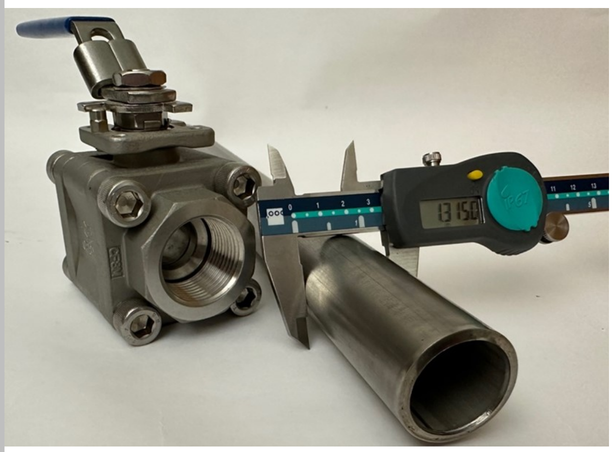
January 31, 2024

Nominal?? What does that word even mean?

Do You Know… The answer to this age old question – Why is 1-inch pipe, not 1-inch? Who in the world



decided that the outside diameter should be 1.315"??? And no, the inside diameter is not 1" either! In fact, if you look at a steel pipe chart, no dimensions for 1/8" – 12" pipe match their fractional or nominal equivalents. Oxford defines **nominal** as *"existing in name only"*. Exactly.

So, what's the explanation behind all of this?

The two primary considerations for system design are flow and pressure. Back in the old days, nice round numbers were easier to work with. If one needed a certain flowrate, they would just figure out how big the hole had to be in the pipe. Today, a system designer may calculate that a ½" inside pipe diameter would provide adequate supply for the required flow. Then that designer needs to figure out how thick the walls of the pipe should be to safely contain the pressure.

During the Industrial Revolution, piping systems, fittings, pumps, boilers and the like were often fabricated on an as-needed basis. As long as the hole was big enough and the wall was thick enough, they'd figure out a way to connect them.

At some point, it was calculated that a ½" inside diameter pipe should have a standard wall thickness of 0.17" to be safe at a given pressure. So the O.D. of the pipe became 0.840". Folks began to standardize on the outside dimension so that one company's pipe or fitting can easily be installed into the next guy's pump or boiler.
Further material and manufacturing advancements resulted in stronger piping. Heavier walls weren't always necessary, so reducing material could cut costs. Since all this standardization was well underway, it just wasn't feasible to go back in time and change the outside diameters… things just wouldn't fit together anymore. Instead of needing the 0.17" wall thickness, they could reduce that wall to 0.109". The result is a pipe with an O.D. of 0.840" and an I.D. of 0.622". So, let's call it ½" "nominal".

These examples use standard weight or Sch 40 pipe dimensions. The explanation is consistent for thinner and heavier wall thicknesses.

Two things to remember:

1. For iron and steel pipe of a given ***nominal*** size, the O.D is always the same. Only the wall thickness and therefore the I.D. change.
2. ***Copper tube is a little different***. The actual O.D. is always 1/8” larger than the nominal size. 1” measures 1.125” OD etc. Types K, L and M tube all have the same O.D., but varying wall thickness, with K being the heaviest, L in the middle and M the thinnest.

For more information on nominal valve and pipe or tube sizes, visit **www.MilwaukeeValve.com** or contact your Milwaukee Valve customer service rep today. A complete listing, by territory, can be searched at our website, at **www.MilwaukeeValve.com/Find-Sales-Rep/**.

MILWAUKEE VALVE
www.milwaukeevalve.com
262.432.2700

HAMMONDVALVE
www.hammondvalve.com
262.432.2702

16550 West Stratton Drive, New Berlin, WI 53151