

Envirotemp FR3 Fluid: OEM Power Design Data

This section provides information on characteristics of FR3 fluid useful in designing Transformers. The following documents are included:

- **CPS Report: Summary of In-Progress Testing for Power Transformer Application of FR3 Fluid**. This is a report on results to date of testing recommended by Harold Moore, including gap and creep breakdown levels for Impulse and AC Withstand Stresses. It also includes some specialized fluid properties vs. temperature test recommended by Mr. Moore.
 - **Conclusion on Data to Date: FR3 fluid dielectric performance is essentially equivalent to mineral oil.**
- **EHC-Weidmann Technical Report on Impregnation Rate of FR3 Fluid**
- **University of Manchester Presentation: An Overview of The Suitability of Ester Oil Dielectrics For Use In Large Power Transformers**
 - **Conclusion: Unused natural ester fluids have comparable electrical properties to unused mineral oil but as the oils age, natural esters hold their values better than mineral oil.**
- **University of New South Wales Report: A Report of the Partial Discharge Test conducted on Envirotemp FR3 Fluid**
 - **Conclusion: In all cases FR3 fluid had higher partial discharge inception and breakdown voltages than mineral oil.**
- **University of Hanover: A Report of the Partial Discharge Test conducted on Envirotemp FR3 Fluid**
 - **Conclusion: In all cases FR3 fluid had higher partial discharge inception and breakdown voltages than mineral oil.**
- **IEEE PES T&D Conference Presentation May 2006: Relative Stability of Non-loadbreak Switch Contacts**. This presentation centered on the relative contact stability in an accelerated life test method.
 - **Conclusion: Contacts are most thermally stable when immersed in FR3 fluid vs. mineral oil.**
- **IEEE PES T&D Conference Presentation May 2006: Dielectric Properties of Natural Esters and their Influence on Transformer Insulation Systems Design and Performance**
 - **Conclusion: Results to date indicate that the creep strength of pressboard in Natural Ester is as good as or better than the creep strength in Mineral Oil for AC and Negative Impulse.**
- **Transformer FR3 Fluid to Mineral Oil Comparative Thermal Rise**
 1. **CPS Report: Comparative Heat Run Tests - 15KVA-30MVA units.**
 2. **Power OEM Report: Comparative Heat Run Tests - 24/32/40 MVA.**
- **CPS Bulleting: Dissolved Gas Guide**