



SERVER MODIFICATIONS

WHAT DOES IT TAKE TO SUBMERGE AN OEM SERVER IN DIELECTRIC FLUID?

Although OEM servers do not currently come from the factory ready for submersion in dielectric fluid, GRC has developed a three-step process to modify servers for submersion in GREENDEF™ coolant: removal of fans, encapsulation of hard drives, and substitution for thermal grease. The modification process is quick and inexpensive -- depending on the server type, modifications can be completed in less than fifteen minutes.



Server chassis fans removed

1. REMOVAL OF SERVER FANS

Obsolete in a fluid-cooled environment, server fans are removed entirely from the chassis. As a result, server power consumption is reduced 10-25%, significantly reducing overall data center energy expenditures.

Some servers require fan emulators to simulate the presence of a fan. GRC supplies these emulators and can install them in a matter of minutes.

2. HARD DRIVE ENCAPSULATION

Hard drives are encapsulated by GRC using a proprietary potting process. Sealed hard drives are completely air-tight and maintain original form factor. The encapsulation material is very thin and seals against coolant penetration.

Sealed hard drives may be run in air as well as coolant, but the encapsulation process cannot be reversed. Encapsulation is unnecessary for solid state drives.



Sealed hard drive [left] and unsealed hard drive [right]



CPU with Indium foil thermal grease substitute

3. THERMAL GREASE REPLACEMENT

Thermal grease assists the heatsink in removing heat from a CPU or a GPU chip. Since this grease is oil-based and will eventually dissolve in GREENDEF™ coolant, it must be replaced with Indium, a soft metal foil with extraordinary heat conductivity.

Indium is safe for submersion and for air cooling alike and it takes less than two minutes to install a piece between a chip and heat sink.