DOVAL STEEL GROUP

HEBRINOX® PIPE, FITTING AND VALVES

INDUSTRIAL VALVES



Special Alloy Valves



Titanium Alloy Valves



Zirconium Alloy Valves



Nickel Alloy Valves



Hastelloy Alloy Valves



Inconel Alloy Valves

Incoloy Alloy Valves



Monel Alloy Valves



Duplex Alloy Valves

Special Alloy Material Valves

Material Group		Forgings	Castings	Bars
		Spec.No.Grade	Spec.No.Grade	Spec.No.Grade
Titanium alloy	**Titanium**			
	Titanium Gr. 2	B381 Gr. F-2	B367 Gr. C-2	B348 Gr. 2
	Titanium Gr. 3	B381 Gr. F-3	B367 Gr. C-3	B348 Gr. 3
	Titanium alloy			
	Titanium Gr. 5	B381 Gr. F-5	B367 Gr. C-5	B348 Gr. 5
	Titanium Gr. 6	B381 Gr. F-6	B367 Gr. C-6	B348 Gr. 6
	Titanium Gr. 12	B381 Gr. F-12	B367 Gr. C-12	B348 Gr. 12
	Titanium Gr. 7	B381 Gr. F-7	B367 Pd7B	B348 Gr. 7
Nickel base alloy	**Ni**			
	Nickel200	B564 N02200	A494 CZ100	B160 N02200
	Nickel201	B160 N02201		B160 N02201
	Ni-alloy			
	Monel 400	B564 N04400	A494 M35-1/M35-C	B164 N04400
	Monel K500	B865 N05500		B865 N05500
	Inconel 600	B564 N06600	A494 CY40	B166 N06600
	Inconel 625	B564 N06625	A494 CW6MC	B446 N06625
	Incoloy 800	B564 N08800	A351 CT15C	B408 N08800
	Incoloy 800H	B564 N08810		B408 N08810
	Incoloy 825	B564 N08825	A494 CU5MCuC	B425 N08825
	Hastelloy B	B335 N10001	A494 N12MV	B335 N10001
	Hastelloy B-2	B462 N10665	A494 N7M	B335 N10665
	Hastelloy C276	B564 N10276	A494 CW12MW / CW6M	B574 N10276
	Hastelloy C-22	B564 N06022	A494 CX2MW	B574 N06022
	Hastelloy C-4	B574 N06455	A494 CW2M	B574 N06455
	Hastelloy G	B462 N06007		B581 N06007
	Hastelloy G30	B462 N06030		B581 N06030
Zirconium	Zirconium702	B493 R60702	B752 702C	B550 R60702
	Zirconium705	B493 R60705	B752 705C	B550 R60705
Iron base alloy	Duplex stainless steel			
	Duplex S31803	A182 F51(2205)	A890/A995 4A(CD3MN)	A276 S31803
	Super-Duplex S32750	A182 F53(2507)	A890/A995 5A(CE3MN)	A276 S32750
	Super-Duplex S32760	A182 F55	A890/A995 6A(CD3MWCuN)	A276 S32760
	Super austenitic stainless steel			
	904L	A182 F904L		B649 N08904
	254SMO	A182 F44	A351 CK3MCuN	A276 S31254
	AL-6XN	B462 N08367	A351 CN3MN	B688 N08367
	Alloy 20	A182 F20/B462 N08020	A351 CN7M	B473 N08020
	austenitic stainless steel			
	304	A182 F304	A351 CF8	A276 304
	304L	A182 F304L	A351 CF3	A276 304L
	316	A182 F316	A351 CF8M	A276 316
	316L	A182 F316L	A351 CF3M	A276 316L
	316Ti	A182 F316Ti		A276 316Ti
	317	A182 F317	A351 CG8M	A276 317
	317L	A182 F317L	A351 CG3M	A276 317L
	347	A182 F347	A351 CF8C	A276 347
	310	A182 F310	A351 CK20	A276 310
	310S	A182 F310S	A351 CK20	A276 310S
Copper	**Copper alloy**			
	Ni-Al-Br		B148 C95800/C95500	

The above materials are applicable to valve shell. Contact WSV for the valve component materials. Trademarks appeared on the book: SandvikAB for SAF2205/ SAF2507 SPECIALS METALS for Inconel.Monel.Incoloy,Haynes for Hastelloy Allegheny Ludlum for AL-6XN Avesta for 254SMO,SUMITOMO for DP3W/NAR.

Material Character and Application

Material Group		Characteristics	Typical application
Titanium alloy	**Titanium**		
	Titanium Gr. 2	High resistance to pitting, crevice corrosion resistance,High resistance to stress corrosioncracking, corrosion fatigue and erosion.	Chemical processes ,oil refining and Pulp and paper mills equipment.
	Titanium Gr. 3		
	Titanium alloy		
	Titanium Gr. 5	Higher strength with (Al,Mo, Sn ,V) . Higher corrosion resistance in reducitc acid with Pt content.	Chemical processes ,oil refining and Pulp and paper mills equipment.
	Titanium Gr. 6		
	Titanium Gr. 12		
	Titanium Gr. 7		
Nickel base alloy	**Nickel**		
	Nickel200	Superior corrosion resistance to carbon acid solution such as soda calcium carbonate.	Alkali salt and concentrated salt Chemical and oil processes equipm ent.
	Nickel201		
	Ni-alloy		
	Monel 400	Superior corrosion resistance under reducing environment, and stress corrosion cracking resistance.	Chemical processes handing alkali chloride and boiled acid, also for oil refining.
	Monel K500		
	Inconel 600	Superior corrosion resistance to pure water and alkali under oxidizing and high temperature environment; also resistance to stress corrosion cracking by Cl ions.	Chemical and food processes.
	Inconel 625	Superior corrosion resistance under oxidizing and high temperature environment; and superior erosion resistance.	Chemical processes in general.
	Incoloy 800	Superior mechanical strength at high temperature and resistance to carburizing with stabilized structure to be used for long duration; also superior corrosion resistance under humid environment.	Petrochemical and carburizing processes.
	Incoloy 800H		
	Incoloy 825	Superior corrosion resistance to sulfuric acid and phosphoric acid;also resistance to stress corrosion cracking and crevice corrosion.	Chemical processes in general.
	Hastelloy B	Resistance to hydrochloric acid of any concentration up to boiling point , resistance to reducing chloride such as sulfuric acid, phosphoric acid and copper chloride, resistant to high temperature but not suitable under highly oxidizing environment.	Corrosion resistance processes handling chlorine, sulfuric acid, phosphoric acid, acetic acid and hydrogen chloride gas, also for processes handling chloridewith high concentration at high temperature.
	Hastelloy B-2		
	Hastelloy C276	Superior resistance under oxidizing environment, such as wet chlorine gas and chlorine dioxide; also resistance to organic and chloride such as acetic acid and seawater.	Processes handling oxidizing acid, formic acid,acetic anhydride and seawater, also for chemical processes handling fluoride.
	Hastelloy C-22		
	Hastelloy C-4	Higher intergranular corrosion resistance than HastelloyB.	Acetic acid, chemical manure, agricultural pesticide processes.
	Hastelloy G	Superior corrosion resistance to mixed acid of phosphoric acid and oxidizing acid.	Processes handling sulfuric acid and phosphoric acid.
	Hastelloy G30		
Zirconium	Zirconium702	High resistance to pitting, crevice corrosion resistance,High resistance to stress corrosion cracking, corrosion fatigue and erosion. Good in nearly all cases, excellent for high temperature acids.	Nuclear cooling processes, chlorhydric acid ,dilute sulphuric acid and alkali processes equipment.
	Zirconium705		
Iron base alloy	**Duplex stainless steel**		
	Duplex S31803	High cracking corrosion resistance to chloride environment,high corrosion resistance to dilute sulphuric acid and phosphoric acid.	Pulp and paper mills, chemical processes,and seawater service.
	Super-Duplex S32750	Higher stress corrosion cracking resistance than austenitic stainless steel, Higher weldability than ferritic stainless steel and higher acid,pitting and crevice corrosion resistance than CF3M with higher mechanical strength.	Salt manufacturing processes, seawater desalination, and seawater service under chloride environment and dilute sulfuric acid, phosphoric acid formic acid acetic acid and urea production under acid environment also for chemical processes.
	Super-Duplex S32760		
	Super austenitic stainless steel		
	904L	The most superior acid and alkali resistance among all austenitic stainless steel and superior pitting and crevice corrosion resistance to chloride solution as seawater.	Chemical processes for highly concentrated chloride, flue ges desulfurization, acid and alkali reactor,salt manufacturing processes and seawater desalination.
	254SMO		
	AL-6XN		
	Alloy 20	Superior corrosion resistance to nitric acid of any concentration at 60℃ and lower, and to heated dilute oxide.	Chemical processes handing acetic acid alkali,dilute hydrochloricacid, dilute hydrofluoric acid, dilute sulphuric acid and phosphoric acid, also for oil refining.
	Austenitic stainless steel		
	304	Super corrosion resistance to nitric acid phosphoric acid and organic acid.	Pulp and paper mills, chemical processes,and seawater service.
	304L	Higher intergranular corrosion resistance than CF8.	
	316	Higher pitting corrosion resistance than CF8.	
	316L	Higher intergranular corrosion resistance than CF8M.	
	316Ti	Higher intergranular corrosion resistance than CF3M with T.	
	317	Higher pitting and crevice corrosion resistance than CF8.	Power generation, seawater service and oil pipeline.
	317L		
	347	Higher intergranular corrosion resistance than CF8M,carbide stablized with Nb.	Pulp and paper mills, chemical processes,and seawater service.
	310	Sulfurous acid and dilute sulphuric acid with Higher Cr Ni content.	Chemical processes.
	310S		
Copper	**Copper alloy**		
	B148 C95800	Specialized anti-corrosive applications.	General sea water-related service.

Ball Valves



Design standard: API, ASME, EN, ISO, JIS, DIN, BS, GB
Connecting type: Flanged, Wafer, SW, BW, Thread type, etc.
Pressure rating: Class150 LB～2500 LB, 1.0 MPa～42.0 MPa, JIS10K～40K
Size range: NPS3/8 " ～48 " , DN8～DN1200
Operation: Lever, Gear

Design Feature:

- 2pc-3pc
- Soft sealing / Metal sealing
- Full bore / Reduce bore
- Fire-safe design, Anti-static, Blow-out proof stem
- Anti - leakage design packing & packing box
- Stem&seat grease feeding system
- Cavity pressure automatic relief structure
- Double block and bleed (DBB) function
- ISO 5211 mounting pad
- Optional locking device



2-PC ball valve



3-PC ball valve



Metal seated ball valve



Floating ball valve



C95800 ball valve



High temp ball valve



Zirconium ball valve



Trunnion ball valve



Jacketed ball valve

Gate Valves

Design standard：API，ASME, EN，ISO，JIS，DIN，BS，GB
Connecting type：Flanged，SW，BW，Thread type, etc.
Pressure rating: Class150 LB～2500 LB，PN1.0 MPa～42.0 MPa，JIS10K～40K
Size range：NPS1/2 " ～60 "，DN15～DN1500
Operation: Hand wheel, Gear



Design Feature:

- Flexible / Solid wedge disc
- Full bore / Reduce bore
- Bolted bonnet / Pressure seal
- Renewable seat / Integral seat



API 602 gate valve



API 600 gate valve



Duplex gate valve



Pressure seal gate valve



904L gate valve



Titanium gate valve



Titanium knife gate valve



Ni-Al-Br C95800 gate valve



Large size gate valve

Globe Valves

Design standard：API，ASME，EN，ISO，JIS，DIN，BS，GB
Connecting type：Flanged，SW，BW，Thread type, etc.
Pressure rating: Class150 LB～2500 LB，PN1.0 MPa～42.0 MPa，JIS10K～40K
Size range：NPS3/8 " ～16 "，DN8～DN400
Operation: Hand wheel, Gear



Design Feature:

- Full bore / Reduce bore
- Bolted bonnet / Pressure seal
- Integral seat
- Conical sealing surface / Flat sealing surface



Pressure seal globe valve



ASME globe valve



Zirconium globe valve



Y pattem globe valve



DIN globe valve



Ni-Al-Br C95800 globe valve



Large size globe valve



Monel globe valve



904L globe valve

Check Valves

Design standard：API，ASME，EN，ISO，JIS，DIN，BS，GB
Connecting type：Flanged，Wafer，Lug，SW，BW，Thread type, etc.
Pressure rating：Class150 LB～2500 LB，PN1.0 MPa～42.0 MPa，JIS10K～40K
Size range：NPS1/2 " ～60 "，DN15～DN1500



Design Feature:

- Lift / Swing / Dual plate / Vertical type
- Full bore / Reduced bore
- Bolted bonnet / Pressure seal
- Renewable seat / Integral seat



Lift check valve



Dual plate check valve



Titanium dual plate check valve



904L vertical check valve



C95800 nozzle check valve



Pressure seal check valve



Zirconium swing check valve



Titanium swing check valve



Hastelloy swing check valve

Plug Valves

Design standard：API, ASME, EN, ISO, JIS, DIN, BS, GB
Connecting type：Flanged, SW, BW, Thread type, etc.
Pressure rating: Class150 LB～600 LB, PN1.0 MPa～10.0 MPa, JIS10 K -40 K
Size range：NPS1/2 " ～24 " , DN15～DN600
Operation: Lever, Gear



Design Feature:

- Full bore/reduce bore
- Soft sealing/metal sealing
- Packing box structure
- Anti erosion adjustable structure
- 2-Way/ 3-Way
- Double gland seal
- Trunnion design



Metal sealing plug valve



Double gland plug valve



Zirconium plug valve



Piston plug valve



Lockable plug valve



Hastelloy sample valve



904L plug valve



Titanium plug valve



Trunnion plug valve

Butterfly Valves



Design standard：API，ASME，EN，ISO，JIS，DIN，BS，GB
Connecting type：Flanged，Wafer，Lug，BW type, etc.
Pressure rating: Class150 LB～600 LB，PN1.0 MPa～10.0 MPa，JIS10K～40K
Size range：NPS 2 " ～100 " ，DN50～DN2500
Operation: Lever, Gear

Design Feature:

- Double offset/Triple offset
- Zero leakage
- Uni-directional or Bi-directional seal
- Soft or metal seated
- Blow-out proof stem
- ISO 5211 mounting pad



Large size butterfly valve



Double offset butterfly valve



Wafer type butterfly valve



C95800 butterfly valve



Hastelloy butterfly valve



Flanged type butterfly valve



Triple offset butterfly valve



Alloy 20 butterfly valve



Lug type butterfly valve

Control Valves

- Type: Linear (Globe, Gate) or Rotary (Ball, Plug, Butterfly), Special control valve
- Operation: Electric, pneumatic, hydraulic, electro-hydraulic, electro-pneumatic
- Size Range: NPS 1/2”~24”
- Pressure rating: 150 LB~ 900 LB
- Connection type: Flanged, Wafer





Titanium globe control valve



Special control valve



Titanium V-ball control valve



Duplex plug control valve



904L plug control valve



3-Way control valve



Titanium butterfly control valve



Zirconium ball control valve



Discharge control valve

Others



Ball type discharge valve



Jacketed discharge valve



Open upward discharge valve



Hastelloy discharge valve



Open downward discharge valve



Needle valve



Pure nickel strainer



Duplex Y strainer



Titanium basket strainer



Titanium ball



Titanium stem



Flange

Solution for Anti-corrosive Valve

Doval valves for critical applications in chemical and petrochemical process (PTA process, Acetic acid, sulfuric and nitric acid, and chlorine services ,Caustic Soda etc.), Onshore/Offshore (Desalination processing, oil/water separation, Fire Fighting, Cooling system) , FPSO/FSO, Oil&Gas, Water treatment, Refinery, Pulp & Paper, Mining, Power generation etc.





Petro-Chemical

Utilities
Potable Water
PTA Process
Acetic Acid Process



Offshore Oil&Gas

Seawater Injection
Oil/Water Separation
Fire Fighting
Cooling System
Ballast System



Pulp&Paper Industries

CLO2 Bleaching System
Displacement Cooking Process
Black Liquid Evaporator
Waste Water&Acid Recovery



LNG

Fire Water Ring Main
Cooling System
Ballast Water Treatment
Utilities



Power Generation

Power Generation
Sea Water Inlets
Cooling System
Desalination
Desulfurize
Utilities



Naval Marine

HVAC
Ballast System
Chilled Water
Grey Water
Black Water
Fuel System

Engineering Data - Soft Seat Material

Seat

Properties		Nylon	Teflon (unfilled)	PEEK	Delrin	Polyphenylene
Temperature Range °F		-30~250	-100~425	-60~500	-50~200	-50~450
Pressure Rating		900~1500	150~600	150~1500	150~1500	150~300
Mechanical Property	Hardness	D75	D58	D85	R-120	D80
	Tensile Strength (psi)	8700(min)	2100~2400	11000(min)	6600~7500 (min)	2000~2350 (min)
	Elongation (%)	250~290	250	30(min)	220	275~310
Physical Property	Specific Gravity	1.04	2.2	1.3	1.41	1.9~2.1
	Water Absorption (%)	0.2	＜0.01	0.18	0.15	0.1~0.2
	Radiantion	$5*10^6$RAD	10^4RAD	10^9RAD	107RAD	9*106RAD
Service Application		High pressure & Low temperature service	Chemical& Cryogenic service	High pressure &temperature service with steam in radiation environment	High pressure& Low temperature ervice	High temperature High Corrosion service

Sealing

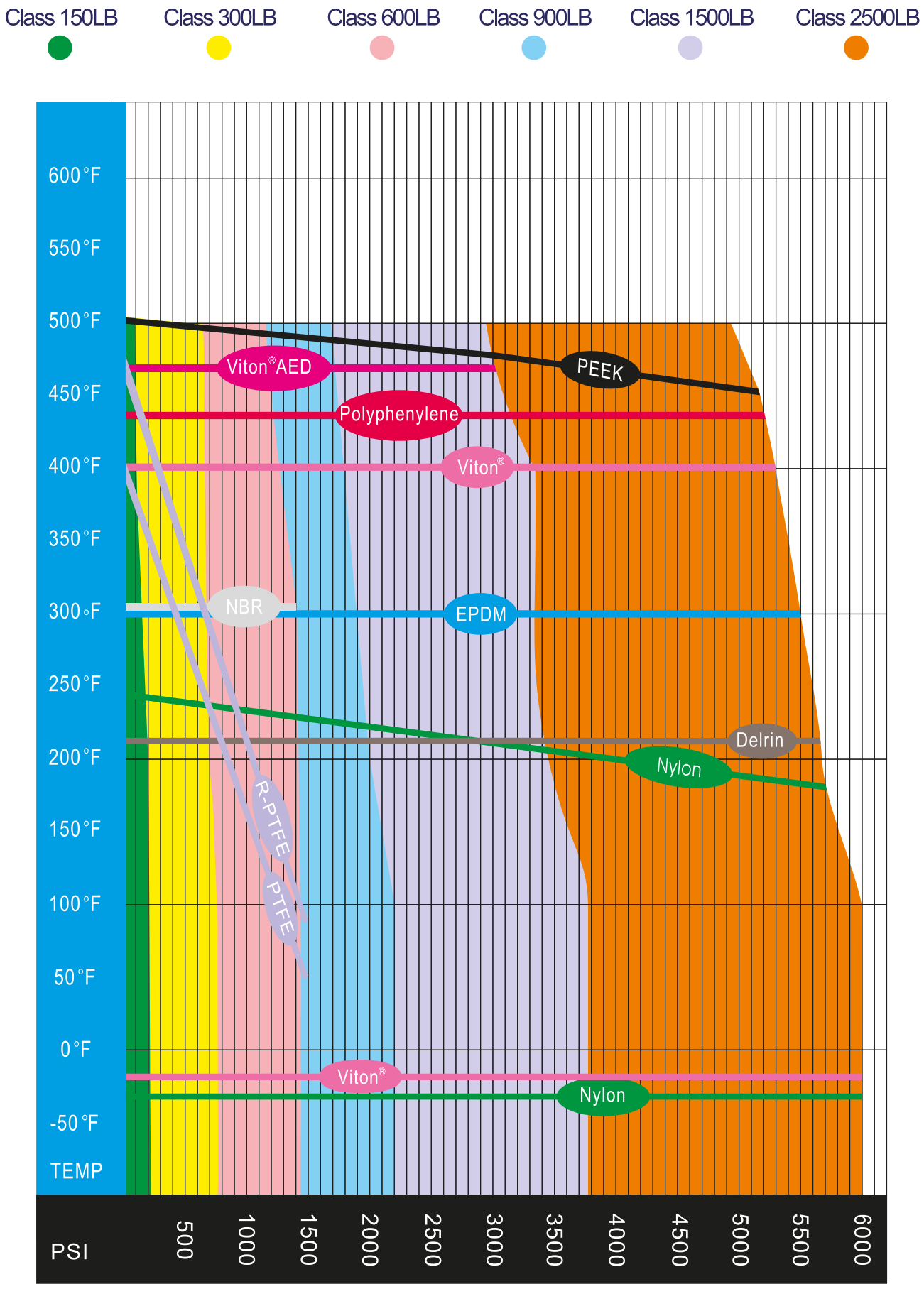
Type	Viton®	EPDM	25% Glass Filled PTFE	NBR	Buna.N
Temperature range °F	-20~400	-60~300	-328~1000	-50~300	-30~250
Service Application	1.85	---	2.24	1.2	1.31
Hardness	D75	D90	D65	D50	D90

Gasket

Type	Flexible Graphite	Spiral Wound Metal+Graphite	Spiral Wound Metal+PTFE
Temperature range °F	-328~1000	-328~1000	-328~500
Service Application	100% Fire-safe	100% Fire-safe	Cryogenic High Corrosion
Hardness	0~14	0~14	0~14

Contact Weidouli for optional requirement of gasket or gland packing other than listed above.

Engineering Data - Pressure Temperature Chart



This chart is just for reference.

Regulations

TS2710457

ISO 14001

1155

OHSAS 18001

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