

Miscibility of APAR's Transformer oils with other mineral oils and oils in service



For mixing unused transformer oils of different grades of APAR with unused Transformer oils of other brands or add to oils in service, guidelines given in IEC 60422 - for maintenance of transformer oils in service, (for both new oils and oils in service) can be applied in general. Oils which meet the same specification and class / type are miscible in all proportions. However when oils mixed as per the above guidelines, the mixture should meet the respective standard used. In case of mixing unused oils of different origin , class/ type and to top up oil in service, compatibility tests should be performed to ascertain that parameters such as Inter Facial Tension , Pour Point, Dielectric Dissipation Factor and Oxidation Stability of the over all mixture should be better than those of the poorest individual oil in mixture.

In case if history of oil in service is unknown, a miscibility and compatibility study has to be established as per the above guidelines.

Uninhibited Oils :

Uninhibited oils of different brands of the same class and standard are normally miscible in all proportions. In countries where products with trace amounts of inhibitor are regarded as uninhibited , a trace or partially inhibited product of the same class and standard can be mixed with an uninhibited product of the same class and standard in any proportion. However the compatibility studies have to be established.

Inhibited Oils:

Inhibited oils of different brands of the same class and standard are normally miscible in all proportions. However since inhibited oils of several classes and standards have different permissible inhibitor levels , care should be taken that the inhibitor level does not exceed the limits allowed by the respective standards , for example

For Trace inhibited grades the maximum permissible limit is 0.08 % inhibitor
For Fully inhibited ASTM grades the maximum permissible limit is 0.30% inhibitor
For Fully inhibited IEC grades the maximum permissible limit is 0.40 % inhibitor

After topping up an inhibited grade in service with new inhibited oil , inhibitor content measurements should be made to establish a new baseline for further maintenance

**Corrosion :**

The new requirements of corrosion stability by the ASTM D 1275 B and Cigre TF. A2.32.01 Test methods which are much more severe than that existing in the current transformer oil standards require special grade oils that can fulfill these additional requirements. If an oil not passing these new corrosivity tests is topped up or mixed with an oil that passes these tests , it will in general make the mixture of the oils still not pass the new corrosivity tests. In order to maintain the good corrosion stability it should be ensured that only oil that passes these new corrosivity tests are used to top up (the oil of the same grade or standard) in service that is already passing the same requirements.

When adding passivated oil to a non passivated oil in service or vice versa , it is recommended to adjust the passivator level in the mixture to that of the passivated oil.