



# 205 Ceramic HT Fluid

Brush Applied Epoxy Novolac Coating Immersion Grade

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## Introduction to 205 Ceramic HT Fluid

205 Ceramic HT Fluid is a 2 component solvent free epoxy novolac coating. The product has been designed to be applied to process equipment, pipelines and structures subject to erosion and corrosion.

The product once cured is suitable for immersion conditions in water, saltwater and aqueous hydrocarbon mixtures at temperatures up to 130°C.

The coating contains ceramic particles to give a hardened finish to metallic surfaces subject to abrasion from high particulate liquids and slurries.

### Key Markets for this material—

Oil & Gas

Power

Chemical

Petrochemical



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## Surface Preparation

### Metallic Substrates – Abrasive blast cleaning

- All oil and grease must be removed from the surface using an appropriate cleaner such as MEK.
- All surfaces must be abrasive blasted to **ISO 8501/4 Standard SA2.5 (SSPC SP10/ NACE 2)** minimum blast profile of 75 microns (3mil) using an angular abrasive.
- Once blast cleaned, the surface must be degreased and cleaned using MEK or similar type material.
- All surfaces must be coated before gingering or oxidation occurs.

**PLEASE NOTE:** For salt contaminated surfaces the substrate must be pressure washed with clean water and checked for salt contamination, please refer to the surface preparation and pre-application guide for further information.

## Mixing

Prior to mixing please ensure the following:

- The base component is at a temperature between 15-25°C (60-77°F).
- The ambient & surface temperature is above 10°C (50°F).
- The ambient & surface temperatures are not less than 3°C (6°F) above the dew point.

Once these 3 checks have been met, please proceed with mixing the product.

- Transfer the contents of the Activator unit into the Base container.
- Using the spatula provided, mix the 2 components until a uniform material free of any streaks is achieved.
- From the commencement of mixing the material should be used within 35 minutes at 20°C (68°F).

## Application

- Stripe coat all edges, corners and equipment.
- Apply the coating at 300-500 microns (12-20mil) WFT using a short bristle brush.
- Allow the stripe coat to cure for 4 hours at 20°C (68°F).
- The first coat of material should be applied at a target thickness of 500 microns (20mil) using a short bristle brush.
- Ensure the coating is forced into the blast profile.
- Special attention should be paid to detailed areas such as edges, corners and welds where brush application by stippling may be required.
- Allow the 1<sup>st</sup> coat of material to cure for approximately 4 hours at 20°C (68°F).
- Once the 1<sup>st</sup> coat has cured hard enough apply a 2<sup>nd</sup> coat of material at a target thickness of 500 microns (20mil).

## Coverage Rates

1kg (2.2lb) of fully mixed product will give the following coverage rates –

0.918m<sup>2</sup> at 500 microns            9.87ft<sup>2</sup> at 40mil

**Please note that the coverage rates quoted are theoretical and do not take into consideration the profile or condition of the surface being repaired.**

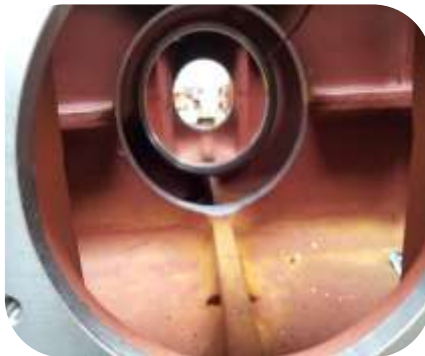
# Technical Specifications

|                                 |  |   |
|---------------------------------|--|---|
| Abrasion Resistance             | Taber H10 Wheels/ 1kg load wet   | 28mm <sup>3</sup> loss / 1000 cycles  |
| Tensile Shear Adhesion          | ASTM D1002—Blast cleaned steel/ 75 micron profile  | 245kg/ cm <sup>2</sup> (3480psi)  |
| Pull off Adhesion               | ASTM D4541—Blast cleaned steel/ 75 micron profile  | 348kg/ cm <sup>2</sup> (4950psi)  |
| Compressive Strength            | ASTM D695  | 1046kg/ cm <sup>2</sup> (14,880psi)   |
| Corrosion Resistance            | ASTM B117  | Minimum 5000hrs   |
| Flexural Strength               | ASTM D790  | 614kg/ cm <sup>2</sup> (8710psi)  |
| Impact Resistance               | ASTMD256   | 32J/M   |
| Hardness Shore D                | ASTM D2240   | 20°C 82    100°C 87<br>150°C 86    200°C 82   |
| Heat Distortion                 | ASTM D648<br>At 264psi fibre stress  | 20°C Cure 53°C<br>100°C Cure 141°C  |
| Continuous Immersion Resistance |  | Full immersion test<br>Water/ hydrocarbon 130°C                                     |
| Dry Heat Resistance             | ASTM D2485   | 240°C<br>PASS   |
| Steam Out Resistance            |  | Tested at 220°C/ 100hrs exposure<br>PASS (No blisters)                              |
| Pressurized Atlas Cell Test     | NACE TM 0174-02<br>110°C    290psi<br>Gas Phase: 100% CH <sub>4</sub><br>Hydrocarbon phase: Kerosene/ Toluene<br>Water Phase: NaCl solution at 8000ppm | Blistering: None<br>Cracking: None<br>Delamination: None                            |
| Explosive Decompression         | NACE TM 0185   | PASS (No blisters)  |
| Thermal Cycling                 | NACE TM 0304   | PASS (No blisters)  |
| Approvals                       | BUREAU VERITAS   | Surface protection and cold repair to Marine Vessels<br>Certificate No: 55258/AO BV |

# Global Projects

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## Oil Refinery Sea Water Filters—Middle East



### PROJECT

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Middle East Oil Refinery sea water intake lines  
30 sea water filters operating at 75°C to 92°C  
Mixture of seawater, sand & gravel  
Operating at flowrates of 2mtrs per second



### Reason for Choosing 205 Ceramic HT Fluid

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Abrasion Resistant finish due to hardened ceramic particle content

High temperature immersion resistance 130°C

Proven to protect metallic surfaces from highly abrasive environments

### Application Details

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Initial coat of 205 Ceramic HT Fluid applied by brush at 500-600 microns wet film thickness

Surface was checked for pinholes using a digital wet sponge tester

All pinholes and misses were rectified on the 1st coat of material

Coated surface was abrasive blast cleaned at low pressure

2nd coat of 205 Ceramic HT Fluid applied at 250-350 microns wet film thickness

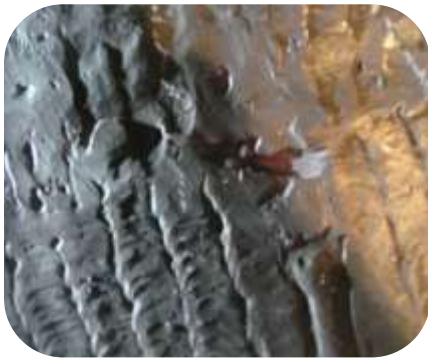




# Global Projects

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## FPSO Seawater Process Vessels—BW Offshore Singapore



### PROJECT

FPSO docked at the Keppel Shipyard in Singapore  
6 seawater process vessels required relining  
Mixture of seawater, hydrocarbons & sand  
Operating at flowrates of 2mtrs per second  
Operating at 65°C to 85°C

### Reason for Choosing 205 Ceramic HT Fluid

Abrasion Resistant finish due to hardened ceramic particle content

High adhesion to mechanically prepared surfaces

Capable of resisting abrasive liquids at elevated temperatures



### Application Details

All surfaces were mechanically abraded using MBX Bristle Blasters

A scrub layer of 205 Ceramic HT Fluid was applied to the steel surface to fill the blast profile AT 100 microns WFT

While the scrub layer was still wet a thicker film of material was applied using a short bristled brush

205 Ceramic HT Fluid applied at 500-600 microns wet film thickness

Surface was checked for pinholes using a digital wet sponge tester



# Global Projects

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## Heat Exchanger Tube Sheet—Conoco Phillips United Kingdom



### PROJECT

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UK oil refinery had identified a heat exchanger body that needed relining

The heat exchanger had been operating at temperatures up to 100°C

The refinery needed a high temperature resistant coating which could withstand the high immersion temperatures

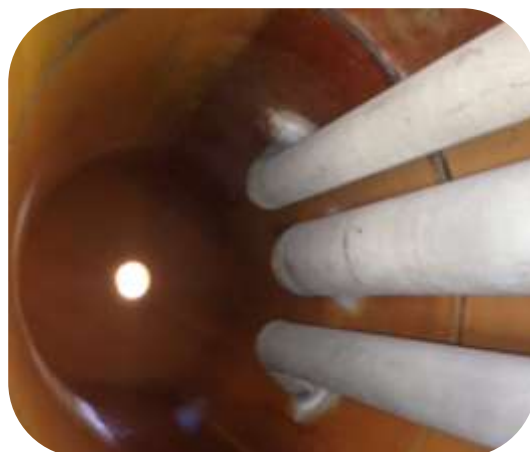
### Reason for Choosing 205 Ceramic HT Fluid

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Abrasion Resistant finish due to hardened ceramic particle content

Resimac was able to demonstrate the track record and success of the coating material

The product was cost effective when compared to the existing coating system used on the refinery site



### Application Details

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All surfaces were abrasive blast cleaned to SA2.5 surface cleanliness, 75 micron profile

205 Ceramic HT Fluid was applied to the surface at 500-600 microns wet film thickness

Once cured the entire coated surface was abrasive blast cleaned at low pressure

2nd coat of 205 Ceramic HT Fluid applied at 250-350 microns wet film thickness

# Global Projects

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## Process Vessel—Suncor, Ontario, Canada



### PROJECT

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Process vessel operating at 95°C had become corroded on the internal surfaces

The existing epoxy liner has failed in the lower half of the vessel

The process vessel required abrasive blast cleaning and coating in-situ

### Application Details

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The client required a quick turn around so a single coat application was recommended

The blast profile was filled with a thin layer of 205 Ceramic HT Fluid at 90-120 microns WFT

While still wet a higher film thickness of 205 was applied by brush at 700-800 microns WFT



## Pipework and Pipe Fittings—Oil Refinery Ecuador



### PROJECT

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Pipe fittings and pipe bends for an oil refinery in Ecuador required lining prior to installation

The operating temperature of the Hydrocarbons processed through the pipe work was 105°C

### Application Details

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All surfaces were abrasive blast cleaned on site to SA2.5 Surface cleanliness

Application recommendation was for 2 coats of 205 Ceramic HT Fluid to be applied to the internal surfaces

1st coat of product was applied at 500-600 microns WFT

Surfaces were abrasive blast cleaned at low pressure

2nd coat of product was applied at 200-300 microns WFT





# Global Projects

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## Pipe Spools & Pipe Work—Jakarta, Indonesia

### PROJECT

Offshore operator based in Indonesia needed a solution to lining 2" to 24" pipe spools

Seawater, sand & hydrocarbons were operating at 90-95°C

An epoxy novolac coating with high abrasion and temperature resistance was specified by the client



### Reason for Choosing 205 Ceramic HT Fluid

Resimac Asia Pacific distributor working in partnership with the local authorised contractor were able to respond rapidly to the request

Onsite support and inspection service provided by the local contractor and regional distributor

Proven application method based on extensive field trials witnessed by the client



### Application Details

All surfaces were abrasive blast cleaned to SA2.5 surface cleanliness, 75 micron profile

The internal surfaces were coated with 500-600 microns of 205 Ceramic HT Fluid

Internal surfaces of the pipe were QC checked using digital wet sponge testers

Any misses or pinholes were rectified after the 1st coat

Pipe surface abrasive blast cleaned at low pressure

Final coat of 205 Ceramic HT Fluid applied at 200-300 microns WFT

# Product Description & Characteristics



## Product Description

2 component solvent free epoxy novolac coating

High build

100% solids

Designed to upgrade existing equipment and metallic surfaces

## Product Characteristics

|  |             |
|--|-------------|
| <b>Volume Capacity (cc per kg)</b>                   | <b>459</b>  |
| <b>Base density (gm per cm<sup>3</sup>)</b>          | <b>2.48</b> |
| <b>Activator density (gm per cm<sup>3</sup>)</b>     | <b>0.99</b> |
| <b>Mixed product density (gm per cm<sup>3</sup>)</b> | <b>2.46</b> |
| <b>Dry heat resistance (°C)</b>                      | <b>240</b>  |
| <b>Intermittent wet heat resistance (°C)</b>         | <b>160</b>  |
| <b>Immersion temperature resistance (°C)</b>         | <b>130</b>  |
| <b>Mixing ratio by volume</b>                        | <b>4:1</b>  |
| <b>Mixing ratio by weight</b>                        | <b>10:1</b> |

## Product Cure times

|            | 20 °C    |           |           | 30 °C    |           |           | 40 °C    |           |           |
|------------|----------|-----------|-----------|----------|-----------|-----------|----------|-----------|-----------|
|            | Pot life | Touch dry | Immersion | Pot life | Touch dry | Immersion | Pot life | Touch dry | Immersion |
| <b>205</b> | 35mins   | 4hrs      | 3 days    | 17mins   | 2hrs      | 1.5 days  | 8.5mins  | 1hrs      | 18hrs     |

# Resimac Technical Support and Expertise

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Formed in 2009 and based in the North of England, Resimac manufactures a wide range of solvent free epoxy and polyurethane coatings and engineering materials for the Marine, Chemical, Water, Power, Oil and Gas Industries.



We are able to offer expert technical advice onsite or online 24 hours a day, 7 days a week.



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Metal Repair

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Thermal Protection

Underwater Repair & Protection

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