator to quality assure the use of any packaging materials prior to any use.

If coated aluminum components are wrapped with any plastic sheet, these coated aluminum components must not be subjected to high heat (>70°C) or high humidity (>80%) or direct sunlight.

Regular adhesive tapes should never come into direct contact with the coating.

Should protective tape be required, then only tape designed for the protection of coated aluminum must be used. No residue of any nature should be left on the finished product.

The suitability of any packaging material for protecting coated substrates must be quality assured by the applicator prior to use.

11. Repair Procedures

It is probable that during fabrication, erection and installation there are on site activities like cutting, fixing of nuts/bolts, handling and movement of aluminum structures. These activities can result in physical damage to the coating. In order, to repair the coating the following procedure is recommended.

- Complete cleaning of damaged area
- Surface preparation prior to application of liquid touch up paint
- Application of Jotun Paints' 2 component surface tolerant Jotamastic 90 by brush (depending on the damage) with a dry film thickness (DFT) of 75 - 100 microns and allowing it to 'dry to over coat' for a minimum of 3 hours @ 25 °C
- Followed by two coats of Jotun Paints' top coat, 2-component HardTop XP or XPL (depending on the gloss levels) @ DFT of 20 - 25 microns per coat.
- The repaired coating system should then be dried / cured for service for 7 days @ 25 °C. Dried / cured for service is the minimum time before the coating can be permanently exposed to the intended environment / medium.

Detailed repair procedure can be found on "Touch Up and Repair Procedure for Damaged Powder Coated Substrates Using Jotun Jotamastic 90 and Hardtop XP and XPL". Your Jotun representative should be contacted if clarifications are needed. Additionally, your Jotun representative should be contacted to secure the nearest shade in Hardtop matching the powder coating. The gloss/shade may differ slightly between powder and liquid coats.

Note: The information on this Application Guide is given to the best of the manufacturer's knowledge, based on laboratory testing and practical experience. Jotun Powder Coatings reserves the right, without notice, to alter or change the content of this Application Guide.

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THIS APPLICATION GUIDE SUPERSEDES ALL PREVIOUSLY ISSUED VERSIONS