



# EPIWELD® 9-N-11

*Two component  
gel epoxy binder  
and adhesive*

## *Advantages:*

- Conforms to Florida Department of Transportation type A & B specifications
- High modulus
- 100% solids
- Non-sagging
- Gap filling
- Gel viscosity

## *Coverage:*

- Smooth Surface – 100 ft<sup>2</sup> per gallon (2.5m<sup>2</sup>/liter)(16mils)
- Rough Surface – 50-75 ft<sup>2</sup> per gallon (1.2-1.8m<sup>2</sup>/liter)(16mils)

*See Coverage  
section for full  
details*

## *Packaging:*

2 gallon (7.6 liter) Unit –  
1 gallon (3.8 liter) each  
part, A & B

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publications

## **Product Description**

EPIWELD® 9-N-11 is a specially formulated, rapid setting epoxy adhesive and binder system for general concrete construction usage and for special concrete repairs, rehabilitation, and preservation. EPIWELD® 9-N-11 has a high modulus of elasticity that allows structural bonding to dry and damp concrete surfaces that are free of standing water or hydrostatic pressure. The non-sag consistency makes it ideal as a bonding agent and grouting material for vertical and overhead patching. When used as an epoxy mortar, EPIWELD® 9-N-11 will accept good aggregate loading without appreciable strength reductions.

EPIWELD® 9-N-11 can be used for the following tasks:

- Anchoring bolts, dowels, pins, and rods in concrete.
- Mixes with aggregates to make epoxy patching mortars or grouts.
- Bonding fresh concrete to hardened concrete, steel or other materials.
- Bonding hardened concrete to hardened concrete or other materials.
- Coating rebar or other metals for corrosion protection.
- Binder for skidproofing materials such as EMAG and sand.

## **Installation**

Before using this product, please refer to the Material Safety Data Sheet for additional information. Proper handling precautions MUST be followed. The conditions of use, handling, and application of this product and information (whether verbal or written), including any suggested formulations and recommendations, are beyond Lambert Corporation's control. Therefore, it is

imperative that testing be performed to determine satisfaction and suitability for intended use and health, safety, and environmental issues. The following information is meant as a guideline of best industry practices. While Lambert Corporation does suggest adherence to these guidelines, unforeseeable variables and/or developed successful installer practices may cause variation in methods and/or results.

### *Surface Preparation-Concrete*

The success of any adhesive application is directly proportional to the completeness of substrate preparation and the care in application. Surface must be clean and structurally sound. All concrete surfaces to be bonded coated or repaired should be dry for best results; however, a damp, surface-dry condition is acceptable. Concrete must be free of standing water. Mechanical scarifying to remove laitance and expose sound, coarse aggregate, will result in optimum bond. Non-porous, dense or glassy type concrete surfaces must be roughened by sandblasting or be etched with a solution of muriatic acid and neutralized. New concrete must be permitted to age before an epoxy is applied. Adequate aging or curing time is generally 28 days or more.

### *Surface Preparation-Steel*

Exposed rebar, anchor bolts, etc. to be bonded must be free of rust, paint, oil, and dirt. Metals should be sanded or sandblasted to a commercial blast finish. If mechanical cleaning is impractical, chemical cleaning should be used, such as a 10% solution of muriatic acid followed by a water rinse and neutralization. A lightly abraded surface gives a better mechanical key.

### *Cautions*

Due to many variables in bonding to damp or dry surfaces, be certain to test application under the same conditions as the full-scale work. When bonding to damp or slightly wet surfaces, be certain to test if dampness or moisture is caused by hydrostatic pressure prevalent in, on, or below grade application. Moisture passing through the substrate by

pressure during application and curing of epoxy will cause bond failures.

#### Mixing

The individual components of EPI-WELD® 9-N-11 should be thoroughly stirred before the two are mixed together. The resin (part-A) and hardener (part-B) should then be mixed in the proper ratio (1 part resin (A) to 1 part (B) by volume) for 3 to 5 minutes resulting in a homogenous and uniformly tan colored material. It is recommended that a slow speed drill (600-RPM max.) and paint paddle or a "jiffy" mixer be used for mixing. Hand mixing with paint paddle is also acceptable but a uniform tan color must be achieved. EPIWELD® 9-N-11 is designed for application both neat and as a grout or mortar. Proportion of aggregate to 1 part mixed epoxy varies with proposed end use. 2 to 3 parts aggregate to 1 part mixed EPIWELD® 9-N-11 is a good general recommendation.

#### Caution

Aggregate must be oven dried to avoid encapsulation of moisture. Condition components to 60-70°F (15.6-21.1°C) prior to use. Epoxies stored below 60°F (15.6°C) will cause the epoxy to thicken substantially making it difficult to blend the two materials and obtain a proper mating of resin and hardener. Pot life of mixed EPIWELD® 9-N-11 at 70°F (21.1°C) is about 30 minutes. Pot life is dependent upon material temperature and quantity catalyzed. The greater the mass, the shorter the pot life. Increased mass and temperature result in higher exothermic and shorter pot life. Higher temperatures decrease pot life; lower temperatures and the addition of aggregate lengthen pot life. Temperatures of substrate will have similar results on pot life.

#### Application

EPIWELD® 9-N-11 can be applied by brush, squeegee, trowel, or roller.

#### Bonding Fresh Concrete to Hardened Concrete

Make sure sufficient coating of EPIWELD® 9-N-11 is applied to the surface to coat all voids and crevices. Only an area of which fresh concrete will be placed within the cure time should be coated. If epoxy sets before the fresh concrete is placed, it will have to be removed and reapplied. Under certain conditions, recoating may be acceptable. It is mandatory that the epoxy be tacky when fresh concrete is poured. If epoxy sets before the fresh concrete is placed, it will have to be removed and the epoxy reapplied. Porous concrete may rapidly absorb EPIWELD® 9-N-11 and leave surface dry. A prime coat may be needed in this case. Thickness of topping or patch should be sufficient to maintain its own structural strength. EPIWELD® 9-N-11 prevents migration of water from the new slab into the old concrete thus producing a stronger concrete. EPIWELD® 9-N-11 also becomes a moisture barrier preventing sub surface water coming through the concrete.

#### Bonding Hardened Concrete to Hardened Concrete

Brush coat each of the mating surfaces with a liberal amount of EPIWELD® 9-N-11. Allow 10 minutes for penetration. It is important that the EPIWELD® 9-N-11 be tacky when mating surfaces are placed together. Bonded parts should be left undisturbed for at least 24 hours. Support pressure may be required during cure time.

#### Binder for Epoxy Aggregate Grout, Mortar, Concrete

To produce a sand filled grout add 1 to 3 parts by volume of clean, dry silica sand to 1 part mixed EPIWELD® 9-N-11. For

proper strength development all components should be at temperatures of 50°F (10°C) and rising. Additional aggregate may be added (up to 5 parts sand to 1 part EPIWELD® 9-N-11). Grout mixes should be placed from one side only to avoid air entrapment.

#### Anchoring Bolts, Rebar, Dowels, and Pins

Used as neat epoxy. For efficient transfer of stress, the hole should be no greater in diameter than 1/4-inch (6.4 mm) larger than the bolt, rebar, dowel, pin to be embedded. Depth of embedment is 10 to 15 times the bolt, rebar, etc. diameter. Where possible, EPIWELD® 9-N-11 could be mixed with fine dry silica sand (40/140 gradation) at a 1 to 1 ratio for further economy and to increase the modulus of elasticity.

#### Hole Preparation

Holes should be clean and free of debris. Air or water flushed rotary percussive drilling equipment is recommended. Holes should be brushed with a nylon or wire brush to dislodge drilling debris. Use compressed air to clean out the hole. Diamond drilled holes are not recommended as they do not provide a rough hole profile which establishes the epoxy anchorage. Concrete should be 28 days or older.

#### Bolt Placement

After placing EPIWELD® 9-N-11 in the hole, insert the bolt, rebar, etc. with a twist action for maximum contact between EPIWELD® 9-N-11, hardware, and expulsion of air voids. Position hardware with wedges, jigs, etc. until initial cure.

#### Patching Compound

After mixing parts A & B together as per instructions, thoroughly blend the selected aggregate into the mixture. For patches greater than 3/4-inch (19.1 mm) in depth, coarse aggregate whose maximum size is 1/3 the thickness of the patch may be mixed with the sand used in the epoxy mortar. Deep patches should be applied in 1-inch (25.4 mm) increments with subsequent layers applied after the preceding one has cooled to touch but still tacky. Epoxy to aggregate ratios by volume are generally in the range of 1 part mixed epoxy to 2-3 parts aggregate.

#### Limitations

EPIWELD® 9-N-11 should not be used at temperatures below 40°F (4.4°C) or over 100°F (37.8°C). During cold periods, temperatures should be 40°F (4.4°C) and rising at time of application. New concrete or other materials being bonded should be placed while EPIWELD® 9-N-11 is still tacky. If it dries, a fresh coat must be applied. Do not apply to wet, "puddled" areas. New concrete surfaces being bonded must be cured a minimum of 28 days which reduces substrate shrinkage. When used as a bonding medium for non-slip surfaces, apply EPIWELD® 9-N-11 to a dry or slightly damp substrate and use only dry aggregates. Do not thin EPIWELD® 9-N-11.

## Technical Data

#### Applicable Standards

- Florida Department of Transportation, Spec-Epoxy Compounds Type A and B.

#### Properties

- Mixing Properties:** 1 part A to 1 part B (by volume)
- Color:**

Part A Resin	Pearl White
Part B Hardener	Tan

Mixed color-light straw brown, concrete  
gray available on special order only.

- **Viscosity:** Neat Epoxy Gel
- **Pot Life:** Neat Epoxy 30-60 min.
- **Tack Free Time:** (thin film)
  - 45°F(7.2°C) 14-16 hours
  - 75°F(23.9°C) 6-8 hours
  - 90°F(32.2°C) 1-2 hour

• **Bond Strength:**

**ASTM C-882 Hardened to Hardened Concrete**

- 2 day (air cure) minimum 2390 PSI(16.5 MPa)
- 12 day (moist cure) minimum 2580 PSI(17.8 MPa)

• **Water Absorption:** **ASTM D-570**

- 24 hours immersed 0.15% max.
- 2 hours boiling water immersed 0.83%

• **Compressive Strength:** **ASTM D-695**

**Neat Epoxy @ 72°F (22.2°C)**

- 24 hours 5220 PSI (36 MPa)
- 3 days 8510 PSI (58.7 MPa)
- 7 days 8640 PSI (59.6 MPa)
- 14 days 12160 PSI (83.8 MPa)

• **Compressive Strength:** **ASTM D-695**

**(Epoxy Mortar 2 to 1 ratio by volume of aggregate to neat epoxy @ 72°F (22.2°C)**

- 24 hours 5370 PSI (37 MPa)
- 3 days 9490 PSI (65.4 MPa)
- 7 days 10480 PSI (72.3 MPa)
- 14 days 10830 PSI (74.7 MPa)

• **Tensile Properties:** **ASTM D-638**

- 14 days Tensile Strength 5670 PSI (39.1 MPa)
- Elongation at Break 1.85%
- Modulus of Elasticity: 4.0 x 105 PSI (0.7MPa)

*Pull Out Test of Rebar* **ASTM E 488**  
**(72 hours Cure Time)**

Rebar Size	Type Failure	Maximum Load
#4	Rebar	13,566 lbs (6153kg)
#6	Rebar	32,500 lbs (14742kg)
#8	Concrete	64,900 lbs (29438kg)

**Coverage**

*Estimated Concrete Coverage*

- Smooth surface - 100 sq. ft. per gallon (2.5 m<sup>2</sup>/L) (16 mils)
- Rough surface – 60-80 sq. ft. per gallon (1.2-1.8m<sup>2</sup>/L) (16 mils)

*Epoxy Grout/Mortar*

*Yield per Gallon*

Epoxy +	Aggregate =	Mortar/Grout
1 gal (3.8 liters)	1 gal (3.8 liters)	1.6 gal (6.1 liters)
1 gal (3.8 liters)	2 gal (7.6 liters)	2.2 gal (8.3 liters)
1 gal (3.8 liters)	3 gal (11.4 liters)	2.8 gal (10.6 liters)

\*1 gallon (3.8 liter) of Lambert emery aggregate or silica sand weighs approximately 10 to 12 pounds (4.5 to 5.4 kg). All above figures will vary slightly according to aggregate mesh size and air.

*Grout Coverage & Thickness*

Binder & Aggregate	Square Feet	Thickness
1 gal (3.8 liters)	12.8 (1.2m <sup>2</sup> )	1/8" (3.2mm)
1 gal (3.8 liters)	8.6 (0.8m <sup>2</sup> )	3/16" (4.8mm)
1 gal (3.8 liters)	6.4 (0.6m <sup>2</sup> )	1/4" (6.4mm)
1 gal (3.8 liters)	4.3 (0.4m <sup>2</sup> )	3/8" (9.5mm)

**Clean-Up & First Aid**

*Clean-Up*

Clean all tools and equipment immediately after use with lacquer thinner. Do not allow epoxy to harden on tools or equipment. Soap and hot water may be used in some cases.

*First Aid*

Avoid breathing possible fumes, mists and vapors that can cause severe respiratory damage. Use of NIOSH approved breathing apparatus is required for more than minimal exposure. Always work in areas with adequate ventilation to allow dissipation of amines and other chemical fumes, and where applicable, solvent fumes. Use of goggles, protective garments, rubber gloves, protective creams is required. If material gets into eyes, flush thoroughly with clean water for 20 minutes; then seek medical treatment. Avoid skin contact. Material can cause contact dermatitis. Always wash exposed areas immediately, using warm water and soap, followed by rinsing with clean water. Observe all safety precautions. It is important when using solvent-based materials or solvents to keep away from open flame or ignition source.

**KEEP OUT OF REACH OF CHILDREN.**  
**FOR INDUSTRIAL USE ONLY.**