



E-TUFF® ENS

Epoxy Nosing & Header Systems & Patching Mortar

1.01 DESCRIPTION

E-Tuff® ENS is an epoxy binder and pre-engineered aggregate system. The epoxy is a semi-rigid 1:1 ratio, two component, 100% solids, low modulus, moisture tolerant, rapid setting, abrasion, chemical and impact resistant epoxy binder. Mixed with pre-engineered aggregate, the blended components develop an epoxy nosing system, repair mortar to patch and protect new or repair existing expansion and construction joints; headers on bridges, elevated highways and parking decks. The blended system will withstand the demands of high vehicular traffic and associated impact. The epoxy nosing system provides excellent concrete edge reinforcement. Used neat, the product seals the pavement and prevents the intrusion of water and waterborne contaminants. VOC compliant in all states and provinces in North America.

1.02 USES

- Airfield and Pavement Header and Nosing
- Bridges and Elevated Highways Header and Nosing
- Concrete and Masonry Repair and Patching
- Concrete Crack (gravity) Filler
- Concrete Joint Filler
- Marine Wharf and Piers Header and Nosing
- Parking Structures and Ramps Header and Nosing
- Ramp and Slope Filler

1.03 FEATURES

- Abrasion, Chemical and Impact Resistant
- Easy to Use Epoxy Mix Ratio 1:1
- Excellent Adhesion
- Fast Setting for Rapid Turn Around
- Reduces Water and Waterborne Chemical Intrusion
- Thermal Compatible with Concrete
- Used Neat (Without Aggregate) to Mend Cracks, Broadcast Aggregate for Traction
- When Combined with Pre-engineered Aggregate, Repair concrete 1/2" to 12" in One Lift.

1.04 TECHNICAL DATA

Meets: ASTM C881, Type III, Grade 2, Class B & C and AASHTO M235, Type III, Grade 2, Class B & C

1.05 PACKAGING

0.5 cuft (0.014 cum) kit: one jug Side-A, one jug Side-B and one bag 55 lbs (24.9 kgs) aggregate

2 cuft (0.57 cum) kit: one pail Side-A, 2 gallons pail B-Side and four bag 55 lbs (24.9 kgs) aggregate

Primer kit: 1:1 mix ratio four gallon (15.4 liters) Side-A and Side-B kit

1.06 COLOR

Concrete Gray

1.07 SURFACE PREPARATION

Concrete: The concrete must be a minimum of 30 days old, sound and free of all contaminants, including oil, grease, dust, laitance and other bond breaking materials. Mechanically abrade the concrete surface by grinding, abrasive blasting or shot blasting to an ICRI Guideline No. 310.2R, CSP 3 - 5.

Asphalt: Asphalt pavements must be dry, free of contaminants which interfere with bond and the aggregates visible. (Asphalt is not considered a structurally sound substrate.)

Steel: SSPC-SP 10 near-white metal blast cleaning (NACE No. 2) is a standard used for near-white metal blast cleaning put forth by the Society for Protective Coatings (SSPC) and NACE International Standard. Near-white metal blast cleaning is to be used to clean unpainted or painted steel surfaces prior to applying **E-Tuff® ENS**. SSPC-SP 10/NACE No. 2 removes all dust, coating, and mill scale. The limit of staining permitted for near-white metal blast cleaning is no more than five percent of each unit area of the surface.

1.08 PRECONDITION EPOXY & AGGREGATE

For best results precondition epoxy and aggregate to 65°F to 85°F (18°C to 29°C) for ease of mixing and optimum flow when using, especially if the substrate temperature is cold. The epoxy and aggregate can be preconditioned to 100°F (38°C) to speed up cure in cooling temperature.

1.09 MIXING

E-Tuff® ENS is shipped in pre-measured 0.5 cuft (0.014 cum) and 2.0 cuft (0.057 cum) kits. Do not break-down kits. DO NOT THIN or add solvent or non-approved aggregate.

E-Tuff® ENS 0.5 cuft (0.014 cum) kit: add Side-B to Side-A pail and mix thoroughly for three minutes at a slow speed using the PSI's **Rapid Pail™** Mixer or a 1/2 inch heavy duty drill and PSI's **Mortar Paddle** utilizing the PSI's **1 Man Stand™**. Keep mixing paddle towards the bottom of the paddle to avoid entraining air. Then add the aggregate. Mix until the aggregate is thoroughly wetted out.

E-Tuff® ENS 2.0 cu. ft. (0.057) kit: add the Side-A and Side-B to the mortar mixer and mix for three minutes thoroughly mixing the liquid components. Slowly introduce each bag of aggregate and thoroughly

mix until the aggregate is wet out.

APPLICATION

2.01 APPLICATION

Set screed or float to desire level, thoroughly compact and strike off. Do not over work. Place expansion joint header at an even plane to the adjacent concrete for smooth transition, avoiding an impact hammer load. When the form is removed and the mortar is found to be above the adjacent concrete, re-profile with a diamond grinder. If mortar is found to be below the adjacent concrete place additional mortar material, as needed.

2.02 CURING

Minimum curing time for epoxy binder and aggregate:

TEMPERATURE	WORKING TIME	INITIAL CURE
60°F (15.6°C)	30 Minutes	8.5 Hours
65° (18.3°C)	25 Minutes	7.5 Hours
70° (21.1°C)	25 Minutes	6 Hours
75°F (23.9°C)	20 Minutes	5 Hours
80°F (26.7°C)	20 Minutes	4.5 Hours
85°F (29.4°C)	15 Minutes	3.5 Hours
Cold Temperature Formula Available Upon Request		

It is highly recommended that all components be conditioned in advance of use to 75°F (26.8°C). This may take 48 hours. It is to the contractor’s benefit to maintain the components at elevated temperatures. Lower temperatures increase the binder’s viscosity and increase curing time.

2.03 CLEAN UP

Clean tools before the epoxy binder sets up using acetone or PSI's **EnviroClean™**.

2.04 SHIPPING, STORAGE and SELF LIFE

The material should be shipped and stored between 40°F to 95°F (5°C to 35°C), in a dry and out of direct sunlight. The shelf life of properly stored and unopen containers is 24 months. Excessive temperature differential and/or high humidity can shorten the self-life.

2.05 LIMITATIONS

- Compressed air equipment must have an oil/air separator.
- Consult PSI representative when mixing or placement is outside the recommendations listed.
- Contact PIS representative before applying as a repair mortar if concrete is less than 28 days old.
- Do not thin with solvent
- For professional use only

READ SDS PRIOR TO USING PRODUCT. FOR PROFESSIONAL USE ONLY.KEEP OUT OF REACH OF CHILDREN.MADE IN THE USA.

PHYSICAL PROPERTIES AT 77°F (25°C) RESIN AND HARDENER	
Viscosity	1,000 cps
Gel Time (60 gram mass)	20 minutes
Tack Free Time	3-5 hours
Adhesion, ASTM D7234	300 psi (2 MPa)
Compression Strength, ASTM D695	5,000 psi (35 MPa)
Compressive Modulus, ASTM D695	110,000 psi (758 MPa)
Tensile Strength, ASTM D638	2,800 psi (19 MPa)
Tensile Elongation, ASTM D638	40%
Flexural Strength D790	3,000 psi (21 MPa)
Shrinkage on Cure, ASTM D2566	0.2%
Water Absorption (24 Hr.), ASTM D570	0.2%
Slant Shear (2 Day), ASTM C882	2,000 psi (14 MPa)
Slant Shear (7 Day), ASTM C882	2,800 psi (19 MPa)
Thermal Compatibility, ASTM C884	Pass
Chloride Ion Permeability, AASHTO T277	0.0 Coulomb

PHYSICAL PROPERTIES AT 77°F (25°C) RESIN AND HARDENER AND AGGREGATE	
Compressive Strength, ASTM C579	
2 Hours	1,500 psi (10 MPa)
24 Hours	5,000 psi (35 MPa)
7 Days	5,200 psi (36 MPa)
Tensile Strength, ASTM C307	2,900 psi (20 MPa)
Tensile Strength, ASTM C307	<1%



Please read all information in the General & Safety Guidelines, Technical Data Sheets, Guide Specifications and Safety Data Sheets (SDS) before applying material. PSI Products are for "Professional Use Only" and preferably applied by professionals who have prior experience with the PSI Products or have undergone training in application of PSI Products. Published technical data and instructions are subject to change without notice. Contact your local PSI representative or visit our website for current technical data, instructions, and project specific recommendations.

LIMITED WARRANTY

PSI warrants its products to be free of manufacturing defects and that they will meet PSI current published physical and chemical properties. Seller's sole responsibility shall be to replace that portion of the product which proves to be defective. There are no other warranties by PSI of any nature whatsoever expressed or implied, including any warranty of merchantability or fitness for a particular purpose in connection with this product. PSI shall not be liable for damages of any sort, including remote or consequential damages resulting from any claimed breach of any warranty whether expressed or implied. PSI shall not be responsible for use of this product in a manner to infringe on any patent held by others. In addition, no warranty or guarantee is being issued with respect to appearance, color, fading, chalking, staining, shrinkage, peeling, normal wear and tear or improper application by the applicator. Damage caused by abuse, neglect and lack of proper maintenance, acts of nature and/or physical movement of the substrate or structural defects are also excluded from the limited warranty. PSI reserves the right to conduct performance tests on any material claimed to be defective prior to any repairs by owner, general contractor, or applicator.

DISCLAIMER

All guidelines, recommendations, statements, and technical data contained herein are based on information and tests we believe to be reliable and correct, but accuracy and completeness of said tests are not guaranteed and are not to be construed as a warranty, either expressed or implied. It is the user's responsibility to satisfy himself, by his own information and test, to determine suitability of the product for his own intended use, application and job situation and user assumes all risk and liability resulting from his use of the product. We do not suggest or guarantee that any hazard listed herein are the only ones which may exist. Neither seller nor manufacturer shall be liable to the buyer or any third person for any injury, loss or damage directly or indirectly resulting from use of, or inability to use, the product. Recommendations or statements, whether in writing or oral, other than those contained herein shall not be binding upon the manufacturer, unless in writing and signed by a corporate officer of the manufacturer. Technical and application information is provided for the purpose of establishing a general profile of the material and proper application procedures. Test performance results were obtained in a controlled environment and PSI makes no claim that these tests or any other tests, accurately represent all environments.

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