

# INTRODUCTION

## ZIRCONIA CERAMIC LINER

TSC's zirconia liners offer lifetime cost savings, significantly longer service, better performance and safer operation than those made of more commonly used alumina ceramic.

In addition, TSC's zirconia liner is a proprietary Zirconium-based matrix that has significantly improved mechanical characteristics.

Zirconia has three important property advantages compared to alumina.

- Zirconia exhibits better impact strength.
- Zirconia is harder than alumina.
- Zirconia can be honed to finer surface finishes than alumina. Finished to 4 RMS, the zirconia liners provide a surface finish that is three to four times finer than alumina.

All three of these property advantages translate to lower ownership costs. The improved wear directly extends the service life of the sleeve, while the improved impact strength reduces significantly the costs of replacing broken liners in the field. The surface finish improvements, meanwhile, have an indirect effect. The finer surface finish means less friction with the elastomer-and-metal pump pistons, which in turn extends piston life and reduces pump-cooling requirements.

- Reduced liner and piston wear.
- Increased impact characteristics.
- Lower thermal load on the liner wash system.
- Higher thermal ratings.
- HP design with shoulder-on-hull to prevent sleeve slippage.
- ID tolerances of  $+.010"/-.000"$ .
- Surface finish of 4-8 RMS.
- Hardness is HV 0.3 kg/mm – 1100/1200 ( 92-94 Rc).
- Improved performance for high temperature applications.
- Liner sizes are available from 4"-8" for all popular mud pumps.



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## FLUID END EXPENDABLES

GARDNER DENVER

PZ-11 HP(PZL) (7500 PSI)

7 x 11

	LINERS	ZIRCONIA LINERS	LINER GASKETS	PISTONS				PISTON RUBBER
SIZE	PART NUMBER	PART NUMBER	PART NUMBER	URETHANE BONDED	RUBBER BONDED	N'DURALL BONDED	REPLACEABLE RUBBER	PART NUMBER
4 1/2"	TS-1197-44HP	TS-07561450	G-756 *	LLU-44-B15	LL-44-B15	HPW-44-B15	I-44-B15	TM-44-BR
5"	TS-1197-50HP	TS-07561500	G-756 *	LLU-50-B15	LL-50-B15	HPW-50-B15	I-50-B15	TM-50-BR
5 1/2"	TS-1197-54HP	TS-07561550	G-756 *	LLU-54-B15	LL-54-B15	HPW-54-B15	I-54-B15	TM-54-BR
5 3/4"	TS-1197-56HP	TS-07561575	G-756 *	LLU-56-B15	LL-56-B15	HPW-56-B15	I-56-B15	TM-56-BR
6"	TS-1197-60HP	TS-07561600	G-756 *	LLU-60-B15	LL-60-B15	HPW-60-B15	I-60-B15	TM-60-BR
6 1/4"	TS-1197-62HP	TS-07561625	G-757 *	LLU-62-L15	LL-62-L15	HPW-62-L15	I-62-L15	TM-62-LR
6 1/2"	TS-1197-64HP	TS-07561650	G-757 *	LLU-64-L15	LL-64-L15	HPW-64-L15	I-64-L15	TM-64-LR
6 3/4"	TS-1197-66HP	TS-07561675	G-757 *	LLU-66-L15	LL-66-L15	HPW-66-L15	I-66-L15	TM-66-LR
7"	TS-1197-70HP	TS-07561700	G-757 *	LLU-70-L15	LL-70-L15	HPW-70-L15	I-70-L15	TM-70-LR
VALVES, SEATS, SPRINGS						GASKETS		
	4 WEB DESIGN	3 WEB DESIGN	FULL OPEN ( 1 )	FULL OPEN ( 2 )			PART NUMBER	
VALVE	TS-6-EH	-	TS-0995M	TS-6-V1	VALVE COVER GASKET		TS-309PZL316	
SEAT	TS-6-ADDB6	-	TS-1380M	TS-6-S6	CYLINDER HEAD GASKET		-	
SPRING	TS-5710-115	-	-	TS-5710-115	WEAR PLATE GASKET		TS-303PZL316	
INSERT (Urethane)	TS-6-WI	-	TS-6-MI	TS-6-FI	EXTENSION ROD SEAL		TS-2011872-2	
INSERT (Rubber)	TS-6-WR	-	-	TS-6-FR	EXTENSION ROD BAFFLE		TS-PZ840	
PISTON ROD & EXTENSION ROD								
ROD CLAMP	PISTON ROD STUD	PISTON NUT	TWO-PIECE PISTON ROD FRONT	CLAMP TYPE PISTON ROD	TWO-PIECE PISTON ROD BACK	THREADED TYPE EXTENSION ROD	CLAMP TYPE EXTENSION ROD	
TMPZ11-03-08	TS-PP1005294	TM-NUT	TS-PP1005290	TM-200	TS-PP1005292	-	TMPZ11-01-06	
FLUID END MODULE								
FLUID END MODULE STUDDER				MODULE SEAL SET		STUDS & NUTS SET		
TS-300PZL2039				TMPZ11HP-SEALKIT		TMPZ11HP-STUDSET		

TSC does not warrant or represent that any of such information is accurate, or that any products listed are compatible with each other.  
Any deviations from the OEM products should be verified as to compatibility.

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