

Application Guide
for Jotun Primax Diamond



Application Guide for Jotun Primax Diamond Powder Coatings

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1.0 Introduction

This document provides guidelines for the factory application of Jotun Primax Diamond for the aesthetic performance complemented with a very smooth surface with protective and functional properties for aluminum alloy wheels.

2.0 General overview

Jotun Primax Diamond are designed for aluminum alloy wheels to provide efficient solutions that can be used to increase mileage performances and create significantly total production cost saving. It offers re-coatable surface, high performance corrosion and machinability in diamond cutting process with superior flow.

The critical steps that must be controlled are:

- 1) Surface preparation and pre-treatment
- 2) Drying
- 3) Powder coating primer application
- 4) Curing
- 5) Intermediate inspection related to the surface prior to wet paint application
- 6) Pre-heating prior to wet paint application
- 7) Wet paint application including flash off and curing
- 8) Final inspection and quality control on compatibility with powder coating primer prior to diamond cut process.

After the diamond cut process

- 9) Pre-treatment
- 10) Powder clear coat
- 11) Curing
- 12) Pre-heating prior to wet clear application
- 13) Wet clear application including flash off and curing
- 14) Final inspection and quality control on compatibility with clear powder coat

3.0 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 top list of the daily, weekly and monthly routines of any powder coating application plant. If engineering controls are inadequate in a powder coating plant, then the use of proper Personal Protective Equipment (PPE) is the last resort. The following PPEs should be used by operators in the powder coating application plant.

- a. Cotton overall
- b. Dust mask
- c. Safety goggles
- d. Hand gloves
- e. Ear plugs or muffs
- f. Anti-static steel toe safety shoes
- g. Hard hat

Please refer to relevant and updated Jotun product SDS.

4.0 Surface Preparation and Pre-Treatment

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

The casted aluminum substrate must be suitable for the pre-treatment, diamond cutting and the coating process.

It should allow the coating to perform technical properties as specified in the relevant Technical Data Sheets (TDS) for Jotun Primax Diamond Powder Coatings, as well as other properties specified for these systems. The substrate must be bare clean, free from corrosion, and not exposed beforehand to any anodic or organic coating.

4.1 Handling

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

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

4.2 Pre-treatment

4.2.1 Chrome-free pre-treatment

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

- a) Degreasing (3 steps)
- b) Rinsing (2 steps)
- c) Surface preparation (Abrasion)

- d) Rinsing (3 steps)
- e) Chrome-free pre-treatment
- f) Rinsing (2 steps)
- g) Addition to chrome free (etc..SAM/Chemetall)
- h) Rinsing (1 step)
- i) Drying Oven

The chemical deposition of the chrome-free conversion layer should be as per supplier's recommendation.

Due to the variety of nano-technology pre-treatments, detailed advice should be sought and followed from the pre-treatment supplier.

5.0 Drying

Pre-treated parts should be dried in an oven. It is recommended that the drying temperature in the drying oven should be between 100°-160°C. However, it is always advisable to follow and perform the process as per chemical supplier's written instructions.

6.0 Powder Coating Primer Application

Pre-treated parts should never be handled with bare hands.

Pre-treated parts are to be transferred to the coating process immediately in a clean and dry state, to avoid deterioration of the pre-treatment integrity. Otherwise, pre-treated components should be properly stored in a cool, dry place and should be covered with a clean plastic sheet.

Target film thickness should be minimum 70 microns in recessed areas. However, maximum film thickness are based on individual customer requirements.

Jotun Primax Diamond Powder Coatings, have good chargeability during the corona application. It is recommended to start the corona application of 80-100 KV and 20 µA (GEMA) on the application current. And for Wagner equipment, 50 KV and 70 µA on the application current. Spraying application parameters may be adjusted to achieve the final coating requirements.

It is advisable to quality assure the reclaim powder prior to any use. Moreover, the use of 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 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 megaohm

7.0 Curing

The powder coating must be cured as specified by Jotun Powder Coatings for Jotun Primax Diamond Powder Coatings (see the relevant Technical Data Sheet).

It is also recommended to conduct an oven test, once a week. E.g. proper adjustment/correction must be made, if required. The temperature is best obtained by measuring it at the thickest wall of the object, while the oven is fully loaded.

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

8.0 Intermediate Inspection

After the curing process, coated components must be visually quality assured in terms of impurities, surface defects, surface cratering and orange peel effect.

The application film thickness should be checked, especially inside areas should be taken consideration.

9.0 Pre-Heating prior to Wet Paint Application.

Primed coated components should never be handled with bare hands.

Primed coated components are to be transferred to the liquid coating line immediately in a clean and dry state. Otherwise, pre-treated components should be properly stored in a cool, dry place and should be covered with a clean plastic sheet.

The primer coated components must be pre-heated prior to wet paint application as specified by liquid paint supplier.

It is recommended that the minimum pre-heating temperature should be between 40°C - 50°C

10.0 Flash off process of Wet Paint

After wet paint application, during flash-off process, the wet coated components should be visually checked and inspected, whether there is compatibility between primer and wet paint or not.

The incompatibility can show itself like a few cratering on liquid coated surface.

11.0 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 a 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 to be carried out after the curing process include film thickness, visual assessment of the color, gloss, adhesion and other mechanical properties, and physical appearance of the coating.

12.0 Diamond Cut Process

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.

Jotun Powder Coatings. Revised August 2017

THIS APPLICATION GUIDE SUPERSEDES ALL PREVIOUSLY ISSUED VERSIONS