



AT ISSUE: ▼

Listing by Underwriters Laboratories Inc. (UL) is an increasingly common requirement for liquid-filled distribution transformers and can often be confused with UL's Combination Classification/Listing or Factory Mutual (FM) Approval.

RECOMMENDATION: ▼

The use of a UL Listed transformer versus a transformer intended to comply with NEC 450-23 "Less-Flammable Liquid-Insulated Transformers" comes down to the application of the transformer. Cooper Power Systems offers UL Listed transformers to satisfy local and state codes that require either UL Listing by name or a transformer Listed & Labeled by a Nationally Recognized Testing Laboratory (NRTL). When transformers are applied indoors or near buildings and compliance with NEC 450-23 is required, Cooper offers either UL Combination Classification/Listing or FM Approval for this application.

RATIONALE: ▼

VERIFIED DESIGN

Cooper Power Systems' three-phase padmount and substation transformer product lines are Listed by UL, indicating conformance to applicable safety and performance standards. For additional information regarding the requirements for UL Listing, see the XPLH guideline on the UL website. Please note UL Listing is optional and must be requested.

A UL Combination Classified/Listed transformer combines both the above Listed transformer with a UL Classified fluid, such as Envirotemp FR3 or R-Temp fluid, hence the name, Combination Classification/Listing. The additional requirements to satisfy NEC 450-23 are contained within the UL Classification file of the high fire point fluid.

Contrasting with UL Combination Classification/Listing, but intended for the same application, is FM Approval. The requirements for FM Approval are contained within FM Approval Standard 3990, specifically written to satisfy NEC 450-23. This is different from the UL two-part approach of the Listed transformer combined with the Classified fluid, although the requirements of FM 3990 and the UL listing requirements in the fluid classification are inherently similar.

ADMINISTRATIVE AND PROCUREMENT COST SAVINGS

When the time comes to specify a new project, the specification writing and research into applicable codes can be a daunting task. The listings and approvals offered on Cooper three-phase padmount and substation transformers, however, can make this job easier. Depending on your application, UL Listing or either of the two NEC 450-23 options outlined above are easy to specify and can make installation approval a breeze when your project is complete.

PERFORMANCE

What UL Listing ultimately means is proven, verified performance. To demonstrate that performance, Cooper's UL Listed transformers bear the UL and c-UL Listing mark.



When UL Combination Classification/Listing is specified, the transformer will bear the UL Listing mark from above along with the statement to the right.

ALSO CLASSIFIED FOR USE AS LESS-FLAMMABLE LIQUID-INSULATED TRANSFORMER IN ACCORDANCE WITH SEC. 450-23 OF THE NATIONAL ELECTRICAL CODE (NEC) AND MARKED USE RESTRICTIONS ON THE TRANSFORMER

Cooper Power Systems' FM Approved transformers bear the FM Approval mark. Transformers bearing this mark have been evaluated and designed to FM Approval Standard 3990.



SAFETY

Safety becomes the bottom line for installations going indoors and adjacent to or on buildings. The NEC has set forth guidelines for transformers installed in those locations in 450-23 "Less-Flammable Liquid-Insulated Transformers." Satisfying these requirements centers around the use of a fluid with a fire point greater than 300°C, such as Envirotemp FR3. Additionally, both the UL Combination Classification/Listing and FM Approval add additional protection features including overcurrent protection and ample pressure relief capability.

THE BOTTOM LINE: ▼

The bottom line is that there *are* options when choosing Listed & Labeled transformers, that are dependent on the intended use of the transformer. UL Listing means the design and manufacturing of the transformer has been evaluated by UL to meet applicable ANSI C57 standards. On the other hand, UL Combination Classification/Listing and FM Approval are not only evaluating the transformer itself but the application as well, to meet NEC 450-23.