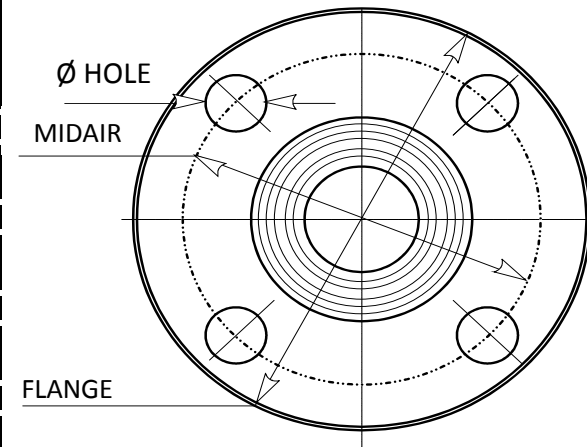


UNI - EN 1092-1 FLANGE

THREADED	UNI 2253				UNI 2254																												
	UNI 2276				UNI 2277				UNI 2278				UNI 6083				UNI 6084																
FLAT	UNI 2280				UNI 2281				UNI 2282				UNI 2283				UNI 2284				UNI 2285/29				UNI 2286/29				UNI 2287/29				
W.NECK	UNI 6091				UNI 6092				UNI 6093				UNI 6094				UNI 6095																
BLIND																																	
DN	PN 6				PN 10				PN 16				PN 25				PN 40				PN 64				PN 100				PN 160				DN
	FLANGE	MIDAIR	N°	Ø	FLANGE	MIDAIR	N°	Ø	FLANGE	MIDAIR	N°	Ø	FLANGE	MIDAIR	N°	Ø	FLANGE	MIDAIR	N°	Ø	FLANGE	MIDAIR	N°	Ø	FLANGE	MIDAIR	N°	Ø	FLANGE	MIDAIR	N°	Ø	
10					90	60	4	14	90	60	4	14	90	60	4	14	90	60	4	14	100	70	4	14	100	70	4	14	100	70	4	14	10
15	80	55	4	11	95	65	4	14	95	65	4	14	95	65	4	14	95	65	4	14	105	75	4	14	105	75	4	14	105	75	4	14	15
20	90	65	4	11	105	75	4	14	105	75	4	14	105	75	4	14	105	75	4	14	130	90	4	18	130	90	4	18	130	90	4	18	20
25	100	75	4	11	115	85	4	14	115	85	4	14	115	85	4	14	115	85	4	14	140	100	4	18	140	100	4	18	140	100	4	18	25
32	120	90	4	14	140	100	4	18	140	100	4	18	140	100	4	18	140	100	4	18	155	100	4	22	155	100	4	22	155	100	4	22	32
40	130	100	4	14	150	110	4	18	150	110	4	18	150	110	4	18	150	110	4	18	170	125	4	22	170	125	4	22	170	125	4	22	40
50	140	110	4	14	165	125	4	18	165	125	4	18	165	125	4	18	165	125	4	18	180	135	4	22	195	145	4	25	195	145	4	25	50
65	160	130	4	14	185	145	8	18	185	145	8	18	185	145	8	18	185	145	8	18	205	160	8	22	220	170	8	25	220	170	8	25	65
80	190	150	4	18	200	160	8	18	200	160	8	18	200	160	8	18	200	160	8	18	215	170	8	22	230	180	8	25	230	180	8	25	80
100	210	170	4	18	220	180	8	18	220	180	8	18	235	190	8	22	235	190	8	22	250	200	8	25	265	210	8	30	265	210	8	30	100
125	240	200	8	18	250	210	8	18	250	210	8	18	270	220	8	25	270	220	8	25	295	240	8	30	315	250	8	33	315	250	8	33	125
150	265	225	8	18	285	240	8	22	285	240	8	22	300	250	8	25	300	250	8	25	345	280	8	33	355	290	12	33	355	290	12	33	150
200	320	280	8	18	340	295	8	22	340	295	12	22	360	310	12	25	375	320	12	30	415	345	12	36	430	360	12	36	430	360	12	36	200
250	375	335	12	18	395	350	12	22	405	355	12	25	425	370	12	30	450	385	12	33	470	400	12	36	505	430	12	39	505	430	12	42	250
300	440	395	12	22	445	400	12	22	460	405	12	25	485	430	16	30	515	450	16	33	530	460	16	36	585	500	16	42	585	500	16	42	300

ANSI FLANGE

Ø	SERIE 150				SERIE 300				SERIE 400				SERIE 600				SERIE 900				Ø
	FLANGE	MIDAIR	N°	Ø	FLANGE	MIDAIR	N°	Ø	FLANGE	MIDAIR	N°	Ø	FLANGE	MIDAIR	N°	Ø	FLANGE	MIDAIR	N°	Ø	
1/2"	88,9	60,5	4	16	95,3	66,7	4	16	95,3	66,5	4	16	95,3	66,5	4	16	120,7	82,5	4	22	1/2"
3/4"	99	69,9	4	16	117,3	82,5	4	19	117,3	82,5	4	19	117,3	82,5	4	19	130	88,9	4	22	3/4"
1"	108	79,3	4	16	124	89	4	19	124	88,9	4	19	124	88,9	4	19	149,4	101,6	4	25	1"
1¼"	117	88,9	4	16	133,4	98,5	4	19	133,4	98,5	4	19	133,4	98,5	4	19	158,8	111,2	4	25	1¼"
1½"	127	98,5	4	16	155,5	114,3	4	22	155,5	114,3	4	22	155,5	114,3	4	22	177,8	124	4	29	1½"
2"	152	121	4	19	165,1	127	8	19	165,1	127	8	19	165,1	127	8	19	215,9	165,1	8	25	2"
2½"	178	140	4	19	190,5	149,2	8	22	190,5	149,3	8	22	190,5	149,3	8	22	244,4	190,5	8	29	2½"
3"	191	152	4	19	209,5	168,2	8	22	209,5	168,2	8	22	209,5	168,2	8	22	241,3	190,5	8	25	3"
4"	229	191	8	19	254	200	8	22	254	200,2	8	25	270	215,9	8	25	292,1	235	8	32	4"
5"	254	216	8	22	279,4	235	8	22	279,4	235	8	25	330,2	266,7	8	29	349,2	279,4	8	35	5"
6"	279	241	8	22	317,5	270	12	22	317,5	269,7	12	25	355,6	292,1	12	29	381	317,5	12	32	6"
8"	343	299	8	22	381	330,2	12	25	381	330,2	12	29	419,1	349,2	12	32	469,9	393,7	12	38	8"
10"	406	362	12	25	444,5	387,3	16	29	444,5	387,3	16	32	508	431,8	16	35	546,1	469,9	16	38	10"
12"	483	432	12	25	520,7	451	16	32	520,7	450,8	16	35	558,8	489	20	35	609,6	533,4	20	38	12"



A TABLE
FLANGE SUMMARY
Valvoind

TABLE

B

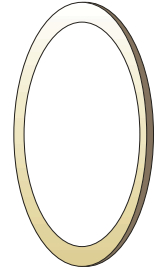
GASKET AND BOLTS

Valvoind

valvole industriali

VALVOIND Srl Via Pascoli, 5 - 24060 Bagnatica (Bergamo) Tel. 035.681919 Fax. 035.684461

DESCRIPTION	White Rubber Rings	ASBESTOS FREE	GRAPHITE WITH INOX INSERT	Teflon Case With asbestos free insert	Spiral wound AISI 316 GRAPHITE
Max. Temp.	90°C	150°C	400°C	220°C	500°C
Max. Pressure	16 bar	16 BAR	100 bar	16 bar	150 BAR
Thickness	2mm	2mm	1.5 mm	3mm	3 mm
Use	Aqueduct	water - steam- oil - weak acids	dhiatermic oil - steam - acids	food - acids - bases	steam dhiatermic oil

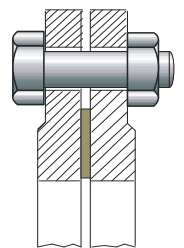


CODE GASKETS

PN 6	TG 100..	TG 110..	TG 120..	TG 140..	PN 16	TG152..
PN 10	TG 101..	TG 111..	TG 121..	TG 141..	PN 40	TG154..
PN 16	TG 102..	TG 112..	TG 122..	TG 142..	PN100	TG156..
PN 25	TG 103..	TG 113..	TG 123..	TG 143..	ASA150	TG162..
PN 40	TG 104..	TG 114..	TG 124..	TG 144..	ASA300	TG164..
PN 63	TG 105..	TG 115..	TG 125..	TG 145..	ASA600	TG166..

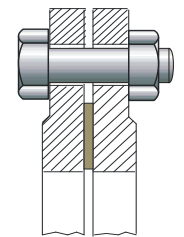
PN 6		GASKET		BOLT	
CODE	DN	Øi / Øe x sp	n°	Ø x lg.	
..03	10	Ø 18/39 x 2	4	10x40	
..04	15	Ø 22/44 x 2	4		
..05	20	Ø 27/54 x 2	4		
..06	25	Ø 34/64 x 2	4		
..07	32	Ø 43/76 x 2	4	12x45	
..08	40	Ø 49/86 x 2	4		
..09	50	Ø 61/96 x 2	4		
..10	65	Ø 77/116 x 2	4	16x55	
..11	80	Ø 89/132 x 2	4		
..12	100	Ø 115/152x2	4		
..13	125	Ø 140/182x2	8		
..14	150	Ø 169/207x2	8	16x60	
..15	200	Ø 220/262 x 2	8		
..16	250	Ø 273/317 x 2	12		
..17	300	Ø 324/373 x 2	12	20x65	
..18	350	Ø 368/423 x 2	16		
..19	400	Ø 419/473 x 2	16		

PN 10		GASKET		BOLT	
CODE	DN	Øi / Øe x sp	n°	Ø x lg.	
..03	10	Ø 18/45 x 2	4	12x50	
..04	15	Ø 22/50 x 2	4		
..05	20	Ø 28/60 x 2	4		
..06	25	Ø 35/70 x 2	4	16x55	
..07	32	Ø 43/82 x 2	4		
..08	40	Ø 49/92 x 2	4		
..09	50	Ø 61/107 x 2	4	16x60	
..10	65	Ø 77/127 x 2	8		
..11	80	Ø 90/142 x 2	8		
..12	100	Ø 115/162 x 2	8		
..13	125	Ø 141/192 x 2	8	20x70	
..14	150	Ø 169/218 x 2	8		
..15	200	Ø 220/273 x 2	8		
..16	250	Ø 274/328 x 2	12	20x75	
..17	300	Ø 325/378 x 2	12		
..18	350	Ø 368/438 x 2	16		
..19	400	Ø 420/490 x 2	16	22x75	



PN 16		GASKET		BOLT	
code	DN	Øi / Øe x sp	n°	Ø x lg.	
..04	15	Ø 22/50 x 2	4	12x50	
..05	20	Ø 28/60 x 2	4		
..06	25	Ø 35/70 x 2	4	16x55	
..07	32	Ø 43/82 x 2	4		
..08	40	Ø 49/92 x 2	4		
..09	50	Ø 61/107 x 2	4	16x60	
..10	65	Ø 77/127 x 2	8		
..11	80	Ø 90/142 x 2	8		
..12	100	Ø 115/162 x 2	8		
..13	125	Ø 141/192 x 2	8	20x70	
..14	150	Ø 169/218 x 2	8		
..15	200	Ø 220/273 x 2	12		
..16	250	Ø 274/328 x 2	12	22x80	
..17	300	Ø 325/385 x 2	12		
..18	350	Ø 368/445 x 2	16		
..19	400	Ø 420/497 x 2	16	27x90	

PN 40		GASKET		BOLT	
code	DN	Øi / Øe x sp	n°	Ø x lg.	
..04	15	Ø 22/50 x 2	4	12x50	
..05	20	Ø 28/60 x 2	4		
..06	25	Ø 35/70 x 2	4	16x55	
..07	32	Ø 43/82 x 2	4		
..08	40	Ø 49/92 x 2	4		
..09	50	Ø 61/107 x 2	4	16x60	
..10	65	Ø 77/127 x 2	8		
..11	80	Ø 90/142 x 2	8		
..12	100	Ø 115/168 x 2	8		
..13	125	Ø 141/195 x 2	8	22x80	
..14	150	Ø 169/225 x 2	8		
..15	200	Ø 220/285 x 2	12		
..16	250	Ø 274/342 x 2	12	27x90	
..17	300	Ø 325/402 x 2	16		
..18	350	Ø 368/458 x 2	16		
..19	400	Ø 420/515 x 2	16	33x110	



TABLE

C

BOLT (SCREW+NUT)
HEXAGON - ZINC PLATED - GAS THREADED

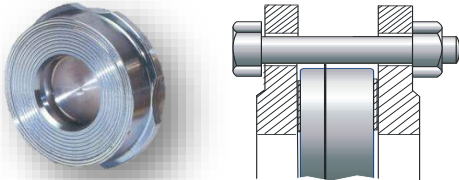
Valvoid

valvole industriali

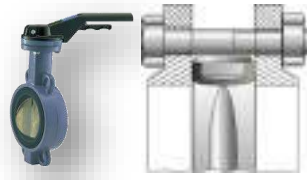
VALVOID Srl Via Pascoli, 5 - 24060 Bagnatica (Bergamo) Tel. 035.681919 Fax. 035.684461

THREADED HEXAGON BOLTS (SCREW+NUT)

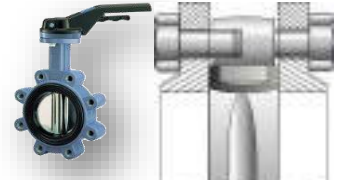
FOR DISC CHECK VALVES



FOR WAFER BUTTERFLY VALVE



FOR LUG BUTTERFLY VALVE



DN	PN 6			PN 10			PN 16			PN 40		
	N°	Ø	L	N°	Ø	L	N°	Ø	L	N°	Ø	L
15	4	10	60	4	12	70	4	12	70	4	12	70
20	4	10	70	4	12	80	4	12	70	4	12	80
25	4	10	70	4	12	80	4	12	80	4	12	80
32	4	12	80	4	16	100	4	16	100	4	16	100
40	4	12	80	4	16	100	4	16	100	4	16	100
50	4	12	90	4	16	110	4	16	110	4	16	110
65	4	12	100	4	16	110	4	16	110	8	16	120
80	4	16	120	4	16	120	8	16	120	8	16	130
100	4	16	130	8	16	130	8	16	130	8	20	150
125	8	16	160	8	16	170	8	16	170	8	22	180
150	8	16	180	8	20	185	8	20	185	8	22	200
200	8	16	220	8	20	230	12	20	230	12	27	250
250	12	16	280	12	20	290	12	22	290	12	30	320
300	12	20	330	12	20	340	12	22	350	16	30	380
350	12	20	360	16	20	360	16	22	380	16	33	420

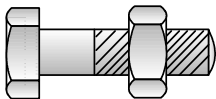
DN	PN 10			PN 16		
	N°	Ø	L	N°	Ø	L
32	4	16	90	4	16	90
40	4	16	110	4	16	110
50	4	16	130	4	16	130
65	4	16	130	4	16	130
80	4	16	140	8	16	140
100	8	16	150	8	16	150
125	8	16	150	8	16	150
150	8	20	160	8	20	160
200	8	20	170	12	20	170
250	12	20	190	12	22	190
300	12	20	190	12	22	200
350	16	20	190	16	22	220
400	16	22	230	16	27	240
450	20	22	230	20	27	250
500	20	22	250	20	30	280
600	20	27	300	20	33	325

DN	PN 10			PN 16		
	N°	Ø	L	N°	Ø	L
32	8	16	30	8	16	30
40	8	16	30	8	16	30
50	8	16	35	8	16	35
65	8	16	35	8	16	35
80	8	16	35	16	16	35
100	16	16	40	16	16	40
125	16	16	45	16	16	45
150	16	20	45	16	20	45
200	16	20	50	24	20	50
250	24	20	55	24	22	55
300	24	20	60	24	22	60
350	32	20	60	32	22	60
400	32	22	70	32	24	70
450	40	22	80	40	27	80
500	40	22	80	40	30	80
600	40	27	90	40	33	90

HEXAGON SCREW

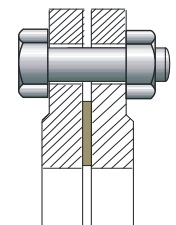
MATERIAL	CODE	THREAD	CODE	THREAD
ZINC PLAT.STEEL	TF 50...	MEDIUM SCREW	TF 60...	ENTIRE SCREW
ST.STEEL	TF 52...	MEDIUM SCREW	TF 62...	ENTIRE SCREW

Code	Ø x Lg.	Code	Ø x Lg.	Code	Ø x Lg.	Code	Ø x Lg.	Code	Ø x Lg.	Code	Ø x Lg.
... 101	10 x 40	... 201	12 x 25	... 301	16 x 35	... 401	20 x 45	... 501	22 x 55	... 701	27 x 90
... 102	10 x 45	... 202	12 x 35	... 302	16 x 30	... 402	20 x 50	... 502	22 x 60	... 702	27 x 100
... 103	10 x 60	... 203	12 x 45	... 303	16 x 35	... 403	20 x 55	... 503	22 x 75	... 703	27 x 240
... 104	10 x 70	... 204	12 x 50	... 304	16 x 40	... 404	20 x 60	... 504	22 x 80	... 704	27 x 250
		... 205	12 x 55	... 305	16 x 45	... 405	20 x 70	... 505	22 x 90	... 705	27 x 300
		... 206	12 x 70	... 306	16 x 50	... 406	20 x 75	... 506	22 x 180		
		... 207	12 x 80	... 307	16 x 55	... 407	20 x 80	... 507	22 x 190	... 801	30 x 110
		... 208	12 x 90	... 308	16 x 60	... 408	20 x 90	... 508	22 x 200	... 802	30 x 120
		... 209	12 x 100	... 309	16 x 65	... 409	20 x 150	... 509	22 x 220	... 803	30 x 280
		... 210	12 x 110	... 310	16 x 70	... 410	20 x 160	... 510	22 x 230	... 804	30 x 320
				... 311	16 x 90	... 411	20 x 170	... 511	22 x 250	... 805	30 x 380
				... 312	16 x 100	... 412	20 x 180	... 512	22 x 290		
				... 313	16 x 110	... 413	20 x 190	... 513	22 x 350	... 901	33 x 130
				... 314	16 x 120	... 414	20 x 200	... 514	22 x 380	... 902	33 x 325
				... 315	16 x 130	... 415	20 x 230			... 903	33 x 420
				... 316	16 x 140	... 416	20 x 290	... 602	24 x 75		
				... 317	16 x 150	... 417	20 x 330	... 603	24 x 230		
				... 318	16 x 160	... 418	20 x 340				
				... 319	16 x 170	... 419	20 x 360				
				... 320	16 x 180						
				... 321	16 x 220						
				... 322	16 x 280						



BOLTS DIN 934 CLASS 8

Ø	Z.PL.STEEL	AISI 316
MA 10	TF80010	TF80510
MA 12	TF80012	TF80512
MA 16	TF80016	TF80516
MA 18	TF80018	TF80518
MA 20	TF80020	TF80520
MA 22	TF80022	TF80522
MA 24	TF80024	TF80524
MA 27	TF80027	TF80527
MA 30	TF80030	TF80530
MA 33	TF80033	TF80533



TABLE

D1

**IP PROTECTION CLASS OF ELECTRIC INSTRUMENTS
ACCORDING TO "CEI EN 60529/1997**


Valvoind

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1st digit**2nd digit**

Degree of protection against the penetration of liquids

Degree of protection against the penetration of solid foreign bodies

None

Dripping water

Dripping water when tilted at 15°

Spraying water

Splashing of water

Water jets

Powerful water jets

Immersion, up to 1 m depth

Immersion, 1 m or more depth

IP . 0

IP . 1

IP . 2

IP . 3

IP . 4

IP . 5

IP . 6

IP . 7

IP . 8

None

IP0 .

IP00

IP01

IP02

Protect against the penetration of solid foreign bodies > Ø 50mm

IP1 .

IP10

IP11

IP12

IP13

Protect against the penetration of solid foreign bodies > Ø 12mm

IP2 .

IP20

IP21

IP22

IP23

Protect against the penetration of solid foreign bodies > Ø 2,5mm

IP3 .

IP30

IP31

IP32

IP33

IP34

Protect against the penetration of solid foreign bodies > Ø 1 mm

IP4 .

IP40

IP41

IP42

IP43

IP44

IP45

IP46

Dust protected

IP5 .

IP54

IP55

IP56

Dust tight

IP6 .

IP64

IP65

IP66

IP67

IP68

Additional 3rd letter

Protection against access to hazardous parts like

IP..A

Back of hand

IP..B

Finger

IP..C

Tool

IP..D

Screw or Wire

Additional 4th letter

Designated for

IP...H

High voltage device

IP...M

Device moving during water test

IP...S

Device standing still during water test

IP...W

Weather conditions

TABLE

D2

ATEX INDICATIVE TABLE LEGISLATION EXPLOSION PRODUCTS



ATEX

INDICATIVE TABLE

GROUP	CATEGORY	PRESENCE EXPLOSIVE PRESENCE	SUBSTANCE	LEVEL OF PROTECTION	PROTECTION PERFORMANCES	CORRELATION WITH DANGEROUS ZONE	EXAMPLE OF PROTECTION
I Products to be used in gassy mines	M1	PRESENT	METHANE, POWDERS, FUELS	very high	TWO INDEPENDENT PROTECTION MEASURES OR SAFETY EVEN IN CASE OF TWO INDEPENDENT DEFECTS		
	M2	PROBABLE PRESENT	METHANE, POWDERS, FUELS	high level	A MEANS OF PROTECTION ALSO IN SERIOUS OPERATING CONDITIONS		
II equipment intended for use on the surface	1	EVER PRESENT OR FOR LONG PERIOD	GAS, VAPORS, MISTS, POWDERS	very high	TWO INDEPENDENT PROTECTION MEASURES OR SAFETY EVEN IN CASE OF TWO INDEPENDENT DEFECTS	GAS : ZONE 0 DUST : ZONE 20	Eex ia
	2	PROBABLE PRESENT	GAS, VAPORS, MISTS, POWDERS	high level	A MEANS OF PROTECTION ALSO IN SERIOUS OPERATING CONDITIONS	GAS : ZONE 1 DUST: ZONE 21	Eex d
	3		GAS VAPORS, MISTS, POWDERS	normal	PROTECTION SUITABLE FOR NORMAL OPERATION	GAS : ZONE 2 DUST: ZONE 22	Eex n

USE IN ATMOSPHERE
POTENTIALLY EXPLOSIVE

II
SURFACE GROUP

2
CAT. 2

G (D)
GAS (DUST)

TABLE

D3

LAW OF EXPLOSION PRODUCTS TEMPERATURE CLASSES


Valvoind

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PROTECTION GRADE	CATEGORY	AREA WITH PRESENCE OF GAS	CATEGORY	AREA WITH PRESENCE OF GAS	DANGER LEVEL OF THE AREA OF USE
VERY HIGH	1G	ZONE 0	1D	ZONE 20	EXPLOSIVE ATMOSPHERES ALWAYS PRESENT
HIGH	2G	ZONE 1	2D	ZONE 21	EXPLOSIVE ATMOSPHERE VERY PROBABLE
NORMAL	3G	ZONE 2	3D	ZONE 22	EXPLOSIVE ATMOSPHERE NOT PROBABLE

TEMPERATURE CLASS	MAXIMUM SURFACE TEMPERATURE WITH 40 ° C ENVIRONMENT
T 1	450°C
T 2	300°C
T 3	200°C
T 4	135°C
T 5	100°C
T 6	85°C

GROUP	TEMPERATURE CLASS					
	T1	T2	T3	T4	T5	T6
II C	HYDROGEN	ACETYLENE				ETHYL NITRATE CARBON SULFUR
II B	COKE GAS WATER GAS	BUTADIENE Ethylbenzene ETHYLENE ETHYLENE OXIDE	SULFURIC ACID ISOPRENE PETROLEUM	ETHICAL ETHICS		
II A	ETHYL ACETATE METILE ACETATE ACETONE ACETIC ACID METHYL ALCOHOL AMMONIA BENZENE BENZENE BUTANONE chloromethylene ETHANE METHANE METHANOL CARBON MONOXIDE NAPHTHALENE PROPANE TOLUENE XYLENE METHANE	BUTYL ACETATE PROPILE ACETATE AMILIC ALCOHOL ETHYL ALCOHOL ISOBUTYL ALCOHOL N-BUTYL ALCOHOL ACETIC ANIDRIDE Cyclohexanone LIQUID GAS NATURAL GAS MONOAMILACETATO N-BUTANE	cyclohexane cyclohexanol DEAN HEPTANE HEXANE DIESEL KEROSENE NAPHTHA REPENT	ACETALDEHYDE ETHER		

**TABLE
E1**

**PHYSICAL CHARACTERISTICS OF SATURATED
WATER VAPOR**

VALVOIND Srl Via Pascoli, 5 - 24060 Bagnatica (Bergamo) Tel. 035.681919-Fax. 035.684461



Pressure				Temperature	Specific volume	Sensitive heat water	Latent heat of vaporization	Total heat
Relative		Absolute						
bar	kg/cm ²	bar	kg/cm ²	°C	m ³ / kg	kcal/kg	kcal/kg	kcal/kg
		0,050	0,051	32,90	28,192	32,9	579,2	612,2
		0,100	0,102	45,80	16,474	45,8	571,9	617,7
		0,150	0,153	54,00	10,022	54,0	567,2	621,2
		0,200	0,204	60,00	7,649	60,1	563,6	623,7
		0,250	0,255	65,00	6,204	65,0	560,7	625,7
		0,300	0,306	69,10	5,229	69,1	558,3	627,4
		0,350	0,357	72,70	4,530	72,7	556,2	628,9
		0,400	0,408	75,90	3,993	75,9	554,3	630,2
		0,450	0,459	78,70	3,580	78,8	552,6	631,3
		0,500	0,510	81,30	3,240	81,4	551,0	632,4
		0,600	0,611	85,90	2,732	86,0	548,2	634,2
		0,700	0,713	89,90	2,365	90,0	545,6	635,7
		0,800	0,815	93,50	2,087	93,6	543,5	637,1
		0,900	0,917	86,70	1,869	96,8	541,5	638,3
		1,000	1,019	99,60	1,964	99,8	539,6	639,4
0,0	0,000	1,013	1,032	100,00	1,673	100,1	539,4	639,6
0,1	0,051	1,063	1,083	101,40	1,601	101,5	538,4	640,0
0,1	0,102	1,113	1,134	102,60	1,553	102,8	537,7	640,6
0,2	0,153	1,163	1,185	105,10	1,471	104,1	536,9	641,1
0,2	0,204	1,213	1,236	106,20	1,414	105,3	536,2	641,5
0,3	0,306	1,313	1,338	107,40	1,312	107,6	534,7	642,3
0,4	0,408	1,413	1,440	109,50	1,225	109,8	533,3	643,1
0,5	0,510	1,513	1,542	111,60	1,149	111,9	531,9	643,8
0,6	0,611	1,613	1,644	113,50	1,038	113,8	530,6	644,5
0,7	0,713	1,713	1,746	115,40	1,024	115,7	529,5	644,9
0,8	0,815	1,813	1,848	117,10	0,971	117,5	528,3	645,4
0,9	0,917	1,913	1,950	118,80	0,923	119,2	527,1	645,9
1,0	1,019	2,013	2,052	120,40	0,881	120,8	526,0	646,4
1,1	1,121	2,113	2,154	121,90	0,841	122,4	525,1	647,0
1,2	1,223	2,213	2,256	123,40	0,806	124,0	524,1	647,5
1,3	1,325	2,313	2,358	124,90	0,773	125,4	523,1	648,0
1,4	1,427	2,413	2,460	126,30	0,743	126,8	522,2	648,5
1,5	1,529	2,513	2,562	127,60	0,714	128,1	521,2	648,8
1,6	1,631	2,613	2,663	128,90	0,689	130,1	520,4	649,3
1,7	1,733	2,713	2,765	130,10	0,665	130,7	519,5	649,6
1,8	1,835	2,813	2,867	131,40	0,643	132,0	518,6	650,0
1,9	1,937	2,913	2,969	132,50	0,622	133,2	517,8	650,3
2,0	2,093	3,013	3,071	133,70	0,603	134,4	517,0	650,7
2,2	2,242	3,213	3,275	135,90	0,568	136,6	515,5	652,1
2,4	2,446	3,413	3,479	138,00	0,536	138,8	514,0	652,8
2,6	2,650	3,613	3,683	140,00	0,509	140,8	512,6	653,4
2,8	2,854	3,813	3,887	141,90	0,483	142,8	511,2	654,0
3,0	3,058	4,013	4,091	143,70	0,461	144,7	509,9	654,6
3,2	3,262	4,213	4,294	145,40	0,440	146,5	508,6	655,1
3,4	3,466	4,413	4,498	147,20	0,422	148,2	507,4	655,6
3,6	3,670	4,613	4,702	148,80	0,405	149,9	506,1	656,0
3,8	3,873	4,813	4,906	150,40	0,389	151,5	505,0	656,5
4,0	4,077	5,013	5,110	152,00	0,374	153,1	503,8	656,9
4,2	4,281	5,213	5,314	153,40	0,361	154,6	502,7	657,4
4,4	4,485	5,413	5,518	154,80	0,348	156,1	501,6	657,8

**TABLE
E2**

**PHYSICAL CHARACTERISTICS OF SATURATED
WATER VAPOR**

VALVOIND Srl Via Pascoli, 5 - 24060 Bagnatica (Bergamo) Tel. 035.681919-Fax. 035.684461



Pressure				Temperature °C	Specific volume m ³ / kg	Sensitive heat water kcal/kg	Latent heat of vaporization kcal/kg	Total heat kcal/kg
Relative		Absolute						
bar	kg/cm ²	bar	kg/cm ²					
4,6	4,689	5,613	5,722	156,20	0,336	157,6	500,6	658,1
4,8	4,893	5,813	5,926	157,60	0,325	159,0	499,5	658,5
5,0	5,097	6,013	6,129	158,90	0,315	160,3	498,5	658,9
5,5	5,607	6,513	6,639	162,10	0,292	163,6	496,1	659,7
6,0	6,116	7,013	7,149	165,00	0,272	166,7	493,8	660,5
6,5	6,626	7,513	7,659	167,80	0,255	169,6	491,6	661,2
7,0	7,136	8,013	8,168	170,50	0,240	172,4	489,4	661,8
7,5	7,645	8,513	8,678	173,00	0,227	175,1	487,4	662,5
8,0	8,155	9,013	9,188	175,40	0,215	177,6	485,4	663,0
8,5	8,665	9,513	9,697	177,70	0,204	180,0	483,5	663,5
9,0	9,174	10,013	10,207	180,00	0,194	182,3	481,6	663,9
9,5	9,684	10,513	10,717	182,10	0,185	184,6	479,8	664,4
10,0	10,194	11,013	11,226	184,10	0,177	186,8	478,0	664,8
11,0	11,213	12,013	12,246	188,00	0,163	190,9	474,6	665,6
12,0	12,232	13,013	13,265	191,70	0,151	194,8	471,4	666,2
13,0	13,252	14,013	14,284	195,10	0,141	198,5	468,3	666,8
14,0	14,271	15,013	15,304	198,30	0,132	202,0	465,3	667,3
15,0	12,291	16,013	16,323	201,40	0,124	205,3	462,5	667,8
16,0	16,310	17,013	17,343	204,40	0,117	208,5	459,7	668,8
17,0	17,329	18,013	18,362	207,20	0,110	211,5	457,0	668,8
18,0	18,349	19,013	19,381	209,90	0,105	214,4	454,4	668,8
19,0	19,368	20,013	20,401	212,50	0,100	217,2	451,8	669,0
20,0	20,387	21,013	21,420	215,00	0,095	220,0	449,4	669,4
21,0	21,407	22,013	22,439	217,30	0,090	222,6	447,0	669,6
22,0	22,426	23,013	23,459	219,60	0,087	225,1	444,6	669,7
23,0	23,445	24,013	24,478	221,80	0,083	227,6	442,2	669,8
24,0	24,465	25,013	25,497	224,00	0,080	230,0	440,0	670,0
25,0	25,484	26,013	26,517	226,10	0,077	232,2	437,7	670,0
26,0	26,520	27,013	27,536	228,20	0,070	234,5	435,3	669,8
27,0	27,540	28,013	28,555	230,10	0,071	236,7	433,2	669,9
28,0	28,560	29,013	29,574	232,10	0,069	238,8	431,1	669,9
29,0	29,580	30,013	30,954	233,90	0,067	240,9	429,0	669,9
30,0	30,600	31,013	31,613	235,80	0,064	243,0	426,9	669,9
35,0	35,700	36,013	36,710	244,3	0,055	252,7	417,0	669,7
40,0	40,800	41,013	41,807	251,9	0,049	261,5	407,6	669,1
45,0	45,900	46,013	46,904	258,8	0,043	269,6	398,6	668,3
50,0	51,000	51,013	52,001	265,3	0,039	277,3	390,1	667,4
54,0	54,268	55	56,063	269,93	0,036			
59,0	59,201	60	61,159	275,55	0,032			
64,0	64,134	65	66,256	280,82	0,030			
69,0	69,068	70	71,353	285,79	0,027			
74,0	74,001	75	76,449	290,50	0,025			
79,0	78,935	80	81,546	294,97	0,024			
84,0	83,868	85	86,642	299,23	0,022			
89,0	88,801	90	91,739	303,31	0,021			
94,0	93,735	95	96,836	307,21	0,019			
99,0	98,668	100	101,932	310,96	0,018			

**TABLE
E3**

**CHARACTERISTICS OF CONDENSATE DISCHARGER
COLLECTORS AND WELL SIZING**



VALVOID Srl Via Pascoli, 5 - 24060 Bagnatica (Bergamo) Tel. 035.681919-Fax. 035.684461

CHARACTERISTICS OF THE VARIOUS TYPES OF DOWNLOADS DURING THE YEAR

FEATURES	INVERTED BUCKET	THERMOSTATIC FLOAT	THERMODYNAMIC DISC	THERMOSTATIC	BIMETALLIC
Operation method	Intermittent	Continuous	Intermittent	Intermittent	Continuous
Low pressure air venting capacity	poor	Excellent	low	Good	Good
Ability to dispose of the air at start-up	discreet	Excellent	poor	Excellent	Excellent
Counter-pressure operation	Excellent	Excellent	poor	Excellent	Excellent
Duration of exercise	Excellent	Good	poor	discreet	discreet
Response to condensation bursts	Immediate	Immediate	Delayed	Delayed	Delayed
Ability to dispose of dirt	Excellent	poor	poor	discreet	poor
Resistance to water hammer	Excellent	poor	Excellent	poor	Excellent
Air vent, CO2 at the steam temperature	Yup	No	No	No	No
Wear resistance	Excellent	Good	poor	discreet	discreet
Corrosion resistance	Excellent	Good	Excellent	Good	discreet
Resistance to frost damage	Good	poor	Good	Good	Good
Ability to purge the steam system	Excellent	discreet	Excellent	Good	Good
Performance at very low loads	Excellent	Excellent	poor	Excellent	Good
Ability to treat nascent steam	discreet	poor	poor	poor	poor
Behavior in mechanical rupture	Open	Closed	Open	Closed	Open
Dimensions (mutual comparison)	average	Great	Small	Small	average

MANIFOLD SIZING

$$\varnothing \text{ (cm)} = \sqrt{\frac{\text{Total output piping area} + 50\%}{0,785}}$$

Ø pipe	DN	Ø est. mm	Ø int. mm	section cm²
1/2"	15	21.3	18.6	2.19
3/4"	20	26.9	22.2	3.91
1"	25	33.7	27.9	6.11
1 1/4"	32	42.4	36.6	10.50
1 1/2"	40	48.3	42.5	14.20
2"	50	60.3	53.8	22.80
2 1/2"	65	76.1	69.6	38.20
3"	80	88.9	81.6	52.40
4"	100	114.3	106.2	88.70
5"	125	139.7	129.9	134.00
6"	150	165.0	155.2	197.00
8"	200	216.0	204.0	343.00
10"	250	267.0	254.0	508.00

$$D = \sqrt{\frac{134,1}{0,785}} = 13 \text{ cm}$$

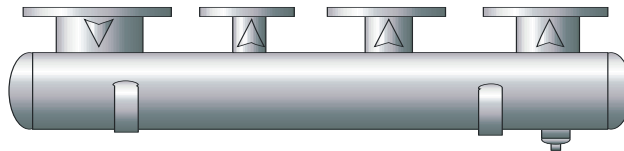
Example:

Entry: N° 1 3" pipe
Exit: N° 1 1 1/2" pipe
N° 1 2" pipe
N° 1 3" pipe

the sum of the section is made only the outgoing pipes

1 1/2" = 14,2 cm²
2" = 22,8 cm²
3" = 52,4 cm²
89,4 cm²
44,7 cm²
134,1 cm²

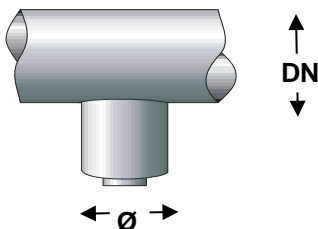
Total Increase 50%



WELL SIZING

N.B. The diameter Ø of the sump must be equal to or greater than the diameter of the tube

N.B. The slope of the pipe must be in the same sense of flow and must be between 0,4 ÷ 1%



PIPE DN	WELL Ø	every 10 m	every 20 m	every 30 m	every 40 m
Deep H of well in mm					
DN 20	3/4"	350	700	1050	1400
DN 25	1"	250	500	750	1000
DN 32	1 1/4"	200	400	600	800
DN 40	1 1/2"	180	360	540	720
DN 50	2"	150	300	450	600
DN 65	2 1/2"	110	220	330	440
DN 80	3"	115	230	345	460
DN 100	4"	110	220	330	440
DN 125	5"	175	350	525	700
DN 150	6"	175	350	525	700
DN 200	8"	150	300	450	600

TABLE

E4

CALCULATION OF THE INITIAL CONDENSATE FLOW IN FUNCTION OF SPEED



VALVOID Srl Via Pascoli, 5 - 24060 Bagnatica (Bergamo) Tel. 035.681919-Fax. 035.684461

INITIAL HEATING CONDENSATION IN STEAM PIPES (normally insulated)

Start-up time not exceeding 20 minutes - kg of saturated steam condensed per m 10 of piping																
press.	DN 40		DN 50		DN 65		DN 80		DN 100		DN 125		DN 150		DN200	
STEAM	(1½")		(2")		(2½")		(3")		(4")		(5")		(6")		(8")	
Ate	Kg	Kg/h	Kg	Kg/h	Kg	Kg/h	Kg	Kg/h	Kg	Kg/h	Kg	Kg/h	Kg	Kg/h	Kg	Kg/h
0,50	0,95	2,85	1,30	3,90	2,20	6,60	2,70	8,10	3,90	11,70	4,90	14,70	6,90	20,70	10,30	30,90
1,00	1,00	3,00	1,40	3,20	2,30	6,90	3,00	9,00	4,30	12,90	5,40	16,20	7,60	22,80	11,30	33,90
1,50	1,15	3,45	1,50	4,50	2,50	7,50	3,20	9,00	4,70	14,10	5,90	17,70	8,00	24,00	12,80	38,40
2,00	1,20	3,60	1,60	4,80	2,60	7,80	3,40	10,20	5,00	15,00	6,50	19,50	8,50	25,50	13,00	39,00
3,00	1,40	4,20	1,70	5,10	2,80	8,40	3,80	11,40	5,40	16,20	7,00	21,00	9,30	27,90	14,30	42,90
4,00	1,50	4,50	1,90	5,70	3,00	9,00	4,00	12,00	5,80	17,40	7,80	23,40	10,00	30,00	15,30	45,90
5,00	1,60	4,80	2,00	6,00	3,30	9,90	4,40	13,20	6,20	18,60	8,00	24,00	10,60	31,80	16,30	48,90
7,00	1,70	5,10	2,30	6,90	3,60	10,80	4,70	14,10	6,70	20,10	9,00	27,00	11,80	35,40	17,80	53,40
10,00	1,90	5,70	2,40	7,20	4,00	12,00	5,30	15,90	7,50	22,50	10,00	30,00	13,10	39,30	19,70	59,10
12,00	2,00	6,00	2,60	7,80	4,20	12,60	5,70	17,10	7,90	23,70	10,40	31,20	13,80	41,40	20,80	62,40
14,00	2,20	6,60	2,70	8,10	4,5	13,50	5,90	17,70	8,30	24,90	11,30	33,90	14,50	43,50	21,80	65,40

EXAMPLE 40 mt PIPE DN 100 Condensed in 20 prime minuts 7,5 kg x4= **30 kg**
 WITH 10 bar PRESSURE Hourly flowrate to bring to the steamtrap 22,5x4=**90 kg/h** (beginning).

FLOW RATE OF THE STEAM PIPES I N FUNCTION OF SPEED in Kg/h

bar	m/s	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150	DN 200	DN 250	DN300
0,4	15	7	14	24	37	52	99	145	213	394	648	917	1.606	2.590	3.678
	25	10	25	40	62	92	162	265	384	675	972	1.457	2.806	4.101	5.936
	40	17	35	64	102	142	265	403	576	1.037	1.670	2.303	4.318	6.909	9.500
0,7	15	7	16	25	40	59	109	166	250	431	680	1.006	1.708	2.791	3.852
	25	12	25	45	72	100	182	287	430	716	1.145	1.575	2.816	4.629	6.204
	40	18	37	68	106	167	298	428	630	1.108	1.712	2.417	4.532	7.251	10.323
1,0	15	8	17	29	40	59	112	182	260	470	694	1.020	1.864	2.814	4.045
	25	12	26	48	72	100	193	300	445	730	1.160	1.660	3.099	4.869	6.751
	40	19	39	71	112	172	311	465	640	1.150	1.800	2.500	4.815	7.333	10.370
2,0	15	12	25	45	70	100	182	280	410	715	1.125	1.580	2.814	4.545	6.277
	25	19	43	70	112	162	295	428	656	1.215	1.755	2.520	4.815	7.425	10.575
	40	30	64	115	178	275	475	745	1.010	1.895	2.925	4.175	7.678	11.997	16.796
3,0	15	16	37	60	93	127	245	385	535	925	1.505	2.040	3.983	6.217	8.743
	25	26	56	100	152	225	425	632	910	1.580	2.480	3.440	6.779	10.269	14.316
	40	41	87	157	250	357	595	1.025	1.460	2.540	4.050	5.940	10.476	16.470	22.950
4,0	15	19	42	70	108	156	281	432	635	1.166	1.685	2.460	4.618	7.121	10.358
	25	30	63	115	180	270	450	742	1.080	1.980	2.925	4.225	7.866	12.225	17.304
	40	49	116	197	295	456	796	1.247	1.825	3.120	4.940	7.050	12.661	19.663	27.816
5,0	15	22	49	97	128	187	352	526	770	1.295	2.105	2.835	5.548	8.586	11.947
	25	36	81	135	211	308	548	885	1.265	2.110	3.540	5.150	8.865	14.268	20.051
	40	59	131	225	338	495	855	1.350	1.890	3.510	5.400	7.870	13.761	23.205	32.244
6,0	15	26	59	105	153	225	425	632	925	1.555	2.525	3.400	6.654	10.297	14.328
	25	43	97	162	253	370	658	1.065	1.520	2.530	4.250	6.175	10.629	17.108	24.042
	40	71	157	270	405	595	1.025	1.620	2.270	4.210	6.475	9.445	16.515	27.849	38.697
7,0	15	29	63	110	165	260	445	705	952	1.815	2.765	3.990	7.390	12.015	16.096
	25	49	114	190	288	450	785	1.205	1.750	3.025	4.815	6.900	12.288	19.377	27.080
	40	76	177	303	455	690	1.210	1.865	2.520	4.585	7.560	10.880	19.141	30.978	43.470
8,0	15	32	70	126	190	285	475	800	1.125	1.990	3.025	4.540	8.042	12.625	17.728
	25	54	122	205	320	465	810	1.260	1.870	3.240	5.220	7.120	13.140	21.600	33.210
	40	84	192	327	510	730	1.370	2.065	3.120	5.135	8.395	12.470	21.247	33.669	46.858
10,0	15	41	95	155	250	372	626	1.012	1.465	2.495	3.995	5.860	9.994	16.172	22.713
	25	66	145	257	405	562	990	1.530	2.205	3.825	6.295	8.995	15.966	25.860	35.890
	40	104	216	408	615	910	1.635	2.545	3.600	6.230	9.880	14.390	26.621	41.011	57.560
14,0	15	50	121	205	310	465	810	1.270	1.870	3.220	5.215	7.390	12.921	20.538	29.016
	25	85	195	331	520	740	1.375	2.080	3.120	5.200	8.500	12.560	21.720	34.139	47.218
	40	126	305	555	825	1.210	2.195	3.425	4.735	8.510	13.050	18.630	35.548	54.883	76.534

TABLE

F1

INTERNATIONAL PRESSURE CONVERSION SYSTEM

VALVOIND Srl Via Pascoli, 5 - 24060 Bagnatica (Bergamo) Tel. 035.681919-Fax. 035.684461

Valvoind

valvole industriali

	bar	mbar	pa N/m ²	kpa	Mpa	atm kg/cm ²	psi lbf/in ²	mm.c.a.	torr mm.Hg
bar	1	1000	10 ⁵	100	0,1	1,01972	14,5038	1,01972x10 ⁴	750,064
mbar	0,001	1	100	0,1	10 ⁻⁴	1,01972x10 ⁻³	0,0145038	10,1972	0,750064
pa	10 ⁻⁵	10 ⁻²	1	0,001	10 ⁻⁶	1,01972x10 ⁻⁵	1,45038x10 ⁻⁴	0,101972	7,50064x10 ⁻³
kPa	0,01	10	1000	1	0,001	0,0101972	0,145038	101,972	7,50064
Mpa	10	10 ⁴	10 ⁶	1000	1	10,1972	145,038	1,01972x10 ⁵	7500,64
Atm	0,980665	980,665	9,80665x10 ⁴	98,0665	9,80665x10 ⁻²	1	14,2234	10 ⁴	735,562
psi	6,89476x10 ⁻²	68,9476	6,89476x10 ³	6,89476	6,89476x10 ⁻³	7,03067x10 ⁻²	1	703,067	51,7146
mm.c.a	9,80665x10 ⁻⁵	9,80665x10 ⁻²	9,80665	9,80665x10 ⁻³	9,80665x10 ⁻⁶	10 ⁻⁴	1,42234x10 ⁻³	1	7,35562x10 ⁻²
Torr	1,33322x10 ⁻³	1,33322	133,322	0,133322	1,33322x10 ⁻⁴	1,35951x10 ⁻³	1,93369x10 ⁻²	13,5951	1

mm c. a.	m bar	m c. a.	Kg/cm2	bar	psi	pa	Kpa	Mpa
10	1					100	0,1	
60	6					600	0,6	
100	10					1.000	1,0	
160	16					1.600	1,6	
250	25					2.500	2,5	
400	40					4.000	4,0	
600	60					6.000	6,0	
1.000	100	1,0	0,1	0,1	1,5	10.000	10,0	
1.600	160	1,6	0,2	0,2	2,3	16.000	16,0	
2.500	250	2,5	0,3	0,3	3,6	25.000	25,0	
4.000	400	4,0	0,4	0,4	5,8	40.000	40,0	
6.000	600	6,0	0,6	0,6	8,7	60.000	60,0	
10.000	1.000	10	1	1	14,5	100.000	100	0,10
		16	1,6	1,6	23,2		160	0,2
		25	2,5	2,5	36,3		250	0,3
		40	4,0	4,0	58		400	0,4
		60	6,0	6,0	87		600	0,6
		100	10	10	143		1.000	1,0
			16	16	228		1.600	1,6
			25	25	357		2.500	2,5
			40	40	571		4.000	4,0
			60	60	857		6.000	6,0
			100	100	1.428			10
			160	160	2.286			16
			250	250	3.571			25
			400	400	5.714			40
			600	600	8.571			60
			1.000	1.000	14.286			100
			1.600	1.600	22.857			160
			2.500	2.500	35.714			250

TABLE

F2

PRESSURE - TEMPERATURE RATING

SYMBOL - MATERIAL COMPARATION

VALVOIND Srl Via Pascoli, 5 - 24060 Bagnatica (Bergamo) Tel. 035.681919-Fax. 035.684461

Valvoind

valvole industriali

MATERIAL	NEW ACRONYMS		OLD ACRONYMS	WORKING PRESSURE IN FUNCTION OF TEMPERATURE											
				TEMP °C	-10	100	120	150	200	250	300	350	400		
Grey Cast Iron	EN-GJL-250	EN-JL 1040	GG 25	PN 16	16	16	16	14,4	12,8	11,2	9,6	-	-		
Ductile Iron	EN-GJS-400-18-LT	EN-JS 1025	GGG 40.3	PN 16	16	16	16	15,5	14,7	13,9	12,8	11,2	-		
Carbon steel	A216-WCB	10.619	GS C25N	PN 25	25	25	25	24,3	23	21,8	20	17,5	-		
St.Steel	A351-CF8M	14.408	GX5CrNi19-10	PN 40	40	40	40	37	35	32	28	24	21		
				PN 40				31,1	29,2	27,5	25,8	24	22,6	21,3	20,4
Materiali	TEMP °C	-60	-30	0	50	100	150	200	250	300	350	400	450	500	
GS-C25N	PN 6	-	6	6	6	6	5.7	5	4.5	3.8	3.4	2.75	2.3	-	
	PN 10	-	10	10	10	10	9.3	8	7	6	5.3	4.6	3.8	-	
	PN 16	-	16	16	16	16	15.3	14	13	11	10	8	6.1	-	
GX-7 CrNiMoNb18 10	PN 6	-	6	6	6	6	5.8	5	4.6	3.8	3.4	2.8	2.3	-	
	PN 10	-	10	10	10	10	8.5	7.8	6.5	5	4	3.4	2	0.6	
	PN 16	-	16	16	16	15.6	14	11.5	10.6	9.4	8.4	7.2	6.5	3.75	
GS-C25N GX-7 CrNiMoNb18 10	PN 25	-	25	25	25	25	23.75	22	20	17	16	13	9.7	-	
		-	25	25	25	24.6	23.8	20	17.5	15	13.5	12.8	11.4	8.4	
GS-C25N GX-7 CrNiMoNb18 10	PN 40	-	40	40	40	40	38.1	35	32	28	24	21	15.2	-	
		-	40	40	40	39	37	36	34.5	30.6	28.4	26.2	24.3	23	
GS-C25N GX-7 CrNiMoNb18 10	PN 63	-	63	63	63	63	58.7	50	45	40	36	32	24.5	-	
		-	63	63	63	62	61	59.5	57.7	52	47	43.5	39	35	
GS-C25N GX-7 CrNiMoNb18 10	PN 100	-	100	100	100	100	92.5	80	70	60	56	50	38	-	
		-	100	100	100	100	97.7	95	88.8	80	73	67.4	61.5	55.7	
Materiali	TEMP °C	-60	-30	0	50	100	150	200	250	300	350	400	450	500	

EN MATERIAL NOMINATION		DIN OLD NOMINATION		ASTM EQUAL	MATERIALS
NUMBER	SYMBOLS	NUMBER	SYMBOLS		
CW608N	CuZn38Pb2	2.0401	CuZn 39 Pb 3	-	Hot-pressed brass
CW614N	CuZn39Pb3	2.0401	CuZn 39 Pb 3	-	Brass
CW710R	CuZn35Ni3Mn2AlPb	2.0540	CuZn 35 Ni 2	-	Special brass
CC332G	CuAl10Ni3Fe2-C	2.0970.01	G-CuAl 9 Ni	-	Bronze
CC480K-GS	CuSn10-Cu	2.1050.01	G-CuSn 10	-	Bronze
CC483K-GS	CuSn12-C	2.1052.04	GC-CuSn 12	-	Bronze
EN-JL 1040	EN-GJL-250	0.6025	GG-25	A126-B	Grey Cast Iron
EN-JS 1030	EN-GJS-400-15	0.7040	GGG-40	A536 60-40-18	S. G. (ductile) iron
EN-JS 1025	EN-GJS-400-18-LT	0.7043	GGG-40.3	-	S. G. (ductile) iron
EN-JS 1049	EN-GJS-400-18-U-LT	0.7043	GGG-40.3	-	S. G. (ductile) iron to AD 2000 A4/W3/2 DIN
EN-JM 1030	EN-GJMW-400-5	0.8040	GTW-40	-	Whiteheart malleable cast iron
1.0038	S235JRG2	1.0038	RSt 37-2	A284-B	Constructional steel
1.0315	P235G2TH	1.0315	ST 37.8	-	Constructional steel
1.0460	P250GH	1.0460	C22.8	A105	Forged steel
1.0619	GP240GH	1.0619	GS-C 25	A216-WCB	Cast steel
1.4008	GX7CrNiMo 12-1	1.4008	G-X 8 CrNi 13	-	Cast stainless steel
1.4107	GX8CrNi12	1.4107	G-X 8 CrNi 12	A217-CA15	Chromium steel
1.4301	X5CrNi18-10	1.4301	X 5 CrNi 18 10	A182-F304	Cast stainless steel
1.4308	GX5CrNi19-10	1.4308	G-X 6CrNi 18 9	A351-CF8	Cast stainless steel, austenitic
1.4317	GX4CrNi13-4	-	-	A743 CA6NM	Cast stainless steel
-	X2CrNiMo17-12-2	1.4404	X2CrNiMo17132	A182 F316L	Cast stainless steel
1.4408	GX5CrNiMo19-11-2	1.4408	G-X 6CrNiMo 18 10	A351-CF8M	Cast stainless steel, austenitic
1.4541	X6CrNiTi18-10	1.4541	X 6 CrNiTi 18 10	-	Cast stainless steel
1.4550	X6CrNiNb18-10	1.4550	X 6 CrNiNb 18 10	A182-F347	Cast stainless steel
1.4552	GX5CrNiNb19-11	1.4552	G-X 5 CrNiNb 18 9	A351-CF8C	Cast stainless steel, austenitic
1.4571	X6CrNiMoTi17-12-2	1.4571	X 6 CrNiMoTi 17 12 2	AISI 316TI	Cast stainless steel
1.4581	GX5CrNiMoNb19-11-2	1.4581	G-X 5 CrNiMoNb 18 10	-	Cast stainless steel, austenitic
1.5415	16Mo3	1.5415	15 Mo 3	A182-F1	Forged steel
1.5419	G20Mo5	1.5419	GS-22 Mo 4	A217-WC1	Cast steel
1.7335	13CrMo4-5	1.7335	13 CrMo 4 4	A182 F22-3	Forged steel
1.7357	G17CrMo5-5	1.7357	GS-17 CrMo 5 5	A217-WC6	Cast steel
1.7380	10CrMo9-10	1.7380	10 CrMo 9 10	A182 F22-3	Forged steel
1.7383	10CrMo9-10	-	-	A182 F22-3	Forged steel

**TABLE
F3**

SYMBOL-MATERIAL COMPARISON



VALVOIND Srl Via Pascoli, 5 - 24060 Bagnatica (Bergamo) Tel. 035.681919-Fax. 035.684461

	CAST ALLOY	DESIGNATION	SPECIFICATION	UNS N°	DESIGNATION	CAST ALLOY	SPECIFICATION	UNS N°
ACCIAI INOSSIDABILI	CA15	AISI 410	ASTM-A217, A743	J91150	(19-39)	HU	ASTM-A297	N08004
	CA6NM	AISI 415	ASTM-A743, A487	J91540	330 (15-35)	HT	ASTM-A297	N08605
	CB7Cu-1	AISI 17-4 PH	ASTM-A747, AMS-5398C	J92180	ACI HX	HX	ASTM-A297	N06006
	CD3MCuN	Duplex Grade 1C	ASTM-A890	J93373	AISI 17-4 PH	CB7Cu-1	ASTM-A747, AMS-5398C	J92180
	CD3MN	Duplex Grade 4A	ASTM-A890, A995	J92205	AISI 304	CF8	ASTM-A351, A743, A744	J92600
	CD3MWCuN	Grade 6A Zeron100	ASTM-A890, A995	J93380	AISI 304L	CF3	ASTM-A351, A743, A744	J92500
	CD4MCuN	Duplex Grade 1B	ASTM-A890, A995	J93372	AISI 316	CF8M	ASTM-A351, A743, A744	J92900
	CD6MN	Duplex Grade 3A	ASTM-A890, A995	J93371	AISI 316L	CF3M	ASTM-A351, A743, A744	J92800
	CE3MN	Duplex Grade 5A	ASTM-A890, A995	J93404	AISI 316LN	CF3MN	ASTM-A743, A351	J92804
	CE8MN	Duplex Grade 2A	ASTM-A351, A890, A995	J93345	AISI 317	CG8M	ASTM-A351, A743, A744	J93000
	CF3	AISI 304L	ASTM-A351, A743, A744	J92500	AISI 317L	CG3M	ASTM-A351, A743, A744	J92999
	CF3M	AISI 316L	ASTM-A351, A743, A744	J92800	AISI 347	CF8C	ASTM-A351, A743, A744	J92710
	CF3MN	AISI 316LN	ASTM-A743, A351	J92804	AISI 410	CA15	ASTM-A217, A743	J91150
	CF8	AISI 304	ASTM-A351, A743, A744	J92600	AISI 415	CA6NM	ASTM-A743, A487	J91540
	CF8C	AISI 347	ASTM-A351, A743, A744	J92710	AISI 904L	CN2MCuN		N08904
	CF8M	AISI 316	ASTM-A351, A743, A744	J92900	AISI AL6XN	CN3MN	ASTM-A351, A743, A744	J94651
	CG3M	AISI 317L	ASTM-A351, A743, A744	J92999	Al Bronze Grade A	952	ASTM-B148	C95200
	CG8M	AISI 317	ASTM-A351, A743, A744	J93000	Alloy 20	CN7M	ASTM-A351, A743, A744	N08007
	CK3MCuN	Avesta 254-SMO	ASTM-A351, A743, A744	J93254	Aluminum-Bronze	954	ASTM-B148	C95400
	CN2MCuN	AISI 904L		N08904	Aluminum-Bronze	955	ASTM-B148	C95500
CN3MN	AISI AL6XN	ASTM-A351, A743, A744	J94651	ASTM-A297	HH	ASTM-A297	J93503	
CN7M	Alloy 20	ASTM-A351, A743, A744	N08007	ASTM-A297	HK	ASTM-A297	J94224	
HASTELLOY	CX2MW	Hastelloy C-22	ASTM A494	N26022	Avesta 254-SMO	CK3MCuN	ASTM-A351, A743, A744	J93254
	CW2M	Hastelloy C4C	ASTM-A494, A990	N26455	Carbon Steel	WCA	ASTM-216	J02502
	CW6M	Hastelloy C Mod.	ASTM-A494	N30107	Carbon Steel	WCB	ASTM-216	J03002
	CW12MW	Hastelloy C	ASTM-A494	N30002	Carbon Steel	WCC	ASTM-216	J02503
	CW12MW	Hastelloy C-276	ASTM-A494	N30002	Carbon Steel	LCB	ASTM-352	J03003
	N7M	Hastelloy B Mod.	ASTM-A494	N30007	Carbon Steel	LCC	ASTM-352	J02505
	N12MV	Hastelloy B	ASTM-A494	N30012	Cast Nickel	CZ100	ASTM-A494	N02100
	INCONEL	CY40	Inconel 600	ASTM-A494	N06040	Copper-Nickel 70*30	964	ASTM-B369
CW6MC		Inconel 625	ASTM-A494, MIL-C-24615	N26625	Duplex Grade 1B	CD4MCuN	ASTM-A890, A995	J93372
MONEL	M30C / M35W	Monel Weldable	ASTM A494, QQ-N-288 CE	N24130	Duplex Grade 1C	CD3MCuN	ASTM-A890	J93373
	M35-1	Monel 400	ASTM-A494, A990	N24135	Duplex Grade 2A	CE8MN	ASTM-A351, A890, A995	J93345
	M35-2	Monel	ASTM-A494	N04020	Duplex Grade 3A	CD6MN	ASTM-A890, A995	J93371
	M35-B / M30H	Monel H	ASTM-A494; QQ-N-288 CB	N24030	Duplex Grade 4A	CD3MN	ASTM-A890, A995	J92205
	M35-C	Monel	QQ-N-288 Comp C	N24025	Duplex Grade 5A	CE3MN	ASTM-A890, A995	J93404
	M35-D / M25S	Monel S	ASTM A494, QQ-N-288 CD	N24025	Grade 6A Zeron100	CD3MWCuN	ASTM-A890, A995	J93380
NI AL BR	952	Al Bronze Grade A	ASTM-B148	C95200	Grade 91	C12A	ASTM-217	J84090
	954	Aluminum-Bronze	ASTM-B148	C95400	Hastelloy B	N12MV	ASTM-A494	N30012
	955	Aluminum-Bronze		C95500	Hastelloy B Mod.	N7M	ASTM-A494	N30007
	958	Ni-Al-Brz	ASTM-B148	C95800	Hastelloy C	CW12MW	ASTM-A494	N30002
	964	Copper-Nickel 70*30	ASTM-B369	C96400	Hastelloy C Mod.	CW6M	ASTM-A494	N30107
	CZ100	Cast Nickel	ASTM-A494	N02100	Hastelloy C-22	CX2MW	ASTM A494	N26022
	ACCIAIO CARBONICO	WCA	Carbon Steel	ASTM-216	J02502	Hastelloy C-276	CW12MW	ASTM-A494
WCB		Carbon Steel	ASTM-216	J03002	Hastelloy C4C	CW2M	ASTM-A494, A990	N26455
WCC		Carbon Steel	ASTM-216	J02503	HI-35	HN	ASTM-A297	J94213
LCB		Carbon Steel	ASTM-352	J03003	Inconel 600	CY40	ASTM-A494	N06040
LCC		Carbon Steel	ASTM-352	J02505	Inconel 625	CW6MC	ASTM-A494, MIL-C-24615	N26625
LC2			ASTM-352	J22500	Monel	M35-2	ASTM-A494	N04020
LC3			ASTM-352	J31550	Monel	M35-C	QQ-N-288 Comp C	N24025
ACCIAI SPECIALI	C12		ASTM-217	J82090	Monel 400	M35-1	ASTM-A494, A990	N24135
	C12A	Grade 91	ASTM-217	J84090	Monel H	M35-B / M30H	ASTM-A494; QQ-N-288 C	N24030
	C5		ASTM-217	J42045	Monel S	M35-D / M25S	ASTM A494, QQ-N-288 C	N24025
	HH	ASTM-A297	ASTM-A297	J93503	Monel Weldable	M30C / M35W	ASTM A494, QQ-N-288 C	N24130
	HK	ASTM-A297	ASTM-A297	J94224	Ni-Al-Brz	958	ASTM-B148	C95800
	HN	HI-35	ASTM-A297	J94213		LC2	ASTM-352	J22500
	HT	330 (15-35)	ASTM-A297	N08605		LC3	ASTM-352	J31550
	HU	(19-39)	ASTM-A297	N08004		C12	ASTM-217	J82090
	HX	ACI HX	ASTM-A297	N06006		C5	ASTM-217	J42045
	SC8625		ASTM A487, A148			SC8625	ASTM A487, A148	
	WC6		ASTM-217	J12072		WC6	ASTM-217	J12072
	WC9		ASTM-217	J21890		WC9	ASTM-217	J21890

TABLE

F5

PRESSURE / TEMPERATURE RATING
ANSI VALVES



VALVOID Srl Via Pascoli, 5 - 24060 Bagnatica (Bergamo) Tel. 035.681919-Fax. 035.684461

A105N (NOTE 1,2) - LF2 (NOTE 2)

Table with columns for Temp (°C) and pressure ratings (150, 300, 600, 800, 900, 1500, 2500, 4500) for STANDARD CLASS and SPECIAL CLASS.

LF3 (NOTE 3)

Table with columns for Temp (°C) and pressure ratings (150, 300, 600, 800, 900, 1500, 2500, 4500) for STANDARD CLASS and SPECIAL CLASS.

F304 (NOTE 6) F304H

Table with columns for Temp (°C) and pressure ratings (150, 300, 600, 800, 900, 1500, 2500, 4500) for STANDARD CLASS and SPECIAL CLASS.

F316 (NOTE 6) F316H

Table with columns for Temp (°C) and pressure ratings (150, 300, 600, 800, 900, 1500, 2500, 4500) for STANDARD CLASS and SPECIAL CLASS.

F304L (NOTE 7) F316L

Table with columns for Temp (°C) and pressure ratings (150, 300, 600, 800, 900, 1500, 2500, 4500) for STANDARD CLASS and SPECIAL CLASS.

F44 - F51 (NOTE 9) F53 (NOTE 9)

Table with columns for Temp (°C) and pressure ratings (150, 300, 600, 800, 900, 1500, 2500, 4500) for STANDARD CLASS and SPECIAL CLASS.

F347 (NOTE 8) F347H

Table with columns for Temp (°C) and pressure ratings (150, 300, 600, 800, 900, 1500, 2500, 4500) for STANDARD CLASS and SPECIAL CLASS.

F321 (NOTE 8) F321H

Table with columns for Temp (°C) and pressure ratings (150, 300, 600, 800, 900, 1500, 2500, 4500) for STANDARD CLASS and SPECIAL CLASS.

For welding end valves only. Flanged end ratings terminate at 565°C

For welding end valves only. Flanged end ratings terminate at 565°C

TABLE

G1



A = EXCELLENT

B = GOOD

C = DECENT

D = POOR

Fluid	Chemical Formula	Materials														
		Cast iron	AISI 416	AISI 316	Aluminum	Hastelloy C	Monel K	EPDM HT	BUNA N	Nat.Rubber	Neoprene	Hypalon	Viton	Silicone	PTFE	
Acetaldeide	CH ₃ CHO	D	D	A	D	A	C	B	D	C	D	D		B	A	
Acetato di amile	CH ₃ CO ₂	C	B	A	A	A			D	D		C	C		A	
Acetato di butile	C ₆ H ₁₂ O ₂	B	A	A	A			C	D	D	D	D			A	
Acetato di calcio monoidrato	(CH ₃ COO) ₂ CA*H ₂ O	D		A				A	B						A	
Acetato di etile	C ₄ H ₈ O ₂	C	B	A		A	A	D	C	D	D	D	D	D	A	
Acetato di metile	CH ₃ COO H ₃	C	B	A	A			C	D	D	D				A	
Acetato di piombo triidrato	(C ₂ H ₃ O ₂) ₂ PB*3H ₂ O	D		A				A	B	B					A	
Acetato di potassio	CH ₃ COOK			A				A							A	
Acetato di sodio 5%	CH ₃ COONA	D	C	A	A	A	B	A	B	B		D			A	
Acetato di vinile	CH ₂ = CH-OCOCH ₂	D		A				C							A	
Acetilene	C ₂ H ₂	B	A	A	A			B	C	B	D	D	B		A	
Aceto 21%	/	D		A		A		B	A		B	B	A	A	A	
Acetone	CH ₃ COH ₃	B	B	A	A	A	A	A	D	D			D		A	
Acido acetico 50% - 50 °C	CH ₃ COOH	D	D	A	D	A		B	B	D	A	A	D	A	A	
Acido acetico anidro	CH ₃ COOH	D	D	A	D	A		D	D	D	D	B	D		A	
Acido arsenico	H ₃ ASO ₄	D		A				A	A		A	A	A	A	A	
Acido benzoico 5%	C ₆ H ₅ COOH	D	B	A		A	B	C		C	C	A	A		A	
Acido borico 5% - 90 °C	H ₃ BO ₃	D	C	A	C	A	B	A	A			A		A	A	
Acido bromidrico 90%	HBR	D	D	D		A		D	D	D	D	D	D		A	
Acido butirrico 5%	C ₄ H ₈ O ₂	D	B	A		A		D	D	D	D	C	D		A	
Acido carbonico	H ₂ CO ₃	D	B	B		A	B	A	A	B	B		A	A	A	
Acido cianidrico	HCN		B	A				A	D		C		A	D	A	
Acido citrico 5% - 60 °C	C ₆ H ₈ O ₇	D		A	C	A	B	A	B	D	A		A	A	A	
Acido cloridrico 15% - 20 °C	HCL	D	D	D	D	A	D	B	B		D	A	A		A	
Acido cloridrico 37% - 20 °C	HCL	D	D	D	D	A	D	D	D		D	A	A		A	
Acido cromatico 5% - 21 °C	H ₂ CRO ₄	D	B	A	D			D	D		D	A	A		A	
Acido fluoridrico 20%	HF	D	C	D	D	A	C		D	D	B	C	A		A	
Acido fluoridrico 20% - 60 °C	HF	D	D	D	D	A	D		D	D	D	D	A		A	
Acido fluosilicico	H ₂ SIF ₆	D		B	A			A			B	A			A	
Acido formico 5% - 65 °C	HCOOH	D	B	A	A	A	B		D	D	A	B	D		A	
Acido fosforico 10%	H ₃ PO ₄	D	C	B	D	A	B	B	B	C	B	A	A		A	
Acido fosforico 75%	H ₃ PO ₄	D	D	B	D			B	D		B	A	A		A	
Acido gallico 5% - 90 °C	C ₇ H ₆ O ₅ * H ₂ O	D		A		A			B		B	C	B		A	
Acido lattico 5%	C ₃ H ₆ O ₃	D	C	B	D	A	B	C			A	A		A	A	
Acido maleico	C ₄ H ₄ O ₄	D	D	B	D		A	D	D	D	D	A	A		A	
Acido nitrico >= 40% - 21 °C	HNO ₃	D			D	B	D	A	D	D	D	A	A		A	
Acido nitrico <40% - 21 °C	HNO ₃	D	D	D	D	B	D	A	D	D	D		C		A	
Acido oleico 38 °C	C ₁₈ H ₃₄ O ₂	D	C	B	B	A	A		C		B	B	A		A	
Acido ossalico 25%	H ₂ C ₂ O ₄	D	C	B	D	B		B	D	B	B	B	A		A	
Acido palmitico	C ₁₆ H ₃₂ O ₂	D	B	A	B			A	B	A	D	A	A		A	
Acido picrico 80%	C ₆ H ₂ (NO ₂) ₃ OH	D		A		A	C	D			B	A	A		A	
Acido solforico 10% - 21 °C	H ₂ SO ₄	D	D	B	D	A	D	B	B	C		A	A		A	
Acido solforico 50% - 21 °C	H ₂ SO ₄	D	D	D	D	B	D	D	D	D	D	A	A		A	
Acido solforico 95% - 21 °C	H ₂ SO ₄	D	D	D	D	D	D	D	D	D	D	D	B	A	A	
Acido solforico 95% - 100%	A ₂ SO ₄	D	D	D	D	D	D	D	D	D	D	D	B	B	D	A
Acido solforoso 80% - 38 °C	H ₂ SO ₃	D	D	D	D	A	D	D	D	D		B	A		A	
Acido stearico 90% - 60 °C	C ₁₈ H ₃₆ O ₂	D	B	A	C	A	C		B		B	B		B	A	
Acido tannico 10% - 60 °C	C ₇₆ H ₅₂ O ₄₆	D	C	A	B	A			D	C	B	B	A		A	
Acido tartarico 65 °C	C ₄ H ₆ O ₂	D	B	A	B	A		A	B	A	A			A	A	
Acrilonitrile	CH ₂ CHCN	B	B	A	A		A	D	D	D	D	D	D		A	
Acqua demineralizzata	H ₂ O	D		A	A		A	A	B	B	A	B	A		A	
Acqua di mare	H ₂ O	D	D	B	B	A	A	A	B		A	B	A		A	
Acqua di piscina	H ₂ O	D		A	A			A	A			B			A	
Acqua di scarico	H ₂ O	D	B	A	A	A	A	A	B			B			A	
Acqua distillata	H ₂ O	D	D	A	D	A		A	B		A				A	
Acqua dolce	H ₂ O	C	A	A	A	A	A	A	B	A	A	B			A	
Acqua minerale	H ₂ O	C	B	A	A	A	A	A	B			C			A	
Acqua ossigenata 90%	H ₂ O ₂	D	C	B	D	A	A		D	D	D	A	B	A	A	
Alcool amilico	C ₅ H ₁₂ O	C	B	A	A		A		C		C	B	B		A	
Alcool butilico	C ₄ H ₉ OH	C	B	A	A	A	A		C		B	D			A	
Alcool etilico	C ₂ H ₆ O	C		A	A	A	A	A	B	B	B	B	B		A	
Alcool isopropilico	C ₃ H ₈ O	C		B	A	A	A	A			D	A	A	A	A	
Alcool metilico	CH ₃ OH	D		A	A	A	A	A	B	B	B	B	D	A	A	
Alcool propilico	CH ₃ CH ₂ CH ₂ OH	D		A	A		A	A	D		A	A	A	A	A	
Amido	C ₆ H ₁₀ O ₅	B	B	A	B		A	A	A		A	A	A		A	
Ammine	NH ₂	D	C	A					C						A	
Ammoniaca anidra	NH ₃	D	B	A	D			A	B				D		A	
Ammoniaca soluzioni	NH ₃	C	B	A	D	A	B	A	B	B	B	B	D		A	
Ammoniaca gas 65%	NH ₃	D	D	A	D			B				D		A	A	
Ammonio allume solfato	AINH ₄ (SO ₄) ₂ *12H ₂ O	D		B					B	C	B	C	B		A	
Anidride carbonica	CO ₂	C	A	A	A				B	B	B	B	A	A	A	
Anidride solforica	SO ₃	D	B	A		A			D	D	D	D	A		A	
Anidride solforosa	SO ₂	D	B	A	C	A	A	B	D	D	D	C	A		A	
Anilina 90% - 21 °C	C ₆ H ₅ NH ₂	C	B	A	C	A		B	D	D	D	D	B		A	
Allumina	Al ₂ O ₃	B	B	B	B	A	B	A	A	B	C	B	B		A	
Aria		A	A	A	A		A	A	A			A			A	
Asfalto		A	A	A	A	A	A		D	D	D	D	A		A	

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Fluid	Chemical Formula	Cast iron	AISI 416	AISI 316	Aluminum	Hastelloy C	Monel K	EPDM HT	BUNA N	Nat.Rubber	Neoprene	Hypalon	Viton	Silicone	PTFE
Azoto	N	B	B	A	B			A	B						A
Benzaldeide	C ₆ H ₅ CHO	C	A	A	A			B	D	D	D	D	D		A
Benzene		C	A	A	B		B	D	A	D	C	D	A		A
Benzolo 21 °C	C ₆ H ₆	C	A	A	A	A	B	D	D	D	D	D	B		A
Bicarbonato di sodio	NA H CO ₃	D		A	D		B	A	B	B	B	A	A	A	A
Bicarbonato di potassio 20%	K ₂ Cr ₂ O ₇	D		A	D			A	D	D			A	A	A
Bicromato di sodio biidrato	Na ₂ Cr ₂ O ₇ *2H ₂ O	D		A	D			A	D				A	A	A
Birra		D	A	A	D	A		A					A	A	A
Bisolfato di calcio	Ca(HSO ₄) ₂	D	D	A	D			A	B						A
Bisolfato di magnesio 20%	60°C Ma(HSO ₄) ₂	D		A	B		B	A	A		A	A	A	A	A
Bisolfato di sodio	NAHSO ₄	D	C	A				A			A		A		A
Bisolfato di potassio 20%	KHSO ₃	D	D	A	D			A	D						A
Borace	H ₃ BO ₃	D	C	A	D	A	A		B	B	A	A			A
Borato di potassio	K ₂ B ₄ O ₇ *2H ₂ O	D		A	D			A	B						A
Bromo gassoso	BR	D	D	D		A	C	D	D	D	D	D	B		A
Bromo liquido	BR	D	D	D		A	C	D	D	D	D	D	B		A
Burro		D		A	D			D	A					A	A
Butadiene	C ₄ H ₆	C	B	A					B				B		A
Butano	C ₄ H ₁₀	B	A	A	A	A	A	D	B	D	B	B	B		A
Caffè		D	D	A	D			A	D	A	A	A	A		A
Calce viva	CaO	D		B	A			A	C						
Carbonato di ammonio sol.	(NH ₄) ₂ CO ₃	D		A	D			A	D	B	B				A
Carbonato di bario	BaCO ₃	D			B	A	B	A	A		A				A
Carbonato di bismuto (secco)	Bi(CO ₃) ₂	A	A	A	A			A	A						
Carbonato di calcio	Ca CO ₃	C				A	A	A	A	A	A	A	A		
Carbonato di magnesio	MgCO ₃	D		A	D			A	B		A	A	A		
Carbonato di potassio	K ₂ CO ₃	D		A	A			A	D						
Carbonato di sodio	Na CO ₃	D	B	A	B	A	A	A	A	A		A	A		
Catrame		C	A	A	A	A	A	D	D	D	D	D	B		
Cemento		B	B	A	B			A	B						
Cianuro di potassio	KCN	D		B	D		B	A	B	B	B	A	A	A	
Cianuro di sodio	NaCN	D		A	D			A	A		A				A
Cicloesano	C ₆ H ₁₂	C	A	A	A			D	A	D	D	D	A		A
Clorato di calcio 65%	Ca(ClO ₃) ₂ *2H ₂ O		B	A		A	B				A	A			A
Clorato di potassio	KClO ₃	D		B	D		B	A	C		B	A	A		A
Clorato di sodio	NaClO ₃	D		A	D		B	A	C						A
Clorobenzene 90%	C ₆ H ₅ Cl	C	A	A	A		A	D	D		D	D	B		A
Cloroformio	CH CL ₃	D	B	A	B		A	D	D	D	D	D	A	D	A
Cloruro di amile	C ₅ H ₁₁ CL	C	B	A	A	A		D	D	D	D	D	D		A
Cloruro di alluminio	AlCl ₃	D	D	D	D		A	A	A	A	A	A	A		A
Cloruro di ammonio 5%-80°C	NH ₄ Cl	D	C	B	D	A	B				A	A			A
Cloruro di bario	Ba CL ₂	D				A	B	A	A	A	A	A	A		A
Cloruro di calcio	Ca CL ₂	C	B	B	C	A	B	A	A	B	A	A	A		A
Cloruro di etile 5%	C ₂ H ₅ CL	C	B	A	A	A	B	A	A	C	C	D	A		A
Cloruro ferrico	Fe CL ₃	D	D		D	D	A	B	B	B	B	B	A	A	A
Cloruro di magnesio 4%	MgCL ₂	C	C	B	C	A	B	A	A	A	A	A	A		A
Cloruro di metile (secco)	CH ₃ CL	B	B	A	A		A	D	D	D	D	D	A		A
Cloruro di nickel	NiCL ₂	D		C		A			A		A				A
Cloruro di potassio 25%-60°C	KCl	D		B	B		A	A	B	B	B	A	A	A	A
Cloruro di rame (secco)	CuCP ₂	D	D	C	D		C	A	B		B	B	A	A	A
Cloruro di sodio 30%-82°C	NaCL	D	C	A	A	A	A	A	A	A	A	A	A	A	A
Cloruro di zinco 5%-71°C	ZuCL ₂	D	D	C	D	B	B	A	B	A	A	A	A	A	A
Colla (non tipo volatile)		D	B	A	B		A	B	B		B		A	A	A
Cromato di potassio	K ₂ CrO ₄	D		A	D			A	C						A
Cromato di sodio	Na ₂ CrO ₄ *4H ₂ O	D		A	D		B	A	C						A
Cromo allume	KCr(SO ₄) ₂	D		B				B	C	C	B	C	B		A
Destrosio	C ₆ H ₁₂ O ₆	D	D	A					A						
Detergenti		D		A	B			A	B						A
Diacetone	C ₆ H ₁₂ O ₂	D			A			A	D	D	D	D	D	A	A
Dicloroetano	CH ₃ CHCl ₂	D		C				D	D	D	D	D	B		A
Diclorofluorometano (freon 12)	CCl ₂ F ₂	D	B	A	B		A	D	A		B				A
Dietilammina	C ₄ H ₁₁ N	C	A	A	A			C	D	C	D	D	D		A
Dow therms		B	A	A	A			D	D	D	B	B	A		A
Elio	He	D	B	A	B			A	A						A
Eptano	C ₇ H ₁₆	C	B	A	A			D	A	D	B	B	A		A
Esano	C ₆ H ₁₄	C	B	A	A			D	B	D	B	B	A		A
Etere dietilico	C ₂ H ₅ O ₄ 2H ₅	D		A	A	A	B	D	D	D	D	D			A
Etere isopropilico	C ₆ H ₁₄ O	C	A	A	A	A	A	D	A	D	C	B	A		A
Fanghi di perforazione		B		A			A	D	A	D		A			
Fenolo	C ₆ H ₅ OH	D		A		A	A	D	D	D	D	D	A		A
Fluoro															
Fluoro	F	D	D	D	D		B		B		C	B			A
Fluoruro di alluminio	AlF ₃	D		B			B		B		B		B		A
Fluoruro di sodio 5%-15°C	NaF	D			C	A	B						A		A
Formaldeide 21°C	HCHO	D	B	A	A	A	B	A	B		A	A	A		A
Fosfato di ammonio	(NH ₄) H ₂ PO ₄	D	C	B	D	B	B	A	A	B	A	A			A
Fosfato bisodico	Na ₂ HPO ₄	D		A	D			D	A						A

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Fluid	Chemical Formula	Cast iron	AISI 416	AISI 316	Aluminum	Hastelloy C	Monel K	EPDM HT	BUNA N	Nat.Rubber	Neoprene	Hypalon	Viton	Silicone	PTFE
Fosfato di potassio	KH ₂ PO ₄	D		B				A	A	A	A	A	A		A
Fosfato di sodio 5%	NaH ₂ PO ₄	D	B	A		A	B	A	A	A	A	A	A		A
Fosfato trisodico	Na ₃ PO ₄	B	B	A	B		B	A	B	B	B	B	A		A
Gas artificiale		B	B	A	A			D	A				A		A
Gas coke		B	B	A	D		B	D	B	D	D	D	A	A	A
Gas cloro secco 21°C	Cl ₂	D	C	B	C	A	C	D	D	D	D	B	A		A
Gas d'alto forno		B	B	A	A			D	A				A		A
Gas illuminante		B	B	A	A		A	D	A	D	B	D	A	D	A
Gas naturale		B	A	A	A			D	A	D	D	A	A		A
Gasolio		C	A	A	B	A	A	D	A				A		A
Gelatina		D	B	A	B			A	B	B	B	A	A	A	A
Glicoletilenico	C ₂ H ₆ O ₂	B	A	A	A	A	A	A	A	B	B	A	A	A	A
Glicerina	C ₃ H ₅ (OH) ₃	C	A	A	B	A	B		A		A	A	A	A	A
Glucosio	C ₆ H ₁₂ O ₆	D	C	A	B	A	B		A		A		A	A	
Grassi		A	A	A	A			D	A		B	B			A
Idrocarburi alifatici	C ₄ H ₂ n	B	B	A	B			D	B		B	A	A	B	A
Idrogeno	H	C	B	A	C			A	A	A	A	A	A		A
Idrogeno solforato	H ₂ S	C	C	B	C			A	D	D	B	C	D		A
Idrossido di alluminio	Al (OH) ₃	D		B					B		B		B		A
Idrossido di ammonio	NH ₄ OH	D	B	A	D	A	C	A	B	D	A	A	B		A
Idrossido di bario	Ba (OH) ₂ *8H ₂ O	C	A	A	D				A	D	A	A			A
Idrossido di calcio 50%-8°C	Ca (OH) ₂	C	A	A	D	A	A	A	A	A	A	A	A		A
Idrossido di magnesio	Mg (OH) ₂	C	A	A	B			A	B	B	A	A	A		A
Idrossido di potassio 5%	KOH	C	B	A	D	A	A	A	A	B	A	A	A		A
Idrossido di sodio 50%-50°C	NaOH	D	C	B	D	A	B	A	B	B	B	A	D		A
Idrossido di sodio 50%-80°C	NaOH	D	C	B	D	A	B	A	B	D		B	D		A
Inchiostro		D	B	A	C		B	A	D		A	C	A	B	A
Ipoclorito di calcio	Ca (OCI) ₂		B	B				A	C		B	A	A		A
Ipoclorito di sodio 5%-15°C	NaOCI	D		B	D	A	A	B	D	D	B	B	A		A
Iposolfito di potassio	K ₂ S ₂ O ₃	D	B	A	B			A	A						
Iso-ottano	C ₈ H ₁₈	C	A	A	A	A	A	D	A		B	A	A		A
Kerosene		A	A	A	A	A	A	D	A	D	D	C	A		A
Latte		D	D	A	A	A		A	A	A	A	A	A	A	A
Liquame		D	B	A	B			A	B						
Magnesia	MgO	B	B	A	D		A	A	B		B	A	A		
Melassa	(C ₆ H ₁₂ O ₆)n	D	D	A	D			A			A				
Mercurio- cloruro 3%	HgCl ₂	D	D	C	D	A	B	A	A		A				A
Mercurio	Hg	A	A	A	D	A	A	A	A	A	A	A	A		A
Metafosfato di sodio	(NAPO ₃)n	D		A	D		A	A	B		B	B	A	C	
Metano	CH ₄	B	B	A	A			D	A	D	B	B	A		A
Metasilicato di sodio	Na ₂ SiO ₃	D		A	D		A	A	C						
Metil-acetone (miscela)		C	A	A	A			B	D	D	D	D	D		A
Metil-etil-chetone	C ₅ H ₁₀ O	A	A	A	A			D	D	D	D	D	D		A
Nafta		C	A	A	A	A	B	D	C	D	C	D	A		A
Naftalina	C ₁₀ H ₈	C	A	A	A			D	D	D			B		A
Nitrato di ammonio	NH ₄ NO ₃	C	B	A	D	A	B		A		A	C			A
Nitrato di magnesio	Mg (NO ₃) ₂	D		B	B		B	A	A	A	A	A	A		
Nitrato di potassio	KNO ₃	C	B	A	C	A	B	A	A	A	A	A	A	A	
Nitrato di sodio	Na NO ₃	D	B	A	B	A	B	A	B	B	A	A			
Nitrato ferrico	Fe (NO ₃) ₂	D		A			A	B	C		B	B	A		
Nitrobenzene	C ₆ H ₅ NO ₂	D		A				B	D	D	D	D	B		A
Oleum	H ₂ S ₂ O ₇	D	D	C		B		D	D	D	D	D	A		A
Oli idraulici (base acqua)		B	B	A	A			D	A	B	B		A		A
Oli lubrificanti		A	A	A	A	A	A	D	A	D	B	B	A		A
Oli minerali		C		C		A		D	A	D	B	B	A		A
Olio di cotone		D		B	B		B		A	A	B		A	A	A
Olio di fegato di merluzzo		D		A	D			D	A					A	A
Olio di mais		D		A	A			D	A					A	A
Olio di noce di cocco		D		A	A			B	A					A	A
Olio di oliva				A				B	A	D	B	B	A		A
Olio di ricino		D		A	A			D	A	A			A	A	A
Oli solfonati		B	B	A	B			D	A	A					A
Oli vegetali		D		A	D			D	A					A	A
Ossido di carbonio 30°C	CO	A	A	A	A			A	B						A
Ossido di etilene	C ₂ H ₄ O	B	B	A				D	D	D	D	D	D	B	A
Ossigeno 90°C	O	A	A	A	A	A	A	A	B	C	B	B	A		A
Ossigeno 150°C	O	A	A	A	A	A	A	D	D	D	D	D	B	B	A
Ozono	O ₃	D	B	A	B			A	D			A	A	A	A
Paraffina	Cn H ₂ n + 2	D		A	A		A	D	A		B	B	A		A
Paraformaldeide	(CH ₂ O)n	D		A	A		B	A	D						A
Pasta di legno (sol. acida)		D		A	D			A	B			B	A		A
Pentano	C ₅ H ₁₂	B	A	A	A		B	D	A	B	B	B	A	B	A
Perborato di sodio	Na BO ₃ 4H ₂ O	D	B	A					B		B		A		A
Percloroetilene	C ₂ Cl ₄	C	B	A				D	C	D	D	D	A		A
Perossido di sodio	Na ₂ O ₂	D	B	A	D			A	B	B	B	B	A		
Petrolio grezzo		D	D	B	C	A	B	D	A	D	B	B	A		A

TABLE
G4



A = EXCELLENT
B = GOOD
C = DECENT
D = POOR

Fluid	Chemical Formula	Cast iron	AISI 416	AISI 316	Aluminum	Hastelloy C	Monel K	EPDM HT	BUNA N	Nat.Rubber	Neoprene	Hypalon	Viton	Silicone	PTFE	
Piperazina	(C ₂ H ₄ NH) ₂	D		A	D			D	C							A
Potassa caustica	KOH	D		A	D			A	B							
Potassio allume solfato	AlK(SO ₄) ₂ *12K ₂ O	D		B							B					A
Potassio cianuro	KCN	C	B	A	D				A		A		A			
Propano	C ₃ H ₈	C	A	A	A			D	A	D	A	A	A			A
Rame arseniato (basico)	Cu HAsO ₃	D	B	A	D			A	B							A
Resine		D	A	A	A	A				C	C	C	B			
Rum		D		A	D			A	B							A
Salamoia (soluzione)		D		A			A	A	A		A	A				A
Salsa inglese		D		A	D		B	A	B		A	D	A	D	A	
Sapone liquido		D		A	A			A	B		B		A	B	A	
Silicato di etile	Si(OC ₂ H ₅) ₄	D		A	D			B	C	D	B		A	D	A	
Silicato di potassio	K ₂ SiO ₃	D		A	D			A	D							
Silicato di sodio	Na ₂ SiO ₃	D	B	A	B	A	B	A	A	A	A	A	A			
Skidrol 500		B	A	A	A			A	C		D	D	D			A
Solfato di alluminio	Al ₂ (SO ₄) ₃	D	B	B	D	A			A		A	A			A	
Solfato di ammonio	(NH ₄) ₂ SO ₄	D	C	B	D	B	B	A	A		A	A	A			A
Solfato di bario	BaSO ₄	D		A	B		B	A	A	A	A	A	A	A		
Solfato di calcio (gesso)	CaSO ₄	C	A	A	A		B	A	A	A	A	A	A	A		
Solfato di magnesio	MgSO ₄	C	B	A	A	A	A	A	C	A	A	A	A	A		
Solfato di nickel 20%-60%°C	NiSO ₄	D		B	D		B	A	C		B	B	A	B	A	
Solfato di rame	CuSO ₄	C	B	A	D		D	A	A	B	A	A	A	A		
Solfato ferrico 5%	Fe ₂ (SO ₄) ₃	D		B	D		A	A	A	A	A	A	A	A		A
Solfato ferroso	FeSO ₄	C	B	A	D			B	A	B	B	B	B			
Solfato di potassio 7%	K ₂ SO ₄	D	B	A	A	A	A	A	A	B	A		A	A	A	
Solfato di sodio 80%-15°C	Na ₂ SO ₄	D	B	A	B	A	B	A	A	B	A	A	A	A	A	
Solfato di zinco 25%-80°C	ZuSO ₄	D	B	A	A	A	B	A	A	B	A	A		A	A	
Solfito di potassio	K ₂ SO ₃ *2H ₂ O	D		A				B	C		B	B				A
Solfito di sodio	Na ₂ SO ₃	D		B	D	A	B	B	A	B	B	B	A			
Solfuro di bario	BaS	C	A	D	D				A		A					A
Solfuro di potassio	K ₂ S	D	B	A					A							A
Solfuro di sodio 70%	Na ₂ S	D	B	A	D	A							A			A
Solfuro di cloruro di calcio	CaCl ₂	C	B	A	C	A		A	A	B	A	A	A			A
Soluzioni di iodio		D	D	D	D	A	A		D	D	D	C	C			A
Soluz. zucchero barbabietola		D	A	A	D				A		A	B				
Soluzioni saponose		D	C	A	A	A	B	A	A		A	A	A			A
Solventi per vernici		D	A	A	A		A	D	D	D	D	D	D			A
Succhi di frutta		D	D	A	D	A		B	B		B					A
Tetracloruro di carbonio (secco)	CCl ₄	D	B	B	B		A	D	D	D	D	D	A			A
Tiosolfato di sodio	Na ₂ S ₂ O ₃	D		A	D		A	A	B		B	A	A	B		A
Toluene	C ₆ H ₅ CH ₃	D	A	A	A			D	D	D	D	D	B			A
Trementina	C ₁₀ H ₁₆	D	D	A	B			D	D	D	D	D	A			A
Tributil fosfato	C ₁₂ H ₂₇ O ₄ P	D	C	A				D	D	C	D	B	C			A
Tricloroetilene	CHClCCl ₂	D	B	A	A		A	D	D	D	D	D	A			A
Tricresilfosfato	C ₂ H ₂₁ O ₄ P	D	D	D	D			B	D	D	D	D	A			A
Trietanolanmina	C ₆ H ₁₅ NO ₃	D	D				B	A	B	D	A	A	D			A
Urea	CO(NH ₂) ₂	D		A			A	B	B		A			D		A
Vapore a 150°C		D	D	A	B		A	A	D	D	D	D	D			A
Vaselina	CnH _{2n} +2	B	B	A	B		A	D	A		B	A	A	D		A
Vino		D	D	A	B	A	A	A	A		B	B		A		A
Whisky		D	D	A	B	A	A	A	A		B	B				A
Xilolo	C ₈ H ₁₀	C		A	A			D	D	D	D	D	D			A
Zolfo fuso	S	D	D	B	D	A	D	A			A	A				

A random discovery: polytetrafluoroethylene (PTFE)

The progenitor of fluorinated polymers is polytetrafluoroethylene (PTFE), whose discovery dates back to 1938 by Roy J. Plunkett, employed at the DuPont laboratory in Jackson (USA). It was a completely casual discovery: Plunkett was doing experiments on the fluorinated gaseous refrigerants of Freon. One test involved a sample of tetrafluoroethylene (TFE, the chemical formula is CF₂ = CF₂, i.e. all the hydrogen atom of ethylene is replaced by fluorine atoms) maintained under pressure at low temperature. It was realized that the gaseous product gave rise to a polymerization spontaneous, turning into a solid mass, white and waxy in appearance. The first checks on the characteristics of the new polymer showed that it was in the presence of a material with somewhat singular properties: it did not come practically attacked by any chemical reagent, its surface was so slippery that no material was in it able to adhere to it, it was absolutely hydrophobic. In addition, it did not degrade when exposed to light and possessed a point of very high meltdown; in contrast to known thermoplastic resins, moreover, the polymer did not flow with temperature higher than the melting point. Plunkett and his collaborators sensed that the new material could have considerable application possibilities; in a short time it was understood that it could be transformed into the desired shape by means of a technology conceptually similar to that of the processing of metallurgical powders: ie obtaining blocks for sintering which could then be machined to the tool. Thus was born the Teflon (DuPont registered trademark), marketed starting from the '40s and still today one of the most successful application polymers.

**TABLE
G5**

**CHEMICAL RESISTANCE OF ELASTOMERS TO
WORKING TEMPERATURES**

VALVOIND Srl Via Pascoli, 5 - 24060 Bagnatica (Bergamo) Tel. 035.681919-Fax. 035.684461

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ACRONYM	DENOMINATION		CHEMICAL RESISTANCE	RASH PRODUCTS	TEMPERATURE		γ kg/dmc
	COMMERCIAL	CHEMICAL			COSTANT	MAX	
NR	GOMMA NAT.	Lattice (vegetale)	acqua-aria- gas	acidi - basi - olii	65°	90°	
CR	NEOPRENE	Policloroprene	fluidi refrigeranti-gas-acqua-aria	idrocarburi -acidi -basi	90°	110°	
EPDM	ETILENE-	Gomma etilenica	vapore-salamoia-esteri-chetoni	idrocarburi - olii - grassi	120°	150°	0,0729
	PROPILENE	propilenica	soda caustica				
FKM	VITON	Gomma al fluoro	idrocarburi -solventi - acidi	freon	150°	180°	
NBR	BUNA N	Gomma nitrilica Butadiene	idrocarburi - olii - grassi	elementi ossidanti	90°	115°	
CSM	HIPALON	Polietilene clorosolfanato	acidi deboli-sostanze ossidanti	acido nitrico-vapore- chetoni	100°	120°	
DELRIN	HOSTAFORM	Resina acetica	idrocarburi-etere-olii-grassi		100°	140°	
	NYLON	Poliammide	idrocarburi-benzina-etere-esteri		100°	120°	0,0507
AU	VULCOLAN	Poliuretano	olii -grassi - antiabrasione		80°	100°	0,0597
	TROGAMID	Poliammide	solventi	acidi - basi concentrati	80°	90°	
PE/HD		Polietilene ad alta densità	solventi organici-soluzioni acquose di acidi,basi,Sali	acidi - ossidanti concentrati	60°	80°	
PP	MOPLEN		solventi organici-soluzioni acquose di acidi,basi,Sali di acidi,basi,sali - olii- grassi-etere	acidi - ossidanti concentrati	90°	110°	0.92
PSF	POYSULFON		acidi	soluzioni alcaline	150°	175°	
PTFE	TEFLON	Pentatetra- fluoretilene	solventi - prodotti chimici	composti di fluoro	180°	220°	0,0903
PVC		Cloruro di polivinile	acidi-basi-salamoia-olii emulsionabili	idrocarburi aromatici e clorurati	50°	60°	
PVDF		Fluoruro di polivinile	acidi - basi - acidi organici - alcoli	acido solfor. chetoni- esteri soluzioni alcaline	130°	150°	
Q	SILICONE	Metilvinilsilicone	prodotti alimentari	vapore-solventi- idrocarburi	130°	150°	
	PIREX	Vetro borosilicato	acidi ossidanti - idrocarburi		300°	500°	0,0993
	CERAMICA	Ossido di alluminio	agenti corrosivi	acido cloridrico - fluoridrico	1500°	1800°	3.80

La suddetta tabella è puramente indicativa. Solo l'utilizzatore, con la sua esperienza può determinare la giusta scelta. Molti fattori influenzano il campo di applicazioni: quali ad esempio la purezza, la concentrazione, la soluzione...

TABLE	
G6	PHYSICAL RESISTANCE OF ELASTOMERS

VALVOIND Srl Via Pascoli, 5 - 24060 Bagnatica (Bergamo) Tel. 035.681919-Fax. 035.684461



FEATURES	NBR	FKM	EPDM	EPDM	VMQ	HNBR	FFKM	FVMQ	CR	AU / EU
			zolfo	perossido						
Compression set	1	1	3	1	2	1	3	2	2	3
Resistance to tearing	2	2	3	2	4	1	2	3	2	1
Abrasion resistance	2	2-3	2	2	4	2	3	3	2	1
Resistance to aging	4	1	2	2	1	2	1	1	2	1
Resistance to ozone	4	1	2	2	1	2	1	1	2	1
Resistance to oil and grease	2	1	5	5	3	2	1	2	3	2
Resistance to petrol	4**	2**	5	5	4	3	1	2	3	3
Resistance to hot water [° C]	80**	80**	130	150	100	100**	***	100	80	50
Resistance to steam [° C]	-	-	130	175	120*	-	***	120*	-	-
Heat resistance of standard materials	100	200	130	150	200	150	260	175	100	100
heat existence special materials [° C]	120	-	-	-	250	-	330	-	-	-
Resistance to low standard material	-30	-15	-45	-50	-55	-30	-15	-55	-40	-40
Resistance to low special material	-50	-35	-	-	-	-40	-35	-	-50	-

1 = very good / 2 = good / 3 = medium / 4 = low / 5 = weak

* = short duration / ** = best result only with special materials / *** = depending on the material

MATERIALS		COMMERCIAL
ACM	gomma poliacrilato	
AEM	gomma etilene acrilato	Vamac®
AU / EU	Uretano polietere - Poliuretano	Desmopan®
CR	gomma cloroprene	Neoprene®
EPDM	gomma etilene-propilene-diene	Nordel®
FEP	fluoroetilenepropilene (analogo al PTFE)	
FFKM	gomma perfluorurata	Kalrez®
FKM	gomma fluorurata	Viton®
FVMQ	gomma fluorosiliconica	Silastic LS®
HG	resine con rinforzo in tela	
HNBR	gomma nitrilica idrogenata	Therban®
NBR	gomma nitrilica	Perbunan®
NBR F	NBR con rinforzo in tela	
NR	gomma naturale	
PTFE	Politetrafluoroetilene	Teflon®-
SBR	gomma butadiene-stirolo	Buna Hüls®
TFE / P	gomma tetrafluoretilene-propilene	Aflas®
TPU	poliuretano termoplastico	
VMQ	gomma siliconica	Silopren®

PTFE and fluoroplastomers in comparison		PTFE	PFA	FEP	E-TFE	E-CTFE	PVDF
Specific weight	Kg / m3	2,16	2,15	2,15	1,71		1,68
Continuous use temperature	°C	260	260	205	160		150
Breaking load	MPa	25	29	25	42		44

TABLE

G7

VISCOSITY SPECIFIC WEIGHT

VALVOIND Srl Via Pascoli, 5 - 24060 Bagnatica (Bergamo) Tel. 035.681919-Fax. 035.684461


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VISCOSITY CONVERSION TABLE

Centistokes	Engler	Saybolt	Redwood
		Universal Secondo	Secondo n°1
c.St. mm ² /S	°E	SSU	SRW n.1
1	1	0	0
12	2	65	55
22	3	100	90
30	4	140	120
38	5	175	155
45	6	210	185
60	8	275	245
75	10	345	305
90	12	415	370

Note: There are no factors between these units and the S.I.

Centistokes	Engler	Saybolt	Redwood
		Universal Secondo	Secondo n°1
c.St. mm ² /S	°E	SSU	SRW n.1
115	15	525	465
150	20	685	610
200	26	910	810
300	39	1385	1215
400	53	1820	1620
500	66	2275	2025
750	97	3365	2995
1500	197	6820	6075

The table is only a term of comparison between the various units

SPECIFIC WEIGHTS OF THE MOST COMMON LIQUIDS (g = Kg/dmc) . (t= 15°C - P=760 mmHg)

Acetone	0,79
Acqua	1
Acqua di mare	1,02
Alcool etilico	0,79
Alcool metilico	0,81
Benzina	0,68

Benzenolo	0,90
Birra	1,02
Esano	0,66
Etano	0,68
Gasolio	0,70
Latte	1,03

Nafta	0,76
Pentano	0,63
Olio vegetale	0,92
Olio Idraulico	0,92
Vino	0,95

SPECIFIC WEIGHTS OF THE MOST COMMON GASES (g = Kg/dmc) . (t= 0°C - P=760 mmHg)

Acetilene	1,176
Anidride carbonica	1,965
Aria	1,293
Argo	1,78
Azoto	1,255
Butano	2

Elio	0,179
Etano	1,035
Etilene	1,259
Idrogeno	0,089

Gas naturale	0,723
Metano	0,722
Ossido di carbonio	1,250
Ossigeno	1,429
Propano	1,52
Vapor d'acqua	0,805

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