

FM APPROVED DISTRIBUTION TRANSFORMER SOLUTIONS

Wilson Transformer Company (WTC) offers a wide range of FM Approved distribution transformer solutions that comply with ANSI/IEEE C57.12.00 and FM Approval Standard 3990 for liquid insulated transformers. These solutions offer substantial fire safety with high flash and fire points of $>300^{\circ}\text{C}$; the increased resilience of this type of additional protection may lower your property insurance costs.



THE TRANSFORMER
PEOPLE

KEY FEATURES

- > Increased fire safety
- > Reduced clearance and transformer installation footprint
- > Reduced civil engineering costs
- > Extended transformer life
- > Increased transformer overloading limits above nameplate
- > Increased environmental protection



FM Approvals are worldwide certification and testing services that assure FM Approved products and services have been objectively tested and conform to the highest international standards.

WTC's Distribution Transformer Business Unit located in regional Victoria has extensive experience in supplying FM Approved transformer solutions to a variety of customers and industries around Australia. These transformers provide higher safety protection, cost and environmental benefits and are widely used in defence, infrastructure, industrial and mining applications.

Our product range of FM Approved transformer solutions includes three phase distribution transformers up to 8000kVA with system voltages up to 72kV and cooling class KFWF/KNAN/KNAF.

The transformer tanks built to this standard are capable of withstanding an internal pressure of 20 psi (140 kPa) for cylindrical type, 15 psi (105 kPa) for rectangular type, without rupture and are equipped with pressure relief devices.



KEY FEATURES

Increased fire safety

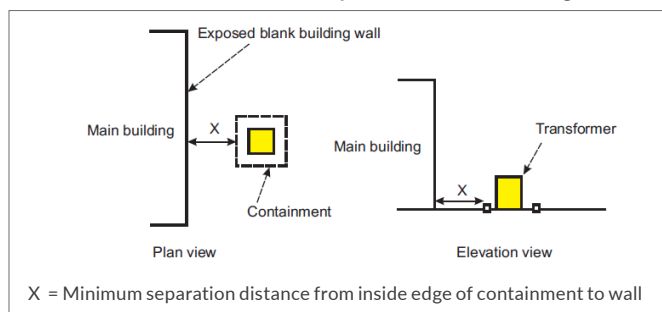
As many distribution transformers are installed near or inside buildings in urban areas or next to critical infrastructure, it is paramount to ensure that fire safety measures are taken to avoid catastrophic failures with long-lasting consequences.

Our FM Approved distribution transformers use FR3® or MIDELE dielectric fluids, both of which are classified as K-class fluids with a high fire point of >300°C. These FM Approved less flammable transformer fluids represent a low fire hazard and can prevent or significantly reduce the extent of damage in the event of a transformer failure.

Reduced clearance and installation footprint

The FM Approved distribution transformers can be installed next to a building or other transformers with a significantly reduced transformer separation clearance requirement of only 0.9 metres. There is no requirement for fire-rated or non-combustible segregation walls. As a result, these transformer solutions substantially reduce the transformer installation footprint and civil engineering costs.

Figure 1. Minimum horizontal separation distance between outdoor liquid-insulated transformers and exposed walls of main buildings



Source: Transformers - FM Global Property Loss Prevention Data Sheets 5-4, p.22, 2019-2020. Posted and reprinted with permission¹.

Table 1. Separation for exposure protection of main building walls

Fluid or Tx type	Fluid volume, m ³	Min horizontal distance from containment to exposed building wall (X in Figure 1)		
		2-hour fire-rated wall, m	Non-combustible wall, m	Combustible wall, m
FM Approved Tx	Per Approval Listing	0.9		
FM Approved liquid in non-Approved Tx	<38	1.5		7.6
	>38	4.6		15.2
Non-Approved Tx liquid	<1.9	1.5	4.6	7.6
	≤1.9-19	4.6	7.6	15.2
	>19	7.6	15.2	30.5

Source: Transformers - FM Global Property Loss Prevention Data Sheets 5-4, p.23, 2019-2020. Posted and reprinted with permission¹.

Table 2. Minimum separation distances between adjacent transformers

Liquid Type	FM Approved Tx?	Liquid Volume, m ³	Distance, m
FM Approved Tx Fluid	YES	N/A	0.9
FM Approved Tx Fluid	No	≤38	1.5
		>38	7.6
Non - Approved Tx Fluid	N/A	<1.9	1.5
		≤19	7.6
		>19	15.2

Source: Transformers - FM Global Property Loss Prevention Data Sheets 5-4, p.25, 2019-2020. Posted and reprinted with permission¹.

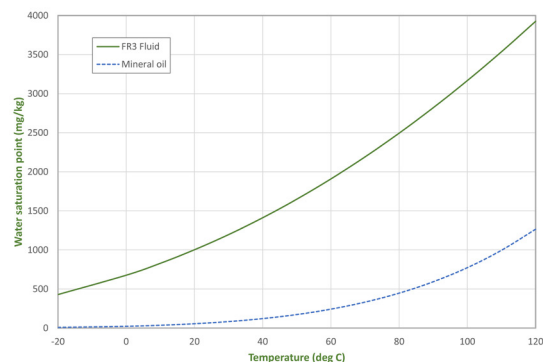
¹ ©2019-2020 Factory Mutual Insurance Company. All rights reserved. No part of this document may be reproduced, stored in a retrieval system, or transmitted, in whole or in part, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without written permission of Factory Mutual Insurance Company.

Extended transformer life

The life expectancy of a transformer is largely determined by the condition of its insulation system. The degradation of the cellulosic materials due to its reaction to water can significantly reduce the life of a transformer and lead to its failure.

The rate of degradation is much lower when natural ester transformer fluids are used. Natural ester fluids can hold significantly more water (ppm) than mineral oil, and thus extend the insulation life of a transformer to five to eight times.

Graph 1. Moisture saturation rates for mineral oil and FR3 fluid



Source: Cargill, <https://www.cargill.com/bioindustrial/fr3-fluid/superior-performance> (Accessed: 5 July 2021). Posted and reprinted with permission.

Image 1. Moisture saturation rates for mineral oil and FR3 fluid



Source: Cargill, <https://www.cargill.com/bioindustrial/fr3-fluid/superior-performance> (Accessed: 5 July 2021). Posted and reprinted with permission.

Increased environmental protection

The FM Approved distribution transformers are filled with FM Approved transformer fluids that are non-toxic, non-hazardous and readily biodegradable in 28 days. They present a much lower risk to the environment if spillage occurs, thus significantly reduce the chance of environmental harm.



WILSON TRANSFORMER COMPANY PTY LTD

Distribution Transformer Business Unit
10 Moloney Drive, Wodonga,
Vic 3690 Australia
T: +61 (0) 2 6024 5944
E: distsales@wtc.com.au

