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TECHNICAL BULLETIN

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Ball Valves/Vented Ball Feature

What is a Vented Ball?

NIBCO stainless steel balls have a feature commonly referred to as a vented ball. This feature is simply a hole in the ball which allows most fluids or gas trapped in the cavity between the ball and valve body to escape. Trapped liquid media may see heat energy increase to the point of vaporization (latent heat of vaporization), traveling through the vent hole as vapor due to A) pressure increase from vaporizing and B) low pressure in the waterway due to high velocity steam.

The vented balls in NIBCO ball valves allow the trapped media to escape to the downstream side of the system when the valve is in the OPEN position. When the valve is in the CLOSED position, trapped media does not have an escape; therefore, care must be taken to ensure the ball is in a half open position on system start up, to evacuate any trapped media regardless of whether the valve has a vented ball or not.

NOTE: After system start up, the valve should then be actuated to the open or closed position to ensure the ball is fully supported by the seats.

Why Use a Vented Ball?

There are several reasons for the vented ball feature. When fluid is trapped between the body cavity and ball and subsequently heated, the fluid increases the pressure in this small space, which distorts the seats. As the seats become distorted they never quite return to their original form, and subsequent cycling of the valve causes damage to the seats. Thus premature failure often occurs.

When this phenomenon is observed in a steam system, condensate (steam that has reverted back to a liquid water state after cooling) can collect in the cavity between the ball and body. Water becomes steam when it has absorbed enough heat (latent heat) to alter its molecular structure. Steam contains significantly higher energy from this latent heat and requires 1,700 times more physical space than water at the same temperature and pressure. Thus if this condensate is heated sufficiently and flashes to steam, it will most likely result in catastrophic failure of the valve body due to the rapid expansion in volume, which is extremely dangerous to personnel and property in the vicinity. Again, ensuring the ball is in the half-open position, when the steam system is coming up to temperature will help to flush any remaining condensate from the body cavity.

How do I know which products have a Vented Ball?

The spec sheets available online at www.nibco.com show which balls are vented. Currently, all ball valves with stainless steel balls (these have “-66” in the figure number) are vented. Chrome plated brass balls do not have the vent feature, as the chrome plating process would fill any holes made for the vent.