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TECHNICAL BULLETIN

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Vented Ball Option for Ball Valves

One of the more misused and misunderstood terms when ball valves are specified is the requirement of a **vented ball**. This bulletin will discuss what that actually means with regards to various applications and compare that to our design options and product offerings.

In general, the term “vent” means to equalize the pressure within and without of a confined space. As it relates to ball valves, this confined space can be thought of as any space within the valve where the media is trapped by the seats on either side of the ball. In the case of an open valve, the media is trapped behind the ball in the body cavity. In a closed valve, the media is both in the body cavity and in the ball itself, but not allowed past the seats in either direction.

The most widely held definition of a **vented ball** is one in which a relief hole is drilled in the upstream side of the ball (the -VB option). When the valve is closed, any media inside the valve has a path to vent to the upstream piping. This is important in situations where rising temperatures around the valve can cause a significant increase in cavity pressure, leading to seat distortion, internal valve damage, or a very dangerous scenario where the valve body catastrophically fails. There are many industrial type applications where having this vent is essential. Application examples where thermal expansion becomes a concern are Cryogenics, Steam, Chlorine, Hydrogen Peroxide, and heat transfer fluids such as Dowtherm™ and Syltherm™ to name a few. Note that when an upstream relief hole is introduced in the valve, it then becomes unidirectional.

Commonly, the error is made when referring to the hole in the stem slot of the ball as a “vented ball”. This hole will allow any increase in internal cavity pressure to equalize to the adjacent piping, but only when the valve is open. When the valve is closed, the media can get from the body cavity to the inside of the ball, but not past the pressure seal of the seats. However, it could do this with or without the hole in the top anyway. Therefore, it is more accurate to think of the hole in the top of the ball as a **stem slot drain** and not a true vent in the sense that an increase in internal pressure has no place to go when the valve is closed. It’s important to understand the difference between these features and know what is acceptable when a vented ball is called out in a simple commercial application.

In summary, the -VB **vented ball** option is available on most Milwaukee industrial ball valves with a SS ball (i.e. 20/22 series, F20 series, 30/35 series). All the SS balls in the bronze commercial product line have the **stem slot drain**, and the -VB is not an option. The CP brass balls and the SS balls in the brass ball valve line (i.e. BA-480S) do not have this feature. Contact the factory with any additional questions.