LOCKWELL

TECHNICAL DATA SHEET

# LOCKWELL FC 909

Fast Cure Sprayed Ceramic

## Product Description

Lockwell FC 909 is a plural component system composed of a proprietary polymeric binder, providing excellent performance in highly corrosive, chemical and abrasive environments, at ambient or elevated temperatures. This product is designed for industrial use at elevated temperatures and will maintain its physical properties under continued exposure at high constant temperature both in exposed as well as immersion conditions.

Lockwell FC 909 is resistant to many solvents, hydrocarbons, steam, chemicals including high levels of Hydrochloric Acid, Sulphuric Acid, Alkalis, Mineral Spirits, Cutting oil, Sulphur fumes, Seawater, in ambient or elevated temperatures. Lockwell FC 909 has good bond to rubber, metals as well as concrete and also suitable in cryogenic applications. Lockwell FC 909 is excellent for lining vessels in direct constant contact with Hydrochloric acid at elevated temperature and acid fumes.

## Application Area

- Internal / External coating for flow lines and transmission lines
- External coating for flow lines and transmission lines
- Petroleum and chemical tanks
- Petroleum and chemical process equipment
- Petroleum and chemical bulk carriers
- Offshore rigs and platforms
- Sour gas pipelines and process equipment
- Patching pipes, fill castings, repair, bond broken parts

## Features

- Fast curing Spray grade
- Back to service in 24 hours
- Excellent chemical resistance to wide range of chemicals
- Suitable for HCL at elevated temperature
- Good bond to rubber
- High temperature resistance- up to 200°C
- Inflammable without carbonization
- Good abrasion and impact resistance
- 100% solids, No VOC content
- Lockwell FC 909 maintains strong adhesive strength and can be used for pitted steel
- Lockwell FC 909 is machine able and can be used as a repair or rebuilding compound

## Technical Data

| | |
|---|---|
| Mixing Ratio (V:V) | 5.7A : 1B |
| Pot Life | 15 - 20 minutes (500 ml mix) |
| Tack Free time | 35 – 40 minutes |
| Maximum recommended recoat window | 45 – 50 minutes |
| Return to Service time | 4 – 6 hours |

## Performance Data

| | |
|---|---|
| Solids by volume | 100% |
| Volatile Organic Compounds | 0 gm/ lit |
| Theoretical coverage @1000 microns | 1m$^2$/ lit |
| Specific Gravity (kg/ liter) | A-1.7, B-1.08 |
| Viscosity at 25°C in cps) | A:300,000, B:4000 |
| Shelf life @ 25°C | 12 to 18 Months |
| Tensile strength ( ASTM D 638 ) | 30 to 35 MPa |
| Adhesive shear strength (ASTM D 1002) | 12-14 MPa |
| Flexural strength (ASTM D 790) | 50-60 MPa |
| Elongation (ASTM D 638) | 3-5% |
| Hardness (ASTM D 2240) | 90 Shore D |
| Water Vapour Permeability (ASTM E 96) | < 0.5 perm-in |
| Water Absorption -24 hours (ASTM D 471) | < 0.5% |
| Thermal Fatigue ( -35°C to 120°C, 20 cycles) | Pass |
| Pinhole Pressure Test @ 100 Kgf/cm$^2$ | Pass |
| Impact Resistance Izod D 256 | 5-7 |
| Fire Rating UBC | Class 1 |
| Flash point Pensky Martin | NA |
| Service temperature | 175°C constant, Spike-200°C Immersion-150°C |
| Abrasion Resistance (ASTM D 4060) | < 45 mg loss Taber CS 10 wheel 1Kg/1000 rev |

## Application Guideline

This product can be applied by common airless spray equipment, brush, roller or trowels. The Lockwell recommended spray equipment is GRACO EXTREME MIX 440/360 which will completely avoid material loss due to exothermic heat, Gelling and pot life. An airless pump 45:1 or higher is recommended. Trowelable grade material is also available for a higher DFT, metal repair and rebuilds application. Lockwell FC 909 is applied over properly repaired substrates in the method most suitable for the application type. Complete application details are provided in SDS. (Supplementary data sheet). A standard abrasive blast is the preferred method of preparing surfaces prior to application of the product and mandatory in dynamic applications. Preparation can also be accompanied by use of proper hand tools to remove all oxidation or other loose particulates.





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Follow any surface preparation with proper solvent (MEK, Acetone) wipe to remove residues and prior to application of the products. Surfaces must be sound, dry, clean, free of oil, grease, dirt, mildew, and other foreign substances. Abrasive blast cleans the substrates to Sa 2½ BS 7079: Part A1: 1989 (ISO 8501-1: 1988). The average surface profile to be in the range 50-75 µm. Manually prepared surfaces should be to a minimum standard of St 3 BS 7079: Part A1: 1989 at the time of coating.

**Mixing Instruction**

Mixing ratio for Lockwell FC 909 is 5.7:1 by volume. Add 5.7 parts of Base (A) to 1 part of Hardener (B) to a wide mouthed mixing container. Mix gently the Side A (base) using a heavy duty slow speed drill fitted with a mixing paddle or commercially available paint mixers. Add side B (hardener) to side A and mix it thoroughly until a streak free homogeneous colour is obtained. Lockwell FC 909 is ready to be applied. Mix only the quantity that can be used during the pot life. Discard material when the mixed material start gelling and do not try to reuse by adding thinner. Mixing this product manually by hand is not recommended. When environment temperature is 10°C or lower, the product can be indirectly heated to 20-25 °C. This will make mixing easier and accelerate the curing and may have effect on Pot life. The mixed material will develop high exothermic heat and it is advisable to use small quantity to prevent wastage and mix it in a wide mouth container keeping the mixing vessel in cold/ice water where possible.

## Storage and Handling Precautions

Twelve to eighteen months in factory delivered, unopened drums. Keep away from extreme heat, freezing, and moisture. The use of drum heaters is encouraged to reduce material viscosity at low temperatures.

Do not open until ready to use, and store in a sealed container after opening. Do not leave it on open sun. Not good for applications below 7°C.

## Packing

Lockwell FC 909 is available in 13.40 liters (21.60 kg) and 6.70 Liters kits (10.8 kg) shipped in metal/Plastic pails of 11.4 liters (19.44 kg) of Part A and 2 liters (2.16 kg) of part B or 5.7 liters (9.72 kg) of part A and 1 liter (1.08 kg) of Part B.

## Chemical Resistance

Each Lockwell product formulation has varying levels of resistance to specific chemicals. Please review the chemical immersion test data included in the Lockwell Test Book for general resistance to specific chemicals at specific concentration levels. Chemical concentrations are complex and when combined with temperatures above ambient levels this complexity increases exponentially. Contact Lockwell Technical Personnel for specific recommendations for chemical resistance prior to specifying these products in this application type. Consult with NCSI for more details on product and chemical resistance. A minimum of 24 hours curing required for full physical properties. Lockwell FC 909 may be force cured at 80°C for 6 hours for faster curing. The following chart is the results of Lockwell FC 909 immersed in chemicals and tested as per ASTM D 3912

| Chemicals | Resistance |
|---|---|
| Hydrochloric acid up to 33% at elevated temperature | R |
| Sulphuric Acid 70% | R |
| Sulphuric Acid 50% at elevated temperature | R |
| Nitric Acid 15% | R |
| Acetic Acid 10% | R |
| Ammonium Hydroxide 50% | R |
| Crude Oil, JetFuel, | R |
| Gasoline, Kerosene, Diesel | R |
| Motor Oil, Lubricants | R |
| Methanol, Ethanol | R |
| Xylene, Toluene | R |
| Acetone, MEK | R |
| Hydrogen Peroxide 30% | R |
| Refined Petroleum products | R |
| Sewage, Waste water | R |
| Most Industrial effluents | R |
| Sea water | R |
| Water @ 150 °C | R |

## Additional Information – Disclaimer

The information provided herein, especially recommendations for the usage and the application of our products, is based upon our knowledge and experience. Due to different materials and equipment used, as well as varying working conditions and environments beyond our control we strictly recommend carrying out intensive trials to test the suitability of our products with regard to the required processes and applications. This data sheet is provided free of charge and we do not accept any liability with regard to the above information or with regard to any verbal recommendation, except for cases where we are liable of gross negligence or false intention.



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