

# CET - ESTER INSULATED BUSHINGS

FOR POWER TRANSFORMER APPLICATIONS

With porcelain or composite insulator acc. to IEC 60137



**CET Ester Insulated bushing** is the new innovative solution from Trench to address the increasing demand for Eco-sustainable HV equipment, combining increased safety and increased thermal performances and enhanced aging resistance. This new alternative technology is the best solution to fulfill nowadays service condition and regulations.



CET – ESTER INSULATED BUSHING

## ENVIRONMENTAL FRIENDLY SOLUTION

Using CET bushings **reduces the risk of environmental damage in case of spillage**. The insulation liquid is classified as readily biodegradable according to OECD 301 unlike mineral oil which is non-biodegradable.

CET bushings have an **increased eco-performance** during the product lifecycle:

- **No pollution hazard** during bushing manufacturing, testing and operation
- Enabling reductions in containment measures for transformer installation or bushing storage
- **Recycling capabilities** of bushings components **at end of life**

## ENHANCED SAFETY

Synthetic esters have a **high fire point**, significantly increasing the fire safety of the equipment.

Using a less flammable K class fluid such as synthetic ester brings the following advantages:

- **No fire risk in case of major failure**: even if ester ignites, the resulting pool of liquid rapidly ceases to burn, without generation of toxic smokes
- Lower costs for installation and maintenance of fire safety equipment
- Associated insurance costs.

## EXTENDED LIFE-TIME

CET products offer the characteristic of **higher load capabilities** at higher temperatures without reducing the insulation life expectancy, compared to conventional OIP insulation. Based on ageing tests, kraft paper has shown improved lifespan when combined with ester liquid: as presented in IEC 60076-14, standard kraft paper combined with synthetic ester can be considered as an insulating system of thermal class 120.

## READY FOR ON-LINE MONITORING

Our products are designed to allow the connection to on-line monitoring systems, for continuous remote monitoring of the product status and early notification of potential bushing failures.



**TRENCH**  
Sense the Power

# EXPLOIT THE ADVANTAGES OF TRENCH ESTER FILLED BUSHINGS

## PROVEN DESIGN OF OIP TECHNOLOGY

CET Ester Bushings are derived from the design of our conventional and proven OIP transformer bushings, providing the same **main features**:

- Available with **porcelain or composite** insulator
- Capacitive fine graded insulation made of kraft paper impregnated with liquid insulation (synthetic ester)
- Excellent long term stability due to extremely low partial discharge and dielectric losses
- Proven high electrical withstand against transient or impulse test
- Immersed part covered by epoxy resin insulator providing high impact resistance
- Electrode embedded in the lower epoxy resin insulator, avoiding external shielding and reducing distance to grounded parts

## TECHNICAL FEATURES

- Effective solution also for cold climates thanks to the low pour point of synthetic ester (-56°C)
  - Technical performance as per IEC 60137-2017
  - Filled with a synthetic ester that is readily biodegradable
  - Increased eco-performance during the product lifecycle
  - Higher load capabilities at higher temperatures without reducing the insulation life expectancy
  - Fire safety: synthetic esters have a higher fire point, significantly increasing the fire safety of the equipment
  - No miscibility issue: synthetic esters are miscible with mineral oils
  - Perfect solution for ESTER transformers for a full ESTER technology
  - Compatible also with mineral oil insulated transformers
  - CET products are fully type tested
- Cost-effective solution, with a price level comparable to OIP bushings

### CET

Rated highest voltage for equipment Um	kV	24	36	52	72,5	100	123	145	170	245
Power Frequency withstand, dry	kV	55	77	105	155	205	255	305	355	505
Lightning impulse (BIL)	kV	125	170	250	325	450	550	650	750	1050
Switching impulse (SIL)	kV	-	-	-	270	375	460	540	620	850
Rated current w/ draw lead conductor	A	800	800	800	800	800	800	800	800	1000
Rated current w/ removable conductor	A	1250	1250	1250	1250	1250	1250	1250	1250	1250
Rated current w/ fixed conductor	A	3150	3150	3150	3150	3150	3150	3150	3150	3150
Creepage distance	mm	780	1116	1612	2248	3100	3813	4495	5270	7595

\* Higher current ratings are available on request