

	Ragione sociale STEFFENINI ITALIAN VALVES S.R.L. Via Agro Castello, 20 24020 Casnigo (BG)	Valutazione dei rischi Denominazione: VALVOLA A SFERA Tipo: 1. TRUNNION 2. GALLEGGIANTE
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Materiali utilizzati per la progettazione

I materiali con cui sono costituiti i vari componenti delle valvole vengono scelti di volta in volta in fase di progettazione in funzione delle condizioni di utilizzo specificate dal Cliente. In base al fluido (in modo che non si verifichino fenomeni di usura e/o reazione chimica, come richiesto dal punto 4.1 (b) dell'Allegato 1), in base alla temperatura di esercizio, considerando anche opportuni margini di sicurezza (come richiesto dal punto 2.2.3 dell'allegato I). I materiali vengono scelti verificando che non vi siano incompatibilità tra materiali adiacenti.

La scelta dei materiali viene effettuata avvalendosi di norme e secondo quanto definito dai requisiti e specifiche cliente. Nella richiesta al fornitore del materiale vengono specificati i requisiti della Direttiva per quel che riguarda l'allungamento e la resilienza degli acciai (come richiesto dal punto 7.5 dell'Allegato I), oltre a questo il materiale deve essere accompagnato da documentazione in conformità alla 10204, ovvero con un certificato di collaudo 3.1. In particolar modo gli acciai devono presentare l'esito della prova di resilienza alla temperatura minima di utilizzo o come minimo a 20°C. approvazione, a seconda della categoria viene svolta direttamente da STEFFENINI VALVES S.R.L. (per i materiali utilizzati in attrezzature fino alla II categoria) o da un Ente Notificato (per i materiali utilizzati in attrezzature di III e IV categoria) come richiesto dal punto 4.2 (c) dell'allegato I della Direttiva.

Pagina 1 di 11

Documento: 6 Materiali utilizzati per la progettazione

UESE ITALIA S.P.A. Via Felice Casati, 20 - 20124 Milano MI Tel.: +39 0418723000 PEC: unitedsafety@pec.it	Sistemi di controllo qualità ISO 9001 2015 EA37 ISO ISO 13485 Mandatario RDM ISO 45001 ISO 27001 ISO 14001	Direzione Tecnica: Corso del Popolo, 58/B – 30172 Venezia (VE) Tel.: 041 8723001 PEC: unitedsafety@pec.it
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STEFFENINI ITALIAN VALVES S.R.L.
Via Agro Castello, 20
24020 Casnigo (BG)

Valutazione dei rischi
Denominazione:
VALVOLA A SFERA
Tipo:
1. TRUNNION
2. GALLEGGIANTE

Mod.P57.1		BOM (Bill of Materials / Distribuzione)					via Agro Castello, 20 24020 - Casnigo (BG) - ITALY					
BOM n.°		SBT3.0404.300.STD.RF.F14.85 Rev00										
VALVE DRAWING n.°		SBT3.0404.300.STD.RF.F14.85 Rev00										
Valve Family		api650 BALL VALVE		Others /		Customer		JOB N° 2000100010001				
Ball Bore		4		inch		Int. Order		2,0001E+12				
Line Bore		4		inch		Int. Item		1				
Valve Class		300		Lbs.		Qty		200200001				
Valve Service		STD				Serial N°		-				
Valve Injection		/				Photograph						
Valve Ends		RF1				NOTE:						
Valve Extension (mm)		/		mm								
Valve Operator		BARBESTOM										
Row	Level	PR/ACQ	Part Description	UM	Qty	Drawing Code	Marking code	Material	Mat. Data-Sheet	QTY	PO	Delivery
1	1	PR	01 - CORPO	NR	1	01.SBT3.0404.300.STD Rev00		ASTM A350 LF2	WMS	1		
2	1.1	ACQ	01 - CORPO GREZZO	NR	1	BT.D254x121	BT.D254x12	ASTM A350 LF2	WMS	1		
3	1	PR	02 - CHIUSURA	NR	2	02.SBT3.0404.300.STD.RF Rev00		ASTM A350 LF2	WMS	2		
4	1.1	ACQ	02 - CHIUSURA GREZZO	NR	2	BT.D254x111	BT.D254x11	ASTM A350 LF2	WMS	2		
5	1	PR	03 - SFERA	NR	1	03.SBT2.0404.1500.STD Rev00		ASTM A350 LF2	WMS	1		
6	1.1	ACQ	03 - SFERA GREZZO	NR	1	BT.D168x150	BT.D168x15	ASTM A350 LF2	WMS	1		
7	1	ACQ	SFERA ANTISTATICO	NR	1	03.AD.D3.09		ASTM A182 F316L	WMS	1		
8	1	PR	04 - STELO	NR	1	04.SBT3.0404.300.STD Rev00		ASTM A182 F316L	WMS	1		
9	1.1	ACQ	04 - STELO GREZZO	mm	1	BT.D59x175	BT.D59x17	ASTM A182 F316L	WMS	1		
10	1	PR	05 - SEDE	NR	2	05.SBT3.0404.300.STD Rev00		ASTM A182 F316/DEVLO	WMS	2		
11	1.1	ACQ	05 - SEDE GREZZO	mm	2	BT.D145x45	BT.D145x4	ASTM A182 F316	WMS	2		
12	1	PR	06 - COPERCHIO	NR	1	06.SBT2.0404.300.STD Rev00		ASTM A350 LF2	WMS	1		
13	1.1	ACQ	06 - COPERCHIO GREZZO	mm	1	BT.D99x67	BT.D99x67	ASTM A350 LF2	WMS	1		
14	1	PR	07 - FLANGIA OPERATRICE	NR	1	07.SBT2.0404.300.STD.F14 Rev00		S355JR (Fe510B GENERIC)		1		
15	1.1	ACQ	07 - FLANGIA OPERATRICE GREZZO	mm	1	BT.D175x28	BT.D175x2	S355JR (Fe510B GENERIC)		1		
16	1	PR	08 - TRUNNION	NR	1	08.SBT2.0404.300.STD Rev00		ASTM A350 LF2		1		
17	1.1	ACQ	08 - TRUNNION GREZZO	mm	1	BT.D99x69	BT.D99x69	ASTM A350 LF2		1		
19	1	ACQ	BOCCOLA D=43 D1=38 H=25	NR	1	BO.N.43x38x25		AISI 316 + PTFE COATED		1		
20	1	ACQ	BOCCOLA D=43 D1=38 H=10	NR	1	BO.N.43x38x10		AISI 316 + PTFE COATED		1		
21	1	ACQ	BOCCOLA D=50 D1=45 H=15	NR	1	BO.N.50x45x15		AISI 316 + PTFE COATED		1		
22	1	ACQ	RALLA D=55 D1=40 H=1,5	NR	1	RA.N.55x40x1.5		AISI 316 + PTFE COATED		1		
23	1	ACQ	RALLA D=30 D1=0 H=2,5	NR	1	RA.N.20x0x2,5		AISI 316 + PTFE COATED		1		
24	1	ACQ	CHIAVETTA 10x8x60 UNI6604-B	NR	1	CH.N.10x8x60 UNI6604-B		ACCIAIO (Rm>560MPa)		1		
25	1	ACQ	VITE T.C.E.I. M8 L=70	NR	3	VT.N.M8x70		A2-70		3		
26	1	ACQ	VITE T.C.E.I. M8 L=45	NR	3	VT.N.M8x45		A2-70		3		
27	1	ACQ	VITE T.C.E.I. M8 L=25	NR	6	VT.N.M8x25		A2-70		6		
28	1	ACQ	DADI 3/4" - 10UNC	NR	12	DA.N.3/4-10UNC		ASTMA194 Gr.7M +2nNiFCC		12		
29	1	ACQ	TRANTI 3/4" - 10UNC L=70	NR	12	TR.N.3/4-10UNCx70		ASTMA194 Gr.7M +2nNiFCC		12		
30	1	ACQ	TRECCIA 4x4	NR	1	GRT.N.4x4.GR		GRAFITE		1		
31	1	ACQ	O-RING D=113,89 T=3,53	NR	2	OR.N.113.89x3.53		FKM 90 AED		2		
32	1	ACQ	O-RING D=158,34 T=3,53	NR	2	OR.N.158.34x3.53		FKM 90 AED		2		
33	1	ACQ	O-RING D=47,63 T=3,53	NR	2	OR.N.47.63x3.53		FKM 90 AED		2		
34	1	ACQ	O-RING D=37,69 T=3,53	NR	1	OR.N.37.69x3.53		FKM 90 AED		1		
35	1	ACQ	MOULA D=3 L=8,5	NR	1	SD.N.D3.W0,51.L8,5,3N		INCONEL X750		1		
36	1	ACQ	MOULA D=9 L=26	NR	14	SD.N.D7.W1,52.L19,44,6N		INCONEL X750		14		

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Sistemi di controllo qualità ISO 9001 | 2015 EA37
ISO | ISO 13485 Mandatario RDM | ISO 45001 |
ISO 27001 | ISO 14001

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37	1	ACQ	SPINA D=6 L=20 (A7)	NIR	2	SP.N.6x20		C40 TRAF. RETT.		2		
38	1	ACQ	SPINA D=8 L=25 (A7)	NIR	4	SP.N.8.25		C40 TRAF. RETT.		4		
40	1	ACQ	VENT & DRAIN BLEEDER 1/2" - NPT	NIR	2	BN.NLOMOM STD		AISI 316		2		
43	1	ACQ	TARGHETTA SBT3	NIR	1	SBT3 NAME PLATE		AISI 316		1		
44	1	ACQ	PACKING	NIR	1					1		
Date			26/11/2019									
Rev.			0									
Prep.			Nanni Flavio									
Check			Nanni Flavio									
Appt.			Nanni Flavio									

Row	Level	PR/ACQ	Descrizione Componente	UM	Qty	Drawing Code	Marking code	Material	Mat. Data-Sheet	QTY	PO	Delivery
1	1	PR	FP - FLANGIA DI PROVA	PR	2	FP_ATR_0503.1500 STD Rev00	A0410	S355JR (Fw510B GENERIC)		2	STOCK	
2	1.1	ACQ	FP - FLANGIA DI PROVA GREZZO	ACQ	2	BT.D91x65	BT.D91x65	S355JR (Fw510B GENERIC)		2	STOCK	
3	1	ACQ	O-RING D=63,97±0,53	ACQ	2	OR.N.63.9x3.53		VITON AED		2	STOCK	
4	1	ACQ	O-RING T=7 (INCOLLATO)	ACQ	2	OR.N.60,4x7		VITON AED		2	STOCK	

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Schede tecniche dei materiali

	Particular Material Appraisal PMA Ref. No 06	Mod. P56.7 Rev.: 0 Page: 1 of 1
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Pressure Equipment Manufacturer: BODY, CLOSURE, STEM, BALL, SEATS, FLANGES		Applicable Design Code: ASME B16.34	
Material specification: ASTM A350		Grade: LF2 CL.1	
Condition: FINISHED, SEMI-FINISHED AND RAW MATERIAL		Product form: ROUND BAR/FORGING	Dimension/Thickness [mm] FROM 10 TO 2000
Application: PRESSURE COMPONENTS		Max. allowable pressure [bar] AS PER ASME VIII div. 1	
Min. allowable temperature [°C]: -46		Max. allowable temperature [°C] +400	

Compliance with Essential Safety Requirements		
Property	Requirement	Compliance
Appropriate properties (Annex 1 § 4.1 (a))	e.g. R_{m} , R_{m20} if required R_{m20}	In compliance with the limits stated in ASME II part D Material Properties
Sufficiently ductile (Annex 1 § 4.1 (a)) (Annex 1 § 7.5)	In steel; 14 %	In compliance with the limits stated in ASME A 350 ($A_{min} > 14\%$)
Sufficiently tough (Annex 1 § 4.1(a), Annex 1 § 7.5)	E.g. in steel; 27 Joule at 20 °C or lowest operating temperature.	KV min > 20 J at -46 °C
Not significantly affected by ageing (Annex 1 § 4.1 (c))	At intended operating temperatures	No affected by ageing between TS max and TS min.
Suitable for intended processing (Annex 1 § 4.1 (d))	e.g. welding, forming, etc	Suitable
Material Marking (Annex 1 § 3.1.5)	Identifiable to Certificate	AS PER ASTM A350 LF2
Type of Certificate (Annex 1 § 4.3)	Cat I; Certificate of Conformance	
	Cat II, III, IV; – e.g. EN 10204:04 3.1	category III & IV -ISO 9001+ 3.1 EN 10204
Material Manufacturers Approval (Annex 1 § 4.3)	ISO 9001 by Euro Accredited Body	
	Independent test e.g. EN 10204:04 3.2	ISO 9001.

Restrictions:

NONE

Additional Testing:

NONE

Notes:

NONE

Others:

- Materials used for equipment in category II, III or IV shall be supplied with a certificate of specific product control. If a certificate 3.1 or 3.2 according to EN 10204:2004 is used an affirmation of compliance with the specification must be given in the certificate, or in a separate document.
- If material certificates issued by the material manufacturer shall be accepted, he must hold at least an ISO 9001-certificate issued by a competent body established within the Community and having undergone a specific assessment for materials.

Pagina 4 di 11

Documento: 6 Materiali utilizzati per la progettazione

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Valutazione dei rischi
Denominazione:
VALVOLA A SFERA
Tipo:
1. TRUNNION
2. GALLEGGIANTE

Particular Material Appraisal				PED	
2014/68/EU					
Pressure Equipment Manufacturer:			STEFFENINI VALVES S.R.L.		
PMA Ref. No:	002	Rev.	0	Additional requirements:	EN 12516
Material specification including date:			ASTM A105		
Product form:					
Forging acc. to ASME B16.34 - group N° 1.1					
Maximum allowable temperature range:			-29 ÷ 538 °C		
1) Upon prolonged exposure to temperatures above 425 °C, the carbide phase of steel may be converted to graphite. Permissible, but not recommended for prolonged usage above 425°C. 2) Only killed steel shall be used above 455°C.					
Compliance with Essential Safety Requirements for materials					
Property	Requirement		Details of Compliance * (to be verified on material certification)		
Appropriate properties (Annex I - 4.1(a)) (Assured by material manufacturer)	Proof strength/Yield strength (at room temperature) R _{m,min} : 485 MPa R _{e,min} : 250 Mpa		Quote R _e ; R _{eH} ; R _m ; R _{mH} ; etc from material specification or where appropriate properties are obtained		
Sufficiently ductile (Annex I - 4.1(a)) (Annex I - 7.5)	In steel A _{min} 14 %		Quote minimum elongation specified in material specification, A _{min long} % A _{min trans} %		
Sufficiently tough (Annex I - 4.1(a)) (Annex I - 7.5)	e.g. in steel; KV _{min} 27J at 20 °C or lowest operating temperature.		Quote impact strength and coincident minimum temperature specified in material specification or provide justification per WGP Guideline 7/17		
Not significantly affected by ageing (Annex I - 4.1(c))	No specific quantitative requirement specified		a) Select materials that are not liable to (strain) ageing b) confirm that material specification ensures Al:N2 ratio > 2:1 c) confirm plastic deformation not sufficient to cause strain ageing.		
Suitability for intended processing (Annex I - 4.1(d))	No specific quantitative requirement specified		Manufacturer must select materials that have appropriate properties for the intended manufacturing processes, e.g. for welding (carbon equivalent), forming (ductility), heat treatment (composition, section size, etc).		
Material certification	Cat I - Certificate affirming compliance with the specification. Cat II, III & IV - Certificate of Specific Product Control.		Certification according to EN 10204:2004 Test Report "type 2.2" Certification according to EN 10204:2004 Inspection Certificate "type 3.1" or "type 3.2"		
Material Marking	Traceability to heat/lot identity of the material manufacturer		Method of traceability to the certification supplied by the material manufacturer.		

* Contents of this column are provided for guidance to the responses required, other solutions may be equally valid.

Pagina 5 di 11

Documento: 6 Materiali utilizzati per la progettazione

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	Particular Material Appraisal PMA Ref. No 01	Mod. PS6.7 Rev.: 0 Page: 1 of 1
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Pressure Equipment Manufacturer: BOLTING & STEM		Applicable Design Code: ASME B16.34	
Material specification: ASTM A193 (AISI 4140 – AISI 4142 – AISI 4145)		Grade: B7	
Condition: FINISHED, SEMI-FINISHED AND RAW MATERIAL		Product form: ROUND BAR	Dimension/Thickness (mm) FROM 19 TO 175
Application: PRESSURE COMPONENTS		Max. allowable pressure (bar) AS PER ASME VIII div. 1	
Min. allowable temperature [°C]: -20		Max. allowable temperature [°C] +427	

Compliance with Essential Safety Requirements

Property	Requirement	Compliance
Appropriate properties (Annex 1 § 4.1 (a))	e.g. R_{m} , R_{m20} if required R_{mH}	In compliance with the limits stated in ASME II part D Material Properties
Sufficiently ductile (Annex 1 § 4.1 (a)) (Annex 1 § 7.5)	In steel; 14 %	In compliance with the limits stated in ASME A 193 ($A_{min} > 16\%$)
Sufficiently tough (Annex 1 § 4.1 (a)), Annex 1 § 7.5)	e.g. in steel; 27 Joule at 20 °C or lowest operating temp.	KVmin > 27 J at -29°C
Not significantly affected by ageing (Annex 1 § 4.1 (c))	At intended operating temperatures	No effected by ageing between TSmax and TSmin.
Suitable for intended processing (Annex 1 § 4.1 (d))	e.g. welding, forming, etc	Suitable
Material Marking (Annex 1 § 3.1.5)	Identifiable to Certificate	AS PER ASTM A193 table 5
Type of Certificate (Annex 1 § 4.3)	Cat I; Certificate of Conformance Cat II, III, IV; – e.g EN 10204:04 3.1	category III & IV -ISO 9001+ 3.1 EN 10204
Material Manufacturers Approval (Annex 1 § 4.3)	ISO 9001 by Euro Accredited Body Independent test e.g EN 10204:04 3.2	ISO 9001.

Restrictions:
NONE

Additional Testing:
NONE

Notes:
NONE

Others:

- 1) Materials used for equipment in category II, III or IV shall be supplied with a certificate of specific product control. If a certificate 3.1 or 3.2 according to EN 10204:2004 is used an affirmation of compliance with the specification must be given in the certificate, or in a separate document.
- 2) If material certificates issued by the material manufacturer shall be accepted, he must hold at least an ISO 9001-certificate issued by a competent body established within the Community and having undergone a specific assessment for materials.

Pagina 6 di 11

Documento: 6 Materiali utilizzati per la progettazione

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	Particular Material Appraisal PMA Ref. No 03	Mod. PS6.7 Rev.: 0 Page: 1 of 1
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Pressure Equipment Manufacturer: NUT	Applicable Design Code: ASME B16.34	
Material specification: ASTM A194	Grade: 2H	
Condition: FINISHED MATERIAL	Product form: ROUND BAR	Dimension/Thickness [mm] FROM 19 TO 175
Application: PRESSURE COMPONENTS	Max. allowable pressure [bar] AS PER ASME VIII div. 1	
Min. allowable temperature [°C]: -29	Max. allowable temperature [°C] +427	

Compliance with Essential Safety Requirements

Property	Requirement	Compliance
Appropriate properties (Annex 1 § 4.1 (a))	e.g. R_{m} , R_{m20} if required $R_{m,dt}$	In compliance with the limits stated in ASME II part D Material Properties
Sufficiently ductile (Annex 1 § 4.1 (a)) (Annex 1 § 7.5)	In steel; 14 %	In compliance with the limits stated in ASME A 194 ($A_{min} > 16\%$)
Sufficiently tough (Annex 1 § 4.1(a), Annex 1 § 7.5)	e.g. in steel; 27 Joule at 20 °C or lowest operating temp.	KVmin > 27 J at -29°C
Not significantly affected by ageing (Annex 1 § 4.1 (c))	At intended operating temperatures	No affected by ageing between T _{Smax} and T _{Smin} .
Suitable for intended processing (Annex 1 § 4.1 (d))	e.g. welding, forming, etc	Suitable
Material Marking (Annex 1 § 3.1.5)	Identifiable to Certificate	AS PER ASTM A194 table 7
Type of Certificate (Annex 1 § 4.3)	Cat I; Certificate of Conformance	
	Cat II, III, IV; – e.g EN 10204:04 3.1	category III & IV -ISO 9001+ 3.1 EN 10204
Material Manufacturers Approval (Annex 1 § 4.3)	ISO 9001 by Euro Accredited Body	
	Independent test e.g EN 10204:04 3.2	ISO 9001.

Restrictions:
NONE

Additional Testing:
NONE

Notes:
NONE

Others:

- 1) Materials used for equipment in category II, III or IV shall be supplied with a certificate of specific product control. If a certificate 3.1 or 3.2 according to EN 10204:2004 is used an affirmation of compliance with the specification must be given in the certificate, or in a separate document.
- 2) If material certificates issued by the material manufacturer shall be accepted, he must hold at least an ISO 9001-certificate issued by a competent body established within the Community and having undergone a specific assessment for materials.

Pagina 7 di 11

Documento: 6 Materiali utilizzati per la progettazione

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MATERIALI E TEMPERATURE MASSIME CONSENTITE

P/T ratings and minimum wall thickness according EN 12516-1

Pressure/temperature (p/r) ratings

The rating Tables 14 to 63 reported in EN 12516-1 specify the allowable pressures at different temperatures for bodies, bonnets and covers with B and Class designations made from the appropriate material group (see Annex F of EN 12516-1). The materials for the body, bonnet and cover are allocated to a material group for the purposes of determining the pressure temperature ratings as given in Tables following tables. STEFFENINI VALVES use these tables as P/T ratings reference.

Material groups

The materials included in a group are not necessarily of the same nominal chemical composition or have identical physical properties. Apart from limitations on the maximum temperature they are considered to be sufficiently similar to allow a valve body having the same dimensions to have the same pressure / temperature rating.

The material groups 1C1 to 1C14 and 2C1 to 2C7 are similar to those in ASME/ANSI B16.5 (Steel flanges) and B16.34 (Steel valves) most of which, as applicable to pipe flanges, are included in ISO 7005-1 and contain the following material types:

1C1 Carbon and C-Mn-Si for varying maximum temperatures up to 425 °C;
1C2 Carbon, 2½ Ni, 3½ Ni for varying maximum temperatures up to 425 °C;
1C3 Carbon, 2½ Ni, 3½ Ni for varying maximum temperatures up to 455 °C;
1C4 Carbon for varying maximum temperatures up to 455 °C;
1C5 Carbon-½ Mo for varying maximum temperatures up to 455 °C;
1C6 Carbon-½ Mo, ½ Cr-½ Mo, 1Cr-½ Mo for varying maximum temperatures up to 595 °C;
1C7 Carbon-½ Mo, ½ Cr-½ Mo, Ni-Cr-½ Mo, Ni-Cr-1Mo for varying maximum temperatures up to 595 °C;
1C8 1Cr-½ Mo, 1¼Cr-½ Mo, 2¼Cr-1Mo for varying maximum temperatures up to 595 °C;
1C9 1Cr-½ Mo, 1¼Cr-½ Mo for varying maximum temperatures up to 595 °C;
1C10 2¼Cr-1Mo for varying maximum temperatures up to 595 °C;
1C11 3Cr-1Mo, Mn-½ Mo, Mn-Si for varying maximum temperatures up to 595 °C;
1C12 5Cr-½ Mo;
1C13 5Cr-½ Mo;
1C14 9Cr-1 Mo;
2C1 18Cr-8Ni;
2C2 18Cr-12Ni-2Mo, 18Cr-8Ni, 18Cr-13Ni-3Mo, 18Cr-9Ni-2Mo;
2C3 18Cr-8Ni, 18Cr-12Ni-2Mo;
2C4 18Cr-10Ni-Ti;
2C5 18Cr-10Ni-Nb;
2C6 25Cr-12Ni, 23Cr-12Ni;
2C7 25Cr-20Ni.

The material groups with 'E' in the group number are based on EN standard steels.

The IE0 to 6E0 groups can be described as follows:

IE0 unalloyed structural steels without guaranteed thermal-temperature strength, application range — 10 °C to + 300 °C;

2E0 unalloyed steels without guaranteed thermal-temperature strength, application range up to 350 °C or 400 °C;

3E0 unalloyed steels with guaranteed thermal temperature strength, application range up to 400 °C;

4E0 low alloyed steels with 0,3 % molybdenum;

5E0 low alloyed steels with 1 % chromium and 0,5 % molybdenum;

6E0 low alloyed steels with 2 % chromium and 1 % molybdenum.

The following groups of materials contain steels with low temperature toughness:

7E0 low-temperature-tough fine-grain steel with $ReH \geq 315 \text{ N/mm}^2$;

7E1 low-temperature-tough fine-grain steel with $ReH \geq 380 \text{ N/mm}^2$;

7E2 low-temperature high alloy nickel steel.

The following groups of materials contain creep-resistant fine-grain steels, differentiating only in strength:

8E0 with $ReH \geq 225 \text{ N/mm}^2$;

8E1 with $ReH \geq 285 \text{ N/mm}^2$;

8E2 with $ReH \geq 315 \text{ N/mm}^2$;

8E3 with $ReH \geq 355 \text{ N/mm}^2$;

9E0 high-temperature tough ferritic steel with 12 % chromium, 1 % molybdenum and 0,5 % vanadium.

The following groups contain austenitic stainless steels, with differences in corrosion resistance, weldability and strength. Groups 10E0 up to 12E0 are free of molybdenum, groups 13E0 to 15E0 are alloyed with molybdenum:

10E0 extra low carbon steel (ELC-steel);

10E1 extra low carbon steel, containing nitrogen;

UESE ITALIA S.P.A. Via Felice Casati, 20 - 20124 Milano MI Tel.: +39 0418723000 PEC: unitedsafety@pec.it	Sistemi di controllo qualità ISO 9001 2015 EA37 ISO ISO 13485 Mandatario RDM ISO 45001 ISO 27001 ISO 14001	Direzione Tecnica: Corso del Popolo, 58/B – 30172 Venezia (VE) Tel.: 041 8723001 PEC: unitedsafety@pec.it
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Ragione sociale
STEFFENINI ITALIAN VALVES S.R.L.
Via Agro Castello, 20
24020 Casnigo (BG)

Valutazione dei rischi
Denominazione:
VALVOLA A SFERA
Tipo:
1. TRUNNION
2. GALLEGGIANTE

11E0 standard carbon-content;
12E0 alloyed with elements, which form extra stable carbides;
13E0 extra low carbon steel with molybdenum;
13E1 extra low carbon steel alloyed with molybdenum and nitrogen;
14E0 standard carbon-content alloyed with molybdenum;
15E0 alloyed with molybdenum and elements, which form extra stable carbides.

ASTM No.	Grade	MIL. Grp.	Limitation	ASTM No.	Grade	MIL. Grp.	Limitation
A105		1C1	Not for prolonged use over 425 °C	A182	F2	1C7	Not to be used over 540 °C
A218	WCB	1C1	Not for prolonged use over 425 °C	A204	O	1C7	Not for prolonged use over 470 °C
A350	LF2	1C1	Not for prolonged use over 425 °C	A217	WC4	1C7	Not to be used over 540 °C. *
A515	T0	1C1	Not for prolonged use over 425 °C	A217	WC5	1C7	a
A510	T0	1C1	Not for prolonged use over 425 °C	A691	CM-75	1C7	—
A537	Cl 1	1C1	Not to be used over 370 °C	A335	P11	1C8	Not for prolonged use over 595 °C
A672	B70	1C1	Not for prolonged use over 425 °C	A335	P12	1C8	Not for prolonged use over 595 °C
A672	Cl 0	1C1	Not for prolonged use over 425 °C	A335	P22	1C8	Not for prolonged use over 595 °C
A675	T0	1C1	Not for prolonged use over 425 °C	A389	FP11	1C8	Not for prolonged use over 595 °C
A698	Gr C	1C1	—	A389	FP12	1C8	Not for prolonged use over 595 °C
A108	C	1C2	Not to be used over 425 °C	A389	FP22	1C8	Not for prolonged use over 595 °C
A203	B	1C2	Not for prolonged use over 425 °C	A387	11 Cl.1	1C8	Not for prolonged use over 595 °C
A203	E	1C2	Not for prolonged use over 425 °C	A387	12 Cl.2	1C8	Not for prolonged use over 595 °C
A218	WCC	1C2	Not for prolonged use over 425 °C	A387	22 Cl.1	1C8	Not for prolonged use over 595 °C
A350	LF3	1C2	Not to be used over 345 °C	A891	1%CR	1C8	Not for prolonged use over 595 °C
A352	LC2	1C2	Not to be used over 345 °C	A891	1CR	1C8	Not for prolonged use over 595 °C. *
A352	LC3	1C2	Not to be used over 345 °C	A891	2%CR	1C8	Not for prolonged use over 595 °C
A352	LCC	1C2	Not to be used over 345 °C	A182	F11 Cl.2	1C8	Not for prolonged use over 595 °C. *
A203	A	1C3	Not for prolonged use over 425 °C	A182	F12 Cl.2	1C8	Not for prolonged use over 595 °C
A203	D	1C3	Not for prolonged use over 425 °C	A217	WC6	1C8	Not to be used over 565 °C. *
A352	LCE	1C3	Not to be used over 345 °C	A387	11 Cl.2	1C8	Not for prolonged use over 595 °C
A515	85	1C3	Not for prolonged use over 425 °C	A739	B11	1C8	Not for prolonged use over 595 °C
A515	60	1C3	Not for prolonged use over 425 °C	A182	F22 Cl.3	1C10	Not for prolonged use over 595 °C. *
A672	B65	1C3	Not for prolonged use over 425 °C	A217	WC9	1C10	Not to be used over 565 °C. *
A672	C65	1C3	Not for prolonged use over 425 °C	A387	22 Cl.2	1C10	Not for prolonged use over 595 °C
A675	85	1C3	Not for prolonged use over 425 °C	A739	B22	1C10	Not for prolonged use over 595 °C
A108	B	1C4	Not for prolonged use over 425 °C	A182	F21	1C11	Not for prolonged use over 595 °C
A350	LF1	1C4	Not for prolonged use over 425 °C	A302	A	1C11	Not to be used over 470 °C
A515	60	1C4	Not for prolonged use over 425 °C	A302	B	1C11	Not to be used over 470 °C
A518	80	1C4	Not for prolonged use over 425 °C	A302	O	1C11	Not to be used over 470 °C
A672	B60	1C4	Not for prolonged use over 425 °C	A302	D	1C11	Not to be used over 470 °C
A672	C60	1C4	Not for prolonged use over 425 °C	A387	21 Cl.2	1C11	Not for prolonged use over 595 °C
A675	60	1C4	Not for prolonged use over 425 °C	A537	Cl.2	1C11	Not to be used over 370 °C
A698	Gr B	1C4	—	A335	P5	1C12	—
A182	F1	1C5	Not for prolonged use over 470 °C	A335	P5b	1C12	—
A204	A	1C5	Not for prolonged use over 470 °C	A389	FP5	1C12	—
A204	B	1C5	Not for prolonged use over 470 °C	A387	5 Cl.1	1C12	—
A217	WC1	1C5	Not for prolonged use over 470 °C. a	A387	5 Cl.2	1C12	—
A352	LC1	1C5	Not to be used over 345 °C	A891	3CR	1C12	—
A691	CM-70	1C5	Not for prolonged use over 470 °C	A182	F6	1C13	—
A335	P1	1C8	Not for prolonged use over 470 °C	A182	F6a	1C13	—
A389	FP1	1C8	Not for prolonged use over 470 °C	A217	C5	1C13	a
A387	12 Cl.1	1C8	Not for prolonged use over 595 °C	A182	F8	1C14	—
A387	2 Cl.1	1C8	Not to be used over 540 °C	A217	C12	1C14	a
A387	2 Cl.2	1C8	Not to be used over 540 °C	A182	F81	1C15	—
A891	1%CR	1C8	Not for prolonged use over 540 °C	A217	C12A	1C15	—
				A335	P91	1C15	—
				A387	91 Cl.2	1C15	—

* Use only at temperatures above 540 °C when carbon content is 0,04 % or higher.

Pagina 9 di 1

Documento: 6 Materiali utilizzati per la progettazione

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Sistemi di controllo qualità ISO 9001 | 2015 EA37
ISO | ISO 13485 Mandatario RDM | ISO 45001 |
ISO 27001 | ISO 14001

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ASTM No.	Grade	MTL Grp.	Limitation	ASTM No.	Grade	MTL Grp.	Limitation
A182	F304	2C1	a	A182	F347	2C5	Not to be used over 540 °C
A182	F304H	2C1	—	A182	F347H	2C5	—
A240	304	2C1	a	A182	F348	2C5	Not to be used over 540 °C
A240	304H	2C1	—	A182	F348H	2C5	—
A312	TP304	2C1	a	A240	347	2C5	Not to be used over 540 °C
A312	TP304H	2C1	—	A240	347H	2C5	—
A351	CF3	2C1	Not to be used over 425 °C	A240	348	2C5	Not to be used over 540 °C
A351	CF8	2C1	a	A240	348H	2C5	—
A358	304	2C1	a	A312	TP347	2C5	Not to be used over 540 °C
A378	TP304	2C1	a	A312	TP347H	2C5	—
A378	TP304H	2C1	—	A312	TP348	2C5	Not to be used over 540 °C
A312	FP304	2C1	a	A312	TP348H	2C5	—
A312	FP304H	2C1	—	A351	CF8C	2C5	a
A479	304	2C1	a	A358	347	2C5	Not to be used over 540 °C
A479	304H	2C1	—	A378	TP347	2C5	Not to be used over 540 °C
A182	F316	2C2	a	A378	TP347H	2C5	—
A182	F316H	2C2	—	A378	TP348	2C5	Not to be used over 540 °C
A240	316	2C2	a	A430	FP347	2C5	Not to be used over 540 °C
A240	316H	2C2	—	A430	FP347H	2C5	—
A240	317	2C2	a	A479	347	2C5	Not to be used over 540 °C
A312	TP316	2C2	a	A479	347H	2C5	—
A312	TP316H	2C2	—	A479	348	2C5	Not to be used over 540 °C
A312	TP317	2C2	a	A479	348H	2C5	—
A351	CF3A	2C2	Not to be used over 345 °C	A240	309H	2C6	—
A351	CF3M	2C2	Not to be used over 455 °C	A240	309S	2C6	a b
A351	CF8A	2C2	Not to be used over 345 °C	A312	TP309H	2C6	—
A351	CF8M	2C2	a	A351	CH20	2C6	a
A351	CG8M	2C2	Not to be used over 540 °C	A351	CH8	2C6	a
A358	316	2C2	a	A358	309H	2C6	—
A378	TP316	2C2	a	A182	F310H	2C7	—
A378	TP316H	2C2	—	A240	310H	2C7	—
A312	FP316	2C2	a	A240	310S	2C7	a b
A312	FP316H	2C2	—	A312	TP310H	2C7	—
A479	316	2C2	a	A351	GK20	2C7	a
A479	316H	2C2	—	A358	310H	2C7	—
A182	F304L	2C3	Not to be used over 425 °C	A479	310H	2C7	—
A182	F316L	2C3	—	A479	310S	2C7	a b
A240	304L	2C3	Not to be used over 425 °C	A182	F44	2C8	—
A240	316L	2C3	—	A182	F51	2C8	Not to be used over 315 °C
A312	TP304L	2C3	Not to be used over 425 °C	A182	F53	2C8	Not to be used over 315 °C
A312	TP310L	2C3	—	A182	F55	2C8	Not to be used over 315 °C
A479	304L	2C3	Not to be used over 425 °C	A240	S31204	2C8	—
A479	310L	2C3	—	A240	S31803	2C8	Not to be used over 315 °C
A182	F321	2C4	Not to be used over 540 °C	A240	S32750	2C8	Not to be used over 315 °C
A182	F321H	2C4	—	A240	S32760	2C8	Not to be used over 315 °C
A240	321	2C4	Not to be used over 540 °C	A312	S31264	2C8	—
A240	321H	2C4	—	A351	CD3MN CuN	2C8	Not to be used over 315 °C

non-alloy and low alloy steels				high alloy steels			
EN standard	Name	Material. No.	Group No.	EN standard	Name	Material. No.	Group No.
10025-1	S235JR	1.0037	1E0	10028-7	X2CrNi18-11	1.4308	10E0
10025-1	S235JRG2	1.0038	1E1	10213-4	GX2CrNi18-11	1.4308	10E0
10213-2	GP240GR	1.0621	2E0	10222-5	X2CrNi18-9	1.4307	10E0
10026-2	P265GH	1.0425	3E0	10028-7	X2CrNi18-10	1.4311	10E1
10213-2	GP240GH	1.0610	3E0	10222-5	X2CrNi18-10	1.4311	10E1
10222-2	P245GH	1.0352	3E0	10028-7	X5CrNi18-10	1.4301	11E0
10026-2	P285GH	1.0481	3E1	10213-4	GX5CrNi18-10	1.4308	11E0
10222-2	P280GH	1.0426	3E1	10222-5	X5CrNi18-10	1.4301	11E0
10026-2	18Mo3	1.5415	4E0	10028-7	X8CrNiTi18-10	1.4541	12E0
10213-2	G20Mo6	1.5410	4E0	10028-7	X8CrNiNb18-10	1.4550	12E0
10222-2	18Mo3	1.5415	4E0	10213-4	GX5CrNiNb18-11	1.4552	12E0
10026-2	13CrMo4-5	1.7335	5E0	10222-5	X0CrNiTi18-10	1.4541	12E0
10213-2	G17CrMo4-5	1.7357	5E0	10222-5	X0CrNiNb18-10	1.4550	12E0
10222-2	13CrMo4-5	1.7335	5E0	10028-7	X2CrNiMo17-12-2	1.4404	13E0
10026-2	10CrMo9-10	1.7380	6E0	10213-4	GX2CrNiMo10-11-2	1.4400	13E0
10213-2	G17CrMo9-10	1.7370	6E0	10222-5	X2CrNiMo17-12-2	1.4404	13E0
10222-2	11CrMo9-10	1.7383	6E0	10222-5	X2CrNiMoN17-11-2	1.4400	13E1
10213-2	GX15CrMo5	1.7365	6E1	10028-7	X5CrNiMo17-12-2	1.4401	14E0
10222-2	X16CrMo5-1	1.7366	6E1	10213-4	GX5CrNiMo18-11-2	1.4408	14E0
10026-3	P276NL1	1.0499	7E0	10222-5	X5CrNiMo17-12-2	1.4401	14E0
10026-3	P276NL2	1.1104	7E0	10028-7	X8CrNiMoTi17-12-2	1.4571	15E0
10213-3	G17Mn5	1.1131	7E0	10028-7	X0CrNiMoNb17-12-2	1.4580	15E0
10213-3	G20Mn5	1.0220	7E0	10213-4	GX5CrNiMoNb18-11-2	1.4581	15E0
10026-4	15NiMn6	1.8228	7E1	10222-5	X8CrNiMoTi17-12-2	1.4571	15E0
10026-3	P355NL1	1.0566	7E1	10213-4	GX2CrNiMoN26-7-4	1.4480	16E0
10026-3	P355NL2	1.1108	7E1	10213-4	GX2CrNiMoCuN26-6-3-3	1.4517	16E0
10213-3	G8Ni14	1.5638	7E1				
10222-3	X12Ni9	1.5660	7E1				
10222-3	15NiMn0	1.0228	7E1				
10026-4	12Ni14	1.5637	7E3				
10026-4	X8Ni9	1.5662	7E3				
10026-4	12Ni19	1.5680	7E3				
10026-4	11MnNi5-3	1.8212	7E3				
10222-3	12Ni14	1.5637	7E3				
10222-3	X8Ni9	1.5662	7E3				
10222-3	13MnNi8-3	1.8217	7E3				
10026-3	P276N	1.0460	8E0				
10026-3	P355N	1.0562	8E1				
10026-3	P276NH	1.0487	8E2				
10222-4	P266NH	1.0477	8E2				
10026-3	P355NH	1.0565	8E3				
10222-4	P355NH	1.0565	8E3				
10213-2	GX23CrMoV12-1	1.4831	9E0				
10222-2	X20CrMoV11-1	1.4922	9E0				