



Project: **Fire-Test for Ball Valve**

Client: **Metso Automation Oy Helsinki, Finland**

Office: **Helsinki**

Client's Order Number: -

Date: **09 April 2010**

Order Status: **Complete**

Inspection Dates

First: **25 February 2010**

Final: **25 February 2010**

This certificate is issued to **Metso Automation Oy** to certify that undersigned surveyor attended their works in Helsinki on the above date for purpose of witnessing fire tests of one (1) soft seated full bore ball valve manufactured by Metso Automation Oy Helsinki, Finland.

Particulars of valve

Type: **D2DY04YAY63**

Rating: **Pressure Class ASME 300**

Size: **NPS 4"**

Materials (as stated by the Manufacturer): See Appendix No. 2 of the test report.

Testing

The test valve was selected and presented by the manufacturer. The test was conducted in accordance with the standard ISO 10497- 5: 2004- identical with API 607, Fifth Edition, June 2005. Throughout the test the valve performed satisfactorily and met all the requirements of the above standard. Visual examination after testing confirmed that the design was in accordance with the manufacturer's drawing and parts list. A copy of the test report has been endorsed.

Before commencing the tests the testing apparatus was examined and found to be in accordance with the above standard.

This fire test also qualifies the following valve types:

D2D 04, 05, 06 and 08 (ANSI 300)

D1F 04, 05, 06 and 08 (ANSI 600)



Christopher Ridgewell
Surveyor to Lloyd's Register EMEA

A member of the Lloyd's Register Group

FIRE TEST FOR BALL VALVE, TYPE D2DY04YAY63

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- OBJECT:** Fire test of ball valve D2DY04YAY63 in accordance with standard ISO 10497- 5: 2004 - identical with API 607, Fifth Edition, June 2005.
- SPECIMEN:** The test valve D2DY04YAY63 is a soft seated full bore ball valve manufactured by METSO AUTOMATION OY Helsinki, Finland. The valve is designed for bi-directional installation. The size of the valve is NPS 4" and pressure class of the body is ASME 300. The manual actuator M12 was mounted on the test valve.
- The assembly drawing, parts list, dimensional drawing of the valve and dimensional drawing of the manual actuator are enclosed in Appendices 1, 2, 3 and 4. Nameplate details and location of temperature measurement points are shown in Appendix 5.
- TESTS:** The valve had been tested before the fire test by the manufacturer according to normal factory procedure.
- The valve was assembled between two end flanges equipped with a 25 mm water pipe.
- The valve was filled with water for the fire test and the pressure of water against the closed ball was 2 bar during the test. The test was conducted at the Laboratory of METSO AUTOMATION (FC RTD) OY Helsinki on February 26, 20010.
- The temperatures and test pressures during the test were recorded with a data logger. The results are shown in Appendices 6. The temperature measurement points were located according to the test standard.
- The flame temperature was raised to the required level in less than 2 minutes and after that the valve was heated with gas burners for 30 minutes and it was cooled with water-spray to lesser than 100 °C. The cooling time was 7 minutes.

**FIRE TEST FOR BALL VALVE,
TYPE D2DY04YAY63**

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The through-seat leakages and external leakages of the test valve during the test are shown in Table 1.

TABLE 1.

February 26, 2009

TEST PHASE	TIME	LEAKAGE	
	min.	ml/min	
		measured	allowed
Start	0	0	
Required flame temperature	2	0	
Seat leakage during heating	32	8	400
External leakage heating + cooling	39	1	100
Seat leakage after cooling	45	1	160

In visual examinations after the test it was stated that the test valve was in full operating condition and complied with the supplied documents.

SUMMARY:

On the basis of the results it can be stated that the tested ball valve D2DY04YAY63 met the requirements presented in standards ISO 10497- 5: 2004 and API 607, Fifth Edition, June 2005.

Juha Perttilä
Laboratory Engineer
METSO AUTOMATION OY
FC RTD

Christopher Ridgewell
Surveyor to Lloyd's
Register

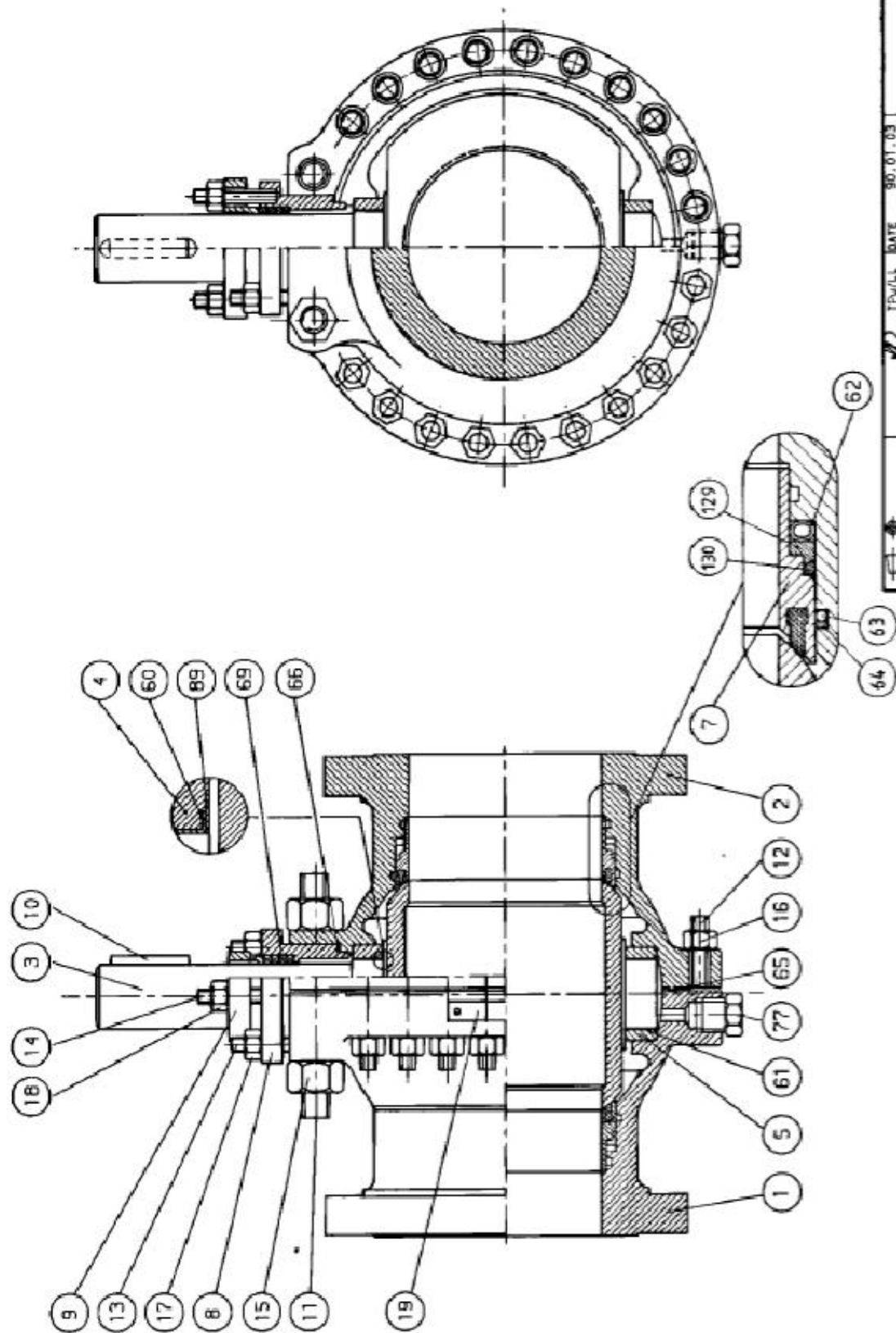
**FIRE TEST FOR BALL VALVE,
TYPE D2DY04YAY63**

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APPENDICES:

1. Assembly drawing C 862760
2. Parts and material list H080644
3. Dimension drawing C 300689
4. Manual actuators dimension drawing.
5. Nameplate details. Location of temperature measurement points.
6. Temperatures and pressure measurement results during the test.

(T1 and T2 = Flame thermocouples,
T3 and T4 = Body thermocouples.
T5 and T6 = calorimeter cubes.
P2= test pressure, P3= Centre cavity.)



	BALL VALVE 02A	TRAIL DATE	90.01.03	SHEET
				NEW NO.

862760

NETLES-JAMESBURY

PLANT	NO. OF	PLANT	PLANT	DATE	REMARKS
ISSUE	MO.	NO.	DATE		



Customer C-Bom
D2DY04YAY6302
BALL VALVE

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Id-code: H080544 Rev: 0

Part	Id-code	Description	Material	Qty	Spares part categories
001	644703	BODY FEMALE	ASTM A216 gr. WCB	1	
002	644713	BODY MALE	ASTM A216 gr. WCB	1	
003	633560	BALL	ASTM A351 gr. CF8M	1	3
004	680970	TRUNNION BEARING	AISI 316	1	3
005	681040	TRUNNION BEARING	AISI 316	1	3
007	H066894	BALL SEAT	AISI 316+PTFE+C25	2	2
000	H066920	SEAT BODY	AISI 316	1	
000	686960	BALL SEAT	PTFE-C25	1	2
008	620483	BONNET	ASTM A105	1	
009	46280	GLAND	A351 gr. CF8M1.4408	1	
010	3145	KEY	EN 10088-1.4460	1	3
011	H053221	STUD	ASTM A193 gr. B7	2	
012	H062941	STUD	ASTM A193 gr. B7	16	
013	235113	STUD	ASTM A193 gr. B7	4	
014	4040	STUD	ASTM A193 gr. B7	2	
015	3345	HEXAGON NUT HEAVY	ASTM A194 gr. 2H	4	
016	3343	HEXAGON NUT HEAVY	ASTM A194 gr. 2H	32	
017	3343	HEXAGON NUT HEAVY	ASTM A194 gr. 2H	4	
018	3342	HEXAGON NUT HEAVY	ASTM A194 gr. 2H	2	
019	H028251	IDENTIFICATION PLATE	AISI 304	1	
060	682230	BEARING STRIP	PTFE-C25-AISI 316	1	
061	682230	BEARING STRIP	PTFE-C25-AISI 316	1	
062	187210	SPRING	UNS N07750	1	2
063	232372	O-RING	VITON GF (FKM)	2	
064	233327	BACK-UP RING	PTFE	2	
065	230044	SEAL STRIP	GRAPHITE	1	
000	200546	STRIP	GRAPHITE	1	
066	230927	SHEET RING	GRAPHITE	1	
069	233407	PACKING RING	GRAPHITE+PTFE	4	
077	3482	HEXAGON PLUG	ASTM A105	1	

Spares part categories: 1 = Recommended soft spares (always needed), 2 = Basic repair (eg. changing of the seat/valve or leverage repair/rotation), 3 = Full repair (eg. changing of the closing element/valve). For full overhaul = select categories 1 + 2 + 3



Customer C-Bom
D2DY04YAY6302
BALL VALVE

Id-code: H080644

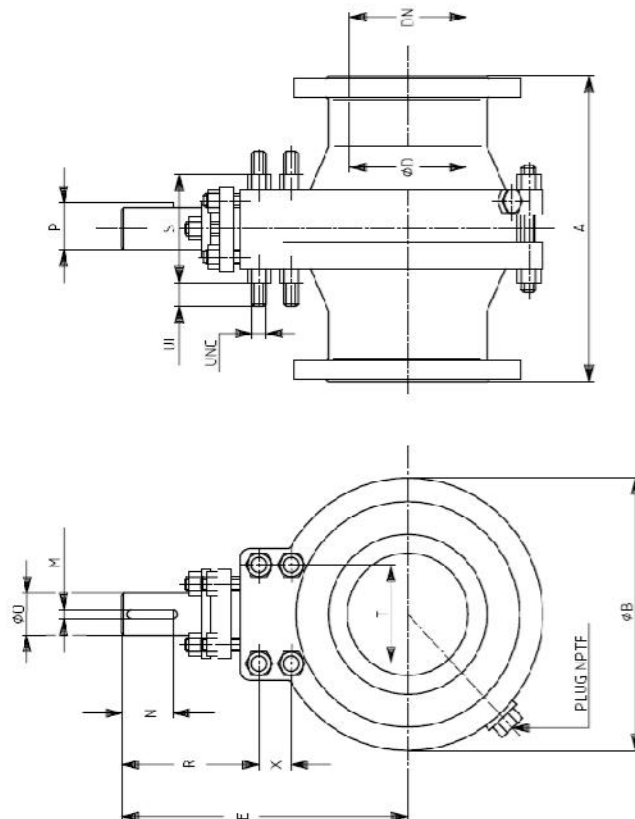
Rev: 0

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Part	Id-code	Description	Material	Qty	Spare part categories
089	682290	THRUST BEARING	PTFE+C25+AISI 316	1	
129	1202600	SET RING	AISI 316	2	
130	233446	BACK SEAL	GRAPHITE	2	
009	200546	STRIP	GRAPHITE	1	

Documents:

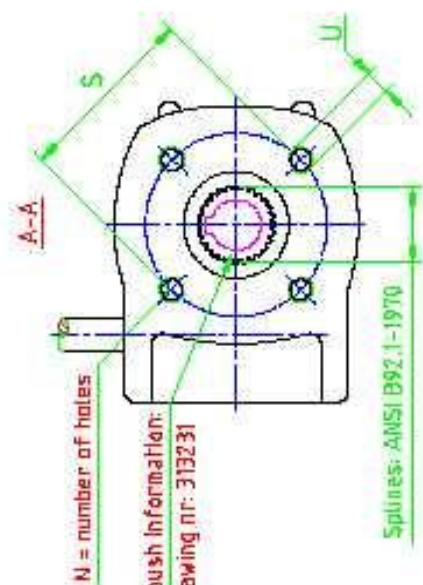
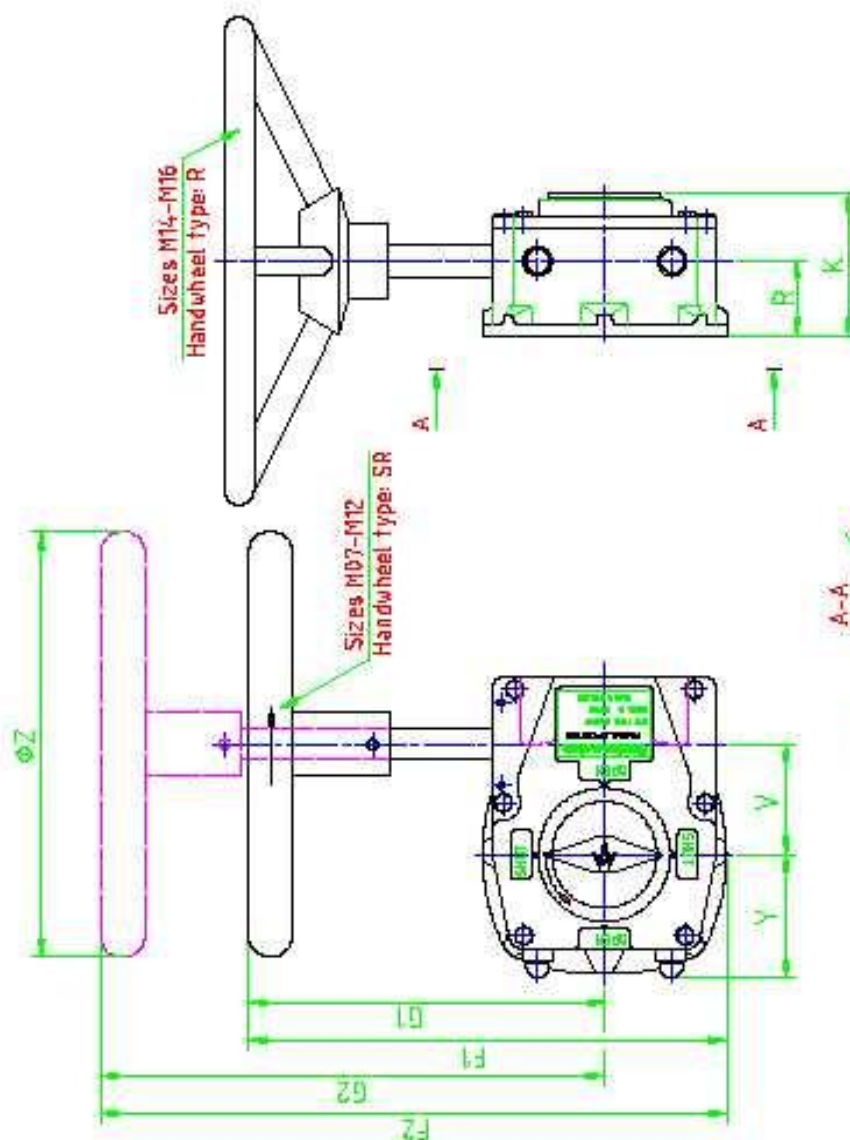
Notes: Y1=A+DRAIN PLUG ON THE VALVE BODY
Y2=D+B7 BOLTING AND 2H NUTS
Y3=FIRE SAFE T-SEAT.



PRESSURE RATING ANSI CLASS 600
WORKING PRESSURES AT 1.1 ANSI B 16.34-1987
FLANGED, FULL BORE

VALVE TYPE	DIMENSIONS IN mm													PUG WEIGHT			
	UN	A	ØS	ØD	E	M	N	ØD	P	H	S	I	X	UL	UNL	N ² F	KC
DIJ31	50	292	206	50	280	6.35	4.6	35	27.8	172	128	80	36	25	5/8-11	35	
DIJ33	80	356	262	77	350	9.52	5.8	35	39.1	212	152	100	42	31	3/4-10	1/2	60
DIJ34	100	432	314	100	392	9.52	6.8	43	44.2	225	158	110	43.7	38	3/4-10	1/2	120
DIJ36	150	529	404	152	495	12.7	90	55	60.6	260	200	130	55	45	1-0	2/4	200
DIJ38	200	640	458	202	595	19.05	119	70	78.2	325	244	160	68	53	11/4-8	3/4	380
DIJ1	250	787	610	254	730	22.22	146	85	94.6	475	244	180	65	62	11/4-8	1	690
DIJ13	300	838	724	302	837	22.22	156	95	104.8	437	358	270	97	88	13/4-8	1	1134
DIJ14	350	849	828	340	830	25.4	180	105	116.1	454	398	240	91	81	13/4-8	1	1500
DIJ16	400	991	951	390	988	31.75	205	120	133.8	482	432	270	101.1	75	2	8	2500
DIJ18	450	1092	1090	440	1140	31.75	225	135	143	557	506	310	128.7	103	2 1/2-8	1	3300
DIJ20	500	1194	1176	490	1240	38.1	250	150	166.6	596	526	314	129.4	93	2 1/2-8	1	3880
DIJ24	600	1397	1274	551	1265	38.1	280	165	181.8	615	550	358	129.6	106	2 1/2-8	1	6500

[illegible]

 N = number of holes

Drive bush Information:
See drawing nr: 313231

UNIT SIZE		M17	M10	M12	M14	M15	M16
INPUT TORQUE, M1 [Nm]		27.7	45.5	68.5	111	166	
MAX OUTPUT TORQUE, N1 [Nm]		294	500	1009	1600	3608	5594
TURNS TO CLOSE		10	10	10.5	15	17	22
HANDWHEEL DIA 2		185	240	254	457	457	610
EN WITH STANDARD INPUT SHAFT		162	169	200	278	330	391
FL WITH STANDARD INPUT SHAFT		196	227	285	378	457	549
RE WITH EXTENDED INPUT SHAFT		-	234	282	351	448	466
R2 WITH EXTENDED INPUT SHAFT		-	297	367	453	532	624
V		30.5	52	66.7	89.5	123	154
Y		45	58	75	86	114	117
K		58	67	81	93.5	115.5	136.5
R		24.5	35	42	50	58	54
MAX STEM HEIGHT		51	57	72	81	92	113
MAX VALVE SHAFT DIA		25	25	30	45	55	70
SPECS ANSI B92.1-1970		2.9	5	9.5	18	30.7	44.7
WEIGHT (kg)							12.8
VALVE MOUNTING FLANGE							55.2
150 S21 TYPE							
S		50	102	125	140	165	165
N, NUMBER OF HOLES		4	4	4	4	4	8
UDIA		118	118	120	120	120	130
UDIA		0	13	12	11.5	11.5	11.5
UDIA		0	13	12	11.5	11.5	11.5

NOTE: LOOK ALSO DRAWING NR. 313230 ABOUT STANDARD AND SPECIAL MODELS
LOOK ALSO DRAWING NR. 313231 ABOUT STANDARD AND MBV DRIVE BUSHES

																																																																																																	
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NAMEPLATE DETAILS

TYPE : D2DY04YAY63

No. : H080644

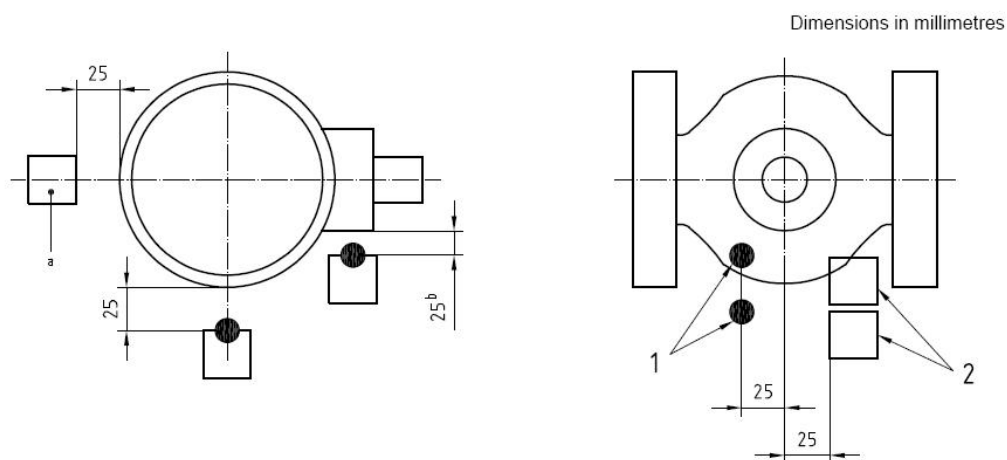
BODY : _WCB_ Tmax : _+230 °C_

TRIM : _316_ Tmin : _-29 °C_

SHAFT : _316_ RATING: _ASME 300_

SEAT : _316+PTFE-C25_ dPs : _51.6 BAR_

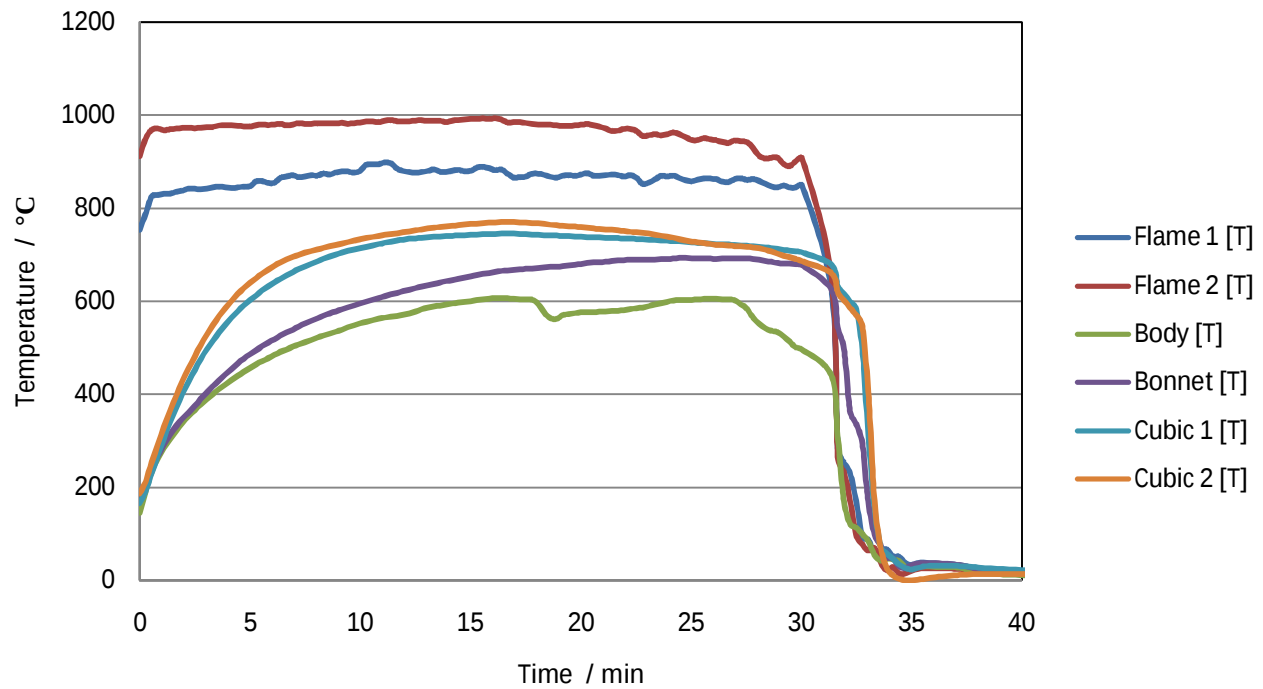
ISO 10497:2004(E)

**Key**

- 1 flame thermocouples
- 2 38 mm calorimeter cubes
- a Additional calorimeter cube added for DN 200 (8 in) and above.
- b From the stem seal.

Figure 4 — Location of temperature measurement sensors for all other valves (soft-seated valves larger than DN 100, NPS 4, PN 10, PN 16, PN 25 and PN 40, Class 150 and Class 300, and all valve sizes > PN 40, Class 300)

Temperature-Time-graph
Valve type: D2DY04YAY63



Pressure-Time-graph

