

SeaLion Repulse

Product description

This is a three component nano repellent, elastomeric silicone fouling release coating. It is biocide free and provides excellent fouling protection and hull performance. This is achieved by a smooth, low friction surface reducing hull deterioration and speed loss. To be used as finish coat in immersed environments. Suitable on approved primers and tie coats on aluminium and carbon steel substrates.

Scope

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

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 SeaLion application to avoid contamination.

Coated surfaces

Over coating

Proper adhesion can only be achieved by a silicone based topcoat after the system has been sufficiently aged. It must be documented that the FRC has been exposed for 24 months or more.

Organic primers/intermediates

Safeguard Universal ES can be used as tie coat on existing antifouling prior to application of the SeaLion system. SeaLion Tiecoat is the only approved substrate for SeaLion Repulse. Before application of the coating system it is important that all surfaces are clean and dry.

Aged antifouling with leached layer

The spent, skeletal, porous layer at the surface of aged antifouling known as leach layer can cause popping/pinholes/bubbling when over coated. Furthermore the leached layer will be weaker in cohesive strength than a new antifouling system. Therefore, all efforts should be made to properly remove the leach layer. Various factors will determine the leached layer's thickness and its strength and integrity; mainly the antifouling's binder technology, but also the vessel's speed and the water temperature where the ship was trading (slow speeds and cold waters often result in thicker leach layer). Leached layers should be removed by very thorough high pressure freshwater washing.

Note that the use of a tie coat is no substitute for proper washing of aged antifouling. Sealer coatings are not significantly better at sealing porous surfaces than are antifoulings. Popping or compromised adhesion may still result. Furthermore, sealing aged antifouling has the disadvantage of blocking off antifouling that might become exposed, and therefore provide fouling protection later in service.

Practically Jotun recommends doing a test spray with thinned antifouling on the washed and dry surface in order to check for potential popping. Please note that the popping itself will have no negative effect on the performance of the antifouling properties however it will have a negative visual effect.

Aged antifouling: Cracked, flaked or "sandwiched" coating systems

It should again be highlighted that if the coating exhibits weak adhesion or has been spot repaired for more than 3 dockings or 15 years, the general recommendation is to blast the surface to Sa 2 as per ISO 8501-1.

Aged antifouling systems of suspect physical integrity which exhibit cracking, flaking and/or heavy 'sandwiching' of multiple layers are best fully removed by grit blasting to Sa 2 or by water-jetting back to WJ 2. An alternative solution to remove existing antifouling paints by sweeping the surface by the means of hydrojetting or abrasive blast cleaning using fine grit. The sweeping should be done down to intact primer system, the method should be with focus on not to create unnecessary surface roughness.

Cracking in an antifouling should not be confused with surface "checking" which would appear as superficial cracks in top of the surface, but not penetrating the full coating layer. A checked surface should be carefully washed in order to remove salts or other contamination but would then be possible to over coat.

Exposed sealer/tie coat

In case of through polishing exposing the existing tie coat another new coat of tiecoat is required in order to ensure proper adhesion to the aged sealer/tiecoat. Before any application takes place it should be high pressure fresh water cleaned as per above guidelines. Overlapping with new sealer coat on top of existing, intact antifouling should be limited as much as practically possible.

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.

Standard grade

Air temperature	0 - 50	°C
Substrate temperature	0 - 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 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

Product mixing ratio (by volume)

SeaLion Repulse Comp A	17	part(s)
SeaLion Repulse Comp B	0,7	part(s)
SeaLion Repulse Comp C	0,75	part(s)

Induction time and Pot life

Paint temperature

23 °C 40 °C

Pot life	1 h	30 min
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The temperature of base and curing agent is recommended to be 18 °C or higher when the paint is mixed.

Thinner/Cleaning solvent

Do not thin

Cleaning solvent: Jotun Thinner No. 7

Application data

Airless Spray Equipment

Pump ratio (minimum) :	42:1
Pump output (litres/minute) :	1.0-2.2
Pressure at nozzle (minimum) :	210 bar/3000 psi
Nozzle tip (inch/1000) :	15-21
Filters (mesh) :	70-100

Material hose length :

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

- long paint- and whip hoses
- low inner diameter hoses
- high paint viscosity
- large spray nozzle size
- inadequate air capacity from compressor
- wrong or clogged filters

Recommended film thickness per coat

Film thickness and spreading rate	Dry film thickness (μm)	Wet film thickness	Theoretical spreading rate (m^2/l)
Typical	150	210	4,8

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.

Correct average wet film thickness can be secured by paint volume distribution based on area and consumption.

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 cm 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	0 °C	10 °C	15 °C	23 °C	40 °C
Surface (touch) dry	8 h	6 h	5 h	3 h	1 h
Dried/cured for immersion	36 h	28 h	24 h	20 h	16 h

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

Surface (touch) dry: The state of drying when slight pressure with a finger does not leave an imprint or reveal tackiness. Dry sand sprinkled on the surface can be brushed off without sticking to or causing damage to the surface.

Dried/cured for immersion: Minimum time before the coating can be permanently immersed in sea water.

Maximum over coating intervals for immersed exposure

Substrate temperature	0 °C	10 °C	15 °C	23 °C	40 °C
Itself	1.5 d	1 d	12 h	8 h	4 h

Other conditions that can affect drying / curing / over coating

Repair of coating system

For comprehensive repair procedures reference is made to SeaLion Code of Practice.

Quality assurance

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

- Confirm all welding and other metal work, whether internal or external to the tank, has been completed before commencing pre-treatment and surface preparation of the substrate
- Confirm installed ventilation is balanced and has the capacity to deliver and maintain the RAQ
- Confirm the required surface preparation standard has been achieved and is held prior to coating application
- Confirm that the climatic conditions are within recommendation in the AG and held during the application
- Confirm the required number of stripe coats have been applied
- Confirm each coat meets the DFT requirements of the specification
- Confirm the coating has not been adversely affected by rain or any other agency during curing
- Observe 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°
- Observe the coating is free from defects, discontinuities, insects, spent abrasive media and other contamination
- Observe the coating is free from misses, sags, runs, wrinkles, fat edges, mud blistering, blistering, obvious pinholes, excessive dry spray, heavy brush marks and excessive film build
- Observe the uniformity and colour are satisfactory

All noted defects should 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

Some coatings used as the final coat may fade and chalk in time when exposed to sunlight and weathering effects. Coatings designed for high temperature service can undergo colour changes without affecting performance. Some slight colour variation can occur from batch to batch. When long term colour and gloss retention is required, please seek advice from your local Jotun office for assistance in selection of the most suitable top coat for the exposure conditions and durability requirements.

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

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.