Respect in the Workplace—It's for More Than Just People

Respect. Whether it's from our boss, our employees, friends, families or neighbors, we need to feel respected. We understand that need to feel respected, but we do not respect all of the devices we use every day to make our jobs easier. Power tools are respected. Equipment is respected. Industrial hose? Heck, what can only 100 psi do?

There are two major categories of hoses: Hydraulic and Industrial. Hydraulic hoses command a tremendous amount of respect in the workplace mainly due to the huge pounds per square inch (psi) rating they carry. The thought process is: "3,000 psi! If that thing comes undone somebody's going to get killed!" Industrial hose is the Rodney Dangerfield of the hose world. Most people using industrial hose show little, if any, respect for this type of hose. They throw it, walk on it, kick it, run over it and sit on it. Most people do not realize the amount of energy inside that industrial hose they have been using and abusing.

There are two dynamics at work in every hose. First, there is psi. Pasquale's law says there must be equal pressure in all directions. The hose is a pressure vessel that is designed to contain a certain amount of outward pressure. The second dynamic at work is force. Force is the linear energy that runs the length of the hose. In essence, it's what is trying to push the fitting out of the end of the hose. Force is calculated by taking the area of a cylinder (hose I.D.) in square inches multiplied by the pounds per square inch. This gives you force in pounds. If you have ever seen a video of a firefighter being tossed about by a fire hose, this is force in action.

For example: a 2-inch I.D. hose at 100 psi has 314 pounds of force. An 8-inch I.D. hose at 100 psi has 5,027 pounds of force. Hanging a full-size pickup truck from the end of that 8-inch hose would have the same force. The couplings at the end of the hose are trying to deal with the stress from the weight of that pickup truck. This is why the couplings and clamping devices that worked well with that 2-inch hose probably won't work for that 8-inch hose even though the pressure (100 psi) is the same.

Let's compare two typical applications: 1/2-inch I.D. hydraulic hose at 3,000 psi and 4-inch I.D. industrial hose at 150 psi. The 1/2-inch hydraulic hose has 588 pounds of force. The 4-inch industrial hose has 1,885 pounds of force. The industrial hose has more than three times the force of the hydraulic hose, but the hydraulic hose is the one everyone is afraid of. In other words, if both hoses were to whip, the industrial hose would pack more than three times the punch of the hydraulic hose.

Many people are injured and some are killed every year because they do not understand the power of the industrial hoses they use every day. Industrial hoses need to be used properly, inspected regularly and stored correctly.

Everyone wants a safe workplace. One way of improving safety is to understand the dynamics in the workplace and that includes the dynamic of force. Before you kick that industrial hose out of your way, remember that it can kick back with deadly force.