Marketing Bulletin MKT-0073-EN Rev. d

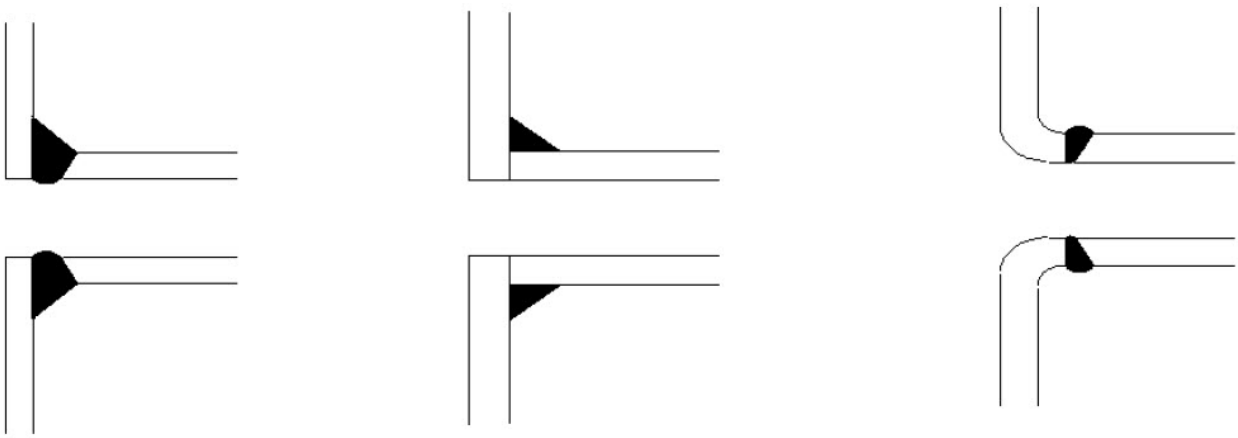
KM26 MLG
Extruded outlets
KTEK products

ABB, K-TEK products has standardized extruded outlets for process connections on pipe chambers. Extruded outlets is the standard nozzle design for all KM26's where they can be used. The resulting outlet is similar to the outlet on a tee. The advantages are as follows:

1. Eliminates the need for post-weld mechanical and flame straightening which improves metallurgy.
2. Eliminates "sink-in" distortion that can interfere with float travel.
3. Provides full bore connection.
4. Eliminates two welds for KM26's with flanged process connections.
5. Improves quality, operation and reliability.

Old K-TEK Standard: Nozzle is a piece of pipe which is saddled and beveled to mate to the float chamber. A code compliant full penetration weld is used to connect the nozzle to the float chamber.

Competitive Standard: Nozzle is a piece of pipe which is square cut and connected to the float chamber with a fillet weld. This joint design does not meet code. In addition, crevice crack corrosion between the nozzle and float chamber can drastically shorten the life of the equipment.

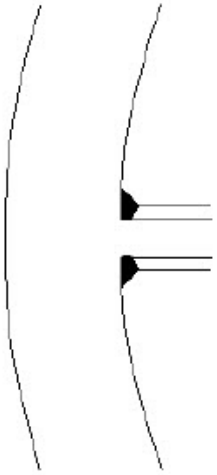


Old K-TEK Standard | Competitive Standard | New K-TEK Standard

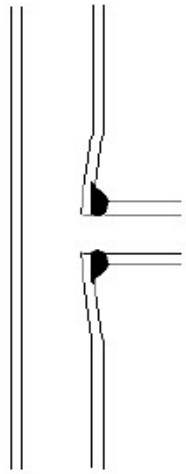
New ABB/K-TEK Standard: Extruded outlet. This outlet is made in three steps. (1) In the first step an ellipse is cut into the pipe. (2) Then a forming head inserts into the pipe. Forming pins retract from the forming head and the head is pulled out of the pipe while spinning. (3) A third operation mills a butt-weld end prep.

Most KM26's are made of stainless steel which distorts more than most other alloys when welded. When our old standard joint design is used the float chamber distorts in two ways when the weld is made. The "bow" distortion is removed with a combination of mechanical and heat straightening. The "sink-in" distortion cannot be removed. Effects of this distortion can sometimes be seen when the gauge is filling or emptying rapidly. When the float gets near the nozzle it slows down.

The following illustrations show the distortion in an exaggerated format. The distortion is minimized when the competitive standard joint design is used; however, this joint design does not meet code. When the extruded outlet is used both types of distortion are totally eliminated. The result is better for the metallurgy since all straightening is eliminated. The float chamber is also completely smooth and round at the process connection resulting in more reliable float travel.



"Bow" Distortion



"Sink-in" Distortion

With the extruded outlet design the outlet in the float chamber will be the same size as the process connection providing a full bore connection for sizes up to 2".

Some frequently asked questions about extruded outlets with answers are as follows:

- **Does it meet code**? Yes. ANSI B31.1, B31.3 and Section VIII all allow extruded outlets.
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- **What chamber sizes can it be used for?** We are currently tooled up to pull 1" to 2" outlets in 2" to 4" & 6" schedule 10 float chambers and 1-1/2 & 2" outlets in 2" to 4" schedule 40 chambers. Testing should confirm that we can also pull 1-1/2 and 2" outlets in 2" to 4" sch. 80 chambers. The machine is capable of pulling up to 4" outlets in up to 8" float chambers with the proper tooling.

- **What is the pressure rating?** Pressure rating calculations are provided by the codes. The typical pressure rating is approximately 30% lower than that for straight pipe. A 2" outlet on 2" s/10 was pressurized to burst at 6600 psig. Code would allow a maximum allowable working pressure of 1100 psig in this case.

- **What about the residual stress?** Hardness tests have been run on a 2" outlet pulled in 2" s/40 (worst case). The maximum hardness was 20 HRC. Nace MRO175 requires 22 HRC maximum. There are also residual stresses after the mechanical and heat straightening per formed with the old standard joint design. A corrosion test per ASTM A262, Practice A has also been done by an independent metallurgist. The test sample passed this test showing that the cold worked area was insignificantly affected.

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