

CSS-UES

Underwater Epoxy Saturant

SIMPSON**Strong-Tie**

®

DESCRIPTION

CSS-UES is a two-component, high-strength, high-modulus epoxy resin system used to saturate the Simpson Strong-Tie Composite Strengthening Systems (CSS) fabrics for marine applications. When extended with fumed silica, thickened CSS-UES is used as a high-performance substrate repair material and CSS finish coating. This product is NSF listed safe for potable water. Please refer to the NSF listing for the NSF 61-listed application.

MATERIAL PROPERTIES

Part A & B Properties

Viscosity at 72°F (22°C)	Part A: Thixotropic gel Part B: 80 cps Mixed: Thixotropic gel
Color	Part A: Light gray Part B: Amber Mixed: Light gray
Density	Part A: 9.92 lb./US gal. (1.19 kg/L) Part B: 8.09 lb./US gal. (0.97 kg/L) Mixed: 9.31 lb./US gal. (1.12 kg/L)

Cured Epoxy Properties

Property	ASTM	Cure Schedule	Test Value
Tensile Strength	D638	7 days at 72°F (22°C) +3 days at 140°F (60°C)	3,300 psi (23 MPa) 8,400 psi (58 MPa)
Tensile Modulus	D638	7 days at 72°F (22°C) +3 days at 140°F (60°C)	285,000 psi (1,970 MPa) 254,000 psi (1,750 MPa)
Elongation at Break	D638	7 days at 72°F (22°C) +3 days at 140°F (60°C)	0.6% 2.1%
Flexural Strength	D790	7 days at 72°F (22°C) +3 days at 140°F (60°C)	7,200 psi (50 MPa) 15,000 psi (100 MPa)
Flexural Modulus	D790	7 days at 72°F (22°C) +3 days at 140°F (60°C)	516,000 psi (3,560 MPa) 485,000 psi (3,340 MPa)
Compressive Strength	D695	7 days at 72°F (22°C) +3 days at 140°F (60°C)	13,700 psi (94 MPa) 13,500 psi (93 MPa)
Compressive Modulus	D695	7 days at 72°F (22°C) +3 days at 140°F (60°C)	439,000 psi (3,030 MPa) 383,000 psi (2,640 MPa)
T _g	D3418	7 days at 72°F (22°C) +3 days at 140°F (60°C)	139°F (59.5°C) 169°F (76.0°C)
Density	D792	7 days at 72°F (22°C) +3 days at 140°F (60°C)	9.31 lb./US gal. (1.12 kg/L) 9.31 lb./US gal. (1.12 kg/L)
Water Absorption (24 hours)	D570	7 days at 72°F (22°C)	<0.5%

PERFORMANCE FEATURES

- Underwater use
- Long working time
- High elongation
- VOC 8 g/L (mixed)
- Ambient cure
- Minimal odor
- High versatility
- NSF listed (info. nsf.org/certified/pwscomponents)

APPLICATIONS

Seismic Retrofit

- Shear strengthening
- Displacement/ductility
- Life safety

Load Rating Upgrade

- Increased live loads
- New equipment
- Change of use

Damage Repair

- Deterioration/corrosion
- Blast/vessel impact

Defect Remediation

- Size/layout errors
- Low concrete strengths

Blast Mitigation

- Hardening
- Progressive collapse

STRUCTURES

- Buildings
- Bridges
- Parking garages
- Piers/wharfs
- Pipes

ELEMENTS

- Columns
- Beams
- Walls
- Piles
- Pier caps

SUBSTRATES

- Concrete
- Masonry
- Timber
- Steel

PACKAGING

Kit Size

3 US gallon (11.4 L)

Model No.

CSS-UES-3KT

MIXING RATIO

2A:1B by volume

SHELF LIFE

2 years in unopened container

STORAGE

Store material in a dry area between 45°F (7°C) and 95°F (35°C) with no exposure to moisture.



Surface Preparation

Repair existing substrate per ICRI Guideline No. 310.1R. Concrete shall be abrasively prepared to achieve an open pore structure and CSP-3 in accordance with ICRI Guideline No. 310.2 by means of high-pressure water blasting or another method approved for underwater applications. Application surface shall be clean, sound, and free of contaminants at time of application. All marine growth, laitance, oil, and other foreign materials that may hinder the bond must be removed before installation. For steel elements, prepare surface by high-pressure waterjetting or other mechanical means necessary to achieve SSPC-SP12/NACE 5 WJ-4. Repair or replace any structural steel elements with excessive section loss as determined by a qualified professional engineer.

Mixing

Add the premeasured contents of the Part B container to the premeasured contents of the Part A container. Mix with a mixing drill and paddle until uniformly blended (approximately 5 minutes at 500 rpm).

Application

CSS installation shall only be performed by contractors and personnel who have been properly trained by Simpson Strong-Tie. Apply a base coat of CSS-UES Underwater Epoxy Saturant thickened with mixed CSS-EP to desired consistency to the surface area to receive CSS fabrics. Apply using gloved hands and/or trowels at a thickness of approximately 80 mils (2mm). Saturate CSS fabrics with neat CSS-UES, using a saturator, trowel or manual roller to ensure full fiber saturation. Apply the saturated CSS fabric over the uncured base coat and smooth the surface using gloved hand pressure, roller, or trowel. Feather all seams and edges with thickened CSS-UES. To protect the installation during curing, immediately wrap the surface using plastic wrap and allow to cure.

Pot Life: 1 hour at 70°F (21°C)

Cure Time: 72 hours at 70°F (21°C)

Coverage Rates:

Saturating*

6–12 oz./yd.2 (204–407 g/m²) fabrics: ~75 SF/US gal. (~1.8 m²/L)

18-27 oz./yd.2 (611–915 g/m²) fabrics: ~50 SF/US gal. (~1.2 m²/L)

CSS-CUCF44 fabric: ~25 SF/US gal. (~0.6 m²/L)

*Highly dependent on waste. These are typical values.

Limitations

- Only install when the ambient, water and substrate temperatures are between 45°F (7°C) and 95°F (35°C).
- Do not thin epoxy.
- Where moisture vapor transmission is expected, note that CSS-UES will create a vapor barrier.
- Do not apply thickened CSS-UES in lifts greater than 1" (25 mm).

CAUTION

Component “A”: May cause eye and/or skin irritation. Prolonged or repeated exposure may cause skin sensitization.

Component “B”: **CORROSIVE!** Severe irritation to eyes and skin. Prolonged or repeated exposure may cause skin sensitization. Components of this product may affect the central nervous system.

Protective Measures: The use of safety glasses and chemical-resistant gloves is recommended. Use appropriate clothing to minimize skin contact. The use of NIOSH-approved respirator is required to protect respiratory tract when ventilation is not adequate to limit exposure below the permissible exposure limit. Refer to Safety Data Sheets (SDS) available at strongtie.com/sds for detailed information.

FIRST AID

Eye Contact: Immediately flush eyes with plenty of cool water for at least 15 minutes while holding the eyes open. If redness, burning, blurred vision, or swelling persists, seek medical advice.

Skin Contact: In case of contact, remove product and immediately wash affected area with plenty of soap and water for at least 5 minutes. Do not apply greases or ointments. Remove contaminated clothing. Clean contaminated clothing with soap and water before reuse. If redness, burning, or swelling persists, seek medical advice.

Ingestion: DO NOT INDUCE VOMITING. Never administer anything by mouth to an unconscious person. Rinse out mouth with water, then drink sips of water to remove taste from mouth. Seek medical advice. Do not leave affected person unattended. If vomiting occurs spontaneously, lay affected person on side and keep head lower than waist to prevent aspiration.

Inhalation: If respiratory irritation or distress occurs, remove affected person to fresh air. If breathing is difficult, give oxygen. If breathing stops, apply artificial respiration. Seek medical advice.

CLEAN-UP

Environmental Precautions

Construct a dike to prevent spreading. Keep out of sewers, storm drains, surface waters, and soils.

Small Spills: Soak up with an absorbent material, such as clay, sand, or another suitable non-reactive material. Place in leak-proof containers. Seal tightly for proper disposal.

Large Spills: Approach suspected leaks with caution. Construct a dike or trench to contain material. Soak up with an absorbent material, such as clay, sand, or another suitable non-reactive material. Place in leak-proof containers. Seal tightly for proper disposal.

Disposal

Dispose of container and unused portions in accordance with local, state, and federal regulations. Emptied container may contain product residue and should not be reused.

LIMITED WARRANTY

This product is covered by the Simpson Strong-Tie RPS Product One-Year Limited Warranty, which is available at strongtie.com/limited-warranties or by calling Simpson Strong-Tie at (800) 999-5099.

Distributor

IMPORTANT INFORMATION

It is the responsibility of each purchaser and user of each Product to determine the suitability of the Product for its intended use. Prior to using any Product, consult a qualified design professional for advice regarding the suitability and use of the Product, including whether the capacity of any structural building element may be impacted by a repair. As jobsite conditions vary greatly, a small-scale test patch is required to verify product suitability prior to full-scale application. The installer must read, understand and follow all written instructions and warnings contained on the product label(s), Product Data Sheet(s), Safety Data Sheet(s) and the strongtie.com website prior to use. For industrial use only by qualified applicators. KEEP OUT OF REACH OF CHILDREN!

WARNING! Cancer and reproductive harm — www.P65Warnings.ca.gov.