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**DESCRIPTION:**

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NUKOTE PP400 is a specialized, high performance structural polyurea designed to enhance and protect buried and exposed assets. Nukote PP400 is a two-component, 100% solids, hybrid polyurea with the physical properties required for engineered designs in structural rehabilitation applications. This aromatic elastomer delivers strong resistance to a broad range of chemicals including hydrogen sulfide and methane, combined with excellent thermal stability, abrasion resistance and UV resistance.

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**FEATURES:**

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- 100% solids with zero VOC
- Fast reactivity and cure time resulting in almost immediate return-to-service time.
- Performs in constant temperatures from -20 °F to 200 °F (-30 °C to 90 °C)
- Retains physical properties on weathering.
- Excellent physical properties
- Puncture, impact, abrasion, and corrosion resistant.
- Strong thermal stability and ductility
- Resistant to many solvents, acids, and alkalis (consult NCSI)

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**TYPICAL USES:**

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- Spray in place structural replacement liners for pipe (SIPP / SAPL)
- Suitable for use in potable water, wastewater, storm water and combi effluents
- Cooling water lines that require structural enhancement
- Suitable for use in gravity flow lines and pressure lines
- Concrete or metal tanks and basins where structural enhancement is desired.
- Carbon fiber inlay applications for structural reinforcement.
- Mining process and effluent pipes and tanks
- Composite liners with imbedded structural reinforcement

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**COLORS:**

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Standard is amber clear. Custom colors, blended to match most RAL numbers, are available upon request subject to minimum order quantity.

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**PACKAGE:**

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100-gallon (380-liter) drum sets, shipped in metal drums of 50 gallons (190 liters) each of side A and side B 10-gallon (38-liter) kits, shipped in plastic pails of 5 gallons (19 liters) each of side A and side B 275-gallon (1045 liter) totes.

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**COVERAGE:**

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Nukote PP400 may be applied at any rate to achieve the desired thickness.  
Calculation for theoretical coverage: 40 Ft<sup>2</sup>/gal @ 40 mils (1 m<sup>2</sup>/liter @ 1mm).

TECHNICAL DATA (All values @ 77 °F / 25 °C)	US	Metric
Solids by volume (ASTM D2697)	100%	100%
Volatile organic compounds (ASTM D2369)	0 lb./gal	0 gm/ lit
Theoretical coverage	40 ft <sup>2</sup> /gal @ 40 mils	1m <sup>2</sup> / lit @ 1mm
Specific Gravity* of materials (ASTM D792)	A:10 ± 0.2, B:8.9 ± 0.3 lb./gal	A:1.2 ± 0.1, B:1.1 ± 0.1 kg/ liter
Viscosity* at 158 °F/70 °C in cps (ASTM D4878)	A-500 ± 20; B-1000 ± 200	A-500 ± 20; B-1000 ± 200
Shelf life @ 77 °F /25 °C	12 Months	12 Months
Tensile Strength** (ASTM D638)	8,160 ± 800 psi	42 ± 4 MPa
Elongation** (ASTM D638)	2.5± 1.0 %	2.5 ± 1.0 %
Hardness (ASTM D2240)	85 ± 5 Shore D	85 ± 5 Shore D
Flexural Strength** (ASTM D790)	14,630 ± 1100 psi	100 ± 10 MPa
Flexural Modulus** (ASTM D790)	400,000 ± 40,000 psi	2,757 ± 275 MPa
Compressive Strength** (ASTM D695)	11,830 ± 1,000 psi	82 ± 8 MPa
Shear Strength** (ASTM D732)	4,800 ± 500 psi	33 ± 3.3 MPa
Impact Resistance** (ASTM G14), No Holidays	> 200 in-lbf	> 20 J (N-m)
Water absorption -24 hours (ASTM D570)	0.5%	0.5%
Tensile Modulus of Elasticity** (ASTM D638)	145,000 psi ± 14,500 psi	1000 ± 100 MPa
Flash point Pensky Martin	>200 °F	>93 °C
Service temperature (Dry)	-20 °F to 200 °F	-30 °C to 90 °C
PROCESSING PROPERTIES (Under standard lab conditions)		
Mix Ratio V/V	1:1	
Gel time @ 160 °F /70 °C	2 to 5 seconds	
Tack free time (DFT & temperature dependent @ 160 °F /70 °C	20 to 60 seconds	
Return to service	24 hours	
<i>(The above properties and values are dependent on equipment settings, spray gun, mix chamber temperature, pressure and related parameters and variations are possible and expected).</i>		

\* Specific gravity and viscosity values of B-sides are highly dependent on pigment loadings in the formulation.

\*\* Final cured material tensile and mechanical performance properties are dependent on application specifics including material processing, deposition, and environmental conditions. (i.e., temperature and humidity)

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#### **STORAGE:**

Twelve 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.

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#### **MIXING:**

Nukote PP400 shall not be diluted under any circumstance. Prior to mixing maintain B-Side of product at 27° C to enhance viscosity. Thoroughly mix Nukote PP400 Part B resin material with air driven power equipment until a homogeneous mixture and color is obtained, usually accomplished through the dedicated spray equipment.

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#### **SURFACE PREPARATION:**

**Metal:** All surfaces shall be clean and free from contamination. The surface shall be assessed and treated in accordance with ISO 8504, Abrasive blast the surface to minimum NACE-2/SSPC SP-10Sa 2.5, as per ISO 8501-1, for a visual assessment of surface cleanliness with an anchor profile of 3 to 4 mils (75 -100 microns). Soluble salts must be removed to an acceptable level depending prior to application of PP400.

**Concrete:** The surface shall be dry, smooth, structurally sound, and free of depression, scale, or foreign deposits of any kind. Remove all curing compounds. Abrasive blast, sweep blast or water blast to remove all laitance and expose voids. Use a good quality epoxy filler or mortar for blow hole filling, skim coat or repairs. Prime, fill imperfections in the substrate surface to limit out-gassing. All concrete surfaces at or below grade level shall be evaluated for moisture. On-grade or below-grade concrete surfaces shall have a moisture barrier installed to protect them from moisture transmission. The surface preparation shall meet and conform to Joint NACE 6/SSPC-SP 13 standards and achieve a surface profile of CSP 3 to CSP 6 as per ICRI Guideline No.03732 for optimum performance.

**Refer to NCSI surface preparation manual for detailed procedures for diverse types of substrates.**

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#### **APPLICATION:**

Nukote PP400 must be applied utilizing high-pressure, heated plural component spray proportioning equipment, like those manufactured by Graco®. The proportioning equipment utilized must be capable of supplying material at a minimum of 2,000 psi and 165° F (74° C). Ongoing, routine maintenance per manufacturer's recommendations is required to ensure correct proportioning of material. Likewise, all other components of the spray system (e.g., spray gun, 360 Ringtech® robotics, spin cast unit, transfer pumps, etc.) must be maintained and confirmed to be in proper working condition prior to commencing work. Appropriate PPE is required to be always worn when spraying material.

For optimum performance, the substrate shall be abrasive blasted. Concrete substrates should be allowed to cure a minimum of 30 days. On concrete, Nukote PP400 should always be applied over a suitable primer for maximum adhesion. Please review your specific project with Nukote technicians. For all submersed applications, a primer is essential. Recommended DFTs are a function of the project performance specifications, please contact a Nukote technician for assistance developing project and application specifications. On horizontal surface applications, a texture "stipple" coat can be applied for non-skid purposes, after reaching the initial desired film thickness.

The following procedures or conditions are required for proper application of material to achieve optimum physical properties:

- Surface or ambient air temperatures should be above 40° F (5° C), and the surface temperature must be at least 10° F (6° C) above the dew point.
- Material should be preheated in drums or totes to a minimum temperature of 130° F (54° C).
- Resin (B-Side) must be thoroughly mixed with an air mixer until the material is homogenous and a uniform color is achieved.
- Material should be pumped through the spray hose back into respective storage containers to facilitate heating and mixing. • Heated hoses must maintain a product temperature of 165° F (74° C) for material delivered to the spray gun.

- When initiating spraying, the gun should be held off-target (i.e., sprayed onto cardboard, plastic, etc.) for approximately 20 seconds to discharge material that is not fully heated. Once the spray pattern is confirmed to be appropriate, spraying may commence on the substrate.
- 10-20 seconds after spraying, material should be checked to verify that the gel time is appropriate. Due to high exothermic temperatures, care should be taken to avoid burns.
- The product should be sprayed in passes of 30-50 mils and care should be taken to avoid applying too much material. Excessive thickness will create problems with the product due to the exothermic chemical reaction.
- On overhead surfaces, the material should be allowed to cool down – to between 120° F (50° C) and 180° F (80° C) – prior to spraying additional passes. This will help to minimize drips or sags and prevent excessive exotherm. At greater thicknesses, additional time is required for latent heat to dissipate.
- The recommended onboard pressure imbalance setting is 300 psi to prevent spraying off-ratio.
- Any indication of irregular output requires immediate attention. Care must be taken to ensure that inline filters in the spray system are clean throughout the spray process.

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#### **EQUIPMENT CLEAN UP:**

Cured product may be disposed of without hazardous materials restrictions. The uncured Isocyanate and resin portions shall be mixed and disposed of in accordance with local regulations. A “drip-free” container shall be disposed of according to local environmental laws and ordinances.

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#### **LIMITATIONS:**

Do not open until ready to use, and store in a sealed container after opening. Adding a nitrogen blanket to any opened containers is recommended strongly prior to storage.

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#### **WARNING:**

This product contains Isocyanate and curatives.

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#### **WARRANTIES AND DISCLAIMERS:**

*Nukote Coating Systems International, a Nevada, USA Corporation warrants that the two components of this product shall conform to the technical specifications published in the product literature. The quality and fitness of the product is dependent upon the proper mixture and application of the components by the applicator. Nukote Coating Systems has no role in the application of the finished polymer other than to manufacture and supply its two components. It is vital that the person applying this product understands the product and is fully trained and certified in the use of plural component equipment and application of plural component materials. There are no warranties that extend beyond the description on the face of this instrument, except when provided in writing, directly by Nukote Coating Systems International and executed under seal by a company officer.*