

Penguard Fulfill SF

Product description

This is a two component solvent free epoxy filler for use on concrete. It is a high strength filler, providing excellent water resistance and compressive strength higher than concrete. It has excellent compatibility with epoxy sealer and subsequent coatings. Can also be used on steel substrates exposed in atmospheric conditions. Suitable for properly prepared concrete and steel substrates. Can be applied up to 5mm without sags.

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. Jotun's liability is in accordance with general product liability rules.

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.

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.

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

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

C5M or C5I: 100 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.

Initial inspection and pretreatment

Inspect the surface for contaminations 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 (LPWC) to Wa 1 (ISO 8501-4) using fresh water.

Non-contaminated areas shall be washed down by Low-Pressure Water Cleaning (LPWC) to Wa 1 (ISO 8501-4) using fresh water to reduce the concentration of surface chlorides.

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. All edges shall have a rounded radius of minimum 2 mm, or subjected to three pass grinding or equally effective method. One may use a mechanical grinder fitted with a suitable abrasive disc. All sharp irregularities, burrs, slivers, slag and spatter on welds, whether apparent before or after blast cleaning, shall be removed before coating application. It is recommended that welding smoke is removed by water cleaning according to ISO 12944-4, section 6.2.1. Welding smoke residues are water soluble and could cause blistering if not removed by washing before blasting. 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.

Pitting repair

In some areas it is practically feasible to use filler to fill pittings. This should then be done either after the initial surface preparation or after application of first coat.

Abrasive blast cleaning

Application of protective coating shall commence before degradation of the required surface standard occurs.

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.

Abrasive media quality

The selected abrasive must be compatible with both the surface to be blast cleaned and the specified coating system. The abrasive shall meet specifications as per relevant parts of ISO 11124 (Specification for metallic blast-cleaning abrasives), or ISO 11126 (Specification for non-metallic blast-cleaning abrasives). It should be sampled and tested as per relevant parts of ISO 11125 (metallic abrasives) or ISO 11127 (non-metallic abrasives). Dry storage of abrasive and shelter for blasting pots is necessary to prevent equipment becoming clogged with damp abrasive.

All abrasive blast media used should be new and not recirculated, with the exception of steel grit. If this is utilized the circulation process must include a cleaning process.

Compressed air quality

The supply of clean air to blasting pots must be secured to avoid contamination of abrasive and thereby of blast cleaned surfaces. Compressors must be fitted with sufficient traps for oil and water. It is also recommended to fit two water separators at the blasting machine to ensure a supply of moisture-free air to the abrasive chamber.

Concrete

Concrete should be a minimum of 28 days old, applying any coating before this time will greatly increase the chance of the coating de-bonding. The moisture content of the concrete should be checked prior to the application of the coating and should not be greater than 5%. Concrete substrates should be mechanically prepared to leave a clean, sound and dry base on which a coating system can be applied.

Clean – Free of oils, grease, dust, dirt, chemicals, loose coating, curing compounds, form release oils, sealers or hardeners.

Sound – Concrete that has unsound areas (voids, hollow spots, and friable surface) may have to be removed, replaced or repaired with materials that are compatible with the selected coating system.

Dry – It is important to address dryness because most coatings require a dry surface for proper adhesion.

Moisture contained within the concrete that moves towards the surface through the pores of the concrete may prevent adequate coating adhesion.

Dry abrasive blast cleaning to SSPC-SP 13/NACE No. 6. Where the concrete has become contaminated with oils, grease, or fuels, water emulsifiable degreasers-cleaners may be used to remove these contaminants. It is important to only clean an area that can be fully washed down after degreasing before any of the cleaner can dry on the surface.

Ultra high pressure water jetting can be used to remove laitance and reveal blowholes and imperfections. Ensure concrete is dry before coating application.

Blast cleaning

Dry abrasive blast cleaning to SSPC-SP 13/NACE No. 6. All prepared surfaces should then have all “blow holes” and other surface defects filled with suitable filler that is compatible with the primer and finish coat system to ensure that the coating can be applied over a smooth and regular substrate.

Diamond disc grinding

Diamond grind the surface to remove all laitance and expose the aggregates.

Water cleaning

Minimum 4 weeks curing. Moisture content maximum 5 %. Low pressure water washing to a rough, clean, dry and laitance free surface.

Coated surfaces

Over coating

This product can be applied on top of Jotun sealer coatings, provided the sealer is fully cured, clean, dust free, dry and undamaged. When applied on coatings past maximum intercoating interval light abrading may be required to achieve proper intercoat adhesion.

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	5 - 50	°C
Substrate temperature	5 - 40	°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

At ambient temperature below 10 °C, it is recommended to pre-heat the material up to 25 °C prior to mixing.

Product mixing

Product mixing ratio (by weight)

Penguard Fulfill SF Comp A	9 part(s)
Penguard Fulfill SF Comp B	1 part(s)

Product mixing

Manual application

Mixing:

According to the correct mixing ratio, and stir/mix thoroughly with a power agitator until a uniform colour material is obtained before application.

Induction time and Pot life

Paint temperature	23 °C
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Pot life	75 min
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Reduced at higher temperatures, and with increased mixing volumes. It is recommend to use all material as soon as possible, after thoroughly mixing.

Thinner/Cleaning solvent

Thinner: Jotun Thinner No. 17

Maximum thinning is 3 % on mixed product for the temperatures below 23°C. No thinning is needed at the temperatures higher than 23 °C. Thinning reduces viscosity but may also decrease sag resistance. Excessive thinning may lead to solvent entrapment.

Application data

Other application tools

Application with trowel

Recommended. Trowel on to achieve the required thickness and smoothness.

Film thickness per coat

Typical recommended specification range

Dry film thickness	200 - 5000 µm
Wet film thickness	206 - 5155 µm
Theoretical spreading rate	4.8 - 0.2 m ² /l
Theoretical spreading rate	2.7 - 0.1 m ² /kg

Drying and Curing time

Substrate temperature	5 °C	10 °C	23 °C	40 °C
Surface (touch) dry	5 h	5 h	3 h	2 h
Walk-on-dry	48 h	28 h	12 h	4 h
Dry to over coat, minimum	48 h	28 h	12 h	4 h
Dried/cured for service	21 d	14 d	7 d	3 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.

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.

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	10 °C	23 °C	40 °C
Itself	5 d	3 d	2 d
epoxy	5 d	3 d	2 d
epoxy mastic	5 d	3 d	2 d

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 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 antifouling 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.

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

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

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.