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The Impact Of Temperature Change On Dry Pipe Systems

In different types of climates and in various types of buildings, facilities, and venues, the standard type of sprinkler systems are simply not a possibility. The standard type of wet system has water present in the pipes of the system on an ongoing basis. While this is fine for areas where there is a consistent temperature, such as an office building or a home, it becomes problematic in unheated areas or when refrigeration systems are in place.

The Basics of a Dry Pipe Sprinkler System

In these types of applications, a dry pipe sprinkler system is the ideal option. This type of system uses pressurized air in the pipe—or sometimes nitrogen—which provides the necessary pressure in the pipe to keep the check valve closed. This is not a standard check valve, but rather a specialized direct differential dry valve.

This valve, which has a larger valve clapper air on the airside of the system as compared to the waterside of the system, is only triggered to open when the air pressure drops due to the opening of a sprinkler somewhere in the system.

The drop in pressure opens the valve and allows the water to flow into the pipe and to the open sprinklers for fire suppression. The valve is typically not equipped with either a latching mechanism or a side chamber, which means that changes to the system are immediately reflected in the opening of the valve. This sometimes leads to incidents where the valve is seen to have tripped in error. In fact, this type of tripping of the valve may be a direct result of changes in temperature across the system.

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Air Issues and Temperature

As water moves into the pressurized air system, there is some air that is trapped in various areas of the pipe in air pockets. These air pockets can be somewhat addressed with venting options, but they still occur in different parts of the system based on the temperature of both the ambient environment and the subsequent changes of internal pressure.

For example, in the winter in an unheated building, the system contracts slightly, with the necessary pressure adjustment naturally occurs. During the day, as the system heats up with exposure to the sun, the pressure increases. Over time, with the air pockets in the system, this pressure change increases, which can result in the tripping of the valve between the two parts of the system. Relief valves can be installed to regulate this pressure change with ambient temperature change.

Another issue that can occur is when the water on the wet side of the system heats up and expands. There is limited air in this side of the system, so the expansion pushes against the valve, creating a peak that is higher than the pressure of the air on the dry pipe side, causing the valve to trip and the water to flow into the dry pipe.

PIPING SYSTEMS INC.
32 Mill Street (Rt. 79) • P.O. Box 409
Assonet, MA 02702 • psi@PipingSystemsInc.com
TEL: (508) 644-2221 • FAX: (508) 644-2447

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www.PipingSystemsInc.com

True or False? It costs the U.S. Mint more money to make pennies and nickels than the coins are actually worth.

True or False?

1) Humans can't breathe and swallow at the same time.

2) Twinkies have an infinite shelf life.

3) It costs the U.S. Mint more money to make pennies and nickels than the coins are actually worth.

4) Adults have fewer bones than babies do.

5) Goldfish have three-second memories.

6) Humans can distinguish between more than a trillion different smells.

7) Lightning never strikes in the same place twice.

8) If you cut an earthworm in half, both halves will regrow their bodies.

9) If you cry in outer space, the tears will just stick to your face.

10) Napoleon Bonaparte was extremely short.

—Buzzfeed

Answers: 1) True; 2) False; 3) True; 4) True; 5) False; 6) True; 7) False; 8) False; 9) True; 10) False

Techniques For Career Success

Hard work is essential to success on the job, but there's more to it than that. The Entrepreneur website offers these tips for getting—and staying—ahead:

- **Manage your time.** You may feel you have too little to do—or too much. Set up a routine that lets you schedule your work efficiently. This may mean getting up early, creating a to-do list at the beginning of the day, or saving emails that aren't urgent until the end of the day—whatever keeps you productive throughout the day.
- **Set goals.** Don't wait for success to come to you. Set concrete goals for yourself—a promotion in two years, for example, or just eliminating your college debt. This will help you focus your efforts where they can get the best payback.
- **Be ready to work hard.** This may seem obvious, but it's important—you won't get ahead if you don't show a willingness to work. Getting results is only part of it—you'll show the people around you that you're dedicating to getting your job done right, whatever it takes.
- **Find a mentor.** Seek out people with more experience for advice and support. Be willing to listen, and respect your mentor's words. A good mentor can steer for forward and help you avoid dead ends.
- **Always seek development.** To get ahead, you've got to stay up on the latest skills. Volunteer for training within your organization, and find it outside wherever you can—consider joining professional organizations that offer development courses.

"Nothing in life is to be feared; it is only to be understood. Now is the time to understand more, so that we may fear less."

—Marie Curie

Find The Suspect

A police officer was testing three people who wanted to become detectives on their skills in recognizing a suspect. She showed the first man a picture for five seconds and then turned it over. "This is your suspect—how would you recognize him?"

"That's easy—we'll catch him fast because he only has one eye!" The police officer frowned. "That's because the picture I showed is his side profile." Annoyed by this ridiculous response, she flashed the picture for five seconds at the second man. "This is your suspect. How would you recognize him?" The second man smiled. "Ha! He'd be too easy to catch because he only has one ear!"

The officer grew angry. "What's the matter with you two? Only one eye and one ear are showing because it's a picture of his side profile! Is that the best answer you can come up with?" Extremely frustrated, she showed the picture to the third man and in a very testy voice asked, "This is your suspect—how would you recognize him? Think hard before giving me another stupid answer."

The third man looked at the picture intently for a moment. "The suspect wears contact lenses." The policeman was surprised. "Wait here for a few minutes while I check his file." She left the room and went to her office, checked the suspect's file on her computer, and came back with a beaming smile on her face.

"Wow! I can't believe it. It's true! The suspect does, in fact, wear contact lenses. Good work! How were you able to make such an astute observation?"

"That's easy," the third man replied. "He can't wear regular glasses, because he only has one eye and one ear."

Creative Thoughts Start in Bed

A survey of 2,000 British residents done by Microsoft Surface found many of people's best ideas tend to occur as they're dozing off, when they first wake up in the morning, and sometimes in the middle of the night. Pay attention to your thoughts in bed, write them down when ideas and solutions come to you, and keep rolling through problems before and after you sleep.

Saturn Beats Out Jupiter For The Most Moons

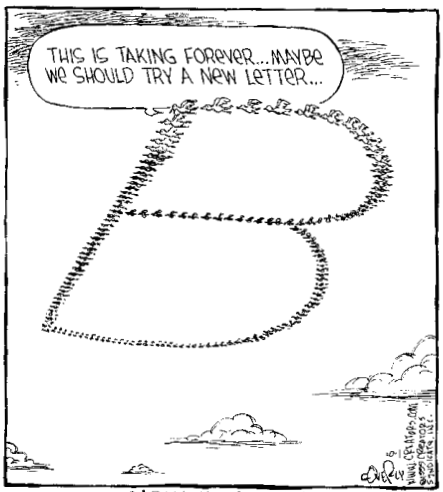
Move over, Jupiter. Twenty (20) new moons have been discovered orbiting the ringed planet Saturn, bringing its total number of moons to 82. Jupiter, formerly believed to be the planet with the most moons in our solar system, has 79 moons.

The *BBC News* website reports that the moons, discovered by the Subaru telescope on Maunakea, Hawaii, are about three miles in diameter. Seven of them orbit Saturn "backwards"—in the reverse direction of the planet's rotation. Those moons take more than three years to complete an orbit around the gas giant, while two of the moons in the more common "prograde" orbit take just two years.

Scientists believe the moons are remnants of at least three larger bodies that were broken up by collisions between other moons or with passing asteroids. "Studying the orbits of these moons can reveal their origins, as well as information about the conditions surrounding Saturn at the time of its formation," says Dr. Scott Sheppard from the Carnegie Institution for Science in Washington D.C., leader of the team responsible for the discovery.

The Carnegie Institution is holding a contest to name the 20 new moons. Submit your name suggestion on Twitter using the hashtag #NameSaturnsMoons.

SPEED BUMP **Dave Coverly**



EARLY MIGRATION

Study Suggests Reading Makes People Better

Do you read a lot? If so, chances are you're more kind and empathetic than most people, according to a study reported on the *Peace Quarters* website.

Researchers in Great Britain asked 123 people about their reading or television watching habits. Then they analyzed participants' social skills, asking questions like, "How often do you consider other people's points of views versus your own?" and "Do you go out of your way to actively help others?"

The results showed that the book readers, usually considered introverted and antisocial, displayed more empathetic traits than people who primarily watch television. The genre of books seemed to make a difference as well. Those who read romance and drama books showed more empathy and skill at seeing situations through another person's eyes.

Of course, it could be that empathetic people tend to read more, instead of reading creating more empathy. Either way, it's good news for bookworms.

Inventive Women From History

Some of the most common things we use every day were invented by creative women. Here are a few, gathered by the *Mental Floss* website:

- **Circular saws.** Tabitha Babbit, a weaver in a Shaker community, suggested that instead of a two-man pit saw that worked only when being pulled forward, a circular saw would be more efficient. She attached a prototype to her spinning wheel in 1813 and filed a patent thereafter.
- **Paper bags.** Margaret Knight created the modern, flat-bottomed paper bag in 1868. Before then, paper bags looked like envelopes. A man tried to steal the idea and file a patent, but Knight filed a lawsuit and won the rights to her creation.
- **Windshield wipers.** Mary Anderson invented the first manual windshield wipers in 1903. They didn't take off because most drivers thought it was safer to simply drive through rain and snow than keep pulling a lever to clear it. Another woman, Charlotte Bridgwood, invented an automatic version in 1917, but it wasn't accepted either. Still, by 1920 windshield wipers were everywhere, starting with Cadillac, which began installing them on all its cars.
- **Liquid paper.** A secretary named Bette Nesmith Graham corrected her typing mistakes with white tempera paint. After years perfecting the formula in her kitchen, she patented Liquid Paper in 1958. Gillette bought her company in 1979 for a whopping $47.5 million.
- **Kevlar.** This lightweight material will stop a bullet. It's five times stronger than steel. A chemist named Stephanie Kwolek discovered it by accident in 1966 as she was trying to develop a lightweight fiber for car tires.

"The crowning fortune of a man is to be born to some pursuit which finds him employment and happiness, whether it be to make baskets, or broadswords, or canals, or statues, or songs."

—Ralph Waldo Emerson

Warm-Ups Are Not Only For Baseball: The Importance Of The Steam Warm-Up Valve

Operating a steam system requires the right equipment, parts, and components for reliability and long duty cycles. The startup of the steam system can be a particularly problematic time in the operation as there are high levels of both condensation as well as expansion in the system due to the presence of steam.

To address these issues and to protect the system as a whole for the startup process, a steam warm-up valve is an essential component to have in place. This valve controls the presence of steam in the pipe to allow for safe thermal expansion and to reduce condensation when the hot steam hits the cold piping.

How the Warm-Up Valve Works

The warm-up valve is a relatively small valve that actually works in conjunction with an isolation or PRV (pressure reducing valve) in the system. Just as the name implies, the warm-up valve operates first, allowing small amounts of steam into the system for a gradual warming of the pipes and components. At the same time as this warming is occurring, there is also a pressure normalization that happens on the inlet and outlet side of the isolation or PRV.

This pressure normalizing or equalizing on both sides of the much larger PRV or isolation valve helps to reduce wear and tear on the big valve. Without this equalization factor, the opening of the large valve could result in water hammer, erosion, or scoring to the seals or seats of the valve through the wire drawing process.

It is vital to select the warm-up valve for the given application. They are most commonly used on pipes that are at least three inches or larger, and the longer and larger the pipe, the larger the warm-up valve needs to be. It is also possible to use two warm-up valves in the system, one for warm-up and one for isolation with large pipes and steam systems.

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Warm-Up Valve... *continued from above*

Extending the Duty Cycle of the System

The vast majority of the valves used in steam systems as the isolation valve are gate valves. This is an ideal option as they offer extremely limited flow restriction when in the fully open position, and they are also a reliable option for fully closing and sealing.

The use of the warm-up valve in the system provides the equalization of pressure on both sides of the gate. This allows the valve to operate automatically and without the need for external, manual operation.

In those systems that are using the quarter turn shut-off valves, including ball and butterfly valves as isolation valves, the warm-up valve also allows for control of the gradual pressure and heating of the system that would not be possible through the use of the butterfly or ball valve on its own.