Barrier Smart Pack

Product description

This is a surface tolerant two component ceramically reinforced polyamine cured zinc rich epoxy coating. 1:1 mixing ratio for easy use and reduced wastage. Designed for brush and roller application, makes it ideal for maintenance and touch-up/repairs during outfitting in new construction projects. Suitable for carbon steel, repair of inorganic zinc silicate coating and damaged galvanised steel substrates. It conforms to the compositional requirements of SSPC paint 20, level 2 and ISO 12944-5. This product complies with ASTM D520 type II zinc dust.

Scope

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

The data and information provided are not definite requirements. They are guidelines to assist with efficient 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.
Jotuns liability is in accordance with general product liability rules.

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Referred standards

Reference is generally made to ISO Standards. When using standards from other regions it is recommended to reference only one corresponding standard for the substrate being treated.

Surface preparation

The required quality of surface preparation can vary depending on the area of use, expected durability and if applicable, project specification.

When preparing new surfaces, maintaining already coated surfaces or aged coatings it is necessary to remove all contamination that can interfere with coating adhesion, and prepare a sound substrate for the subsequent product.

Inspect the surface for hydrocarbon and other contamination and if present, remove with an alkaline detergent. Agitate the surface to activate the cleaner and before it dries, wash the treated area using fresh water.
Paint solvents (thinners) shall not be used for general degreasing or preparation of the surface for painting due to the risk of spreading dissolved hydrocarbon contamination. Paint thinners can be used to treat small localized areas of contamination such as marks from marker pens. Use clean, white cotton cloths that are turned and replaced often. Do not bundle used solvent saturated cloths. Place used cloths into water.
When the surface is an existing coating, verify with technical data sheet and application guide of the involved products, both over coatability and the given maximum over coating interval.

Process sequence

Surface preparation and coating should normally be commenced only after all welding, degreasing, removal of sharp edges, weld spatter and treatment of welds is complete. It is important that all hot work is completed before coating commences.

Soluble salts removal

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Soluble salts have a negative impact on the coating systems performance, especially when immersed. Jotun's general recommendations for maximum soluble salts (sampled and measured as per ISO 8502-6 and -9) content on a surface are:
For areas exposed to (ISO 12944-2):
C1-C4: 200 mg/m²
C5: 100 mg/m²
CX: 50 mg/m²
Norsok standard: 20 mg/m²

Carbon steel

Initial rust grade

The steel shall preferably be Rust Grade A or B (ISO 8501-1). It is technically possible to apply the coating to rust grades C and D, but it is practically challenging to ensure specified film thickness on such a rough surface, hence risk of reduced lifetime of the coating system. When steel of Rust Grade C or D is coated, the frequency of inspection and testing should be increased.

Metal finishing

For areas in corrosivity category C1 to C4 (ISO 12944-2) all irregularities, burrs, slivers, slag and spatter on welds, sharp edges and corners shall conform to minimum grade P2 (ISO 8501-3) Table 1, or as specified.
For areas in corrosivity category C5 the requirement is conformance to grade P3 (ISO 8501-3) Table 1.
Defective welds shall be replaced and treated to an acceptable finish before painting. Temporary welds and brackets shall be ground to a flat finish after removal from the parent metal.
Surface preparation and coating should normally be commenced only after all metal finishing and degreasing of a specific area is complete. It is important that as much hot work as possible is completed before coating commences.

Abrasive blast cleaning

Cleanliness

After pre-treatment is complete, the surface shall be dry abrasive blast cleaned to Sa 2½ (ISO 8501-1) using abrasive media suitable to achieve a sharp and angular surface profile.

Surface profile

Recommended surface profile 30-85 µm, grade Fine to Medium G (ISO 8503-2).

Dust contamination

At the completion of abrasive blasting the prepared surface shall be cleaned to remove residues of corrosion products and abrasive media, and inspected for surface particulate contamination. Maximum contamination level is rating 1 (ISO 8502-3) as per Figure 1. Dust size no greater than class 2.

Hand and Power Tool Cleaning

Power tool cleaning

Minor damage of the coating may be prepared to St 3 (ISO 8501-1). Suitable methods are disc grinding with rough disc, Bristle Blaster and Needle hammer. Ensure the surface is free from mill scale, residual corrosion, failed coating and is suitable for painting. The surface should appear rough and mat.

For larger areas, please consult your local Jotun representative for guidance.

Overlapping zones to intact coating shall have all leading edges feathered back by sanding methods to remove all sharp leading edges and establish a smooth transition from the exposed substrate to the surrounding coating. Consecutive layers of coating shall be feathered to expose each layer and new coating shall always overlap to an abraded existing layer. Abrade intact coatings around the damaged areas for a minimum 100 mm to ensure a mat, rough surface profile, suitable for over coating.
Mechanical repairs are only accepted for minor areas of damage where abrasive blasting is expected to create more damage to the coating system than actual benefit to the performance of the coating system.

Water jetting

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This product is suitable for DC A, DC B and DC C surfaces prepared to Wa 2½ (ISO 8501-4). For DP Z surface Wa 2 is accepted. Maximum accepted grade of flash rust is L.

Galvanised steel

This product is not intended for full over coating of galvanised surfaces or inorganic zinc coated surfaces. However, for damages of the surface to bare metal the following surface preparation should be carried out before applying this product to the damaged area:
Remove all rust, loose paint, grease or other contaminants by using one of the above approved surface preperations for carbon steel. Feather edges of surrounding intact galvanised or inorganic zinc coated surface and over coat with this product to the edge of the feathering.

Coated surfaces

Shop primers

Shop primers are accepted as temporary protection of steel plates and profiles. Refer to the technical data sheet for the generic types accepted. Certain standards require pre-approval of the shop primer as part of a complete system. Contact your nearest Jotun office for specific system compatibility. Before being overcoated the shop primer must be fully cured, clean, dust free, dry and undamaged. Inorganic zinc shop primers must be free of zinc salts (white rust).
Corroded and damaged areas must be blast cleaned to minimum Sa 2½ (ISO 8501-1).

Inorganic zinc silicates

This product may be used to repair damages on an inorganic zinc silicate surface. Surface preparation as described under the section of galvanised steel.

Application

Acceptable environmental conditions - before and during application

Before application, test the atmospheric conditions in the vicinity of the substrate for the dew formation according to ISO 8502-4.

Air temperature	0 - 60	°C
Substrate temperature	0 - 60	°C
Relative Humidity (RH)	10 - 85	%

The following restrictions must be observed:

- Only apply the coating when the substrate temperature is at least 3 °C (5 °F) above the dew point
- Do not apply the coating if the substrate is wet or likely to become wet
- Do not apply the coating if the weather is clearly deteriorating or unfavourable for application or curing
- Do not apply the coating in high wind conditions

Material storage conditions

Extended transportation or storage time may cause settling of zinc pigments. To ensure homogenous mixture of components it is advised to turn containers with Comp. A upside-down 24 hours before use. Recommended storage temperature is between 0°C and 30°C. Continous exposure to direct sunlight should be avoided. Higher temperatures will reduce shelf life of the product.

Product mixing

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Due to the presence of the ceramic reinforcement components in part B, product separation with the formation of the white semi-dry top layer may be expected. This is completely normal and will not influence product properties. This layer shall not be removed. This layer needs to be mechanically mixed with the rest of the component B until homogeneous.

Ideally the product should be shaken prior to usage using a mechanical shaker. If settling has occured the initial mixing should be done manually to ensure the settled material is distributed properly, lumps should be broken up. Use mechanical agitation and a heavy duty mixer or similar tool; stir until homogeneous.

Product mixing ratio (by volume)

Barrier Smart Pack Comp A	1 part(s)
Barrier Smart Pack Comp B	1 part(s)

Induction time and Pot life

Paint temperature	**23 °C**
Induction time	10 min
Pot life	6 h

The temperature of base and curing agent is recommended to be 18 °C or higher when the product is mixed.

Thinner/Cleaning solvent

Thinner: Jotun Thinner No. 17

Application data

Brush application

Recommended application method. Use a soft synthetic brush for best result. Will provide typical film thickness in one coat.

Roller application

Recommended application method. Use a short haired filt roller or similar. Will provide typical film thickness in one coat.

Other application tools

Spray application

Airless Spray Equipment

Pump ratio (minimum) :	42:1
Pressure at nozzle (minimum) :	120 bar/1740 psi
Nozzle tip (inch/1000) :	15-19
Nozzle output (litres/minute) :	0.9-1.9
Filters (mesh) :	70

Note*
Several factors influence and need to be observed to maintain the recommended fluid flow/product atomization pattern. Among factors causing pressure drop are:
- Pump size
- Extended hoses or hose bundles
- Extended hose whip-end line
- Small internal diameter hoses
- Narrow tip angle
- High paint viscosity

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- Large spray nozzle size
- Inadequate air capacity from compressor
- Incorrect or clogged filters
- Product temperatures

Spray application technique

Pay close attention to both spraying technique and the correct setting of equipment during application in order to achieve an even, pinhole free film. A combination of the correct inbound air / outbound material pressure, correct airless tip or spray set up and a recommend gun to substrate distance of 30-50 cm is recommended. Apply the coating in even and uniform parallel passes and overlap each pass 50% to achieve an even film. Use a painter's wet film comb during application to control the wet to dry film thickness of the coating.

Film thickness per coat

Typical recommended specification range

Dry film thickness	60	-	125	µm
Wet film thickness	85	-	180	µm
Theoretical spreading rate	11.7	-	5.6	m²/l

This product can be applied up to 50 % higher than maximum specified film thickness without loss of technical properties.

Film thickness measurement

A zinc epoxy should be applied in a smooth and even film. Too rough film could give risk of popping when the subsequent coat is applied. Film thickness exceeding recommended maximum may cause cracking and poor film integrity.

Wet film thickness (WFT) measurement and calculation

To ensure correct film thickness, it is recommended to measure the wet film thickness continuously during application using a painter's wet film comb (ISO 2808 Method 1A). Use a wet-to-dry film calculation table to calculate the required wet film thickness per coat.
A wet to dry film thickness chart is available on the Jotun Web site.

Dry film thickness (DFT) measurement

When the coating has cured to hard dry state the dry film thickness can be checked to SSPC PA 2 or equivalent standard using statistical sampling to verify the actual dry film thickness. Measurement and control of the WFT and DFT on welds is done by measuring adjacent to and no further than 15 mm from the weld.

Ventilation

Sufficient ventilation is very important to ensure proper drying/curing of the film.

Stripe coating

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The stripe coat sequence can be either of the following:
1. Surface preparation, stripe coat, full coat.
2. Surface preparation, full coat, stripe coat. This sequence can be used when a large substrate area has been prepared and leaving the substrate exposed for a long time while doing stripe coating could lead to surface deterioration.
It is important to pay special attention to edges, openings, rear sides of stiffeners, scallops etc. and to apply a stripe coat to these areas where the spray fan may not reach or deposit an even film.
When applying a stripe coat to bare metal use only a stiff, round stripe coating brush to ensure surface wetting and filling of pits in the surface.
Stripe coating shall be of a different colour to the main primer coat and the topcoat colour and should be applied in an even film thickness, avoiding excessive brush marks in order to avoid entrapped air. Care should be taken to avoid excessive film thickness. Pay additional attention to pot life during application of stripe coats.
Jotun recommends a minimum of one stripe coat. However, in extremely aggressive exposure conditions there may be good reason to specify two stripe coats.

Coating loss

The consumption of paint should be controlled carefully, with thorough planning and a practical approach to reducing loss. Application of liquid coatings will result in some material loss. Understanding the ways that coating can be lost during the application process, and making appropriate changes, can help reducing material loss.
Some of the factors that can influence the loss of coating material are:
- type of spray gun/unit used
- air pressure used for airless pump or for atomization
- orifice size of the spray tip or nozzle
- fan width of the spray tip or nozzle
- the amount of thinner added
- the distance between spray gun and substrate
- the profile or surface roughness of the substrate. Higher profiles will lead to a higher "dead volume"
- the shape of the substrate target
- environmental conditions such as wind and air temperature

Drying and Curing time

Substrate temperature	0 °C	5 °C	10 °C	23 °C	40 °C
Surface (touch) dry	2 h	1 h	30 min	20 min	15 min
Walk-on-dry	24 h	10 h	6 h	2.5 h	1 h
Dry to over coat, minimum	24 h	10 h	6 h	2.5 h	1 h
Dried/cured for service	21 d	21 d	7 d	1 d	1 d

Drying and curing times are determined under controlled temperatures and relative humidity below 85 %, and at average of the DFT range for the product.

Surface (touch) dry: The state of drying when slight pressure with a finger does not leave an imprint or reveal tackiness.

Walk-on-dry: Minimum time before the coating can tolerate normal foot traffic without permanent marks, imprints or other physical damage.

Dry to over coat, minimum: The recommended shortest time before the next coat can be applied.

Dried/cured for service: Minimum time before the coating can be permanently exposed to the intended environment/medium.

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Maximum over coating intervals

Maximum time before thorough surface preparation is required. The surface must be clean and dry and suitable for over coating. Inspect the surface for chalking and other contamination and if present, remove with an alkaline detergent. Agitate the surface to activate the cleaner and before it dries, wash the treated area by low-pressure water cleaning using fresh water.

Where an extended overcoating time is stated, the product can be overcoated after an extended time period, however the anticipated level of inter-coat adhesion can only be achieved through good painting practices.

The max overcoating time the product is able to achieve without any surface preparation depends on environmental exposure conditions (such as UV, temperature, humidity etc.), system composition and other factors.

If the surface has signs of chalking or any contamination, surface treatment, such as methodical abrading followed by freshwater washing should be employed. Alkaline detergent should be used to remove heavy contamination. If you are unsure a test patch should be used to consider sufficient cohesion.

If maximum over coating interval is exceeded the surface should in addition be carefully roughened to ensure good inter coat adhesion.

Areas for atmospheric exposure

Average temperature during drying/curing	5 °C	10 °C	23 °C	40 °C
epoxy	2.5 mth	2 mth	1 mth	7 d
epoxy mastic	2.5 mth	2 mth	1 mth	7 d

Other conditions that can affect drying / curing / over coating

Repair of coating system

Damages to the coating layers:
Prepare the area through sandpapering or grinding, followed by thorough washing. When the surface is dry the coating may be over coated by itself or by another product, ref. original specification.
Always observe the maximum over coating intervals. If the maximum over coating interval is exceeded the surface should be carefully sanded removing the top of the surface followed by thorough fresh water washing in order to remove zinc salts. Alternatively the surface can be abrasive swept.

Damages exposing bare substrate:
Remove all rust, loose paint, grease or other contaminants by spot blasting, mechanical grinding, water and/or solvent washing. Feather edges and roughen the overlap zone of surrounding intact coating. Apply the coating system specified for repair.

Repair of damaged areas

Sags and runs can be caused by too high wet film thickness, too much thinner added or the spray gun used too close to the surface.
Repair by using a paint brush to smooth the film when still wet.
Sand down to a rough, even surface and re-coat if the coating is cured.
Dry spray can be caused by poor atomization of the paint, spray gun held too far from the surface, high air temperature, thinner evaporating too fast or coating applied in windy conditions.
Sand down to a rough even surface and re-coat.

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Quality assurance

The following information is the minimum required. The specification may have additional requirements.

- Confirm that all welding and other metal work has been completed before commencing pre-treatment and surface preparation
- Confirm that installed ventilation is balanced and has the capacity to deliver and maintain the RAQ
- Confirm that the required surface preparation standard has been achieved and is held prior to coating application
- Confirm that the climatic conditions are within recommendations in the AG, and are held during the application
- Confirm that the required number of stripe coats have been applied
- Confirm that each coat meets the DFT requirements in the specification
- Confirm that the coating has not been adversely affected by rain or other factors during curing
- Observe that adequate coverage has been achieved on corners, crevices, edges and surfaces where the spray gun cannot be positioned so that its spray impinges on the surface at 90° angle
- Observe that the coating is free from defects, discontinuities, insects, abrasive media and other contamination
- Observe that the coating is free from misses, sags, runs, wrinkles, fat edges, mud cracking, blistering, obvious pinholes, excessive dry spray, heavy brush marks and excessive film build
- Observe that the uniformity and colour are satisfactory

All noted defects shall be fully repaired to conform to the coating specification.

Caution

This product is for professional use only. The applicator and operator 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 should 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 in 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 sought medical attention 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

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

Symbols and abbreviations

min = minutes
h = hours
d = days
°C = degree Celsius
° = unit of angle

TDS = Technical Data Sheet
AG = Application Guide
SDS = Safety Data Sheet
VOC = Volatile Organic Compound
MCI = Jotun Multi Colour Industry (tinted colour)

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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
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

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 data given 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.

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