PENN-TROY
MANUFACTURING INC.

Stemming from the Thread

The method used to create a threaded stem makes a big difference.

Stems are one of the most critical parts of a valve. Regardless of whether it's rising or non-rising, the stem does the work that gets results. Since stems can have such a large impact on the valve, it's important to pay attention to the details, like the method used to create the threaded stem.

The two most common methods used to form threads are rolling and cutting. Both begin with a round bar of steel, but cutting refers to the method of removing steel to create threads, while rolling refers to the method that compresses steel to form threads. Rolled threads are becoming increasingly popular, most likely due to the fact that they are more efficient to produce. The tooling used in rolling threads takes longer to wear and the process allows for higher rates of production, lower material costs and no chips or loss of metal.

To illustrate how both of these methods work, let's say you begin with a steel bar with a one-inch diameter. If you cut threads, the result is a steel bar that is still an inch in diameter from one end to the

other, with threads cut into part of the bar. However, if you roll the threads and want to achieve the same one-inch diameter thread, you begin with a steel bar that has a diameter of less than an inch. The compression of the rolling method displaces the steel and results in a one inch diameter thread, slightly larger than the body of the steel bar. Since rolling uses a smaller steel bar, it reduces the money spent on steel, and other costs associated with weight of the steel.

Hardness

Just because the steel bar with the rolled thread has a body with a smaller diameter, doesn't mean that it's weaker. The thread dimensions are exactly the same. Some reports show rolled stems to be up to 30% stronger than their cut counterparts. These reports show that the compression from the rolling reforms the grain of the material, rather than cutting and interrupting the grain, which leads to a stronger tensile and shear strengths in rolled threads.

Caption: An illustration of cut thread and rolled thread – notice how the grain of the cut thread is split, but the grain of the rolled thread is a continuous line.

Finish

The compression of the rolling also causes a smooth finish. The smooth finish allows the stem to require less torque to operate, which can save you money when you need to actuate your valves.

Cut stems, on the other hand, have more burrs and a rougher finish which can lead to galling.

Wear Resistance

The finish of the thread also has an effect on the life of the stem. The rougher finish of cut stems can lead to galling and therefore shorten the life of the stem. A smoother finish, like that of a rolled thread, makes the threads less likely to gall and reduces the wear, extending the life of the stem. Rolled threads also have increased resistance to stripping, because shear stresses take place across the material grain, rather than with it.

When it comes to choosing a valve, it's worth looking into the method used to create the threaded stem, as it can have an effect on everything from your budget, to the life of the stem. Penn-Troy has been the leading American manufacturer of water and wastewater valves for more than 30 years. Over that time, we've refined our valve designs to provide customers with unmatched value in durability and longevity. Because we don't just manufacture valves—we manufacture trust.