

Double Metal Liner

Material for shell is forged steel ASTM1045. Normalizing hardness degree is 160BHN (HB180-200), percentage elongation 17% ($\delta > 17\%$), tensile strength not less than 85000PSI ($\sigma_b > 610\text{Mpa}$), Flexural Strength not less than 60000PSI ($\sigma_b > 450\text{MPa}$) and shell with HP.

Sleeve material is high chrome centrifugal, which is chrome containing 26-28%, its thickness 0.25~0.35 inch quenching hardness HRC59-67.

Its Chemical Composition Table is as following

Element	C	Cr	Si	Mn	Mo	V	S、P
Content	2.8%-3.1%	26%-28%	0.6%-0.9%	0.5%-1%	0.5%-0.8%	0.1%-0.2%	<0.05%

Some special chemical composition will be adopted to use on the sleeve according to the requirement of the client or special working conditions

under normal working conditions Hour of Service Life of each liner reach more than 1000 hours



High Frequency, Carburization & quenching Liner

Material ASTM1020 seamless steel tube or forged steel. The bore will be carburized first and then High Frequency quenching. The thickness of Carburized layer is more than 1.5mm and hardness of the bore is HRC58-62 under normal working conditions Hour of Service Life of each liner reach more than 300 hours



Chrome-plated Liner

Material is ASTM1045 or ASTM5140 seamless steel tube or forged steel. Thickness of chrome plated is 0.15~0.2mm and hardness of its bore is HRC58-60 under normal working conditions Hour of Service Life of each liner reach more than 300 hours



Zirconia liner manufactured by the Phase Transformation & Toughness Built-up technology has various advantages such as wear resistance, corrosion-resisting, high pressure resistance, high temperature resistance and high strength & hardness, which made the service life of each liner reach more than 4000 (four thousand) hours and based on the feedback information from our customers, the service life for some liners can reach to 10000 (ten thousand) hours and it is five to ten times of the double metal liner.

The circuit of our manufacturing technology is as following:

Choice raw material – dry powder over heat – semi-finished product sintering – examination & inspection – cutting & grind processing of the sleeve & shell – hot mount – grind the inner hole – inner hole honing – CNC lathe fine processing the dimensions of each part.

Properties of engineering ceramic liners

NO	Properties	Units	Values	Note
1	Composition	%	Y2O3+ZrO2 ≥ 99.5%	ZrO2 ≥ 95%
2	Density	g/cm ³	5.95-6.05	
3	Flexural Strength	Mpa	800-1200	
4	Tensile Strength	Mpa	500-600	
5	Weibull Modulus	M	>30	
6	Compressive Strength	Mpa	>1950	
7	Modulus of Elasticity	Gpa	200	
8	Poisson `s Ratio		0.31	
9	Hardness	HV0.3kg/mm ²	>1120	HB ≥ 87
10	Fracture Toughness	Mpa ^{1/2}	8-10	
11	Average Grain Size	μm	0.4-0.6	
12	Thermal Conductivity	W/m*K	3.08	



OLEC Engineering technology services

olecets.com

sales@olecets.com

+33 786843374



List of Liner We Can Supply

Pump Type	Pump Size	Pump Type	Pump Size	Pump Type	Pump Size	Pump Type	Pump Size	Pump Type	Pump Size
National		Emsco		Gardner-Denver		Ideco		Russia	
7-P-50	6-1/4*7	F-350	6-3/4*7	PZ-7/PZ-GA	7*7	T-1300	7-1/2*12	UNBT950L	
8-P-80	6-1/2*8-1/2	F-500	6-3/4*7-1/2	PZ-8	7*8	T-1600	7-1/2*12	UNBT1180L	
9-P-100	6-3/4*9	F-650	6-3/4*8	PZ-9 (PV-9)	6-1/4*9	T-800	7*9	NBT-1	
10-P-130	6-3/4*10	F-750	6-3/4*8	PZ-10	7*10	T-1000	7*10	NBT-300	
12-P-160	7-1/2*12	FA-750	6-3/4*8	PZ-11	7*11	T-500	7*8	NBT-500	
14-P-220	9*14	F-800	7*9	PJ-8	4-1/2*6	MM-1000	7-1/4*16	NBT-600	
E-700	7-3/4*16	F-1000	7*10	PA-8	4-1/2*6	MM-700-F	7-1/4*16	NBT-950	
G-1000	7-3/4*16	DA-700	7-1/2*15	PJ-8A	5*8	MM-600-F	7-1/4*16	8T310	
K-700	7-3/4*16	DB-700	7-1/2*15	PA-8K	4-1/2*8	MM-550-F	7-1/4*15	8T-650	7-1/2*8
H-850-A	7-3/4*15	D-700	7-1/2*15	PA-5	4-1/2*8	MM-500	7-1/2*15	9T	
G-1000-C	7-3/4*16	FB-1300	7*12	FY-FXD	7-1/2*10	MM-450	7-1/2*12	UNB600	
K-500 (CAST)	7-1/2*15	FB-1600	7*12	KG-KXG	7-3/4*18	MM-300-A	7-1/4*12	Upetrom	
K-380	7-1/4*14	F-1300	7-1/2*12	GP-GXR	7-3/4*18	Skytop/Brewster		3PN-1600	
K-500A	7-1/4*15	F-1600	7-1/2*12	FQ-FXQ	7-3/4*16	B-1600-T	7*12	3PN-1300	9-1/2*7-1/2
700A	7-1/4*16	FA-1300	7-1/2*12	FK-FXK	7-1/4*14	B-1300-T	7*12	3PN-1000	
N-1600	7-1/4*16	FA-1600	7-1/2*12	FXN-DMA	7-1/2*14	B-1100-T	7*10	2PN-630	
N-1800	7-1/4*16	FC-2200	8*15	GQ-GXQ	7-1/4*16	B-1000-T	7*10	2PN-800	
N-1100	7-1/4*16	D-300	7-1/2*14	GQ-GXN	7-1/4*14	B-750-T	7-3/4*16	2PN-1258	
C-250	7-1/4*15	D-500	7-1/2*16	FO-FXO	5*10	B-550-F	7*14	Drillmec	
C-350	7-3/4*18	D-14	7-1/2*14	FD-FXX	5-1/2*8	Ellis Williams		7TS-600	7*9
C-150-B	7-1/4*12	D-16	7-1/2*16	FG-FXG	5*6	W-250-C	5*5	9T-800	7*9
C-150	6-3/4*12	DB-550	7-1/2*16	FD-FXD A-G	5*10	W-440-LP	4-1/2*6	9T-1000	7*9
JWS-400	6*8-1/2	DB-700	7-1/2*16	FD-FXX	5*8	W-446	6*6	12T-1600	7-1/2*12
JWS-165-L	4-1/2*5	D-550	7-1/2*16	FC-FXX	5*8	15W600	7*15	14T-2200	9*14
Oilwell		D-700	8*16	FXZ-FXZ	5-1/2*12	WH-1300	7-1/2*12	Bomco	
350-PT	7*8	D-375	7-1/2*14	PE-5	4*4-7/8	OPI		F1600L	
850-PT	7-1/2*9	DA-500	7-1/2*16	TEE-5	4-1/2*4-7/8	1000-DL	7-1/2*10	F-1600HL	7500PSI
1100-PT	7-1/2*10	DA-700	8-1/2*16	KT TEE-5	4-1/2*4-1/2	1000-HDL	7-1/2*10	F-2200	7500PSI
A-350-PT	7*8	D-175	6-3/4*12	THE	5-1/2*5	700-HDL	7*8	LS-NOW	
A-560-PT	7*8	D-12	6-3/4*12	FF-FXF	4*6	350D	6*8	3NB-500C	6-1/2*10
A-600-PT	7*8	D-1000	8-1/4*18	PAH	5*8	GIST 500	6-1/2*7-1/2	3NB-1000C	6-3/4*10
A-850-PT	7-1/2*9	DA-850	8-1/4*18	Wirth		Wilson		3NB-1300C	7*12
A-1100-PT	7-1/2*10	D-225	7-1/4*12	TPK-2200	7-1/2*14	UU-162	3-1/2*4	3NB-1600	7*12
A-1400-PT	7-1/2*10	D-850		TPK-2000	7*12	600	6-1/2*14	Honghua	
A-1700-PT	7-1/2*12	D-125		TPK-1600	7*12	TD-182	4*5	HHF-500	6-3/4*7-1/2
214-P	7-1/4*14	Gasco		TPK-1300	7*10	P-637	6*14	HHF-800/1000	7*9 7*10
14P-HD	7-1/4*14	FIG. 1849	4-1/4*6	TPK-1000	6-1/4*9-1/4	Other		HHF-1300/1600	7*12
212-P	7-1/4*12	FIG. 2652	7-1/4*12	Weathford		1338G	6-1/2*15	HHF-1600HL	7500PSI
612-P	6*12	FIG-3673	4*7	2165		H-700	6-1/2*11	Rongsheng	
712-P	7-1/4*12	Great American		MP-5	6-3/4*7-1/2	WH-4000 A.B	7*10	RSF-500	6-3/4*7-1/2
218-P	7-1/4*18	GA550	7-1/4*14	MP-8	7*10	HT-400-D	5-1/2*7	RSF-800/1000	7*9 7*10
Wheatley		GA750	7-1/4*16	MP-10	7*10	7TS-450		RSF-1300/1600	7*12
FIG. 7036	6*6	Omega		MP-13	7*12	7TS-500	7-1/4*8	RSF-1600L	7*12
FIG. 1036	6*6	D-750	6-3/4*8	MP-16	7*12	9-W-1000	7*9	RSF-1600HL	7500PSI

OLEC Engineering technology services

olecets.com

sales@olecets.com

+33 786843374

