****DRAFT ONLY****

Safeguard FRC S

Product description

This is a three component elastomeric silicone tie coat. It provides excellent adhesion for Jotun FRC topcoats.
Can be applied directly onto the following primers:
Safeguard Universal ES
Safeguard Plus

A complete application procedure covering dry docking with Jotun Foul Release Coatings (FRC) is available, ref. TSS-TI-084.

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.

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.

Process sequence

Surface preparation and coating application should normally be done 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 done before coating application. It is recommended that all other areas have been completed/painted (top side, boot top, seachest) before FRC application to avoid contamination.

Coated surfaces

Organic primers/intermediates

Safeguard Universal ES and Safeguard Plus are approved substrates for application of Safeguard FRC S. Application to any other anticorrosive coating or sealer may give inferior adhesion. Safeguard Universal ES can be used as tie coat on existing antifouling prior to application of Safeguard FRC S.

Maximum time before application of Safeguard FRC S on an approved substrate is:

5-40 °C : 3 d

(Temperatures refer to average temperature during drying/curing).

New tie coat or new antifouling

If the over coating interval of the tie coat is exceeded, it is recommended to apply an additional thin coat of the same tie coat before applying the top coat.

Exposed sealer/tie coat

Exposed Jotun FRC Tiecoats
In case of superficial damaged areas exposing the existing tie coat, another new coat of tie coat is required in order to ensure proper adhesion to the aged tie coat. Before any application takes place it should be high pressure fresh water cleaned as per above guidelines. Overlapping with new tie coat on top of existing, intact tie coat should be limited as much as practically possible.

Exposed Safeguard
If the exposed safeguard was earlier overcoated with Jotun FRC tiecoats this area is silicone contaminated and must be overcoated with Jotun FRC tiecoats again, alternatively remove the total system down to steel and rebuild.

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 - 50	°C
Relative Humidity (RH)	30 - 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

Product mixing

Before application, the three components must be thoroughly mixed as explained here below:
Stir component A at least for one minute.
Component B is added to the component A container (20L) and mixed thoroughly by vigorous stirring.
Component C is then added to the mixture (A+B) and mixed thoroughly to ensure the mixed product is homogenous before use.

Product mixing ratio (by volume)

Safeguard FRC S Comp A	16.7 part(s)
Safeguard FRC S/PE Comp B	0.6 part(s)
Safeguard FRC S/PE Comp C	0.9 part(s)

Induction time and Pot life

Paint temperature	10 °C	15 °C	23 °C	30 °C	40 °C
Pot life	1 h	1 h	1 h	45 min	30 min

Induction time: Not required

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

Thinner/Cleaning solvent

Do not add thinner.

Cleaning solvent: Jotun Thinner No. 10

Application data

Spray application

Airless Spray Equipment

Pump ratio (minimum) :	42:1
Pressure at nozzle (minimum) :	210 bar/3000 psi
Nozzle tip (inch/1000) :	15-23
Nozzle output (litres/minute) :	1.0-2.2
Filters (mesh) :	70-100

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

Film thickness per coat

Typical recommended specification range

Dry film thickness	90	µm
Wet film thickness	150	µm
Theoretical spreading rate	6.4	m²/l

Film thickness measurement

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). The measurements should be done as soon as possible after application.
Fast drying paints may give incorrect (too low) readings resulting in excessive dry film thickness. For multi layer physically drying (resoluble) coating systems the wet film thickness comb may give too high readings resulting in too low dry film thickness of the intermediate and top coats.
Use a wet-to-dry film calculation table (available on the Jotun Web site) to calculate the required wet film thickness per coat.

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.

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	5 °C	10 °C	15 °C	23 °C	30 °C	40 °C
Surface (touch) dry	12 h	8 h	6 h	4 h	3 h	2 h
Dry to over coat, minimum	24 h	18 h	16 h	12 h	9 h	6 h

Drying and curing times are determined under controlled temperatures and relative humidity below 85 %, and above 30 %, and at average of the DFT range for the product.

For detailed overcoating instructions when rain is expected refer to TSS-TI-084.

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

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

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.

Areas for immersed exposure

Average temperature during drying/curing	5 °C	10 °C	15 °C	23 °C	30 °C	40 °C
Itself	7 d	7 d	7 d	7 d	7 d	7 d
silicone resin based FRC	4 d	4 d	4 d	4 d	4 d	4 d

1 Self on self a mist coat of Safeguard FRC S can be applied to renew the overcoating interval.

2 The recommendations for "silicone resin based FRC" are for SeaQuest series only.

3 For detailed overcoating instructions in humid conditions refer to TSS-TI-084.

Other conditions that can affect drying / curing / over coating

Repair of coating system

For comprehensive repair procedures reference is made to TSS-TI-084.

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

TDS = Technical Data Sheet
AG = Application Guide
SDS = Safety Data Sheet

°C = degree Celsius
° = unit of angle
µm = microns = micrometres
g/l = grams per litre
g/kg = grams per kilogram
m^2/l = square metres per litre
mg/m^2 = milligrams per square metre
psi = unit of pressure, pounds/$inch^2$
Bar = unit of pressure
RH = Relative humidity (% RH)
UV = Ultraviolet
DFT = dry film thickness
WFT = wet film thickness

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.