

Protect your business from fires involving pressurized hydraulic fluids.



Hydraulic systems are found in nearly all types of industries. They use pressurized fluid to create power to operate numerous types of machines for metalwork, paper milling, plastic injection molding, and many others.

The fluid presents a unique potential fire hazard due to the pressure it is under. The hazard occurs when a pin-sized leak in the equipment or components creates an atomized spray of the combustible hydraulic fluids. Accidental release of hydraulic fluids is most dangerous in systems operating above 200 psi.

When the fluid becomes atomized, it can be easily ignited by nearby heat sources and creates a flame spray that can extend up to 40 ft. These flame sprays can last an extended period of time, due to the small amount of fluid being released from the leak. Nearby combustible material such as pallets, work-in-process, or even other hydraulic equipment can become ignited, creating a large fire in a short time.

Steps to preventing hydraulic fires.

SUBSTITUTION

The best method for preventing hydraulic fluid fires is to use an FM-approved, less hazardous fluid rather than a combustible hydraulic fluid. These FM-approved fluids:

- Are more difficult to ignite
- Have a higher flash point and lower flame spread
- Have shown in tests that they will readily extinguish when not exposed to continuous ignition sources

While these FM-approved, less hazardous fluids have many characteristics that reduce the likelihood of a sustained flame spray, it is important to note that they do contain combustible compounds that will burn under severe fire conditions.

Converting to a less hazardous fluid does require equipment to be retrofitted with compatible parts. This could include changing out hoses, packing, seals, etc. Careful planning and choosing the right replacement fluid can help reduce downtime and interruptions to operations.

Combustible Hydraulic Fluids

PUMP SHUTDOWNS

Another method for controlling hydraulic fluid fires is to have adequate hydraulic pump shutdowns in place. These shutdowns should not be confused with low-level shutoffs as they serve different functions. Hydraulic pump shutdowns are meant to stop the pump when a combustible oil fire is detected. Low-level shutoffs are meant to shut down the system when a certain minimum level of fluid is left in the tank, to prevent damage to the system. A low-level shutdown will not respond to a small leak in a timely manner and could allow fluid to continue being supplied to a fire for several hours before the fluid level is reduced enough to cause a shutdown.

There are two types of hydraulic pump shutdowns — manual and automatic. Automatic pump shutdowns are triggered by the activation of a sprinkler system flow alarm, which triggers the building alarm panel or a dedicated heat detection unit, installed above each hydraulic system. Manual shutdowns include both local shutdowns at the equipment for the operator, as well as remote shutoffs. Remote shutoffs can be tied to a group of machines and located on an exit path to allow for safe evacuation. Automatic shutdowns are preferred, as they do not rely on human interaction.

In all cases, these shutdowns trigger the prompt, safe shutdown of equipment and turn off the power to the hydraulic pump. Additional considerations to stop leaks may be necessary with hydraulic systems that incorporate accumulators.

SPRINKLER PROTECTION

Adequately designed, water-based sprinkler protection should be installed over all hydraulic equipment and in adjacent areas that could be impacted by a hydraulic fire spray. This includes protecting pits with standalone hydraulic equipment.



PREVENTIVE MAINTENANCE

A formal preventative maintenance schedule that focuses on the inspection of equipment and hoses is essential in preventing the types of conditions that can lead to a hydraulic system fire. Special focus should be placed on looking for worn hoses, seals, or piping. Visual inspections should include metal braided hoses near pinch points, assessment of any deteriorated hoses, and significant dripping/leaks of fluid.

CLEARANCE OF COMBUSTIBLES

Maintaining proper clearance around hydraulic equipment can help limit the potential fire load. As much as possible, combustible materials should be stored at least 40 feet from hydraulic equipment. Storage areas and warehousing should have at least a 75-foot clearance to ensure it does not become involved in a hydraulic system fire.

Providing solutions to help our members manage risk.®

For your risk management and safety needs, contact Nationwide Loss Control Services: 1-866-808-2101 or LCS@nationwide.com.