



voestalpine Böhler Welding Austria GmbH

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Boehler Uddeholm CZ s.r.o.

Evropska 423/178
16100 PRAHA 6-Vokovice
Tschechische R.

Werkszeugnis 2.2

Test Report 2.2

nach / as per : EN 10204

Nr. No. : 2015-2082000558-900006-003

Rev. 0

Seite / Page : 1 / 1

Bestell-Nr.	PO no.	4502215633	vom / of 02.02.2015
Auftrags-Nr.	Order no.	1082000393	
Lieferschein/Pos./Split	Delivery note/pos./split	2082000558/000060/900006	vom / of 02.02.2015
Produkt	Product	WIG-Stab / GTAW Rod	350002
Handelsname	Trade name	BOEHLER EML 5	100145
Normbezeichnung	Standard designation	EN ISO 636-A: W 46 5 W2Si	2004510-W
		AWS A5.18: ER70S-3	0005
Abmessung	Dimension	2,0 x 1000 mm	
Charge	Heat no.	463621	
Liefermenge	Quantity	575,0 KG	

Chemische Analyse in % des Produktes

Chemical composition in % of the product

C	Si	Mn	P	S	Cr	Mo	Ni	V	Cu	Al					
0,10	0,01	1,08	0,011	0,007	0,05	< 0,01	0,02	< 0,01	0,02	< 0,01					

Mechanische Gütewerte

Mechanical properties

Zugversuch Probenvorbereitung		Tensile test Specimen preparation			nach / according to : EN ISO 6892-1/09 nach / according to : EN ISO 5178		
T	Rel. / Rp 0,2 MPa	Rp 1,0 MPa	Rm MPa	A (Lo = 5d) %	Z %	WBH PWHT	Bemerkung Remarks
20°C	≥ 460		530 - 680	≥ 23			

Kerbschlagbleivversuch Probenvorbereitung		Impact test Specimen preparation			nach / according to : EN ISO 148-1/10 nach / according to : EN ISO 9016 VWT 0/b		
T	Kerbschlagarbeit Impact energy KV / J	Mittelwert Average KV / J	Laterale Breitung Lateral expansion mm	Duktiler Bruchanteil Shear fracture %	WBH PWHT	Bemerkung Remarks	
-50°C	≥ 47						
20°C	≥ 130						

Ort / Town
Kapfenberg

Datum / Date
03.02.2016

Dieses Zeugnis wurde maschinell erstellt und gilt auch ohne Unterschrift.
This certificate was issued by DP-equipment and does not require signature.

Abnahmebeauftragter / Authorized representative
Fiedler

voestalpine
ONE STEP AHEAD

Zeugnis-Nr / Certificate No.

435/19

**Pister®**
KugelhähnePister Kugelhähne GmbH
Vogesenstr. 37
DE-76461 MuggensturmTel: 0049-7222-500248
Fax: 0049-722250026848
Email: e.heck@pister-gmbh.com**Werkstoff / Material****Druckprüfung / Pressure test**Abnahmeprüfzeugnis nach EN 10204-3.1
Inspection certificate acc to EN 10204-3.1

X

X

Werkszeugnis nach EN 10204-2.2
Test report acc. EN 10204-2.2Besteller
Customer
MSA a.s.
Hlucinska 641
CZ - 74722 Dolni BenesovKunden - Nr.
Customer Nr. 21149Bestell-Nr.
Order No 5C11219PAb-Nr.
OA-Nr. 30108053Prüfvorschrift
Test specification EN 12266-1Kennzeichnung
Marking 08/19Herstellerzeichen
Brand of manufacturer PGeräte - Nr.
Serial No. 435/19
S.-Nr.: S01-S189Stempel des Werkssachverständigen
Plant experts stampBesteller - Kennzeichnung
Customer identificationBemerkung
NoteMedium: Natural gas, Petroleum products
-60°C / +150°C**Umfang der Lieferung / Scope of supply**Pos Nr.
Item NoStückzahl
QuantityArtikel
Object

10

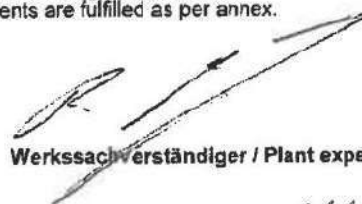
189

ASKH DN25 PN250 3469 9 G1/BW -60°C
P-Nr.: 810-025-039 Art.-Nr: 8-8422-45L4/005000

Die Maß- und Sichtprüfung ergab keine, die Funktion beeinträchtigenden, Abweichungen.

The dimensional and visual inspection did not result in deviations influencing the operation.
Die gestellten Anforderungen sind laut Anlage erfüllt. The requirements are fulfilled as per annex.

Muggensturm, 09.08.2019


Werkssachverständiger / Plant expert

Anlagen (Beiblatt für Amaturen) / Annex(es) (supplement for valves)


MSA, a.s. 7001 Benesov 03-9

Anlage zum Zeugnis - Nr. / Annex to certificate No.

435/19



Pister Kugelhähne GmbH
Vogesenstr. 37
DE-76461 Muggensturm

Tel: 0049-7222-500246
Fax: 0049-7222-50026848
Email: e.heck@pister-gmbh.com

Beiblatt für Armaturen

Supplement for valves

Pos.-Nr.
Item No.

10

Stückzahl
Quantity

189

Artikel
Object

ASKH DN25 PN250 3469 9 G1/BW

P-Nr: 810-025-039

Art.-Nr: 8-8422-45L4/005000

Die druckführenden Armaturenteile sind durch Werkstoff-Abnahmestempel ausreichend gekennzeichnet.

The pressure transmitting valve components have been sufficiently marked by material acceptance stamp.

Dichtheit des Gehäuses, Prüfmedium Luft
Tightness of body, test medium air

Siehe Druckprüfblatt

bar

Festigkeitsprüfung des Gehäuses, Prüfmedium Wasser
Tightness of body, test medium water

Wasser / water

1,5 x PN =

bar

Sitzdichtheit, Prüfmedium Wasser / Luft
Seat leakage, test medium water / air

1,1 x PN =

bar

Sitzdichtheit, Prüfmedium Luft
Seat leakage, test medium air

bar

Betätigungsfunktion
Functional test

bar

Bemerkungen:
Remarks:

Anlage: Allgem. Gebrauchs- und Betriebsanleitung
General Instructions and Operating manual

Die Werkstoffnachweise für die folgenden Bauteile wurden erbracht.
The quality of the material for the undermentioned parts has been approved.

Baut. Nr. Part No.	Bauteil Part	Werkstoff Material	EN 10204	Schmelze / Chargen - Nr Heat No.	Lieferwerk Supplier
1	Gehäuse/body	TS1E355	Rd. 80	195AP2	NDT Service
2	Schaltwelle/stem	1.4571	DN 25	916301	Deco
3	Kugel/ball	1.4571	DN 25	CZN-6St./pcs.	Volz
4	Kugel/ball	1.4571	Rd. 42	471615-183St./pcs.	Olarra
5	Stutzen/adapter	TS1E355	Rd. 50	205743	Arcelor Mittal
6	Stutzen/adapter	TS1E355	Rd. 50	205743	Arcelor Mittal
7	Verschluß./plugscr.	TS1E355	Rd. 50	220953	Arcelor Mittal

Muggensturm, 09.08.2019

MSA CHELPIPE
GROUP
MSA s.r.o. Olně Benešov

Werkssachverständiger / Plant expert

Abnahmeprüfzeugnis EN 10204 – 3.1
Inspection Certificate EN 10204 – 3.1

PMS-Formblatt-Nr.: 8.2-89 Rev. -



Druckprüfung **DIN 3230 T5 PG3 Sonder MSA**
Pressure Test

Kunde <i>customer</i>	MSA a.s. 21149	Auftragsnr. <i>Confirmation no.</i>	30108053
Art.nr. <i>Art.no.</i>	810-025-039	Stückzahl <i>Pcs.</i>	189
Benennung <i>Type</i>	ASKH-DN25 PN250 G1/BW f/g DfG 34699 -60C	DN / PN	25 / 250

Prüfung <i>Test Plan</i>	Medium & Druck <i>Medium & press.</i>	Haltezeit <i>test duration</i>	Ausgeführt & bestanden <i>performed & passed</i>
DIN 3230 - BV Dichtheit Gehäuse vor Festigkeitsprüfung. <i>Tightness of body before strength test.</i>	Luft / air 0,5 bar	60 s	✓
DIN 3230 - BA Festigkeitsprüfung Gehäuse. <i>Strength test of body.</i>	Wasser / water 1,5 PN bar	60 s	✓
DIN 3230 - AQ Betätigungsfunktion. <i>Operation.</i>	Wasser / water 250 bar	—	✓
DIN 3230 - BV Dichtheit Gehäuse nach Festigkeitsprüfung. <i>Tightness of body after strength test.</i>	Luft / air 1,1 PN bar	60 s	✓
DIN 3230 - BW Dichtheit Abschluss Leckrate A. <i>Seat tightness leakage rate A.</i>	Luft / air 0,5 bar	60 s	✓
DIN 3230 - BW Dichtheit Abschluss Leckrate A. <i>Seat tightness leakage rate A.</i>	Luft / air 1,1 PN bar	60 s	✓
EN 12266-2 F21 Antistatikausführung 12V (wenn anwendbar). <i>Antistatic version 12V (if applicable).</i>	Bauweise/Type: Metall/Metal Kunststoff/Metall Plastic/Metal	R ≤ 10Ω R ≤ 10 ⁶ Ω	

Die nach der Auftragsnummer gelieferten Kugelhähne erfüllen die in der Bestellung vorgegebenen Anforderungen und sind in Übereinstimmung mit den geltenden Normen hergestellt worden. Die Werksprüfungen wurden vollständig durchgeführt und bestanden.

The products delivered under the confirmation number comply with the requirements of the order and are manufactured acc. the valid standards. All intended inspections have been performed and passed.

14.08.19 Heinrich 
Datum / Date Name des Prüfers / Name of inspector Unterschrift / Sign

Pister Kugelhähne GmbH | Vogesenstrasse 37 | D-76457 Muggensturm
Telefon (0 72 22) 50 02-0 | Telefax (0 72 22) 50 02-50 | www.pister-gmbh.com

MSA 
MSA, a.s. Benešov 03-9



TRINECKÉ ŽELEZÁŘNY
MORAVIA STEEL

14636

A02 Druh dokumentu / Type of inspection document									
Inspekční certifikát 3.1 - Inspection certificate 3.1, EN 10204:2004									
A01/A05 Výrobní závod / Manufacturer					A03 Číslo dokumentu / Document No.		Stránka / Page		
TRINECKÉ ŽELEZÁŘNY, a.s., Průmyslová 1000, Staré Město, 739 61 Třinec, Czech Republic					2017/01/013343-MRO		1/2		
A07 Číslo objednávky / Purchaser's order No.					A06 Příjemce / Consignee				
16200777					Dener trading s.r.o.				
A10 Číslo kontraktu / Contract No.					Hlavní 128				
0041426257					739 11 Frýdlant nad Ostravicí				
A08 Číslo zakázky / Manufacturer's order No.					Česká republika				
3300254806/000010									
B01, B09-B11 Popis výrobku / Rozměry / Tolerance Product description / Dimensions / Tolerance				B02, B04 Označení oceli / Stav dodání Steel designation / Deliv. state		B03 Materiálová norma Classification standard		B03 Rozměrová norma Dimensional standard	
Tyče kruhové - Round bars				LF2 +N		ASTM A 350/ASME SA		EN 10060	
50 mm + 0,800 - 0,800									
5-6 m									
A11 Dopr. prostředek č. Way on No.	A12 Ložný list č. Loading list No.	B07 Tavba Heat No.	B08 Kruhy / Kusy Coils / Pieces	B08 Svazky Crbd	B13 Hmotnost (kg) Weight (kg)				
9T08515	3317001271	T50630	0	1	1850				
B07, B14, C70 Tavba / Rok výroby / Způsob výroby Heat No. / Year of production / Steelmaking process		C71-C82 Chemické složení-Chemical composition [%]							
T50630/2016		C							
BO-ZPO2		Mn							
BOF-cc billets		Si							
		P							
		S							
		Cu							
		Cr							
		Ni							
		Al							
		H							
		0.18							
		1.11							
		0.23							
		0.012							
		0.005							
		0.04							
		0.14							
		0.04							
		0.024							
		1.20 ppm							
		N							
		Mo							
		V							
		Ti							
		Co							
		As							
		Sn							
		B							
		Pb							
		Ca							
		0.0046							
		0.010							
		0.016							
		0.0014							
		0.003							
		0.003							
		0.004							
		0.0005							
		0.0005							
		0.0018							
		Nb							
		Ta							
		CEQ							
		0.003							
		0.002							
		0.40							
Mechanické hodnoty-Mechanical values									
B07 Tavba Heat No.	B05 Stav zkoušení Test state	C11 Mez kluzu Yield point Re [MPa]	C12 Mez pevnosti Tensile strength Rm [MPa]	C13 Tažnost Elongation A5 [%]	C14 Kontrakce Contraction Z [%]	B05 Stav zkoušení Test state	C03 Zkušební teplota Test temperature	C40, C42 Zkouška rázem v ohybu Energy of impact KV [J] / KCV [J/cm ²]	
T50630	+N	357	502	31,7	53,6	+N	- 20 °C	93,0	116,2
		363	504	31,3	52,8			147,1	183,8
								146,3	182,8
						+N	- 45 °C	53,1	66,4
								84,7	105,9
								52,8	66,0
						+N	- 60 °C	32,2	40,3
								36,2	45,3
								44,3	55,4

MORAVIA STEEL
14636



TŘINECKÉ ŽELEZÁŘNY
MORAVIA STEEL

A02 Druh dokumentu / Type of inspection document						
Inspekční certifikát 3.1 - Inspection certificate 3.1, EN 10204:2004						
A01/A05 Výrobní závod / Manufacturer					Stránka / Page	
TŘINECKÉ ŽELEZÁŘNY, a.s., Průmyslová 1000, Staré Město, 739 61 Třinec, Czech Republic					2 / 2	
A03 Číslo dokumentu / Document No.					2017/01/013343-MRO	
B07 Tavba Heat No.	D56 Přehovací zkoušky Heading tests [EN 10263-1]	D57 Odehlížení Decarburization [max. / mm]	C54 Mikročistota Micropurity [DIN 50602]	C57 Velikost zrna Grain size	C30 Tvrdość HB Hardness HB	C93 Vakuování Vacuum degassing
T50630				149 - 150 ano/yes		
B07 Tavba Heat No.	D02 UZ kontrola US test	D54 Povrchové vady Surface defects				
T50630 100% EN 10308/4		100% EN 10221/C				
						
D01 Kontrola povrchu, tvaru a rozměru odpovídá objednávce. Control of surface, shape and dimension corresponds to the order						
D05 Dodržena radioizotopická aktivita tavebního vzorku - max. 100 Bq/kg. Radio - isotopic activity was controlled in ladle sample, it was no higher than 100 Bq/kg.					A04 / Značka výrobce / Manufacturer's logo	
Z01 Dodaný materiál odpovídá předpisu objednávky. Products conform with the prescription of order.						
Z03 Tento dokument byl elektronicky podepsán v souladu se zákonem č. 227/2000Sb. This document was electronically undersigned according to Law No. 227/2000 Coll.						
Z02 Potvrdil - Expert: : Jašek Radim, Ing., referent T.Ju., nezávislý oprávněný zástupce Officer for Quality Inspection, Releasing and Attestation. independent authorized agent						
Třinec: 31.01.2017						

 SIDERFORGEROSS 36011 Arsiero (VI) ITALY - Via Carlietta di Mezzo, 38 Tel. 0445 714400 - Fax 0445 714444	Inspection Certificate Quality Control Department		COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV 461. = ISO 9001 = COGOLLO PLANT 36010 Cogollo del Cengio (VI) ITALY - Via M. Schiro, 2
	N° 15365 19 REV.0 Date 09/01/2020		

Purchaser:
 MSA, A.S.
 HLUCINSKA 641
 74722 DOLNI BENESOV - CZECH REPUBLIC CZ

Order No.:
 4A04319B
SFRG Job No.:
 OV194783

Certificate type: EN 10204 ed. MARCH 2005
☐ 2.2 ☒ 3.1 ☐ 3.2
Melting practice
☒ E.F.V.D. ☐ E.F. ☐ AOD ☐ VOD

CHEMICAL ANALYSIS / LADLE ANALYSIS

MATERIAL: ASTM-A694-F60 ED.16 **HEAT:** 267080 **SUPPLIER:** ACCIAIERIE VENETE S.p.A.

C	Mo	Si	Ni	Cr	S	P	Al	Cu	Mn	Ti	Sn	V	Nb	N	H	B	Ca	O		
%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	%	ppm		
0,148	1,217	0,22	0,188	0,131	0,008	0,012	0,031	0,2	0,035	0,002	0,008	0,077	0,003	0,0081	1,6	2	0,0069	16		

C.E. (Long) = 0,423

HEAT TREATMENT

TYPE	TEMP °C	HOURS	COOLING	TYPE	TEMP °C	HOURS	COOLING
QUENCHING	900	4	WATER				
TEMPERING	580	8	AIR				

MECHANICAL TESTS

REQUIRED	UTS	YS 0.2	YS	EL	RA	IMPACT TEST	HB on pieces
	MPa	MPa	MPa	%	%	Dir. Type Temp °C Avr/Min J Min Max	
FROM PIECE ☐	MIN 515	415		20		TAN KV -46 20 16	237
FROM QTC ☒	MAX						

Treated with the Pcs

OBTAINED

N° TEST	DIM	SECT	LENGTH	TEMP	DIR	UTS	YS 0.2	YS	EL	RA	IMPACT TEST	HB on pieces
	mm	mm	mm	°C		MPa	MPa	MPa	%	%	Dir. Type Temp °C JOULE Min Max	
10589	12,50	122,72	62,50	+20	TAN	652	484		32,0	70,0	TAN KV -46 167 139 153	211

OUR ITEM	CUSTOMER ITEM	DESCRIPTION	DRAWING	QUANTITY
1	from 10 to 10	COUNTER FI-FORGDN 800 PN 100MODEL: 1095x779x223 F	4-2954-C70	4-2954-C708/005847 3
	from to			
	from to			
	from to			
	from to			
	from to			

REMARKS:

MATERIAL ACCORDING TO SPEC. 005847

Note: Prodotti conformi ai requisiti dell'ordine - Products are in compliance with the requirements of the order - Les produits sont conforme à votre ordre - Produkt entsprechen bestellungs spezifikation.

Material conforming

☒ Quality Control Dept.

Material non conforming

☐

Surveyor:


MSA
 MSA, a.s., Dolní Benešov

SGQ 138/99 Page 1 di 1



SIDERFORGEROSS **Inspection Certificate** **Quality Control Department**

38011 Arsiero (VI) ITALY - Via Certiera di Mezzo, 38
Tel. 0445 714400 - Fax 0445 714444

N° 15364.19 REV.0 Date 09/01/2020

38010 Cogollo del Cengio (VI) ITALY - Via M. Schiro, 2

COMPANY WITH QUALITY SYSTEM CERTIFIED BY DNV = ISO 9001 = **COGOLLO PLANT**

Purchaser:
MSA, A.S.
HLUCINSKA 641
74722 DOLNI BENESOV - CZECH REPUBLIC CZ

Order No.:
4A04319B
SFRG job No.:
OV194783

Certificate type: EN 10204 ed. MARCH 2005
☐ 2.2 ☒ 3.1 ☐ 3.2
Melting practice
☒ E.F.V.D. ☐ E.F. ☐ AOD ☐ VOD

CHEMICAL ANALYSIS / LADLE ANALYSIS

MATERIAL: ASTM-A604-F60 ED.16

HEAT: 265641

SUPPLIER: ACCIAIERIE VENETE S.p.A.

C	Mn	Si	Ni	Cr	S	P	Al	Cu	Mo	Ti	Sn	V	Nb	N	H	B	Ca	O		
%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	ppm	ppm	%	%		
0,161	1,222	0,216	0,125	0,12	0,008	0,013	0,034	0,168	0,025	0,002	0,008	0,072	0,003	0,0094	1,6	3	0,0011	0,0018		

C.E. (Long) = 0,418

HEAT TREATMENT

TYPE	TEMP °C	HOURS	COOLING	TYPE	TEMP °C	HOURS	COOLING
QUENCHING	900	4	WATER				
TEMPERING	580	8	AIR				

MECHANICAL TESTS

FROM PIECE ☐

FROM QTC ☒

REQUIRED	UTS			EL		IMPACT TEST					HB on pieces	
	MPa	MPa	MPa	%	%	Dir.	Type	Temp °C	Ave/Min	J	Min	Max
MIN	515	415		20		TAN	KV	-46	20	16		237
MAX												

Treated with the Pos

OBTAINED

N° TEST	DIM	SEC	LENGTH	TEMP	DIR	UTS	YS 0.2	YS	EL	RA	IMPACT TEST				HB ON PIECES	
	mm	mm	mm	°C							Dir.	Type	Temp °C	JOULE	Min	Max
10888	12,50	122,72	62,50	+20	TAN	595	432		34,5	71,0	TAN	KV	-46	157 167 142		176

OUR ITEM	CUSTOMER ITEM	DESCRIPTION	DRAWING	QUANTITY	
1	from 10 to 10	COUNTER FI-FORGDN 800 PN 100MODEL: 1085x770x223 F	4-2954-C70	4-2954-C708/005847	1
	from to				
	from to				
	from to				
	from to				
	from to				

REMARKS

MATERIAL ACCORDING TO SPEC. 005847

Note: Prodotti conformi ai requisiti dell'ordine - Products are in compliance with the requirements of the order - Les produits sont conformes à votre ordre - Produkt entsprechen bestellungs spezifikation.

Material conforming

☒ Quality Control Dept:

Surveyor:

MSA

Material non conforming

☐

MSA, a.s., Dolni Benesov

SGQ 138/98 Page 1 di 1



MSA, a.s. DOLNÍ BENEŠOV	Protokol kapilární zkoušky Dye penetrant test report		Datum: 25.2.2020 Date:
	Číslo/Number: 429/20		Počet listů: 1/1 Number of sheets:
Název výrobku/typ: Name of product/ type: Ball valve 32" Class 600/K83 TB-RF			Projekt: KIT METAL, Rumunsko Project: 20-7208
Výrobní příkaz: Production number: D2052D0/1			Číslo výkresu: Drawing number: 2-C0315.1-000
Název součásti: Name of part: Body / accessory pipes, nipples welds			Počet kusů: Quantity of piece: 1
Rozsah zkoušky: Extent of testing: 100% Welds			Materiál: Material: A 333 Gr.6
Číslo postupu: Procedure number: M02/051/OK, ISSUE:2, REVISION:7			Měrka: Test block: N410436001
Penetrant/Sarže: MR 311-R Penetrant/Chargen: 08/2023/311-R/1078A		Čistič/Sarže: MR 79 Remover/Chargen: 08/2023/79/1253A	
Vývojka/Sarže: MR 70 Developer/Chargen: 07/2023/70/1227A		Osvětlení: Illumination: 1520 Lx	
Teplota: Test temperature: 20°C			Metoda: Method: Colour
Prováděcí předpis/norma: Requirements for quality / standard: API 6D, ASME Code V, Art. 6			
Hodnocení dle: Evaluation according to: No defects			
Datum zkoušky: Date of testing: 24.2.2020	Zkoušku provedl: Rončka Aleš Test inspector: Z-SC-057354	Číslo razidla: Stamp number: 4772	
Výsledek zkoušky: Test result: Vyhovující Satisfactory			
Číslo kusu/tavby: No. of piece/cast:	Č. zkoušky: Test number:	Zkuš. partie: Position:	Hodnocení: Evaluation: No defects
1 / 268943	1522/20	All welds of pipes	OK
Razítko, podpis, č. certifikátu: Stamp, signature, certificate number: Ondřej Hanzlík, Z-SC-07613/PT3, Level III			



MSA, a.s. DOLNÍ BENEŠOV		Protokol kapilární zkoušky Dye penetrant test report		Datum: 3.3.2020 Date:	
		Číslo/Number: 513/20		Počet listů: 1/1 Number of sheets:	
Název výrobku/typ: Name of product/ type: Ball valve 32" Class 600/K83 TB-RF				Projekt: KIT METAL, Rumunsko Project: 20-7208	
Výrobní příkaz: Production number: D2052D0/2				Číslo výkresu: Drawing number: 2-C0315.1-000	
Název součásti: Name of part: Body / accessory pipes, nipples welds				Počet kusů: Quantity of piece: 1	
Rozsah zkoušky: Extent of testing: 100% Welds				Materiál: Material: A 333 Gr.6	
Číslo postupu: Procedure number: M02/051/OK, ISSUE:2, REVISION:7				Měrka: Test block: N410436001	
Penetrant/Šarže: Penetrant/Chargen: 08/2023/311-R/1078A		Čistič/Šarže: Remover/Chargen: 08/2023/79/1253A			
Vývojka/Šarže: Developer/Chargen: 07/2023/70/1227A		Osvětlení: Illumination: 1520 Lx			
Teplota: Test temperature: 20°C				Metoda: Method: Colour	
Prováděcí předpis/norma: Requirements for quality / standard: API 6D, ASME Code V, Art. 6					
Hodnocení dle: Evaluation according to: No defects					
Datum zkoušky: Date of testing: 28.2.2020		Zkoušku provedl: Schimetzek M. Test inspector: Z-SC-07609		Číslo razidla: Stamp number: 5321	
Výsledek zkoušky: Test result: Vyhovující Satisfactory					
Číslo kusu/tavby: No. of piece/cast:		Č. zkoušky: Test number: 1669/20		Hodnocení: Evaluation: OK	
2 / 268943		All welds of pipes			
Razítko, podpis, č. certifikátu: Stamp, signature, certificate number: Ondřej Hanzlík, Z-SC-07613/PT3, Level III					





Strojírenský zkušební ústav, s.p.
(Engineering Test Institute, Public Enterprise)
Product Certification Body
Hudcova 424/56b, 621 00 Brno, Czech Republic

CERTIFICATE

B-32-00277-17

Manufacturer: MSA, a.s.
Hlučinská 641, 747 22 Dolní Benešov, Czech Republic
Company ID No.: 45192278
Products: Ball valves
Type designation: K83
classes: 150, 300, 600, 900
with used materials: A350 LF2, A182 F316, A182 F316L

Strojírenský zkušební ústav, s.p. (Engineering Test Institute, Public Enterprise) hereby certifies that, under the condition of a double mounting with the SIL3 requirements for functional safety of active elements in electronic systems, as required by

ČSN EN 61508-1 ed.2:2011, ČSN EN 61508-2 ed.2:2011, ČSN EN 61508-6 ed.2:2011

within functions of safety shut-off in the operation with low and high frequency of demands for safety shut-off.

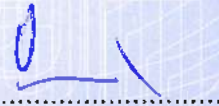
The present Certificate has been issued on the basis of the Final Report 32-0336 of 2017-03-14, issued by the Engineering Test Institute, Public Enterprise.

Certification scheme applied: ČSN EN ISO/IEC 17067:2014, Scheme 1a.

The rules for using the Certificate are specified on Page 2.

Brno, 2017-03-14




Ing. Aleš Onderek
Deputy Director



RULES FOR USING THE CERTIFICATE:

For the purposes of placing the products on the market, the present Certificate may only be used provided the normative documents specified on Page 1 remain valid.

The Certificate may only be used as a certificate for the products specified on Page 1. This also applies to its use in advertising, promotional and commercial materials. Unauthorised or deceptive use of the Certificate may result in its withdrawal.

It is forbidden to change, amend or overwrite the data contained in the Certificate.

The Certificate may not be used for the products changed without the consent of the Engineering Test Institute in such a way that conformity with the technical requirements specified on Page 1 is affected.



CERTIFICAT

B-32-00277-17

Producator: MSA, a.s.
Hlucinská 641 , 747 22 Dolní Benetov, Republica Ceha

ID companie.: 45192278

Produs: Robinet cu sfera

Tip: K83
clasa: 150, 300, 600, 900 cu materiale folosite: A350 LF2,
A182 F316, A182 F316L

Strojirenský zkušební ústav, S.P. (Institutul Ingineriei de Test, Intreprindere Publica) certifica prin prezenta ca, sub conditia unei montari duble cu cerintele SIL3 pentru siguranta functionala a elementelor active in sistemele electronice, asa cum este cerut de

ÖSN EN 61508-1 ed.2:2011, ÖSN EN 61508-2 ed.2:2011, EN 61508-6 ed.2:2011

In cadrul functiilor de oprire in siguranta pentru functionare cu frecventa scazuta si inalta.

Prezentul certificat a fost emis pe baza Raportului Final 32-0336 din 2017-03-14, emis de Institutul Ingineriei de Test, Intreprindere Publica. Schema de certificare aplicata: EN ISO/IEC 17067:2014, Schema 1a.

Regulile de utilizare ale certificatului sunt specificate pe pagina 2.

Brno, 2017-03-14



B-32-00277-17, page 1 (2)

REGULI DE UTILIZARE ALE CERTIFICATULUI:

In scopul introducerii produselor pe piata, prezentul certificat poate fi utilizat numai cu conditia ca documentele normative specificate in pagina 1 sa ramana valabile.

Certificatul poate fi utilizat doar ca sa certifice produsele specificate in pagina 1. Acest lucru se aplica si utilizarii sale in materiale publicitare, promotionale si comerciale. Utilizarea neautorizata sau inselatoare a certificatului poate duce la retragerea acestuia.

Este interzisa modificarea sau suprascrierea datelor prezente in certificat.

Certificatul nu poate fi utilizat pentru produsele modificate fara acordul Institutului Ingineriei de Test in asa fel incat sa fie afectate conformitatile cu cerintele tehnice specificate in pagina 1.



01	14.11.19	specification of ball material modified
00	11.11.19	
Rev.	Date	INSPECTION AND TEST PLAN/ changes
Client:	KIT METAL SRL	
Project :	Transgaz	
Contract No.:	Document title	
2019.10.10.-KIT/10.10.2019	INSPECTION AND TEST PLAN	
Supplier / Contractor No. 20-7208		
 		

	INSPECTION AND TEST PLAN Ball valve type K83 Class 600 and PN40 per API 6D Customer: Kitmetal MSA Contract No: 20-7208 Project: Transgaz	Doc.: ITP-20-7208-002 Page: 1 of 2 Issue No.: 1 Revision No.: 1 Issued: 31st October 2019 Revised: 14th November 2019
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No.	Inspected component	Inspection operation	Regulation/criterion	MSA	Customer / TPI
1: INCOMING INSPECTION OF MATERIALS					
1.1	Body, Cover	certificate verification EN 10204 3.1	A350 LF2	H	R
1.2	Stem	certificate verification EN 10204 3.1 HV=500-900	42CrMoS4/AISI 4140 + 30 μ ENP	H	R
1.3	Ball, seat	certificate verification EN 10204 3.1 Ball: HV+WC=500-900 Seat: HV=500-900	A350 LF2 + 30 μ ENP + WC	H	R
1.4	Bolt / Nut	certificate verification EN 10204 3.1	A193 B7 / A194 2H galvanized	H	R
2: PRODUCTION INSPECTION					
2.1	Individual components, welds	dimensions, surface finish, marking, visual test of welds	- drawing	H	R
3: NON-DESTRUCTIVE TESTING					
3.1	Body / accessory pipes, nipples (if applicable)	PT 100%	ASME Code V, art.6 No defects Drawing	H	R
3.2	Personnel certification	QP-GEN-18.01	SNT TC 1A, Level III EN 9712 Level 2,3	H	R
4: PRESSURE TESTS AND FUNCTIONAL TEST					
4.0	Ball valve	Antistatic testing	API 6D, annex H.5	H	R
4.1	Ball valve	100% hydrostatic shell test Pressure: 1,5 PN PN40: 6 MPa Class 600: 15,7 MPa Duration: 60 min Medium: water	API 6D, art. 9.3 Customer's request no leakage allowed no deformation allowed	H	R
4.2	Ball valve	100% functional test using actuator 1 $\times$ open / close Without pressure	MSA TLGP	H	R
4.3	Ball valve	Torque test 0-0-P P-0-0 Pressure: Δp Medium: water	API 6D, annex H.6	H	R
4.4	Ball valve	100% hydrostatic seat test left and right side separately and DBB Pressure: 1,1 PN PN40: 4,4 MPa Class 600: 11,4 MPa Duration: 6-18": 5 min ≥ 20 ": 10 min Medium: water	API 6D, art.9.4 API 6D, annex H.9 – DBB	H	R

	INSPECTION AND TEST PLAN Ball valve type K83 Class 600 and PN40 per API 6D Customer: Kitmetal MSA Contract No: 20-7208 Project: Transgaz	Doc.: ITP-20-7208-002 Page: 2 of 2 Issue No.: 1 Revision No.: 1 Issued: 31st October 2019 Revised: 14th November 2019
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4.5	Ball valve	100 % hydrostatic seat test DIB-1 Pressure: 1,1 PN PN40: 4,4 MPa Class 600: 11,4 MPa Duration: 6-18": 5 min ≥20": 10 min Medium: water	API 6D, annex H.10 – DIB-1	H	R
4.6	Ball valve	100% pneumatic shell test Pressure: 1,1 PN PN40: 4,4 MPa Class 600: 11,4 MPa Duration: ≤18": 15 min >20": 30 min Medium: air	API 6D, annex H.4.2	H	R
4.7	Ball valve	100% Pneumatic low pressure seat test Pressure: 0,6 MPa Duration: 6-18": 5 min ≥20": 10 min Medium: air	API 6D, annex H.3.3	H	R
4.8	Ball valve	100% pneumatic high pressure seat test Pressure: 1,1 PN PN40: 4,4 MPa Class 600: 11,4 MPa Duration: ≤18": 15 min >20": 30 min Medium: air	API 6D, annex H.4.3	H	R

5: FINAL INSPECTION

5.1	Ball valve	100 % visual inspection, dimensions, marking, painting	- Painting procedure - Purchase order - API 6D - drawing	H	R
5.2	Ball valve accompanying documentation	100 % completeness	- Purchase order - EN 10204 3.1	H	R
5.3	Ball valve packaging, final inspection before shipping	100 % completeness, quality	- Purchase order	H	R

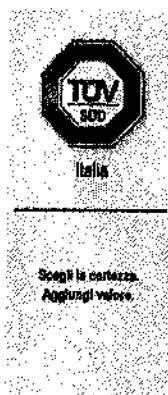
R Review of Documentation
H Hold production stop
W Witness to be notified

PT Penetrant testing
DBB Double block and bleed test
DIB Double isolation and bleed test

Prepared by:		Verified by:		Approved by:
David Zorvan	Pavel Vílkus	Ondřej Hanzlík	Tomáš Vavřinec	Vladimír Stoyka
Quality Assurance Officer	Head of Technology Department	Head of NDT Department	Head of Input Control Department	Quality Director

	INSPECTION AND TEST PLAN Ball valve type K83 Class 600 and PN40 per API 6D Customer: Kitmetal MSA Contract No: 20-7208 Project: Transgaz	Doc.: ITP-20-7208-002 Page: 3 of 2 Issue No.: 1 Revision No.: 1 Issued: 31st October 2019 Revised: 14th November 2019
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Note: For the mentioned standards, the latest valid edition, errata and addendum shall always be understood.



FUGITIVE EMISSION CERTIFICATE

CERTIFICATE NUMBER: FG-087311-693

CLIENT: MSA a.s.
ADDRESS: Hlučinská 641, 742 22 Dolní Benešov, Czech Republic

TEST LOCATION: TIV VALVES S.r.l.
Via Caboto, 10/12 20025 - Legnano (MI) Italy

REPORT NUMBER: FE-T-K83.2-001

SCOPE OF REPORT: Fugitive Emission test carried out according to: EN ISO 15848-1 Edition 2015.

max BAR: 87,6 bar

max °C: +200°C

QUALIFIED VALVE: Size: 6" (Stem Dia. 45mm)
Rating Class: 600
Drawing N°: K83.2 113.204-069
Type: TRUNNION VALVE

RANGE AND TYPE OF VALVES COVERED: ISO FE BH-C03-SSA1-t(-46°C, +200°C)-CL600-ISO 15848-1
In accordance with ISO 15848, we also extend the certification to valve with same stem and body seals material, design (shape) and construction, with stem size 50% lower and 200% higher than stem tested.

TÜV
INSPECTOR
Frecchiari Mauro

CERTIFICATION DATE
13/11/2015



	☐ Review
Date: 13/11/15	☒ Witness
Name: _____	

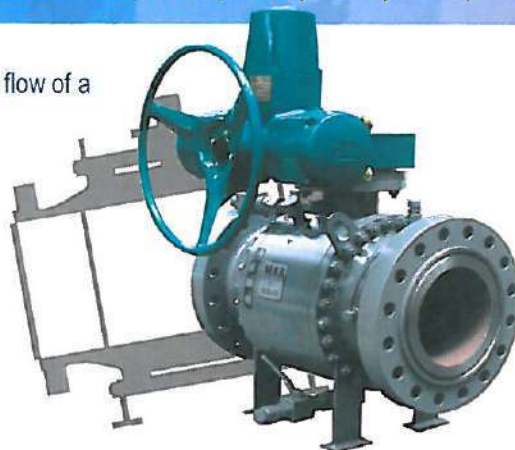
TÜV Italia s.r.l. - TÜV SÜD Group

Ball Valve K83 TB

PN 16, 40, 63, 100, 160, 260
Class 150, 300, 400, 600, 900, 1500

The ball valves are intended to close or open completely the flow of a working medium. They are used for:

- water
- petroleum
- gas etc.



technical description:

construction:

body, cover - are made of forged semi-products. The construction is made of two components up to NPS 4 (DN 100), the larger diameters are made of three components.

balls - is trunnion-seated and made of one component from wrought semi-product. The ball surface is covered with a Cr layer with thickness of 25 to 30 μm and hardness larger than 900 HV or a Ni layer with thickness 25,4 to 80 μm with the same hardness depending on the working medium.

seats - seat construction: seat combined with a primary gasket metal-metal and a secondary sealing ensured by a special gum ring (FKM, HNBR, etc.). The necessary seat thrust to ball is produced by the springs and piston effect of seat. Seats are with primary soft sealing. Gasket ring is made of material PTFE, NYLON, DEVLON, PEEK. Seats are of the SPE design (Single Piston Effect) with the ability to release automatically the higher pressure from the space between ball, body and seat. The DPE seats (Double Piston Effect) ensure two-way tightness. Both types of seats could be sealed tertiary with the injection of sealing paste and supplied in fire-resistant design.

pins - pins are of the Anti Blow Out design that prevents the pin from pushing out by the medium's pressure. The pin is sealed by three independent rings. If the tightness is lost it can be sealed by the injection of sealing paste. The last gasket ring could be exchanged at full pressure load while operating without the risk the pin will be pushed out.

lubrication - forces arising from the effect of pressure on the ball are caught by the self-lubricating PTFE bearings with a small friction coefficient. In that way the ball valves have small needed torque and do not require maintenance.

pressure reduction in body - ball valve with the seats of double sealing for media expanding under the influence of temperature must be equipped with a transfer valve for the decrease of pressure in the space between ball, body and cover.

antistatic desing - antistatic design of ball valves ensures conductive connection of ball valves. It excludes electrostatic charging of ball.

operation - the operation of ball valve could be manual, electric, hydropneumatic, electrohydraulic, hydraulic, pneumatic e.g. AUMA, ROTORK, BIFI, PC INTERTECHNIK. The actuators are situated directly on the ball or on the extension. A customer defines the height.

designed dimensions:

The dimensions of standard design are stated in the table below.

material design:

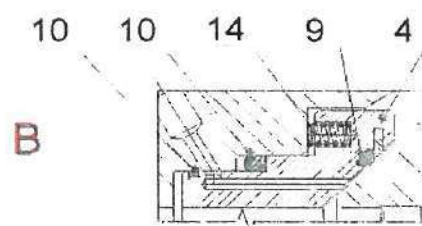
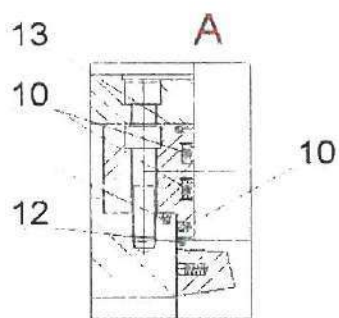
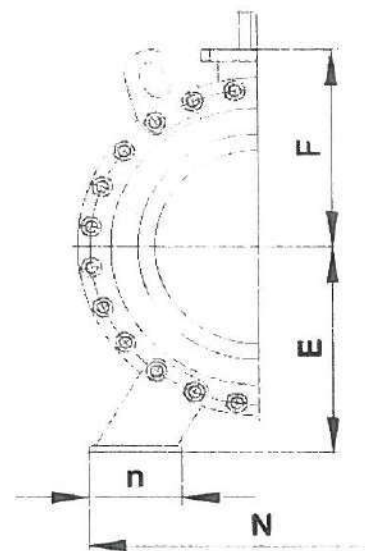
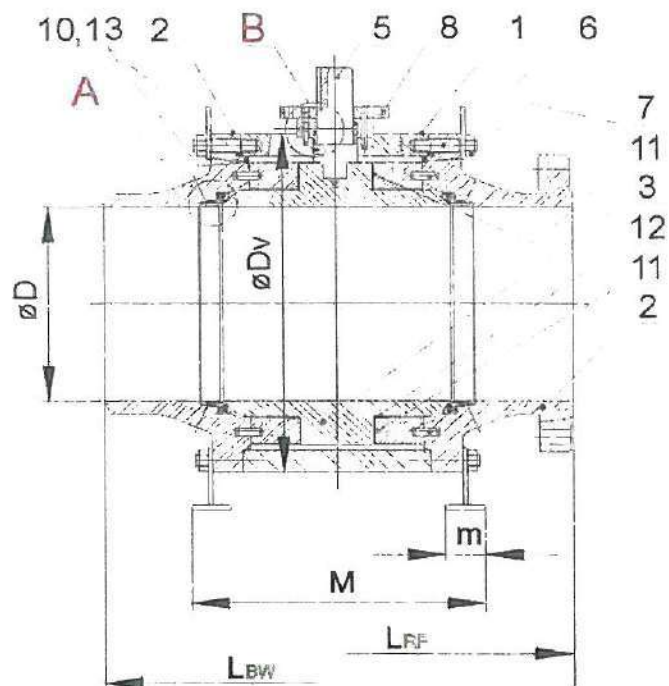
The standard design is specified in the tables. The ball valves are also supplied in other material designs according to customer's requirements.

testing:

Pressure testing is executed on the ball valves in accordance with the standards API SPEC 6D or API Std 598 or DIN 3230 or the requirements of customer.

order specification:

Data necessary for the order: nominal diameter and pressure, number of pieces, reference to the basic standard, face-to-face length, dimension of connecting pipeline or flange, working pressure, medium, temperature, type of operation, requirements on testing, length of extension.



materials:

body and cover	A 350 LF2, A 694 F52, A 694 F60, A 182 F304, A 182 F316, A 182 F6A
ball	A 350 LF2, A 182 F304, A 182 F316, A 182 F51
seat	A 350 LF2, A 182 F316, A 182 F51
operating pin	AISI 4140, A 350 LF2, A 182 F6A, A 182 F304, A 182 F316, 17.04 PH

standard material specification

	name of item	standard design from -29°C to 120°C	low temperatures from -60°C to 120°C
1	body	ASTM A 350 LF2	ASTM A 350 LF2
2	cover	ASTM A 350 LF2, A 694 F52, A 694 F60	ASTM A 350 LF2, A 694 F52, A 694 F60
3	ball	ASTM A 350 LF2 + Cr or Ni	ASTM A 350 LF2 + Cr or Ni
4	seat	ASTM A 350 LF2 + Ni	ASTM A 350 LF2 + Ni
5	operating pin	ASTM A 350 LF2, AISI 4140 + Ni (Cr)	ASTM A 350 LF2, AISI 4140 + Ni (Cr)
6	bolt	ASTM A 193 B7	ASTM A 320 L7 (M)
7	nut	ASTM A 194 2H	ASTM A 194 Gr.7 (M)
8	flange	ASTM A 350 LF2, S 355 J2	ASTM A 350 LF2, S 355 J2
9	ball gasket	THERBAN, VITON, PTFE, NYLON, DEVLON, PEEK	THERBAN (LOW), PTFE, NYLON, DEVLON, PEEK
10	gasket ring	THERBAN, VITON	THERBAN (LOW)
11	KU casing	OCEL + PTFE	OCEL + PTFE
12	axial bearing	OCEL + PTFE	OCEL + PTFE
13	gasket ring - fire safe	GRAFIT	GRAFIT
14	seat springs	AISI 302	AISI 302

	name of item	acid surrounding acc. to NACE MR-01-75 from -46°C to 120°C	high temperatures from -10°C to 200°C
1	body	ASTM A 350 LF2	ASTM A 350 LF2
2	cover	A 350 LF2, A 694 F52, A 694 F60	ASTM A 350 LF2, A 694 F60
3	ball	ASTM A 350 LF2 + Ni	ASTM A 350 LF2 + Cr or Ni
4	seat	ASTM A 350 LF2 + Ni or F316	ASTM A350 LF2 + Ni
5	operating pin	ASTM A 350 LF2 + Ni, A 182 F316	ASTM A 350 LF2, AISI 4140 + Ni (Cr)
6	bolt	ASTM A 320 L7M	ASTM A 193 B7
7	nut	ASTM A 194 7M	ASTM A 194 2H
8	flange	ASTM A 350 LF2, S 355 J2	ASTM A 350 LF2, S 355 J2
9	ball gasket	VITON, DEVLON, PTFE, NYLON, PEEK	VITON, PTFE, PEEK
10	gasket ring	VITON	VITON
11	KU casing	NEREZ OCEL + PTFE	OCEL + PTFE
12	axial bearing	NEREZ OCEL + PTFE	OCEL + PTFE
13	gasket ring - fire safe	GRAFIT	GRAFIT
14	seat springs	INCONEL 750	AISI 302



applied standards:

The standards that are applied for construction, production and testing of valves regarding to the customer's requirements:

ASME / ANSI	B 16.5, B 16.10, B 16.25, B 16.34, B 16.37, ASME section V, VIII and IX.
API	SPEC Q1, SPEC 6A, SPEC 6D, SPEC 5L, SPEC 6FA, std. 607, std 598
MSS	SP 6, SP 25, SP 53, SP 54, SP 72
BS	1560, 2080, 5146, 5351, 6755 part 2
ASTM	specification according to the applied material
ISO	EN ISO 9001:2000, 5211m EN 10 204, NACE - MR-01-75
DIN	1690, 2505, 2544-48, 2526, 3203, 3230, 3840, specification according to the applied material
ČSN	13 3060, 38 6410, specification according to the applied material
STN	13 3060, 38 6410, specification according to the applied material

designed dimensions

PN 16 (20) - Class 150

NPS	DN	D	LBW	LRF	LRTJ	Dv	E	F	Weight (kg)	
		mm							BW	RF, RTJ
2"	50	49	216	178	191	175	93	118	21	27
3"	80	74	283	203	216	200	108	133	40	45
4"	100	100	305	229	241	240	128	210	58	69
6"	150	152	457	394	406	330	231	245	145	170
8"	200	203	521	457	470	405	277	288	245	270
10"	250	254	559	533	546	479	310	331	320	354
12"	300	305	635	610	622	549	344	368	560	610
14"	350	337	762	686	699	598	370	393	860	925
16"	400	387	838	762	775	688	415	437	1 036	1 206
18"	450	438	914	864	876	760	453	470	1 320	1 540
20"	500	489	991	914	927	842	491	515	1 758	1 832
22"	550	540	1067	991	1003	930	545	560	2 150	2 350
24"	600	591	1 143	1 067	1 080	995	598	605	2 860	2 970
26"	650	635	1 245	1 143	-	1 045	622	632	3 420	3 650
28"	700	686	1 346	1 245	-	1 150	675	683	4 250	4 533
30"	750	737	1 397	1 295	-	1 226	713	721	5 000	5 307
32"	800	781	1 524	1 372	-	1 325	763	775	5 640	6 090
34"	850	822	1 626	1 473	-	1 415	808	840	6 420	6 870
36"	900	876	1 727	1 524	-	1 468	834	849	8 040	8 565
40"	1 000	978	1 780	1 850	-	1 616	928	943	10 260	10 872
42"	1 050	1 022	1 840	1 900	-	1 690	965	1 012	13 600	14 500
44"	1 100	1 075	1 900	1 950	-	1 782	1 010	1 026	14 800	15 850
48"	1 200	1 168	2 100	2 180	-	1 922	1 061	1 097	16 800	17 800
56"	1 400	1 362	2 250	2 300	-	2 250	1 232	1 268	25 720	27 205

PN 40 (50) - Class 300

NPS	DN	D	LBW	LRF	LRTJ	Dv	E	F	Weight (kg)	
		mm							BW	RF, RTJ
2"	50	49	216	216	232	175	93	118	22	28
3"	80	74	283	283	298	210	113	133	41	55
4"	100	100	305	305	321	245	130	225	59	78
6"	150	152	457	419	403	330	231	245	145	178
8"	200	203	521	502	518	405	277	288	245	293
10"	250	254	559	568	584	479	310	331	320	392
12"	300	305	635	648	664	549	344	368	560	660
14"	350	337	762	762	778	598	370	393	860	990
16"	400	387	838	838	854	688	415	437	1 036	1 286
18"	450	438	914	914	930	760	453	470	1 320	1 640
20"	500	489	991	991	1010	842	491	515	1 758	1 928
22"	550	540	1 092	1 092	1 114	930	545	560	2 190	2 450
24"	600	591	1 143	1 143	1 165	995	598	605	2 860	3 060
26"	650	635	1 245	1 245	1 270	1045	622	632	3 500	3 820
28"	700	686	1 346	1 346	1 372	1 150	675	683	4 250	4 815
30"	750	737	1 397	1 397	1 422	1 226	713	721	5 000	5 595
32"	800	781	1 524	1 524	1 553	1 325	763	775	5 640	6 430
34"	850	822	1 626	1 626	1 654	1 415	808	840	6 420	7 050
36"	900	876	1 727	1 727	1 756	1 468	834	849	8 040	8 966
40"	1 000	978	1 780	1 850	-	1 616	928	943	10 260	10 890
42"	1 050	1 022	1 840	1 900	-	1 690	965	1 012	13 600	14 500
44"	1 100	1 075	1 900	1 950	-	1 782	1 010	1 026	14 800	16 050
48"	1 200	1 168	2 100	2 180	-	1 922	1 061	1 097	16 800	17 800
56"	1 400	1 362	2 250	2 300	-	2 250	1 232	1 268	25 720	27 205

PN 63 - Class 400

NPS	DN	D	L BW	L RF	L RTJ	Dv	E	F	Weight (kg)	
		mm							BW	RF, RTJ
2"	50	49	292	292	295	175	93	125	24	30
3"	80	74	356	356	359	220	113	148	50	68
4"	100	100	406	406	410	245	130	200	64	88
6"	150	152	495	495	498	330	237	249	148	198
8"	200	203	597	597	600	413	277	297	289	362
10"	250	254	673	673	676	488	314	337	404	522
12"	300	305	762	762	765	569	355	378	648	785
14"	350	337	826	826	829	621	381	400	908	1 072
16"	400	387	902	902	905	713	427	448	1 401	1 619
18"	450	438	978	978	981	775	460	492	1 650	1 810
20"	500	489	1 054	1 054	1 060	868	500	538	2 181	2 487
22"	550	540	1 143	1 143	1 153	956	558	583	2 510	2 830
24"	600	591	1 232	1 232	1 241	1 030	615	615	3 436	3 856
26"	650	635	1 308	1 308	1 321	1 080	640	650	3 860	4 320
28"	700	686	1 397	1 397	1 410	1 180	675	690	5 276	5 836
30"	750	737	1 524	1 524	1 537	1 265	733	749	6 340	7 126
32"	800	781	1 651	1 651	1 667	1 365	783	815	8 227	9 197
34"	850	832	1 778	1 778	1 794	1 460	830	863	9 420	10 260
36"	900	876	1 880	1 880	1 895	1 510	905	892	10 458	11 621
40"	1 000	978	1 900	2 000	-	1 650	943	955	13 210	14 233
42"	1 050	1 022	1 950	2 100	-	1 725	982	1 013	15 200	16 450
44"	1 100	1 075	2 050	2 200	-	1 820	1 030	1 060	17 100	18 150
48"	1 200	1 168	2 180	2 400	-	1 970	1 105	1 135	20 800	22 685
56"	1 400	1 362	2 380	-	-	2 275	1 254	1 290	31 800	-

PN 100 - Class 600

NPS	DN	D	L BW	L RF	L RTJ	Dv	E	F	Weight (kg)	
		mm							BW	RF, RTJ
2"	50	49	292	292	295	175	93	125	25	31
3"	80	74	356	356	359	210	113	148	53	78
4"	100	100	432	432	435	245	130	200	71	100
6"	150	152	559	559	562	330	237	249	152	208
8"	200	203	660	660	664	413	277	297	295	378
10"	250	254	787	787	791	488	314	337	420	560
12"	300	305	838	838	841	569	355	378	663	824
14"	350	337	889	889	892	621	381	400	923	1 080
16"	400	387	991	991	994	713	427	448	1 429	1 714
18"	450	438	1 092	1 092	1 092	775	460	492	1 830	2 120
20"	500	489	1 194	1 194	1 200	868	500	538	2 250	2 664
22"	550	540	1 295	1 295	1 305	956	558	583	2 760	3 250
24"	600	591	1 397	1 397	1 407	1 030	615	615	3 550	4 092
26"	650	635	1 448	1 448	1 461	1 080	640	650	4 460	5 150
28"	700	686	1 549	1 549	1 562	1 180	675	690	5 420	5 800
30"	750	737	1 651	1 651	1 664	1 265	733	749	6 450	7 083
32"	800	781	1 778	1 778	1 794	1 365	783	815	8 330	9 137
34"	850	832	1 930	1 930	1 946	1 460	830	863	9 850	11 150
36"	900	876	2 083	2 083	2 099	1 510	905	892	10 690	11 549
40"	1 000	978	1 900	2 000	-	1 650	943	955	13 210	14 355
42"	1 050	1 022	1 950	2 100	-	1 725	982	1 013	15 230	16 975
44"	1 100	1 075	2 050	2 200	-	1 820	1 030	1 060	17 100	18 550
48"	1 200	1 168	2 180	2 400	-	1 970	1 105	1 135	20 800	22 990
56"	1 400	1 362	2 380	-	-	2 275	1 254	1 290	31 800	-

PN 160 - Class 900

NPS	DN	D	LBW	LRF	LRTJ	Dv	E	F	Weight (kg)	
		mm							BW	RF, RTJ
2"	50	49	368	368	371	190	102	135	40	63
3"	80	74	381	381	384	220	112	148	69	83
4"	100	100	457	457	460	245	130	225	140	157
6"	150	152	610	610	613	335	288	255	230	286
8"	200	203	737	737	740	425	333	295	345	440
10"	250	254	838	838	841	512	376	357	560	720
12"	300	305	965	965	968	598	419	386	770	990
14"	350	324	1 029	1 029	1 038	665	453	420	950	1 220
16"	400	375	1 130	1 130	1 140	734	487	471	1 150	1 610
18"	450	425	1 219	1 219	1 232	808	524	509	2 140	2 600
20"	500	473	1 321	1 321	1 334	889	565	547	2 860	3 480
22"	550	524	1 422	1 422	1 441	980	625	594	3 580	4 350
24"	600	572	1 549	1 549	1 568	1 069	670	644	4 310	5 230
26"	650	619	1 570	1 600	1 622	1 148	709	685	5 180	6 350
28"	700	667	1 600	1 660	1 682	1 222	746	757	6 030	7 370
30"	750	714	1 660	1 760	1 782	1 302	786	798	7 240	8 850
32"	800	762	1 760	1 850	1 872	1 388	829	836	8 470	10 300
34"	850	810	1 850	1 950	1 980	1 475	873	880	10 530	12 770
36"	900	857	1 900	2 050	2 080	1 548	924	918	12 440	15 050
40"	1 000	954	2 100	2 180	-	1 725	1 013	1 007	15 240	18 580
42"	1 050	1 000	2 180	2 250	-	1 750	1 025	1 018	20 065	23 995
44"	1 100	1 048	2 250	2 380	-	1 995	1 048	1 150	21 820	26 170
48"	1 200	1 143	2 380	2 450	-	2 120	1 210	1 212	25 730	31 200

PN 260 - Class 1500

NPS	DN	D	LBW	LRF	LRTJ	Dv	E	F	Weight (kg)	
		mm							BW	RF, RTJ
2"	50	49	368	368	371	190	102	135	52	99
3"	80	74	470	470	473	230	126	158	88	115
4"	100	100	546	546	549	285	152	203	160	180
6"	150	146	705	705	711	425	333	300	330	400
8"	200	194	832	832	841	536	388	350	615	735
10"	250	241	991	991	1 000	652	446	427	925	1 120
12"	300	289	1 130	1 130	1 146	766	503	470	1 300	1 550
14"	350	318	1 257	1 257	1 276	868	569	522	1 600	1 915
16"	400	362	1 384	1 384	1 407	988	629	598	1 950	2 350
18"	450	407	1 537	1 537	1 559	1 090	680	650	2 750	3 300
20"	500	454	1 664	1 664	1 686	1 180	725	692	3 715	4 455
22"	550	500	1 692	1 692	1 721	1 320	785	764	4 625	5 545
24"	600	544	1 943	1 943	1 972	1 415	858	817	5 540	6 660
26"	650	590	2 070	2 070	2 124	1 535	918	878	7 000	8 460
28"	700	635	2 198	2 198	2 251	1 645	973	969	8 020	9 650
30"	750	680	2 300	2 300	-	1 735	1 018	1 015	9 690	11 620
32"	800	725	2 400	2 400	-	1 865	1 083	1 075	11 000	13 220
34"	850	771	2 550	2 550	-	1 980	1 140	1 133	13 500	16 200
36"	900	816	2 700	2 700	-	2 090	1 195	1 190	15 900	18 880

quality system:

The whole manufacturing process is completely monitored and includes the following tests and inspections: acceptance inspections of all input materials and sub-deliveries, inspections of particular components in the course of manufacture, assembly testing, pressure testing, operating testing, non-destructive testing and final inspections of finished product.

testing:

MSA, a.s. executes the whole range of special tests which verify the properties of valves. They are as follow:

pressure testing

All pressure tests are executed according to API 598, API 6D and DIN 3230. MSA, a.s. also performs standardly the special tests according to API 6D, e.g. testing with air low pressure, DBB and DPE testing. A criterium for acceptance is zero permeability. At the same time, MSA, a.s. executes tests at full operating pressure as standard by which a possible leakage could be detected in the body-cover joint, spindle, fittings or grease equipments etc.

fire testing

Fire test is executed at MSA, a.s. according to the standard API 6FD, API 607 and BS 6755, part 2, for pressure class 150, 300, 400, 600, 900 and 1500.

testing on tightness and operability

Test is executed at the temperature from -60°C to 200°C.

cycle testing

Cycle test means 5000 cycles (open - close) at the full differential pressure with gas containing large mechanical impurities.

hydrodynamic and aerodynamic testing

Verification of hydropneumatic and aerodynamic properties that is performed by simulative measuring of torque value in dependence with the angle of ball opening.

operating testing

All ball valves are tested operationally together with the actuator. A value of torque is verified in the course of testing.

non-destructive testing

MSA, a.s. executes the non-destructive tests in the own facilities and testing room. The non-destructive tests includes RT, MT, UT or DP testing. The testing operators are highly qualified and certified according to EN 473 or STN-TC-1A.

special testing

MSA, a.s. executes the special tests by which the properties of ball valves are verified. All testing is monitored by an independent inspection organization.

visual inspection

Visual inspection is performed on all castings that are used for the valves of MSA, a.s. according to the quality regulation MSS SP-55 for steel castings and according to the order specifications.

certification:

Quality system of MSA, a.s. is based on the strict observation of EN ISO 9001:2000 and API Spec Q1 (Specification D - number 0239).

research and development:

Specialists of MSA, a.s. work on the development and research of new products and verify their properties as well such as:

- suitability of applied material
- strenght and rigidity of construction (FEM method)
- operability with the emphasis on strenght and controlability
- hydraulic and aerodynamic properties etc.

New products are tested in the testing room of MSA, a.s. as well as in real operating conditions. The properties of product are observed during the whole service life and findings are applied in the development and production of new products.



PN16, 40, 63, 100, 160, 260

Robineti cu sfera K83 TB

Clasa 150, 300, 400, 600, 900, 1500

Robinetii cu sfera au rolul de a inchide sau deschide complet fluxul unui mediu de lucru.

Sunt folositi pentru:

- apa
- petrol
- gaz etc



Descriere tehnica

Construcție:

Corp, carcasa – sunt realizate din semiproduse forjate. Construcția este realizată din două componente pentru diametrele de până la NPS 4 (DN 100), pentru diametrele mai mari de DN100 construcția este formată din trei componente.

Sferele – sunt asezate trunnion și sunt fabricate dintr-o singură componentă, din semiprodus forjat. Suprafața sferei este acoperită cu un strat de Cr, cu grosimea de la 25 până la 30 μm și duritate mai mare de 900 HV, cu un strat Ni, cu grosimea de la 25,4 până la 80 μm , cu aceeași duritate în funcție de mediul de lucru sau cu un strat de Wolfram (Tungsten), de o grosime de la 50 până la 150 μm și o duritate mai mare de 900 HV.

Scaune – construcția scaunului: scaun combinat cu o garnitură primară metal-metal și o etansare secundară asigurată de un inel special de guma (FKM, HNBR (Viton, Therban), etc.). Pentru necesitatea a scaunului la sferă este produsă de arcuri și de efectul pistonului scaunului. Scaunele sunt prevăzute cu etansare primară moale. Inelul garniturii este fabricat din material PTFE, NYLON, DEVLON, PEEK. Scaunele sunt de construcție SPE (Single Piston Effect) cu capacitatea de a elibera automat presiunea mai mare din spațiul dintre sferă, corp și scaun. Scaunul DPE (Double Piston Effect) asigură etanșeitate în două sensuri. Ambele tipuri de scaune ar putea fi sigilate terțiar cu injecție de pastă de etansare și furnizate în construcție rezistentă la foc.

Pin/tija – pin-urile/tije sunt de construcție anti explozie și aceasta previne împingerea pin-ului/tije de către presiunea mediului. Pinul/tija este etansată de trei inele independente. Dacă etanșeitatea se pierde aceasta poate fi etansată prin injectarea de pastă de etansare. Ultimul inel al garniturii poate fi schimbat în timpul operației la presiune maximă fără riscul ca pin-ul/tija să fie împins afară.

Lubrifiere – forțele care reies din efectul presiunii asupra sferei sunt prinse de rulmenții PTFE autolubrificaliți cu un coeficient mic de frecare. În acest fel robinetii cu sferă au un cuplu necesar mic și nu necesită întreținere.

Reducerea presiunii în corp – robinetul cu sferă, cu scaun de etansare dublu pentru mediile care se extind sub influența temperaturii trebuie să fie echipat cu o supapă de transfer pentru scăderea presiunii în spațiul dintre sferă, corp și carcasa. Construcție antistatică – proiectarea antistatică a robinetilor cu sferă asigură conectarea conductivă a robinetelor cu sferă. Exclue încărcarea electrostatică a sferei.

Actionare – acționarea robinetilor cu sferă ar putea fi manuală, electrică, hidropneumatică, electrohidraulică, hidraulică, pneumatică de exemplu: AUMA, ROTORK, BIFI, PC INTERTECHNIK. Dispozitivul de acționare este situat direct pe sferă sau pe extensie. Clientul definește înălțimea.

Dimensiuni de proiectare:

Dimensiunile standard ale proiectului sunt indicate in tabelul de mai jos.

Constructia materialului:

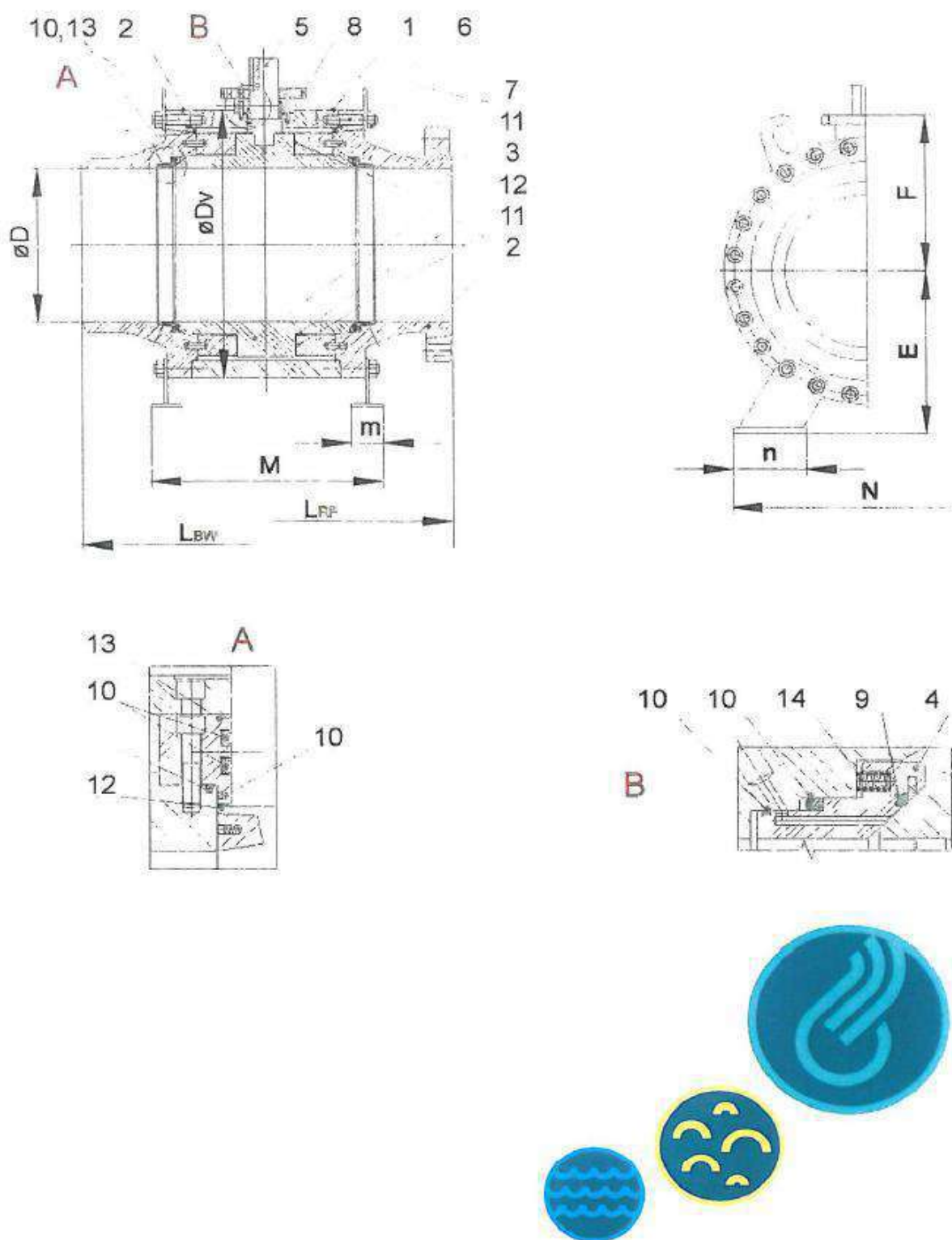
Constructia standard este specificata in tabel. Robinetii cu sfera pot fi furnizati si cu alte materiale, in conformitate cu cerintele clientului.

Testarea:

Testarea presiunii se executa la robinetii cu sfera in conformitate cu standardele API SPEC 6D sau API Std 598 sau DIN 3230 , sau dupa cerintele clientului.

Caiet de sarcini:

Date necesare pentru comanda: diametru nominal, numar de bucati, referinta la standardul initial, lungimea fata - fata, dimensiunea conductei de conectare sau a flansei, presiune de lucru, mediu, temperatura, tipul de functionare, cerinte privind testarea, lungimea extensiei.



Materiale:

Corp si carcasa	A 350 LF2, A 694 F52, A 694 F60, A 182 F304, A 182 F316, A 182 F6A
Sfera	A 350 LF2, A 182 F304, A 182 F316, A 182 F51
Scaun	A 350 LF2, A 182 F316, A 182 F51
Pin-ul/tija de functionare	AISI 4140, A 350 LF2, A 182 F6A, A 182 F304, A 182 F316, 17.04 PH

Specificatii standard ale materialului:

	Denumire	Constructie standard de la -29°C la 120°C	Temperaturi joase de la -60°C la 120°C
1	Corp	ASTM A 350 LF2	ASTM A 350 LF2
2	Carcasa	ASTM A 350 LF2, A 694 F52, A 694 F60	ASTM A 350 LF2, A 694 F52, A 694 F60
3	Sfera	ASTM A 350 LF2 + Cr or Ni	ASTM A 350 LF2 Ni
4	Scaun	ASTM A 350 LF2 + Ni	ASTM A 350 LF2
5	Pin/tija de functionare	ASTM A 350 LF2, AISI 4140 + Ni (Cr)	ASTM A 350 LF2, AISI 4140 + Ni (Cr)
6	Prezon	ASTMA 193 B7	ASTM A 320 17 (M)
7	Piulita	ASTMA 194 2H	ASTM A 194 Gr.7 (M)
8	Flansa	ASTM A 350 LF2, S 355 U	ASTM A 350 LF2, S 355 J2
9	Garnitura sfera	THERBAN, VITON, PTFE, NYLON, DEVLON, PEEK	THERBAN (LOW), PTFE, NYLON, DEVLON, PEEK
10	Garnitura „O ring”	THERBAN, VITON	THERBAN (LOW)
11	Carcasa KU	OCEL + PTFE	OCEL + PTFE
12	Rulment axial	OCEL + PTFE	OCEL + PTFE
13	Garnitura protectie foc	GRAFIT	GRAFIT
14	Arcuri scaun	AISI 302	AISI 302

	Denumire	Mediu acid conform ACE MR -01-75 de la -46°C la 120°C	Temperatura ridicata de la -10°C la 200 °C
1	Corp	ASTM A 350 LF2	ASTM A 350 LF2
2	Carcasa	A 350 LF2, A 694 F52, A 694 F60	ASTM A 350 LF2, A 694 F60
3	Sfera	ASTM A 350 LF2 + Ni	ASTM A 350 LF2 +Cr sau Ni
4	Scaun	ASTM A 350 LF2 +Ni or F316	ASTM A350 LF2 + Ni
5	Pin/tija de functionare	ASTM A 350 LF2 + Ni, A 182 F316	ASTM A 350 LF2, AISI 4140 +Ni (Cr)
6	Prezon	ASTM A 320 L7M	ASTMA 193 87
7	Piulita	ASTM A 194 7M	ASTM A 194 2H
8	Flansa	ASTM A 350 LF2, S 355 J2	ASTM A 350 LF2, S 355 J2
9	Garnitura sfera	VITON, DEVLON, PTFE, NYLON, PEEK	VITON, PTFE, PEEK
10	Garnitura „O ring”	VITON	VITON
11	Carcasa KU	NEREZ OCEL + PTFE	OCEL + PTFE
12	Rulment axial	NEREZ OCEL + PTFE	OCEL + PTFE
13	Garnitura protectie foc	GRAFIT	GRAFIT
14	Arcuri scaun	INCONEL 750	AISI 302



Standarde aplicate:

Standardele aplicate pentru constructia, productia si testarea robinetilor cu sfera in ceea ce priveste cerintele clientului:

ASME I ANSI B 16.5, B 16.10, B 16.25, B 16.34, B 16.37, ASME sectiune V, VIII and IX.

API SPEC Q1, SPEC 6A, SPEC 3D, SPEC 5L, SPEC 6FA, std. 607, std 598

MSS SP 6, SP 25, SP 53, SP 54, SP 72

BS 1560, 2080, 5146, 5351, 6755 part 2

ASTM specificatie in functie de materialul aplicat

ISO EN ISO 9001:2000, 5211m EN 10 204, NACE - MR-01-75

DIN 1690, 2505, 2544-48, 2526, 3203, 3230, 3840, specificatie in functie de materialul aplicat

CSN 13 3060, 38 6410, specificatie in functie de materialul aplicat

STN 13 3060, 38 6410 specificatie in functie de materialul aplicat

Dimensiune de constructie

PN 16 (20) – CLASA 150

NPS	DN	D	L BW	L RF	L RTJ	Dv	E	F	Greutate (kg)	
		mm							BW	RF,RTJ
2"	50	49	216	178	191	175	93	118	21	27
3"	80	74	283	203	216	200	108	133	40	45
4"	100	100	305	229	241	240	128	210	58	69
6"	150	152	457	394	406	330	231	245	145	170
8"	200	203	521	457	470	405	277	288	245	270
10"	250	254	559	533	546	479	310	331	320	354
12"	300	305	635	610	622	549	344	368	560	610
14"	350	337	762	686	699	598	370	393	860	925
16"	400	387	838	762	775	688	415	437	1036	1206
18"	450	438	914	864	876	760	453	470	1320	1540
20"	500	489	991	914	927	842	491	515	1758	1832
22"	550	540	1067	991	1003	930	545	560	2150	2350
24"	600	591	1143	1067	1080	995	598	605	2860	2970
26"	650	635	1245	1143	-	1045	622	632	3420	3650
28"	700	686	1346	1245	-	1150	675	683	4250	4533
30"	750	737	1397	1295	-	1226	713	721	5000	5307
32"	800	781	1524	1372	-	1325	763	775	5640	6090
34"	850	822	1626	1473	-	1415	808	840	6420	6870
36"	900	876	1727	1524	-	1468	834	849	8040	8565
40"	1000	978	1780	1850	-	1616	928	943	10260	10872
42"	1050	1022	1840	1900	-	1690	965	1012	13600	14500
44"	1100	1075	1900	1950	-	1782	1010	1026	14800	15850
48"	1200	1168	2100	2180	-	1922	1061	1097	16800	17800
56"	1400	1362	2250	2300	-	2250	1232	1268	25720	27205

PN 40 (50) – CLASA 300

NPS	DN	D	L BW	L RF	L RTJ	Dv	E	F	Greutate (kg)	
		mm							BW	RF,RTJ
2"	50	49	216	216	232	175	93	118	22	28
3"	80	74	283	283	298	200	113	133	41	55
4"	100	100	305	305	321	245	130	225	59	78
6"	150	152	457	419	403	330	231	245	145	178
8"	200	203	521	502	518	405	277	288	245	293
10"	250	254	559	568	584	479	310	331	320	392
12"	300	305	635	648	664	549	344	368	560	660
14"	350	337	762	762	778	598	370	393	860	990
16"	400	387	838	838	854	688	415	437	1036	1286
18"	450	438	914	914	930	760	453	470	1320	1640
20"	500	489	991	991	1010	842	491	515	1758	1928
22"	550	540	1067	1092	1114	930	545	560	2190	2450
24"	600	591	1143	1143	1165	995	598	605	2860	3060
26"	650	635	1245	1245	1270	1045	622	632	3500	3820
28"	700	686	1346	1346	1372	1150	675	683	4250	4815
30"	750	737	1397	1397	1422	1226	713	721	5000	5595
32"	800	781	1524	1524	1553	1325	763	775	5640	6430
34"	850	822	1626	1626	1654	1415	808	840	6420	7050
36"	900	876	1727	1727	1756	1468	834	849	8040	8966
40"	1000	978	1780	1850	-	1616	928	943	10260	10890
42"	1050	1022	1840	1900	-	1690	965	1012	13600	14500
44"	1100	1075	1900	1950	-	1782	1010	1026	14800	16050
48"	1200	1168	2100	2180	-	1922	1061	1097	16800	17800
56"	1400	1362	2250	2300	-	2250	1232	1268	25720	27205

PN 63 – CLASA 400

NPS	DN	D	L BW	L RF	L RTJ	Dv	E	F	Greutate (kg)	
		mm							BW	RF,RTJ
2"	50	49	292	292	295	175	93	125	24	30
3"	80	74	356	356	359	220	113	148	50	68
4"	100	100	406	406	410	245	130	200	64	88
6"	150	152	495	495	498	330	237	249	148	198
8"	200	203	597	597	600	413	277	297	289	362
10"	250	254	673	673	676	488	314	337	404	522
12"	300	305	762	762	765	569	355	378	648	785
14"	350	337	826	826	829	621	381	400	908	1072
16"	400	387	902	902	905	713	427	448	1401	1619
18"	450	438	978	978	981	775	460	492	1650	1810
20"	500	489	1054	1054	1060	868	500	538	2181	2487
22"	550	540	1143	1143	1153	956	558	583	2510	2830
24"	600	591	1232	1232	1241	1030	615	615	3436	3856
26"	650	635	1308	1308	1321	1080	640	650	3860	4320
28"	700	686	1397	1397	1410	1180	675	690	5276	5836
30"	750	737	1524	1524	1537	1265	733	749	6340	7126
32"	800	781	1651	1651	1667	1365	783	815	8227	9197
34"	850	822	1778	1778	1794	1460	830	863	9420	10260
36"	900	876	1880	1880	1895	1510	905	892	10458	11621
40"	1000	978	1900	2000	-	1650	943	955	13210	14233
42"	1050	1022	1950	2100	-	1725	982	1013	15200	16450
44"	1100	1075	2050	2200	-	1820	1030	1060	17100	18150
48"	1200	1168	2180	2400	-	1970	1105	1135	20800	22685
56"	1400	1362	2380	-	-	2275	1254	1290	31800	-

PN 100 – CLASA 600

NPS	DN	D	L BW	L RF	L RTJ	Dv	E	F	Greutate (kg)	
		mm							BW	RF,RTJ
2"	50	49	292	292	295	175	93	125	25	31
3"	80	74	356	356	359	210	113	148	53	78
4"	100	100	432	432	435	245	130	200	71	100
6"	150	152	559	559	562	330	237	249	152	208
8"	200	203	660	660	664	413	277	297	295	378
10"	250	254	787	787	791	488	314	337	420	560
12"	300	305	838	838	841	569	355	378	663	824
14"	350	337	889	889	892	621	381	400	923	1080
16"	400	387	991	991	994	713	427	448	1429	1714
18"	450	438	1092	1092	1092	775	460	492	1830	2120
20"	500	489	1194	1194	1200	868	500	538	2250	2664
22"	550	540	1295	1295	1305	956	558	583	2760	3250
24"	600	591	1397	1397	1407	1030	615	615	3550	4092
26"	650	635	1448	1448	1461	1080	640	650	4460	5150
28"	700	686	1549	1549	1562	1180	675	690	5420	5800
30"	750	737	1651	1651	1664	1265	733	749	6450	7083
32"	800	781	1678	1678	1794	1365	783	815	8330	9137
34"	850	822	1930	1930	1946	1460	830	863	9850	11150
36"	900	876	2083	2083	2099	1510	905	892	10690	11549
40"	1000	978	1900	2000	-	1650	943	955	13210	14355
42"	1050	1022	1950	2100	-	1725	982	1013	15200	16975
44"	1100	1075	2050	2200	-	1820	1030	1060	17100	18550
48"	1200	1168	2180	2400	-	1970	1105	1135	20800	22990
56"	1400	1362	2380	-	-	2275	1254	1290	31800	-

PN 160 – CLASA 900

NPS	DN	D	L BW	L RF	L RTJ	Dv	E	F	Greutate (kg)	
		mm							BW	RF,RTJ
2"	50	49	368	368	371	190	102	135	40	63
3"	80	74	381	381	384	220	112	148	69	83
4"	100	100	457	457	460	245	130	225	140	157
6"	150	152	610	610	613	335	288	255	230	286
8"	200	203	737	737	740	425	333	295	345	440
10"	250	254	838	838	841	512	376	357	560	720
12"	300	305	965	965	968	598	419	386	770	990
14"	350	324	1029	1029	1038	665	453	420	950	1220
16"	400	375	1130	1130	1140	734	487	471	1150	1610
18"	450	425	1219	1219	1232	808	524	509	2140	2600
20"	500	473	1321	1321	1334	889	565	547	2860	3480
22"	550	524	1422	1422	1441	980	625	594	3580	4350
24"	600	572	1549	1549	1568	1069	670	644	4310	5230
26"	650	619	1570	1600	1622	1148	709	685	5180	6350
28"	700	667	1600	1660	1682	1222	746	757	6030	7370
30"	750	714	1660	1760	1782	1302	786	798	7240	8850
32"	800	762	1760	1850	1872	1388	829	836	8470	10300
34"	850	810	1850	1950	1980	1475	743	880	10530	12770
36"	900	857	1900	2050	2080	1548	924	918	12440	15050
40"	1000	954	2100	2180	-	1725	1013	1007	15240	18580
42"	1050	1000	2180	2250	-	1750	1025	1018	20065	23995
44"	1100	1048	2250	2380	-	1995	1048	1150	21820	26170
48"	1200	1143	2380	2450	-	2120	1210	1212	25730	31200

PN 260 – CLASA 1500

NPS	DN	D	L BW	L RF	L RTJ	Dv	E	F	Greutate (kg)	
		mm							BW	RF,RTJ
2"	50	49	368	368	371	190	102	135	52	99
3"	80	74	470	470	473	230	125	158	88	115
4"	100	100	546	546	549	285	152	203	160	180
6"	150	146	705	705	711	425	333	300	330	400
8"	200	194	832	832	841	536	388	350	615	735
10"	250	241	991	991	1000	652	446	427	925	1120
12"	300	289	1130	1130	1146	766	503	470	1300	1550
14"	350	318	1257	1257	1276	868	569	522	1600	1915
16"	400	362	1384	1384	1407	988	629	598	1950	2350
18"	450	407	1537	1537	1559	1090	680	650	2750	3300
20"	500	454	1664	1664	1686	1180	725	62	3715	4455
22"	550	500	1692	1692	1721	1320	785	764	4625	5545
24"	600	544	1943	1943	1972	1415	858	817	5540	6660
26"	650	590	2070	2070	2124	1535	918	878	7000	8460
28"	700	635	2198	2198	2251	1645	973	969	8020	9650
30"	750	680	2300	2300	-	1735	1018	1015	9690	11620
32"	800	725	2400	2400	-	1865	1083	1075	11000	13220
34"	850	771	2550	2550	-	1980	1140	1133	13500	16200
36"	900	816	2700	2700	-	2090	1195	1190	15900	18880



Sistem de calitate:

Intregul proces de fabricatie este complet monitorizat si include urmatoarele teste si inspectii: inspectii de acceptare a tuturor materialelor de intrare si sub-livrari, inspectii ale anumitor componente, in cursul fabricatiei, testarea ansamblului, testarea presiunii, testarea functionarii, testarea nedistructiva si inspectii finale ale produsului finit.

Testare:

MSA a.s. executa intreaga gama de teste speciale, care verifica proprietatile robinetilor cu sfera. Acestea sunt dupa cum urmeaza:

Testarea presiunii:

Toate testele de presiune sunt executate conform API 598, API 6D si DIN 3230. MSA a.s., de asemenea, efectueaza in mod standard teste speciale conform API 6D, ex: teste cu presiune redusa a aerului, testare DBB si DPE. Un criteriu de acceptare este permeabilitatea zero. In acelasi timp, MSA a.s. executa teste la presiunea maxima de functionare ca standard, prin care s-ar putea detecta o posibila scurgere in articulatia carcasei-corpului, axului, armaturilor sau echipamentelor de lubrifiere etc.

Testul de foc

Testul de foc este executat la MSA a.s. conform standardelor API 6FD, API 607 si BS 6755, partea 2, pentru clasa de presiune 150, 300, 400, 600, 900 si 1500.

Testarea etanseitatii si operabilitatii

Testul se executa la temperatura de la -60 °C to 200 °C.

Testarea ciclului

Testarea ciclului inseamna 5000 de cicluri (deschis - inchis) la presiune diferentiala maxima, cu gazul care contine impuritati mecanice mari.

Testarea hidrodinamica si aerodinamica

Verificarea proprietatilor hidropneumatice si aerodinamice, care se realizeaza prin masurarea simultana a valorii cuplului in functie de unghiul de deschidere a sferei.

Testarea functionarii

Toti robinetii cu sfera sunt testati in timpul functionarii, impreuna cu dispozitivul de actionare. O valoare a cuplului este verificata in timpul testarii.

Testare nedistructiva

MSA a.s. executa teste nedistructive in propriile fabrici si sali de testare. Testele nedistructive includ testarea RT, MT, UT sau DP. Operatorii de testare sunt calificati si certificati conform EN 473 sau STN-TC-IA.

Testare speciala

MSA a.s. executa testele speciale, prin care sunt verificate proprietatile robinetelor cu sfera. Toate testarile sunt monitorizate de o organizatie de inspectie independenta.

Inspectie vizuala

Inspectia vizuala se efectueaza pentru toate piesele turnate, care sunt utilizate pentru robinetii cu sfera MSA a.s. conform regulamentului de calitate MSS SP-55, pentru piesele turnate din otel si conform specificatiilor comenzii.

Certificare:

Sistemul de calitate al MSA a.s. se bazeaza pe respectarea stricta a EN ISO 9001:2000 si API Spec QI (Specification D - numarul 0239).

Cercetare si dezvoltare:

Specialistii MSA a.s. lucreaza la dezvoltarea si cercetarea de noi produse si verifica proprietatile acestora precum:

- aplicarea materialului adecvat
- rezistenta si rigiditatea constructiei (metoda FEM)
- operabilitate cu accent pe rezistenta si controlabilitate
- proprietati hidraulice si aerodinamice etc.

Produsele noi sunt testate in sala de testare a MSA a.s. precum si in conditii reale de functionare. Proprietatile produsului sunt observate pe toata durata de viata si rezultatele sunt aplicate in dezvoltarea si productia de noi produse.

 MSA GROUP	FUGITIVE EMISSION TYPE TEST CERTIFICATE	Doc N°
		FE-T-K83.2-001
		Room / High Temperature

APPLICABLE STANDARDS
EN ISO 15848-1 : 2015

VALVE TESTED			
Valve Type:	TRUNNION BALL VALVE	Size:	6" DN: 150
Valve Model:	K83.2	Class:	600 PN: 100
Body Material:	ASTM A350 LF2	Stem Seals:	ELASTOMERIC O-RING
Serial Number:	J151302/2	Dwg:	K83.2 113.204-069

PERFORMANCE CLASSES		
Tightness Class	Endurance Class	Temperature Class
BH	CO3	-46°C / +200°C

CLASS DESIGNATION
ISO FE BH – CO3 - SSA1 – t(-46°C, +200°C) – CL600 – ISO 15848-1

TEST DATA			
AMBIENT TEMPERATURE TEST		TEMPERATURE TEST	
Test Temperature	ROOM TEMPERATURE	Test Temperature	+200°C
Test Pressure	102,1 bar	Test Pressure	87,6 bar

STEM SEAL TEST		BODY JOINT TEST	
Test Fluid	HELIUM	Test Fluid	HELIUM
Leak detection method (STEM)	VACUUM (Annex A)	Leak detection method (body)	SNIFFING (Annex B)
OD Stem	45 mm		
Allowable leakage (xmm)	≤ 1,78E-06 mbar l s-1	Allowable leakage (xmm)	50 ppmv
Opening Time	20 s	Closing time	20 s

TEST APPARATUS	
TEST RIG TYPE	Gas test bench
VALVE MOUNTING	Vertical stem
ACTUATOR TYPE	AUMA SAEx C07.6/GS 100.3
LEAK DETECTOR	Phoenix L300

INSPECTOR  ☐ REVIEW ☒ WITNESS Signe : 	THIRD PARTY INSPECTION  ☐ Review ☒ Witness 596  Name: 	DATE: Start: 09 November 2015 End: 13 November 2015
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	FUGITIVE EMISSION TYPE TEST CERTIFICATE	Doc N°
		FE-T-K83.2-001
		Room / High Temperature

TEST AT AMBIENT TEMPERATURE

PRELIMINARY OPERATION

Stem seal Adjustment:	NOT APPLICABLE
Mass Spectrometer calibration routine	SATISFACTORY PERFORMED

BODY JOINTS LEAKAGE

Test start time:	07:00	Test end time:	07:10
Test Fluid:	HELIUM	Leak detection method	SNIFFING (Annex B)
Test Temperature (beginning of test)	ROOM TEMPERATURE	Test Temperature (end of the test)	ROOM TEMPERATURE
Test pressure	102.1 bar		
Allowable leakage	50 ppmv	Maximum recorded value	0 ppmv

STEM LEAKAGE

Test start time:	07:12	Test end time:	07:17
Test Fluid:	HELIUM	Leak detection method	VACUUM (ANNEX A)
Test Temperature (beginning of test)	ROOM TEMPERATURE	Test Temperature (end of the test)	ROOM TEMPERATURE
Test pressure	102.1 bar		
OD stem	45 mm	Allowable leakage	≤1,78x10 ⁻⁶ mbar l s ⁻¹
Allowable leakage	8,01E-05 mbar l s ⁻¹	Maximum recorded value	7,20E-07 mbar l s ⁻¹

MECHANICAL CYCLING AT AMBIENT TEMPERATURE

Test start time:	07:20	Test end time:	07:40
Test Fluid:	HELIUM	Test Pressure	102.1 bar
Test Temperature (beginning of test)	ROOM TEMPERATURE	Test Temperature (end of the test)	ROOM TEMPERATURE
N. of cycles	50	Cumulative N. of cycles	50
Opening time	20 s	Closing time	20 s

PRELIMINARY OPERATION

Stem seal Adjustment:	NOT APPLICABLE
Mass Spectrometer calibration routine	SATISFACTORY PERFORMED

STEM LEAKAGE

Test Fluid:	HELIUM	Leak detection method	VACUUM (ANNEX A)
OD stem	45 mm	Allowable leakage (xmm)	≤ 1,78 E-06 mbar l s ⁻¹
Allowable leakage	8,01 E-05 mbar l s ⁻¹	Maximum recorded value	8,80E-07 mbar l s ⁻¹

INSPECTOR  ☐ REVIEW ☒ WITNESS Signe : 	THIRD PARTY INSPECTION  ☐ Review ☒ Witness 597341/15 Name: 	DATE: Start: 09 November 2015 End: 13 November 2015
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FUGITIVE EMISSION TYPE TEST CERTIFICATE

Doc N°

FE-T-K83.2-001

Room / High Temperature

STATIC TEST AT TEST TEMPERATURE

PRELIMINARY OPERATION

Stem seal Adjustment:	NOT APPLICABLE
Mass Spectrometer calibration routine	SATISFACTORY PERFORMED

STEM LEAKAGE

Test start time:	11:50	Test end time:	12:00
Test Fluid:	HELIUM	Leak detection method	VACUUM (ANNEX A)
Test Temperature (beginning of test)	+200°C	Test Temperature (end of the test)	+200°C
Test pressure	87.6 bar	Allowable leakage	≤ 1,78x10 ⁻⁶ mbar l s ⁻¹
OD stem	45 mm	Maximum recorded value	1,8E-06 mbar l s ⁻¹
Allowable leakage	8,01E-05 mbar l s ⁻¹		

MECHANICAL CYCLING AT TEST TEMPERATURE

Test start time:	12:03	Test end time:	12:20
Test Fluid:	HELIUM	Test Pressure	87.6 bar
Test Temperature (beginning of test)	+200°C	Test Temperature (end of the test)	+200°C
N. of cycles	50	Cumulative N. of cycles	100
Opening time	20 s	Closing time	20 s

PRELIMINARY OPERATION

Stem seal Adjustment:	NOT APPLICABLE
Mass Spectrometer calibration routine	SATISFACTORY PERFORMED

STEM LEAKAGE

Test Fluid:	HELIUM	Leak detection method	VACUUM (ANNEX A)
OD stem	45 mm	Allowable leakage (xmm)	≤ 1,78 E-06 mbar l s ⁻¹
Allowable leakage	8,01 E-05 mbar l s ⁻¹	Maximum recorded value	2,73E-06 mbar l s ⁻¹

INSPECTOR

☐ REVIEW☒ WITNESS

Signe:

THIRD PARTY INSPECTION

☐ Review
☒ Witness

5983/11/15

Name:

DATE:

Start: 09 November 2015

End: 13 November 2015



PINTERA GROUP

**FUGITIVE EMISSION TYPE
TEST CERTIFICATE**

Doc N°

FE-T-K83.2-001

Room / High Temperature

INTERMEDIATE TEST AT AMBIENT TEMPERATURE**PRELIMINARY OPERATION**

Stem seal Adjustment:	NOT APPLICABLE
Mass Spectrometer calibration routine	SATISFACTORY PERFORMED

STEM LEAKAGE

Test start time:	07:00	Test end time:	07:15
Test Fluid:	HELIUM	Leak detection method	VACUUM (ANNEX A)
Test Temperature (beginning of test)	ROOM TEMPERATURE	Test Temperature (end of the test)	ROOM TEMPERATURE
Test pressure	102.1 bar	Allowable leakage	$\leq 1,78 \times 10^{-6}$ mbar l s ⁻¹
OD stem	45 mm	Maximum recorded value	7.46E-07 mbar l s ⁻¹
Allowable leakage	8,01E-05 mbar l s ⁻¹		

MECHANICAL CYCLING AT TEST TEMPERATURE

Test start time:	07:20	Test end time:	20:14
Test Fluid:	HELIUM	Test Pressure	102.1 bar
Test Temperature (beginning of test)	ROOM TEMPERATURE	Test Temperature (end of the test)	ROOM TEMPERATURE
N. of cycles	2300	Cumulative N. of cycles	2500
Opening time	20 s	Closing time	20 s

PRELIMINARY OPERATION

Stem seal Adjustment:	NOT APPLICABLE
Mass Spectrometer calibration routine	SATISFACTORY PERFORMED

STEM LEAKAGE

Test Fluid:	HELIUM	Leak detection method	VACUUM (ANNEX A)
OD stem	45 mm	Allowable leakage (xmm)	$\leq 1,78 \times 10^{-6}$ mbar l s ⁻¹
Allowable leakage	8,01 E-05 mbar l s ⁻¹	Maximum recorded value	6.43E-07 mbar l s ⁻¹

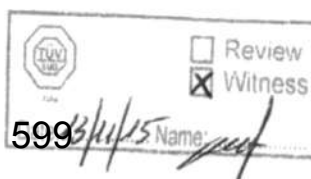
INSPECTOR



Signe :

☐ REVIEW
☒ WITNESS

THIRD PARTY INSPECTION

☐ Review
☒ Witness

5993/11/15

Name:

DATE:

Start: 09 November 2015

End: 13 November 2015

 OMTRAC GROUP	FUGITIVE EMISSION TYPE TEST CERTIFICATE	Doc N°
		FE-T-K83.2-001
		Room / High Temperature

FINAL TEST AT AMBIENT TEMPERATURE

PRELIMINARY OPERATION

Stem seal Adjustment:	NOT APPLICABLE
Mass Spectrometer calibration routine	SATISFACTORY PERFORMED

BODY JOINTS LEAKAGE

Test start time:	07:45	Test end time:	07:50
Test Fluid:	HELIUM	Leak detection method:	SNIFFING (ANNEX B)
Test Temperature (beginning of test)	ROOM TEMPERATURE	Test Temperature (end of the test)	ROOM TEMPERATURE
Test Pressure	102.1 bar		
Allowable leakage	50 ppmv	Maximum recorded value	13 ppmv

STEM LEAKAGE

Test start time:	07:55	Test start time:	07:58
Test Fluid:	HELIUM	Leak detection method:	VACUUM (ANNEX A)
Test Temperature (beginning of test)	ROOM TEMPERATURE	Test Temperature (end of the test)	ROOM TEMPERATURE
Test pressure	102.1 bar		
OD Stem	45 mm	Allowable leakage	$\leq 1,78 \times 10^{-6}$ mbar l s ⁻¹
Allowable leakage	8,01 E-05 mbar l s ⁻¹	Maximum recorded value	9.72E-06 mbar l s ⁻¹

POST TEST EXAMINATION

Observation on sealing components (for information only):

No relevant sign of wear and corrosion on metallic components

INSPECTOR  ☐ REVIEW ☒ WITNESS Signe : 	THIRD PARTY INSPECTION  ☐ Review ☒ Witness 600341/15 Name: 	DATE: Start: 09 November 2015 End: 13 November 2015
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	FUGITIVE EMISSION TYPE TEST CERTIFICATE	Doc N°
		FE-T-K83.2-001
		Room / High Temperature

WE HEREBY CERTIFY THAT THE VALVE

Type : TRUNNION BALL VALVE
Mod. : K83.2
Size : 6"
Class : 600

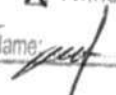
WITH THE FOLLOWING PERFORMANCE CLASSES

TIGHTNESS CLASS : BH
ENDURANCE CLASS : CO3
TEMPERATURE CLASS : AMB. / +200°C

HAS BEEN SUCCESSFULLY TYPE IN ACCORDANCE

WITH REQUIREMENTS OF:

ISO 15848:2015 Part 1

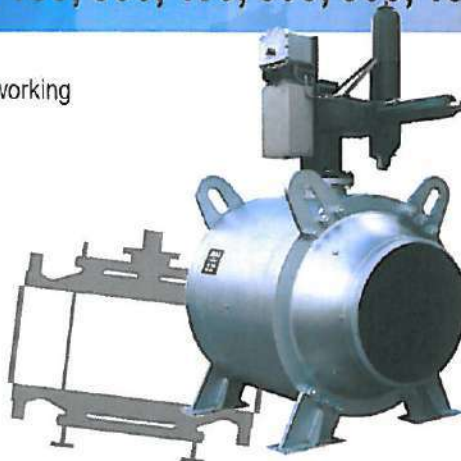
INSPECTOR  ☐ REVIEW ☒ WITNESS Signe: 	THIRD PARTY INSPECTION  ☐ Review ☒ Witness 6013/11/15 Name: 	DATE: Start: 09 November 2015 End: 13 November 2015
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Ball Valve K83 TW

PN 16, 40, 63, 100, 160, 260
Class 150, 300, 400, 600, 900, 1500

Ball valves are intended to close or open completely the flow of a working medium. They are used for:

- water
- oil
- gas etc.



technical description:

construction:

body, cover - are made of the forged semi-products. The construction is made of two components up to PS 4 (DN 100), the larger diameters are made of three components.

balls - is trunnion-seated and made of one component from wrought semi-product. The ball surface is covered with a Cr layer with thickness of 25 to 30 μm and hardness larger than 900 HV or a Ni layer with thickness 25,4 to 80 μm with the same hardness depending on the working medium.

seats - seat construction: seat combined with a primary gasket metal-metal and a secondary sealing ensured by a special gum ring (FKM, HNBR, etc). The necessary seat thrust to ball is produced by the springs and piston effect of seat. Seats with primary soft sealing. Gasket ring is made of material PTFE, NYLON, DEVLON, PEEK. Seats are of the SPE design (Single Piston Effect) with the ability to release automatically the higher pressure from the space between ball, body and seat. The DPE seats (Double Piston Effect) ensure two-way tightness. Both types of seats could be sealed tertiary with the injection of sealing paste and supplied in the fire-resistant design.

pins - pins are of the Anti Blow Out desing that prevents the pin from pushing out by the medium's pressure. The pin is sealed by three independent rings. If the tightness is lost it can be sealed by the injection of sealing paste. Last gasket ring is possible to exchnage at full pressure load during the operation without the risk of pin pushing out.

lubrication - forces arising from the effect of pressure on the ball are caught by the self-lubricating PTFE bearings with a small friction coefficient. In that way the ball valves have small needed torque and do not require maintanance.

pressure reduction in body - ball valve with the seats of double sealing for media expanding under the influence of temperature must be equipped with a transfer valve for the decrease of pressure in the space between ball, body and cover.

antistatic desing - antistatic design of ball valves ensures conductive connection of ball valves. It excludes electrostatic charging of ball.

operation - the operation of ball valve could be manual, electric, hydropneumatic, electrohydraulic, hydraulic, pneumatic e.g. AUMA, ROTORK, BIFI, PC INTERTECHNIK. The actuators are situated directly on the ball or on the extension. A customer defines the height.

designed dimensions:

The dimensions of standard design are stated in the table below.

material design:

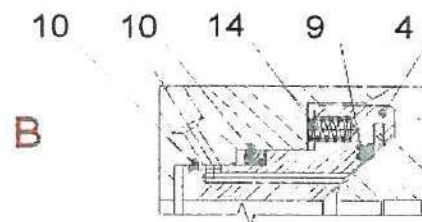
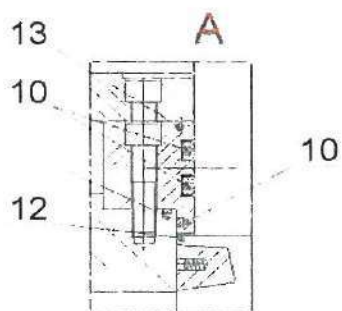
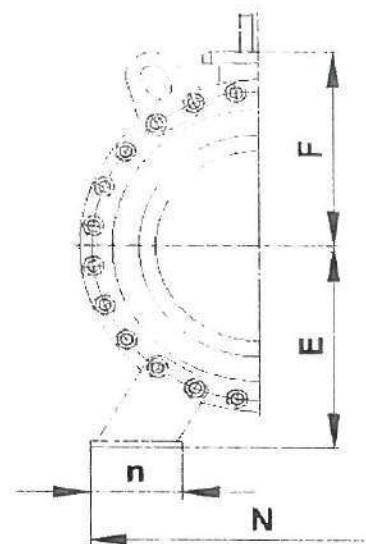
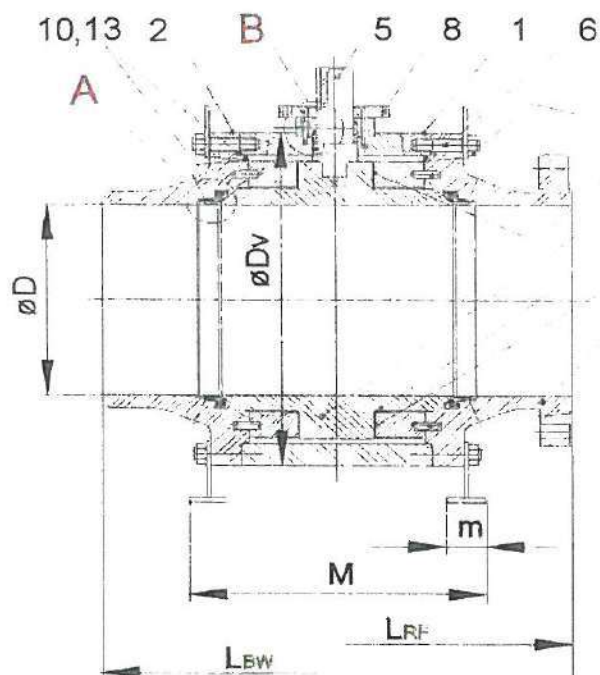
The standard design is specified in the tables. The ball valves are also supplied in other material designs according to customer's requirements.

testing:

The pressure tests are executed on the ball valves in accordance with the standards API SPEC 6D or API Std 598 or DIN 3230 or customer's requirements.

order specification:

Data neccesary for the order: nominal diameter and pressure, number of pieces, reference to the basic standard, face-to-face lenght, dimension of connecting pipeline or flange, working pressure, medium, temperature, type of operation, requirements on testing, lenght of extension.



materials

body and cover	A 350 LF2, A 694 F52, A 694 F60, A 182 F304, A 182 F316, A 182 F6A
ball	A 350 LF2, A 182 F304, A 182 F316, A 182 F51
seat	A 350 LF2, A 182 F316, A 182 F51
operating pin	AISI 4140, A 350 LF2, A 182 F6A, A 182 F304, A 182 F316, 17.04 PH

standard material specification

	name of item	standard design from -29°C to 120°C	low temperatures from -60°C to 120°C
1	body	ASTM A 350 LF2	ASTM A 350 LF2
2	cover	ASTM A 350 LF2, A 694 F52, A 694 F60	ASTM A 350 LF2, A 694 F52, A 694 F60
3	ball	ASTM A 350 LF2 + Cr nebo Ni	ASTM A 350 LF2 + Cr nebo Ni
4	seat	ASTM A 350 LF2 + Ni	ASTM A 350 LF2 + Ni
5	operating pin	ASTM A 350 LF2, AISI 4140 + Ni (Cr)	ASTM A 350 LF2, AISI 4140 + Ni (Cr)
6	bolt	ASTM A 193 B7	ASTM A 320 L7 (M)
7	nut	ASTM A 194 2H	ASTM A 194 Gr.7 (M)
8	flange	ASTM A 350 LF2, S 355 J2	ASTM A 350 LF2, S 355 J2
9	ball gasket	THERBAN, VITON, PTFE, NYLON, DEVLON, PEEK	THERBAN (LOW), PTFE, NYLON, DEVLON, PEEK
10	gasket ring	THERBAN, VITON	THERBAN (LOW)
11	KU casing	OCEL + PTFE	OCEL + PTFE
12	axial bearing	OCEL + PTFE	OCEL + PTFE
13	gasket ring - fire safe	GRAFIT	GRAFIT
14	seat springs	AISI 302	AISI 302

	name of item	standard design from -29°C to 120°C	low temperatures from -60°C to 120°C
1	body	ASTM A 350 LF2	ASTM A 350 LF2
2	cover	A 350 LF2, A 694 F52, A 694 F60	ASTM A 350 LF2, A 694 F60
3	ball	ASTM A 350 LF2 + Ni	ASTM A 350 LF2 + Cr nebo Ni
4	seat	ASTM A 350 LF2 + Ni nebo F316	ASTM A 350 LF2 + Ni
5	operating pin	ASTM A 350 LF2 + Ni, A 182 F316	ASTM A 350 LF2, AISI 4140 + Ni (Cr)
6	bolt	ASTM A 320 L7M	ASTM A 193 B7
7	nut	ASTM A 194 7M	ASTM A 194 2H
8	flange	ASTM A 350 LF2, S 355 J2	ASTM A 350 LF2, S 355 J2
9	ball gasket	VITON, DEVLON, PTFE, NYLON, PEEK	VITON, PTFE, PEEK
10	gasket ring	VITON	VITON
11	KU casing	NEREZ OCEL + PTFE	OCEL + PTFE
12	axial bearing	NEREZ OCEL + PTFE	OCEL + PTFE
13	gasket ring - fire safe	GRAFIT	GRAFIT
14	seat springs	INCONEL 750	AISI 302

applied standards:

The standards that are applied for construction, production and testing of valves regarding to the customer's requirements:

ASME / ANSI	B 16.5, B 16.10, B 16.25, B 16.34, B 16.37, ASME section V, VIII and IX.
API	SPEC Q1, SPEC 6A, SPEC 6D, SPEC 5L, SPEC 6FA, std. 607, std 598
MSS	SP 6, SP 25, SP 53, SP 54, SP 72
BS	1560, 2080, 5146, 5351, 6755 part 2
ASTM	specification according to the applied material
ISO	EN ISO 9001:2000, 5211m EN 10 204, NACE - MR-01-75
DIN	1690, 2505, 2544-48, 2526, 3203, 3230, 3840, specification according to the applied material
ČSN	13 3060, 38 6410, specification according to the applied material
STN	13 3060, 38 6410, specification according to the applied material

designed dimensions

PN 16 (20) - Class 150

NPS	DN	D	LBW	LRP	LRTJ	Dv	E	F	Weight (kg)	
		mm							BW	RF, RTJ
2"	50	49	216	178	191	175	93	118	21	27
3"	80	74	283	203	216	200	108	133	40	45
4"	100	100	305	229	241	240	128	210	58	69
6"	150	152	457	394	406	330	231	245	145	170
8"	200	203	521	457	470	405	277	288	245	270
10"	250	254	559	533	546	479	310	331	320	354
12"	300	305	635	610	622	549	344	368	560	610
14"	350	337	762	686	699	598	370	393	860	925
16"	400	387	838	762	775	688	415	437	1 036	1 206
18"	450	438	914	864	876	760	453	470	1 320	1 540
20"	500	489	991	914	927	842	491	515	1 758	1 832
22"	550	540	1067	991	1003	930	545	560	2 150	2 350
24"	600	591	1 143	1 067	1 080	995	598	605	2 860	2 970
26"	650	635	1 245	1 143	-	1 045	622	632	3 420	3 650
28"	700	686	1 346	1 245	-	1 150	675	683	4 250	4 533
30"	750	737	1 397	1 295	-	1 226	713	721	5 000	5 307
32"	800	781	1 524	1 372	-	1 325	763	775	5 640	6 090
34"	850	822	1 626	1 473	-	1 415	808	840	6 420	6 870
36"	900	876	1 727	1 524	-	1 468	834	849	8 040	8 565
40"	1 000	978	1 780	1 850	-	1 616	928	943	10 260	10 872
42"	1 050	1 022	1 840	1 900	-	1 690	965	1 012	13 600	14 500
44"	1 100	1 075	1 900	1 950	-	1 782	1 010	1 026	14 800	15 850
48"	1 200	1 168	2 100	2 180	-	1 922	1 061	1 097	16 800	17 800
56"	1 400	1 362	2 250	2 300	-	2 250	1 232	1 268	25 720	27 205

PN 40 (50) - Class 300

NPS	DN	D	LBW	LRP	LRTJ	Dv	E	F	Weight (kg)	
		mm							BW	RF, RTJ
2"	50	49	216	216	232	175	93	118	22	28
3"	80	74	283	283	298	210	113	133	41	55
4"	100	100	305	305	321	245	130	225	59	78
6"	150	152	457	419	403	330	231	245	145	178
8"	200	203	521	502	518	405	277	288	245	293
10"	250	254	559	568	584	479	310	331	320	392
12"	300	305	635	648	664	549	344	368	560	660
14"	350	337	762	762	778	598	370	393	860	990
16"	400	387	838	838	854	688	415	437	1 036	1 286
18"	450	438	914	914	930	760	453	470	1 320	1 640
20"	500	489	991	991	1010	842	491	515	1 758	1 928
22"	550	540	1 092	1 092	1 114	930	545	560	2 190	2 450
24"	600	591	1 143	1 143	1 165	995	598	605	2 860	3 060
26"	650	635	1 245	1 245	1 270	1045	622	632	3 500	3 820
28"	700	686	1 346	1 346	1 372	1 150	675	683	4 250	4 815
30"	750	737	1 397	1 397	1 422	1 226	713	721	5 000	5 595
32"	800	781	1 524	1 524	1 553	1 325	763	775	5 640	6 430
34"	850	822	1 626	1 626	1 654	1 415	808	840	6 420	7 050
36"	900	876	1 727	1 727	1 756	1 468	834	849	8 040	8 966
40"	1 000	978	1 780	1 850	-	1 616	928	943	10 260	10 890
42"	1 050	1 022	1 840	1 900	-	1 690	965	1 012	13 600	14 500
44"	1 100	1 075	1 900	1 950	-	1 782	1 010	1 026	14 800	16 050
48"	1 200	1 168	2 100	2 180	-	1 922	1 061	1 097	16 800	17 800
56"	1 400	1 362	2 250	2 300	-	2 250	1 232	1 268	25 720	27 205

PN 63 - Class 400

NPS	DN	D	L BW	L RF	L RTJ	Dv	E	F	Weight (kg)	
		mm							BW	RF, RTJ
2"	50	49	292	292	295	175	93	125	24	30
3"	80	74	356	356	359	220	113	148	50	68
4"	100	100	406	406	410	245	130	200	64	88
6"	150	152	495	495	498	330	237	249	148	198
8"	200	203	597	597	600	413	277	297	289	362
10"	250	254	673	673	676	488	314	337	404	522
12"	300	305	762	762	765	569	355	378	648	785
14"	350	337	826	826	829	621	381	400	908	1 072
16"	400	387	902	902	905	713	427	448	1 401	1 619
18"	450	438	978	978	981	775	460	492	1 650	1 810
20"	500	489	1 054	1 054	1 060	868	500	538	2 181	2 487
22"	550	540	1 143	1 143	1 153	956	558	583	2 510	2 830
24"	600	591	1 232	1 232	1 241	1 030	615	615	3 436	3 856
26"	650	635	1 308	1 308	1 321	1 080	640	650	3 860	4 320
28"	700	686	1 397	1 397	1 410	1 180	675	690	5 276	5 836
30"	750	737	1 524	1 524	1 537	1 265	733	749	6 340	7 126
32"	800	781	1 651	1 651	1 667	1 365	783	815	8 227	9 197
34"	850	832	1 778	1 778	1 794	1 460	830	863	9 420	10 260
36"	900	876	1 880	1 880	1 895	1 510	905	892	10 458	11 621
40"	1 000	978	1 900	2 000	-	1 650	943	955	13 210	14 233
42"	1 050	1 022	1 950	2 100	-	1 725	982	1 013	15 200	16 450
44"	1 100	1 075	2 050	2 200	-	1 820	1 030	1 060	17 100	18 150
48"	1 200	1 168	2 180	2 400	-	1 970	1 105	1 135	20 800	22 685
56"	1 400	1 362	2 380	-	-	2 275	1 254	1 290	31 800	-

PN 100 - Class 600

NPS	DN	D	L BW	L RF	L RTJ	Dv	E	F	Weight (kg)	
		mm							BW	RF, RTJ
2"	50	49	292	292	295	175	93	125	25	31
3"	80	74	356	356	359	210	113	148	53	78
4"	100	100	432	432	435	245	130	200	71	100
6"	150	152	559	559	562	330	237	249	152	208
8"	200	203	660	660	664	413	277	297	295	378
10"	250	254	787	787	791	488	314	337	420	560
12"	300	305	838	838	841	569	355	378	663	824
14"	350	337	889	889	892	621	381	400	923	1 080
16"	400	387	991	991	994	713	427	448	1 429	1 714
18"	450	438	1 092	1 092	1 092	775	460	492	1 830	2 120
20"	500	489	1 194	1 194	1 200	868	500	538	2 250	2 664
22"	550	540	1 295	1 295	1 305	956	558	583	2 760	3 250
24"	600	591	1 397	1 397	1 407	1 030	615	615	3 550	4 092
26"	650	635	1 448	1 448	1 461	1 080	640	650	4 460	5 150
28"	700	686	1 549	1 549	1 562	1 180	675	690	5 420	5 800
30"	750	737	1 651	1 651	1 664	1 265	733	749	6 450	7 083
32"	800	781	1 778	1 778	1 794	1 365	783	815	8 330	9 137
34"	850	832	1 930	1 930	1 946	1 460	830	863	9 850	11 150
36"	900	876	2 083	2 083	2 099	1 510	905	892	10 690	11 549
40"	1 000	978	1 900	2 000	-	1 650	943	955	13 210	14 355
42"	1 050	1 022	1 950	2 100	-	1 725	982	1 013	15 230	16 975
44"	1 100	1 075	2 050	2 200	-	1 820	1 030	1 060	17 100	18 550
48"	1 200	1 168	2 180	2 400	-	1 970	1 105	1 135	20 800	22 990
56"	1 400	1 362	2 380	-	-	2 275	1 254	1 290	31 800	-

PN 160 - Class 900

NPS	DN	D	LBW	LRF	LRTJ	Dv	E	F	Weight (kg)	
		mm							BW	RF, RTJ
2"	50	49	368	368	371	190	102	135	40	63
3"	80	74	381	381	384	220	112	148	69	83
4"	100	100	457	457	460	245	130	225	140	157
6"	150	152	610	610	613	335	288	255	230	286
8"	200	203	737	737	740	425	333	295	345	440
10"	250	254	838	838	841	512	376	357	560	720
12"	300	305	965	965	968	598	419	386	770	990
14"	350	324	1 029	1 029	1 038	665	453	420	950	1 220
16"	400	375	1 130	1 130	1 140	734	487	471	1 150	1 610
18"	450	425	1 219	1 219	1 232	808	524	509	2 140	2 600
20"	500	473	1 321	1 321	1 334	889	565	547	2 860	3 480
22"	550	524	1 422	1 422	1 441	980	625	594	3 580	4 350
24"	600	572	1 549	1 549	1 568	1 069	670	644	4 310	5 230
26"	650	619	1 570	1 600	1 622	1 148	709	685	5 180	6 350
28"	700	667	1 600	1 660	1 682	1 222	746	757	6 030	7 370
30"	750	714	1 660	1 760	1 782	1 302	786	798	7 240	8 850
32"	800	762	1 760	1 850	1 872	1 388	829	836	8 470	10 300
34"	850	810	1 850	1 950	1 980	1 475	873	880	10 530	12 770
36"	900	857	1 900	2 050	2 080	1 548	924	918	12 440	15 050
40"	1 000	954	2 100	2 180	-	1 725	1 013	1 007	15 240	18 580
42"	1 050	1 000	2 180	2 250	-	1 750	1 025	1 018	20 065	23 995
44"	1 100	1 048	2 250	2 380	-	1 995	1 048	1 150	21 820	26 170
48"	1 200	1 143	2 380	2 450	-	2 120	1 210	1 212	25 730	31 200

PN 260 - Class 1500

NPS	DN	D	LBW	LRF	LRTJ	Dv	E	F	Weight (kg)	
		mm							BW	RF, RTJ
2"	50	48	368	368	371	190	102	135	52	99
3"	80	74	470	470	473	230	125	158	88	115
4"	100	100	546	546	549	285	152	203	160	180
6"	150	146	705	705	711	425	333	300	330	400
8"	200	194	832	832	841	536	388	350	615	735
10"	250	241	991	991	1 000	652	446	427	925	1 120
12"	300	289	1 130	1 130	1 146	766	503	470	1 300	1 550
14"	350	318	1 257	1 257	1 276	868	569	522	1 600	1 915
16"	400	362	1 384	1 384	1 407	988	629	598	1 950	2 350
18"	450	407	1 537	1 537	1 559	1 090	680	650	2 750	3 300
20"	500	454	1 664	1 664	1 686	1 180	725	692	3 715	4 455
22"	550	500	1 692	1 692	1 721	1 320	785	764	4 625	5 545
24"	600	544	1 943	1 943	1 972	1 415	858	817	5 540	6 660
26"	650	590	2 070	2 070	2 124	1 535	918	878	7 000	8 460
28"	700	635	2 198	2 198	2 251	1 645	973	969	8 020	9 650
30"	750	680	2 300	2 300	-	1 735	1 018	1 015	9 690	11 620
32"	800	725	2 400	2 400	-	1 865	1 083	1 075	11 000	13 220
34"	850	771	2 550	2 550	-	1 980	1 140	1 133	13 500	16 200
36"	900	816	2 700	2 700	-	2 090	1 195	1 190	15 900	18 880



quality system:

The whole manufacturing process is completely monitored and includes the following tests and inspections: acceptance inspections of all input materials and sub-deliveries, inspections of particular components in the course of manufacture, assembly testing, pressure testing, operating testing, non-destructive testing and final inspections of finished product.

testing:

MSA, a.s. executes the whole range of special tests which verify the properties of valves. They are as follow:

pressure testing

All pressure tests are executed according to API 598, API 6D and DIN 3230. MSA, a.s. also performs standardly the special tests according to API 6D, e.g. testing with air low pressure, DBB and DPE testing. A criterium for acceptance is zero permeability. At the same time, MSA, a.s. executes tests at full operating pressure as standard by which a possible leakage could be detected in the body-cover joint, spindle, fittings or grease equipments etc.

fire testing

Fire test is executed at MSA, a.s. according to the standard API 6FD, API 607 and BS 6755, part 2, for pressure class 150, 300, 400, 600, 900 and 1500.

cycle testing

Cycle test means 5000 cycles (open - close) at the full differential pressure with gas containing large mechanical impurities.

testing on tightness and operationability

Test is executed at the temperature from -60°C to 200°C

hydrodynamic and aerodynamic testing

Verification of hydropneumatic and aerodynamic properties that is performed by simulative measuring of torque value in dependence with the angle of ball opening.

operating testing

All ball valves are tested operationally together with the actuator. A value of torque is verified in the course of testing.

non-destructive testing

MSA, a.s. executes the non-destructive tests in the own facilities and testing room. The non-destructive tests includes RT, MT, UT or DP testing. The testing operators are highly qualified and certified according to EN 473 or STN-TC-1A.

special testing

MSA, a.s. executes the special tests by which the properties of ball valves are verified. All testing is monitored by an independent inspection organization.

visual inspection

Visual inspection is performed on all castings that are used for the valves of MSA, a.s. according to the quality regulation MSS SP-55 for steel castings and according to the order specifications.

certification:

Quality system of MSA, a.s. is based on the strict observation of EN ISO 9001:2000 and API Spec Q1 (Specification D - number 0239).

research and development:

Specialists of MSA, a.s. work on the development and research of new products and verify their properties as well such as:

- suitability of applied material
- strenght and rigidity of construction (FEM method)
- operability with the emphasis on strenght and controlability
- hydraulic and aerodynamic properties etc.

New products are tested in the testing room of MSA, a.s. as well as in real operating conditions. The properties of product are observed during the whole service life and findings are applied in the development and production of new products.

**Robineti cu sfera K83 TW****PN16, 40, 63, 100, 160, 260****Clasa 150, 300, 400, 600, 900, 1500**

Robinetii cu sfera au rolul de a inchide sau deschide complet fluxul unui mediu de lucru.

Sunt folositi pentru:

- apa
- petrol
- gaz etc

**Descriere tehnica**

Construcție:

Corp, carcasa – sunt realizate din 3 semiproduse forjate, sudate între ele. Construcția este realizată monobloc, FW, indiferent de diametrele robinetelor.

Sferele – sunt așezate trunnion și sunt fabricate dintr-o singură componentă, din semiproduș forjat. Suprafața sferei este acoperită cu un strat de Cr, cu grosimea de la 25 până la 30 μm și duritate mai mare de 900 HV, cu un strat Ni, cu grosimea de la 25,4 până la 80 μm, cu aceeași duritate în funcție de mediul de lucru sau cu un strat de wolfram (WC), de o grosime de la 50 până la 150 μm și o duritate mai mare de 900 HV.

Scaune – construcția scaunului: scaun combinat cu o garnitură primară metal-metal, MTM, care asigură etanșeitatea. Forța necesară a scaunului la sferă este produsă de arcuri și de efectul pistonului scaunului. Scaunele sunt de construcție SPE (Single Piston Effect) cu capacitatea de a elibera automat presiunea mai mare din spațiul dintre sferă, corp și scaun. Scaunul DPE (Double Piston Effect) asigură etanșeitate în două sensuri. Ambele tipuri de scaune ar putea fi sigilate terțiar cu injectie de pastă de etansare și furnizate în construcție rezistentă la foc.

Pin/tija – pin-urile/tije sunt de construcție anti explozie și aceasta previne împingerea pin-ului/tije de către presiunea mediului. Pinul/tija este etansată de trei inele independente. Dacă etanșeitatea se pierde aceasta poate fi etansată prin injectarea de pastă de etansare. Ultimul inel al garniturii poate fi schimbat în timpul operației la presiune maximă fără riscul ca pin-ul/tija să fie împinsă afară.

Lubrifiere – forțele care reies din efectul presiunii asupra sferei sunt prinse de rulmentii PTFE autolubrificali cu coeficient mic de frecare. În acest fel robinetii cu sferă au un cuplu necesar mic și nu necesită întreținere.

Reducerea presiunii în corp – robinetul cu sferă cu scaun de etansare dublu pentru mediile care se extind sub influența temperaturii trebuie să fie echipat cu o supapă de transfer pentru scăderea presiunii în spațiul dintre sferă, corp și carcasa.

Construcție antistatică – proiectarea antistatică a robinetilor cu sferă asigură conectarea conductivă a robinetelor cu sferă. Exclue încărcarea electrostatică a sferei.

Actionare – Actionarea robinetilor cu sferă ar putea fi manuală, electrică, hidropneumatică, electrohidraulică, hidraulică, pneumatică de exemplu: AUMA, ROTORK, BIFI, PC INTERTECHNIK. Dispozitivul de acționare este situat direct pe sferă sau pe extensie. Clientul definește înălțimea.

Dimensiunile de proiectare:

Dimensiunile standard ale proiectului sunt indicate în tabelul de mai jos.

Construcția materialului:

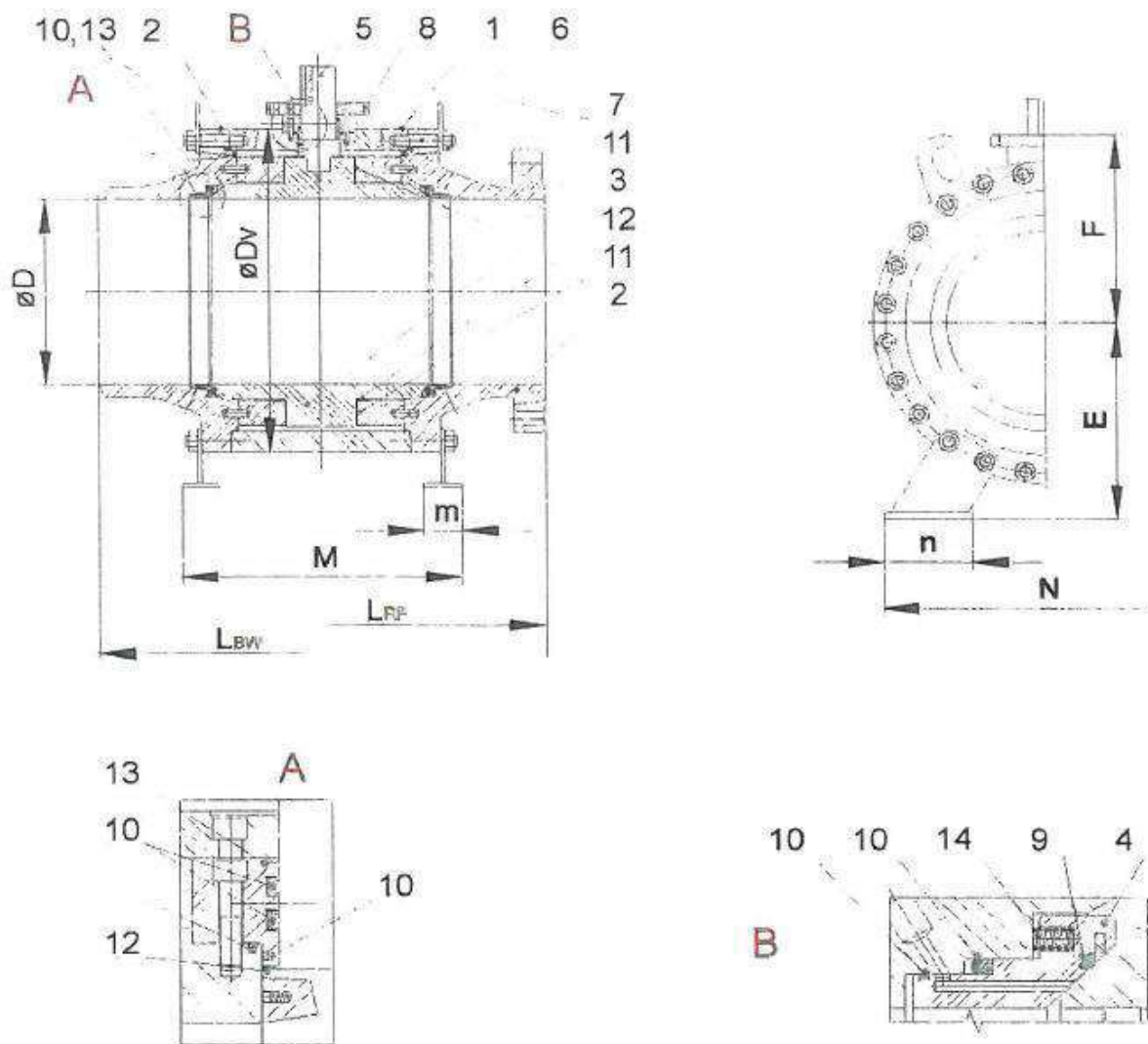
Construcția standard este specificată în tabel. Robinetii cu sferă pot fi furnizați și cu alte materiale în conformitate cu cerințele clientului.

Testarea:

Testarea presiunii se executa la robinetii cu sfera in conformitate cu standardele API SPEC 6D sau API Std 598 sau DIN 3230 sau dupa cerintele clientului.

Caiet de sarcini:

Date necesare pentru comanda: diametru nominal, numar de bucati, referinta la standardul initial, lungimea fata - fata, dimensiunea conductei de conectare sau a flansei, presiune de lucru, mediu, temperatura, tipul de functionare, cerinte privind testarea, lungimea extensiei.



Materiale:

Corp si carcasa	A 350 LF2, A 694 F52, A 694 F60, A 182 F304, A 182 F316, A 182 F6A
Sfera	A 350 LF2, A 182 F304, A 182 F316, A 182 F51
Scaun	A 350 LF2, A 182 F316, A 182 F51
Pin-ul/tija de functionare	AISI 4140, A 350 LF2, A 182 F6A, A 182 F304, A 182 F316, 17.04 PH

Specificatii standard ale materialului:

	Denumire	Constructie standard de la -29°C la 120°C	Tmeperaturi joase de la -60°C la 120°C
1	Corp	ASTM A 350 LF2	ASTM A 350 LF2
2	Carcasa	ASTM A 350 LF2, A 694 F52, A 694 F60	ASTM A 350 LF2, A 694 F52, A 694 F60
3	Sfera	ASTM A 350 LF2 + Cr or Ni	ASTM A 350 LF2 Ni
4	Scaun	ASTM A 350 LF2 + Ni	ASTM A 350 LF2
5	Pin/tija de functionare	ASTM A 350 LF2, AISI 4140 + Ni (Cr)	ASTM A 350 LF2, AISI 4140 + Ni (Cr)
6	Prezon	ASTMA 193 B7	ASTM A 320 17 (M)
7	Piulita	ASTMA 194 2H	ASTM A 194 Gr.7 (M)
8	Flansa	ASTM A 350 LF2, S 355 U	ASTM A 350 LF2, S 355 J2
9	Garnitura sfera	THERBAN, VITON, PTFE, NYLON, DEVLON, PEEK	THERBAN (LOW), PTFE, NYLON, DEVLON, PEEK
10	Garnitura „O ring”	THERBAN, VITON	THERBAN (LOW)
11	Carcasa KU	OCEL + PTFE	OCEL + PTFE
12	Rulment axial	OCEL + PTFE	OCEL + PTFE
13	Garnitura protectie foc	GRAFIT	GRAFIT
14	Arcuri scaun	AISI 302	AISI 302

	Denumire	Constructie standard de la -29°C la 120°C	Tmeperaturi joase de la -60°C la 120°C
1	Corp	ASTM A 350 LF2	ASTM A 350 LF2
2	Carcasa	A 350 LF2, A 694 F52, A 694 F60	ASTM A 350 LF2, A 694 F60
3	Sfera	ASTM A 350 LF2 + Ni	ASTM A 350 LF2 +Cr sau Ni
4	Scaun	ASTM A 350 LF2 +Ni or F316	ASTM A350 LF2 + Ni
5	Pin/tija de functionare	ASTM A 350 LF2 + Ni, A 182 F316	ASTM A 350 LF2, AISI 4140 +Ni (Cr)
6	Prezon	ASTM A 320 L7M	ASTMA 193 87
7	Piulita	ASTM A 194 7M	ASTM A 194 2H
8	Flansa	ASTM A 350 LF2, S 355 J2	ASTM A 350 LF2, S 355 J2
9	Garnitura sfera	VITON, DEVLON, PTFE, NYLON, PEEK	VITON, PTFE, PEEK
10	Garnitura „O ring”	VITON	VITON
11	Carcasa KU	NEREZ OCEL + PTFE	OCEL + PTFE
12	Rulment axial	NEREZ OCEL + PTFE	OCEL + PTFE
13	Garnitura protectie foc	GRAFIT	GRAFIT
14	Arcuri scaun	INCONEL 750	AISI 302



Standarde aplicate:

Standardele aplicate pentru constructia, productia si testarea robinetilor cu sfera in ceea ce priveste cerintele clientului:

ASME I ANSI B 16.5, B 16.10, B 16.25, B 16.34, B 16.37, ASME sectiune V, VIII and IX.

API SPEC Q1, SPEC 6A, SPEC 3D, SPEC 5L, SPEC 6FA, std. 607, std 598

MSS SP 6, SP 25, SP 53, SP 54, SP 72

BS 1560, 2080, 5146, 5351, 6755 part 2

ASTM specificatie in functie de materialul aplicat

ISO EN ISO 9001:2000, 5211m EN 10 204, NACE - MR-01-75

DIN 1690, 2505, 2544-48, 2526, 3203, 3230, 3840, specificatie in functie de materialul aplicat

CSN 13 3060, 38 6410, specificatie in functie de materialul aplicat
STN 13 3060, 38 6410 specificatie in functie de materialul aplicat

Dimensiune de constructie

PN 16 (20) – CLASA 150

NPS	DN	D	L BW	L RF	L RTJ	Dv	E	F	Greutate (kg)	
		mm							BW	RF,RTJ
2"	50	49	216	178	191	175	93	118	21	27
3"	80	74	283	203	216	200	108	133	40	45
4"	100	100	305	229	241	240	128	210	58	69
6"	150	152	457	394	406	330	231	245	145	170
8"	200	203	521	457	470	405	277	288	245	270
10"	250	254	559	533	546	479	310	331	320	354
12"	300	305	635	610	622	549	344	368	560	610
14"	350	337	762	686	699	598	370	393	860	925
16"	400	387	838	762	775	688	415	437	1036	1206
18"	450	438	914	864	876	760	453	470	1320	1540
20"	500	489	991	914	927	842	491	515	1758	1832
22"	550	540	1067	991	1003	930	545	560	2150	2350
24"	600	591	1143	1067	1080	995	598	605	2860	2970
26"	650	635	1245	1143	-	1045	622	632	3420	3650
28"	700	686	1346	1245	-	1150	675	683	4250	4533
30"	750	737	1397	1295	-	1226	713	721	5000	5307
32"	800	781	1524	1372	-	1325	763	775	5640	6090
34"	850	822	1626	1473	-	1415	808	840	6420	6870
36"	900	876	1727	1524	-	1468	834	849	8040	8565
40"	1000	978	1780	1850	-	1616	928	943	10260	10872
42"	1050	1022	1840	1900	-	1690	965	1012	13600	14500
44"	1100	1075	1900	1950	-	1782	1010	1026	14800	15850
48"	1200	1168	2100	2180	-	1922	1061	1097	16800	17800
56"	1400	1362	2250	2300	-	2250	1232	1268	25720	27205

PN 40 (50) – CLASA 300

NPS	DN	D	L BW	L RF	L RTJ	Dv	E	F	Greutate (kg)	
		mm							BW	RF,RTJ
2"	50	49	216	216	232	175	93	118	22	28
3"	80	74	283	283	298	200	113	133	41	55
4"	100	100	305	305	321	245	130	225	59	78
6"	150	152	457	419	403	330	231	245	145	178
8"	200	203	521	502	518	405	277	288	245	293
10"	250	254	559	568	584	479	310	331	320	392
12"	300	305	635	648	664	549	344	368	560	660
14"	350	337	762	762	778	598	370	393	860	990
16"	400	387	838	838	854	688	415	437	1036	1286
18"	450	438	914	914	930	760	453	470	1320	1640
20"	500	489	991	991	1010	842	491	515	1758	1928
22"	550	540	1067	1092	1114	930	545	560	2190	2450
24"	600	591	1143	1143	1165	995	598	605	2860	3060
26"	650	635	1245	1245	1270	1045	622	632	3500	3820
28"	700	686	1346	1346	1372	1150	675	683	4250	4815
30"	750	737	1397	1397	1422	1226	713	721	5000	5595
32"	800	781	1524	1524	1553	1325	763	775	5640	6430
34"	850	822	1626	1626	1654	1415	808	840	6420	7050
36"	900	876	1727	1727	1756	1468	834	849	8040	8966

40"	1000	978	1780	1850	-	1616	928	943	10260	10890
42"	1050	1022	1840	1900	-	1690	965	1012	13600	14500
44"	1100	1075	1900	1950	-	1782	1010	1026	14800	16050
48"	1200	1168	2100	2180	-	1922	1061	1097	16800	17800
56"	1400	1362	2250	2300	-	2250	1232	1268	25720	27205

PN 63 – CLASA 400

NPS	DN	D	L BW	L RF	L RTJ	Dv	E	F	Greutate (kg)	
		mm							BW	RF,RTJ
2"	50	49	292	292	295	175	93	125	24	30
3"	80	74	356	356	359	220	113	148	50	68
4"	100	100	406	406	410	245	130	200	64	88
6"	150	152	495	495	498	330	237	249	148	198
8"	200	203	597	597	600	413	277	297	289	362
10"	250	254	673	673	676	488	314	337	404	522
12"	300	305	762	762	765	569	355	378	648	785
14"	350	337	826	826	829	621	381	400	908	1072
16"	400	387	902	902	905	713	427	448	1401	1619
18"	450	438	978	978	981	775	460	492	1650	1810
20"	500	489	1054	1054	1060	868	500	538	2181	2487
22"	550	540	1143	1143	1153	956	558	583	2510	2830
24"	600	591	1232	1232	1241	1030	615	615	3436	3856
26"	650	635	1308	1308	1321	1080	640	650	3860	4320
28"	700	686	1397	1397	1410	1180	675	690	5276	5836
30"	750	737	1524	1524	1537	1265	733	749	6340	7126
32"	800	781	1651	1651	1667	1365	783	815	8227	9197
34"	850	822	1778	1778	1794	1460	830	863	9420	10260
36"	900	876	1880	1880	1895	1510	905	892	10458	11621
40"	1000	978	1900	2000	-	1650	943	955	13210	14233
42"	1050	1022	1950	2100	-	1725	982	1013	15200	16450
44"	1100	1075	2050	2200	-	1820	1030	1060	17100	18150
48"	1200	1168	2180	2400	-	1970	1105	1135	20800	22685
56"	1400	1362	2380	-	-	2275	1254	1290	31800	-

PN 100 – CLASA 600

NPS	DN	D	L BW	L RF	L RTJ	Dv	E	F	Greutate (kg)	
		mm							BW	RF,RTJ
2"	50	49	292	292	295	175	93	125	25	31
3"	80	74	356	356	359	210	113	148	53	78
4"	100	100	432	432	435	245	130	200	71	100
6"	150	152	559	559	562	330	237	249	152	208
8"	200	203	660	660	664	413	277	297	295	378
10"	250	254	787	787	791	488	314	337	420	560
12"	300	305	838	838	841	569	355	378	663	824
14"	350	337	889	889	892	621	381	400	923	1080
16"	400	387	991	991	994	713	427	448	1429	1714
18"	450	438	1092	1092	1092	775	460	492	1830	2120
20"	500	489	1194	1194	1200	868	500	538	2250	2664
22"	550	540	1295	1295	1305	956	558	583	2760	3250
24"	600	591	1397	1397	1407	1030	615	615	3550	4092
26"	650	635	1448	1448	1461	1080	640	650	4460	5150
28"	700	686	1549	1549	1562	1180	675	690	5420	5800
30"	750	737	1651	1651	1664	1265	733	749	6450	7083
32"	800	781	1678	1678	1794	1365	783	815	8330	9137
34"	850	822	1930	1930	1946	1460	830	863	9850	11150
36"	900	876	2083	2083	2099	1510	905	892	10690	11549
40"	1000	978	1900	2000	-	1650	943	955	13210	14355

42"	1050	1022	1950	2100	-	1725	982	1013	15200	16975
44"	1100	1075	2050	2200	-	1820	1030	1060	17100	18550
48"	1200	1168	2180	2400	-	1970	1105	1135	20800	22990
56"	1400	1362	2380	-	-	2275	1254	1290	31800	-

PN 160 – CLASA 900

NPS	DN	D	L BW	L RF	L RTJ	Dv	E	F	Greutate (kg)	
		mm							BW	RF,RTJ
2"	50	49	368	368	371	190	102	135	40	63
3"	80	74	381	381	384	220	112	148	69	83
4"	100	100	457	457	460	245	130	225	140	157
6"	150	152	610	610	613	335	288	255	230	286
8"	200	203	737	737	740	425	333	295	345	440
10"	250	254	838	838	841	512	376	357	560	720
12"	300	305	965	965	968	598	419	386	770	990
14"	350	324	1029	1029	1038	665	453	420	950	1220
16"	400	375	1130	1130	1140	734	487	471	1150	1610
18"	450	425	1219	1219	1232	808	524	509	2140	2600
20"	500	473	1321	1321	1334	889	565	547	2860	3480
22"	550	524	1422	1422	1441	980	625	594	3580	4350
24"	600	572	1549	1549	1568	1069	670	644	4310	5230
26"	650	619	1570	1600	1622	1148	709	685	5180	6350
28"	700	667	1600	1660	1682	1222	746	757	6030	7370
30"	750	714	1660	1760	1782	1302	786	798	7240	8850
32"	800	762	1760	1850	1872	1388	829	836	8470	10300
34"	850	810	1850	1950	1980	1475	743	880	10530	12770
36"	900	857	1900	2050	2080	1548	924	918	12440	15050
40"	1000	954	2100	2180	-	1725	1013	1007	15240	18580
42"	1050	1000	2180	2250	-	1750	1025	1018	20065	23995
44"	1100	1048	2250	2380	-	1995	1048	1150	21820	26170
48"	1200	1143	2380	2450	-	2120	1210	1212	25730	31200

PN 260 – CLASA 1500

NPS	DN	D	L BW	L RF	L RTJ	Dv	E	F	Greutate (kg)	
		mm							BW	RF,RTJ
2"	50	49	368	368	371	190	102	135	52	99
3"	80	74	470	470	473	230	125	158	88	115
4"	100	100	546	546	549	285	152	203	160	180
6"	150	146	705	705	711	425	333	300	330	400
8"	200	194	832	832	841	536	388	350	615	735
10"	250	241	991	991	1000	652	446	427	925	1120
12"	300	289	1130	1130	1146	766	503	470	1300	1550
14"	350	318	1257	1257	1276	868	569	522	1600	1915
16"	400	362	1384	1384	1407	988	629	598	1950	2350
18"	450	407	1537	1537	1559	1090	680	650	2750	3300
20"	500	454	1664	1664	1686	1180	725	62	3715	4455
22"	550	500	1692	1692	1721	1320	785	764	4625	5545
24"	600	544	1943	1943	1972	1415	858	817	5540	6660
26"	650	590	2070	2070	2124	1535	918	878	7000	8460
28"	700	635	2198	2198	2251	1645	973	969	8020	9650
30"	750	680	2300	2300	-	1735	1018	1015	9690	11620
32"	800	725	2400	2400	-	1865	1083	1075	11000	13220
34"	850	771	2550	2550	-	1980	1140	1133	13500	16200
36"	900	816	2700	2700	-	2090	1195	1190	15900	18880



Sistem de calitate:

Intregul proces de fabricatie este complet monitorizat si include urmatoarele teste si inspectii: inspectii de acceptare a tuturor materialelor de intrare si sub-livrari, inspectii ale anumitor componente in cursul fabricatiei, testarea ansamblului, testarea presiunii, testarea functionarii, testarea nedistructiva si inspectii finale ale produsului finit.

Testare:

MSA, a.s. executa intreaga gama de teste speciale, care verifica proprietatile robinetilor cu sfera. Sunt dupa cum urmeaza:

Testarea presiunii:

Toate testele de presiune sunt executate conform API 598, API 6D si DIN 3230. MSA, a.s. de asemenea, efectueaza in mod standard teste speciale, conform API 6D, ex: testare cu presiune redusa a aerului, testare DBB si DPE. Un criteriu de acceptare este permeabilitate zero. In acelasi timp, MSA, a.s. executa teste la presiunea maxima de functionare ca standard prin care s-ar putea detecta o posibila scurgere in articulatia carcasei-corpului, axului, armaturilor sau echipamentelor de lubrifiere etc

Testul de foc

Testul de foc este executat la MSA, a.s. conform standardelor API 6FD, API 607 si BS 6755, partea 2, pentru clasa de presiune 150, 300, 400, 600, 900 si 1500.

Testarea etanseitatii si operabilitatii

Testul se executa la temperature de la -60 °C to 200 °C.

Testarea ciclului

Testarea ciclului inseamna 5000 de cicluri (deschis - inchis) la presiune diferentiala maxima cu gazul care contine impuritati mecanice mari.

Testarea hidrodinamica si aerodinamica

Verificarea proprietatilor hidropneumatice si aerodinamice care se realizeaza prin masurarea simultana a valorii cuplului in functie de unghiul de deschidere a sferei.

Testarea functionarii

Toti robinetii cu sfera sunt testati in timpul functionarii impreuna cu dispozitivul de actionare. O valoare a cuplului este verificata in timpul testarii.

Testare nedistructiva

MSA, a.s. executa teste nedistructive in propriile fabrici si sali de testare. Testele nedistructive includ testarea RT, MT, UT sau DP. Operatorii de testare sunt calificati si certificati conform EN 473 sau STN-TC-IA.

Testare speciala

MSA, a.s. executa testele speciale prin care sunt verificate proprietatile robinetelor cu sfera. Toate testarile sunt monitorizate de o organizatie de inspectie independenta.

Inspectie vizuala

Inspectia vizuala se efectueaza pentru toate piesele turnate, care sunt utilizate pentru robinetii cu sfera MSA a.s., conform regulamentului de calitate MSS SP-55, pentru piesele turnate din otel si conform specificatiilor comenzii.

Certificare:

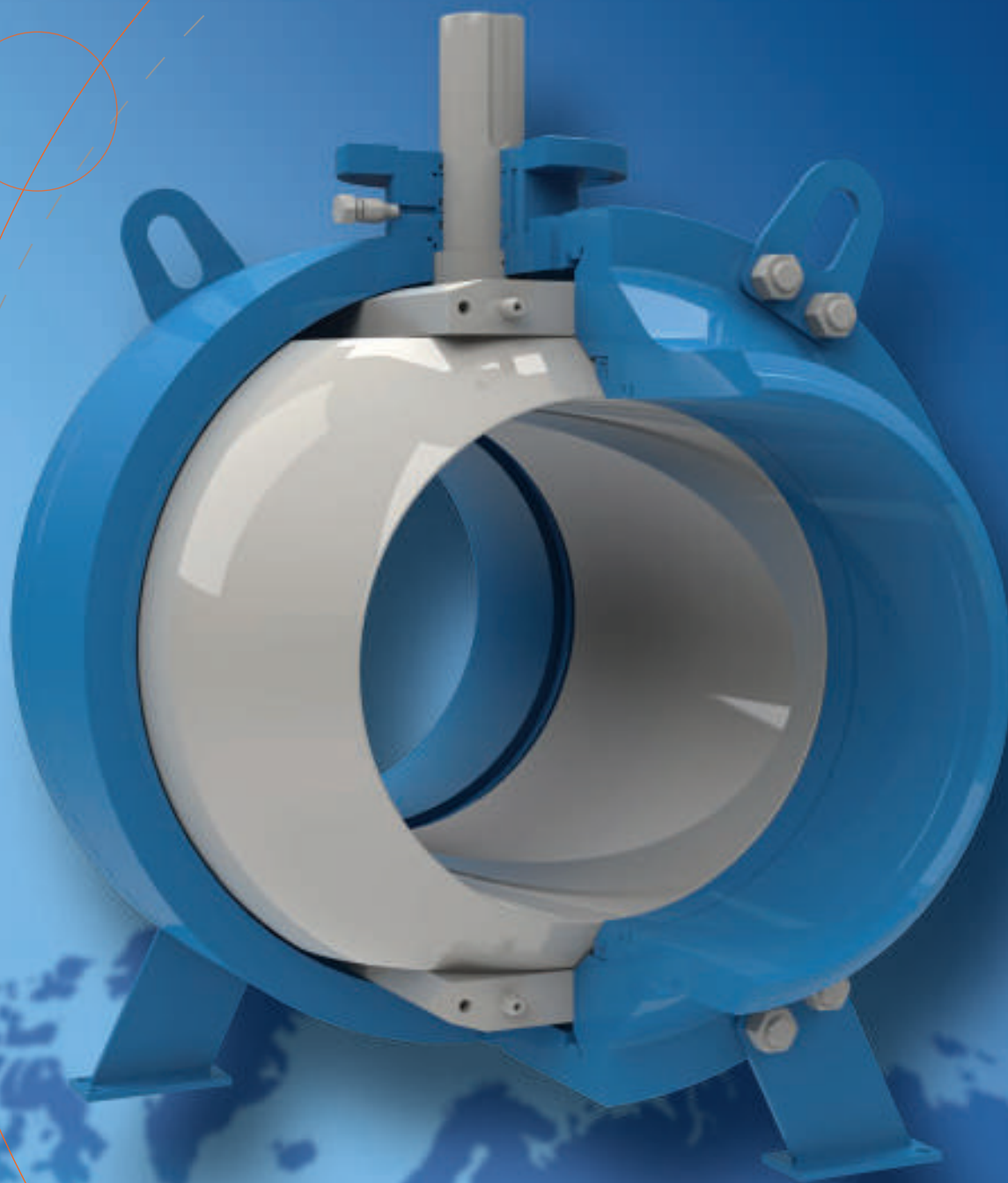
Sistemul de calitate al MSA, a.s. se bazeaza pe respectarea stricta a EN ISO 9001:2000 si API Spec Q1 (Specification D - numarul 0239).

Cercetare si dezvoltare:

Specialisti MSA a.s. lucreaza la dezvoltarea si cercetarea de noi produse si verifica proprietatile acestora, precum:

- aplicarea materialului adecvat
- rezistenta si rigiditatea constructiei (metoda FEM)
- operabilitate cu accent pe rezistenta si controlabilitate
- proprietati hidraulice si aerodinamice etc.

Produsele noi sunt testate in sala de testare a MSA a.s. precum si in conditii reale de functionare. Proprietatile produsului sunt observate pe toata durata de viata si rezultatele sunt aplicate in dezvoltarea si productia de noi produse.



MSA



**CHELPIPE
GROUP**

BALL VALVES

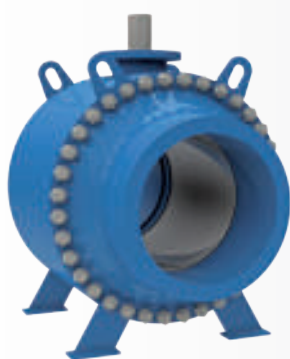


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K 83 TW



K 83 TB



K 89



K 88

Ball Valve Design

