

# Tyfo® 111

## Low Viscosity Injection Epoxy

### DESCRIPTION

Tyfo® 111 Low Viscosity Injection Epoxy is a two-component, very low viscosity, high modulus epoxy adhesive.

### USE

Recommended for the repair of cracks in concrete with automatic meter, mix and dispense pressure injection equipment.

### ADVANTAGES

- Good high temperature properties
- Low Viscosity
- Resistance to creep and stress relaxation
- Excellent adhesion under adverse application conditions (cold, wet concrete)

### PACKAGING

Order in 150-gallon or 15-gallon units.

### MIX RATIO

Two parts component A to 1 part component B by volume; 100:43 by weight.

### SHELF LIFE

Three years in original, unopened and properly stored containers.

### STORAGE CONDITIONS

Store at 40° to 90° F (4° to 32° C) away from sunlight in a dry place. Avoid freezing.

### CERTIFICATE OF COMPLIANCE

- Will be supplied upon request, complete with state and federal packaging laws with copy of labels used.
- Material safety data sheets will be supplied upon request.

### HOW TO USE

#### TYFO® 111 INJECTION EPOXY

### SURFACE PREPARATION

The concrete must be sound and free of all bond-inhibiting substances. Accumulations of water must be removed with compressed, oil-free air.

### MIXING

Tyfo® 111 is a two-component system designed specifically for use with automatic meter, mix and dispense equipment. Mix ratio is 2 parts of component A to 1 part of component B by volume. Application equipment should be routinely checked daily to determine that the equipment is metering and proportioning the components accurately and is delivering thoroughly mixed material.

### APPLICATION

Apply material in accordance with established industry procedures. Use only trained personnel with experience in pressure injection application. Allow for adequate cure of the epoxy adhesive before the repaired structure is returned to service.

### LIMITATIONS

The recommended minimum substrate temperature during installation is 50° F (10° C). The maximum sustained in-service temperature of fully cured material is approximately 120° F (49° C) in applications where substantial and sustained shear stresses are encountered. The material is not recommended for application in wide cracks above 80° F (27° C). The installed thickness should not exceed 0.25-inch unless preplaced aggregate is used to dissipate heat generated during the curing process.

### EPOXY MATERIAL PROPERTIES

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Curing Schedule, 7 days at 73° F (23° C) +/-4° F (-20° C). Test temperature, 73° F (23° C) +/-4° F (-20° C), unless otherwise specified.		
PROPERTY	ASTM METHOD	TYPICAL TEST VALUE*
Density (Pound/Gallon)	D-1475	Part A = 9.5 (4.3kg) Part B = 8.1 (3.7kg) Mixed = 9.0 (4.1kg)
Viscosity, cps	D-2393	Part A 300 Part B 100 Mixed 200
Viscosity @ 40° F (4° C), cps	D-2393	Part A 750 Part B 425 Mixed 1,450
Gel Time, 5 minutes min. @ 40° F (4° C)	D-2471	21 85
Tensile Strength, psi	D-638	9,000 (62.1 MPa)
Elongation at Break, Percent	D-638	2.0%
Compressive Yield Strength, psi	D-695	16,000 (110.3 MPa)
Compressive Modulus, psi	D-695	410,000 (2.8 GPa)
Heat Deflection Temperature, F (C)	D-648	140° F (60° C)
Wet Slant Shear Strength <sup>1</sup>	AASHTO T-237	Cement Mortar Failure <sup>2</sup>

(1) Cure schedule, 7 days at 40° F (4° C).

(2) Compressive strength of cement mortar, >4,500 psi

Note: Tyfo® 111 Low Viscosity Injection Epoxy meets or exceeds the properties of a material specified in ASTM C-881-90 Type I and IV, Grade 1.

\* Specification values can be provided upon request.

## CAUTION!

**COMPONENT A** - Liquid epoxy resin. HMIS Health Hazard Rating: 2 (Moderate Hazard). Causes skin and eye irritation. May cause allergic reaction. Harmful if swallowed. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Avoid prolonged or repeated contact with skin.

**COMPONENT B** - Liquid epoxy hardener. HMIS Health Hazard Rating: 3 (Serious Hazard). Contains alkaline amines. Danger! Corrosive liquid. Causes severe eye and skin burns. May cause allergic skin and respiratory reaction. Do not get in eyes, on skin or clothing. Avoid breathing vapor. Keep container closed when not in use. Use only with adequate ventilation. Wash thoroughly after handling. Combustible. Keep away from heat or open flame.

## SAFETY PRECAUTIONS

Use of an approved respirator is recommended for possible contact with vapor. Rubber gloves are recommended when handling this material to avoid skin irritation. Safety glasses are recommended to prevent eye irritation.

## FIRST AID

In case of skin contact, wash thoroughly with soap and water. For eye contact, flush immediately with plenty of water; contact physician immediately. For respiratory problems, remove to fresh air. Wash clothing before reuse.

## CLEANUP

Collect with absorbent material, flush with water. Dispose of in accordance with local disposal regulations. Uncured material can be removed with approved solvent. Cured materials can only be removed mechanically.

## SHIPPING LABELS CONTAIN

- State specification number with modifications, if applicable
- Component designation
- Type, if applicable
- Manufacturer's name
- Date of manufacture
- Batch name
- State lot number, if applicable
- Directions for use
- Warnings or precautions required by law

**KEEP CONTAINER TIGHTLY CLOSED.  
NOT FOR INTERNAL CONSUMPTION.  
CONSULT MATERIAL SAFETY DATA SHEET  
(MSDS) FOR MORE INFORMATION.  
KEEP OUT OF REACH OF CHILDREN.  
FOR INDUSTRIAL USE ONLY.**

## Fyfe Co. LLC

"The Fibrwrap® Company"

Nancy Ridge Technology Center

6310 Nancy Ridge Drive, Suite 103, San Diego, CA 92121

Tel: 858.642.0694 Fax: 858.642.0947

E-mail: [info@fyfeco.com](mailto:info@fyfeco.com) Web: <http://www.fyfeco.com>

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