

Soltex, Inc.
Laboratory Test Report

**"The Effect of Blending Beta
Fluid with R-Temp Fluid"**

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Soltex, Inc.

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Purpose:

The purpose of this laboratory investigation is to determine the characteristics of blends of dielectric fluids. Specifically, this experiment evaluated the physical, electrical, and chemical properties of blends of Beta Fluid with R-Temp® Fluid.

Experimental Procedure:

A laboratory blend was made of the two fluids by combining 2000 ml of Beta Fluid with 2000 ml of R-Temp Fluid (both liquids measured at 20°C.) The blend was heated to 85 C. and mechanically agitated for 30 minutes to ensure complete mixing. The blend was then cooled overnight to room temperature before testing.

Testing was performed per ASTM Standard Test Methods as set forth in 1993 Annual Handbook of Standards, Section 10.03 (Electrical Insulating Liquids and Gases). All tests were performed by the Quality Control laboratory at Soltex's manufacturing facility.

Test Results:

Results of the tests are shown in Table One.

Conclusions:

The results of the tests show that the fluids are miscible when mixed at 50% v/v. No incompatibilities were noted. All test results were well within the accepted ranges.

Both R-Temp and Beta Fluids are paraffinic petroleum fluids manufactured from lubricant base stock oils. On a molecular level, both fluids are similar. Because both fluids are 100% hydrocarbon-based, miscibility and compatibility would be expected.

Long chain paraffinic hydrocarbons, such as Beta Fluid and R-Temp Fluid , are compatible with nearly all materials used in the construction of electrical

equipment. They exhibit very little "solveny" action, and therefore may be used with a wide range of plastics, varnishes, papers, tapes, and wire insulation. Generally, any material that can be used with conventional transformer oil can be used successfully with long-chain paraffins. Soltex recommends that all materials be tested for compatibility in conjunction with one another before use in transformers.

The data from this experiment show that mixtures of Beta Fluid and R-Temp Fluid can be successfully used as an electrical insulating fluid in electrical equipment when the equipment construction materials are compatible with either fluid used alone.

References:

1. "Insulating Materials for Design and Engineering Practice", Vol 2; F.M. Clarke; 1959, Wiley & Sons.
2. "Insulating Liquids: their Use, Manufacture, and Properties"; A.C.M. Wilson, 1980, IEE Press (London)

Table One
Results of Laboratory
Testing

Property	R-Temp Fluid	Beta Fluid	50/50 Blend
Appearance	dark yellow	light yellow	dark yellow
Viscosity, cSt. @ 100 C.:	12.6	12.1	12.2
Dielectric Strength ASTM D877, kV:	44	43	43
Power Factor, % @ 100 C.,: ASTM D924	0.10	0.13	0.10
Permittivity @ 20 C. : ASTM D924	2.2	2.2	2.2
Neutralization Number, mg KOH/g: ASTM D974	0.01	<0.01	0.01
Specific Gravity ASTM D1298:	.87	.87	.87
Flash Pt, C. :	280	275	275
Fire Pt, C. : ASTM D92	306	306	306

R-Temp Fluid is a registered trademark of Cooper Power Systems, Inc. Beta Fluid is a registered trademark of Soltex, Inc.