

RAMFILL PLUS NM

COMPOSITE MECHANICAL REINFORCEMENT WITHOUT WELDING



RAMFILL PLUS NM repair systems are Mechanical Non-Metal reinforcement sleeves for operating pipelines, manufactured with RAM-100 Epoxy resin and high resistance synthetic mesh (carbon fiber, fiberglass, Kevlar, or Aramid), per regulations and according to the requirements and specifications of each project or client's choice.

These repair systems can be produced in a continuous roll, long enough to supply coverage for the number of layers per project specifications and required safety regulations, and to cover the entire length of the repair on the pipe.

RAMFILL PLUS NM repair sleeves are designed to

withstand from 1,000 psi (70.3 kg/cm²), to 2,000 psi (140.6 kg/cm²), 3,000 psi (210.9 kg/cm²) or greater pressures, depending on the number of layers applied per repair, and taking in consideration the characteristics of the deficiency or flaw, the diameter, specifications, original conditions, remaining wall thickness, geometry, length of the repair and operating and maximum allowable pressure of the pipeline. The high strength synthetic mesh is pre-primed with RAM-100 Epoxy resin, which reduces the installation time and enhances the adhesion between layers and epoxy resin.

RAMFILL PLUS NM composite reinforcement sleeves can be used for the permanent repair of process, conduction, or distribution pipelines of liquid, gas or a combination of hydrocarbons. These repair systems can be installed in any section of the pipeline and for the following deficiencies found:

- Wall loss or mechanical damage
- Dented or fatigued pipelines
- Transfer zones, reductions, or misalignments
- Distribution and transmission pipelines
- Straight in-line sections, bents, curves, elbows, tees, inserts, flanges
- Process pipelines for: chemical products, oil, gas, water and vapor
- When the operations cannot be stopped
- When the operating pressure cannot be reduced
- On overhead, superficial, underground, off- or on-shore pipelines



Main Characteristic	
Type of Installation	On-site, easy and fast installation on active pipelines without interrupting the operations, in a dry, humid, or wet environment
Curing process	Fast curing process through the exothermic reaction of the components of the composite repair systems, even in a wet environment
Type of Repair	Considered permanent repair systems because of their mechanical and thermal stability
Design characteristics	Recovering the mechanical resistance of the pipe reduced from the loss of material due to the wear and tear or accidental circumstances, and Restoring the stress strength characteristics of the original conditions of the pipe
Design compliance	Complies with the methodology for flaws categorized as Type "A" described in norm ISO/TS 24817:2006 sections 6.5.2 through 6.5.6, 6.5.9.3, and 6.5.9.7, and in norm ASME PCC-02 2011, sections 3.4.1 through 3.4.10.1, as applicable

System Specifications	
VOC	0%
Time of application	30 – 45 minutes @ 24°C (75.2°F)
Application temperature	-5°C (23°F) to 90°C (194°F)
Operating temperature	-5°C (23°F) to 135°C (275°F)
Shelf life	12 months from the date of manufacture stored in a shaded dry place, in the original sealed containers
Thickness	Varies depending on number of layers per application
Number of layers	As required per each repair
Layer thickness	0.060 to 0.075 mm
Length	0.3 m (1 ft.) to the required length to repair the integrity deficiencies found
Geometry	Easily molded to straight, bent, curved, and any shape required for the repair
UV finish	For protection to UV ray exposure, apply a 3-5 mm layer of polyurethane finish

RAMFILL PLUS NM repair systems comply with the following norms and specifications used by *PEMEX*:

- *NRF-059-PEMEX-2012 – Reinforcements without Welding for the Repair of Transmission Pipelines*
- *PEMEX-PEP P.6.0371.2012 – Design and Installation of No Metal Enclosures of Rehabilitation in PEP Facilities Process.*

Contact us to obtain a quote, for additional details, or specific questions regarding **RAMFILL®** steel reinforcement sleeves

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