PRESSURE AND FUNCTIONAL TESTING API 598

Technical Instruction AP/PT5	Review: 00	Date: 05/03/19	Page: 1/3
Issued by: GP		Approved by: BT	

LIST OF REVIEWS

REV.	DATE	DESCRIPTION

TESTING VALVES AS PER API 598

1. SHELL HYDROSTATIC TEST

Scope: 100% of batch.
Testing pressure: See table Nº 1
Testing times: See table Nº 2
Acceptance criteria: See table Nº 3

1. Mount the valve on the test-bed, closing off the inlet and outlet ports, and with the disc/ball in the half open position, fill the interior completely with water until it overflows through the vent connection provided in the upper test flange. The stem must be accessible to operate the valve.
2. Close the vent connection.
3. Valve shall be operated for one complete open/close cycle, then half open (at least 10º to ensure pressurisation of the cavity).
4. Check for the absence of leaks at the temporary joints, used for the test. Dry the external surface of the valve.
5. Apply the required test pressure as per Table No. 1 & Table No. 2 pressures & durations shown below. Close the water inlet and maintain the pressure for the required time.
6. Leaks through the pressure retaining parts are not permitted, except through the temporary joints, which are installed for the carrying out of the test, and only provided that they do not obstruct the interpretation of the results. Permanent deformations will not be allowed.

2. HYDROSTATIC TESTING OF SEATS

This test is optional depending on size, class and type but is carried out for standard.

Scope: 100% of batch. To apply from both directions (except check valves).
Testing pressure: See table Nº 1
Testing times: See table Nº 2
Acceptance criteria: See table Nº 3

1. Close off the valve inlet and outlet ports with flanges.
2. The valve is adjusted until the ball/disc is in a half open position.
3. The valve is filled with water through the lower flange, until it overflows from the venting in the upper flange.
4. The valve is operated until it closes and is pressurised through the lower flange.
5. The pressure is maintained for the required time as per Table No. 1 & Table No. 2 pressures & durations shown below, and it is checked that there are no drops from the drain / vent and upper flange vent. (The leakage shall be measured in opposite side only when there is no provision of drain/vent)
6. As per Table No. 3 below.
7. The valve is operated to open under pressure, checking that the actuating device is operational.
8. Follow the same operation for the other seat.
9. See pressures and testing times as per Table No. 1 & Table No. 2.

PRESSURE AND FUNCTIONAL TESTING API 598

3. PNEUMATIC TESTING OF TIGHTNESS SEATS

Not performed on metal seated check valves.

Scope: 100% of batch. To apply from both directions.
Testing pressure: Between 4 & 7 bars
Testing times: See table Nº 2
Acceptance criteria: See table Nº 3

This test is optional depending on size, class & type but on API 608 valves and API 600 gate valves it is always performed by GSL.

1. The valve inlet and outlet are closed off with flanges.
2. The valve is adjusted until the ball/disc is in a half open position.
3. The valve is filled with dry, clean and oil free nitrogen or air through the lower flange. If the air test pressure is above 10 barg the test must be carried out with the valve submerged in water, for safety reasons.
4. The valve is adjusted until it is in the closed position.
5. The pressure is released through the upper flange and it is connected to a tube with an internal diameter of 4mm, the end of which is submerged between 3 and 6mm below the surface of water.
6. Acceptance criteria: Refer to Table No. 3 below.
7. The valve is operated until it opens, it is pressurised again to the test pressure, then closed again and the pressure is released through the lower flange, checking the lower closure for bubbles.
8. As per Table No. 1 & Table No. 2 pressures & durations shown below

TABLE No 1

SHELL AND SEAT HYDRO TESTING PRESSURE

CLASS	1.5 x PN (bar)	1.1 x PN (bar)
150#	30	22
300#	78	56
600#	156	114
800#	204	152
900#	233	171
1500#	388	281
2500#	647	474

Note: This pressure is applicable for A105N, LF2, WCB, LCC, F304, F316, CF8M, CF8, CF3M, CF3 for other materials see B16.34.

TABLE No 2

TESTING MINIMUM TIMES (SECONDS)

DN	TESTS	
	Shell	Seats
≤ 50NB (2”)	15	15
65NB ~ 150NB (2 1/2” - 6”)	60	60
200NB ~ 300NB (8” - 12”)	120	120
≥ 350NB (14”)	300	120

NOTE: These are minimum test times, GSL test durations are equal or longer.

PRESSURE AND FUNCTIONAL TESTING API 598

TABLE No 3

MAXIMUM PERMISSIBLE LEAK FOR SEATS TESTING

DN	SOFT SEAT		METAL SEAT VALVE*		METAL SEAT CHECK VALVE	
	Water	Air	Water (drops per minute)	Air (bubble per minute)	Water (cm^3/min)	Air (litres per minute)
≤2”	0		0	0	6	1,33
2 1/2”	0		5	10	7,5	1,83
3”	0		6	12	9	2,17
4”	0		8	16	12	2,83
5”	0		10	20	15	3,50
6”	0		12	24	18	4,17
8”	0		16	32	24	5,67
10”	0		20	40	30	7,00
12”	0		24	48	36	8,33
14”	0		28	56	42	9,83
16”	0		32	64	48	11,17
18”	0		36	72	54	12,67
20”	0		40	80	60	14,00
24”	0		48	96	72	16,83
26”	0		52	104	78	18,17
28”	0		56	112	84	19,67
30”	0		60	120	90	21,00
32”	0		64	128	96	22,33
36”	0		72	144	108	25,17
40”	0		80	160	120	28,00
42”	0		84	168	126	29,33
48”	0		96	192	144	33,67

1 Millilitre = 16 drops ; 1 Millilitre = 7 bubbles

* ISO 5208 or ANSI/FCI 70 leakage rates can also be specified.