

PAL BUTTERFLY VALVE DESIGN FEATURES

A high strength durable and compact butterfly valve capable of working in high pressure and temperature environments.

Valves are manufactured in a wide range of standard and exotic materials for corrosion resistance against various aggressive chemicals, acids, alkalies and gasses.

The shafts being eccentric to the disc combined with low coefficient of friction seals and bearings, results in the valve having lower operational torques compared to other designs of butterfly valves. Substantial savings are thus guaranteed when considering the costs of valve automation.

The self energising body seal ring as described below combines the unique strength of PTFE, UHMWPE and PEEK with the resilience of elastomeric type "O" rings, resulting in a long life zero leakage simple to replace at low cost valve seal.

A positive disc to drive shaft connection using a keyed or spline drive system, which eliminates the use of taper pins or fasteners. This also allows for simple and quick disengagement for maintenance purposes.

The one piece shaft offers superior strength under higher pressure conditions.

THE NEW PAL T TYPE PRESSURE ENERGISED DISC SEAL

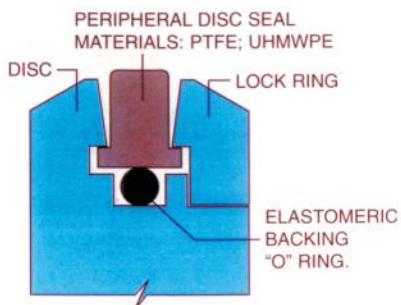


Figure 1
The diagram shows the valve in assembled condition, opened and under no pressure. The lock ring and butterfly body have shoulders which loosely capture the "T" shaped seal. The seal is positively retained in position by an "O" ring.

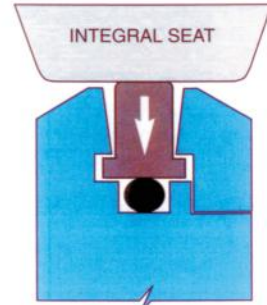


Figure 2
The diagram shows the valve in a closed position but under no pressure conditions and contacting the integrally machined disc seat. The seal ring being dimensionally slightly smaller than the disc bore, compresses itself and forces the "O" ring to compress further. The T seat moves away from the body and seat ring shoulders- The "O" ring exerts an upward force that continually energises the body seal maintaining contact between seal and seat.

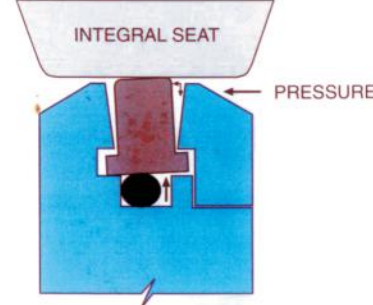
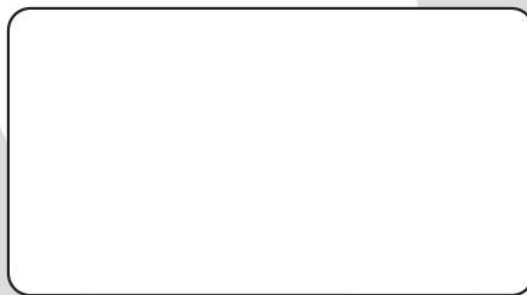


Figure 3
The diagram indicates pressure applied from one side of the disc in a closed position. The line pressure automatically exerts an upward force on the underside of the "T" seal, increasing the pressure of the seal at the contact face. The higher the pressure, the tighter the seal. When the disc moves to an open valve position the tension is lost and the components revert to a relaxed position.

DISTRIBUTOR



PALTECH

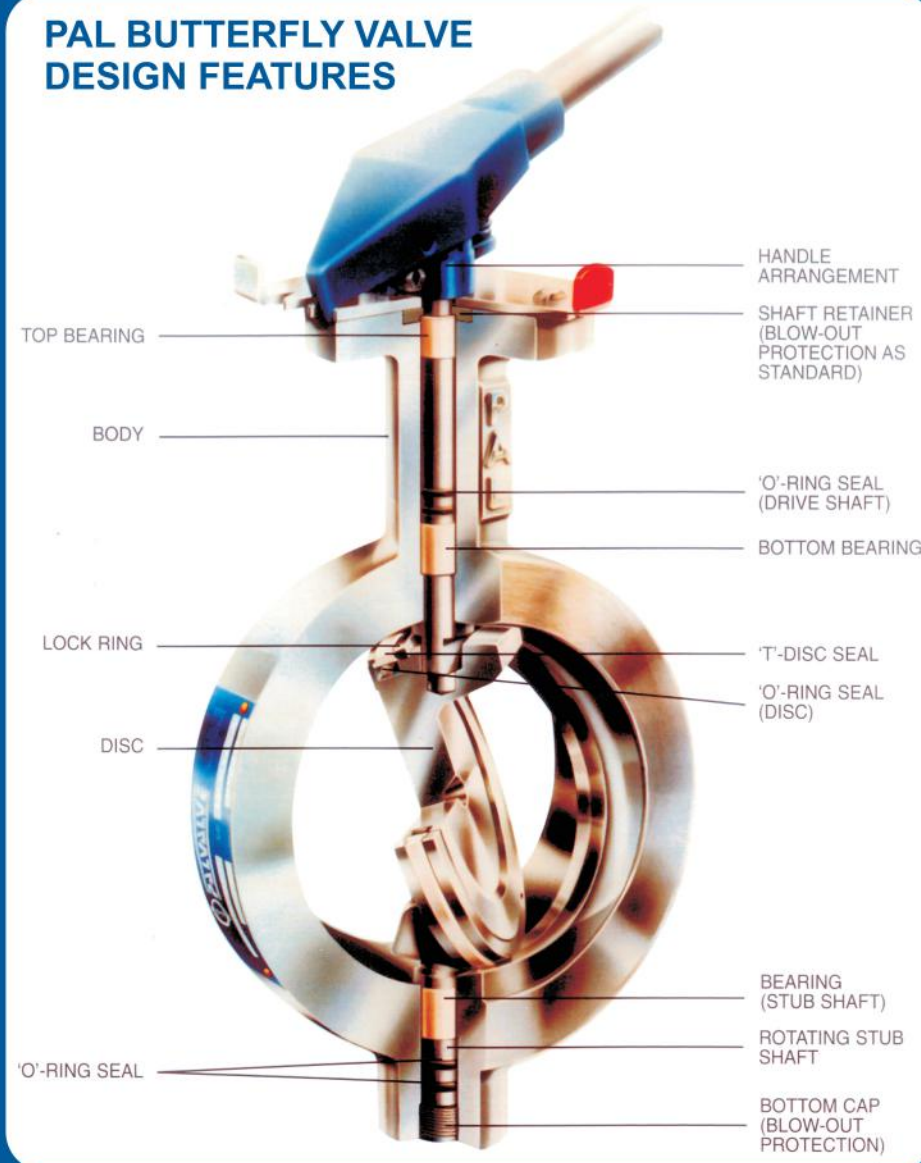
ADVANCED VALVE TECHNOLOGY



T-BAR
A NEW
ANGLE ON
PRESSURE

**LOCALLY
MANUFACTURED
VALVES**

PAL BUTTERFLY VALVE DESIGN FEATURES



A NEW GENERATION OF PAL BUTTERFLY VALVES

On going research and development of a unique design of butterfly valve, capable of handling higher pressures and temperatures and more aggressive process conditions than conventional butterfly valves.

An ideal substitute for ball and plug valves.



MATERIAL SELECTION & CONSTRUCTION

A SIMPLE NUMERICAL/ALPHABET SYSTEM TO IDENTIFY OF CONSTRUCTION

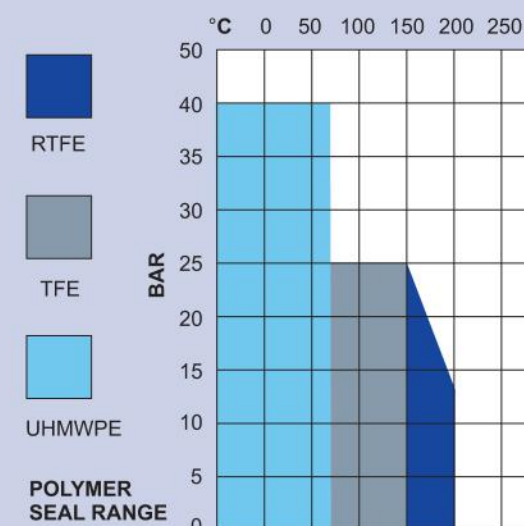
REF NO. PIPE SIZE	BODY MATERIAL	DISK MATERIAL	SHAFT MATERIAL	DISK SEAL	BODY & SHAFT "O" RINGS	OPERATION
2 50	L LM25 ALUMINIUM	L LM25 ALUMINIUM	4 304 ss	P PTFE	N NITRILE	L LEVER OPERATOR
3 80	N LM25 HARD ANODISED	N LM25 HARD ANODISED	6 316 ss	R FILLED PTFE	V VITON	LU LEVER OPERATOR WITH LOCK UP
4 100	W CARBON STEEL (ENC)	W CARBON STEEL (ENC)	57 EN57 (17-4PH)	U UHMWPE	S SILICONE	B BARE SHAFT
5 150	S CF8M STAINLESS	S CF8M STAINLESS	10 CD 4	K PEEK	F F.E.P	G GEAR OPERATOR
6 200	STEEL	STEEL	9 904 L	M METAL	E EPDM	P PNEUMATIC
40 BAR	D CD4 MCu. DUPLEX	D CD4 MCu. DUPLEX	28 PAL 28			
7 250	STAINLESS STEEL	STAINLESS STEEL	8 MONEL 400			E ELECTRIC
40 BAR	A ALLOY 20-CN7M	A ALLOY 20-CN7M	2 RUTHALLOY			H HYDRAULIC
8 200	E PAL 28	E PAL 28				
9 250	B CB7-PH.	B CB7-PH.				
	M MONEL - M35	M MONEL - M35				
	R RUTHALLOY	R RUTHALLOY				

EXAMPLE: 100mm ALLOY 20 VALVE WITH 904L SHAFTS. REINFORCED PTFE DISC SEAL RING. VITON DISC AND SHAFT SEALS WITH LEVER AND LOCK UP ATTACHMENT. BY USING THE LEGEND, THE ABOVE DESCRIPTION IS CONVERTED TO A TYPE:

SIZE	BODY - DISK - SHAFTS	BODY SEAL	"O" RINGS	OPERATION
4	AA9	R	V	LU

MATERIAL CHARACTERISTICS

CF8M:	COMMONLY USED ALLOY FOR A WIDE RANGE OF APPLICATIONS COVERING WEAK TO MILD ACIDS. ALKALIES AND WHERE PRODUCT CONTAMINATION RESISTANCE IS ESSENTIAL.	CD4:	A HIGH CHROME SUPER STAINLESS OR "DUPLEX" STAINLESS STEEL FOR IMPROVED RESISTANCE AGAINST CHLORIDE ENVIRONMENTS AND STRESS CORROSION. OFTEN MORE SUITABLE FOR HIGHER TEMPERATURE ACIDS AND SALTS.
CN7M:	A HIGHER NICKEL, CHROME ALLOY FOR IMPROVED CORROSION RESISTANCE FOR VARIOUS ACID APPLICATIONS SHOWING PARTICULARLY GOOD RESULTS FOR SULPHURIC ACID ACROSS A WIDE RANGE OF TEMPERATURES AND CONCENTRATIONS.	PAL28:	AN ALLOY SIMILAR TO CN7M (ALLOY 20) BUT CONTAINING HIGHER NICKEL, CHROME AND MOLYBDENUM CONTENTS FOR IMPROVED CORROSION RESISTANCE FOR STRONG ACIDS DEAERATED AND WHERE CHLORIDES ARE PRESENT.
LM25:	A LIGHT WEIGHT ALUMINIUM ALLOY WITH SILICON, HEAT TREATED FOR GENERAL PURPOSE APPLICATIONS. IN THE HARD ANODISED FORM THE APPLICATIONS ARE WIDER DUE TO THE SURFACE STRUCTURE BEING CONVERTED TO A HARD FORMATION OF ALUMINIUM OXIDE, VEGETABLE OILS, PHARMACEUTICALS, PETROL AND DIESEL ARE SOME OF THE MANY APPLICATIONS.	CB7:	A CHROME NICKEL STEEL WHICH IS PRECIPITATION HARDENED FOR APPLICATIONS WHERE HIGH ABRASION RATES ARE ANTICIPATED.
		WCB:	A COMMON REFINERY TYPE CAST CARBON STEEL ALLOY FOR HIGH TEMPERATURE CONDITIONS. BODIES AND DISCS ELECTROLESS NICKEL COATED FOR CORROSION RESISTANCE. SUITABLE FOR NON CORROSIVE CONDITIONS SUCH AS DIESEL AND PETROL.



VALVE SPECIFICATIONS

- F-F DIMENSIONS ARE TO API 609 CLASS B
- BODY FLANGES SUITABLE FOR BS4504 T25, T40, T64, ASME/ANSI B16.5 CLASS 300, BS 10 F&H.
- MOUNTING PADS AND OFFSET SQUARE ON SHAFTS ARE TO ISO 5211 STANDARDS.
- SERRATED SPIRAL FINISH ON FACES ARE TO ASME/ANSI B16.5

TORQUE FIGURES Nm

VALVE SIZE(mm)	DIFFERENTIAL LINE PRESSURE Kpa							
	0	600	1000	1200	1600	2000	2500	4000
50	4	10	11	14	17	21	26	34
80	12	13	25	28	38	50	63	100
100	15	32	38	44	53	63	75	113
150	55	75	113	119	130	175	195	250
200	60	95	125	140	165	225	*	*
250	68	175	255	283	343	402	*	*

TORQUE FIGURES IN PTFE INCLUDE 25% SAFETY FACTOR

* Consult Factory

FLOW COEFFICIENT CV.

VALVE SIZE(mm)	DEGREES OPEN								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
50	0.3	4	11	24	42	64	89	115	143
80	0.3	15	40	67	100	137	190	255	316
100	3	24	66	92	151	220	331	491	645
150	26	81	136	201	314	471	718	976	1247
200	33	177	321	523	802	1197	1737	2607	3827
250	19	168	393	677	1125	1577	2276	3570	5200

AS DETERMINED BY THE LABORATORY FOR ENERGY RAU CV IN US GAL/min.