



DiamondWrap

Clock Spring DiamondWrap® is ideal for plant and refinery repairs involving complicated geometry situations such as tees, flanges, & varying diameter pipe. It is an engineered, wet applied repair system featuring proprietary carbon fiber cloth applied with a two-part epoxy and a high modulus filler material. It is available in multiple kit sizes for any diameter pipe, in any configuration. Engineered repairs follow ISO or ASME guidelines.

Repairs can be used as a pressure-containing repair to seal leaks or as a reinforcing repair to restore the strength of a pipe in the circumferential and axial direction.

Diamond-Wrap can be installed with minimal disruption to the operation of a pipe, without the use of hot work or shut downs, which are critical in a high-consequence process pipe environment.

As the superior alternative to clamps, DiamondWrap is regularly used in plants, refineries, tank farms, terminals and offshore locations around the globe. An engineered repair designed using DiamondWrap will help ensure your pipe is repaired quickly and get you safely to the next scheduled turn-around without unplanned down time.

DiamondWrap has been certified by Lloyd's Register in accordance with the ASME PCC-2 and ISO 24817 standards, and is used world-wide.

- Eliminate unplanned down time for high consequence piping.
- Extend the life of aging and corroding assets.
- Engineered repairs are designed by our qualified engineers following ISO or ASME guidelines.
- Ideal option for repairs involving complicated geometry situations such as tees, flanges and varying diameter pipe.
- No pipe cutting or welding necessary.
- Available in multiple kit-sizes for any diameter pipe or configuration.
- Engineered Repair Design Report (ISO or ASME) is available.
- Service temperature limit up to 580° F / 304° C.
- Excellent adhesion to virtually any substrate.
- Carbon fiber system with negligible creep ensuring long service life.

LEAK REPAIR

DiamondWrap can be used for leak repair, even in challenging environments with complicated pipe architecture and through-wall defects, after the active leak has been stopped.

COMPLEX GEOMETRIES

Facilities often feature complicated design of pipe works with tees, flanges and valves. DiamondWrap is very useful for a quick, economical repair in these applications.

HARSH CHEMICALS

Internal corrosion caused by harsh chemicals pose a threat to high consequence piping. DiamondWrap has excellent chemical resistance in the event of substrate failure.



CLOCK SPRING DIAMONDWRAP SUBSYSTEMS

DETAILS	STANDARD	HIGH TEMP. AMBIENT	HIGH TEMP. 701	ULTRA HIGH TEMP.	ACID RESISTANT
Primer Color	Light Gray	Gray	Orange	Clear	Green
Glass Transition Temperature (T _g)	212°F / 100°C	340°F / 171°C	385°F / 196°C	615°F / 324°C	240°F / 115°C
Max Operating Temperature	180°F / 82°C	300°F / 148°C	340°F / 171°C	580°F / 304°C	180°F / 82°C
Application Temperature	60°F - 140°F	120°F - 300°F	150°F - 300°F	275°F - 450°F	60°F - 160°F
Cure Time	8 hours @ 77°F / 25°C	8 hours @ 120°F / 49°C	8 hours @ 150°F / 66°C	8 hours @ 300°F / 149°C	8 hours @ 77°F / 25°C
System Filler Available	Yes	Yes	Yes	No	Yes
Stretch Film Required	No	No	Yes	Yes	No
Kit Type	2-part epoxy	2-part epoxy	2-part epoxy	Pre-impregnated	2-part epoxy

ISO TS 24817 / PCC-2 QUALIFICATION DATA

QUALIFICATION REQUIREMENT	RESULT	RESULT
Ply or layer thickness	0.57 mm	0.023 inch
Tensile modulus (Hoop)	49.1 GPa	7,130 ksi
Tensile modulus (Axial)	23.8 GPa	3,460 ksi
Tensile Strength (Hoop)	576 MPa	83 ksi
Tensile Strength (Axial)	247 MPa	35 ksi
Tensile Strain to failure (Hoop)		1.27%
Tensile Strain to failure (Axial)	1.30%	1.30%
Poisson's Ratio		0.196
Lap Shear Strength to Steel (Sandblasted)	17.2 MPa	2500 psi
Barcol/Shore Harness		80 (Shore D)
Thermal Expansion Coefficient (Hoop)	$2.52 \times 10^{-5}/^{\circ}\text{C}$	$1.4 \times 10^{-5}/^{\circ}\text{F}$
Thermal Expansion Coefficient (Axial)	$1.278 \times 10^{-5}/^{\circ}\text{C}$	$0.71 \times 10^{-5}/^{\circ}\text{F}$
Application Temperatures	See Chart Above	
Service Temperature Limits for Non-Leaking Defects	-55°C to 304° C	-67°F to 580° F

Clock Spring is a licensed trademark of NCF Industries, Inc.

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