

STRITT & PRIEBE INC.

Hot Tapping & Hot Tap Sizing

“Hot Tapping” is a common term used throughout the industry for installing connections into an existing pipe, tank or vessel that is “Hot” – a system in operation under pressure and temperature – without interruption of service. This procedure is normally performed by a contractor who is experienced with working on “Hot” systems.

The typical procedure is as follows:

1. A weld-o-let or tapping saddle is applied to the pipe.
2. A weld neck flange is applied to the weld-o-let or a flange is applied to a saddle or split tee.
3. Install gate valve or a full port ball valve. **Make sure valve gate completely clears waterway.**
4. The hot tapping machine is then bolted to the outlet flange of the valve. The tapping machine is a pressure vessel that is capable of containing process media. During operation, the machine moves a cutter through the open gate valve and cuts a hole into the pipe that is “Hot”.
5. The tapping machine will cut a clean hole that is slightly smaller in diameter than the ID of the attached pipe and/or valve. Typically, the cutting tool is magnetic so that the cutting chips and the center of the new hole can adhere to the cutter.
6. After cutting is complete, the cutter is retracted back through the open valve.
7. The valve is then closed to isolate the tapping machine from the process media.
8. The pressure is then relieved from the tapping machine and downstream of the valve.
9. Finally, the tapping machine is removed from the outlet flange of the valve.

The valve, which acts as an isolation valve, can now terminate the piping system. An addition of new piping is completed downstream of the isolation valve and brought “on line” (running under pressure and temperature) by opening the isolation valve. If the additional piping is to be installed at a later time, a blind flange can be installed to the outlet of the valve to further isolate the line.

Prior to performing the actual hot tap procedure, it is strongly recommended that a mock hot tap operation be performed with the hot tap machine attached to the valve that is going to be used in the procedure. Performing a mock operation may indicate that a larger tap diameter may be possible. Appropriate procedures must be followed throughout the complete phase of hot tapping (i.e. design, fabrication, testing, installation, etc.) It is the responsibility of those performing the hot tap procedure (not Stritt & Priebe, Inc.) to insure that the valve size and type used is appropriate for the tap diameter and procedure performed. **It is extremely important to insure that valve seating surfaces do not get damaged during the hot tap procedure.** Damaging the seats may result in seat leakage that is excessive for the valve and for the successful completion of the hot tap procedure. It should be made clear to the customer that metal-to-metal seated valves will generally not provide the same leakage control as valves with resilient seating. As a result, some leakage is possible in the closed position.

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Hot Tapping & Hot Tap Sizing (cont')

The recommended maximum hot tap diameters listed below are applicable to bolted bonnet cast steel gate valves manufactured with port diameters in accordance with ASME B16.34. Items such as seat ring angle, seat ring seal weld, bore tolerance and tool clearance have been considered in determining the maximum hot tap diameters.

MAXIMUM HOT TAP DIAMETER (INCH)			
VALVE NPS	VALVE CLASS		
	150	300	600
2	1.43	1.43	1.43
2.5	1.93	1.93	1.93
3	2.43	2.43	2.43
4	3.40	3.40	3.40
5	4.40	4.40	4.40
6	5.40	5.40	5.40
8	7.15	7.15	7.03
10	9.15	9.15	8.90
12	11.12	11.12	10.87
14	12.12	12.12	11.75
16	14.12	14.12	13.62
18	16.00	15.75	15.25
20	18.00	17.75	17.00
24	21.96	21.71	20.71
30	27.93		

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Hot Tapping & Hot Tap Sizing (cont')

The following is a list of tapping dimensions for IBBM gate valves with existing seat mounting lugs.

SIZE (INCHES)	HOT TAP MAX. DIAMETER
2	1.5
2.5	2
3	2.5
4	3.37
6	5.19
8	7.44
10	9.44
12	11.44
14	13.37
16	15.19
18	7.25
20	19.19
24	23.19

If seat installation lugs are removed, (these can be ground off – mechanic must be careful to not damage the seat) the full pipe size can be tapped. i.e. 4" valve / 4" tap. Bronze gate valves may also be used for tapping at their full pipe size.

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