

## MM INDUSTRIAL SALES

### Reports on

# Advances in Fire Resistant Hydraulic Fluid Technology for Saw Mills and Logging Equipment

Hydraulic systems fires are an extremely dangerous and often costly situation. Normally, hydraulic fluids can be considered non-flammable as the flash point for most hydraulic fluid is higher than 350°F. Since well-maintained hydraulic systems typically operate well below this temperature, the risk of fire is minimal IF the hydraulic system is operating normally. However, the fire risk significantly increases in the case of a leak or rupture in the hydraulic system.

### WHY FIRE RISK INCREASES IN CASE OF A LEAK OR RUPTURE IN A HYDRAULIC SYSTEM

In a hydraulic system, the fluid is pumped at high pressures to power machinery. If a break occurs in a hydraulic line, the hydraulic fluid can spray forming a mist. Misting the fluid effectively lowers the energy required to combust it, making the hydraulic fluid highly flammable. The result is often an uncontrollable and devastating fire.

Saw mills and logging equipment have a high threat from hydraulic system fires. Not only is the lubricant a source of fuel, but the risk of fire is exasperated by the presence of other combustible material such as wood and saw dust and the ease of hydraulic line ruptures due to the proximity of sharp cutting equipment. Those hazards, combined with the remote location of most mills, makes controlling all potential fire threats a top priority.

### THE PROBLEM WITH CURRENT WATER GLYCOL EMULSION TECHNOLOGY

One of the best ways to reduce the risk of a hydraulic system fire is to use a Fire Resistant Hydraulic Fluid (FRHF). Today, the most common FRHF technology is a water glycol emulsion. This type fluid combines a glycol based fluid with water. In the event of an ignition of the hydraulic fluid mist, the flame will be extinguished by the presence of water in the formulation. The problem with this type of formulation is that it offers poor wear protection (one of the primary purposes of any fluid or lubricant).

Wear protection is often accomplished by the generation of a protective film between moving metal parts. When compared to a traditional hydraulic fluid, the thickness of a water glycol emulsion is significantly less. This often results in an increase in wear and a reduction in hydraulic pump life. In addition, water glycol emulsions are not compatible with most mineral oil hydraulic fluids, requiring time consuming change out and flushing procedures. These problems limit the types of hydraulic systems that can utilize water glycol emulsions.

### THE SOLUTION

To solve these issues, an alternative FRHF technology has been developed by Isel, an industrial lubricant manufacturer. This next generation FRHF contains additives which prevents the fluid from forming a flammable mist in the event of a leak. The benefit to using an additive to control misting rather than water is that the lubricating film thickness can be maintained. **This helps ensure proper wear protection and a long component life.**

In field tests, the fire-resistant properties of the additized FRHF fluid were compared to a standard mineral oil via a spray flammability test. The spray flammability test utilizes a high pressure hydraulic pump to push a test fluid through a misting injection nozzle at 1000 psi. The resulting mist is then ignited. As shown below, a standard hydraulic fluid ignites easily producing a flame thrower effect. The additive based Isel FRHF hydraulic fluid resists ignition.

	Standard Mineral ISO-46 Oil	Water Glycol FRHF	MM-2584-46
Typical Film Thickness as % of mineral oil	100%	30%	100%
Relative Bearing Life as % of mineral oil	100%	25%	>100%



Standard mineral oil Hydraulic Fluid  
ISO-46



Additive based FRHF: 2584-46

MM Industrial Sales recently installed Isel’s FHRF fluid under the MM-2584 brand name at the Ottawa Forest Product saw mill in Amasa, Michigan. Ottawa Forest Products immediately noticed **NO leakage as well as improved pump and valve performance.**

For more information, call MM Industrial Sales at 1-844-442-6977 or email [Mark@mindustrialsales.com](mailto:Mark@mindustrialsales.com).