

**PRODUCT DESCRIPTION**

Sealing Transformer Oil Leaks (Dielectric fluid, nitrogen and SF6) has been a common problem in utilities worldwide. They occur due to various reasons, namely bad welds, cracked voltage bushings, valves, switches, corrosion, etc. In the past, maintenance personnel would have to take the leaking equipment out of service, drain the oil and replace old worn components like gasketing etc or replace entire components. The costs of such repairs and replacement was in the tens of thousands of dollars as well as the downtime. The invention of the Transformer Repair Kit by EMP Inc. has changed this costly process. Now utilities worldwide are using our products to save time and labor by repairing transformer leaks using our high efficiency epoxy polymers to repair leaks permanently. The leaks can now be repaired without draining the system or depressurizing the vessels. The Transformer Leak consists of 3 major products applied in 3 steps in the correct order.

Step #1: Oil Stop Plug

Step #2: Oil Stop Fast Cure

(2022 Update: Available in easy to mix stick form)

Step #3: Oil Stop Final Coat



Transformer Leak Repair Kit # TLRK991

#1 Oil Stop Plug - is a compound with an affinity to stick to oily metals and displace oils from surfaces as well as provide leak blocking pressures up to 17 psi. It's used as the first defense in active leak sealing.

#2 Oil Stop Fast Cure - this oil resistant fast cure composite polymer(under 20 min) with a pot life of under 3-5 mins and is applied on top of Oil Stop Plug about 1.5" further away and around it.

#3 Oil Stop Final Coat - is a flexible impact resistant epoxy polymer to provide protection and lock the entire application as a solid monolithic repair. This product is applied over the Oil Stop Fast Cure and extends about 1.5 - 2" away.

*Usage:*

Power Plants/Nuclear & Utility Companies, Ship & Marine Industry, Oil & Gas Refineries, Hotels, Hospitals, Universities



# TRANSFORMER LEAK REPAIR KIT

Product Codes: 991

TECHNICAL DATA SHEET (Dielectric Fluid, Nitrogen & SF6 Transformer Leak Repairs - Multi Component)

## INTENDED USES

- Repair of leaking transformers (dielectric fluid, SF6 & Nitrogen) without draining

## BENEFITS

- Repair leaks in under 10 min
- Versatile System
- Prevent shut downs and costly repairs
- Easy mix ratio, no special tools required
- No hot work involved
- Sold as kit containing mixing board, applicators, spatula set & Fiberzite Reinforcement Fabric.
- Highly chemical resistant
- Excellent bonding to steel, aluminum, copper, brass, stainless steel

## PRODUCT SPECIFICATIONS

Performance Data	Oil Stop Plug	Oil Stop Fast Cure	Oil Stop Final Coat
Color	Gray or Blue	Gray	Black
Adhesive Tensile Shear(ASTM D1002)	N/A	2500	N/A
Compressive Strength (ASTM D685)	N/A	9300	N/A
Cured Hardness Rating (Shore D)	N/A	80	85(Shore A)
Coverage per unit	1.15 cu. inch	21 sq in at 1/4"	95 sq inch @ 1/4"
Dielectric Strength	N/A	70 volts/mil	370 volts/mil
Flexural Strength (ASTM D790)	N/A	7370 psi	N/A
Initial Cure @ 75F/24C	Immediate	20 min	N/A
Full Cure @ 75F/24C	Immediate	1 hour	10 hours
Full Immersion @ 75F/24C	Immediate	1 hour	24 hours
Machinable/Sanding @ 75F Cure Time	N/A	1 hour	N/A
Pot Life (Working Time) @ 75F/24C	Unlimited	4-5 min	10 min
Pull of adhesion (ASTM D4541)	Immediate	3300 psi	N/A
Ratio Mix by Volume	No mixing	1:1	Full kits
Shrinkage	0%	0%	0%
Temperature Resistance Dry	N/A	300F/149C	250F/121C
Temperature Resistance Wet (Immersion)		150F/65C	175F/79 C

**N/A - Not applicable due to product consistency, multi-component combination and monolithic structure.**

Note: \*Oil Stop Fast Cure Epoxy (Oil Resistant) is sold in tubs (Resin & Hardener) as paste form or in a easy to use premeasured stick form with Resin on the outer core and Hardener in the inner core. The stick version or tubs may come in the Transformer Leak Repair Kit based on availability and demand.

**TECHNICAL DATA SHEET (Dielectric Fluid, Nitrogen & SF6 Transformer Leak Repairs - Multi Component)**

**\*Cure Time:** Components cures faster with warmer temperatures and slower with colder temperatures. Temperatures will affect the pot life, initial cure, full and immersion cure rates of the product as well. However product performance after cure is un-affected. Please consult with EMP Inc.

**SURFACE PREPARATION**

Note: Surface Preparation is an integral part of this repair. As with any type of coating, proper surface preparation is key. Paying close attention to prep will result in a successful life time repair.

First and foremost, 5"-6" around the hole is cleaned thoroughly using the wire brush and metal file. For bolts and flange areas, keep in mind the overlapping and extending of one product from one to the next. Sand area well to bare metal. Remove all loose rust and paint. For best results, create a profile to the surface for proper mechanical bonding. Solvent wipe this area using EMP Cleaner #701. Wipe clean. Let the oil drip or seep out, this is not relevant.

**MIXING COMPONENTS & APPLICATION METHOD**

*Note: Always read product labels carefully before using product.*

**Temperature Considerations**

If components are being stored in cold conditions, please move all products to warm area to soften epoxy before use. Store product at 75F/23C before for use. Indirect heating maybe used to warm containers. For best results always apply at 40F or above. Heaters may be used by enclosing area with plastic to elevate the temperature for proper application.

**/STEP #1 OIL STOP PLUG:**

Remove Oil Stop Plug from the blue colored encasement.

This actual product is designed to form a hard skin on its surface. It keeps the inside of product softer. This is normal. Oil Stop Plug is meant to be a rigid product with a slight flex to it. Simply use a razor blade to expose the product. Using a razor blade cut about 1/4" from one end to expose fresh product inside the core. Then shave down starting from 1" above the cut end downward (to the cut end). Sharpen product so it forms a point (or a flat point) equivalent to your repair area allowing you to jam it in. Make sure the inner product has some flex to it. This can be tested by inserting a finger nail to see if it is soft. If not soft, discard product.



**SEALING THE LEAK:**

*OIL STOP PLUG is a versatile product and can be used in a variety of ways. The below are just two methods.*

1) Locate the leaking point.

- a) If the hole is clearly visible (1/16"-1/18" diameter), you may sharpen the product into a conical shape as best as possible to fit the hole. Jam the product in like a plug and snap off or cut the plug slightly higher than the surface. Using your gloved finger, press around and over the leak to the substrate to form a bond.
- b) Pin hole leaks or fine cracks: Rub Oil Stop Plug vigorously over the area until the leak stops.
- c) Once leak has stopped, do not disturb the repair. Using a sharp pen knife, cut a thin slice of Oil Stop Plug and apply around edges to further secure the area to form a stronger bond.

Unused portions must be returned back to the original packaging it was supplied in and stored in a plastic bag by removing all air. Store in a cool dry place.

**Note:** In certain unique situations, the transformer oil may have to be drained to conduct a proper repair. Please consult EMP Inc. Technical Department for an in-depth tutorial on how to conduct a long lasting repair. If draining is to be conducted. Start with Step #2 by application of Oil Stop Fast Cure and apply Oil Stop Final Coat to the damaged area and allow to dry for 24 hours before refilling.

**STEP #2 OIL STOP FAST CURE EPOXY**

Once the leak has been sealed, using a clean rag, solvent wipe around the Oil Stop Plug removing any transformer oil that was seeping after plugging it. Use Cleaner # 701 a few times making sure that there is no oil residue left. Allow to dry. Note: Try not to disturb the Oil Stop Plug but make sure that the area around the repair starting from the edge of the Oil Stop Plug going outward to the prepared surface is thoroughly cleaned.

\*This product is conveniently packaged in a pre-measured stick form (resin on outside and hardener on inside of the stick) ready to mix and apply.

Wear gloves (Latex, Rubber or Nitrile). Cut the amount desired. Remove foil cover. Roll Oil Stop 2 between the palms back and forth (knead) . Bend material on top of itself and repeat rolling procedure until a smooth, streak free, even consistency has been achieved. Apply at once.

**STEP #3: OIL STOP FINAL COAT**

The Oil Stop Final Coat is designed to lock the entire repair into a monolithic layer as well as provide an impact resistant flexible protective system for damaged areas of the transformer. Open both parts of Oil

**TECHNICAL DATA SHEET (Dielectric Fluid, Nitrogen & SF6 Transformer Leak Repairs - Multi Component**

Stop Final Coat. (Resin and Hardener). Pour the Hardener into the Resin container and mix for 2 minutes using the wooden padded provided making sure to scrape the sides and bottom repeatedly. NOTE: The mix will turn from a thick liquid to a paste grade material during the mix. Remove entire contents into the plastic mixing board using the paddle into the plastic mix tub provided and mix again for one minute to assure a proper mix. Apply immediately using a spatula or applicator in the kit. Build a layer of 1/8" over the Oil Stop Fast Cure and extend about 1.5 to 2 inches.

Repair has been completed. Recommendation: As with any repair when using coatings or epoxies, we recommend using masking tape before applying Oil Stop Fast Cure. Square out your application area and remove tape right after properly spreading the material to give you a clean edge. Masking tape can also be used with the Oil Stop Final Coat by making the square around the Oil Stop Fast Cure extending outward to 1.5"-2". Apply and remove tape. This method will provide a professional repair.

Note: Smaller mix portions of Oil Stop Final Coat is not recommended but it can be achieved by dividing out the Hardener and Resin portions into halves. For accurate measurements. Use a digital weight scale and smaller cups. Weigh each divided cup of resin and hardener and add or remove product until an equal weight distribution is achieved between divided parts.

**Lathing & Machining**

Not applicable.

**Storage & Handling**

Store at room temperature in a cool, dry place. Keep containers tightly closed after use. If long term storage is required after use, encase the resin and hardener in a plastic bag, remove all air and store. Vacuum packaging via plastic bags increases the shelf life.

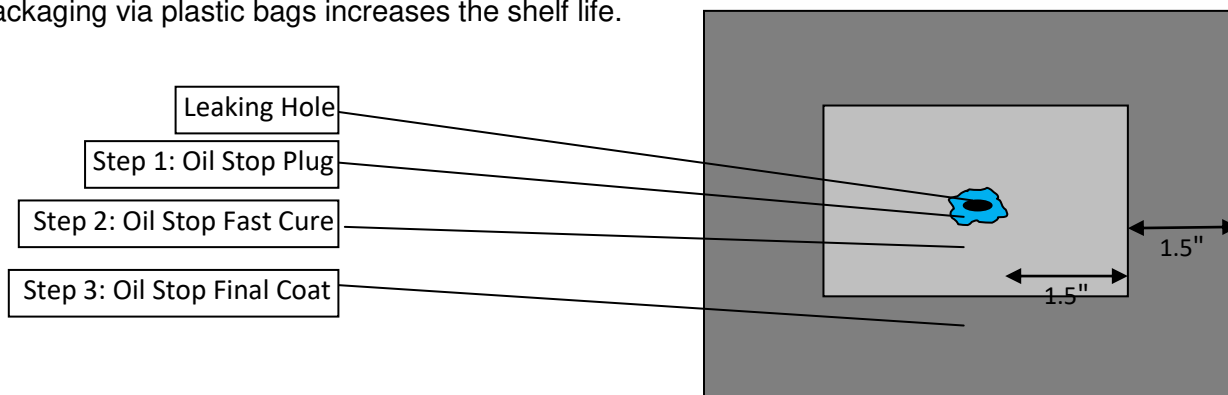


Fig. 1



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### Packaging

#### TRANSFORMER LEAK REPAIR KIT, PN# 991

- 1 Unit Oil Stop Plug
- 1 Unit - Oil Stop Plug Fast Cure
- 1 Unit - Oil Stop Final Coat
- 1 - Mixing Board
- 1 - Spatula Set
- 2 - Mix Paddle
- 1 - Applicator
- 1 - Stiff Bristle Brush
- 1 - Plastic Mixing Container

#### TRANSFORMER LEAK REPAIR KIT, PN 995 - Customized Formulation

#### ***Optional, Additional Products:***

Metal Repair System Applicator Tool Kit, Part # TK220 (Also sold separately))

Metal Cleaner #701 - Non-Residue forming, metal surface prep cleaner. Fast evaporation.

Release Agent PN# 1126 - can be used in areas where epoxies shouldn't adhere to. (eg: forming casting metal components/molds etc)



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Data Sheet: Revision 1.

## Warranty Information



**SAFETY PRECAUTION: READ MATERIAL PRODUCT SAFETY DATA SHEETS BEFORE USING PRODUCT.** Our products are intended for use by experienced professional only. Suitable chemical resistant gloves, safety glasses or full face shields, protective clothing and respirators must be worn as per product safety data sheet while conducting surface preparation and applying product. Do not smoke or drink while using product. Keep away from open flames and sparks.

EMPCORR warrants their product from defects. Because the application, handling or storing of our products is beyond our control, EMPCORR will not be held liable and in any form whatsoever for the results obtained after usage. To the best of our knowledge, the technical data contained herein is accurate on the date of publication and is subject to change without prior notice. Purchasers shall conduct their own tests to determine the suitability of our products for their particular purpose. Product properties, performance data and contents of this technical data sheets should not be constructed as specifications. User must contact EMPCORR to verify correctness before specifying or ordering. No guarantee of accuracy is given or implied. EMPCORR assumes no responsibility for coverage, performance or injuries resulting from use. No other warranty or guarantee of any kind is made by EMPCORR, express or implied, statutory, by operation of law, or otherwise, including merchantability and fit for a particular purpose

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