MATERIAL SPECIFICATIONS - BALL VALVES

BODY AND TRIM MATERIAL

CARBON STEEL
- ASTM A105

LOW TEMPERATURE CARBON STEEL
- ASTM A350 LF2

LOW ALLOY STEEL
- AISI 4140
- ASTM A694 F60
- API 6A 60K (A694 F60 MOD)
- ASTM A694 F65
- ASTM A694 F52

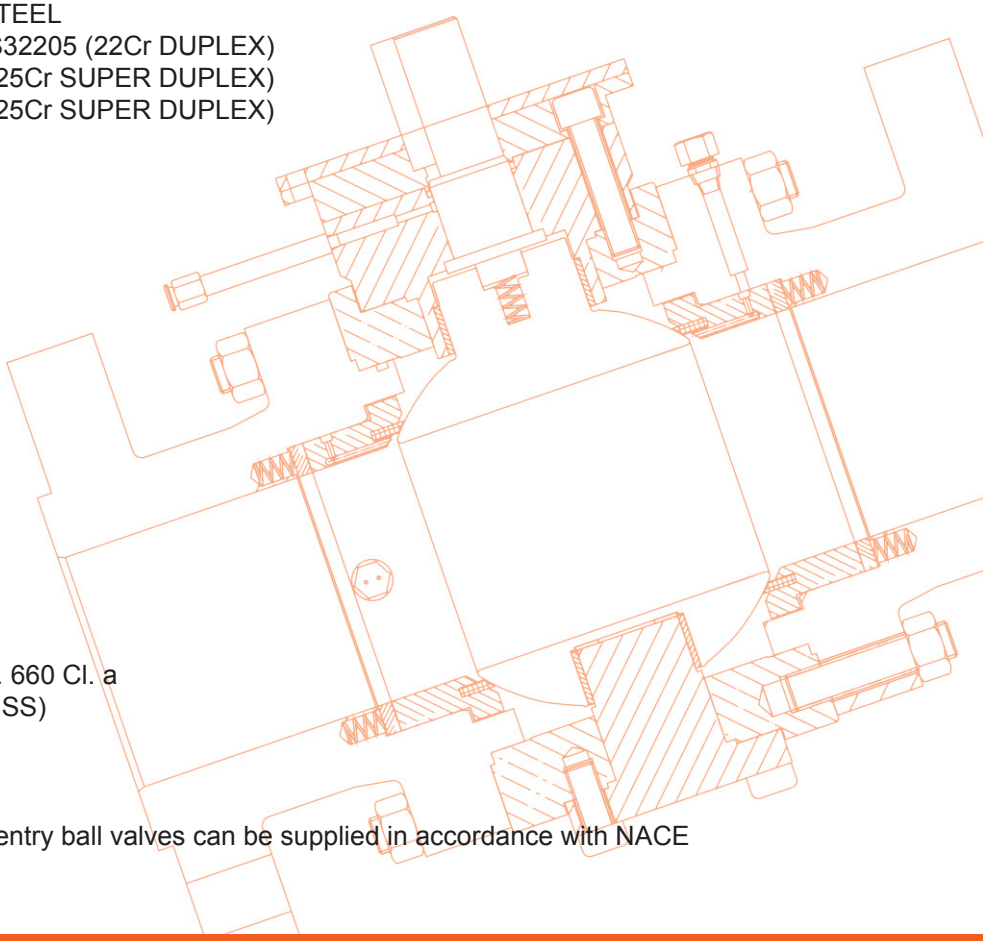
MARTENSITIC STAINLESS STEEL
- ASTM A182 F6A
- ASTM A182 F6NM

AUSTENITIC STAINLESS STEEL
- ASTM A182 F316
- ASTM A182 F316LN
- ASTM A182 F44 (6% MOD)
- ASTM A182 F316 FXM-19

PRECIPITATION HARDENING STAINLESS STEEL
- ASTM A564 Gr. 630 H1150M (UNS S17400)

FERRITIC-AUSTENITIC STAINLESS STEEL
- ASTM A182 F51 - UNS S31803/S32205 (22Cr DUPLEX)
- ASTM A182 F53 - UNS S32750 (25Cr SUPER DUPLEX)
- ASTM A182 F55 - UNS S32760 (25Cr SUPER DUPLEX)

NICKEL ALLOY
- INCOLOY 825 – UNS N08825
- INCONEL 625 – UNS N06625
- INCONEL 750 – UNS N07750
- MONEL K-400 – UNS N04400
- MONEL K-500 – UNS N05500



BOLTS & NUTS

ASTM A193 B7 & A194 Gr. 2H
ASTM A193 B7M & A 194 Gr. 2HM
ASTM A320 L7 & A 194 Gr. 7 or Gr. 4
ASTM A320 L7 & A 194 Gr. 7M
ASTM A320 L43 & A 194 Gr. 7M
ASTM A193 B8 Cl. 2 & A 194 Gr. 8
ASTM A193 B8M Cl. 2 & A 194 Gr. 8M
ASTM A453 B8 Gr. 660 Cl. a & A453 Gr. 660 Cl. a
UNS S31803 & UNS S31803 (DUPLEX SS)

NACE

On request, our trunnion-mounted side-entry ball valves can be supplied in accordance with NACE MR0175/ ISO 15156 requirements.

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SEAT INSERTS & SEAL MATERIAL OPERATING LIMITS

MATERIAL	TEMPERATURE ºC		PRESSURE CLASS*		SIZE*	
	MIN.	MAX.	SEAT INSERT	SEAL	SEAT INSERT	SEAL
NYLON®SMX	-60	140	2500	N/A	NPS 60	N/A
NYLON 12-G (LAURAMID)	-60	100	2500	N/A	NPS 60	N/A
NYLON 6 (DEVLON-V API)	-100	140	2500	N/A	NPS 60	N/A
PEEK - VIRGIN	-100	250	2500	N/A	NPS 36	N/A
PEEK + CARBON/VESPEL	-20	300	2500	N/A	NPS 36	N/A
PTFE GLASS FILLED (25%)	-100	200	300	N/A	NPS 16	N/A
PTFE CARBON FILLED (25%)	-100	265	300	N/A	NPS 16	N/A
PCTFE	-196	150	2500	N/A	NPS 30	N/A
HNBR - Therban	-40	150	600	2500	NPS 60	NPS 60
FKM A/B (VITON A/B)	-29	180	600	2500	NPS 60	NPS 60
FKM GLT (VITON GLT)	-40	200	600	2500	NPS 60	NPS 60
PTFE+ELGILOY SPRING	-196	200	N/A	2500	N/A	NPS 36
GRAPHITE	-240	560	480	2500		NPS 60

* As size increases pressure/temperature ratings can decrease especially seat insert materials. Similarly, with lower temperatures and larger sizes, the pressure/temperature ratings of elastomers and seat inserts is effected. Different brands and grades of seals and elastomers have different temperature ratings.

SEAL MATERIALS

ELASTOMERS

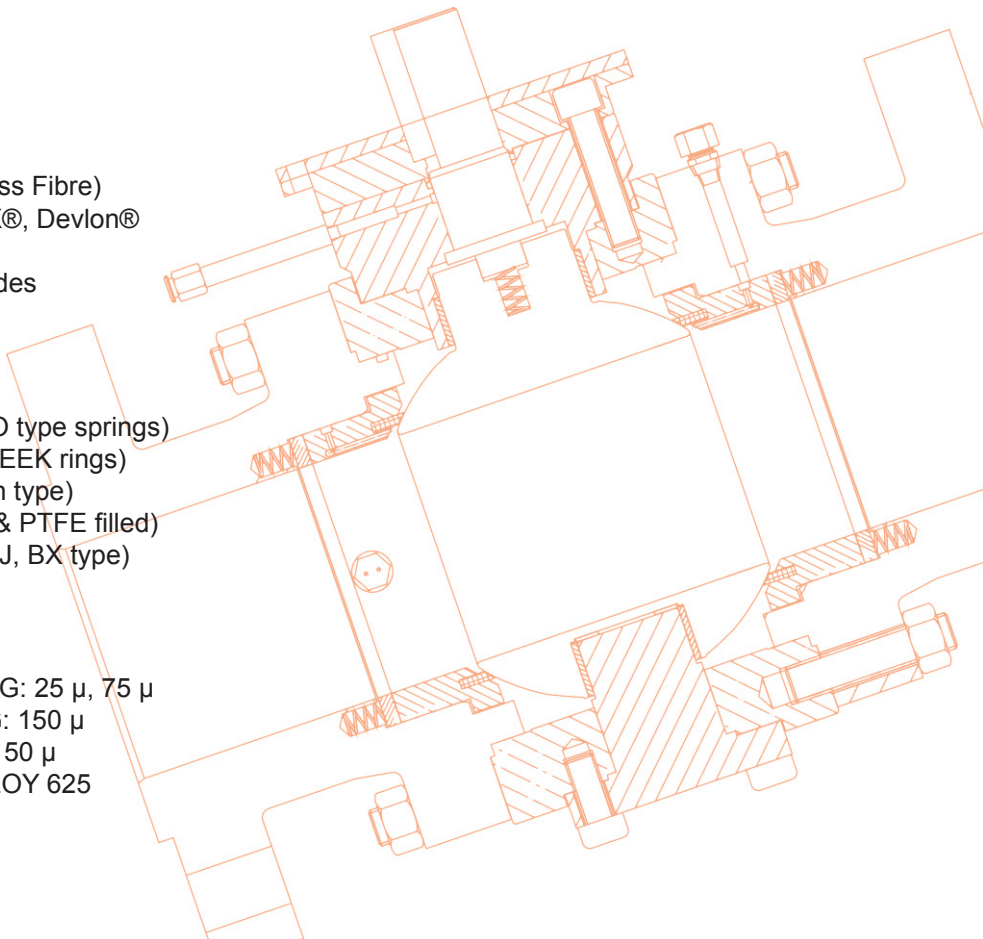
- HBNR: Low temperature & AED
- FKM: Viton® grades B, GF, GLT & AED
- AFLAS compounds
- Elast-O-Lion®: HNBR - 985

THERMOPLASTIC

- VPTFE® (Virgin)
- RPTFE® (Carbon Graphite & Glass Fibre)
- NYLON grades: Lauramid®, SMX®, Devlon®
- PCTFE: KEL-F®
- PEEK: Virgin & Carbon Filled grades
- VESPEL®

STATIC & DYNAMIC SEALS

- Lip Seal (radial & face-seal, U & O type springs)
- Chevron type (PFTE, RPTFE & PEEK rings)
- Graphoil® Packing (Low Emission type)
- Spiral Wound Gaskets (Graphite & PTFE filled)
- Solid Metal Seals (T seal ring, RTJ, BX type)



PLATING/COATING

- ELECTROLESS NICKEL PLATING: 25 µ, 75 µ
- TUNGSTEN CARBIDE COATING: 150 µ
- CHROME CARBIDE COATING: 150 µ
- WELD OVERLAY: AISI 316L, ALLOY 625
- STELLITE

SEAT MATERIALS

H
Seat code

Reinforced PTFE
This material is offered as the standard seal in 150 and 300 class ball valves. 15% glass reinforced PTFE rated suitable for temperatures -60°C to 232°C, chemical resistance is compatible to Virgin TFE with improved cycle life and greater pressure/temperature rating than PTFE. RPTFE seats are furnished with RPTFE body seals and PTFE packing except on firesafe models which are furnished with graphoil packing and body seals.

P
Seat code

Virgin PTFE
This material is the basic seat material used in most floating ball valves. It's chemical compatibility is excellent for almost all media service applications. Temperature range -60°C to 204°C.

C
Seat code

Carbon Filled PTFE
Carbon filled TFE -25% Carbon Graphite with 75% TFE - is good for temperature ranging from -55°C to 270°C. This material offers a wide temperature range with better cycle life than RTFE.

S
Seat code

Stainless Steel Filled PTFE
Combines the strength of metal with the lubricity of TFE. 50% 316 powder combined with 50% TFE. Offers abrasion resistance of metal with higher pressure rating than RTFE. -29°C to 288°C.

Z
Seat code

Delrin (POM)
Special Delrin seats offered for higher pressure and lower temperature service. They can be used in high pressure air, oil and other gas media but are not suited for strong oxidizing. Temperature rating -50°C to 100°C. Delrin seats are usually furnished complete with 90 durometer Viton B body seals.

E
Seat code

PEEK
Polyetheretherketone - high pressure semi-rigid elastomer. Best suited for high pressure and temperature service. Also offers very good corrosion resistance. Temperature rating -56.6°C to 288°C.

N
Seat code

NYLON/DEVLON
Nylon (polyamide) seats are offered for higher pressure and lower temperature service. They can be used in high temperature air, oil and other gas media but are not suited for strong oxidizing. Not recommended for water. Temperature rating -100°C to 150°C.

Y
Seat code

UHMW Polyethylene
Ultra-high molecular weight Polyethylene, ideal for use in low level radiation service. This seat also meets the requirements of the tobacco industry where TFE is prohibited and it offers excellent resistance to abrasive media. Temperature range -56.6°C to 93°C.

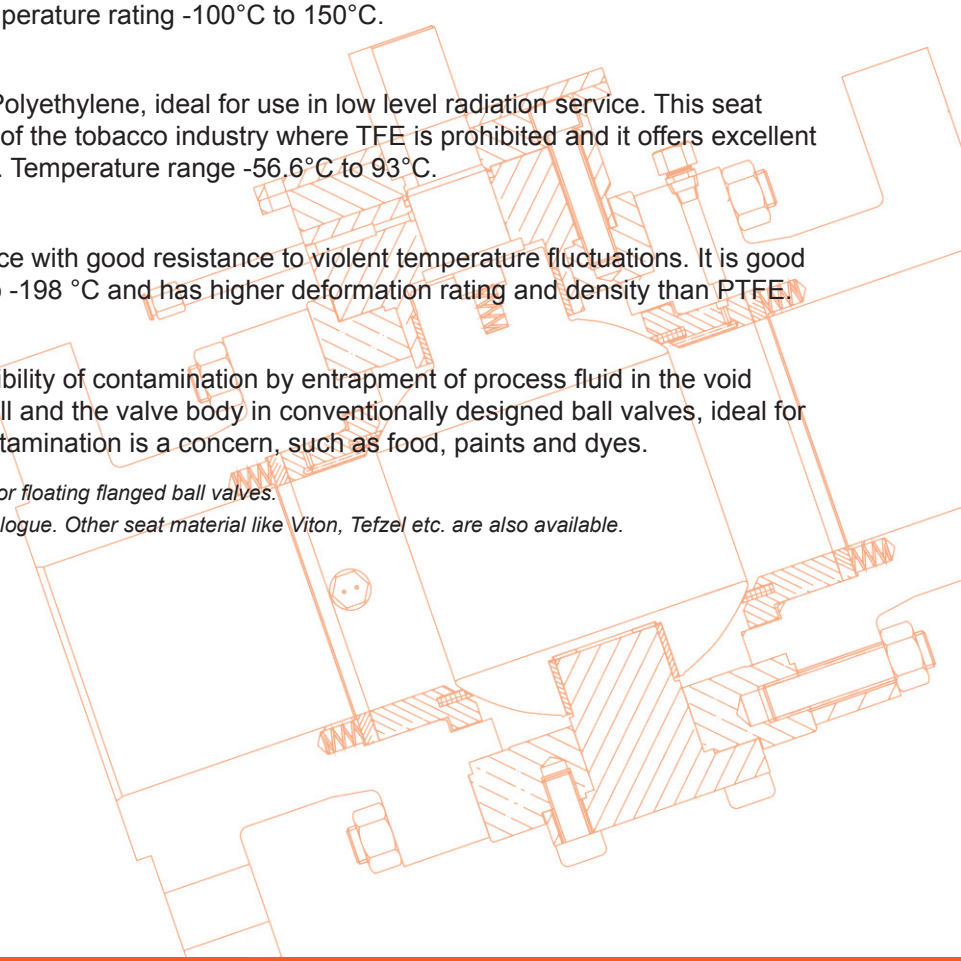
K
Seat code

Kel F
Recommended for cold service with good resistance to violent temperature fluctuations. It is good for cryogenic service down to -198 °C and has higher deformation rating and density than PTFE.

X
Seat code

Filled Cavity
Designed to reduce the possibility of contamination by entrapment of process fluid in the void normally found behind the ball and the valve body in conventionally designed ball valves, ideal for applications where cross contamination is a concern, such as food, paints and dyes.

Note: Australian Pipeline Valve seat code shown is for floating flanged ball valves.
For trunnion ball valves seat code numbers see catalogue. Other seat material like Viton, Tefzel etc. are also available.



SEAT INSERTS & SEAL MATERIAL OPERATING LIMITS

SEALS MATERIALS					
	MATERIAL TYPE	TEMPERATURE RANGE °C	TEMPERATURE RANGE °F	APPLICATION	RECOMENDATIONS
STANDARD	REINFORCED **PTFE** 20% Carbon + 5% Graphite	-190 +250	-310 +482	Medium pressure Low/High temperature	Higher temperature and Pressure than Virgin PTFE. Good for Steam Service
	VIRGIN **PTFE**	-196 +200	-319 +392	Low pressure Low torque - Low temperature	All services subject to temperature limitation
	REINFORCED **PTFE + BRONZE**	-196 +250	+310 +482	Medium pressure Low//High temperature	Auto lubricant properties - recommended for steam
HIGH PERFORMANCE	**DEVLON - V** POLYAMIDE - NYLON	-100 +155	-148 +311	High pressure High temp - Low temperature	H2S and Hydrocarbons
	GRAPHITE	-90 +350	-130 +662	Low pressure High temperature	Not suitable for high cycles or automated valves
	DELRIN ACETAL RESIN	-70 +95	-94 +203	High pressure Low temperature	Hydrocarbons, NACE. Co2. Do not use for oxygen
	PEEK POLYETHER KETONE	-80 +250	-62 +482	High pressure High temperature	Hydrocarbons, Nace. For Tobacco and Nuclear Service
	VESPEL SP 21 POLYIMIDE	-200 +260	-328 +500	High pressure High temperature	Good Chemical Resistance. For Gas, Oil, Petroleum. Not for Steam
	UHMWPE POLYETHILENE	-150 +150	-240 +300	Low pressure Low torque	Food and Tobacco industries. Nuclear Service.
	KEL'F PCTFE	-196 +150	-319 +302	High pressure Low temperature	Like virgin ptfe but improved resistance to nitric acid, hydrofluoric acid and liquid oxygen
	PFA	-60 +250	-76 +482	Medium pressure Low/Medium temperature	Lower porosity - Particularly Good to Avoid Polymerisation
	METAL SEAT (tungsten carbide or chrome carbide)	-200 +500	-328 +932	High pressure High temperature	Abrasion and high temperature applications

SEATS MATERIALS					
	MATERIAL TYPE		TEMPERATURE RANGE °C		APPLICATION
O-RINGS	**NITRILE**	**NBR**	-30	+120 CONTINUOUS +150 INTERMITTENT	Water
	HYDROGENATED NITRILE	**HNBR**	-46	+160 CONTINUOUS +180 INTERMITTENT	H2S, crude oil, hydrocarbons, small concentration of methanols
	MODIFIED HYDROGENATED NITRILE	**HNBR-LT**	-55	+160 CONTINUOUS +180 INTERMITTENT	H2S, crude oil, hydrocarbons, small concentration of methanols
	FLUROELASTOMERS (VITON B)	**FKM**	-20	+220 CONTINUOUS +230 INTERMITTENT	Sour gas, hydrocarbons
	FLUROELASTOMERS (VITON AED)	**FKM**	-29	+230 CONTINUOUS +250 INTERMITTENT	Sour gas, hydrocarbons
	FLUROELASTOMERS (VITON GLT)	**FKM**	-46 (-40 continuous)	+220 CONTINUOUS +250 INTERMITTENT	Sour gas, hydrocarbons
	PERFLUROELASTOMERS (CHEMRAZ 526)	**FFKM**	-25	+315 CONTINUOUS +350 INTERMITTENT	Sour gas, hydrocarbons, high % of methanol
	PERFLUROELASTOMERS (KALREZ)	**FFKM**	-25	+325	Sour gas and corrosive fluids
	AFLAS	**FEPM**	+5	+200	Amine / Methanol service
	SILICON+PFA		-60	+250	Low temperature applications/ Good Chemical Resistance
SPECIAL	**EXPANDED GRAPHITE**		-240	+680	Used on Metal Seated High Temperature valves
	LIP SEALS		-196	+260	Good for Chemical Resistance

FIRE SAFE SEAL				
	MATERIAL TYPE	TEMPERATURE RANGE °C		APPLICATION
	GRAPHITE	-200	+400	All - excluding clean services

~ Fast Track Valve Manufacturer ~

Australian Pipeline Valve provides this technical information to assist the valve community. Please share and refer us to any specifiers or purchasers of valves/actuators within your network.

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