

Increased Fire Safety

March 2024

Page 1 of 2

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Transformer fires are particularly unforgiving, spreading very quickly and causing extensive damage, often with the tragic loss of human life. In short, transformer fires are an everyday occurrence in power networks worldwide.

MIDEL eN 1204 offers the perfect solution in terms of fire risk mitigation. As a high fire point K-class fluid it joins a set of dielectric liquids that have an impeccable 100% fire safety record since their introduction in the 1970s.

FM Global® and Underwriters Laboratory, two internationally recognised insurance companies, have listed MIDEL eN 1204 as a less flammable fluid for dielectric purposes. This means it requires lower fire safety measures than mineral oil. In addition, MIDEL eN 1204's fire safe properties allow for use in transformers inside buildings and other critical areas where mineral oil would not be acceptable.



Flash and Fire Point

MIDEL eN 1204 has been specifically formulated to give a high flash and fire point, well in excess of those required for K-class rating (IEC 61039) and far superior to mineral oil (Table 1).

Table 1 - Flash and Fire Points - IEC 61039 Class K2

Parameter	Test Method	MIDEL eN 1204	Mineral Oil
Flash Point	ISO 2592 / ASTM D92	327°C	160°C
Fire Point	ISO 2592	360°C	170°C
Net Calorific Value	ASTM D240-02	37.5MJ/kg	46.0MJ/kg

Data quoted above are typical values

The high fire point of MIDEL eN 1204 ensures that it will be very difficult to ignite and that the risk of pool fires is all but eliminated. In addition, being a K-class fluid, MIDEL eN 1204 benefits from reduced equipment spacing requirements, as specified in IEC 61936. This has the potential to save significant expense, by allowing a smaller footprint and shorter cable runs.

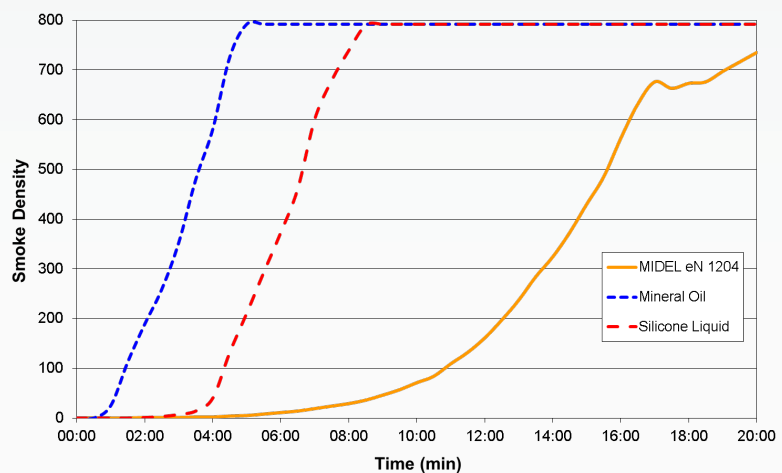
Smoke and Combustion Products

In the extremely unlikely event of MIDEL eN 1204 igniting it would produce a non toxic, much lighter smoke in comparison to that of burning mineral oil. MIDEL eN 1204's smoke is also not as dense as the white silica smoke produced by silicone liquid fires. This is very pertinent when considering evacuation and rescue procedures.

Method

The smoke density of MIDEL eN 1204 was tested by recognised fire safety laboratory Exova Warrington to a modified version of the NFX 10-702 method, designed to test railway carriage materials. One aspect of this testing is to measure the optical obscuration of the smoke produced by burning the subject material. In the case of MIDEL eN 1204 a comparison was made with mineral oil and silicone liquid. The time to reach full obscuration is observed, to give a comparison of smoke production.

Figure 1 – Smoke density test results



Increased Fire Safety

March 2024

Page 2 of 2

Results

It can be seen from Figure 1 that MIDEL eN 1204 produced smoke at a much slower rate than the other two fluids and did not reach the maximum limit within the 20 minutes test period. Predictably, mineral oil produced thick black smoke, silicone liquid produced a grey smoke and both were denser than the thin white smoke produced by MIDEL eN 1204.

Further fire testing has been conducted by M&I Materials and external laboratories and details are available on request. In terms of protection of personnel and property MIDEL eN 1204 is the obvious choice when specifying a fire safe fluid.