

Resist 5 WF

Product description

This is a two component waterborne inorganic zinc alkali silicate coating. It has zero VOC. It is a fast curing, very high zinc dust containing product. It conforms to the compositional requirements of SSPC paint 20, level 3, ISO 12944-5 and AS/NZS 3750.15. It provides supreme corrosion protection. It is heat resistant up to 540 °C (1004 °F). To be used as single coat system in atmospheric and immersed environments. This product complies with ASTM D520 type II zinc dust.

Scope

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

The data and information provided are not definite requirements. They are guidelines to assist with efficient and safe use, and optimum service of the product. Adherence to the guidelines does not relieve the applicator of responsibility for ensuring that the work meets specification requirements. 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 substrates, maintaining already coated substrates or aged coatings it is necessary to remove all contamination that can interfere with coating performance, and prepare a sound surface for the subsequent product. Application of the protective coating shall commence before degradation of the surface occurs.

Pure fresh water, if required with an alkaline detergent added, is suitable for general cleaning. Paint solvents (thinners) are not recommended for general degreasing or other surface preparation due to the risk of spreading soluble hydrocarbon contamination. Paint thinners can be used to treat small amounts of contamination such as dye penetration and marker pen inks. 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 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.

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:

Potable water tanks: 20 mg/m²

Chemical tanks: 50 mg/m²

Carbon steel

Initial rust grade

The steel shall preferably be Rust Grade A or B according to ISO 8501-1. The use of Rust Grade C steel requires more thorough preparation work and possibly also more paint application in order to achieve the specified DFT. The risk of chloride contamination with Rust Grade C steel is significantly higher, so if steel of Rust Grade C is used the frequency of inspection and testing for chloride contamination on the surface should be increased and emphasized in the Inspection and Test Plan (ITP).

Metal finishing

All welds, sharp edges and corners shall be prepared to conform to ISO 8501-3 Table 1 minimum grade P3 or NACE RP0178 grade C comparator.

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.

All edges shall be treated to a rounded radius of minimum 2 mm, or subjected to three pass grinding or at least equivalent process. 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 washing by low-pressure Water Cleaning LP WC method to ISO 8501-4, Wa1 using fresh water, especially if the welding seams have been smoothed by disc grinding.

Abrasive blast cleaning

Cleanliness

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

Surface profile

The surface shall have a sharp and angular surface profile 30-85 µm, grade Fine to Medium G (ISO 8503-2). Measure the achieved profile with surface replication tape (Testex) (ISO 8503-5) or by surface roughness stylus instrument (ISO 8503-4).

Dust contamination

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

Hand and Power Tool Cleaning

Power tool cleaning

Minor coating damage may be prepared to St 3 (ISO 8501-1). Mechanical repairs are only accepted for minor areas of damage where abrasive blasting would have created more damage to the coating system.

Coated surfaces

Shop primers

Shop primers may have been used as temporary protection of the steel plates. Prior to application of inorganic zinc silicate the shop primer shall be removed by blast cleaning to Sa 2½ (ISO 8501-1) using abrasive media suitable to achieve a sharp and angular surface profile 30-85 µm grade Fine to Medium G; Ry5 (ISO 8503-2).

Inorganic zinc silicates

For maintenance and repair inorganic zinc silicate can be applied onto intact, clean and undamaged "old" inorganic zinc silicate substrates provided the over coating is done as per the Repair of coating system paragraph.

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	10 - 60	°C
Substrate temperature	10 - 50	°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

Product mixing

Product mixing ratio (by volume)

Resist 5 WF Comp A	6.25 part(s)
Resist 5 WF Comp B	3.75 part(s)

Induction time and Pot life

Paint temperature **23 °C**

Pot life 5 h

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

Thinner/Cleaning solvent

Thinner: Water

Do not add thinner.

Application data

Spray application

Air Spray Equipment

Pressure at nozzle (minimum) :	3.8 bar/30 psi
Nozzle tip:	22-70 (inch/1000)

Airless spraying is not recommended.

Water borne alkali metal zinc silicate should only be applied with air spray equipment (HVLP). Spray guns should be fitted with Air Cap, Material Nozzle and Material Needle suitable for zinc. Paint delivery to the gun can be via a pressure pot or via a non-metallic diaphragm pump. Pressure pots shall be fitted with an air powered internal impeller or reciprocating mixing paddle that is set at slow speed to avoid trapping air in the coating. If using a diaphragm pump the paint container shall be fitted with a slow speed impeller.

Do not use application equipment that has been used with solvent borne coatings. Jotun recommends that material hoses are replaced and new. It is preferable to have a set of equipment that is only used for applying water borne zinc. Flush liberally with clean water during any stoppage / down time.

Water borne alkali metal silicate has a strong attraction to metals. Atomized coating can build up on the air cap and gun during use. The use of a Teflon coated air cap and nylon or other non-metallic material nozzle and needle / needle tip will avoid build up during use.

Film thickness per coat

Typical recommended specification range

Dry film thickness	50 - 200	µm
Wet film thickness	65 - 265	µm
Theoretical spreading rate	15 - 3.75	m ² /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 cm from the weld.

Application / Drying / Curing considerations

Test of curing:

Pencil hardness and water insolubility test as per AS/NZS 3750.15.

To ensure complete curing throughout the film additional Coin Test is recommended. The film is scraped harshly with a coin. The coin shall produce a shiny mark without any loosened zinc.

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	10 °C	23 °C	40 °C
Surface (touch) dry	40 min	15 min	10 min
Walk-on-dry	2 h	45 min	20 min
Dried to handle	24 h	3 h	3 h
Dried/cured for service	10 d	5 d	3 d

Drying and curing times are determined under controlled temperatures and relative humidity below 60 %, and at average of the DFT range for the product.

Higher temperature and lower humidity will assist in removing moisture from the film.

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.

Dried to handle: Minimum time before the coated objects can be handled without physical damage.

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

Other conditions that can affect drying / curing / over coating

Repair of coating system

Damages exposing bare substrate:

A damaged inorganic zinc coating is relatively difficult to repair. Minor mechanical damages are addressed below. For major damages (larger than 40 cm²) or scattered mechanical damages the optimum repair is vacuum blasting of affected areas, followed by feathering of an overlapping zone. The coating should then be touched up with the same product with a careful overlapping of 2 cm on existing coating.

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

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

TDS = Technical Data Sheet
AG = Application Guide

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

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.
