

## Jotatherm TB550

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### Product description

This is a two component solvent free amine cured syntactic epoxy insulant. Provides thermal insulation and corrosion protection. This product is suitable for temperature scenarios of -40 °C to 150 °C. Can be used as an independent solution, or in combination with Jotachar epoxy passive fire protection materials.

### 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.

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### 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 localised areas of contamination such as dye penetration inks and 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.

**In the case of surface preparation, the requirements of the Jotachar TDS / AG should be used instead of the corresponding primer TDS / AG.**

#### 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 recommends the following maximum soluble salts (sampled and measured as per ISO 8502-6 and -9) content on a surface; 80 mg NaCl / m<sup>2</sup> unless otherwise specified.

#### Carbon steel

##### Metal finishing

Surface laminations and sharp edges should be removed, sharp edges must be rounded off smooth prior to priming. Weld spatter, or flux, dust and spent abrasive and all contamination must also be removed before primer application. Ensure substrate is clean and dry before painting.

### Abrasive blast cleaning

Abrasive blasting should not take place under adverse ambient conditions, when relative humidity exceeds 85 % or when the steel temperature is less than 3°C (37°F) above ambient dew point.

#### 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

Measure the achieved profile with surface replication tape (Testex) to ISO 8503-5 or by surface roughness stylus instrument to ISO 8503-4.

Achieved surface roughness should be as required by specified primer. The recommended surface profile is 50-75 µm, grade Fine to Medium G; Ry 5 (ISO 8503-1). Finished surfaces shall be dull, profiled and show no areas of shiny metal.

Do not handle the prepared surface with bare hands.

#### Compressed air quality

To avoid contaminating the substrate, the dryness and cleanliness of the compressed air supply used for blast cleaning should be verified by testing the air on a white blotter as per ASTM D4285.

#### Dust contamination

At the completion of abrasive blasting remove residues of abrasive media and inspect for surface particulate contamination. Maximum contamination level is rating 1 (ISO 8502-3) as per Figure 1 of the standard for dust size no greater than class 2.

### Hand and Power Tool Cleaning

#### Power tool cleaning

Power tool cleaning is not acceptable as a primary surface preparation for steel. It is only recommended for small areas of repair, typically less than 1 m<sup>2</sup> in size where abrasive blasting is expected to create more damage to the coating system than actual benefit to the performance of the coating system.

Power tool cleaning to St 3 (ISO 8501-1) with 50 µm surface profile or as prescribed in SSPC SP11 with 50 µm surface profile. Removal of all loose mill scale, loose rust, loose paint and other loose detrimental foreign matter to a bare metal finish with a surface profile.

In areas where blasting is not feasible or permitted, power tool surface preparation can be acceptable provided a surface profile of 50 µm is achieved. Power tool cleaning is not acceptable for projects required to comply with NORSOK M-501 without an accepted deviation from the project team.

Overlapping zones to intact coating shall have all leading edges feathered back by sanding methods to remove all sharp 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 overcoating.

DO NOT power tool clean stainless steel substrates.

### Galvanised steel

#### Abrasive blast cleaning

After removal of excess zinc and surface defects the area to be coated shall be degreased to ISO 12944-4, Part 6.2.4 Alkaline Cleaning. The galvanised surface shall be sweep blast-cleaned (SSPC-SP 16) with the nozzle angle at 45-60° from perpendicular at reduced nozzle pressure to create a sharp and angular surface profile using approved non-metallic abrasive media. As a guide, the surface profile should not be less than 50 µm (2 mils). Finished surfaces shall be dull, profiled and show no areas of shiny metal. Do not handle the prepared surface with bare hands.

Galvanized bolts should be degreased in case of oil/grease contamination, abraded for surface roughening, solvent cleaned, followed by application of approved primer.

Thermally sprayed zinc (TSZ) may be coated after the use of an approved epoxy tie coat, applied soon after initial application of TSZ. TSZ which has been exposed to high humidity or outdoor weathering, may have zinc salts (white rust) formation on the surface which is detrimental to adhesion. Zinc salts must be removed prior to application. Use high pressure water-washing at a minimum of 170 bar (2500 psi) to remove zinc salts. Approved epoxy tie coat to be applied when dry.

## Stainless steel

### Abrasive blast cleaning

After pre-treatment is complete, the surface shall be dry abrasive blast cleaned to Sa 1 (ISO 8501-1) using abrasive media suitable to achieve a sharp and angular surface profile. Sweep (brush off) blast cleaning is defined as; the removal of all loose mill scale, loose rust and loose coating with abrasive blast cleaning. As a guide, the surface profile should not be less than 50 µm (2 mils).

Chlorinated or chlorine containing solvents or detergents must not be used on stainless steel.

## Coated surfaces

### Verification of existing coatings including primers

When the surface is an existing coating, verify with technical data sheet and application guide of the involved products, both overcoatability and the given maximum overcoating interval. Only approved and qualified primers can be used in conjunction with the Jotachar product range. It is the application contractor's responsibility to ensure that only approved primers are used. For the current list of approved primers please contact your local Jotun office.

The applied primer should be:

- Dry and cured enough to stand for overcoating, as per minimum overcoating time stated on manufacturer's TDS
- Maximum overcoating period as per Jotun approved primer Application Guide (AG) or contact your local Jotun office
- Strongly adhered to the steel substrate
- Free from any damage, defects or contamination (including oil, grease, soluble salts and dust)
- Uniform in thickness and within the recommended DFT range. It is important to apply the approved primer systems carefully according to the specified DFT as over thickness could affect the performance of the system.

### Primer system maximum dry film thickness

As a general guideline the following maximum dry film should be adhered to.

Primer system:

Epoxy, including epoxy zinc phosphate  
- Dry Film Thickness: 50-100 µm (2-4 mils)  
- Max in overlaps: 125 µm (5 mils)

Epoxy mastic  
- Dry Film Thickness: 100-150 µm (4-6 mils)  
- Max in overlaps: 175 µm (7 mils)

Zinc epoxy  
- Dry Film Thickness: 50-75 µm (2-3 mils)  
- Max in overlaps: 100 µm (4 mils)

Zinc epoxy and epoxy tie coat

- Dry Film Thickness: 75-110  $\mu\text{m}$  (3-4.4 mils)
- Max in overlaps: 125  $\mu\text{m}$  (5 mils)

Inorganic zinc silicate primers are not approved for Jotatherm.

Where Jotatherm TB550 is used for high temperature service from 120°C to 150°C to reduce substrate temperature below 80°C, the preferred Jotun primer is Jotacote F60 applied at 100 microns.

Dry film thickness and overcoating periods as per manufacturer's instructions must be strictly observed.

The generic type of primers systems approved are found on the TDS. The dry film thickness of the primer system should be as per the product specification and above guideline.

It is the responsibility of the applicator installing Jotatherm to assess the condition of the primer coating before Jotatherm is applied. Any defective areas must be repaired prior to application of Jotatherm.

Refer to your Jotun representative for a specification and approved primer system.

### Reduction of high primer thickness

Areas of high primer thickness should be reduced to the recommended thickness as per the above guideline using medium grade sandpaper, grinding or other suitable methods followed by fresh water washing to remove dust/contaminants. Frequent changes of abrasive paper to be made to avoid polishing the surface. Abrasive sweep blasting followed by thorough cleaning/vacuuming can also be used.

Ensure the surface is clean and dry before application of Jotatherm.

### Over coating

The primer manufacturer and Jotun should be consulted for minimum and maximum recommended overcoating times. Refer to specific product technical data sheet for details.

### Organic primers/intermediates

Clean, dry and undamaged compatible coating.

### Shop primers

Shop primers are accepted as temporary protection of steel plates and profiles. As long as the shop primer is dry, clean, intact and not damaged it is possible to apply this product over the shop primer. However, if the shop primer is not in sound condition or damaged the shop primer should be completely removed by blast cleaning to minimum Sa 2½ (ISO 8501-1) to a surface profile as recommended.

## Application

Apply the approved primer within 4 hours of completing the blasting, before degradation of the surface occurs. This product can be applied by trowel or by heated twin feed spray (plural component).

It is possible to apply Jotatherm directly to blasted steel, provided environmental controls and relevant project approval allows it. Apply within 4 hours of completing the blasting, relative humidity <60 %, substrate temperature >15 °C (59 °F) and at least 3 °C (5 °F) above the dew point, before degradation of the of the surface. Classification Society certification typically require 50  $\mu\text{m}$  DFT of epoxy primer.

ALL SPRAY EQUIPMENT USED WITH JOTATHERM TB550 MUST BE APPROVED BY JOTUN TECHNICAL SALES SUPPORT TEAM.

### Coat backs and project detailing

Whilst there is no specific requirement for insulation use, a Jotatherm TB550 with Jotachar system for fire protection must follow the same guidelines as required for Jotachar.

Typically the application of Jotachar should extend through the unprotected or secondary steelwork for 450 mm in order to prevent heat transfer into protected or primary steel work during fire situation. The point of measuring this extension is the point of contact of protected with unprotected steel work.

Project coat back requirements differ due to many factors including coat back optimization, Classification or Code

of Practice requirements which will require clarification with the project.  
Coat back is not required for the following structures providing that the cross sectional area is less than 3000 mm<sup>2</sup>;

- Secondary structural members and attachments that are less than 1 meter length
- Divisions less than 1m<sup>2</sup> area

If a different coat back distance is required by the project specification or classification societies, consultation with the design engineers or classification society should be considered.

For technical drawings of coat backs and repairs, please consult Jotun Technical Sales Support.

### 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 - 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

This product should be stored in sealed containers, away from direct sunlight and high humidity. The following are the recommended storage temperature ranges:

- General storage 1 °C (34 °F) minimum and 35 °C (95 °F) maximum
- Pre-heating for plural component spray application at 40-50 °C (113-122°F) for minimum 12 hours prior to use.
- For manual application at ambient temperature below 20 °C (68°F), it is recommended to pre-heat the material up to 20-35 °C (68-95°F) for minimum 12 hours prior to use.

Protect product from frost.

Uniform heating of the material is required. Heaters in direct contact with the containers are not recommended, as it may overheat the outer layers of the product in the container, changing its properties. At temperatures below 20 °C (68°F) it is recommended to also place the spray unit in a heated, insulated container.

### Product mixing

Product MUST NOT be thinned.

A high torque variable speed, paddle paint mixer is required for mixing.

For manual application at ambient temperature below 20 °C (68°F), it is recommended to pre-heat the material up to 20-35 °C (68-95°F) for minimum 12 hours prior to mixing.

Mix the two components together until a uniform buff coloured material is obtained. During mixing, care should be taken to scrape the material from the walls of container into the center.

Care should also be taken not to mix more material than can be applied within the pot life of the product.

### Product mixing ratio (by weight)

Jotatherm TB550 Comp A	2.4 part(s)
Jotatherm TB550 Comp B	1 part(s)

### Product mixing

Individual components must have been stored for minimum 12 hours at 25 to 30 °C (77 to 86 °F). Stir/mix thoroughly with a power agitator before application.

### Induction time and Pot life

Paint temperature	15 °C	23 °C
Pot life	40 min	25 min

The given figures are for trowel and roller workability.

Working pot life is not applicable for plural airless spray application as the material is mixed at the spray gun during application. For manual application, mixed material should be applied with minimum delay. Due to exothermic reaction, the larger the volume of mixed material, the shorter the pot life will be.

The temperature of base and curing agent is recommended to be 20 °C or higher when the product is mixed.

### Thinner/Cleaning solvent

Do not add thinner.

Cleaning solvent: Jotun Thinner No. 7 / Jotun Thinner No. 10

For rolling, use Jotun Thinner No. 7 or Jotun Thinner No. 17.

### Application data

#### Spray application

Dry film thickness is in the range of 2 to 40 mm dependent upon the intended usage and project specific requirements.

After spraying, immediately flush out the mixed material from the static mixer and spray line (whip end) with hot water using the flushing pump. For long time storage or maintenance of the spray unit it is recommended to use Jotun Thinner No. 7 to dissolve and flush out the material residues.

In a continuous spray application process lasting typically 2 hours, replacement of the static mixer with a freshly cleaned one is recommended to ensure ease of application.

#### Airless Spray Equipment

Pressure at nozzle (minimum) :	200 bar/2900 psi
Nozzle tip (inch/1000) :	27-35

Several factors influence, and need to be observed to maintain the recommended pressure at the nozzle. Among factors causing pressure drop are:

- extended hoses or hose bundles
- extended hose whip-end line
- small internal diameter hoses
- high paint viscosity
- large spray nozzle size
- inadequate air capacity from compressor
- incorrect or clogged filters

### Plural component (Twin Pump) airless spray equipment

Spray application should not start unless the weight ratio check is within  $\pm 5\%$  of the designated ratio. After checking and confirming acceptability of the mix ratio, it is not recommended to alter or change any of the operating parameters of the plural spray unit except the metering pump air motor inlet pressure. Proper atomisation should be achieved by adjusting the metering pump pressure within 200–320 bar (2900–4000 psi).

Pre-heating for plural component spray application at 40–50 °C (113–122°F) for minimum 12 hours prior to use.

The following instructions are recommended for application using plural component spray equipment.

#### Spray equipment:

A compact unit consisting of the following major components;

- Metering pump with two appropriate sized liquid ends or legs for component A and one for component B to allow the correct volume ratio of product to be delivered (fixed ratio equipment)
- Two metering pumps with one liquid end or leg, one for component A and one for component B (Digital variable ratio equipment i.e. Graco XM)
- Two ram assisted feed plate airless supply pumps, one for each component
- Two heated and pressurised storage tanks equipped with pneumatic or electrical agitators, one for each component
- In-line electrical heaters to heat up the material components.
- Hot water circulation
- Flush pump
- Insulated heated spray line
- Remote mixing manifold and static mixer
- High pressure spray gun
- High pressure safety shut down system

Some units are also equipped with the following:

- Ratio monitoring system to shut down the unit when metering pump is out of ratio
- Optical level control for the material tanks with automatic refill

Jotun should always be consulted regarding the suitability of any proposed equipment.

### Operating parameter summary

Component tank temperatures	Component A: 65 °C (149 °F) Component B: 55 °C (131 °F)
Component tank pressures	Component A: 6 bar (87 psi) Component B: 2.5 bar (36 psi)
Component tank stirrer speed	Component A: 10 rpm Component B: 10 rpm
In-line heater temperatures	Component A: 65 °C (149 °F) Component B: 55 °C (131 °F)
Hose heater temperature	60 - 70 °C (140 - 158 °F)
Temperature at nozzle	55 - 65 °C (131 - 149 °F)
Metering pump pressure	200 - 320 bar (2900 - 4600 psi)
Nozzle tip (inch/1000) :	27-35 orifice 30-50 fan angle

The above setting parameters of temperature, pressure and stirring speed are for guidance only, settings may vary depending on ambient conditions and equipment used.

### Weight ratio check

Weight ratio checks procedure:

- The ratio check should only be performed once both components have attained the required temperatures to spray
- Set the metering pump air motor pressure to 2.8 bar (40 psi)
- Empty approximately 10–15 kg of component A and 10–15 kg of component B into separate, clean containers from the pressure release (dump) valves located on the mixing block, in order to remove any cold material from the lines. (This material can be used again, either back into machine or hand application)
- Weigh clean, empty containers for components A and B and record the weights
- Place the containers under the ratio check valves and open the valves at exactly the same time
- Close the valves when the Component A container is at least half full. Valves should be closed at exactly the same time



- Calculate the net weight of each component by subtracting the weight of the empty containers
- Calculate the ratio of Part A to Part B as a percentage of the total weight

Note: Methods of taking ratio checks may vary. Please follow the machine manufactures guidelines.

Weight of empty container	Component A : a (kg)
	Component B : b (kg)
Weight of container, including product	Component A : c (kg)
	Component B : d (kg)

$$\text{Weight ratio A/B} = \frac{c - a}{d - b} = X/1$$

The acceptable mix ratio range of component A to component B is  $\pm 5\%$  of designated ratio

- 2.28 : 1 minimum
- 2.52 : 1 maximum

In addition to the ratio checks, it is also important to constantly check metering pump pressure gauges and the buff colour shade of the mixed Jotatherm product.

### Spray application technique

Spray application should be performed with the spray gun at right angles to the substrate. Apply in parallel paths, overlapped at 50 %, with constant speed and distance in order to achieve a uniform thickness. The spray unit delivers a high volume of material (up to 345 cm<sup>3</sup> per cycle), the crew size should be large enough to finish the sprayed material surface by trowelling or rolling if and when required.

Rolling the material with a short nap roller dampened with Jotun Thinner No. 7 or No. 17 solvent will remove trowel marks and high points and can also be used to obtain a smooth finish. Rolling should be conducted within 30 minutes of spray application. When trowelling, it should be conducted within 30 minutes of spray application.

If the final required DFT cannot be achieved in a single coat then it is recommended to leave the coat with a sprayed or scratched finish to ensure good intercoat adhesion.

### Other application tools

#### Jotatherm CSP1 Scrim

Jotatherm CSP1 Scrim has been specially developed to optimize the resistance of Jotatherm TB550 to cryogenic liquid.

It is only required in those areas which have been identified as at risk from a cryogenic liquid spill. For standard applications it is not required.

#### Scrim requirements

Jotatherm CSP1 Scrim is to be installed in the top third of the Jotatherm TB550 film and not closer than 2mm to the top of the film.

- In the case of the lowest specification of 3mm, it would be 1mm+scrim+2mm.
- For film thickness <6mm, scrim installed between mid third and top third is acceptable.

There is no requirement to overlap adjoining sections of scrim. However, they must be installed flush, i.e. butted up against each other. 100% coverage is required.

- 1) Cut the scrim to the required size prior to start of application
- 2) Apply scrim to wet Jotatherm at top third thickness.
- 3) Roll the scrim into the wet Jotatherm with a short nap roller dampened with Jotun Thinner No. 7 or No. 17 solvent.
- 4) Install adjoining sections of scrim butted up against previous section of scrim.
- 5) After installation of Jotatherm CSP1 Scrim either continue to build up the coating thickness or spray a light coat of Jotatherm to cover the scrim.
- 6) Scrim and terminations must be encapsulated with Jotatherm after installing to prevent moisture ingress and dirt pick up.

### Packaging and storage



Supplied boxed in 100 x 1.27 meter rolls. Store in clean and dry conditions.

### Manual application

Jotatherm TB550 can be applied manually, i.e. by trowel. The following instructions are specified for manual application.

Usually manual application requires less than a full kit of the product. Therefore, the required amounts of Component A and B should be accurately weighed according to the correct mixing ratio and thoroughly mixed. Clean and dry containers should be used.

Care should be taken not to mix more material that can be applied within the pot life.

Jotatherm TB550 is applied manually using a plastering trowel or similar and then smoothed off using a short nap roller dampened with Jotun Thinner No. 7 or No. 17 solvent. Rolling should be conducted within 30 minutes of initial application.

If the final required DFT of the product cannot be achieved in a single coat then it is recommended to leave the coat with a sprayed or scratched finish to ensure good intercoat adhesion.

### Surface finish

Before the start of any application, it is recommended that all interested parties agree on the required surface finish. The applicator should apply a sample area which is acceptable to the clients representative. This area should be used as a reference area for the project.

The spray applied film should be closed and uniform in thickness, free from voids and sagging. Horizontal surfaces should be finished with a slight slope to avoid water pooling in case of rain or dew condensation.

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## Film thickness per coat

### Typical recommended specification range:

Dry film thickness:

2 - 40 mm (dependent upon the intended usage and project specific requirements)

Spray application:

Typical maximum thickness achievable per coat is 5 mm

Manual application:

Typical maximum thickness achievable per coat is 25+ mm

Film build is dependent upon steel configuration, geometry, ambient conditions, pump type and set up as well as primer used.

Absolute maximum DFT is the thickness at which the system can be applied without sagging or slumping.

Some primers may have a semi gloss finish. The higher gloss level of these primers will mean a reduction in the achievable wet film thickness of the 1st coat of Jotatherm TB550. A test area should be applied to determine the achievable wet film thickness of the first application. Reduction of gloss by sanding can improve coating build up.

Achieving the specified dry film thickness for each member of the structure is essential to achieve the required fire rating. Final applied PFP system may involve several coats to achieve specified fire rating. The nominal DFTs mentioned above are per coat. Final applied coating may involve several coats and will be specified as per the required fire rating.

## Film thickness measurement

### Wet film thickness (WFT) measurement and calculation

Regular checking of wet film thickness during application is required to control the applied thickness, it is recommended to use a pre-cut bridge gauge of 50 mm width made from a putty knife to measure the wet film thickness. This product is a solvent free epoxy of 100 % solids; applied wet film thickness will be equal to dry film thicknesses. All members of the application team (sprayer, troweller, rollers) should be using these gauges to ensure the required film thickness is achieved and maintained.

### Dry film thickness (DFT) measurement

When the coating has cured the dry film thickness can be checked to ISO 19840, or equivalent standard, or as per project specification. There are two principal methods for measuring the thickness of thick film epoxy PFP:

#### 1. Destructive method

Straight holes (1.5-2 mm diameter) are drilled through the applied film of PFP to the substrate, and then the film thickness is measured using a calibrated depth gauge. The holes should be marked and repaired after the measurement.

This method is not recommended as it is time intensive and causes damage to the PFP and primer.

#### 2. Non-destructive method

An electromagnetic or ultrasound dry film thickness gauge is used to measure the dry film thickness of the applied system. Care must be taken to follow the equipment manufacturer's instructions. Any equipment used should have a valid calibration certificate.

This is the recommended method for assessing dry film thickness of the applied system as it is fast, accurate and does not cause any damage.

### Frequency of measurements

The measurements should be taken in a frequency as per the project specification requirements. It is advisable not to take any measurements within 25 mm of any edges or corners of structures. This should be considered as guidance only.

On open profile sections a minimum of one reading should be taken every linear meter along the length of each coated side.

For closed profile sections readings should be taken every linear meter on four points at equal distance around the circumference.

On flat areas (e.g. associated equipment), a minimum of two readings should be taken every one square meter.

### DFT acceptance criteria

The average dry film thickness (DFT) applied to each steel section shall be greater than or equal to the specified dry film thickness. Unless otherwise specifically stated in the project specification the minimum acceptable dry film thickness at any single point should not be less than 85 % of the specified dry film thickness up to a maximum of 1.5 mm less than the specified dry film thickness.

For DFT up to and less than 10 mm the minimum allowable dry film thickness is 85 % of the specified DFT.

For DFT above 10 mm the minimum acceptable thickness is the specified DFT less 1.5 mm.

Where any single thickness reading is found to be less than 85 % or 1.5 mm of the specified DFT, a further three readings shall be taken within 200 to 300 mm around the area of the low reading. If one or more of the additional readings are less than 85 % or 1.5 mm of the specified DFT, further readings shall be made to determine the extent of the area of under thickness. In such cases, low thickness areas identified must be brought up to the specified dry film thickness before proceeding to the next application stage.

Areas of over-application of this product above the specified DFT, do not normally create a problem, providing there has not been any solvent thinning. For maximum DFT, client and users need to discuss with Jotun on a project specific basis.

### Ventilation

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

## Drying and Curing time

Substrate temperature	5 °C	15 °C	23 °C	40 °C
Surface (touch) dry	6 h	3 h	1 h	1 h
Walk-on-dry	36 h	12 h	6 h	3 h
Dry to over coat, minimum	6 h	3 h	1 h	1 h
Dried/cured for service	36 h	12 h	6 h	3 h

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	5 °C	15 °C	23 °C	40 °C
Itself	3 d	3 d	3 d	2 d
epoxy	14 d	14 d	14 d	14 d
epoxy mastic	14 d	14 d	14 d	14 d
polysiloxane	14 d	14 d	14 d	14 d
polyurethane	14	14 d	14 d	14 d
Jotachar	3 d	3 d	3 d	2 d

Refer to your Jotun representative for a detailed specification including approved primer and topcoat systems.

Any topcoat used should be approved by Jotun Technical Sales Support. While the generic type of the topcoat may fit the description in the over coating table, the specific topcoat should still be tested for adhesion.

The maximum over coating times depend on the environmental exposure conditions, type of topcoat, and other factors. The topcoat manufacturer should be consulted.

Jotatherm TB550 has tested ability to withstand severe weather and environmental exposure to stringent industry standards, without a topcoat. The product is only available in a matt buff colour, therefore generally a topcoat is used to meet owners' colour scheme.

Specific areas where top-coating of Jotatherm TB550 is recommended:

- For aesthetic requirements and high UV exposure. (A general characteristic of all epoxy coatings is chalking with prolonged periods of high UV and moisture exposure)
- Areas of high and continuous moisture exposure, such as the upper surfaces of horizontal decks and flanges.
- For splash zone areas, topcoat system to comprise of Jotun Norsok System No. 7A, 2x300 µm epoxy or similar.

Exceeded maximum over coating interval of primers

For maximum over coating intervals of approved Jotun primers when used with Jotatherm TB550, refer to the approved primer's Application Guide (AG).

Always observe the maximum over coating intervals. Any primer surface which has surface chalking or has exceeded its maximum over coating interval will need to be treated by appropriate abrasion method, e.g. Sweepblasting, to ensure good intercoat adhesion. It is recommended that a site adhesion test patch, together with a coating survey, is done after secondary surface preparation of the primer.

Corroded and damaged areas should be blast cleaned back to Sa 2½ (ISO 8501-1) and primer re-applied.

Where the above is not possible, surface treatment such as mechanical grinding/disking or very thorough sand papering should be employed. Use suitable sand paper grade of P100 and P120. Polishing of surface must be avoided and frequent changes of the abrasive papers to be made for a matt surface. Followed by thorough fresh water washing to remove all dust. Surface to be thoroughly dried out prior to the application Jotatherm TB550.

Zinc epoxy primers which have been exposed to high humidity or outdoor weathering, may have zinc salts (white rust) formation on the surface which is detrimental to adhesion. Zinc salts must be removed prior to application of Jotatherm TB550. Careful sanding and/or high pressure water-washing at a minimum of 170 bar (2500 psi) to remove zinc salts. An epoxy tie coat may be applied over the epoxy zinc primer to prevent salts forming.

Depending on primer type, conditions and site practicalities, surface treatment and application of an approved epoxy tie coat may be recommended before application of Jotatherm TB550.

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## Other conditions that can affect drying / curing / over coating

### Adding anti-skid to the coating system

Where non-slip properties are required, Jotun anti-skid can be broadcast into an epoxy coat applied on to Jotatherm. The epoxy coat should be applied followed by aggregate broadcasted onto the wet film, then sealed off with another pass of the spray gun. The anti-skid deck system can be topcoated with a cosmetic finish.

Jotun Anti-skid, medium particle size (400-600 µm). The recommended usage is 2.5 - 3.3 kg per 10 litres of paint.

Jotun Anti-skid, course particle size (700-1000 µm). The recommended usage is 3.0 - 4.0 kg per 10 litres of paint.

### Site conditions and practicalities

It is recommended that Jotatherm is overcoated when sufficiently cured and before the surface is subjected to surface contamination. The use of an epoxy tie-coat may have to be considered before application of topcoat when assessing site practicalities and application practice.

It is good general practice for a 16-hour cure period for all epoxy primers which have been applied at temperatures >10 °C.

### Amine bloom / Sweating

Amine bloom is also referred to as amine blushing or sweating, which is an undesired chemical reaction with water on the coating surface that can lead to insufficient adhesion of the subsequent coat. Contributing factors can be lower than minimum temperature during curing, high content of carbon dioxide in the air, high relative humidity and condensation.

If amine bloom is suspected, wash with warm alkaline detergent and/or high pressure fresh water washing to remove all contaminants. Light abrasion of the surface and removal of dust before overcoating will further secure good intercoat adhesion.

Excessive rolling with solvent, in extreme cases, may cause amine bloom on the surface of Jotatherm. This is not acceptable for subsequent coat adhesion.

### Water/Moisture contamination

When uncured material is subjected to rain or excessive condensation, water may be absorbed. Also, amine blushing may form on the surface adversely affecting the inter-coat adhesion.

In case of water contamination of an uncured product, the following action should be taken;

- Allow the material to cure
- Dry and wipe the surface with solvent
- Remove uncured material
- Repair the affected area (As per Repair of coating system section)

### Removal

Overspray and unwanted coated surfaces with Jotatherm should be removed with a scraper whilst wet. Substrate should immediately be cleaned by Jotun Thinner No. 7, removing all residue.

Once applied and cured this product can be removed if required.

- A disc grinder should be used to cut through the coating to the substrate
- The material can then be removed with a pneumatic chisel, or manually using a hammer and chisel. Care should be taken not to damage the steel substrate
- Edges of Jotatherm repair area to be at an angle of approx. 45°
- Other means of removal may also be considered, please consult Jotun Technical Sales Support

### Repair of coating system

Repair of damaged areas requires complete removal of those areas and restoration of the complete system 'as new'. This includes surface preparation and primer installation.

The following repair procedure is recommended:

- The adjacent border area should be checked to confirm integrity of material and adhesion.
- Mark out the area to be repaired. Masking should be done to protect the surrounding area in a square or rectangular shape.
- Any defective material should be removed using appropriate tools.
- Squaring the repair area is recommended.
- Cut the edges of the repair area at an angle of approx. 45°. Refer to technical drawing FES GEN Repair Procedure of Jotatherm.
- The surrounding area of up to 50-100 mm (depending on technical drawing and specified use) should be roughened using a grinding disc to ensure sound adhesion of the new coat of Jotatherm TB550. After roughening use Jotun Thinner No. 7 to ensure the area is clean.
- Restore the cleanliness, degree of surface preparation and surface roughness of the substrate as per the original specification requirement.
- Apply Jotatherm TB550 to the repair area applied to the same coating thickness as existing. When scrim is used for cold spill protection, install the scrim at the same depth and flush/butted against existing scrim. Ensure the dry film thickness on the repair area meets the specification and the protection requirement.
- Ensure a 50-100 mm overlap to the surrounding area to ensure a suitable weather seal and in line with technical drawing.

### Repair of small areas:

- Areas less than 10 cm<sup>2</sup> may be prepared by power tool cleaning as prescribed in SSPC SP11 with 50 µm surface profile. On the clean dry surface apply Jotatherm TB550 to specified dft.
- Areas larger than 10 cm<sup>2</sup> but less than 1 m<sup>2</sup> may be prepared by power tool cleaning as prescribed in SSPC SP11 with 50 µm surface profile. The affected area should be primed using the approved repair primer followed by Jotatherm TB550 to the specified dft.
- Areas greater than 1 m<sup>2</sup> may be prepared by blast cleaning the affected area to Sa 2½ (ISO 8501-1) using abrasive media suitable to achieve a sharp and angular surface profile. The recommended surface profile is 50-75 µm, grade Fine to Medium G; Ry 5 (ISO 8503-1). Power tools should not be used as a primary surface preparation method for large areas.
- Apply the original specified primer to the specified dft.
- Apply Jotatherm at the specified thickness as per the Jotatherm TB550 Application Guide to the repair area including the feathered edges. Installation of scrim as per original specification.
- Manual application is acceptable at the repair areas providing that a smooth finish is achieved by rolling the surface.
- Apply the specified topcoat at the recommended thickness as per the product application instructions.

### Repair of other materials:

Please consult with Jotun Technical Sales Support.

### Weld cutback

The product should be removed prior to welding. The extent of the cutback varies depending on the nature of welding operation.

For small weld operations, e.g. welding of clips or similar fixation, initially remove 100-150 mm in all directions from welding area, on both sides of the steel. After completion of welding, if any blistering or discoloration of the product has occurred, the cutback should be extended 50 mm beyond these defects.

For larger weld operations, e.g. welding of a pipe support or similar structure, initially cutback 200-250 mm in all directions from welding area, on both sides of the steel. After completion of welding, if any blistering or discoloration of the product has occurred, the cutback should be extended 75 mm beyond these defects.

In the case of welding of pre-coated structure members, a welding cutback allowance is recommended to avoid removing and damaging the applied product, initially a cutback of 300-350 mm either side of the weld is required for welding processes which do not require preheat.

For welding processes which require preheat, the cutback allowance depends on the preheat temperature and duration.

## 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 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.

## 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

m<sup>2</sup>/l = square metres per litre

mg/m<sup>2</sup> = milligrams per square metre

psi = unit of pressure, pounds/inch<sup>2</sup>

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.