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TECHNICAL BULLETIN

UltraPress® Release Notes

August 22, 2007

This technical bulletin summarizes the qualification testing performed on the new UltraPress® brass ball valves prior to introduction in the marketplace, and presents specifications for the valve type for users to reference.

Background

The Viega company developed the ProPress® fitting system and began to sell it in Europe. Subsequently, the Rigid Tool Company bought the rights and began to sell the fitting system in the US. Valves were initially addressed by conversion fittings, e.g. thread x ProPress®, etc. Over the course of time, various companies have introduced valves with this style of fitting on the ends, either by brazed in fittings, or integrally made fittings. Integrally made fittings have to be in an easily deformable material. The closer to copper in mechanical and galvanic properties, the better. Today, many makers of brass (an easily formed material close to copper galvanically and often used in direct contact with copper in sweat valves) valves offer an integral end that is dimensionally compatible with the ProPress® system, and can be installed with ProPress® compliant tools.

The spec groups (e.g. Manufacturer's Standardization Society (MSS), American Society for Testing and Materials (ASTM), American Society of Mechanical Engineers (ASME)) have not released any standards that define the requirements for valves with these end connections, although they are working on it (as of the date of this Tech. Bulletin, MSS is working on a standard). In the absence of governing specifications, Milwaukee Valve engineering started a program to measure the capabilities of valves available for sale. We then developed our own test-based qualification plan for the UltraPress® design. The construction, testing and performance requirements are summarized below, test data and photos of our lab setup are on sheet (2) of this bulletin.

Basic Specifications for UltraPress Valve:

- Valve must be full port, meet MSS SP110 in all respects except for the end fittings.
- Valve must be made from ASTM B283 Alloy C37700, fully annealed.
- Valve must have a smooth cylindrical port in the ball (no totally 'hollow' balls allowed).
- Valve must mate with standard copper (K or L) tubing, in any temper, conforming to ASTM B88
- Valve must assemble and seal reliably with tooling made for/compliant with the ProPress® system.
- Valve must have factory installed O-ring's, in EPDM material.
- Valve must be certified approved to NSF 61.
- Prior to production and sale, at a minimum, each size must be qualified by:
    - Hydrostatic (axial) test to failure, must hold FS (factor of safety) of at least (4) to pressure rating (800 psig test pressure holding capability, minimum[1]).
    - Completely reversed bending/fatigue test, with superimposed alternating pressure spikes, to 250,000 cycles of bending with 250,000 [0-80-0]psig pressure cycles superimposed.

Notes: 1. The valve is based on a 600 WOG design, but the fitting limit is 200 psi. The 4X requirement is against the fitting rating. (The fitting is where the valve fails in this test.)

Test Data

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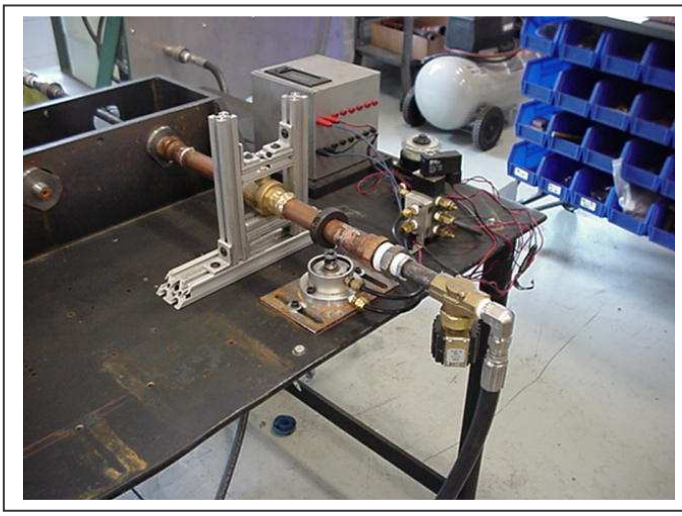
Each test valve had copper tubing crimped into each end. The ends were then capped off, and the assemblies subjected to step-wise increasing pressures until failure was noted, as summarized in the table below.

Another valve of each size was then piped to pressure source, with one end clamped, and the other end connected to a linear driver. The valves were then subjected to superimposed full pressure spikes with completely reversed bending cycles (to substantial deflection and stress, well beyond what would be expected in a well-designed and built piping/plumbing arrangement). The valves were required to pass 250,000 cycles. A photo of the test rig is shown below on the right; all sizes passed.

ULTRA PRESS - PRESS X PRESS

Hydrostatic burst test

Size	valve #	pressure	mode of failure
1/2"	#1	3000 psi	Split tlpc
	#2	3000 psi	Split tlpc
3/4"	#1	1800 psi	Tube separated from tlpc
	#2	2500 psi	Tube separated from tlpc
1"	#1	1500 psi	Tube separated from tlpc
	#2	1500 psi	Tube separated from tlpc
1 1/4"	#1	1200 psi	Tube separated from tlpc
	#2	1500 psi	Tube separated from tlpc
1 1/2"	#1	1100 psi	Tube separated from tlpc
	#2	1000 psi	Tube separated from tlpc
2"	#1	1000 psi	Tube separated from tlpc
	#2	900 psi	Tube separated from tlpc



Conclusion

The testing performed and summarized above demonstrates that the UltraPress® valve is a robust product which carries ample structural margin for anticipated services. We recommend users of this valve type write their specifications around the items listed on page (1) of this technical bulletin, to ensure they get the best performance from their finished systems.

As with any valve product, the final selection of configuration and materials is the responsibility of the end user and/or his engineering designee.