

UPR-UV Resin

Quad-Cure® UVL-400

TECHNICAL DATA

TYPICAL PERFORMANCE CHARACTERISTICS*

LIQUID COMPONENTS

CHARACTERISTICS	TEST METHOD	PERFORMANCE
Density 77°F 25°C	ASTM D1475-85	1,1 ± 0,1 g/cm³
Viscosity (1 min⁻¹) 77°F 25°C	ASTM D445-83**	4,800 ± 500 mPa•s
Viscosity (20 min⁻¹) 77°F 25°C	ASTM D445-83**	3,000 ± 300 mPa•s
Flash point (closed space)	Seta Flash Point Cup	> 212°F 100°C
Appearance, color	ASTM D1544-80	transparent, yellowish liquid
Shelf life (protected from light, at max. 77°F 25°C)		6 months

* The values stated in inch-pound units are to be regarded as the standard. The values given in international system are for information only.

** Brookfield, RVTD, Spindle 4

HARDENED RESIN / MECHANICAL PERFORMANCE

CHARACTERISTICS	TEST METHOD	PERFORMANCE
Young's modulus	ASTM D638	> 435 ksi 3,000 MPa
Tensile strength	ASTM D638	> 5,801 psi 40 MPa
Elongation at break	ASTM D638	> 2%
Flexural modulus	ASTM D790	> 333 ksi 2,300 MPa
Flexural strength	ASTM D790	> 10,152 psi 70 MPa
Glass transition temperature (T _g)	ASTM D5026	212-230°F 100-110°C

³ All the properties were measured on UV cured samples (irradiation strength ~30 mW/cm²) 125 mil plate of cured resin only.

COMPOSITES

PATCH FIBROUS REINFORCEMENTS (FIBERGLASS PATCH LINER)

CHARACTERISTICS	TEST METHOD	PERFORMANCE
Young's modulus	ASTM D638	> 1,160 ksi 8,000 MPa
Tensile strength	ASTM D638	> 14,503 psi 100 MPa
Elongation at break	ASTM D638	> 5.0%
Flexural modulus	ASTM D790	> 1,015 ksi 7,000 MPa
Flexural strength	ASTM D790	> 21,755 psi 150 MPa
Adhesion strength on PVC	ASTM D4541	≥ 435 psi 3.0 MPa



A High-Strength, Styrene-Free UV Resin Exhibiting Extreme Adhesion Characteristics to Vitrified-Clay Pipe (VCP)

DESCRIPTION

Quad-Cure® UVL-400 has been developed for the UV-CIPP rehabilitation process. The resin is well-suited for point and sectional repairs, as well as for inversion lining of small diameter pipe. The resin can be used as a matrix material for in-situ or for pre-impregnated composites. Quad-Cure UVL-400 resin is a one-component system, and already contains the necessary UV initiator and the thixotropic agent¹. The resin is completely styrene-free.

¹ The thixotropic agent content should be/can be adjusted according to the specific application.

PROPERTIES

- Good chemical resistance²
- High strength
- Thixotropic
- Excellent adhesion on VCP

² Mechanical properties of the treated composites are included in the special information section.

AMBIENT TEMPERATURE AT WORK

- Minimum ambient temperature at work: 32°F | 0°C
- Maximum ambient temperature at work: 104°F | 40°C

WORKABILITY TIME

It remains liquid as long as the resin is not exposed to UV light, to include sunlight.

COMPOSITES

INVERSION HOSE (FELT LINER)

CHARACTERISTICS	TEST METHOD	PERFORMANCE
Young's modulus	ASTM D638	> 362 ksi 2,500 MPa
Tensile strength	ASTM D638	> 1,740 psi 12 MPa
Elongation at break	ASTM D638	> 51.0%
Flexural modulus	ASTM D790	>217 ksi 1,500 MPa
Flexural strength	ASTM D790	> 5,801 psi 40 MPa
Adhesion strength on PVC	ASTM D4541	≥ 435 psi 3.0 MPa

MIXING

The resin itself is a one-component system, therefore mixing the components is not required, however it contains a thixotropic agent, therefore it must be stirred before use. Try to introduce as little air as possible when mixing by fully submerging mixer into product and mixing slowly.

CURING CONDITIONS

Quad-Cure UVL-400 contains the required amount of photo-initiator. For proper curing, the resin shall be irradiated by UV-light, preferably with a wavelength of 400 nm ± 20 nm and a power intensity of at least 20 mW/cm² for Short-liner, and 200 mW/cm² for inversion lining technique. The photo-initiator allows the use of high-pressure mercury lamps or UV-LEDs for curing.

TOOL CLEANING

Before any exposure to UV light, the resin shall be removed from the tools and equipment that have been contaminated, using clean rags. The resin layer which remains can be removed by wiping with an acetone soaked rag.

DELIVERY

PACKAGING

DESIGNATION	PACKAGING	NET MASS
Quad-Cure UVL-400	1 Gallon 3.78 L Pail	8.34 lb. 3.78 kg

STORAGE

Quad-Cure UVL-400 shall be stored indoors in the original, unopened and undamaged packaging in a dry place at temperatures between 41°F | 5°C and 86°F | 30°C. Store in dark and 100% light tight containers only. Exposure to direct sunlight should be avoided. When stored as directed the quality of the product is guaranteed for 6 months from delivery provided it remains in its original, unopened packaging.

SAFETY

Always use safety glasses and protective clothing including gloves when using this product. Do not ingest. Always read the container warning label and Safety Data Sheet (SDS) prior to use.

CHEMICAL RESISTANCE

IMMERSION LIQUID	YOUNG'S MODULUS	TENSILE STRENGTH	ELONGATION AT BREAK
- (reference)	406 ± 43 ksi 2,800 +/- 300 MPa	2,103 +/- 290 psi 14.5 +/- 2.0 MPa	1.9 ± 0.5%
1% NaOH	373 ± 45 ksi 2,572 +/- 310 MPa	2,610 +/- 870 psi 18.0 +/- 6.0 MPa	1.3 ± 0.5%
10% H ₂ SO ₄	374 ± 33 ksi 2,579 ± 227 MPa	2,683 +/- 435 psi 18.5 +/- 3.0 MPa	1.2 ± 0.5%
5% H ₂ O ₂	342 ± 50 ksi 2,358 +/- 345 MPa	2,639 +/- 449 psi 18.2 +/- 3.1 MPa	1.3 ± 0.3%

Any application of the product for purposes other than clearly mentioned in this data sheet, is possible only by preliminary consulting with Vortex Companies, Products division.