Jotun Super Durable 2003

Product description

This lead-free TGIC powder coating is specifically designed to meet stringent requirements of the construction industry. It provides longevity to the projects and building components by ensuring high levels of gloss retention, colour stability and corrosion protection along with aesthetic performance. This powder enables efficient application and provides uniform flow and attractive finish even after recycling. This product is certified according to Qualicoat Class 2 and has weathering performance in line with AAMA 2604. This product is available in the following collections: Cool Shades Collection

Critical steps

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

Scope

The Application Guide (AG) 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, Technical Data Sheet (TDS) and Safety Data Sheet (SDS).

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 Personal Protective Equipment (PPE) should always be worn in the powder application line.

Refer to relevant Jotun product SDS for further information.

Surface preparation and pre-treatment

Proper attention must be given to the cleaning and surface preparation of components (objects) or substrates.

The substrates must be suitable for pretreatment and the coating process. It must allow the coating properties to perform as specified in the relevant TDS for Jotun Super Durable as well as other properties specified for this system. The substrates must be bare, clean, free from corrosion and not exposed beforehand to any anodic or organic coating.

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

Handling

Components shall be carefully handled. Avoid contamination with dust, oil, fat, finger marks, etc. Care should be taken to secure a proper treatment of the total area.

Chrome pre-treatment

This Application Guide supersedes those previously issued.
The Application Guide (AG) must be read in conjunction with the relevant specification, Technical Data Sheet (TDS) and Safety Data Sheet (SDS) for all the products used as part of the coating system.
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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 ≥1 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 µSiemens/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

Chrome-free pre-treatment

Suitable chrome-free pre-treatments are also recommended. Due to the variety of chrome-free pre-treatments available today, only the approved systems from Qualicoat and GSB must be used. Detailed advice must be sought from the pre-treatment supplier.

Before commencing to any continuous coating production using Jotun Super Durable product, wet adhesion tests must be performed to verify the suitability of the pre-treatment parameters. Consult with your pre-treatment supplier.

Drying

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

Powder coating application

Pre-treated components must never be handled with bare hands.

Pre-treated 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 must be powder coated within 16 hours.

Application parameters

A single coat application must be taken in one operation to a minimum film thickness of 60 microns for exposed areas. The coating thickness must not exceed 80 microns if the coated component is to be treated mechanically after coating (e.g. sawing, milling, drilling, etc.).

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

Line and equipment considerations

Jotun Super Durable have a high chargeability during corona application. It is recommended to start the corona application at 60 kV and 10 µA application current. Adjustments on spraying application parameters may be needed to achieve the final coating requirements.

Reclaim Powder

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. The ratio of reclaim to virgin must not exceed 30%.

Metallic and special effect powder coating

For the application of Jotun's Metallic and Special Effect powder coatings, please refer to Metallic and Special Effects powder coating appendix.

Curing

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Components once powder coated, must 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 Super Durable TDS.

Laboratory tests show that a continuous heat up rate of >15°C/min can stabilize the gloss (and appearance) development of coatings.

It is recommended to conduct a weekly oven test. The temperature is best obtained by measuring it at the thickest wall of the component whilst the oven is fully loaded. The air temperature in the curing zone must not deviate from the adjusted nominal temperature by more than ± 10°C.

Post cure handling

Coated components must be cooled to below 40°C before handling. Precaution must be taken to avoid damage on the finished coating during stacking, packaging, storing and transportation.

Final inspection and quality control

Thorough inspection and coordination with the other application steps are essential for a quality coating. Inspection must 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 a suitable solvent e.g. Methyl Ethyl Ketone (MEK)

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 component is possible due to differences in application lines such as oven types (batch vs. conveyor), component heat up rates, oven temperature stability etc. For more information on permissible specular gloss variations please refer to the respective AAMA and Qualicoat standards.

Packing

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

To prevent any damage during transportation, each coated component must be packed individually and isolated from other components by crepe paper, with a weight of 150 grams/m2, or other suitable cellulose based packaging. Additionally, polyolefin packaging can also be used. Laboratory tests shows low density polyethylene (LDPE) with a film thickness of >60 microns can be used for this purpose. However, due to several manufacturers/brands of packing materials having varying packaging properties, it is the responsibility of the powder coating applicator to quality assure the use of any packaging materials prior to any use.

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

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

Should protective tape be required, then only tape designed for the protection of the coated component must be used. No residue of any nature must 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.

Caution

This product is for professional use only. The applicators and operators shall be trained, experienced and have the capability and equipment to mix/stir and apply the coatings correctly and according to Jotun's technical documentation. Applicators and operators shall use appropriate personal protection equipment when using this product. This guideline is given based on the current knowledge of the product. Any suggested deviation to suit the site conditions shall be forwarded to the responsible Jotun representative for approval before commencing the work.
For further advice please contact your local Jotun office.

Health and safety

Please observe the precautionary notices displayed on the container. Use under well ventilated conditions. Do not inhale spray mist. Avoid skin contact. Spillage on the skin should immediately be removed with suitable cleanser, soap and water. Eyes should be well flushed with water and medical attention sought immediately.

Accuracy of information

Always refer to and use the current (last issued) version of the TDS, SDS and if available, the AG for this product. Always refer to and use the current (last issued) version of all International and Local Authority Standards referred to in the TDS, AG & SDS for this product.

Colour variation

When applicable, products primarily meant for use as primers or antifoulings may have slight colour variations from batch to batch. Such products and epoxy based products used as a finish coat may chalk when exposed to sunlight and weathering.

Colour and gloss retention on topcoats/finish coats may vary depending on type of colour, exposure environment such as temperature, UV intensity etc., application quality and generic type of paint. Contact your local Jotun office for further information.

Reference to related documents

The Application Guide (AG) must be read in conjunction with the relevant specification, Technical Data Sheet (TDS) and Safety Data Sheet (SDS) for all the products used as part of the coating system.

When applicable, refer to the separate application procedure for Jotun products that are approved to classification societies such as PSPC, IMO etc.

Appendix - Metallic and special effect powder coating

Introduction

Application of metallic, and other special effect, powder coatings is more sensitive to variations in application conditions than solid colored powder coatings.
Dry blended powder coatings are more sensitive than bonded powder coatings. Various factors such as line conditions, gun settings, the ratio of the reclaim to virgin, the distance from gun to substrates, maintenance of the equipment, type of equipment can greatly influence when spraying these type of powder coatings, and so, need more care and attention to achieve a consistent result.
This document is intended as a guideline for the applicator; to inform of the various parameters that can influence the outcome and aesthetic appearance of an object coated with metallic or special effect powder coatings, and to effectively manage those parameters to achieve the optimum outcome

Application Parameters

The final appearance of any item coated with metallic and special effect powder coatings can be affected by some or all the following parameters:
- Earthing of the line and the part to be coated
- The guns and charging equipment used (from various manufacturers)
- The hopper and level of powder in the hopper
- Cleanliness of the coating line and jigs (hangers)
- Gun settings; voltage (kV), current (µA) and transportation air
- Type of nozzle
- Spraying distance, orientation of the item to be coated
- Line speed and spraying technique
- Usage of powder coating reclaim
- Re-coating
- Orientation of the main visible surface
- Substrate material
- Type and uniformity of surface preparation

Prior to application, the suitability of the entire coating line should be established by comparison with the reference panels that can be supplied on request. Once defined, all these parameters, should be recorded, kept stable and checked regularly to ensure a consistent result.

In order to achieve the best result with a large project or multiple parts that must fit together after coating, it is best to ensure that a reference panel is used. If multiple batches are needed, then it is advised that the parameters are checked on a non-significant part first to ensure consistency of appearance and finish.

Line and equipment consideration

Ensure correct and efficient earthing of the coating line, the object to be coated, and all equipment used.

It is recommended that only corona guns be used when spraying metallic and special effect powder coatings. Tribo equipment is not recommended for spraying metallic and special effect powder coatings. Metallic and special effect powder coatings tend to coat the inside surfaces of tribo equipment causing shorting or failure to charge sufficiently. If used, please seek advice from your Jotun representative. The end-result might be different

when using Tribo and Corona equipment.

All equipment manufacturers have guns and application equipment that is perfectly suitable for use with metallic and special effect powder coatings, however, each may give a slightly different result due to charging mechanisms, design, current use, etc. For best results, it is advised that you do not mix guns from different suppliers on the same project. For advice on specific equipment, you should contact the equipment supplier directly.

On some corona lines, ion collectors can be used to improve the application properties and appearance of the finished powder. However, when spraying metallic and other special effect powder coatings, it is advised that you do not use these as they modify the electrostatic corona field, and this can influence and alter the appearance of the final metallic or special effect.

Automatic guns and reciprocators are recommended to be used. These will give the most consistent results. If manual 'filling in' is needed, e.g. on recessed areas or hard to reach areas, this should be done first, prior to using the automatic guns. This allows the final result to look more uniform. Otherwise, this can lead to color / effect variations.

In items that needs to be coated on both sides, it is advisable that, the main visible side to be coated last.

Line speed, number and orientation of guns and reciprocator stroke speed should be aligned so as not to create "striping" (or zebra) effect on the object and to ensure a good even coverage with an even film thickness. For advice on how to adjust the oscillating speed and height, you should contact the equipment supplier directly.

Wherever possible, it is recommended the guns be fitted with slot or flat nozzles rather than conical deflector nozzles. Metallic and special effect pigments can build up on a conical deflector type nozzle and come away periodically causing spitting and uneven appearance of the final coating.

A fluidizing bed should always be used when applying metallic and special effect powder coatings. A stabilized fluidized bed that contains the metallic and special effect powder coatings, keeps the powder coatings well agitated for uniform transportation from the fluidized bed to the charging guns.
It is not recommended to use powder directly from the box (as some application equipment allows), as one may not get a homogeneous result. This is due to potential separation of contents in the box during transportation and storage. This is far more important for dry blended products.

Settings and technique

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.
It is recommended to start the corona application of 60 KV and 10 µA on the application current. Spraying application parameters may be adjusted to achieve the final coating requirements.

Increasing the kV may result in a brighter metallic appearance but will also result in a faster build-up of metallic particles around the nozzle. Additionally, high kV will increase the risk of separation of the base powder and the effect pigment (more so in dry blended powder than in bonded powder) and thus high kV settings should be avoided.

Powder transport air should also be controlled. If it is too high, it can also lead to potential separation of components in a dry blended powder.

Gun to object distance is more important when spraying metallic coatings. It is recommended to set the gun to object distance at 20 – 35 cm (7-14 inches). Manual spraying should be avoided or minimized, but where necessary, it should be done before the automatic guns. When spraying manually, it is important to maintain an even gun distance as you can get variations on edges, and back ionization if the gun is held too close.

Film thickness and evenness should be controlled as much as possible. Variations in thickness can lead to variations in appearance or edge effects.

Nozzles, lines and equipment should be regularly cleaned, particularly in the event of any build-up of metallic pigment on gun tips. It is recommended to clean gun tips every 30-60 minutes if using dry blended powder.

The environment of the coating area should be controlled, particularly in terms of humidity. Applicators should be aware of the effect of high atmospheric humidity on the final finish. Best practice is to have a stable environment of 45% - 55%.

After determining the optimum conditions to give the desired result, it is advisable to conduct a small production run with the established settings. This will minimize the rejection percentage due to color variation. Once approved, ensure that parameters are recorded and maintained to achieve consistent results.

Reclaim powder

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%. Reclamation of the powder is one of the main differences between dry blended and bonded metallic coatings.

It is not recommended to reclaim dry blended metallic and special effect powder coatings. This is due to the high risk of separation of the effect pigments and the base coat during the spraying process.
Bonded metallic and effect powder coatings can be reclaimed and used again; but the ratio of reclaim to virgin should not exceed 30%.

For more information or clarification, please contact your local Jotun representative to assist. Powder school training can be provided on request.

Curing

The powder coating must be cured as specified by Jotun Powder Coatings. Please refer to relevant TDS. It is also recommended to conduct an oven test, once a week. E.g. proper adjustment/correction can 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 ± 10°C.
To achieve an attractive visual surface with a minimum of orange peel for epoxy-polyester powder coatings (hybrid powders), a rapid heat-up is recommended for all metallic and special effect powder coatings. For best results, it is recommended to combine a convection oven with an IR booster to reach up to 80% of the curing temperature within 2 minutes. This will increase the output as well as provide more attractive and consistent end-result.
Other types of powder coatings such as polyesters may need a slower heat-up curve due to the nature of product chemistry.

Post cure handling

Coated 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.

Symbols and abbreviations

min = minutes
h = hours
d = days
°C = degree Celsius
° = unit of angle
µm = microns = micrometres
g/l = grams per litre
g/kg = grams per kilogram
m²/l = square metres per litre
mg/m² = milligrams per square metre
psi = unit of pressure, pounds/inch²
Bar = unit of pressure
RH = Relative humidity (% RH)
UV = Ultraviolet
DFT = dry film thickness
WFT = wet film thickness
kV = kilovolts
µA = microampere

TDS = Technical Data Sheet
AG = Application Guide
SDS = Safety Data Sheet
VOC = Volatile Organic Compound
MCI = Jotun Multi Colour Industry (tinted colour)
RAQ = Required air quantity
PPE = Personal Protective Equipment
EU = European Union
UK = United Kingdom
EPA = Environmental Protection Agency
ISO = International Standards Organisation
ASTM = American Society of Testing and Materials
AS/NZS = Australian/New Zealand Standards
NACE = National Association of Corrosion Engineers
SSPC = The Society for Protective Coatings
PSPC = Performance Standard for Protective Coatings
IMO = International Maritime Organization
ASFP = Association for Specialist Fire Protection
AAMA = American Architectural Manufacture Association
CSA = Canadian Standards Association

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Disclaimer

The information in this document is given to the best of Jotun's knowledge, based on laboratory testing and practical experience. Jotun's products are considered as semi-finished goods and as such, products are often used under conditions beyond Jotun's control. Jotun cannot guarantee anything but the quality of the product itself. Minor product variations may be implemented in order to comply with local requirements. Jotun reserves the right to change the given data without further notice.

Users should always consult Jotun for specific guidance on the general suitability of this product for their needs and specific application practices.

If there is any inconsistency between different language issues of this document, the English (United Kingdom) version will prevail.