

Tryton Tool Service 9639 - 116th St. Grande Prairie, AB T8V 5W3 (780)832-0011(24 Hrs.)



TUBING SWIVEL

The Tubing Swivel allows surface connections to remain in place while the work string is rotated and moved vertically. It is primarily used in conjunction with Selective Treating Tools to provide a means of operating the by-pass valve while the treating line is connected. The Tubing Swivel can also be used in conjunction with other Tryton equipment during various treating and stimulation operations.

When using this swivel, it is strongly recommended that the treating line be secured to the Tubing Swivel with a suitable safety chain or cable.



TUBING O.D.		OPERATING LOAD RATING		LINE CONNE	PIPE ECTION	THREAD CONNECTION		
in.	mm	lbs.	DaN	in. mm		in.	mm	
2-7/8	73	100,000	44,500	2.00	50.8	2-7/8 EUE	73	
3-1/2	88.9	135,000	60,000	2.00	50.8	2-7/8 EUE	60.3	



CASING SCRAPER

The Casing Scraper is used to remove foreign matter on the inside casing wall in order to provide a smooth clean casing I.D. for running and setting packers and other sub-surface equipment.

The Casing Scraper features a one piece body with full 360 casing I.D. cover- age provided by six spring loaded Scraper Blades. The design also features a large bypass area around and between the blades for ease of circulating. Each blade is secured in its own individual pocket and ensures that all thrust and rotational forces are absorbed directly by the one piece body. The Casing Scraper features leaf type Incoloy Springs behind each self-sharpening blade, providing maximum usage before repairs or replacement is necessary.

The Casing Scraper may be run on tubing or drill pipe and operated equally well when reciprocated vertically or when rotated. Normally rotation is not necessary unless restrictions are encountered. In areas where packers or other tools are to be set, the scraper should be reciprocated through a number of times to ensure the casing is clean and smooth.

API regular Pin up and Box down are normally supplied with the Casing Scraper, with other connections available if required.



		CASING		B	LADE D	ER	CONNECTION		
0	O.D. WEIGHT				COLLAPSED EX			API REG.	
in.	mm	ppf	kg/m	in	mm	in	mm	in	mm
4-1/2	114.3	6.75-16.00	10.04-24.70	3.62	91.9	4.42	112.2	2-3/8	60.3
5	127.0	8.00-21.00	11.90-31.25	4.00	101.6	4.80	121.9	2-3/8	60.3
5-1/2	139.7	9.00-23.00	13.9-34.23	4.50	114.3	5.28	134.1	2-7/8	73.0
6-5/8	168.2	12.00-34.00	17.86-50.60	5.38	136.6	6.34	161.0	2-7/8	73.0
7	177.8	13.00-40.00	19.34-59.82	5.71	145.0	6.72	170.6	2-7/8	73.0
7-5/8	193.6	20.00-45.00	29.76-67.41	6.25	158.7	7.26	184.4	2-7/8	73.0
8-5/8	219.0	20.00-49.00	29.76-72.92	7.25	184.1	8.41	213.6	3-1/2	88.9
9-5/8	244.4	32.30-58.00	48.06-86.91	8.20	208.2	9.29	253.9	3-1/2	88.9
10-3/4	273.0	32.75-65.70	48.73-97.77	9.20	233.6	10.53	267.4	3-1/2	88.9



TWR BRIDGE PLUG

The TWR Bridge Plug is a proven and reliable wireline or hydraulically set retrievable bridge plug. It is commonly used for zone or well isolation during fracturing, acidizing, cement squeezing, testing or up-hole/surfacerepair operations.

The TWR's double acting slips securely anchor the Bridge Plug against pressure differentials from above or below. The three element pack off design ensures reliable sealing at high pressures and temperatures.

The unique equalizing valve design allows any pressure differential to be equalized before the Retrieving Head is latched onto the plug. This feature is especially advantageous when retrieving the WR on endless tubing.

The TWR Bridge Plug is connected to the Wirelineor Hydraulic Setting Tool, ran to required setting depth and set.

The Retrieving Tool is lowered onto the Bridge Plug while circulating any sand or other debris off the plug. The Retrieving Head will open the valve, allowing any pressure differential to equalize. Continued downward movement will latch the Retrieving Head onto the Bridge Plug - upward motion releases the plug. The TWR Retrieving Tool is used to retrieve the Bridge Plug.

When using the tool on endless tubing, a Safety Sub should be used in conjunction with the Retrieving Head.

The Retrieving Head may be disconnected from the Bridge Plug if necessary with approximately 8 to 10 turns of right hand rotation while holding a slight amount of tension.

• WIRELINE OR HYDRAULIC SET

- ◆ MAY BE RAN AND RETRIEVED ON WIRELINE, COIL OR REGULAR JOINTED PIPE
- * MAY BE LUBRICATED INTO THE WELL UNDER PRESSURE
- ♦ IDEAL FOR RIGLESS OPERATIONS
- THREE ELEMENT SYSTEM FOR RELIABLE HIGH PRESSURE, HIGH TEMPERATURE OPERATIONS
- * PROVEN EQUALIZING SYSTEM FOR SAFE, RELIABLE RELEASE
- ONE PIECE, DOUBLE ACTING SLIPS HOLD PRESSURE SECURELY FROM ABOVE OR BELOW
- ***** REQUIRES STRAIGHT PULL, NO ROTATION TO RELEASE





TWR BRIDGE PLUG TECHNICAL DATA

		CAS	SING			GAUGE RING		
0).D.	WE	IGHT	I.	D	0	.D.	
in.	mm	lb/ft	kg/m	in.	mm	in.	mm	
4-1/2	114.3	13.50	20.1	3.920	99.6	3.800	96.5	
4-1/2	114.3	11.60	17.3	4.000	101.6	3.800	96.5	
4-1/2	114.3	10.50	15.6	4.052	102.9	3.800	96.5	
4-1/2	114.3	9.50	14.1	4.090	103.9	3.800	96.5	
5	127.0	18.00	26.8	4.276	108.6	4.062	103.2	
5	127.0	15.00	22.3	4.408	112.0	4.062	103.2	
5	127.0	13.00	19.3	4.494	114.1	4.250	108.0	
5	127.0	11.50	17.1	4.560	115.8	4.250	108.0	
5-1/2	139.7	26.00	38.7	4.548	115.5	4.250	108.0	
5-1/2	139.7	23.00	34.2	4.670	118.6	4.250	108.0	
5-1/2	139.7	20.00	29.8	4.778	121.4	4.500	114.3	
5-1/2	139.7	17.00	25.3	4.892	124.3	4.500	114.3	
5-1/2	139.7	17.00	25.3	4.892	124.3	4.641	117.9	
5-1/2	139.7	15.50	23.1	4.950	125.7	4.641	117.9	
5-1/2	139.7	15.50	23.1	4.950	125.7	4.728	120.1	
5-1/2	139.7	14.00	20.8	5.012	127.3	4.728	120.1	
5-1/2	139.7	13.00	19.3	5.044	128.1	4.728	120.1	
6-5/8	168.3	32.00	47.6	5.675	144.1	5.560	141.2	
6-5/8	168.3	28.00	41.7	5.791	147.1	5.560	141.2	
6-5/8	168.3	24.00	35.7	5.921	150.4	5.658	143.7	
6-5/8	168.3	20.00	29.8	6.049	153.6	5.658	143.7	
7	177.8	38.00	56.6	5.920	150.4	5.658	143.7	
7	177.8	35.00	52.1	6.004	152.5	5.658	143.7	
7	177.8	32.00	47.6	6.094	154.8	5.875	143.7	
7	177.8	29.00	43.2	6.184	157.1	5.875	149.2	
7	177.8	26.00	38.7	6.276	159.4	6.023	149.2	
7	177.8	23.00	34.2	6.366	161.7	6.023	153.0	
7	177.8	20.00	29.8	6.456	164.0	6.230	153.0	
7	177.8	17.00	25.3	6.538	166.1	6.230	158.2	
7-5/8	193.7	39.00	58.0	6.625	168.3	6.375	158.2	
7-5/8	193.7	33.70	50.2	6.765	171.9	6.375	161.9	
7-5/8	193.7	29.70	44.2	6.875	174.6	6.625	161.9	
7-5/8	193.7	26.40	39.3	6.969	177.0	6.625	168.3	
7-5/8	193.7	24.00	35.7	7.025	178.4	6.625	168.3	
8-5/8	219.1	49.00	72.9	7.511	190.8	7.260	168.3	
8-5/8	219.1	44.00	65.5	7.625	193.7	7.260	184.4	
8-5/8	219.1	40.00	59.5	7.725	196.2	7.260	184.4	
8-5/8	219.1	36.00	53.6	7.825	198.2	7.600	184.4	
8-5/8	219.1	32.00	47.6	7.921	201.2	7.600	193.0	
8-5/8	219.1	28.00	41.7	8.017	203.6	7.600	193.0	
8-5/8	219.1	24.00	35.7	8.097	205.7	7.600	193.0	
9-5/8	244.5	53.50	79.6	8.535	216.8	8.285	193.0	
9-5/8	244.5	47.00	69.9	8.681	220.5	8.285	210.4	
9-5/8	244.5	43.50	64.7	8.755	222.4	8.500	210.4	
9-5/8	244.5	40.00	59.5	8.835	224.4	8.500	215.9	
9-5/8	244.5	36.00	53.6	8.921	226.6	8.500	215.9	
9-5/8	244.5	32.30	48.1	9.001	228.6	8.500	215.9	



TR BY-PASS VALVE

The TR By-Pass Valve is a rotational circulating valve designed for use with Selective Treating Tools. This valve opens or closes off communication between the tubing and the annulus.

The valve is used to bypass tubing fluid when running or retrieving Selective Tools, and if required can also be used for circulation of fluids.

The TR By-Pass Valve features a pressure balanced sleeve design which allows for easy operation of the valve under high differential pressures. Specially designed chemical and wear resistant seals ensure reliable and trouble free operation.

Exclusive to this valve are the thrust bearings which allow for easy operation under tension or compression loads.

The TR By-Pass Valve is opened by rotating 3 turns to the right and closed by rotating 3 turns to the left.



CASING O.D.		VALVE O.D.		VA I.	LVE D.	THREAD CONNECTION		
in.	mm	in.	mm	in. mm		in.	mm	
4-1/2	114.3	3.75	95.2	1.93	49.0	2-3/8 EUE	60.3	
5	127.0	3.75	95.2	1.93	49.0	2-3/8 EUE	60.3	
5-1/2	139.7	3.75	95.2	1.93	49.0	2-3/8 EUE	60.3	
6-5/8	168.3	3.75	95.2	1.93	49.0	2-3/8 EUE	60.3	
7	177.8	5.00	127.0	2.44	62.0	2-3/8 EUE	73.0	
8-5/8	219.1	5.00	127.0	2.44	62.0	2-3/8 EUE	73.0	
9-5/8	244.5	5.00	127.0	2.44	62.0	2-3/8 EUE	73.0	



TA FLUID CONTROL VALVE

The TA Fluid Control Valve is a pressure actuated, hydrostatic down hole valve that is used to provide control over the displacement of tubing fluids. The TA Fluid Control Valve is actuated by applying tubing pressure over and above the hydrostatic pressure in the tubing. The TA Fluid Control Valve is normally used in conjunction with SelectiveTreating Tools, but may also be used for other applications that require. 0

0 0

The Fluid Control Valve Seating Nipple must be run as part of the tubing string.

- ♦ OPERATES BY TUBING PRESSURE ONLY
- ANNULUS FLUID LEVEL CHANGES DO NOT EFFECT THE VALVE
- ♦ DURABLE METAL TO METAL SEAT
- ◆ CALIBRATED FOR ACCURATE FIELD OPERATIONS
- ♦ EQUALIZING SYSTEM TO ASSIST IN WIRELINE RETRIEVAL
- TOOL CAN BE RUN IN PLACE, ON WIRELINE OR IF SUFFICIENT FLUID IS PRESENT IN THE TUBING, DROPPED FROM SURFACE

S	IZE	BODY	2 O.D.	NOG	O O.D.	FISHING PUL NECK O.D. TO		PULLI TOO	NG L
in.	mm	in.	mm	in.	mm	in. mm		in.	mm
2	50.8	1.750	44.5	1.875	47.6	1.375	34.9	2" Camco JDC	2" Otis RB



TD FLUID CONTROL VALVE

The TD Fluid Control Valve is a pressure actuated valve used to provide surface control over fluid injected into wells with low reservoir pressures by supporting the hydrostatic head in the tubing. The TD Fluid Control Valve may be run in place in the tubing, on wireline, or can be dropped from the surface. The Fluid Control Valve Seating Nipple must be run as part of the tubing string.

This valve is usually used in conjunction with the Selective Treating Tools to provide control of fluid volumes pumped with each setting when selectively acidizing low fluid level wells.

The TD Fluid Control Valve operates using differential pressures and is not dependent on well depth. This type of valve is much better suited to deep wells than is a hydrostatically operated Fluid Control Valve.

The TD Fluid Control Valve utilizes specially designed chemical and wear resistant seals to ensure problem free operation. An extended filter tube is run on this valve to ensure debris cannot get into the valve during pumping operations.

ILUI	MUAL	υλιλ				
TUE	BING	M	4X	SEATING		
SI	ZE	VALV	E O.D.	NIPPL	E I.D.	
in.	mm	in.	mm	in.	mm	
2-3/8		1.875		1.812		
2-7/8		2.312		2.250		



STA CUP TYPE SELECTIVE TREATING ASSEMBLY

The STA cup type selective treating assembly designed to selectively acidize predetermined perforated intervals. The STA will isolate intervals from .3m (12 inches) to any length by the addition of standard tubing pups joints, A large built-in annular bypass, make the STA easy to run and retrieve. Drag blocks, using Inconel springs, provide drag for a positive method of controlling the circulating valve. The retrievable control bar is used to blank off the lower portion below the stimulation ports

The STA assembly is normally ran into the well with the circulating valve open to a position just above the perforated interval to be stimulated. The circulation valve is closed and the control bar is dropped from surface or is run with the STA, to pressure test the STA's complete assembly. Opening the circulation valve will equalize the tubing to annulus. The STA tool can now be returned to the proper stimulation interval by dropping the fluid control valve and closing the circulation valve, a feed rate can be taken. Opening the circulation valve will permit the treating fluid to be circulated to the STA tool for treatment. By closing the circulation valve the stimulation treatment can be performed.

To move the STA tool to a new interval for further treatment, pick up on the work string each interval until completed. To test the treated intervals, move the complete assembly above the perforations and set the packer. To retrieve the assembly, open the circulating valve and remove the work string from the well.



Control Bar Specifications

	FISHING NECK SIZE										
Inches	Mm Inches Mm Inches Mm										
4/1/02	114	5/1/02	139	7	177.8						
0.75	19	1.187	30.14	1.187	30.14						
1 in. OTIS RB PULLING TOOL 1-1/4" OTIS RB PULLING TOOL											



<u>STA CUP TYPE SELECTIVE TREATING ASSEMBLY</u> <u>TECHNICAL DATA</u>

CA S	SING IZE	CAS WEI	SING TI GHT		MBLE .D.	MIN. I.D.		THREAD CONN.	
In	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm
4-1/2	114.3	9.5-13.5	14.1-20.1	3.771	95.5	1.25	31.8	2-3/8 EUE 8RD	60.3
5.0	127.0	11.5-15	17.1-22.3	4.500	114.3	1.25	31.8	2-3/8 EUE 8RD	60.3
5.0	127.0	18-21	26.8-31.3	4.125	104.8	1.25	31.8	2-3/8 EUE 8RD	60.3
5-1/2	139.7	14-17	20.8-25.3	4.781	121.4	1.75	44.5	2-3/8 EUE 8RD	60.3
5-1/2	139.7	20-23	29.8-34.2	4.625	117.5	1.75	44.5	2-3/8 EUE 8RD	60.3
7.0	177.8	17-20	25.3-29.8	6.210	157.7	2.25	57.2	2-7/8 EUE 8RD	73.0
7.0	177.8	23-26	34.2-38.7	5.940	150.9	2.25	57.2	2-7/8 EUE 8RD	73.0
7.0	177.8	28-35	41.7-52.1	5.780	146.8	2.25	57.2	2-7/8 EUE 8RD	73.0
7-5/8	193.7	33.7-39	50.2-58	7.260	184.4	2.25	57.2	2-7/8 EUE 8RD	73.0
8-5/8	219.1	40-49	59.5-72.9	7.410	188.2	2.25	57.2	2-7/8 EUE 8RD	73.0
9-5/8	244.5	47-53.5	69.9-79.6	8.250	209.6	2.25	57.2	2-7/8 EUE 8 RD	73.0
10-3/4	273.1	32.3-43.5	48.1-64.7	8.500	215.9	2.25	57.2	2-7/8 EUE 8RD	73.0



<u>STA SELECTIVE TREATING ASSEMBLY</u> <u>EXAMPLE TOOL STRING</u>





STA SELECTIVE TREATING ASSEMBLY EXAMPLE PROCEDURE





TFV FLUID CONTROL VALVE

The TFV Fluid Control Valve is a high pressure, ball type, tubing actuated fluid control valve. The TFV Fluid Control Valve holds pressure from above and below, rotates open or closed with ½ turn at the valve, and can be assembled to open with right or left hand rotation making it operational with a variety of production packers. The TFV valve applications range from tubing tester, washing, acidizing, fracing and converting double grip production packer into temporary bridge plug.

- + HOLDS PRESSURE FROM ABOVE AND BELOW
- ¹/₂ TURN TO OPEN AND CLOSE
- ASSEMBLES FOR RIGHT OR LEFT HAND ROTATION TO OPEN
- TUBING CAN BE LEFT IN TENSION, COMPRESSION OR NEUTRAL

TUBING S	SIZE	MA O.	AX. D.	MA I.	AX. D.	PRODUCT
in.	mm	in.	mm	in. mm		NUNIDER
2-3/8 EUE	60.3	3.771	95.78	1.750	44.45	T574-45A-000





TXP INDEX VALVE

The TXP Index Valve is primarily used to convert a double grip mechanical set packer into a retrievable bridge plug. This high pressure valve provides a system to run a retrievable bridge plug with the valve open and set the bridge plug then close the valve.

- ◆ LARGE BY-PASS FOR RUNNING AND RETRIEVING
- ♦ PROVEN RELIABLE DESIGN
- ♦ BY-PASS LOCKED IN THE CLOSING POSITION AFTER SET

TXP RETRIEVING TOOL

The Type TXP Retrieving Tool is used to control the setting and releasing of double grip mechanical set bridge plugs using the type TXP Index Valve.

- ♦ CONTROLS THE INDEX VALVE LOCKING AND UNLOCKING SYSTEM
- ♦ NO SEAL ALLOWS FOR CIRCULATION LOW ON TOOL PRIOR TO OR AFTER LATCHING ONTO THE INDEX VALVE





TXP INDEX VALVE TECHNICAL DATA

CAS SI	SING ZE	CAS WEI	SING IGHT	TUBIN SIZE	G	MAX RET.	AAX. O.D. MIN. I.D. RUNNING ET. TOOL RET. TOOL TOOL PROI		RUNNING TOOL PROD.	VALVE PRODUCT	
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	NUMBER	NUMBER
4-1/2	114.3	9.5-13.5	14.1-20.9	2-3/8 EUE	60.3	3.750	95.25	1.750	44.45	T128-45A-000	T129-45A-000
5.0	127	11.5-15	17.1-22.3	2-3/8 EUE	60.3	3.750	95.25	1.750	44.45	T128-45A-000	T129-45A-000
5.0	127	18-20.8	26.8-31.0	2-3/8 EUE	60.3	3.750	95.25	1.750	44.45	T128-45A-000	T129-45A-000
5-1/2	139.7	13-20	19.3-29.8	2-3/8 EUE	60.3	4.500	114.3	1.750	44.45	T128-55A-000	T129-45A-000
5-1/2	139.7	20-23	29.8-34.2	2-3/8 EUE	60.3	4.500	114.3	1.750	44.45	T128-55A-000	T129-45A-000
7.0	177.8	17-26	25.3-38.7	2-3/8 EUE	60.3	5.400	137.16	1.750	44.45	T128-70A-000	T129-45A-000
7.0	177.8	26-32	38.7-47.6	2-3/8 EUE	60.3	5.400	137.16	1.750	44.45	T128-70A-000	T129-45A-000



TSU RETRIEVABLE BRIDGE PLUG

The TSU Retrievable Bridge Plug is a high pressure packer style retrievable bridge plug that is capable of being set in tension or compression. The large internal bypass system allows for multiple setting and releasing under extreme pressures.

The TSU Retrievable Bridge Plug setting operation requires the tubing string to be picked up, turn one quarter to the right at the plug and slack off. To release set down, apply right hand torque and pickup. The bypass system will allow pressure to equalize before the upper slips are pulled on and released from the casing wall.

- CAN BE SET SHALLOW OR DEEP
- ♦ SETS ONE QUARTER TURN TO RIGHT -RELEASES ONE QUARTER TURN TO RIGHT
- ♦ LARGE INTERNAL TWIN SEALING BYPASS SYSTEM
- EQUALIZES BEFORE UPPER SLIPS ARE RELEASED

CASING SIZE		CASI WEIG	NG HT	M O	AX .D.	PRODUCT
in.	mm	ft./lbs	kg/m	in.	mm	NUMBER
4-1/2	114.3	9.5-13.5 PPF	14.1-20.1	3.594	91.29	T725-45C-000
4-1/2	114.3	13.5-15.1 PPF	20.1-22.5	3.750	95.25	T725-45A-000
4-1/2	114.3	15.1-16.6 PPF	22.524.7	3.656	92.86	T725-45B-000
5	127	11.5-15 PPF	17.1-22.3	3.594	104.78	T725-50A-000
5	127	18-21 PPF	26.8-31.3	4.000	101.60	T725-50B-000
5-1/2	139.7	9-14 PPF	13.3-20.8	4.812	122.22	T725-55C-000
5-1/2	139.7	14-20 PPF	20.8-29.8	4.625	117.48	T725-55A-000
5-1/2	139.7	20-23 PPF	19.834.2	4.500	114.30	T725-55B-000
6	152.4	14-20 PPF	20.8-29.8	5.188	131.78	T725-60A-000
6-5/8	168.3	17-20 PPF	25.3-29.8	5.750	146.10	T725-65A-000
7	177.8	17-26 PPF	25.3-38.7	6.000	152.40	T725-70B-000
7	177.8	23-29 PPF	34.2-43.2	5.969	151.61	T725-70C-000
7	177.8	26-35 PPF	38.7-52.1	5.875	149.23	T725-70A-000





TSU SPRING LOADED RETRIEVING TOOL

The TSU Spring Loaded Retrieving Tool is used with the TSU Retrievable Bridge Plug. The spring loaded design minimizes the possibility of the bridge plug coming free during running and retrieving. The strong compression spring keeps the bridge plug J-pins securely locked in the retrieving tool jay until sufficient weight collapses the spring allowing the retrieving tool to be removed.

- SPRING LOADED DESIGN
- FULL BORE DESIGN FOR MAXIMUM CIRCULATION
- DURABLE CONSTRUCTION

				-		-				
CAS	SING	CASING		TUBINO	r T	MAX.		MI	N.	PRODUCT
SIZE		WI	EIGHT	SIZE		O.D.		I.D.		NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	
4-1/2	114.3	9.5-13.5	14.1-20.1	2-3/8 EUE	60.3	3.750	95.25	2.000	50.8	T577-45A-000
5.0	127	11.5-15	17.1-22.3	2-3/8 EUE	60.3	3.750	95.25	2.000	50.8	T577-45A-000
5.0	127	18-20.8	26.8-31.0	2-3/8 EUE	60.3	3.750	95.25	2.000	50.8	T577-45A-000
5-1/2	139.7	13-20	19.3-29.8	2-3/8 EUE	60.3	4.500	114.30	2.000	50.8	T577-55A-000
5-1/2	139.7	20-23	29.8-34.2	2-3/8 EUE	60.3	4.500	114.30	2.000	50.8	T577-55A-000
5-1/2	139.7	13-20	19.3-29.8	2-7/8 EUE	73.0	4.500	114.30	2.375	60.3	T577-56A-000
5-1/2	139.7	20-23	29.8-34.2	2-7/8 EUE	73.0	4.500	114.30	2.375	60.3	T577-56A-000
7.0	177.8	17-26	25.3-38.7	2-7/8 EUE	73.0	5.875	149.23	2.500	63.5	T577-70A-000
7.0	177.8	26-32	38.7-47.6	2-7/8 EUE	73.0	5.875	149.23	2.500	63.5	T577-70A-000



TSW RETRIEVABLE BRIDGE PLUG

The TSW Bridge Plug Is A High Performance Tool that will hold high pressure from above and below. The TSW is used primarily for treating, testing and fracturing of the well bore. When run in the tubing set position the TSW bypass system allows fluid flow during either running or retrieving. The TSW can be set shallow or deep because the packing elements can be expanded in tension or compression. When running on wireline the TX Packer Wireline Adapter Kit must be used. The standard spring loaded retrieving tool is used to retrieve the tubing set and wireline set versions of the TSW Bridge Plug.

- TUBING OR WIRELINE SET
- CAN BE SET SHALLOW OR DEEP (TENSION OR COMPRESSION)
- WITHSTANDS HIGH PRESSURE ABOVE AND BELOW
- ¼ TURN SET ¼ TURN RELEASE OPERATION (TUBING SET)
- EQUALIZES PRESSURE BEFORE RELEASING UPPER SLIP SYSTEM
- SEQUENTIAL RELEASE UPPER SLIP SYSTEM
- ◆ USES COMMON REPLACEMENT PARTS
- **OPTIONAL SHEAR RELEASE**

Γ	CAS	ING	CASI	NG	MAX	KO.D.	PRODUCT
L	SĽ	ZE	WEIGHT I	OFT	rool	NUMBER	
	in. mm		lbs/ft.	kg/m	in.	mm	
	4-1/2	114.3	9.5-13.5 PPF	14.1-20.1	3.750	95.25	T727-45A-000
	4-1/2	114.3	13.5-15.10 PPF	20.1-22.5	3.656	92.86	T727-45B-000
	5	127	11.5-15 PPF	17.1-22.3	4.125	104.78	T727-50A-000
	5	127	18-20.8 PPF	26.8-31.0	4.000	101.60	T727-50B-000
	5-1/2	139.7	14-20 PPF	20.8-29.8	4.625	117.48	T727-55A-000
	5-1/2	139.7	20-23 PPF	29.8-34.2	4.500	114.30	T727-55B-000
	5-1/2	139.7	9-14 PPF	13.4-20.8	4.812	122.22	T727-55C-000
	5-1/2	139.7	13-15.5 PPF	19.3-23.1	4.781	121.44	T727-55D-000
	7	177.8	26-32 PPF	38.7-47.6	5.875	149.23	T727-70A-000
	7	177.8	17-26 PPF	25.3-38.7	6.000	152.40	T727-70B-000
	7	177.8	23-29 PPF	34.2-43.2	5.969	151.60	T727-70C-000

TECHNICAL DATA



TUBING SET MODE

WIRELINE SET MODE



THD COMPRESSION PACKER

The THD Compression Squeeze Packer is used for high pressure fracturing, acidizing, squeeze cementing and production testing. The THD has an integral bypass system that allows circulation around the packer without releasing the tool. The THD Packer can be used with the TSU Bridge Plug for multiple zone operations.

- ♦ LARGE INTERNAL BYPASS
- PREMIUM CARBIDE SLIPS AND DRAG BLOCKS
- ♦ HYDRAULIC ACTUATED HOLD DOWN SYSTEM
- FULL BORE DESIGN
- ◆ AVAILABLE IN SEVERAL J-SLOT CONFIGURATIONS, INCLUDING MANUAL & AUTO





<u>THD COMPRESSION PACKER</u> <u>TECHNICAL DATA</u>

CASING SIZE		CASING WEIGHT		MAX. O.D.		MIN. I.D.		THREAD CONN.		PRODUCT NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	
4-1/2	114.3	11.6-13.5	17.26-20.1	3.750	95.25	1.875	47.63	2-3/8 EUE 8RD	60.3	T613-45A-000
4-1/2	114.3	9.5-11.6	14.1-17.26	3.813	96.85	1.875	47.63	2-3/8 EUE 8RD	60.3	T613-45D-000
5.0	127	11.5-15	17.1-22.3	4.125	104.78	1.875	47.63	2-3/8 EUE 8RD	60.3	T613-50A-000
5.0	127	18-20.8	26.8-31.0	4.000	101.60	1.875	47.63	2-3/8 EUE 8RD	60.3	T613-50B-000
5-1/2	139.7	14-20	20.8-29.8	4.625	117.48	2.000	50.80	2-3/8 EUE 8RD	60.3	T613-55A-000
5-1/2	139.7	20-23	29.8-34.2	4.500	114.30	2.000	50.80	2-3/8 EUE 8RD	60.3	T613-55B-000
7.0	177.8	17-26	25.3-38.7	6.000	152.40	2.500	63.50	2-7/8 EUE 8RD	73.0	T613-70B-000
7.0	177.8	26-32	38.7-47.6	5.875	149.23	2.500	63.50	2-7/8 EUE 8RD	73.0	T613-70A-000
7.0	177.8	23-29	34.2-43.2	5.969	151.61	2.500	63.50	2-7/8 EUE 8RD	73.0	T613-70C-000
7-5/8	193.7	33.7-39	50.2-58.0	6.453	163.91	2.500	63.50	2-7/8 EUE 8RD	73.0	T613-75A-000
7-5/8	193.7	24-29.7	35.7-44.2	6.688	169.88	2.500	63.50	2-7/8 EUE 8RD	73.0	T613-75B-000
9-5/8	244.5	32.3-43.5	48.1-64.7	8.500	215.90	4.000	101.60	4-1/2 EUE 8RD	114.3	T613-95B-000
9-5/8	244.5	40-53.5	59.5-79.6	8.250	209.60	4.000	101.60	4-1/2 EUE 8RD	114.3	T613-95A-000



TSP TENSION SQUEEZE PACKER

The TSP Tension Squeeze Packer is a full bore tension set squeeze packer that holds pressure from above and below. The TSP Tension Squeeze Packer can be used where sufficient tubing weight is not available to achieve pack off with compression set squeeze packers. The TSP is used for squeeze cementing operations casing testing, formation fracturing and high pressure acidizing. The TSP is normally run with the TC Unloader which allows circulation around the tool and equalizes tubing and annulus pressures during retrieving.

- FULL BORE DESIGN
- ♦ EMERGENCY ROTATIONAL RELEASE SYSTEM
- ♦ HOLDS PRESSURE FROM ABOVE AND BELOW
- ♦ EXTERNAL J-SLOT DESIGN REDUCES DEBRIS BUILD UP
- DURABLE CONSTRUCTION





<u>TSP TENSION SQUEEZE PACKER</u> <u>TECHNICAL DATA</u>

CAS SI	SING ZE	CAS WEI	SING IGHT	TUBII SIZI	NG E	M O	AX .D.	M I.I	IN D.	PRODUCT NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	
4-1/2	114.3	9.5-13.5	14.1-20.0	2-3/8 EUE	60.3	3.750	95.25	2.000	50.8	T628-45A-000
5.0	127	11.5-15	17.1-22.3	2-3/8 EUE	60.3	4.125	104.78	2.000	50.8	T628-50A-000
5.0	127	18-20.8	26.8-31.0	2-3/8 EUE	60.3	4.000	101.60	2.000	50.8	T628-50B-000
5-1/2	139.7	14-20	20.7-29.6	2-3/8 EUE	60.3	4.625	117.48	2.000	50.8	T628-55A-000
5-1/2	139.7	20-23	29.8-34.2	2-3/8 EUE	60.3	4.500	114.30	2.000	50.8	T628-55B-000
7.0	177.8	17-26	25.3-38.7	2-7/8 EUE	73.0	6.000	152.40	2.500	63.5	T628-70B-000
7.0	177.8	26-32	38.7-47.6	2-7/8 EUE	73.0	5.875	149.23	2.500	63.5	T628-70A-000
8-5/8	219.1	24-40	35.7-59.5	2-7/8 EUE	73.0	7.500	190.50	2.500	63.5	T628-85A-000



TC UNLOADER

The TC Unloader is a tension set unloader usually run above the TSP Tension Set Squeeze Packer to equalize tubing and annulus pressure differentials. With the heavy duty collet, the TC Unloader can be left in the open position allowing fluid to pass while running and retrieving preventing the packer elements from swabbing.

- SIMPLE OPERATION (TENSION TO CLOSE-COMPRESSION TO OPEN)
- FULL OPEN BORE
- HEAVY DUTY COLLET FOR REPEATED USE
- PERMITS FULL CIRCULATION AROUND PACKER
- LARGE BYPASS AREA



TUB SIZ	TUBING SIZE		MAX. O.D.		IN. D.	THREAD CONNECTI	ON	PRODUCT NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	
1-1/4	31.75	2.250	57.15	.750	19.05	1.660 EU 10RD	42.16	T525-04A-000
2-3/8	60.3	3.250	82.55	1.625	41.28	2-3/8 EUE 8RD	60.30	T525-06A-000
2-3/8	60.3	3.750	95.25	2.00	50.80	2-3/8 EUE 8RD	60.30	T525-20A-000
2-7/8	73.0	4.500	114.30	2.500	63.50	2-7/8 EUE 8RD	73.00	T525-25A-000



TSP SAND PUMP

The TSP Sand Pump offers a rapid and cost effective method to clean out sand and debris from the wellbore without loading the hole and circulating.

- ELIMINATES THE DAMAGING EFFECTS OF CIRCULATION
- ◆ THOROUGH AND LASTING CLEAN OUT-OUT
- **•** NO CIRCULATION FLUIDS ARE REQUIRED
- ◆ FAIL-SAFE OPERATION AND DESIGN
- ◆ NO NEED FOR EXPENSIVE COILED TUBING UNITS
- **•** REDUCES EXPENSIVE BOTTOM HOLE PUMP CHANGES

The tool assembly is run in on existing tubing until it reaches the fill point. Reciprocation (5' stroke) of the pump assembly draws fluid and sand in through the bottom trap valves and up into the tubing chamber. The sand and debris collects in the cavity pipe above the trap valves, while the fluid goes through the pump assembly and is discharged into the annulus. Once the pump has drawn all of the sand up into the cavity pipe, and the tool assembly is at bottom, the debris-loaded tool is pulled to the surface and unloaded.

The pump rod is a hexagonal Kelly, which allows normal rotation of the entire tubing siting if required to mill or fish tools.

The size and weight of the tubing used and the cavity pipe may be varied to apply to the amount of sand in the hole and desired operations.



TSP SAND PUMP TO SURFACE EXAMPLE TOOL STRING



- 1. FLUID LEVEL: Must be maintained above the pump assembly for efficient operation.
- 2. TUBING DRAIN: Drains tubing while tripping out.
- 3. CHECK VALVE: Flapper or ball design with the function to maintain fill in tubing.
- 4. **KELLY:** Provides the transmission of torgue from
- 5. **PUMP ASSEMBLY:** Reciprocation of the pump assembly pumps fluid and fill through the assembly and on up to surface.
- 6. ANCHOR: Maintains position of pump assembly.
- 7. CHECK VALVE: As per item 3.
- 8. TAIL JOINTS: To maintain the pump assembly in
- 9. CHECK VALVE: As per item 3.
- 10. PUP JOINT: Space out check valves.
- 11. CHECK VALVE: As per item 3.
- 12. BIT: Different bit types available dependent upon
- 13. FILL: Completion or maintenance sand, surplus frac-sand or debris where well cannot be





TSB PUMP TUBING BAILER

The TSB Pump Tubing Bailer is a fast and efficient way to clean out sand or other fill from a well. It is an efficient mechanical pump capable of removing large volumes of fill in a single trip. The TSB Pump Tubing Bailer does not depend on hydrostatic differential pressure in order to operate and is therefore very effective in extremely low fluid wells.

Large volume of sand or fill can be cleaned out in one trip. The debris chamber is adjustable to accommodate any amount of sand or fill to be retrieved. The bailer assembly is designed with circulating drain ports eliminating the pulling of wet strings.

A specially designed hard faced drilling washover shoe on bottom of assembly allows rotation through compacted sand.

- ♦ HEAVY DUTY CONSTRUCTION
- ♦ OPERATION SIMPLICITY
- ◆ CIRCULATING DRAIN VALVE ELIMINATES WET TRIPS
- ◆ ECONOMICAL
- ♦ CLEANOUT CAN BE ACCOMPLISHED IN ONE RUN
- **◆** *EFFECTIVE IN LOW FLUID WELLS*

The TSB Pump Bailer Assembly is made up on the tubing string with the required amount of chamber between the pump assembly and the valve assembly. The pump assembly must be spaced out so that it will be below the fluid level in the well for it to operate properly. Once on bottom, the pump is stroked up and down. As the sand is pumped up into the fill pipe, it is necessary to move the pump assembly down so that the bottom of the pump is always contacting the top of the fill. If necessary, the assembly may be rotated. Continue this operation until either bottom is reached or the fill pipe is full (will stop making hole).

When pulling, the tubing will drain automatically.



TSB BAILER EXAMPLE TOOL STRING

- 1. **FLUID LEVEL:** The bailer is a hydrostatic tool that operates by having an overbalance of fluid in the well.
- 2. **DRAIN VALVE:** The Drain Valve allows the tubing to drain while tripping out.
- 3. **KELLY:** The Kelly provides the transmission of torque from the tubing string to the bit.
- 4. **PUMP ASSEMBLY:** Applied compression to the pump assembly opens the main valve and the annular overbalance forces the fluid and sand in through the bottom trap valves and up into the tubing chamber. The sand and debris collects in the cavity pipe above the valves, while the fluid goes through the pump assembly and is discharged into the tubing above.
- 5. **BALL VALVE:** The Ball Valve eliminates pressure build up in the adjustable chamber.
- 6. **CHAMBER:** The Chamber is made up of tubing to accommodate the amount of estimated fill.
- 7. **CHECK VALVE:** The Check Valve is of either flapper or ball design. The function of the valve is to maintain fill trapped in the adjustable chamber until surface is reached. The second Check Valve is run in case first Check Valve fails.
- 8. PUP JOINT: Space out Check Valves.
- 9. CHECK VALVE: As per item 7.
- 10. **BIT:** Different bit types available dependent upon fill to be encountered.
- **11. FILL:** Completion or maintenance sand, surplus frac-sand or debris where well cannot be circulated.





PDQ HYDRAULIC SETTING TOOL

The PDQ Hydraulic Setting Tool is used for hydraulically setting Permanent Bridge Plugs on tubing. Total pressure or combination of pressure and tubing tension can be utilized to set the permanent bridge plug.

The PDQ Hydraulic Setting Tool allows circulation before and after setting operations.

The PDQ Hydraulic Setting Tool Permanent Bridge Plug combination can be run in conjunction or tandem with other equipment.

• SIMPLE OPERATION

CIRCULATION BEFORE AND AFTER SETTING OPERATIONS

◆ ALL SETTING TOOL COMPONENTS RETRIEVED

The PDQ Hydraulic Setting Tool and Permanent Bridge Plug combination are to setting depth. The tubing will automatically fill as the bridge plug is run in.

The ball may be run in place or dropped. Once the ball is down pressure up to the required pressure (specification chart page 5 - 6) to preset the bridge plug slips. In low fluid wells the hydrostatic pressure of the column of fluid required to fill the tubing acts as a pressure setting force.

With the setting pressure held apply tension (specification chart page 5 - 6) to complete the setting of the bridge plug.

To disengage setting tool from the bridge plug apply a slight amount of tension and rotate the tubing approximately 10 - 12 turns to the right.

Alternate ways for disengagement are:

- (1) Applied pressure to hydraulically set the bridge plug and to hydraulically shear the shear stud.
- (2) Combination of applied pressure and applied tension to set the bridge plug and to shear the shear stud.





PDQ HYDRAULIC SETTING TOOL TECHNICAL DATA

CASING					PDQ H	YDRAU	ULIC SE	TTING	FOOL	
SIZE WEIGHT				0	D	BALL	SIZE	CONNE	PART	
in.	mm	lbs./ft.	kg/m	in.	mm	in.	mm	in.	mm	NUMBER
4-1/2	114.3	9.5-15.5	14.14-23.06	3.750	95.25	1.00	25.4	2.375	60.30	786-45
5	127.0	11.5-20.8	17.11-30.95	3.968	100.79	1.00	25.4	2.375	60.30	786-50
5-1/2	139.7	13.0-26.0	19.34-38.69	4.438	112.73	1.00	25.4	2.875	73.03	786-55
7	177.8	17.0-38.0	25.30-56.54	5.468	138.89	1.00	25.4	2.875	73.03	786-70
7-5/8	193.7	20.0-39.0	29.76-58.03	5.500	139.70	1.00	25.4	2.875	73.03	786-75
9-5/8	244.5	29.0-61.1	43.15-90.92	8.000	203.20	1.00	25.4	2.875	73.03	786-95

		CASING		PDQ HY SETTIN	DRAUL NG TOO	IC L	
SL	ZE	WEI	GHT			SETT TEN	FING SION
in.	mm	lbs./ft.	kg/m	psi	kpa	lbs.	daN
4-1/2	114.3	9.5-15.5	14.14-23.06	2000	14,000	11,000	5,000
5	127.0	11.5-20.8	17.11-30.95	2000	14,000	11,000	5,000
5-1/2	139.7	13.0-26.0	19.34-38.69	2000	14,000	21,500	10,000
7	177.8	17.0-38.0	25.30-56.54	2000	14,000	21,500	10,000
7-5/8	193.7	20.0-39.0	29.76-58.03	2000	14,000	21,500	10,000
9-5/8	244.5	29.0-61.1	43.15-90.92	2000	14,000	21,500	10,000



10-20 HYDRAULIC SETTING TOOL

The 10-20 Hydraulic Setting Tool is designed to be run on drill pipe, tubing, endless tubing or other handling equipment that can transmit pressure to the setting tool for the purpose of setting bridge plugs, cement retainers, retainer production packers, and services plugs or packers normally set by wireline. It is especially applicable to setting plugs or packers in deviated wells or in locations where a wireline unit is not available or practical.

A large integral by-pass allows the setting tool to be run with fluid entering the running string establishing circulation prior to the setting operation.

***** RUN ON DRILL PIPE, TUBING OR ENDLESS TUBING

***** BY-PASS MAY BE RUN OPEN OR CLOSED

- ◆ PRESSURE STAGES MAY BE ADDED OR REMOVED DEPENDING ON SETTING PRESSURE GENERATED
- ***** RUNNING STRING MAY BE DRAINED OR CLOSED AFTER SETTING

CASING SIZE		SETTING TOOL SIZE	TOOL O.D.		SETTING STROKE		SETTING FORCE	
in.	mm		in.	mm	in.	mm	lbs.	daN
4-1/2	114.3	#10-20	3.500	88.9	8.250	209.55	35,000	15,570
13-3/8	339.7	#10-20	3.500	88.9	8.250	209.55	50,000	22,240

SETTING	First Stage
CHAMBER	7.060
area/stage sq. In.	Additional Stage 5.840





TX PACKER WIRELINE ADAPTER KIT

The TX Wireline Adapter Kit is used in conjunction with a Tryton wirteline set tool and #10 OR #20 wireline setting tool. When running the TX Wireline Adapter Kit with TX and TXN profiles in a TL On/Off Tool Slick Joint, the plug prong must be shortened to accommodate the inner adapter spacing. Extended length adapter kits are available if required, but the shortened prong is the preferred method creating a shorter overall packer assembly.

- ◆ ALLOWS "PLUG-IN-PLACE" RUNNING
- ◆ ACCEPTS COMMON BLANKING PLUG TYPES AND SIZES
- ♦ USES COMMON REDRESS PARTS

- ◆ PLUG IN TOP OF PACKER REDUCES DEBRIS BUILD UP
- ♦ ELIMINATES RUNNING PROFILE NIPPLE OR PUMP-OUT PLUG **BELOW PACKER**
- ◆ CAN BE USED WITH #10 OR #20 HYDRAULIC SETTING DEVICE.



SI	ZE	MA O	\ .]
in	mm	in	Γ

SI	ZE	MA O	AX .D.	PART
in.	mm	in.	mm	NUMBER
4-1/2	114.3	3.750	95.25	T598-45A-000
5.0	127	3.750	95.25	T598-45A-000
5-1/2 x 2-3/8	139.7 X 60.3	4.500	114.3	T598-55A-000
5-1/2 x 2-3/8	139.7 X 73.0	4.500	114.3	T598-56A-000
7 x 2-3/8	177.8 X 60.3	4.500	114.3	T598-55A-000
7 x 2-7/8	177.8 X 73.0	4.500	114.3	T598-56A-000
7-5/8 x 2-7/8	193.7 X 73.0	4.500	114.3	T598-56A-000
7 x 3	177.8 X 88.9	5.500	139.7	T598-73A-000



ER CUP PACKER

The ER Cup Packer, formerly known as the HP Packer, is available in a single or double cup design. The primary use is for isolating casing and tubing leaks. The packer cups can be installed in any direction allowing each assembly to hold pressure in both directions.

♦ AVAILABLE IN SINGLE OR DOUBLE ELEMENT DESIGN

♦ COMPACT & INEXPENSIVE MEANS OF ISOLATION

♦ USES WIRE REINFORCED CUPS FOR DURABILITY



CAS SIZ	ING ZE	THREA CONN	AD I.	CAS WEI	SING GHT	M O	AX D.D.	M I.	IN D.	PRODUCT NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	
2-7/8	73.0	1.660 NU	42.2	6.4-6.5	9.5-9.7	2.250	57.15	.625	15.9	T439-25A-000
3-1/2	88.9	1.900 NU	48.3	9.2-9.3	13.7-13.8	2.781	70.63	1.250	31.75	T439-35A-000
3-1/2	88.9	1.900 NU	48.3	9.2-9.3	13.7-13.8	2.781	70.63	1.500	38.1	T439-36A-000
3-1/2	88.9	1.900 NU	48.3	10.2	15	2.750	69.85	1.250	31.75	T439-35B-000
3-1/2	88.9	1.900 NU	48.3	10.2	15	2.750	69.85	1.500	38.1	T439-36B-000
4-1/2	114.3	2-3/8 EU	60.3	9.5-11.6	14.1-17.2	3.750	95.25	2.000	50.8	T439-45A-000
4-1/2	114.3	2-3/8 EU	60.3	15.1-16.6	22.5-24.7	3.625	92.08	2.000	50.8	T439-45B-000
5.0	127	2-3/8 EU	60.3	13-15	19.3-22.3	4.125	104.78	2.000	50.8	T439-50A-000
5.0	127	2-3/8 EU	60.3	18-20.3	26.8-30.2	4.000	101.60	2.000	50.8	T439-50B-000
5-1/2	139.7	2-3/8 EU	60.3	13-15	19.3-22.3	4.750	120.65	2.000	50.8	T439-55A-000
5-1/2	139.7	2-3/8 EU	60.3	15.5-17	23.1-25.3	4.625	117.40	2.000	50.8	T439-55B-000
5-1/2	139.7	2-3/8 EU	60.3	20-23	29.8-34.2	4.500	114.3	2.000	50.8	T439-55C-000
7.0	177.8	2-7/8 EU	73.0	17-20	25.3-29.8	6.000	152.4	2.500	63.5	T439-70A-000
7.0	177.8	2-7/8 EU	73.0	22-24	32.7-35.7	6.000	152.4	2.500	63.5	T439-70B-000
7.0	177.8	2-7/8 EU	73.0	26-29	38.7-43.1	5.875	149.2	2.500	63.5	T439-70C-000



THT TENSION PACKER

The THT Tension Packer was designed for use in old scaly casing or open hole applications. The THT Packer's unique design features make it the packer of choice when producing or injecting in old pipe or open hole applications. The standard packer comes with deep wide wicker slips that allow penetration into scaly casing or open hole formations. The THT Packer has three releasing methods built int the design, virtually eliminating retrieval problems

- ♦ OPEN J-SLOT REDUCES DEBRIS BUILD UP
- ◆ SAFETY TUBING RELEASE
- WIDE WICKER SLIPS INSURE SETTING IN SCALY CASING
- FULL OPENING DESIGN
- ◆ AUTOMATIC J-SLOT DESIGN FOR EASY SET AND RELEASE





<u>THT TENSION PACKER</u> <u>TECHNICAL DATA</u>

CASING		CASING		MAX		MIN		THREAD		PRODUCT
SIZE		WEIGHT		O.D.		I.D.		CONNECTION		NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	
2-7/8	73.0	6.4-6.5	9.5-9.7	2.250	57.15	.750	19.1	1.315 EUE 10RD	33.4	T405-25A-000
3-1/2	88.9	7.7-10.2	11.5-15	3.781	96.0	1.500	38.1	1.900 EUE 10RD	48.3	T405-35A-000
4.0	101.6	9.5-11.0	14.1-16.4	3.250	82.55	1.500	38.1	2.375 EUE 8RD	60.3	T405-40A-000
4.0	101.6	9.5-11.0	14.1-16.4	3.250	82.55	1.875	47.6	2.375 EUE 8RD	60.3	T405-41A-000
4-1/2	114.3	15.10-16.6	22.5-24.7	3.500	88.9	2.0	50.8	2.375 EUE 8RD	60.3	T405-45B-000
4-1/2	114.3	9.5-13.5	14.1-20.9	3.750	95.25	2.0	50.8	2.375 EUE 8RD	60.3	T405-45A-000
5.0	127	11.5-18.0	17.1-26.8	4.125	104.78	2.0	50.8	2.375 EUE 8RD	60.3	T405-50A-000
5.0	127	18-20.8	26.8-31.0	4.000	101.6	2.0	50.8	2.375 EUE 8RD	60.3	T405-50B-000
5-1/2	139.7	13-20	19.3-29.8	4.625	117.4	2.0	50.8	2.375 EUE 8RD	60.3	T405-55A-000
5-1/2	139.7	20-23	29.8-34.2	4.500	114.3	2.0	50.8	2.375 EUE 8RD	60.3	T405-55B-000
5-1/2	139.7	13-20	19.3-29.8	4.625	117.4	2.437	61.9	2.875 EUE 8RD	73.0	T405-56A-000
5-1/2	139.7	20-23	29.8-34.2	4.500	114.3	2.437	61.9	2.875 EUE 8RD	73.0	T405-56B-000
6.0	152.4	20-23	29.8-34.2	5.000	127	2.437	61.9	2.875 EUE 8RD	73.0	T405-60B-000
6-5/8	168.3	20-24	29.8-35.7	5.750	146.1	2.437	61.9	2.875 EUE 8RD	73.0	T405-65A-000
6-5/8	168.3	24-32	35.7-47.6	5.500	139.7	2.437	61.9	2.875 EUE 8RD	73.0	T405-65B-000
7.0	177.8	17-29	25.3-43.2	6.000	152.4	2.437	61.9	2.875 EUE 8RD	73.0	T405-70A-000
7.0	177.8	17-29	25.3-43.2	6.000	152.4	3.000	76.2	3-1/2 EUE 8RD	88.9	T405-73A-000
7-5/8	193.7	20-29.7	29.8-44.2	6.625	168.3	2.437	61.9	2.875 EUE 8RD	73.0	T405-75A-000
8-5/8	219.1	24-40	35.7-59.5	7.500	190.5	2.437	61.9	2.875 EUE 8RD	73.0	T405-85A-000
8-5/8	219.1	20-24	29.8-35.7	7.875	200	2.437	61.9	2.875 EUE 8RD	73.0	T405-85B-000
9-5/8	244.5	32.3-43.5	48.0-64.7	8.500	215.9	2.500	63.5	2.875 EUE 8RD	73.0	T405-95A-000
9-5/8	244.5	43.5-53.5	64.7-79.6	8.250	209.6	2.500	63.5	2.875 EUE 8RD	73.0	T405-95B-000
9-5/8	244.5	32.3-43.5	48.0-64.7	8.500	215.9	3.000	76.2	3-1/2 EUE 8RD	88.9	T405-96A-000
9-5/8	244.5	43.5-53.5	64.7-79.6	8.250	209.6	3.000	76.2	3-1/2 EUE 8RD	88.9	T405-96B-000
9-5/8	244.5	32.3-43.5	48.0-64.7	8.500	215.9	4.000	101.6	4-1/2 EUE 8RD	114.3	T405-97A-000
9-5/8	244.5	43.5-53.5	64.7-79.6	8.250	209.6	4.000	101.6	4-1/2 EUE 8RD	114.3	T405-97A-000
10-3/4	273.1	32.7-55.5	48.6-82.6	9.500	241.3	2.500	63.5	2-7/8 EUE 8RD	73.0	T405-10A-000
10-3/4	273.1	32.7-55.5	48.6-82.6	9.500	241.3	3.000	76.2	3-1/2 EUE 8RD	88.9	T405-101A-000
10-3/4	273.1	32.7-55.5	48.6-82.6	9.500	241.3	4.000	101.6	4-1/2 EUE 8RD	114.3	T405-102A-000
13-3/8	339.7	48-72	71.4-107	12.000	304.8	4.000	101.6	4-1/2 EUE 8RD	114.3	T405-13A-000



T-1 TANDEM TENSION PACKER

The T-1 Tandem Tension Packer is used in conjunction with another Tryton hookwall packer as an isolation packer in multiple zone completions.

The T-1 Tandem Tension Packer can be set 2 ways. In the unjayed position simply apply tension shearing the brass shear screw energizing the packing element.

In the jayed position, set down weight shearing the brass shear screws, then rotate 1/8 right hand turn at packer and pull tension to energize the packing element.

To release set down weight to remove applied tension and engage the unloader to equalize pressures, then rotate 1/8 left hand turn at the packer to re-engage into running jay position.



• FULL BORE DESIGN

- ♦ SIMPLE, ECONOMICAL PACKER FOR ZONE ISOLATION
 - **BUILT IN UNLOADER**
- AVAILABLE IN RIGHT OR LEFT HAND J-SLOT
- **♦** CONFIGURATIONS

CASING SIZE		CASING WEIGHT		TUBING SIZE		MAX O.D.		MIN I.D.		PRODUCT NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	
4-1/2	114.3	9.5-13.5	14.1-20.1	2-3/8 EUE	60.3	3.750	95.25	2.000	50.8	T437-45A-000
5.0	127	11.5-15	17.1-22.3	2-3/8 EUE	60.3	4.125	104.78	2.000	50.8	T437-50A-000
5.0	127	18-20.8	26.8-31.0	2-3/8 EUE	60.3	4.000	101.6	2.000	50.8	T437-50B-000
5-1/2	139.7	13-20	19.3-29.8	2-3/8 EUE	60.3	4.625	117.4	2.000	50.8	T437-55A-000
5-1/2	139.7	20-23	29.8-34.2	2-3/8 EUE	60.3	4.500	114.3	2.000	50.8	T437-55B-000
7.0	177.8	17-26	25.3-38.7	2-7/8 EUE	73.0	6.000	152.4	2.500	63.5	T437-70B-000
7.0	177.8	26-32	38.7-47.6	2-7/8 EUE	73.0	5.875	149.2	2.500	63.5	T437-70A-000
7.0	177.8	17-26	25.3-38.7	3-1/2 EUE	88.9	6.000	152.4	3.000	76.2	T437-73B-000
7.0	177.8	26-32	38.7-47.6	3-1/2 EUE	88.9	5.875	149.2	3.000	76.2	T437-73A-000
8-5/8	219.1	24-40	35.7-59.5	2-7/8 EUE	73.0	7.500	190.5	2.500	63.5	T437-85A-000
8-5/8	219.1	24-40	35.7-59.5	3-1/2 EUE	88.9	7.500	190.5	3.000	76.2	T437-86A-000
9-5/8	244.5	32.3-43.5	48.1-64.7	3-1/2 EUE	88.9	8.500	215.9	3.000	76.2	T437-95B-000
9-5/8	244.5	40-53.5	59.5-79.6	3-1/2 EUE	88.9	8.250	209.6	3.000	76.2	T437-95A-000



T-2 SHEAR TENSION PACKER

The T-2 Shear Tension Packer is used for water injection testing and , pumping wells. The T-2 design uses an external J-slot unlike most drag block tension packers that use internal J-slots. The external J-slot is extremely durable and will accept torque without damage, it also allows for increased cross-section of the mandrel for optimum wear. The top and bottom connections of the T-2 Packers are interchangeable which allows the packer to convert to compression set tool while maintaining a rotational safety release system. The shear release mechanism use slotted brass screws that remain visible and are easily adjusted in the field.

******EXTERNAL J-SLOT DESIGN FOR DURABILITY*

- ♦ USES DRAG BLOCKS FOR EXTENDED LIFE
- ♦ INTERCHANGEABLE TOP AND BOTTOM CONNECTIONS ALLOWS TOOL TO INVERT (TENSION OR COMPRESSION
- ♦ AUTOMATIC J-SLOT FOR EASY RELEASE
- ***** ROTATIONAL SAFETY RELEASE
- ♦ SHEAR SAFETY RELEASE
- ◆ USES COMMON REPLACEMENT PARTS




<u>T-2 SHEAR TENSION PACKER</u> <u>TECHNICAL DATA</u>

CASING SIZE		CASING WEIGHT		TUBIN SIZF	TUBING SIZE		MAX. O.D.		IN. D.	PRODUCT NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	
4-1/2	114.3	9.5-13.5	14.1-20.9	2-3/8 EUE	60.3	3.750	95.25	1.938	49.2	T456-45A-000
5.0	127	11.5-15	17.1-26.8	2-3/8 EUE	60.3	4.125	104.8	1.938	49.2	T456-45A-000
5.0	127	18-20.8	26.8-31.0	2-3/8 EUE	60.3	4.000	101.6	1.938	49.2	T456-45A-000
5-1/2	139.7	14-20	20.8-29.8	2-3/8 EUE	60.3	4.625	117.4	1.938	49.2	T456-55A-000
5-1/2	139.7	20-23	29.8-34.2	2-3/8 EUE	60.3	4.500	114.3	1.938	49.2	T456-55B-000
5-1/2	139.7	14-20	20.8-29.8	2-7/8 EUE	73.0	4.625	117.4	2.375	60.3	T456-56A-000
5-1/2	139.7	20-23	29.8-34.2	2-7/8 EUE	73.0	4.500	114.3	2.375	60.3	T456-56A-000
7.0	177.8	17-26	25.3-38.7	2-7/8 EUE	73.0	6.000	152.4	2.500	63.5	T456-70B-000
7.0	177.8	26-32	38.7-47.6	2-7/8 EUE	73.0	5.875	149.2	2.500	63.5	T456-70A-000
7.0	177.8	17-26	25.3-38.7	3-1/2 EUE	88.9	6.000	152.4	3.000	76.2	T456-73B-000
7.0	177.8	26-32	38.7-47.6	3-1/2 EUE	88.9	5.875	149.2	3.000	76.2	T456-73A-000
8-5/8	219.1	24-40	35.7-59.5	2-7/8 EUE	73.0	7.500	190.5	2.500	63.5	T456-85A-000
8-5/8	219.1	24-40	35.7-59.5	3-1/2 EUE	88.9	7.500	190.5	3.000	76.2	T456-86A-000
9-5/8	244.5	32.3-43.5	48.0-64.7	2-7/8 EUE	73.0	8.500	215.9	2.500	63.5	T456-95B-000
9-5/8	244.5	40-53.5	59.5-79.6	2-7/8 EUE	73.0	8.250	209.6	2.500	63.5	T456-95A-000
9-5/8	244.5	32.3-43.5	48.0-64.7	3-1/2 EUE	88.9	8.500	215.9	3.000	76.2	T456-96B-000
9-5/8	244.5	40-53.5	59.5-79.6	3-1/2 EUE	88.9	8.250	209.6	3.000	76.2	T456-96A-000



AD-1 TENSION PACKER

The AD-1 Tension Packer is a compact, economical, retrievable packer. Primarily used in waterflood applications, this packer can also be used for production and/or treating operations. It is used where a set-down packer is impractical. Since the AD-1 is tension set, it is ideally suited for shallow wells where set-down weight is not available.

To set the packer is ran to the desired setting depth. Upon making the last movement downward, rotate the tubing to the left one-quarter turn at the tool. Pick up and pack-off.

To release the packer lower the tubing at least one foot (0.30 m) more than is needed to remove applied tension so that the J-pin will move fully to the top of the J-slot. Rotate the tubing to the right one-quarter turn at the packer so slips will now be in the running position. Packer can then be moved to a new position, reset or it can be retrieved.

As an alternate release method, this packer has shear rings designed to part at tensions ranging from 4,000 - 26,700 daN. The cone, packing element and guide drop down and are carried out of the hole by the bottom sub.

- ♦ UTILIZES RUGGED ROCKER TYPE SLIP
- ♦ BORE THROUGH THE PACKER MANDREL IS LARGER THAN DRIFT
- ♦ SIMPLE, LOW COST PACKER FOR FLUID INJECTION
- ♦ THREE RELEASE METHODS INSURE RETRIEVABILITY
- USES PROVEN ONE-PIECE PACKING ELEMENT
- ♦ ALTERNATIVE SHEAR RELEASE





AD-1 TENSION PACKER TECHNICAL DATA

	C	ASING		I.D. RANGE					
0.	D.	WEI	GHT	M	IN	M	MAX		
in.	mm	lb/ft	kg/m	in.	mm	in.	mm		
4-1/2	114.3	9.5-10.5	14.1-15.6	3.910	99.3	4.160	105.7		
5	127.0	15-18	22.3-26.8	4.161	105.7	4.408	112.0		
5	127.0	11.5-15	17.1-22.3	4.408	112.0	4.560	115.8		
5-1/2	139.7	26	38.7	4.408	112.0	4.560	115.8		
5-1/2	139.7	20-23	29.8-34.2	4.625	117.5	4.778	121.4		
5-1/2	139.7	15.5-20	23.1-29.8	4.778	121.4	4.950	125.7		
5-1/2	139.7	13-15.5	19.3-23.1	4.950	125.7	5.190	131.8		
5-1/2	139.7	13-17	19.3-25.3	4.876	123.9	5.044	128.1		
6-5/8	168.3	24	35.7	5.830	148.1	5.921	150.4		
6-5/8	168.3	17-20	25.3-29.8	5.922	150.4	6.135	155.8		
7	177.8	38	56.6	5.830	148.1	5.921	150.4		
7	177.8	32-35	47.6-52.1	5.922	150.4	6.135	155.8		
7	177.8	26-29	38.7-43.2	6.136	155.9	6.276	159.4		
7	177.8	20-26	29.8-38.7	6.276	159.4	6.456	164.0		
7	177.8	17-20	25.3-29.8	6.456	164.0	6.538	166.1		
7-5/8	193.7	33.7-39	50.2-58.0	6.539	166.1	6.765	171.8		
7-5/8	193.7	24-29.7	35.7-44.2	6.766	171.9	7.025	178.4		
7-5/8	193.7	20-24	29.8-35.7	7.025	178.4	7.125	181.0		

GA RI O	UGE NG .D.	PAC BO	KER RE	THREAD CONN.			
in.	mm	in.	mm	in.	mm		
3.771	95.8	1.89	48.01	2.4	60.3		
4.125	104.8	1.89	48.01	2.375	60.3		
1.250	108.0	1.89	50.04	2.375	60.3		
4.250	108.0	1.97	50.04	2.375	60.3		
4.500	144.3	1.97	50.04	2.375	60.3		
4.641	117.39	1.97	50.04	2.375	60.3		
4.781	121.4	1.97	73.66	2.375	60.3		
4.750	120.7	2.90	61.47	2.875	73.0		
5.656	143.7	2.42	61.47	2.875	73.0		
5.812	147.6	2.42	61.47	2.875	73.0		
5.656	143.7	2.42	61.47	2.875	73.0		
5.812	147.6	2.42	61.47	2.875	73.0		
5.968	151.6	2.42	61.47	2.875	73.0		
6.078	154.4	2.42	61.47	2.875	73.0		
6.266	159.2	2.42	61.47	2.875	73.0		
6.453	163.9	2.42	61.47	2.875	73.0		
6.672	169.5	2.42	61.47	2.875	73.0		
6.812	173.0	2.42	61.47	2.875	73.0		



TBR COMPRESSION ISOLATION PACKER

The TBR Compression Isolation Packer is an economical means of isolating multiple zone wells. The TBR Compression Isolation Packer is used as the upper packer in tandem string applications.

- ECONOMICAL
- ADJUSTABLE SHEAR VALUES
- **RESETABLE**
- SIMPLE OPERATION

TECHNICAL DATA

CASING SIZE		TUBING		MAX	X O.D	MIN	I.D.	PRODUCT
in.	mm	in.	mm	in. mm		in.	mm	NUMBER
4-1/2	114.3	2-3/8	60.3	3.750	95.25	2.000	50.8	T641-45A-000
5	127	2-3/8	60.3	4.000	101.60	2.000	50.8	T641-50A-000
5-1/2	139.7	2-3/8	60.3	4.625	117.40	2.000	50.8	T641-55A-000
5-1/2	139.7	2-7/8	73.0	4.625	117.40	2.000	50.8	T641-56A-000
7	177.8	2-7/8	73.0	6.000	152.40	2.500	63.5	T641-70B-000
7	177.8	2-7/8	73.0	5.875	149.23	2.500	63.5	T641-70A-000
7	177.8	3-1/2	88.9	5.875	149.23	3.000	76.2	T641-73A-000
7	177.8	3-1/2	88.9	6.000	152.40	3.000	76.2	T641-73B-000
9-5/8	244.5	4-1/2	101.6	8.500	215.90	4.000	101.6	T641-97A-000





TDC DUAL COMPRESSION PACKER

The TDC Dual Compression Packer is a retrievable compression set isolation packer. The bypass tube is an integral part of the TDC and a telescoping slip joint is used for spacing out and connection to a gas lift mandrel. The TDC is the upper packer in a two packer chamber gas lift completion. The TDC packer is keyed with heavy duty bolts that allow torque for setting and releasing of a lower packer.

To set, once the lower packer is set, 4,500 daN (10,000 lbs.) tubing weight is applied to shear the shear screws and energize the packing element.

To release, simply pick straight up with the tubing string.



• SIMPLE OPERATION

- RUGGED CONSTRUCTION
- ◆ ADJUSTABLE SETTING SHEAR SCREWS

TECHNICAL DATA

CAS SIZ	ING ZE	CASING WEIGHT		TUI SI	TUBING SIZE		MAX. O.D.		IN. D.	PRODUCT NUMBERS
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	
4-1/2	114	9.5-11.6	14.14-17.26	1.900	48.3	3.813	96.85	1.500	38.1	T900-45A-000
5	127	11.5-18	17.1-26.8	1.900	48.3	4.062	103.17	1.500	38.1	T900-50A-000
5-1/2	139.7	14-20	20.8-29.8	1.900	48.3	4.625	117.48	1.500	38.1	T900-55A-000
6-5/8	168.3	20-28	29.8-41.7	2-7/8	73.0	5.625	142.88	2.500	63.5	T900-65A-000
7	177.8	17-29	25.3-43.2	2-7/8	73.0	6.000	152.40	2.500	63.5	T900-70B-000
7	177.8	26-32	38.7-47.6	2-7/8	73.0	5.875	149.23	2.500	63.5	T900-70A-000
7-5/8	193.7	33.7-39	50.2-58.0	2-7/8	73.0	6.453	163.91	2.500	63.5	T900-75A-000
9-5/8	244.5	32-43.5	47.6-64.7	2-7/8	73.0	8.500	215.90	2.500	63.5	T900-95B-000
9-5/8	244.5	43.5-53.5	59.5-79.6	2-7/8	73.0	8.250	209.55	2.500	63.5	T900-95A-000



THI HYDRAULIC ISOLATION PACKER

The THI Hydraulic Isolation Packer is a hydraulic set, single string tandem packer used in multiple zone wells. The **THI** Hydraulic Isolation Packer is used as the upper packer in multiple zone applications.



- ◆ ECONOMICAL DESIGN
- ♦ EASILY ADJUSTABLE SET AND RELEASE SHEAR SCREWS
- ♦ COMPACT

TECHNICAL DATA

CASING SIZE		CASING WEIGHT		TUBING SIZE		MAX. O.D.		MIN. I.D.		PRODUCT NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	
4-1/2	114.3	9.5-13.5	14.1-20.9	2-3/8 EUE	60.3	3.750	95.25	2.000	50.80	T654-45A-000
5.0	127	11.5-15	17.1-22.3	2-3/8 EUE	60.3	4.125	104.78	2.000	50.80	T654-50A-000
5.0	127	18-20	26.8-31.0	2-3/8 EUE	60.3	4.000	101.6	2.000	50.80	T654-50B-000
5-1/2	139.7	13-20	19.3-29.8	2-3/8 EUE	60.3	4.625	117.48	2.000	50.80	T654-55A-000
5-1/2	139.7	20-23	29.8-34.2	2-3/8 EUE	60.3	4.500	114.3	2.000	50.80	T654-55B-000
7.0	177.8	17-16	25.3-38.7	2-7/8 EUE	73	6.000	152.40	2.500	63.50	T654-70B-000
7.0	177.8	26-32	38.7-47.6	2-7/8 EUE	73	5.875	149.23	2.500	63.50	T654-70A-000



HYDRO SEAL PACKER

The Hydro-Seal Packer is designed to be run in either open or cased hole applications. The Hydro-Seal can be ran alone or in tandem in order to provide water shut-off or zonal isolation in either vertical or horizontal wells. The packer is hydraulically set with an internal locking mechanism providing a positive and reliable long-term pack-off. Both durable construction and a small OD makes the Hydro-Seal Packer an excellent alternative to the use of inflatable packers.

The Hydro-Seal is hydraulically set by applying pressure against a temporary plugging device in the tubing below the packer. The setting pressure can be adjusted through field accessible setting shear pins. The Hydro-Seal is released simply by applying tubing tension at the tool and can be assisted with applied tubing pressure. The shear release can also be adjusted in the field. The Hydro-Seal can be run in conjunction with other Tryton completion tools and accessories as required.

The Hydro-Seal can be used for a number of applications including zonal isolation in cased or open hole, gas or water shut-off, testing, selective stimulation, formative fracture isolation or as an excellent alternative to inflatable packers

- ◆ MULTIPLE PACKING ELEMENTS
- ♦ DUAL ACTION SETTING PISTON
- ♦ INTERNAL LOCKING MECHANISM
- ♦ FIELD ADJUSTABLE SETTING PRESSURE
- ♦ FIELD ADJUSTABLE SHEAR RELEASE
- ***** TUBING PRESSURE SHEAR RELEASE ASSIST
- ◆ MINIMUM OD IDEALLY SUITED FOR OPEN HOLE AND HORIZONTAL APPLICATIONS
- CAN BE RAN ALONE OR IN TANDEM
- ♦ CAN BE USED IN CONJUNCTION WITH OTHER COMPLETION TOOLS AND ACCESSORIES
- * AVAILABLE IN STANDARD, SOUR SERVICE, OR PREMIUM SERVICE VERSION

PACKER OD (mm)	95.25	114.3	114.3	117.4	149.23	149.23
PACKER OD (in)	3.750	4.50	4.50	4.625	5.875	5.875
TBG. CONNECTION (mm)	60.3	60.3	73.0	73.0	73.0	88.9
TBG. CONNECTION (in)	2.375	2.375	2.875	2.875	2.875	3.50

TRAIN		
ТЕСНА	ICAL	DATA



HYDRO CT PACKER

The Hydro CT Packer can be ran either on jointed pipe utilizing a conventional rig or rigless application using coiled tubing. The Hydro CT can be ran alone or in tandem for testing, production, water shut-off or zonal isolation in either vertical or horizontal wells. The Hydro CT is hydraulically set with an internal locking mechanism providing a positive and reliable long-term pack-off. Both durable construction and compact size makes the Hydro CT Packer an excellent alternative to conventional hydraulic packers.

The Hydro CT Packer is hydraulically set by applying air, nitrogen or fluid differential pressure against a temporary plugging device in the tubing below the packer. The setting pressure can be adjusted through field accessible setting shear pins.

The Hydro CT is released simply by applying tubing tension at the tool. As the releasing mechanism is independent of the setting mechanism low releasing shear values can be used. In addition differential pressure across the packer does not act on the releasing mechanism. The shear release can be adjusted in the field. The Hydro CT can be ran in conjunction with other Tryton completion tools and accessories as required.

The Hydro CT can be used for a number of applications including testing, production, zonal isolation, gas or water shut-off, selective stimulation, formative fracture isolation or as an alternative to inflatable packers.

- ◆ 3 ELEMENT PACK-OFF SYSTEM
- ♦ INTERNAL LOCKING MECHANISM

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- * FIELD ADJUSTABLE SETTING PRESSURE
- * FIELD ADJUSTABLE SHEAR RELEASE
- RELEASING MECHANISM INDEPENDENT OF SETTING MECHANISM
- * CAN BE RAN IN SINGLE OR MULTIPLE PACKER APPLICATIONS
- ◆ CAN USED IN CONJUNCTION WITH OTHER COMPLETION TOOLS AND ACCESSORIES
- ♦ SUITED FOR BOTH VERTICAL AND HORIZONTAL APPLICATIONS
- ◆ AVAILABLE IN STANDARD, SOUR SERVICE, OR PREMIUM SERVICE VERSION

TECHNICAL DATA	4
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CAS SI	SING ZE	G CASING WEIGHT		TUBING SIZE		MAX O.D.		MIN I.D.		PRODUCT NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	
4-1/2	114.3	9.5-13.5 PPF	14.1-20.9	2-3/8 EUE	60.3	3.750	95.25	2.000	50.80	T658-45A-000
5.0	127	11.5-15 PPF	17.1-22.3	2-3/8 EUE	60.3	4.125	104.78	2.000	50.80	T658-50A-000
5.0	127	18-20 PPF	26.8-31.0	2-3/8 EUE	60.3	4.000	101.6	2.000	50.80	T658-50B-000
5-1/2	139.7	13-20 PPF	19.3-29.8	2-3/8 EUE	60.3	4.625	117.48	2.000	50.80	T658-55A-000
5-1/2	139.7	20-23 PPF	29.8-34.2	2-3/8 EUE	60.3	4.500	114.3	2.000	50.80	T658-55B-000
7.0	177.8	17-16 PPF	25.3-38.7	2-7/8 EUE	73	6.000	152.40	2.500	63.50	T658-70B-000
7.0	177.8	26-32 PPF	38.7-47.6	2-7/8 EUE	73	5.875	149.23	2.500	63.50	T658-70A-000





TRB HYDRO-GRIP HYDRAULIC SET PACKER

The TRB Hydro-Grip Hydraulic Set Packer is a single string pressure activated double grip production packer used in single or multi zone completions. The TRB Hydro-Grip Packer is ideally suited for applications where it is desired to set the packer after the well is flanged up.. The TRB is ideal for multi zone completions because the pressure balance system is zone activated offsetting pressure differentials across the packer.

To set, the packer is ran to depth using a pump-out plug, expendable seat, trip sub or profile nipple below the packer. Pressure tubing string to a pre-determined pressure shearing the set shear screws closing the bypass system and energizing the packing elements.

To release straight pull on tubing string shears the release screws, opening the equalizing system and then activates the sequential release slip system.

• RUNNING BYPASS

- RELEASE EQUALIZING SYSTEM
- PRESSURE BALANCED SYSTEM
- INTERNAL COMPONENTS LOCKED ELIMINATES PREMATURE SET
- STRAIGHT PULL RELEASE





<u>TRB HYDRO-GRIP HYDRAULIC SET PACKER</u> <u>TECHNICAL DATA</u>

CASING SIZE		CASING WEIGHT		THREAD CONNECTI	THREAD CONNECTION		MAX. O.D.		IIN. .D.	PRODUCT NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	
4-1/2	114.3	9.5-13.5	14.1-20.1	2-3/8 EUE 8RD	60.3	3.750	95.25	2.000	50.80	T650-45A-000
5	127	11.5-18	17.1-26.8	2-3/8 EUE 8RD	60.3	4.125	104.78	2.000	50.80	T650-50A-000
5	127	18-20.8	26.8-31.0	2-3/8 EUE 8RD	60.3	4.000	101.60	2.000	50.80	T650-50B-000
5-1/2	139.7	13-14	19.3-20.8	2-3/8 EUE 8RD	60.3	4.812	122.22	2.000	50.80	T650-55C-000
5-1/2	139.7	14-20	20.8-29.8	2-3/8 EUE 8RD	60.3	4.625	117.48	2.000	50.80	T650-55A-000
5-1/2	139.7	20-23	29.8-34.2	2-3/8 EUE 8RD	60.3	4.500	114.30	2.000	50.80	T650-55B-000
6-5/8"	168.3	17-20	25.3-29.8	2-7/8 EUE 8RD	73.0	5.750	146.10	2.500	63.50	T650-65A-000
7"	177.8	17-26	25.3-38.7	2-7/8 EUE 8RD	73.0	6.000	152.40	2.500	63.50	T650-70A-000
7"	177.8	26-35	38.7-52.1	2-7/8 EUE 8RD	73.0	5.875	149.23	2.500	63.50	T650-70C-000
7"	177.8	17-26	25.3-38.7	3-1/2 EUE 8RD	88.9	6.000	152.40	3.000	76.20	T650-73B-000
7	177.8	26-32	38.7-47.6	3-1/2 EUE 8RD	88.9	5.875	149.23	3.000	76.20	T650-73A-000
9-5/8	244.5	32.3-43.5	48.1-64.7	3-1/2 EUE 8RD	88.9	8.500	215.90	3.000	76.20	T650-95B-000
9-5/8	244.5	43.5-53.5	64.7-79.6	3-1/2 EUE 8RD	88.9	8.250	209.60	3.000	76.20	T650-95A-000
9-5/8	244.5	32.3-43.5	48.1-64.7	4-1/2 EUE 8RD	114.3	8.500	215.90	4.000	101.60	T650-96B-000
9-5/8	244.5	43.5-53.5	64.7-79.6	4-1/2 EUE 8RD	114.3	8.250	209.60	4.000	101.60	T650-96A-000



TS-3 SINGLE GRIP COMPRESSION PACKER

The TS-3 Single Grip Packer is designed for wells that do not require a hold-down device when minimal differential pressure from below the packer is expected. Full opening design allows unrestricted fluid flow and wireline operations through the tubing. The TS-3 also incorporates an internal bypass to prevent swabbing when running and retrieving.

To set, run the tool to setting depth, pick up tubing and rotate to the right ¼ turn at the packer. Tubing weight is applied, which sets the lower slips, closes the bypass valve, and expands the packing elements.

To release, raise the tubing, which first opens the bypass valve, then releases the slips and packing elements.

- *** OPTIONAL J-SLOT CONFIGURATIONS**
- LARGE BYPASS FOR RUNNING, RETRIEVING AND EQUALIZING
- NORMALLYRIGHT HAND COMPESSION SET, STRAIGHT PICK-UP RELEASE



<u>TS-3 SINGLE GRIP COMPRESSION PACKER</u> <u>TECHNICAL DATA</u>

CA	SING IZF	CAS WFI	ING GHT	0	.D.)F	NOMINAL CASING I.D. RANGE			G
		W EI	GIII	тс	OOL	M	IN	M	AX
in.	mm	lbs	kg	in.	mm	in. mm		in.	mm
2-7/8	73.0	6.4-6.5	9.5-9.6	2.250	57.15	2.375	60.33	2.441	62.00
4	101.6	9.5-11.0	14.1-16.3	3.250	82.55	3.476	88.29	3.548	90.12
4-1/2	114.3	15.1-16.6	22.3-24.6	3.594	91.29	3.754	95.30	3.826	97.18
4-1/2	114.3	9.5-13.5	14.1-20.1	3.750	95.25	3.920	99.5 7	4.090	103.89
5	127.0	18.0-20.8	26.82-13.9	4.000	101.60	4.156	105.56	4.276	108.61
5	127.0	11.5-15.0	17.1-22.3	4.125	104.78	4.408	111.96	4.560	115.82
5-1/2	139.7	20.0-23.0	29.8-34.2	4.500	114.30	4.670	118.62	4.778	121.36
5-1/2	139.7	14.0-20.0	20.8-29.8	4.625	117.48	4.778	121.36	5.012	127.31
5-1/2	139.7	20.0-23.0	29.8-34.2	4.500	114.30	4.670	118.62	4.778	121.36
5-1/2	139.7	15.5-20.0	23.1-29.8	4.625	117.48	4.718	119.84	4.950	125.73
5-1/2	139.7	13.0-14.0	19.2-20.8	4.813	122.25	5.012	127.31	5.044	128.12
7	177.8	26.0-35.0	38.7-51.8	5.875	149.23	6.004	152.50	6.276	159.41
7	177.8	17.0-26.0	25.3-38.7	6.125	139.70	6.276	144.15	6.538	150.39
7-5/8	193.7	33.7-39.0	50.2-58.1	6.453	163.91	6.625	168.28	6.765	171.83
7-5/8	193.7	24.0-29.7	35.8-44.3	6.672	169.47	6.875	174.63	7.025	178.44
8-5/8	219.1	24.0-40.0	35.8-59.6	7.500	190.50	7.725	196.22	8.097	205.66
9-5/8	244.5	43.5-53.5	64.8-79.7	8.250	209.55	8.535	216.79	8.758	222.45
9-5/8	244.5	32.2-43.5	32.2-48.0	8.500	215.90	8.755	222.38	9.001	228.63

MINI TOO	MUM L I.D.	THREAD CONNECTIO) ONS	PRODUCT NUMBER
in.	mm	in.	mm	
0.625	15.88	1.050 EU 10RD	26.6	T612-25A-000
1.500	38.10	1.900 EU 10RD	48.2	T631-40A-000
1.500	38.10	1.900 EU 10RD	48.2	T612-41A-000
1.938	49.23	2.375 EU 8RD	60.3	T631-45A-000
1.938	49.23	2.375 EU 8RD	60.3	T631-52A-000
1.938	49.23	2.375 EU 8RD	60.3	T631-50A-000
2.000	50.80	2.375 EU 8RD	60.3	T631-57A-000
2.000	50.80	2.375 EU 8RD	60.3	T631-55A-000
2.375	60.33	2.375 EU 8RD	60.3	T631-59A-000
2.375	60.33	2.875 EU 8RD	73.0	T631-56A-000
2.375	60.33	2.875 EU 8RD	73.0	T631-58A-000
2.500	63.50	2.875 EU 8RD	73.0	T631-70A-000
3.000	76.20	2.875 EU 8RD	73.0	T631-72A-000
2.500	63.50	2.875 EU 8RD	73.0	T631-74A-000
2.500	63.50	3.500 EU 8RD	88.8	T631-75A-000
2.500	63.50	2.875 EU 8RD	73.0	T631-76A-000
4.000	101.60	4.500 EU 8RD	114.2	T631-85A-000
4.000	101.60	4.500 EU 8RD	114.2	T631-96A-000



TS-4 DOUBLE GRIP COMPRESSION PACKER

The TS-4 Double Grip Compression Set Packer is used for production, stimulation and testing. The mechanical upper hold down system reduces the cost and maintenance of a button type hydraulic hold down system. The TS-4 is equipped with a running bypass that reduces swabbing. Set down weight closes the bypass valve, sets the upper and lower slips and energizes the packing elements. The closed bypass valve activates the pressure balanced hold down system. Pressure from below aids in holding the bypass valve closed and preventing upward movement of the tubing string.

To se, run the tool to setting depth, pick up tubing and rotate to the right ¹/₄ turn at the packer. Tubing weight is applied, which sets the lower slips, closes the bypass valve, and expands the packing elements.

To release, raise the tubing, which first opens the bypass valve, then releases the slips and packing elements.

• NO HYDRAULIC HOLD DOWN BUTTONS

- ♦ BUILT IN UNLOADER WASHES DEBRIS FROM WHEN RETRIEVING
- ◆ SEQUENTIAL RELEASE UPPER SLIP SYSTEM
- ♦ AVAILBLE IN AUTOMATIC AND MANUAL JAY CONFIGURATIONS





<u>TS-4 DOUBLE GRIP COMPRESSION PACKER</u> <u>TECHNICAL DATA</u>

CAS SIZ	ING ZE	CAS WEI	ING GHT	THREA CONNECT	AD ION	M (IAX.).D.	MIN. I.D.		PRODUCT NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	
2-7/8	73.0	6.4-6.5	9.5-9.7	1.050 EU 10RD	26.7	2.250	57.15	.625	15.88	T611-25A-000
3-1/2	88.9	7.7-10.2	11.5-15	1.900 NU 10RD	48.3	2.781	70.63	1.250	37.75	T611-35A-000
4-1/2	114.3	9.5-13.5	14.1-20.9	2-3/8 EUE 8RD	60.3	3.750	95.25	2.000	50.80	T611-45A-000
5	127	11.5-15	17.1-22.3	2-3/8 EUE 8RD	60.3	4.125	104.78	2.000	50.80	T611-50A-000
5	127	18-20.8	26.8-31.0	2-3/8 EUE 8RD	60.3	4.000	101.60	2.000	50.80	T611-50B-000
5-1/2	139.7	14-20	20.8-29.8	2-3/8 EUE 8RD	60.3	4.625	117.48	2.000	50.80	T611-55A-000
5-1/2	139.7	20-23	29.8-34.2	2-3/8 EUE 8RD	60.3	4.500	114.30	2.000	50.80	T611-55B-000
5-1/2	139.7	15.5-20	23.1-29.8	2-7/8 EUE 8RD	73.0	4.625	117.48	2.375	60.30	T611-56A-000
5-1/2	139.7	20-23	29.8-34.2	2-7/8 EUE 8RD	73.0	4.500	114.30	2.375	60.30	T611-56B-000
7	177.8	17-26	25.3-38.7	2-7/8 EUE 8RD	73.0	6.000	152.40	2.500	63.50	T611-70B-000
7	177.8	26-32	38.7-47.6	2-7/8 EUE 8RD	73.0	5.875	149.23	2.500	63.50	T611-70A-000



TS-5 ANCHOR PACKER

The TS-5 Anchor Packer is the upper packer in a zone isolation completion. The packer was designed to run above the TS-3 Compression Packer. The TS-5 sets by applying weight closing the bypass seal and energizing the packing elements. Once set the TS-5 can be locked in place allowing the tubing string to be removed using the TL On/Off Tool. The TS-5 sets and releases with one quarter turn right hand rotation at the packer.

- ♦ ALLOWS TUBING DISCONNECT IN STRADDLE COMPLETIONS
- ♦ SEQUENTIAL RELEASE SLIP SYSTEM
- LARGE BYPASS AREA
- ♦ EQUALIZING BYPASS SYSTEM OPENS BEFORE UPPER SLIPS ARE RELEASED





TS-5 ANCHOR PACKER <u>TECHNICAL DATA</u>

CAS SIZ	CASING CASING SIZE WEIGHT		SING IGHT	THREAD CONNECTION		MA O.	AX. D.	M I.	IN. D.	PRODUCT NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	
4-1/2	114.3	9.5-13.5	14.1-20.9	2-3/8 EUE 8RD	60.3	3.750	95.25	2.000	50.80	T628-45A-000
5	127	11.5-15	17.1-22.3	2-3/8 EUE 8RD	60.3	4.125	104.78	2.000	50.80	T628-50A-000
5	127	18-20.8	26.8-31.0	2-3/8 EUE 8RD	60.3	4.000	101.60	2.000	50.80	T628-50B-000
5-1/2	139.7	13-20	19.3-29.8	2-3/8 EUE 8RD	60.3	4.625	117.48	2.000	50.80	T628-55A-000
5-1/2	139.7	20-23	29.8-34.2	2-3/8 EUE 8RD	60.3	4.500	114.30	2.000	50.80	T628-55B-000
5-1/2	139.7	15.5-20	23.1-29.8	2-7/8 EUE 8RD	73.0	4.625	117.48	2.375	60.30	T628-56A-000
5-1/2	139.7	20-23	29.8-34.2	2-7/8 EUE 8RD	73.0	4.500	114.30	2.375	60.30	T628-56B-000
7	177.8	17-26	25.3-38.7	2-7/8 EUE 8RD	73.0	6.000	152.40	2.500	63.50	T628-70B-000
7	177.8	26-32	38.7-47.6	2-7/8 EUE 8RD	73.0	5.875	149.23	2.500	63.50	T628-70A-000
7-5/8	193.7	24-29.7	35.7-44.2	3-1/2 EUE 8RD	88.9	6.672	169.47	3.000	76.20	T628-76A-000
8-5/8	219.1	24-40	35.7-59.5	2-7/8 EUE 8RD	73.0	7.500	190.50	2.500	63.50	T628-85A-000



SNAPSET II COMPRESSION SET ISOLATION PACKER

The Snapset Il Compression Set Isolation Packer is used in multi-zone completions. The Snapset Il is used where high differential pressures above the packer are not expected. The Snapset Il sets in compression with a lower anchor style packer below. The collet in the lower end of the tool shifts at a pre-determined value to energize the packing elements and set the upper slips. To release, straight pick-up on the tubing string is required..

- COMPENSATING PISTON HOLD DOWN SYSTEM
- RUNNING BYPASS
- EQUALIZING SYSTEM
- KEYED FOR ROTATION THRU PACKER
- INTERNAL COLLET TO PREVENT PRE-SET
- 3 ELEMENT PACKING SYSTEM
- SEQUENTIAL RELEASE SLIP SYSTEM





<u>SNAPSET II COMPRESSION SET ISOLATION PACKER</u> <u>TECHNICAL DATA</u>

CAS SI	SING ZE	CA WE	SING IGHT	THREAD CONNECTION		MA O.	X. D.	M I.	IN. D.	PRODUCT NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	
2-7/8	73.0	6.4-6.5	9.5-9.7	1.050 EUE 10RD	26.67	2.250	57.15	.625	15.88	T636-25A-000
4	101.6	9.5-11	14.14-16.4	1.900 EUE 10RD	48.3	3.250	82.55	1.500	38.10	T636-40A-000
4-1/2	114.3	15.1-16.6	22.5-24.7	1.900 EUE 10RD	48.3	3.594	91.29	1.500	38.10	T636-45C-000
4-1/2	114.3	9.5-13.5	14.14-20.1	2-3/8 EUE 8RD	60.3	3.750	95.25	1.938	49.23	T636-45A-000
4-1/2	114.3	13.5-15.1	20.1-22.5	2-3/8 EUE 8RD	60.3	3.656	92.86	1.938	49.23	T636-45B-000
5	127	11.5-15	17.1-22.3	2-3/8 EUE 8RD	60.3	4.125	104.78	1.938	49.23	T636-50A-000
5	127	18-20.8	26.8-31.0	2-3/8 EUE 8RD	60.3	4.000	101.60	1.938	49.23	T636-50B-000
5-1/2	139.7	13-14	19.3-20.8	2-3/8 EUE 8RD	60.3	4.812	122.22	2.000	50.80	T636-55C-000
5-1/2	139.7	14-20	20.8-29.8	2-3/8 EUE 8RD	60.3	4.625	117.48	2.000	50.80	T636-55A-000
5-1/2	139.7	20-23	29.8-34.2	2-3/8 EUE 8RD	60.3	4.500	114.30	2.000	50.80	T636-55B-000
5-1/2	139.7	13-14	19.3-20.8	2-7/8 EUE 8RD	73.0	4.812	122.22	2.375	60.30	T636-56C-000
5-1/2"	139.7	13-15.5	19.3-23.1	2-7/8 EUE 8RD	73.0	4.781	121.44	2.375	60.30	T636-56D-000
5-1/2"	139.7	15.5-20	23.1-29.8	2-7/8 EUE 8RD	73.0	4.625	117.48	2.375	60.30	T636-56A-000
5-1/2"	139.7	20-23	29.8-34.2	2-7/8 EUE 8RD	73.0	4.500	114.30	2.375	60.30	T636-56B-000
6"	152.4	14-20	20.8-29.8	2-7/8 EUE 8RD	73.0	5.188	131.78	2.375	60.30	T636-60A-000
6-5/8"	168.3	17-20	25.3-29.8	2-7/8 EUE 8RD	73.0	5.750	146.10	2.500	63.50	T636-65A-000
7"	177.8	17-26	25.3-38.7	2-7/8 EUE 8RD	73.0	6.000	152.40	2.500	63.50	T636-70B-000
7"	177.8	23-29	34.2-43.2	2-7/8 EUE 8RD	73.0	5.969	151.61	2.500	63.50	T636-70C-000
7"	177.8	26-32	38.7-47.6	2-7/8 EUE 8RD	73.0	5.875	149.23	2.500	.63.50	T636-70A-000
7-5/8"	193.7	24-29.7	35.7-44.2	2-7/8 EUE 8RD	73.0	6.672	169.47	2.500	63.50	T636-75A-000
7-5/8"	193.7	33.7-39	50.2-58.0	2-7/8 EUE 8RD	73.0	6.453	163.91	2.500	63.50	T636-75B-000
8-5/8"	219.1	24-40	35.7-59.5	2-7/8 EUE 8RD	73.0	7.500	190.50	2.500	63.50	T636-85A-000



TX-6 DOUBLE GRIP RETRIEVABLE PACKER

The TX-6 is a lower pressure single string double grip retrievable production packer that holds pressure from above and below. The TX-6 is capable of being set in tension or compression, once set the tubing string can be left in tension, compression or neutral. Incorporated into the design is and internal bypass system that equalizes pressure before the upper slips are pulled from the casing wall. This system allows the TX-6 Packer is designed to meet the requirements for production, testing, zone isolation and injection applications. The TX-6 Packer sets and releases to the right with one quarter at the packer.

- TUBING OR WIRELINE SET
- CAN BE PACKED -OFF WITH EITHER TENSION OR COMPRESSION
- LARGE INTERNAL BYPASS
- QUARTER TURN TO RIGHT TO SET AND RELEASE
- TUBING CAN BE LEFT IN TENSION, COMPRESSION OR NEUTRAL
- COMPATIBLE WITH A WIDE VARIETY OF TRYTON PACKER ACCESSORIES
- AVAILABLE WITH SECONDARY EMERGENCY SHEAR RELEASE
- SOUR SERVICE VERSION AVAILABLE





<u>TX-6 DOUBLE GRIP RETRIEVABLE PACKER</u> <u>TECHNICAL DATA</u>

CAS SI	SING ZE	CAS WE	CASING WEIGHT		G	M. O	AX .D.	MIN I.D.	
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm
4-1/2	114.3	9.5-13.5	14.1-20.1	2-3/8 EUE	60.3	3.750	95.25	2.000	50.8
5.0	127	11.5-15	17.1-22.3	2-3/8 EUE	60.3	4.125	104.78	2.000	50.8
5.0	127	18-20.8	26.8-31.0	2-3/8 EUE	60.3	4.000	101.6	2.000	50.8
5-1/2	139.7	13-20	19.3-29.8	2-3/8 EUE	60.3	4.625	117.4	2.000	50.8
5-1/2	139.7	20-23	29.8-34.2	2-3/8 EUE	60.3	4.500	114.3	2.000	50.8
7.0	177.8	17-26	25.3-38.7	2-7/8 EUE	73.0	6.000	152.4	2.500	63.5
7.0	177.8	26-32	38.7-47.6	2-7/8 EUE	73.0	5.875	149.2	2.500	63.5
7.0	177.8	17-26	25.3-38.7	3-1/2 EUE	88.9	6.000	152.4	3.000	76.2
7.0	177.8	26-32	38.7-47.6	3-1/2 EUE	88.9	5.875	149.2	3.000	76.2
8-5/8	219.1	24-40	35.7-59.5	2-7/8 EUE	73.0	7.500	190.5	2.500	63.5
8-5/8	219.1	24-40	35.7-59.5	3-1/2 EUE	88.9	7.500	190.5	3.000	76.2
9-5/8	244.5	32.3-43.5	48.1-64.7	3-1/2 EUE	88.9	8.500	215.9	3.000	76.2
9-5/8	244.5	40-53.5	59.5-79.6	3-1/2 EUE	88.9	8.250	209.6	3.000	76.2

С



TX-8 DOUBLE GRIP RETRIEVABLE PACKER

The TX-8 is a medium pressure single string double grip retrievable production packer that holds pressure from above and below. The TX-8 is capable of being set in tension or compression. Once set, the tubing string can be left in tension, compression or neutral. Incorporated into the design is an internal bypass system that allows pressure to equalize above and below the packer before the upper slips are pulled from the casing wall. This system allows the TX-8 Packer to be used for a wide variety of downhole applications from stimulation/service packer to production packer to retrievable bridge plug. The TX-8 Packer sets and releases to the right with one quarter of a turn at the packer.

- MECHANICALLY SET ON TUBING
- * CAN BE PACKED-OFF WITH EITHER TENSION OR COMPRESSION
- OPEN J-SLOT DESIGN
- LARGE INTERNAL BYPASS
- QUARTER TURN TO SET AND RELEASE
- SEQUENTIAL RELEASE UPPER SLIP SYSTEM
- TUBING CAN BE LEFT IN TENSION, COMPRESSION OR NEUTRAL
- COMPATIBLE WITH A WIDE VARIETY OF TRYTON PACKER ACCESSORIES
- ◆ AVAILABLE WITH SECONDARY EMERGENCY SHEAR RELEASE
- AVAILABLE WITH PREMIUM ELASTOMERS
- SOUR SERVICE VERSION AVAILABLE





<u>TX-8 DOUBLE GRIP RETRIEVABLE PACKER</u> <u>TECHNICAL DATA</u>

CAS	SING ZE	CASI WEIC	NG GHT	THREAD CONNECTION		M. O	AX. .D.	M I.	IN. D.	PRODUCT NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	
2-7/8	73.0	6.4-6.5	9.5-9.7	1.050 EUE 10RD	26.67	2.250	57.15	.625	15.88	T603-25A-000
3-1/2	88.9	9.2-10.2	13.7-15	1.900 NU 10RD	48.3	2.781	70.62	1.250	31.75	T603-35A-000
4	101.6	9.5-11	14.14-16.4	1.900 EUE 10RD	48.3	3.250	82.55	1.500	38.10	T603-40A-000
4-1/2	114.3	15.1-16.6	22.5-24.7	1.900 EUE 10RD	48.3	3.594	91.29	1.500	38.10	T603-45C-000
4-1/2	114.3	9.5-13.5	14.14-20.1	2-3/8 EUE 8RD	60.3	3.750	95.25	1.938	49.23	T603-45A-000
4-1/2	114.3	13.5-15.1	20.1-22.5	2-3/8 EUE 8RD	60.3	3.656	92.86	1.938	49.23	T603-45B-000
4-1/2	114.3	9.5-13.5	14.14-20.1	2-3/8 EUE 8RD	60.3	3.750	95.25	2.000	50.80	T603-46A-000
4-1/2	114.3	13.5-15.1	20.1-22.5	2-3/8 EUE 8RD	60.3	3.656	92.86	2.000	50.80	T603-46B-000
5	127	11.5-15	17.1-22.3	2-3/8 EUE 8RD	60.3	4.125	104.78	1.938	49.23	T603-50A-000
5	127	18-20.8	26.8-31.0	2-3/8 EUE 8RD	60.3	4.000	101.60	1.938	49.23	T603-50B-000
5-1/2	139.7	13-14	19.3-20.8	2-3/8 EUE 8RD	60.3	4.812	122.22	2.000	50.80	T603-55C-000
5-1/2	139.7	14-20	20.8-29.8	2-3/8 EUE 8RD	60.3	4.625	117.48	2.000	50.80	T603-55A-000
5-1/2	139.7	20-23	29.8-34.2	2-3/8 EUE 8RD	60.3	4.500	114.30	2.000	50.80	T603-55B-000
5-1/2	139.7	13-14	19.3-20.8	2-7/8 EUE 8RD	73.0	4.812	122.22	2.375	60.30	T603-56C-000
5-1/2"	139.7	13-15.5	19.3-23.1	2-7/8 EUE 8RD	73.0	4.781	121.44	2.375	60.30	T603-56D-000
5-1/2"	139.7	15.5-20	23.1-29.8	2-7/8 EUE 8RD	73.0	4.625	117.48	2.375	60.30	T603-56A-000
5-1/2"	139.7	20-23	29.8-34.2	2-7/8 EUE 8RD	73.0	4.500	114.30	2.375	60.30	T603-56B-000
6"	152.4	14-20	20.8-29.8	2-7/8 EUE 8RD	73.0	5.188	131.78	2.375	60.30	T603-60A-000
6-5/8"	168.3	17-20	25.3-29.8	2-7/8 EUE 8RD	73.0	5.750	146.10	2.500	63.50	T603-65A-000
7"	177.8	17-26	25.3-38.7	2-7/8 EUE 8RD	73.0	6.000	152.40	2.500	63.50	T603-70B-000
7"	177.8	23-29	34.2-43.2	2-7/8 EUE 8RD	73.0	5.969	151.61	2.500	63.50	T603-70C-000
7"	177.8	26-32	38.7-47.6	2-7/8 EUE 8RD	73.0	5.875	149.23	2.500	.63.50	T603-70A-000
7-5/8"	193.7	24-29.7	35.7-44.2	2-7/8 EUE 8RD	73.0	6.672	169.47	2.500	63.50	T603-75A-000
7-5/8"	193.7	33.7-39	50.2-58.0	2-7/8 EUE 8RD	73.0	6.453	163.91	2.500	63.50	T603-75B-000
8-5/8"	219.1	24-40	35.7-59.5	2-7/8 EUE 8RD	73.0	7.500	190.50	2.500	63.50	T603-85A-000
9-5/8"	244.5	32.3-43.5	48.1-64.7	4-1/2 EUE 8RD	114.3	8.500	215.90	4.000	101.60	T603-95B-000
9-5/8"	244.5	43.5-53.5	59.5-79.6	4-1/2 EUE 8RD	114.3	8.250	209.60	4.000	101.60	T603-95A-000
10-3/4	273.1	32.75-45.5	48.6-67.9	4-1/2 EUE 8RD	114.3	9.687	246.05	4.000	101.60	T603-10A-000



TX-8W WIRELINE SET DOUBLE GRIP RETRIEVABLE PACKER

The TX-8W is the wireline set version of the TX-8 retrievable packer. This version allows the packer to be used as a wireline set tubing retrievable packer using the standard TL On/Off Tool as the seal assembly and retrieving tool. This packer configuration allows for less equipment and tubing trips over conventional wireline set seal bore production packers, with the added benefit of converting the tool to mechanical set version if desired.

When run with the TX Packer Wireline Adapter Kit a blanking plug can be run in place above the TX-8W in the On/Off tool slick joint profile converting the tool to a temporary bridge plug.

- WIRELINE OR HYDRAULIC SET ON TUBING
- OPEN J-SLOT DESIGN
- LARGE INTERNAL BYPASS
- QUARTER TURN TO RIGHT TO RELEASE
- ◆ SEQUENTIAL RELEASE UPPER SLIP SYSTEM
- TUBING CAN BE LEFT IN TENSION, COMPRESSION OR NEUTRAL
- COMPATIBLE WITH A WIDE VARIETY OF TRYTON PACKER ACCESSORIES
- AVAILABLE WITH SECONDARY EMERGENCY SHEAR RELEASE
- AVAILABLE WITH PREMIUM ELASTOMERS
- SOUR SERVICE VERSION AVAILABLE





<u>TX-8W WIRELINE SET DOUBLE GRIP RETRIEVABLE PACKER</u> <u>TECHNICAL DATA</u>

CAS	SING ZE	CAS WEI	SING GHT	THREAD CONNECTION		G THREAD MAX. Γ CONNECTION O.D.		AX. .D.	MIN. I.D.		PRODUCT NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm		
4	101.6	9.5-11	14.1-16.4	1.900 EUE 10RD	48.3	3.250	82.55	1.500	38.10	T601-40A-000	
4-1/2	114.3	9.5-13.5	14.1-20.9	2-3/8 EUE 8RD	60.3	3.750	95.25	1.938	49.23	T601-45A-000	
4-1/2	114.3	9.5-13.5	14.1-20.9	2-3/8 EUE 8RD	60.3	3.750	95.25	2.000	50.80	T601-46A-000	
4-1/2	114.3	9.5-15.1	14.1-22.5	2-3/8 EUE 8RD	60.3	3.656	92.86	2.000	50.80	T601-46B-000	
4-1/2	114.3	13.5-15.1	20.9-22.5	2-3/8 EUE 8RD	60.3	3.656	92.86	1.938	49.23	T601-45B-000	
4-1/2	114.3	15.1-16.6	22.5-24.7	1.900 EUE 10RD	48.3	3.594	91.29	1.500	38.10	T601-45D-000	
4-1/2	139.7	15.1-20	22.5-29.8	2-3/8 EUE 8RD	60.3	3.500	88.90	1.703	43.26	T601-45C-000	
5	168.3	11.5-15	17.1-22.3	2-3/8 EUE 8RD	60.3	4.125	104.78	1.938	49.23	T601-50A-000	
5	139.7	18-20.8	26.8-31.0	2-3/8 EUE 8RD	60.3	4.000	101.60	1.938	49.23	T601-50B-000	
5-1/2	139.7	13-14	19.3-20.8	2-3/8 EUE 8RD	60.3	4.812	122.22	2.000	50.80	T601-55C-000	
5-1/2	152.4	14-20	20.8-29.8	2-3/8 EUE 8RD	60.3	4.625	117.48	2.000	50.80	T601-55A-000	
5-1/2	177.8	20-23	29.8-34.2	2-3/8 EUE 8RD	60.3	4.500	114.3	2.000	50.80	T601-55B-000	
5-1/2	177.8	13-14	19.3-20.8	2-7/8 EUE 8RD	73.0	4.812	122.22	2.375	60.30	T601-56C-000	
5-1/2	177.8	13-15.5	19.3-23.1	2-7/8 EUE 8RD	73.0	4.781	121.44	2.375	60.30	T601-56D-000	
5-1/2	177.8	15.5-20	23.1-29.8	2-7/8 EUE 8RD	73.0	4.625	117.48	2.375	60.30	T601-56A-000	
5-1/2	177.8	20-23	29.8-34.2	2-7/8 EUE 8RD	73.0	4.500	114.30	2.375	60.30	T601-56B-000	
6	193.7	14-20	20.8-29.8	2-7/8 EUE 8RD	73.0	5.188	131.78	2.375	60.30	T601-60A-000	
6-5/8	193.7	17-20	25.3-29.8	2-7/8 EUE 8RD	73.0	5.750	146.10	2.500	63.50	T601-65A-000	
7	219.1	17-26	25.3-38.7	2-7/8 EUE 8RD	73.0	6.000	152.40	2.500	63.50	T601-70A-000	
7	114.3	23-29	34.2-43.2	2-7/8 EUE 8RD	73.0	5.969	151.61	2.500	63.50	T601-70B-000	
7	127	26-32	38.7-47.6	2-7/8 EUE 8RD	73.0	5.875	149.23	2.500	.63.50	T601-70C-000	
7	127	17-26	25.3-38.7	3-1/2 EUE 8RD	88.9	6.000	152.40	3.000	76.20	T601-73B-000	
7	139.7	26-32	38.7-47.6	3-1/2 EUE 8RD	88.9	5.875	149.23	3.000	76.20	T601-73A-000	
7-5/8	139.7	24-29.7	35.7-44.2	2-7/8 EUE 8RD	73.0	6.672	169.47	2.500	63.50	T601-75A-000	
7-5/8	139.7	33-39	49.1-58.0	2-7/8 EUE 8RD	73.0	6.453	163.91	2.500	63.50	T601-75B-000	
8-5/8	139.7	24-40	35.7-59.5	2-7/8 EUE 8RD	73.0	7.500	190.50	2.500	63.50	T601-85A-000	



TX-10 DOUBLE GRIP RETRIEVABLE PACKER

The TX-10 is a high pressure single string double grip retrievable production packer that holds pressure from above and below. The TX-10 is capable of being set in tension or compression, once set the tubing string can be left in tension, compression or neutral. Incorporated into the design is an internal bypass system that allows pressure to equalize above and below the packer before the upper slips are pulled from the casing wall. This system allows the TX-10 Packer to be used for a wide variety of downhole applications from stimulation/service packer to production packer to retrievable bridge plug. The TX-10 Packer sets and releases to the right with one quarter of a turn at the packer.

- MECHANICALLY SET ON TUBING
- CAN BE PACKED -OFF WITH EITHER TENSION OR COMPRESSION
- OPEN J-SLOT DESIGN
- LARGE INTERNAL BYPASS
- QUARTER TURN TO SET AND RELEASE
- SEQUENTIAL RELEASE UPPER SLIP SYSTEM
- TUBING CAN BE LEFT IN TENSION, COMPRESSION OR NEUTRAL
- ◆ COMPATIBLE WITH A WIDE VARIETY OF TRYTON PACKER ACCESSORIES
- ◆ AVAILABLE WITH SECONDARY EMERGENCY SHEAR RELEASE
- AVAILABLE WITH PREMIUM ELASTOMERS
- * SOUR SERVICE VERSION AVAILABLE





<u>TX-10 DOUBLE GRIP RETRIEVABLE PACKER</u> <u>TECHNICAL DATA</u>

CAS SI	SING ZE	CASI WEIG	NG HT	THREAD CONNECTION		M. O	AX. .D.	M I.	IN. D.	PRODUCT NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	
4-1/2	114.3	15.1-16.6	22.5-24.7	1.900 EUE 10RD	48.3	3.594	91.29	1.500	38.10	T603-45D-000
4-1/2	114.3	9.5-13.5	14.14-20.1	2-3/8 EUE 8RD	60.3	3.750	95.25	1.938	49.23	T603-45A-000
4-1/2	114.3	13.5-15.1	20.1-22.5	2-3/8 EUE 8RD	60.3	3.656	92.86	1.938	49.23	T603-45B-000
4-1/2	114.3	9.5-13.5	14.14-20.1	2-3/8 EUE 8RD	60.3	3.750	95.25	2.000	50.80	T603-46A-000
4-1/2	114.3	13.5-15.1	20.1-22.5	2-3/8 EUE 8RD	60.3	3.656	92.86	2.000	50.80	T603-46B-000
5	127	11.5-15	17.1-22.3	2-3/8 EUE 8RD	60.3	4.125	104.78	1.938	49.23	T603-50A-000
5	127	18-20.8	26.8-31.0	2-3/8 EUE 8RD	60.3	4.000	101.60	1.938	49.23	T603-50B-000
5-1/2	139.7	13-14	19.3-20.8	2-3/8 EUE 8RD	60.3	4.812	122.22	2.000	50.80	T603-55C-000
5-1/2	139.7	14-20	20.8-29.8	2-3/8 EUE 8RD	60.3	4.625	117.48	2.000	50.80	T603-55A-000
5-1/2	139.7	20-23	29.8-34.2	2-3/8 EUE 8RD	60.3	4.500	114.30	2.000	50.80	T603-55B-000
5-1/2	139.7	13-14	19.3-20.8	2-7/8 EUE 8RD	73.0	4.812	122.22	2.375	60.30	T603-56C-000
5-1/2"	139.7	13-15.5	19.3-23.1	2-7/8 EUE 8RD	73.0	4.781	121.44	2.375	60.30	T603-56D-000
5-1/2"	139.7	15.5-20	23.1-29.8	2-7/8 EUE 8RD	73.0	4.625	117.48	2.375	60.30	T603-56A-000
5-1/2"	139.7	20-23	29.8-34.2	2-7/8 EUE 8RD	73.0	4.500	114.30	2.375	60.30	T603-56B-000
6"	152.4	14-20	20.8-29.8	2-7/8 EUE 8RD	73.0	5.188	131.78	2.375	60.30	T603-60A-000
6-5/8"	168.3	17-20	25.3-29.8	2-7/8 EUE 8RD	73.0	5.750	146.10	2.500	63.50	T603-65A-000
7"	177.8	17-26	25.3-38.7	2-7/8 EUE 8RD	73.0	6.000	152.40	2.500	63.50	T603-70B-000
7"	177.8	23-29	34.2-43.2	2-7/8 EUE 8RD	73.0	5.969	151.61	2.500	63.50	T603-70C-000
7"	177.8	26-32	38.7-47.6	2-7/8 EUE 8RD	73.0	5.875	149.23	2.500	.63.50	T603-70A-000
7-5/8"	193.7	24-29.7	35.7-44.2	2-7/8 EUE 8RD	73.0	6.672	169.47	2.500	63.50	T603-75B-000
7-5/8"	193.7	33.7-39	50.2-58.0	2-7/8 EUE 8RD	73.0	6.453	163.91	2.500	63.50	T603-75A-000
8-5/8"	219.1	28-40	41.7-59.5	2-7/8 EUE 8RD	73.0	7.500	190.50	2.500	63.50	T603-85A-000
8-5/8"	219.1	24-40	35.7-59.5	3-1/2 EUE 8RD	88.9	7.500	190.50	3.000	76.20	T603-86A-000
9-5/8"	244.5	32.3-43.5	48.1-64.7	4-1/2 EUE 8RD	114.3	8.500	215.90	4.000	101.60	T603-95B-000
9-5/8"	244.5	43.5-53.5	59.5-79.6	4-1/2 EUE 8RD	114.3	8.250	209.60	4.000	101.60	T603-95A-000



TX-10W WIRELINE SET DOUBLE GRIP RETRIEVABLE PACKER

The TX-10W is the wireline set version of the TX-10 retrievable packer. This version allows the packer to be used as a wireline set tubing retrievable packer using the standard TL On/Off Tool as the seal assembly and retrieving tool. This packer configuration allows for less equipment and tubing trips over conventional wireline set seal bore production packers, with the added benefit of converting the tool to mechanical set version if desired.

When run with the TX Packer Wireline Adapter Kit a blanking plug can be run in place above the TX-10W in the on/off tool slick joint profile converting the tool to a temporary bridge plug.

- WIRELINE OR HYDRAULIC SET SET ON TUBING
- OPEN J-SLOT DESIGN
- ◆ LARGE INTERNAL BYPASS
- QUARTER TURN TO RIGHT TO RELEASE
- ◆ SEQUENTIAL RELEASE UPPER SLIP SYSTEM
- TUBING CAN BE LEFT IN TENSION, COMPRESSION OR NEUTRAL
- COMPATIBLE WITH A WIDE VARIETY OF TRYTON PACKER ACCESSORIES
- AVAILABLE WITH SECONDARY EMERGENCY SHEAR RELEASE
- AVAILABLE WITH PREMIUM ELASTOMERS
- SOUR SERVICE VERSION AVAILABLE





<u>TX-10W WIRELINE SET DOUBLE GRIP RETRIEVABLE PACKER</u> <u>TECHNICAL DATA</u>

CAS SIZ	SING ZE	CAS WEI	ING GHT	THREAI CONNECTI	D ON	M. O	AX. .D.	M I.	IN. D.	PRODUCT NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	
4'	101.6	9.5-11	14.1-16.4	1.900 EUE 10RD	48.3	3.250	82.55	1.500	38.10	T601-40A-000
4-1/2"	114.3	9.5-13.5	14.1-20.1	2-3/8 EUE 8RD	60.3	3.750	95.25	1.938	49.23	T601-45A-000
4-1/2"	114.3	13.5-15.1	20.1-22.5	2-3/8 EUE 8RD	60.3	3.656	92.86	1.938	49.23	T601-45B-000
4-1/2"	114.3	15.1-16.6	22.5-24.7	1.900 EUE 10RD	48.3	3.594	91.29	1.500	38.10	T601-45D-000
4-1/2"	114.3	15.1-20	22.5-29.8	2-3/8 EUE 8RD	60.3	3.500	88.90	1.703	43.26	T601-45C-000
5"	127	11.5-15	17.1-22.3	2-3/8 EUE 8RD	60.3	4.125	104.78	1.938	49.23	T601-50A-000
5"	127	18-20.8	26.8-31.0	2-3/8 EUE 8RD	60.3	4.000	101.60	1.938	49.23	T601-50B-000
5-1/2"	139.7	13-14	19.3-20.8	2-3/8 EUE 8RD	60.3	4.812	122.22	2.000	50.80	T601-55C-000
5-1/2"	139.7	14-20	20.8-29.8	2-3/8 EUE 8RD	60.3	4.625	117.48	2.000	50.80	T601-55A-000
5-1/2"	139.7	20-23	29.8-34.2	2-3/8 EUE 8RD	60.3	4.500	114.30	2.000	50.80	T601-55B-000
5-1/2"	139.7	13-14	19.3-20.8	2-7/8 EUE 8RD	73.0	4.812	122.22	2.375	60.30	T601-56C-000
5-1/2"	139.7	13-15.5	19.3-23.1	2-7/8 EUE 8RD	73.0	4.781	121.44	2.375	60.30	T601-56D-000
5-1/2"	139.7	15.5-20	23.1-29.8	2-7/8 EUE 8RD	73.0	4.625	117.48	2.375	60.30	T601-56A-000
5-1/2"	139.7	20-23	29.8-34.2	2-7/8 EUE 8RD	73.0	4.500	114.30	2.375	60.30	T601-56B-000
6"	152.4	14-20	20.8-29.8	2-7/8 EUE 8RD	73.0	5.188	131.78	2.375	60.30	T601-60A-000
6-5/8"	168.3	17-20	25.3-29.8	2-7/8 EUE 8RD	73.0	5.750	146.10	2.500	63.50	T601-65A-000
7"	177.8	17-26	25.3-38.7	2-7/8 EUE 8RD	73.0	6.000	152.40	2.500	63.50	T601-70A-000
7"	177.8	23-29	34.2-43.2	2-7/8 EUE 8RD	73.0	5.969	151.61	2.500	63.50	T601-70B-000
7"	177.8	26-32	38.7-47.6	2-7/8 EUE 8RD	73.0	5.875	149.23	2.500	.63.50	T601-70C-000
7-5/8"	193.7	24-29.7	35.7-44.2	2-7/8 EUE 8RD	73.0	6.672	169.47	2.500	63.50	T601-75A-000
7-5/8"	193.7	33.7-39	50.2-58.0	2-7/8 EUE 8RD	73.0	6.453	163.91	2.500	63.50	T601-75B-000
8-5/8"	219.1	24-40	35.7-59.5	2-7/8 EUE 8RD	73.0	7.500	190.50	2.500	63.50	T601-85A-000
9-5/8"	244.5	32.3-43.5	48.1-64.7	4-1/2 EUE 8RD	114.3	8.500	215.90	4.000	101.60	T601-95B-000
9-5/8"	244.5	40-53.5	59.5-79.6	4-1/2 EUE 8RD	114.3	8.250	209.60	4.000	101.60	T601-95A-000



TX LANDING NIPPLE

The TX Landing Nipple is a full bore landing nipple that allows for the location of many Flow Control Devices, such as Blanking Plugs, Bottom Hole Chokes, etc.

The TX has a locking groove which serves to allow for the internal locking of the flow control devices. The honed seal area provides a polished seal surface to pack off any flow control device, The unique locking groove profile allows: for full selectivity in running flow control devices into the TX. Many TX Landing Nipples can be run in the production tubing without any loss in operational flexibility.

There are a wide range of materials from which the TX can be machined. The "standard" material is alloy steel which meets NACE MR 01-75 (1988 Editorial Revision) specifications for H2S service (hardness is 18-22 Rc).



TECHNICAL DATA

SI	SIZE AVAILABILITY CHART													
Tubing Size	1.900	1.900 2-1/6 2-3/8 2-7/		2-7/8	3-1	1/2								
(Metric)	48 mm	52mm	60mm	73mm	891	nm								
Seal Bore	1.500	1.625	1.875	2.312	2.750	2.813								
(Metric)	38mm	41mm	47mm	58mm	69mm	71mm								

	DIMENSIONAL DATA												
Seal Bore	1.500	1.625	1.875	2.312	2.750	2.813							
(Metric)	38mm	41mm	47mm	58mm	69mm	71mm							
Length*	13.56	13.75	14.0	14.2	16	.14							
Min. OD**	2.12	2.34	2.71	3.23	4.	25							

* Length may vary depending on the type of thread used.

** Nipple OD may vary depending on the type of thread used.



TXN LANDING NIPPLE

The TXN Landing Nipple is a Bottom No-Go landing nipple that allows for the location of many Flow Control Devices, such as Blanking Plugs, Bottom Hole Chokes, etc.

The TXN has a locking groove which serves to allow for the internal locking of the flow control devices. The honed seal area provides a polished seal surface to pack off any flow control device. The bottom nogo shoulder provides the means to positively locate the appropriate flow control device into the TXN.

There are a wide range of materials from which the TXN can be machined. The "standard" material is alloy steel which meets NACE MR 01-75 (1988 Editorial Revision) specifications for H2S service (hardness is 18-22 Rc).



TECHNICAL DATA

SIZE AVAILABILITY CHART											
Tubing Size	1.900	2-1/6	2-3/8	2-7/8	3-	1/2					
(Metric)	48 mm	52mm	60mm	73mm	891	nm					
Seal Bore	1.500	1.625	1.875	2.312	2.750	2.813					
(Metric)	38mm	41mm	47mm	58mm	69mm	71mm					

DIMENSIONAL DATA											
Seal Bore	1.500	1.625	1.875	2.312	2.750	2.813					
(Metric)	38mm	41mm	47mm	58mm	69mm	71mm					
Length*	13.56	13.75	14.0	14.2	16.14						
OD**	2.12	2.34	2.71	3.23	4.25						
No-Go ID	1.448	1.536	1.791	2.205	2.635	2.698					

* Length may vary depending on the type of thread used.

** Nipple OD may vary depending on the type of thread used.



TF LANDING NIPPLE

The TF Landing Nipple is a Selective landing nipple that allows for the location of many Flow Control Devices, such as Blanking Plugs, bottom Hole Chokes, etc.

The TF Nipple has a locking groove which serves to allow for the internal locking of the flow control devices. The honed seal area provides a polished seal surface to pack off any flow control device. In addition, in many cases it is possible to run and land APl sucker rod pumps into TF Landing Nipples.

There are a wide range of materials from which the TF can be machined. The "standard" material is alloy steel which meets NACE MR 01-75 (1984 Editorial Revision) specifications for H2S service (hardness is 18-22 Rc)

All API and premium threads can be machined into the TF Nipple.



TECHNICAL DATA

	SIZE AVAILABILITY CHART												
Tubing Size	1.9	900	2-1	1/6		2-3/8			2-7/8		3-1/2	2	
(Metric)	48 :	mm	521	52mm		60mm			73mm			89mm	
Seal Bore	1.43	1.50	1.56	1.62	1.78	1.81	1.87	2.25	2.28	2.31	2.75	2.81	
(Metric)	36	38	39	41	45	46	47	57	57.5	58	69	71	

DIMENSIONAL DATA												
Seal Bore	1.43	1.50	1.56	1.62	1.78	1.81	1.87	2.25	2.28	2.31	2.75	2.81
(Metric)	36	38	39	41	45	46	47	57	57.5	58	69	71
Length*(in.)	11-	-15	11-	11-15		12-17			13-18	13-18		
Min. Odt (in.)	2.1	.09	2.25		2.56			í.	3.109	3.687	7	

* Length may vary depending on the type of thread used.

[†] Nipple OD is normally joint or coupling OD. OD cannot be smaller than that shown in the chart



TR LANDING NIPPLE

TheTR Landing Nipple is a Bottom No-Go landing nipple that allows for the location of many Flow Control Devices, such as Blanking Plugs, Bottom Hole Chokes, etc

The TR has a locking groove which serves to allow for the internal locking of the flow control devices. The honed seal area provides a polished seal surface to pack off any flow control device. The bottom no-go shoulder provides the means to positively locate the appropriate flow control device info the TR.

There are a wide range of materials from which the TR Can be machined. The "standard" material is alloy steel which meets NACE MR 01-75 (1984 Editorial Revision) specifications for H2S service (hardness is 18-22 Rc)



TECHNICAL DATA

	SIZE AVAILABILITY CHART											
Tubing Size	1.9	900	2-	1/6		2-3/8		2-'	7/8	3-1/2		
(Metric)	48 :	mm	521	nm	60mm			731	nm	89mm		
Seal Bore	1.43	1.50	1.56	1.62	1.78	1.81	1.87	2.25	2.31	2.75		
(Metric)	36	38	39	41	45	46	47	57	58	69		

DIMENSIONAL DATA											
Seal Bore	1.43	1.50	1.56	1.62	1.78	1.81	1.87	2.25	2.31	2.75	
(Metric)	36	38	39	41	45	46	47	57	58	69	
Length*	9.5	-12	9.68-	9.68-11.56		10.5-13		11.5-13.5		12.5-14.5	
Min. OD**	2.1	.09	2.2	250	2.560		3.109		3.687		
No-Go ID	1.385	1.447	1.510	1.572	1.728	1.760	1.822	2.197	2.259	2.697	

* Length may vary depending on the type of thread used.

** Nipple OD is normally joint or coupling OD. OD cannot be smaller than that shown in the chart



TXA SLIDING SLEEVE





TXA SLIDING SLEEVE TECHNICAL DATA

SIZ	SIZE AVAILABILITY CHART											
Seal Bore	1.50	1.62	1.87	2.31	2.75							
(Metric)	38	41	47	58	69							
Length*	30.75	31.28	33.91	35.62	44.88							
Nom. OD**	2.375	2.62	3.09	3.75	4.28							
Minimum	1.500	1.625	1.875	2.312	2.750							
ID												

SIZE AVAILABILITY CHART											
Tubing Size	1.900	2-1/16	2-3/8	2-7/8	3-1	1/2	4-1/2				
(Metric)	48mm	52mm	60mm	73mm	891	nm	114mm				
Seal Bore	1.50	1.62	1.87	2.31	2.75	2.81	3.81				
(Metric)	38	41	47	58	69	71	97				

* Length may vary if special threads are used.
** Maximum OD may be greater if special threads are used.

ADDITIONAL DIMENSIONS & DATA

Size	1.50	1.87	2.31	2.75
Shifting Tool	В	В	В	В
Flow Area-in2	.897	2.355	2.981	4.459
Max. Pressure-psi	10,000	10,000	10,000	8,000
Vee packing reqd.	12	8	12	12
Split Ring Segs reqd.	4	4	4	6



TL SLIDING SLEEVE

The TL Sliding Sleeve is a down hole device, normally screwed into the production tubing, that allows communication between the tubing and the casing.

The closing sleeve has bonded upper seals to ensure the integrity of the seals for the extended periods of time downhole. They can be of various elastomer types.

The upper sub has a selective TF landing nipple profile machined into it to allow for the proper shifting of the sleeve and to serve as a receptacle for other flow control devices such as blanking plugs and separation tools.

A standard D-2 Shifting Tool is used to shift the TL Sliding Sleeve open and closed. The sleeve is designed so that normal wireline operations will not open or close the sleeve inadvertently. Upward jarring opens the sleeve and downward jarring closes it.





OPEN

TECHNICAL DATA

	SIZE AVAILABILITY CHART												
Tubing Size	1.9	900	2-1	1/6		2-3/8		2-7	7/8	3-1	1/2	4-1	1/2
(Metric)	48 :	mm	52r	52mm		60mm		73mm		89mm		114mm	
Seal Bore	1.43	1.50	1.56	1.62	1.78	1.81	1.87	2.25	2.31	2.75	2.81	3.75	3.81
(Metric)	36	38	39	41			47	57	58	69	71	95	97



<u>TL SLIDING SLEEVE</u> <u>TECHNICAL DATA</u>

Seal Bore	1.43	1.50	1.56	1.62	1.78	1.81	1.87	2.25	2.31	2.75	2.81	3.75	3.81
(Metric)	36	38	39	41	45	46	47	57	58	69	71	95	97
Length*	30	.53	30.38			31.97			35.28		.66	47.	.75
Max. OD**	2.3	375	2.500		2.910			3.410		4.500		5.50	
Inner Sleeve ID	1.5	531	1.6	56	1.937			2.375		2.875		3.9	10
Flow Area	1.893	in. sq.	1.893 in. sq.		2.839 in. sq.			4.138 in. sq.		6.106 in. sq.		11.527	in. sq.
Α	25.0	25.06	24.94	25.0	26.66	26.66	26.72	28.25	28.31	29.5	29.56	36	.25
В	6.	09	6.09		7.97			8.28		8.75		13.125	
С	4.81		4.81		5.81			6.25		6.75		7.3	75
D	1		1		1		1			1	1	l	
Ε	4.69	4.75	4.81	4.88	5.66	5.69	5.75	6.12	6.19	6.66	6.72	6.46	6.54



* Length may vary if special threads are used.
** Maximum OD may be greater if special threads are used.


TL PERMANENT SEAL BORE PACKER

The TL Permanent Seal Bore Production Packer is a versatile permanent packer that can be used for single or multiple zone completions. The TL Permanent Packer is ideally suited for wells where high pressure, temperatures and corrosive fluids are anticipated. The TL packer is available in a wide variety of seal bore materials and elastomers in order to facilitate hostile down hole environments. The TL is recommended for injection stimulation, testing or can be converted into a temporary bridge plug by using a knock-out, pump-out or screw-out plug bottom assembly.

The TL Permanent Seal Bore Production Packer is available with a complete line of tubing seal accessories and elastomers. Seal assemblies are available with TATR, TRTR, TVTR, BONDED NITRILE, BONDED VITON, BONDED ECO and BONDED EPDM.

- WIRELINE OR HYDRAULIC SET
- ◆ COMPONENTS KEYED FOR MILLING
- LARGE SEAL BORE
- ◆ AVAILABLE IN A WIDE RANGE OF MATERIALS AND ELASTOMERS
- ◆ COMPATIBLE WITH A WIDE VARIETY OF TRTON PACKER ACCESSORIES





<u>TL PERMANENT SEAL BORE PACKER</u> <u>TECHNICAL DATA</u>

CAS	SING ZE	CASIN WEIGI	G IT	MAX OF T	. O.D. OOL	PAC BC	CKER DRE	MIN. THRU	IIN. BORE HRU SEALS PRODUCT NUMBER in. mm .703 43.26 .703 43.26 .703 43.26 .703 43.26 .703 43.26 .703 43.26 .703 43.26 .703 43.26 .703 43.26 .703 43.26 .703 43.26 .703 43.26 .703 43.26 .703 43.26 .703 43.26 .703 43.26 .704 .705 .703 43.26 .705 .700.00 .938 49.23 .7670-55C-000 .938 49.23 .7670-55B-000 .375 .60.30		
In.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm		
4-1/2	114.3	9.5-13.5 PPF	14.4-20.1	3.750	95.25	2.390	60.71	1.703	43.26	T670-43A-000	
4-1/2	114.3	13.5-15.10 PPF	20.1-22.5	3.594	91.29	2.500	63.50	1.901	48.29	T670-44B-000	
4-1/2	114.3	9.5-13.5 PPF	14.1-20.1	3.750	95.25	2.688	68.28	1.938	49.23	T670-45A-000	
5	127	15-20.8 PPF	22.3-31.0	3.968	100.79	2.390	60.71	1.703	43.26	T670-50A-000	
5	127	15-20.8 PPF	22.3-31.0	3.968	100.79	2.688	68.28	1.938	49.23	T670-51A-000	
5	127	11.5-13 PPF	17.1-19.3	4.250	107.95	2.688	68.28	1.938	49.23	T670-55C-000	
5-1/2	139.7	13-17 PPF	19.3-25.3	4.562	115.87	2.688	68.28	1.938	49.23	T670-55A-000	
5-1/2	139.7	17-23 PPF	25.3-34.2	4.437	112.70	2.688	68.28	1.938	49.23	T670-55B-000	
5-1/2	139.7	13-17 PPF	19.3-25.3	4.562	115.87	3.000	76.20	2.375	60.30	T670-56A-000	
5-1/2	139.7	17-23 PPF	25.3-34.2	4.437	112.70	3.000	76.20	2.375	60.30	T670-56B-000	
7	177.8	23-32 PPF	34.2-47.6	5.687	144.45	3.250	82.55	2.406	61.11	T670-70A-000	
7	177.8	32-38 PPF	47.6-56.5	5.468	138.89	3.250	82.55	2.406	61.11	T670-70C-000	
7	177.8	17-20 PPF	25.3-29.8	6.187	157.15	3.250	82.55	2.406	61.11	T670-70B-000	
7	177.8	20-23 PPF	29.8-34.2	6.000	152.40	4.000	101.60	3.000	76.20	T670-71A-000	
7	177.8	26-29 PPF	38.7-43.2	5.875	149.23	4.000	101.60	3.000	76.20	T670-71B-000	
7-5/8	193.7	24-39 PPF	35.7-58.0	6.625	158.75	3.250	82.55	2.406	61.11	T670-75A-000	
7-5/8	193.7	24-33.7 PPF	35.7-50.2	6.500	165.10	4.000	101.60	3.000	76.20	T670-76A-000	
7-5/8	193.7	33.7-39 PPF	50.2-58.0	6.125	155.58	4.000	101.60	3.000	76.20	T670-76B-000	
9-5/8	244.5	29.3-53.5 PPF	43.6-79.6	8.125	206.38	3.250	82.55	2.406	61.11	T670-95A-000	
9-5/8	244.5	29.3-53.5 PPF	43.6-79.6	8.125	206.38	4.000	101.60	3.000	76.20	T670-96A-000	
9-5/8	244.5	29.3-53.5 PPF	43.6-79.6	8.125	206.38	4.750	120.65	3.875	98.43	T670-97A-000	
9-5/8	244.5	36-47 PPF	53.6-69.9	8.438	214.33	6.000	152.40	4.875	123.83	T670-98B-000	
9-5/8	244.5	40-58.4 PPF	60.4-86.9	8.218	208.74	6.000	152.40	4.875	123.83	T670-98A-000	



TLJ PERMANENT SEAL BORE PACKER

The TLJ Permanent Seal Bore Production Packer is a J-Latch permanent packer that can be used for single or multiple zone completions. The TLJ Permanent Packer is ideally suited for wells where high pressure, temperatures and corrosive fluids are anticipated. The TLJ packer is available in a wide variety of seal bore materials and elastomers in order to facilitate hostile down hole environments. The TLJ is recommended for injection stimulation, testing or can be converted into a temporary bridge plug by using a knock-out, pump-out or screw-out plug bottom assembly.

The TLJ Permanent Seal Bore Production Packer is available with a complete line of tubing seal accessories and elastomers. Seal assemblies are available with TATR, TRTR, TVTR, BONDED NITRILE, BONDED VITON, BONDED ECO and BONDED EPDM.

- WIRELINE OR HYDRAULIC SET
- ◆ J-LATCH ANCHORING SYSTEM
- COMPONENTS KEYED FOR MILLING
- LARGE SEAL BORE
- AVAILABLE IN A WIDE RANGE OF MATERIALS AND ELASTOMERS
- COMPATIBLE WITH A WIDE VARIETY OF TRTON PACKER ACCESSORIES





<u>TLJ PERMANENT SEAL BORE PACKER</u> <u>TECHNICAL DATA</u>

CAS	SING ZE	CASIN WEIGH	M 0.I T(AX. D. OF DOL	PAC BO	KER RE	MIN. 1 THRU	BORE SEALS	PRODUCT NUMBERS	
In.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	
4-1/2	114.3	9.5-13.5 PPF	14.4-20.1	3.750	95.25	2.390	60.71	1.703	43.26	T671-43A-000
4-1/2	114.3	13.5-15.10 PPF	20.1-22.5	3.594	91.29	2.500	63.50	1.901	48.29	T671-44B-000
4-1/2	114.3	9.5-13.5 PPF	14.1-20.1	3.750	95.25	2.688	68.28	1.938	49.23	T671-45A-000
5	127	15-20.8 PPF	22.3-31.0	3.968	100.79	2.390	60.71	1.703	43.26	T671-50A-000
5	127	15-20.8 PPF	22.3-31.0	3.968	100.79	2.688	68.28	1.938	49.23	T671-51A-000
5	127	11.5-13 PPF	17.1-19.3	4.250	107.95	2.688	68.28	1.938	49.23	T671-55C-000
5-1/2	139.7	13-17 PPF	19.3-25.3	4.562	115.87	2.688	68.28	1.938	49.23	T671-55A-000
5-1/2	139.7	17-23 PPF	25.3-34.2	4.437	112.70	2.688	68.28	1.938	49.23	T671-55B-000
5-1/2	139.7	13-17 PPF	19.3-25.3	4.562	115.87	3.000	76.20	2.375	60.30	T671-56A-000
5-1/2	139.7	17-23 PPF	25.3-34.2	4.437	112.70	3.000	76.20	2.375	60.30	T671-56B-000
7	177.8	23-32 PPF	34.2-47.6	5.687	144.45	3.250	82.55	2.406	61.11	T671-70A-000
7	177.8	32-38 PPF	47.6-56.5	5.468	138.89	3.250	82.55	2.406	61.11	T671-70C-000
7	177.8	17-20 PPF	25.3-29.8	6.187	157.15	3.250	82.55	2.406	61.11	T671-70B-000
7	177.8	20-23 PPF	29.8-34.2	6.000	152.40	4.000	101.60	3.000	76.20	T671-71A-000
7	177.8	26-29 PPF	38.7-43.2	5.875	149.23	4.000	101.60	3.000	76.20	T671-71B-000
7-5/8	193.7	24-39 PPF	35.7-58.0	6.625	158.75	3.250	82.55	2.406	61.11	T671-75A-000
7-5/8	193.7	24-33.7 PPF	35.7-50.2	6.500	165.10	4.000	101.60	3.000	76.20	T671-76A-000
7-5/8	193.7	33.7-39 PPF	50.2-58.0	6.125	155.58	4.000	101.60	3.000	76.20	T671-76B-000
9-5/8	244.5	29.3-53.5 PPF	43.6-79.6	8.125	206.38	3.250	82.55	2.406	61.11	T671-95A-000
9-5/8	244.5	29.3-53.5 PPF	43.6-79.6	8.125	206.38	4.000	101.60	3.000	76.20	T671-96A-000
9-5/8	244.5	29.3-53.5 PPF	43.6-79.6	8.125	206.38	4.750	120.65	3.875	98.43	T671-97A-000
9-5/8	244.5	36-47 PPF	53.6-69.9	8.438	214.33	6.000	152.40	4.875	123.83	T671-98B-000
9-5/8	244.5	40-58.4 PPF	60.4-86.9	8.218	208.74	6.000	152.40	4.875	123.83	T671-98A-000



TC-1 DRAG BLOCK TUBING ANCHOR/CATCHER

The TC-1 Drag Block Anchor Catcher is a reliable, retrievable double grip anchor catcher which prevents excessive movement of the tubing string during pumping operation, thus increasing pump efficiency and decreasing rod and tubing wear.

- ♦ RETRIEVABLE BY RH ROTATION WITH OPTIONAL LH AVAILABLE
- EFFICIENT AND RELIABLE DRAG BLOCK SYSTEM
- FIELD ADJUSTABLE EMERGENCY SHEAR RELEASE
- ◆ SLIPS COMPLETELY RETRACT AFTER RELEASE PERMITTING UP OR DOWN MOVEMENT AND ELIMINATING POTENTIAL DAMGE TO THE TOOL, THE TUBING, OR THE CASING





<u>TC-1 DRAG BLOCK TUBING ANCHOR/CATCHER</u> <u>TECHNICAL DATA</u>

	CASING										
0	.D.	WEIGHT									
In.	mm	ppf	kg/m								
4-1/2	114.3	9.5-11.6	14.14-17.26								
5-1/2	139.7	17-20	25.30-29.76								
5-1/2	139.7	13-17	19.34-25.30								
6-5/8	168.28	12-22	17.86-32.74								
7	177.8	23-35.3	14.1-17.2								
7	177.8	17-32	25.30-47.62								
7-5/8	193.68	36-45	53.57-66.96								
9-5/8	244.48	32.3-58	48.06-86.30								

	ANCHOR												
MAX SLIP	XIMUM TRAVEL	B(MA	DDY X OD	MAN	DREL D	EU BOX	PRODUCT NUMBER						
In.	mm	in. mm		in.	mm	in.	mm						
4.25	107.95	3.75	111.13	2.000	50.800	2.375	60.325	008-450					
5.58	141.73	4.50	114.30	2.440	61.976	2.875	73.025	008-550-A					
5.58	141.73	4.50	114.30	2.440	61.976	2.875	73.025	008-550-В					
6.80	141.73	5.75	146.05	3.000	76.200	3.500	88.900	008-700-A					
6.80	141.73	5.75	146.05	3.000	76.200	3.500	88.900	008-700-A					
6.80	141.73	5.75	146.05	3.000	76.200	3.500	88.900	008-700-В					
6.80	141.73	5.75	146.05	3.000	76.200	3.500	88.900	008-700-В					
9.20	233.68	7.76	197.10	3.000	76.200	3.500	88.900	008-958-B					



<u>TC-1L DRAG BLOCK TUBING ANCHOR/CATCHER</u> 219.1mm (8 5/8") - 244.5mm (9 5/8")

The TC-1L is the larger version of the TC-1 Drag Block Anchor Catcher. With all the same features the TC-1L is a reliable, retrievable double grip anchor catcher which prevents excessive movement of the tubing string during pumping operation, thus increasing pump efficiency and decreasing rod and tubing wear.

- RETRIEVABLE BY RH ROTATION WITH OPTIONAL LH AVAILABLE
- ◆ EFFICIENT AND RELIABLE DRAG BLOCK SYSTEM
- FIELD ADJUSTABLE EMERGENCY SHEAR RELEASE
- ♦ SLIPS COMPLETELY RETRACT AFTER RELEASE PERMITTING UP OR DOWN MOVEMENT AND ELIMINATING POTENTIAL DAMGE TO THE TOOL, THE TUBING, OR THE CASING

	CA		ANCHOR			
C).D	MAX. SLIP TRAVEL				
in.	mm	ppf	kg/m	in.	mm	
8-5/8	219.08	24.00-44.00	35.71-65.47	8.29	210.56	
9-5/8	244.48	32.30-58.00	48.06-86.30	9.26	235.20	

ANCHOR												
BODY MAX O.D.	MANDREL I.D.	STD. EUE BOX PIN	NUMBER PRODUCT									
6.75	3.00	3.500	058-858									
171.45	171.45 76.20 88.90 058-958											





TS STOP TURN ANCHOR

The TS Stop Turn Anchor is primarily designed to prevent tubing from backing off or to tighten a string of tubing that has been in the well. It is usually run with positive displacement "screw pumps". The TS sets with right hand rotation and releases with left hand rotation.

- COMPACT, BENEFICIAL FOR GAS BYPASS
- ♦ ROCKER DRAG/SLIP SYSTEM FOR SETTING AND RELEASING
- ◆ LOCK-IN SET SYSTEM





TS STOP TURN ANCHOR TECHNICAL DATA

	CASING											
	D			ID RANGE								
0	U	WE	GHI	Μ	IN	MAX						
In.	mm	lb/ft	kg/m	in.	mm	in.	mm					
4-1/2	114.3	9.5-13.5	14.1-20.1	3.92	99.6	4.09	103.9					
5-1/2	139.7	13-20	19.3-29.8	4.778	121.4	5.044	128.1					
7	177.8	17-26	25.3-38.7	6.276	159.4	6.538	166.1					
8-5/8	219.0	24-44	35.7-65.5	7.625	193.7	8.191	208.1					
9-5/8	244.5	32-53.5	47.6-79.6	8.435	214.2	9.001	228.6					

ANC 0	HOR D	ANC ID B	HOR BORE	THREAD CONNECTION			
In.	mm	in.	mm	in.	mm		
3.75	95.25	1.933	49	2.375	60.3		
4.620	117.0	2.440	62.0	2.875	73.0		
5.880	149.0	2.440	62.0	2.875	NA		
7.000	177.8	3.000	76.20	3.500	88.90		
8.250	209.6	3.000	76.20	3.500	88.90		



ST NO TURN TOOL

The ST No Turn Tool can be ran with a progressive cavity pump on fiberglass tubing string. The unique slip design allows the anchor to grip the casing wall when right hand rotation is applied and prevents any right handed torque. The ST No Turn Tool sets to the right, releases to the let or straight pull of the tubing string will engage the adjustable shear safety release mechanism.

- ♦ VERTICALLY CUT WICKER SLIP ALLOWS RIGHT HAND TORQUE
- REDUCES WEAR ON TUBING STRING
- RIGHT HAND SET, LEFT HAND RELEASE OR SHEAR RELEASE
- PARTS INTERCHANGEABLE WITH
 STANDARD TOOL
- ♦ STURDY STAINLESS STEEL DRAG SPRINGS



CAS SI	SING ZE	CASING WEIGHT		TUBING SIZE		MAX. O.D.		THREAD CONNECTIO	PRODUCT NUMBER	
In.	mm	lbs/ft kg/m		in.	mm	in.	mm	In.	mm	
4-1/2	114.3	9.5-13.5	14.1-20.1	3.750	95.25	2.000	50.8	2-3/8 EUE 8RD	60.3	T354-45A-000
5-1/2	139.7	13-23	19.3-34.2	4.500	114.3	2.000	50.8	2-3/8 EUE 8RD	60.3	T354-55A-000
5-1/2	139.7	13-23	19.3-34.2	4.500	114.3	2.375	60.3	2-7/8 EUE 8RD	73.0	T354-56A-000
7	177.8	17-35	25.3-52.08	5.875	149.2	2.500	63.5	2-7/8 EUE 8RD	73.0	T354-70A-000
7	177.8	17-35	25.03-52.08	5.875	149.2	2.000	50.8	2-3/8 EUE 8RD	60.3	T354-71A-000



DB-5 BRIDGE PLUG

The DB-5 Bridge Plug is an economical, fully drillable bridge plug. For applications where 35 mpa (5000psi) plug is sufficient. The DB-5 is designed for well abandonments or zone suspension.

- **CONSTRUCTED WITH READILY DRILLABLE MATERIALS**
- ◆ 35 MPA (5000 PSI) RATED @ 120 DEGREES CELSIUS (250 DEGREES FAHRENHEIT)
- WIRELINE OR HYDRAULIC SET



CASING SIZE CASING WEIGHT		WFICHT	DI I I	COD	SETTING RANGE			SETTIN	PRODUCT			
CASING SIZE CASING WEIGHT		WEIGHT	FLUG U.D.		MIN		MAX		DETTINGTORCE		NUMBER	
In.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in	mm	lbs	daN	
4-1/2	114.3	9.5-16.6	14.1-24.7	3.500	88.9	3.826	97.18	4.090	103.89	33,000	14,678	450DB5-00
5-1/2	139.7	13-23	20.8-34.2	4.312	109.52	4.580	116.33	5.044	128.12	33,000	14,678	550DB5-00
7	177.8	17-35	25.3-52	5.687	144.45	6.000	152.40	6.538	166.07	50,000	22,240	700DB5-00



DB-10 BRIDGE PLUG

The DB-10 Bridge Plug is an economical, fully drillable bridge plug. For applications where 70 mpa (10,000psi) plug is sufficient. The DB-10 is designed for well abandonments or zone suspension.

- CONSTRUCTED WITH READILY DRILLABLE MATERIALS
- ♦ RETAINING RINGS TO ASSIST IN PREVENTING ELEMENT EXTRUSION
- ◆ 70 MPA (10,000 PSI) RATED @ 150 DEGREES CELSIUS (300 DEGREES FAHRENHEIT)
- HIGHER TEMPERATURE OF PACKING ELEMENT AVAILABLE UPON REQUEST
- WIRELINE OR HYDRAULIC SET





DB-10 BRIDGE PLUG TECHNICAL DATA

CASIN	C SIZE	CAS	SING	PLUG			SETTING	G RANG	E	SETTIN	CEODCE	PRODUCT
CASIN	G SIZE	WEI	GHT	TLUC	ю. р .	M	IN.	M	AX.	SETTIN	GFURCE	NUMBER
In.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	lbs	daN	
2-3/8	60.3	4-5.8	5.95-8.6	1.750	44.45	1.780	45.21	2.074	52.68	13,000	5,782	238DB10-00
2-7/8	73.0	6.4-6.5	9.5-9.7	2.220	56.39	2.340	59.44	2.525	64.14	13,000	5,782	278DB10-00
3-1/2	88.9	5.7-10.3	8.6-15.3	2.750	69.85	2.867	72.82	3.258	82.75	13,000	5,782	350DB10-00
4	101.6	5.6-14	8.3-20.8	3.140	79.76	3.340	84.84	3.732	94.79	20,000	8,896	400DB10-00
4-1/2	114.3	9.5-16.6	14.1-24.7	3.562	90.47	3.826	97.18	4.090	103.89	33,000	14,678	450DB10-00
5	127	15.5-20.8	17.1-31	3.937	100.00	4.154	105.51	4.560	115.82	33,000	14,678	500DB10-00
5-1/2	139.7	13-23	20.8-34.2	4.312	109.52	4.580	116.33	5.044	128.12	33,000	14,678	550DB10-00
5-3/4	146	14-25.2	20.8-37.5	4.699	119.35	4.890	124.21	5.290	134.37	33,000	14,678	575DB10-00
6-5/8	168.3	17-32	25.3-48	5.375	136.531	5.595	142.11	6.135	155.83	50,000	22,240	658DB10-00
7	177.8	17-35	25.3-52	5.687	44.45	6.000	152.40	6.538	166.07	50,000	22,240	700DB10-00
7-5/8	193.7	20-39	29.8-58	6.312	160.321	6.625	168.28	7.125	180.98	50,000	22,240	758DB10-00
8-5/8	219.1	24-49	35.7-72.9	7.125	80.98	7.310	185.67	8.097	205.66	50,000	22,240	858DB10-00



<u>DB-L BRIDGE PLUG</u> 244.5mm (9 5/8") - 508mm (20")

The DB-L Bridge Plug is an economical, fully drillable larger size bridge plug and is designed for well abandonments or zone suspension.

- ♦ CONSTRUCTED WITH READILY DRILLABLE MATERIALS
- ◆ RETAINING RINGS TO ASSIST IN PREVENTING ELEMENT EXTRUSION
- ◆70 MPA (10,000 PSI) RATED @ 150 DEGREES CELSIUS (300 DEGREES FAHRENHEIT)
- HIGHER TEMPERATURE OF PACKING ELEMENT AVAILABLE UPON REQUEST
- WIRELINE OR HYDRAULIC SET



CAS	CASING CASING WEIGHT		G WEIGHT	PLUG O.D.			SETTIN	G RANGE		SET	TING	
SI	IZE						MIN			FORCE		
In.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	lbs	daN	
9-5/8	244.5	29.3-58.4	43.6-86.9	8.125	206.38	8.379	212.83	9.063	230.20	50,000	22,240	958DB-8
10-3/4	269.9	32.7-60.7	48.7-90.3	9.437	239.70	9.660	245.36	10.192	258.88	50,000	22,240	1075DB-5
11-3/4	298.5	38-60	56.5-89.3	10.437	265.10	10.772	273.61	11.150	283.21	50,000	22,240	1175DB-4
11-3/4	298.5	60-83	89.3-123.5	9.937	252.40	10.192	258.88	10.772	273.61	50,000	22,240	1176DB-4
13-3/8	339.7	48-84.5	71.4-125.7	11.880	301.75	12.125	307.98	12.715	322.96	50,000	22,240	1338DB-3
16	406.4	65-118	96.7-175.5	14.125	358.78	14.125	358.78	15.250	387.35	50,000	22,240	1600DB-1.5
20	508.0	94-133	139.8-197.8	18.730	475.74	18.730	475.74	19.124	485.75	50,000	22,240	2000DB-1.5



HM-2 BRIDGE PLUG

The HM-2 Bridge Plug is designed to set with a combination of hydraulic pressure and mechanical pull. Used for temporary or permanent well abandonments and zone isolation.

- CONSTRUCTED WITH READILY DRILLABLE MATERIALS
- ◆ RETAINING RINGS TO ASSIST IN PREVENTING ELEMENT EXTRUSION
- ◆ 70 MPA (10,000 PSI) RATED @ 150 DEGREES CELSIUS (300 DEGREES FAHRENHEIT)
- HIGHER TEMPERATURE OF PACKING ELEMENT AVAILABLE UPON REQUEST
- ***** RIGHT HAND ROTATION TO RELEASE WORK STRING





<u>HM-2 BRIDGE PLUG</u> <u>TECHNICAL DATA</u>

CASIN	C SIZE	CASING	WEIGHT	PLUCOD			SETTI	NG RANO	FE	SURFACE		MINIMUM		MAXIMUM	
CASIN	G SIZE	CASING	WEIGHT	ILU	з О.D.	MIN		MAX		PRESSURE		PULL FORCE		PULL I	FORCE
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	psi	mPa	lbs.	DaN	lbs	daN
3-1/2	88.9	5.7-10.3	8.6-15.3	125.7	11.880	301.75	12.175	3.258	82.75	1500	10.3	10,000	4448	13,000	5782
4	101.6	5.6-14	8.3-20.8	2.750	69.85	2.867	72.82	3.732	94.79	1500	10.3	17,000	7566	20,000	8896
4-1/2	114.3	9.5-16.6	14.1-24.7	3.190	81.03	3.340	84.84	4.090	103.89	1500	10.3	28,000	12,454	30,000	13,344
5	127	11.5-20.8	17.1-31.0	3.562	90.47	3.826	97.18	4.560	115.82	1500	10.3	28,000	12,454	30,000	13,344
5-1/2	139.7	13-23	19.3-34.2	3.937	100.0	4.154	105.51	5.044	128.12	1500	10.3	28,000	12,454	30,000	13,344
5-3/4	146.1	14-25.2	20.8-37.5	4.312	109.52	4.580	116.33	5.290	134.37	1500	10.3	30,000	13,344	33,000	14,678
6-5/8	168.3	17-32	25.3-47.6	4.699	119.35	4.890	124.21	6.135	155.83	1500	10.3	45,000	20,016	50,000	22,240
7	177.8	17-35	25.3-52.1	5.375	136.53	5.595	142.11	6.538	166.07	1500	10.3	45,000	20,016	50,000	22,240
7-5/8	193.7	20-39	29.8-58.0	5.687	144.45	6.000	152.40	7.125	180.98	1500	10.3	45,000	20,016	50,000	22,240
8-5/8	219.1	24-49	35.7-72.9	6.312	160.32	6.625	168.28	8.097	205.66	1500	10.3	45,000	20,016	50,000	22,240
9-5/8	244.5	29.3-58.4	43.6-86.9	7.125	180.98	7.310	185.67	9.063	230.20	1500	10.3	45,000	20,016	50,000	22,240
10-3/4	273.1	82.7-60.7	48.6-90.3	8.175	207.65	8.379	212.83	10.192	258.88	1500	10.3	45,000	20,016	50.000	22,240
13-3/8	339.7	48-84.5	71.4-	9.437	239.70	9.660	245.36	12.715	322.96	1500	10.3	45,000	20.016	50,000	22.240

Note: A stabilizer with minimum O.D. of the plug should be ran in conjunction with the plug in a vertical hole. A minimum of two stabilizers should be used in a deviated or directional well.



TCR CEMENT RETAINER

The TCR Cement Retainer is an economical, fully drillable cement retainer. Easily converted from wireline set to mechanical set with minimal changes. This provides the user with reliable high pressure plugging devices.



Mechanical Set Cement Retainer



Wireline Set Cement Retainer

- **•** WIRELINE OR MECHANICAL SET
- ♦ LOCK TOGETHER DESIGN AND EXTRA CLEARANCE O.D.
- ◆ SLIDE VALVE CONTROLLED FROM SURFACE BY PICKING UP WORK STRING TO CLOSE AND SETTING DOWN TO OPEN.
- ♦ LOCKED IN SQUEEZE PRESSURE THE VALVE AUTOMATICALLY CLOSES WHEN THE STINGER IS REMOVED LOCKING IN SQUEEZE PRESSURE WHILE EXCESS CEMENT IS CIRCULATED OUT
- ISOLATES HYDROSTATIC PRESSURE THE VALVE PROTECTS SENSITIVE ZONE IN LOW FLUID LEVEL WELLS.
- ◆ 70 MPA (10,000 PSI) RATED@ 150 DEGREES CELSIUS (300 DEGREES FAHRENHEIT)



<u>TCR CEMENT RETAINER</u> <u>TECHNICAL DATA</u>

			SETTING RANGE.						
CASIN	G SIZE	CASING	RETA O	RETAINER O.D.		MUM	MAXIMUM		
In.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm
4-1/2	114.3	9.5-15.1	14.1-22.5	3.593	91.26	3.826	97.18	4.090	103.89
5	127	11.5-20.8	17.1-31.0	3.937	100	4.156	105.56	4.560	115.82
5-1/2	139.7	13-23	19.3-34.2	4.312	109.52	4.580	116.33	5.044	128.12
5-3/4	146	14-25.2	20.8-37.5	4.7000	119.38	4.890	124.21	5.290	134.37
6-5/8	168.3	17-32	25.3-47.6	5.375	136.53	5.595	142.11	6.135	155.83
7	177.8	17-35	25.3-52.0	5.688	144.48	6.004	152.50	6.538	166.07
7-5/8	193.7	28-39	29.8-58.0	6.312	160.32	6.625	168.28	7.125	180.98
8-5/8	219.1	24-49	35.7-72.9	7.125	180.98	7.511	190.78	8.097	206.66
9-5/8	244.5	29.3-58.4	43.6-86.9	8.125	206.38	8.435	214.25	9.063	230.20
10-3/4	273	32.8-60.7	48.7-90.3	9.437	239.70	9.660	245.36	10.192	258.88
11-3/4	298.5	38-60	56.5-89.3	10.437	265.10	10.772	273.61	11.150	283.21
11-3/4	298.5	60-83	89.3-123.5	9.937	252.40	10.192	258.88	10.772	273.61
13-3/8	339.7	48-80.7	71.4-120.0	11.875	301.63	12.175	309.25	12.715	322.96
16	406.4	65-118	96.7-175.5	14.125	358.78	14.675	373.1	15.250	387.35
20	508	94-133	139.8-197.8	18.375	466.73	18.730	475.74	19.124	485.75



TCR J-LATCH STINGER

The TCR J-latch is a positive latch for operating the sliding valve inside a cement retainer. That provides positive control of the sliding valve during stage cementing operations.

- POSITIVE AND RELIABLE J-LATCH SYSTEM
- ♦ ALLOWS HIGH PRESSURE TUBING TESTING
- ♦ MULTIPLE SAFETY RELEASE (ROTATE AND SHEAR OUT)
- ♦ GIVES POSITIVE INDICATION OF STINGER LOCATION

CASING	G SIZE	TUBING SIZE			
In.	mm	in.	mm		
4-1/2	114.3	2-3/8	60.3		
5-1/2	139.7	2-7/8	73.0		
7	177.8	2-7/8	73.0		





TCR MECHANICAL SETTING TOOL

The TCR Mechanical Setting Tool is designed to run and set the Cement Retainers on tubing. In addition to the setting function the Retainer Mechanical Setting Tool will operate the retainer sleeve valve once the retainer is set.

- **SIMPLE DEPENDABLE OPERATION**
- **•** SAVES ON WIRELINE COST
- PROVEN ONE-TRIP SYSTEM

Run the Retainer Mechanical Setting Tool/Retainer combination assembly at a moderate rate of speed while preventing right-hand rotation transmitting to the setting tool. It is recommended tubing be rotated left every 10 stands until positive resistance is felt.

When the desired setting depth has been reached pull the assembly two feet above the desired setting point. Rotate the tubing to the right sufficiently to transmit 10 turns to the setting assembly.

Lower the setting assembly downward to the desired setting point. Pull recommended tension above string weight, setting the slips and create a pack off, as recommended in the setting chart below.

Slack off equivalent amount of weight onto assembly and again apply recommended tension. The retainer is now set and pressure testing may be performed. The setting tool may be released from the cement retainer by pulling 227daN(500 lbs) tension over string weight and rotate tubing 10 turns right. The setting tool may be relatched to the cement retainer by slacking off 454 daN (1,000 lbs) string weight and snapped out by applying 2272 daN (5,000 lbs) tension. The snap out forces will decrease after repeated usage and will stabilize at 1140 daN (2,500 lbs).

The tension sleeve valve is opened with downward motion (compression) and closed with upward motion (tension). Two inches of travel from closed to open position.





<u>TCR MECHANICAL SETTING TOOL</u> <u>TECHNICAL DATA</u>

	CAS	SING			RETAINER MECHANICAL SETTING TOOL							
SIZE		WEIGHT		0	O.D.		I.D.		CTION	PRODUCT		
In.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	NUMBER		
4-1/2	114.3	9.5-15.1	14.1-22.5	3.593	91.3	0.785	22.2	2.375	60.3	985-2345-0000		
5	127.0	11.5-18.0	17.1-26.8	3.593	91.3	0.785	22.2	2.375	60.3	985-2350-0000		
5-1/2	139.7	13.0-23.0	19.3-34.2	4.312	109.5	0.785	22.2	2.375	60.3	985-2355-0000		
6-5/8	168.3	17.0-34.0	25.3-50.6	4.938	125.4	1.250	31.8	2.875	73.0	985-2765-0000		
7	177.8	17.0-35.0	25.3-52.1	5.375	136.5	1.250	31.8	2.875	73.0	985-2770-0000		
7-5/8	193.7	20.0-39.0	29.8-58.0	6.312	160.3	1.250	31.8	2.875	73.0	985-2775-0000		
8-5/8	219.1	24.0-49.0	35.7-72.9	7.125	181.0	1.250	31.8	2.875	73.0	985-2785-0000		
9-5/8	244.5	29.3-53.5	43.6-79.6	8.125	206.4	1.250	31.8	2.875	73.0	985-2795-0000		

Other sizes available upon request



TL ON/OFF TOOL OVERSHOT

The TL On/Off Tool Overshot is the disconnect/re-connect portion of the TL On/Off Tool. The TL Overshot is connected to the tubing string and disconnects from the TL Slick Joint, which is connected to a double grip packer that does not require tension or compression to maintain a pack-off. Applications include treating, testing and production.

The TL Overshot is available in a wide range of materials and both 42 MPa(6000psi) and 70 *MPa*(10,000psi) differential pressure rating.

- ◆ PROVEN BONDED SEAL SYSTEM
- ♦ AVAILABLE IN A WIDE RANGE OF MATERIALS
- AVAILABLE IN BOTH 42MPa(6000 PSI) AND 70 MPa(10,000PSI) PRESSURE RATING
- NORMALLY LH RELEASE WITH OPTIONAL RH AVAILABLE
- CAN BE SHEAR PINNED UP OR DOWN POSITION
- AVAILABLE IN SPRING LOADED DESIGN

CASIN	MAX. O.D.		MIN. I.D.		THREA CONNECT	PRODUCT NUMBER		
In.	mm	lbs/ft	kg/m	in.	mm	in.	mm	
2-7/8	73.0	2.250	57.15	1.000	25.4	1.660 EUE	42.2	T512-25A-000
3-1/2	88.9	2.750	69.85	1.500	38.1	1.900 NUE	48.3	T512-35A-000
4	101.6	3.250	82.55	1.500	38.1	1.900 EUE	48.3	T512-40A-000
4-1/2-5	114.3-127	3.750	95.25	2.000	50.8	2-3/8 EUE	60.3	T512-45A-000
4-1/2-5	114.3-127	3.750	95.25	2.375	60.3	2-7/8 EUE	73.0	T512-46A-000
5-1/2-6-5/8	139.7-168.3	4.500	114.3	2.000	50.8	2-3/8 EUE	60.3	T512-55A-000
5-1/2-6-5/8	139.7-168.3	4.500	114.3	2.500	63.5	2-7/8 EUE	73.0	T512-56A-000
7-7-5/8	177.8-193.7	5.750	146	2.500	63.5	2-7/8 EUE	73.0	T512-70A-000
7-7-5/8	177.8-193.7	5.750	146	3.000	76.2	3-1/2 EUE	88.9	T512-73A-000
8-5/8	219.1	6.500	165.1	2.500	63.5	2-7/8 EUE	73.0	T512-85A-000
8-5/8	219.1	6.500	165.1	4.000	101.6	4-1/2 EUE	114.3	T512-86A-000
9-5/8	244.5	7.500	190.5	2.500	63.5	2-7/8 EUE	73.0	T512-95A-000
9-5/8	244.5	7.500	190.5	4.000	101.6	4-1/2 EUE	114.3	T512-96A-000
10-3/4	273.1	8.500	215.9	2.500	63.5	2-7/8 EUE	73.0	T512-10A-000
10-3/4	273.1	8.500	215.9	4.000	101.6	4-1/2 EUE	114.3	T512-11A-000





TLON/OFFTOOLSLICKJOINT

The TL On/Off Tool Slick Joint connects to a double grip packer that does not require tension or compression to maintain a pack-off.

After disconnecting from the tubing string with the TL Overshot, the TL Slick Joint remains connected to the packer. As a wireline profile is generally cut in the slick joint whereat a wireline plug can be ran prior to disconnecting and a temporary bridge plug is formed allowing for well control and/or remedial up-hole work. Applications include treating, testing and production.

The TL Slick Joint is available in a wide range of materials and both 42 Mpa(6000psi) and 70 Mpa (10,000 psi) differential pressure rating.

- AVAILABLE WITH A WIDE RANGE OF PROFILE SIZES AND TYPES
- ♦ AVAILABLE IN A WIDE RANGE OF MATERIALS
- ◆ AVAILABLE IN BOTH 42MPa(6000 PSI) AND 70 MPa(10,000PSI) PRESSURE RATING





TLU ON/OFF TOOL

The TLU On/Off Tool is used in liner applications to disconnect the liner from the tubing string. The overshot is the liner top or guide, while the stinger is used for the running tool. The seals have been relocated to the stinger allowing the seal to be replaced. If required a wireline profile can be cut in the slick joint.



• AVAILABLE WITH A WIRELINE PROFILE

♦ AVAILABLE IN A WIDE RANGE OF MATERIALS

CASING SIZE		MAX. O.D.		MIN. I.D.		THREAD CONNECTIO	PRODUCT NUMBER	
in.	in. mm		mm	in.	mm	in.	mm	
4-1/2-5.0	114.3-127	3.750	95.25	2.375	60.3	2-3/8 EUE 8RD	60.3	T513-46A-000





TR ROTATIONAL SHEAR SAFETY JOINT

The TR Rotational Safety Joint provides for emergency release of the tubing string. The TR Rotational Safety Joint uses larger square left-hand threads to separate the upper and lower subs with right-hand rotation abandoning any production equipment below.

- ♦ AVAILABLE IN MOST COMMON TUBING SIZES
- FULL BORE I.D.
- ◆ READILY FIELD ADJUSTABLE
- SHEARS BY LH ROTATION
- ◆ AVAILABLE IN A WIDE RANGE OF MATERIALS
- ♦ AVAILABLE IN BOTH STANDARD AND H2S SERVICE



TUBING SIZE		MAX. O.D.		MIN. I.D.		THREAD CONNECTIO	PRODUCT NUMBER	
In.	mm	in.	mm	in.	mm	in.	mm	
1.660	42.2	2.220	56.4	1.375	34.9	1.660 EUE 10RD	42.2	T568-16A-000
1.900	48.3	2.500	63.5	1.500	38.1	1.900 EUE 10RD	48.3	T568-19A-000
2-3/8	60.3	3.062	77.8	2.000	50.8	2-3/8 EUE 8RD	60.3	T568-20A-000
2-7/8	73.0	3.688	93.7	2.500	63.5	2-7/8 EUE 8RD	73.0	T568-25A-000
3-1/2	88.9	4.500	114.3	3.000	76.2	3-1/2 EUE 8RD	88.9	T568-35A-000



TS TENSION SHEAR SAFETY JOINT

The TS Tension Shear Safety Joint provides for emergency release of the tubing string. Straight pull separates the tool at a predetermined shear value.

- ♦ AVAILABLE IN MOST COMMON TUBING SIZES
- FULL BORE I.D.
- READILY FIELD ADJUSTABLE
- SHEARS BY STRAIGHT PULL
- AVAILABLE IN A WIDE RANGE OF MATERIALS
- ♦ AVAILABLE IN BOTH STANDARD AND H2S SERVICE



TUBING SIZE		MAX. O.D.		MIN. I.D.		THREAD CONNECTIO	PRODUCT NUMBER	
In.	mm	lbs/ft	kg/m	in.	mm	in.	mm	
1.660	42.2	2.220	56.4	1.375	34.9	1.660 EUE 10RD	42.2	T569-16A-000
1.900	48.3	2.500	63.5	1.500	38.1	1.900 EUE 10RD	48.3	T569-19A-000
2-3/8	60.3	3.062	77.8	2.000	50.8	2-3/8 EUE 8RD	60.3	T569-20A-000
2-7/8	73.0	3.688	93.7	2.500	63.5	2-7/8 EUE 8RD	73.0	T569-25A-000
3-1/2	88.9	4.500	114.3	3.000	76.2	3-1/2 EUE 8RD	88.9	T569-35A-000



TQ TORQUE-THRU SHEAR SAFETY JOINT

The TQ Torque-Thru Shear Safety Joint provides for emergency release of the tubing string. Straight pull separates the tool at a predetermined shear value. In addition, the TQ Torque-Thru Shear Safety Joint allows torque to be transmitted through the tool without affecting the shear screws.

- ♦ AVAILABLE IN MOST COMMON TUBING SIZES
- FULL BORE I.D.
- READILY FIELD ADJUSTABLE
- SHEARS BY STRAIGHT PULL
- ♦ ALLOWS FOR TORQUE TO BE TRANSMITTED THROUGH WITHOUT AFFECTING THE SHEAR SCREWS
- ♦ AVAILABLE IN A WIDE RANGE OF MATERIALS
- ♦ AVAILABLE IN BOTH STANDARD AND H2S SERVICE



TUBING SIZE		MAX. O.D.		MIN. I.D.		THREAD CONNECTIO	PRODUCT NUMBER	
In.	mm	lbs/ft	kg/m	in.	mm	in.	mm	
1.660	42.2	2.220	56.4	1.375	34.9	1.660 EUE 10RD	42.2	T569-16A-005
1.900	48.3	2.500	63.5	1.500	38.1	1.900 EUE 10RD	48.3	T569-19A-005
2-3/8	60.3	3.062	77.8	2.000	50.8	2-3/8 EUE 8RD	60.3	T569-20A-005
2-7/8	73.0	3.688	93.7	2.500	63.5	2-7/8 EUE 8RD	73.0	T569-25A-005
3-1/2	88.9	4.500	114.3	3.000	76.2	3-1/2 EUE 8RD	88.9	T569-35A-005



BLAST JOINTS

Blast Joints are used to protect the tubing string from the abrasive action of flowing gas or oil when positioned opposite the perforations. Blast Joint may also be used directly below the well head to protect from the abrasion of doing a hydraulic fracturing operation down the annulus.

Blast Joints are made from high quality steel treated to between 28 & 36 RC hardness to insure maximum abrasion resistance and strength. For H2S service, blast joints are heat treated to between 18 & 22 RC hardness as per N.A.C.E. specification MR-0175. Other materials are available on advance order if required.

Full tubing I.D. is maintained through the blast joint with the O.D. the same as tubing couplings. As standard, blast joints have API EUE tubing connections, but can be cut with virtually any thread connection required.

- ♦ AVAILABLE IN A WIDE RANGE OF SIZES AND CONNECTIONS
- ♦ AVAILABLE IN A WIDE RANGE OF LENGTHS FROM .6M (2FT) TO 3.6M (12FT)
- ♦ AVAILABLE IN A WIDE RANGE OF MATERIALS
- ♦ FULL BORE I.D.
- ◆ AVAILABLE IN STANDARD AND H2S SERVICE

TECHNICAL DATA

	BLAST JOINT												
CONNE	CTION	I	D	CONNE	CTION	PRODUCT							
In.	mm	in.	mm	in.	mm	NUMBER							
1.900	48.3	1.500	38.1	2.500	63.5	082-1900-0000							
2.375	60.3	1.995	50.7	3.062	77.8	082-2300-0000							
2.875	73.0	2.441	62.0	3.688	93.7	082-2700-0000							
3.500	88.9	3.000	76.2	4.500	114.3	082-3500-0000							

AVAILABLE LENGTHS:

2 ft	(0.61 m)
4 ft	(1.22 m)
6 ft	(1.83 m)
8 ft	(2.44 m)
10 ft	(3.05 m)
20 ft	(6.56 m)



PUMP OUT PLUGS

The TA Pump-Out Plug Assembly is used below a production packer or tailpipe. The assembly holds pressure from below and unseats with a predetermined amount of tubing pressure. The TA Pump-Out Plug is readily field adjustable.

TECHNICAL DATA

TECHNICAL DATA

THREAD		MAX.		BC	DY	PRODUCT
CONNECTION		0.D.		I.	D.	NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	
1.660 EUE	42.2	2.200	55.88	1.250	31.75	ALUMINUM
1.900 EUE	48.3	2.500	63.50	1.500	38.10	ALUMINUM
2-3/8 EUE	60.3	3.063	77.80	2.000	50.80	ALUMINUM
2-7/8 EUE	73.0	3.750	95.25	2.500	63.50	ALUMINUM
3-1/2 EUE	88.9	4.500	114.3	3.000	76.20	ALUMINUM

The TB Pump-out Plug Assembly is used below a production packer or tailpipe. The assembly holds pressure from below and unseats with a predetermined amount of tubing pressure. The TB Pump-out Plug assembly is recommended when running into lines or highly deviated wells. The TB Pump-Out Plug is readily field adjustable.

I EUIINICAL DAIA												
THREA	MAX.		BC	DY	PRODUCT							
CONNEC	ΓΙΟΝ	0.	D.	I.	D.	NUMBER						
In.	mm	lbs/ft	kg/m	in. mm								
1.660 EUE	42.2	2.200	55.88	1.250	31.75	ALUMINUM						
1.900 EUE	48.3	2.500	63.50	1.500	38.10	ALUMINUM						
2-3/8 EUE	60.3	3.063	77.80	2.000	50.80	ALUMINUM						
2-7/8 EUE	73.0	3.750	95.25	2.500	63.50	ALUMINUM						
3-1/2 EUE	88.9	4.500	114.3	3.000	76.20	ALUMINUM						



The TC Pump-out Plug Assembly is used below a production packer to test tubing integrity or to activate a hydraulic set packer. The Pump-out Plug assembly allows fluid flow form both directions until a 35mm (1-3/8in)diameter ball is gravitated down into the landing seat. Pressure applied to tubing string will shear out ball and seat at a predetermined pressure rating. The TC Pump-Out Plug is readily field adjustable.

THREA CONNEC	MA O.	AX. D.	SF I.	D.	BODY I.D.		
In.	mm	lbs/ft	lbs/ft kg/m		in. mm		
2-3/8 EUE	60.3	3 .250	82.55	1.000	2.500	2.000	25.40
2-7/8 EUE	73.0	4.250	107.95	1.187	3.000	2.500	30.15
3-1/2 EUE	88.9	4.500	114.3	1.187	31.75	3.000	30.15





TXJ EXPANSION JOINT

The TXJ Expansion Joint is placed in the tubing string to allow for pipe contraction or expansion. The TXJ Expansion Joint may be run in conjunction with retrievable or permanent type production packers.

The TXJ Expansion Joint can be splined in order to allow for left or right-hand rotation when setting or releasing packers, on/off tools or seal units in permanent production packers.

The TXJ Expansion Joint may be ordered to accommodate different length requirements and temperature ranges.

- ◆ AVAILABLE IN A WIDE RANGE OF SIZES AND CONNECTIONS
- ♦ AVAILABLE IN A WIDE RANGE OF LENGTHS FROM .6M (2FT) TO 3M (10FT)
- ♦ AVAILABLE IN A WIDE RANGE OF MATERIALS
- FULL BORE I.D.
- ♦ AVAILABLE IN STANDARD AND H2S SERVICE





TFB CASING PACKER

The TFB Casing Packer is an economical full bore tension or compression packer used for isolating bad areas of casing. The TFB Casing Packer is a versatile tool used for injection, producing and cementing in liner strings.

The TFB Casing Packer comes with deep wide wicker slips, single or double element system making this packer ideal for setting in scaly pipe or open hole formations.

The TFB Casing Packer is available in either manual or automatic J-slot configurations and is also available with a right hand rotational safety release when run as tension set tool.

- FULL BORE DESIGN
- TENSION OR COMPRESSION SET
- AVAILABLE WITH ROTATIONAL SAFETY RELEASE SYSTEM
- AVAILABLE IN SINGLE OR DOUBLE ELEMENT DESIGN
- ECONOMICAL
- EASILY CONVERTIBLE INTO LINER HANGER SYSTEM





TFB CASING PACKERTECHNICAL DATA

CAS SI	SING ZE	CAS WE	SING IGHT	TUBING SIZE		MAX O.D.		MIN. I.D.		PRODUCT NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	
4-1/2	114.3	9.5-13.5	14.1-20.1	2-7/8 EUE 8RD	73.0	3.750	95.25	2.50	63.5	T440-45A-000
5.0	127	11.5-15	17.1-22.3	2-7/8 EUE 8RD	73.0	4.125	104.8	2.50	63.5	T440-50A-000
5.0	127	18-20.8	26.8-31.0	2-7/8 EUE 8RD	73.0	4.000	101.6	2.50	63.5	T440-50B-000
5-1/2	139.7	13-20	19.3-29.8	3-1/2 EUE 8RD	88.9	4.625	117.4	3.0	76.2	T440-55A-000
5-1/2	139.7	20-23	29.8-34.2	3-1/2 EUE 8RD	88.9	4.500	114.3	3.0	76.2	T440-55B-000
5-1/2	139.7	13-15.5	19.3-23.1	4 NU 8RD	101.6	4.781	121.4	3.50	88.9	T440-56A-000
5-1/2	139.7	13-17	19.3-25.3	4 NU 8RD	101.6	4.650	118.1	3.50	88.9	T440-56B-000
7.0	177.8	17-38	25.3-56.5	4-1/2 8RD CSG	114.3	5.750	146	4.0	101.6	T440-70A-000
7.0	177.8	17-29	25.3-43.2	5.0 8RD CSG	127	5.969	151.6	4.5	114.3	T440-71B-000
7.0	177.8	17-23	25.3-34.2	5-1/2 8RD CSG	139.7	6.187	157.1	5.0	127	T440-72B-000
7-5/8	193.7	20-33.7	29.8-50.2	4-1/2 8RD CSG	114.3	6.625	168.3	4.0	101.6	T440-75A-000
7-5/8	193.7	20-33.7	29.8-50.2	5-1/2 8RD CSG	139.7	6.625	168.3	5.0	127	T440-76A-000
8-5/8	219.1	24-40	35.7-59.5	4-1/2 8RD CSG	114.3	7.50	190.5	4.0	101.6	T440-84A-000
8-5/8	219.1	24-40	35.7-59.5	5-1/2 8RD CSG	139.7	7.50	190.5	5.0	127	T440-85A-000
8-5/8	219.1	24-40	35.7-59.5	6-5/8 8RD CSG	168.3	7.50	190.5	5.50	139.7	T440-86A-000
8-5/8	219.1	32 PPF	47.6	7.0 8RD CSG	177.8	7.656	194.5	6.50	165.1	T440-87B-000
9-5/8	244.5	32.3-43.5	48.1-64.7	7.0 8RD CSG	177.8	8.50	215.9	6.50	165.1	T440-97A-000
9-5/8	244.5	40-53.5	59.5-79.6	7.0 8RD CSG	177.8	8.25	209.6	6.50	165.1	T440-97B-000
10-3/4	273.1	40-55.5	59.5-82.6	7.0 8RD CSG	177.8	9.50	241.3	6.50	165.1	T440-10A-000
10-3/4	273.1	40-55.5	59.5-82.6	7.0 8RD CSG	177.8	9.50	241.3	7.0	177.8	T440-101A-000



TVP GAS VENT PACKER SYSTEM

An upper packer systemis used in conjunction with the TFB Casing Packer. Together these tools create a unique packer system that are used to isolate bad areas of casing while allowing gas to vent from below.

The TVP Packer System can be used in tension or compression, but is ideally suited for pumping wells with the tubing string landed in tension.

The TVP Packer is designed with a double element system for setting in heavily corroded casing.

- FULL BORE DESIGN ALLOWS MAXIMUM TUBING SIZE
- ♦ DOUBLE ELEMENT SYSTEM INSURES SEALING
- ♦ TORQUE MECHANISM ALLOWS MANIPULATION OF PACKER SYSTEM
- ♦ EASILY ADJUSTABLE SHEAR MECHANISM
- ♦ NO O-RING SEALS
- ◆ PACKING ELEMENT DESIGN

TE	VICA	LDA	1TA
	исл	$L D \Gamma$	

CAS	ING	CAS	SING	LINER SIZE		TUBING		MAX.		MIN.		PRODUCT
SIZ	ZE	WE	IGHT			SIZE		O.D.		I.D.		NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	in.	mm	
4-1/2	114.3	9.5-13.5	14.1-20.1	3" 8V LP	76.2	2-3/8 NU	60.3	3.750	95.25	2.0	50.8	T442-45A-000
5.0	127	11.5-15	17.1-22.3	3" 8V LP	76.2	2-3/8 NU	60.3	4.000	101.6	2.0	50.8	T442-50A-000
5.0	127	18-20.8	26.8-31.0	3" 8V LP	76.2	2-3/8 NU	60.3	4.125	104.8	2.0	50.8	T442-50B-000
5-1/2	139.7	13-20	19.3-29.8	3" 8V LP	76.2	2-3/8 EU	60.3	4.625	117.4	2.0	50.8	T442-55A-000
5-1/2	139.7	20-23	29.8-34.2	3" 8V LP	76.2	2-3/8 EU	60.3	4.500	114.3	2.0	50.8	T442-55B-000
5-1/2	139.7	13-15.5	19.3-23.1	4" NU 8RD	101.6	2-7/8 EU	73.0	4.781	121.4	2.50	63.5	T442-56A-000
5-1/2	139.7	17-20	25.3-29.8	4" NU 8RD	101.6	2-7/8 EU	73.0	4.650	118.1	2.50	63.5	T442-56B-000
7.0	177.8	17-38	25.3-56.5	4-1/2 8RD CSG	114.3	2-7/8 EU	73.0	5.750	146	2.50	63.5	T442-70A 000

* Available in single or double element design.



TWS HANGER PACKER

The TWS Hanger Packer is a compression set liner hanger packer for use in open hole or casing. The TWS hanger uses deep wide wicker slips that penetrate in scaly casing and open hole formations. The TWS Hanger cone is shear pinned to eliminate premature setting of the packing element while running, once the slips engage the cone the brass shear screws break energizing the packing element.

The TWS Hanger Packer is ran in using the TWS Running Tool. The running tool comes with a two foot stroke allowing rotation at the hanger without picking up on the casing string, this allows the right hand break thread to rotate free and disconnect without damage.

- **•** SIMPLE OPERATION
- DEEP WIDE WICKER SLIPS
- FULL OPENING
- * STAINLESS STEEL SLIP ARMS AND DRAG SPRINGS
- ◆ AVAILABLE IN STAINLESS STEEL CONSTRUCTION





TWS CASING PACKER TECHNICAL DATA

CAS	SING ZE	CA	SING	TUBING SI	ZE	MAX.		M	IN. D	PRODUCT NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	NUMBER
4-1/2	114.3	9.5-13.5	14.1-20.1	2-7/8 EUE 8RD	73.0	3.750	95.25	2.50	63.5	T441-45A-000
5.0	127	11.5-15	17.1-22.3	2-7/8 EUE 8RD	73.0	4.125	104.78	2.50	63.5	T441-50A 000
5.0	127	18-20.8	26.8-31.0	2-7/8 EUE 8RD	73.0	4.000	101.6	2.50	63.5	T441-50A-000
5-1/2	139.7	13-20	19.3-29.8	3-1/2 EUE 8RD	88.9	4.625	117.4	3.0	76.2	T441-55A-000
5-1/2	139.7	20-23	29.8-34.2	3-1/2-EUE 8RD	88.9	4.500	114.3	3.0	76.2	T441-55B-000
5-1/2	139.7	13-15.5	19.3-23.1	4 NU 8RD	101.6	4.781	121.4	3.50	88.9	T441-56A-000
5-1/2	139.7	13-17	19.3-25.3	4NU 8RD	101.6	4.650	118.1	3.50	88.9	T441-56B-000
7.0	177.8	17-38	25.3-56.5	4-1/2 8RD CSG	114.3	5.750	146.1	4.0	101.6	T441-70A-000
7.0	177.8	17-29	25.3-43.2	5.0 8RD CSG	127	5.969	151.6	4.5	114.3	T441-71B-000
7.0	177.8	17-23	25.3-34.2	5-1/2 8RD CSG	139.7	6.187	157.1	5.0	127	T441-72B-000
7-5/8	193.7	20-33.7	29.8-50.2	4-1/2 8RD CSG	114.3	6.625	168.3	4.0	101.6	T441-75A-000
7-5/8	193.7	20-33.7	29.8-50.2	5-1/2 8RD CSG	139.7	6.625	168.3	5.0	127	T441-76A-000
8-5/8	219.1	24-40	35.7-59.5	4-1/2 8RD CSG	114.3	7.50	190.5	4.0	101.6	T441-84A-000
8-5/8	219.1	24-40	35.7-59.5	5-1/2 8RD CSG	139.7	7.50	190.5	5.0	127	T441-85A-000
8-5/8	219.1	24-40	35.7-59.5	6-5/8 8RD CSG	168.3	7.50	190.5	5.50	139.7	T441-86A-000
8-5/8	219.1	32 PPF	47.6	7.0 8RD CSG	177.8	7.656	194.5	6.50	165.1	T441-87B-000
9-5/8	244.5	32.3-43.5	48.1-64.7	6-5/8 8RD CSG	168.3	8.50	215.9	6.0	152.4	T441-94A-000
9-5/8	244.5	40-53.5	59.5-79.6	6-5/8 8RD CSG	168.3	8.25	209.6	6.0	152.4	T441-94B-000
9-5/8	244.5	32.3-43.5	48.1-64.7	7.0 8RD CSG	177.8	8.50	215.9	6.50	165.1	T441-97A-000
9-5/8	244.5	40.53.5	59.5-79.6	7.0 8RD CSG	177.8	8.25	209.6	6.50	165.1	T441-97B-000
10-3/4	273.1	40-53.5	59.5-79.6	7.0 8RD CSG	177.8	9.50	241.3	6.50	165.1	T441-10A-000
10-3/4	273.1	40-53.5	59.5-79.6	7-5/8 8RD CSG	193.7	9.50	241.3	7.0	177.8	T441-101A-000



TMC VALVE

The TMC Valve is used with the TFB Casing Packer to cement liner strings into the well bore or open hole. The TFB Casing Packer is set in compression allowing the MC Valve to shear at a pre-determined value, opening the cementing ports. The cementing ports are closed by picking up on the casing string.



CASING	SIZE	МАХ	K O.D.	MIN. I.D.		HOLE SIZE		PRODUCT
in.	mm	in.	mm	in.	mm	in.	mm	NUMBER
4-1/2 LTC	114.3	5.500	139.7	4.000	101.6	6" & UP	152.4	T107-45A-000
5-1/2 LTC	139.7	6.500	165.1	5.000	127	7" & UP	177.8	T107-55A-000


PUMP-OUT CEMENTING SLEEVE

The Pump-Out Cementing Sleeve is used for cementing liner strings in the well bore usually run above the FB Casing Packer.

The Pump-Out Cementing Sleeve is run above the FB Casing Packer, once the Casing Packer is set (tension or compression) the Pump-Out Cementing Sleeve is activated by gravitating a ball into the lower seat, applied pressure shifts lower seat and opens port holes for cementing.

After the cementing operation is completed, pump the wiper plug into the upper seat and apply pressure to shift the closing sleeve over the port holes. Final pressure of 2500 psi will pump out all internal parts of the Pump-Out Cementing Sleeve.

- NO DRILLING REQUIRED
- ♦ SHORT COMPACT DESIGN
- ♦ *MEETS TUBING YIELD STRENGTH*



SIZE MAX O.D.		MIN. I.D. @ PUMP-OUT		THREAD CONNECTI	PRODUCT NUMBER			
in.	mm	in.	mm	in.	mm	in.	mm	
2-3/8	60.3	3.125	79.4	2.000	50.80	2-3/8 EUE 8RD	60.3	T218-20A-000
2-7/8	73	3.750	95.25	2.500	63.50	2-7/8 EUE 8RD	73	T218-25A-000
3-1/2	88.9	4.500	114.3	3.000	76.20	3-1/2 EUE 8RD	88.9	T218-35A-000
4.0	101.6	4.625	117.47	3.453	87.70	4.0 NU 8RD	101.6	T218-40A-000
4-1/2	114.3	5.500	139.7	4.000	101.6	4-1/2 8RD CSG	114.3	T218-45A-000
5-1/2	139.7	6.500	165.1	5.000	127.0	5-1/2 8RD CSG	139.7	T218-55A-000





RCP CASING PATCH

The RCP Retrievable Casing Patch is designed to straddle corroded areas and/or perforations in the casing. The large bore design of the RCP allows for larger tubing string sizes for well completion. The system can be incorporated with a on/off disconnect on the upper section allowing for the assembly to be installed with a tubing string, which once set, can be removed and the production string ran in place.

The RCP Retrievable Casing Patch can be set mechanically or hydraulically. Mechanically, the RCP assembly is ran to setting depth and after making the last movement upwards, left-hand torque is applied through the running string and setting mechanism. The running string is then lowered until the slips are engaged in the casing and sufficient tubing weight is applied to ensure a complete pack-off of the elements. The internal ratchet mechanism of the RCP then locks the assembly in the set position and the pack-off force into the elements. Hydraulically, the RCP is set by applying a pre-dertimed pressure through a special hydraulic setting tool which engages the slips and ratchet system, completes the element pack-off, and shears a stud which disengages the running tools.

Whether the RCP is mechanically or hydraulically set, the assembly can be released simply by engaging a spear into the I.D. of the tool and picking staright up.

- SIMPLE OPERATION
- FULL BORE DESIGN
- **SPACER PATCH PIPE VARIES AS REQUIRED**
- DEEP WIDE WICKER SLIPS
- ◆ INTERNAL RATCHET SYSTEM TO LOCK-IN SET/PACK-OFF
- * STAINLESS STEEL SLIP ARMS AND DRAG SPRINGS
- MECHANICAL OR HYDRAULIC SET
- STRAIGHT PICK-UP TO RELEASE

TECHNICAL DATA

CASING SIZE		MAX. O.D.		MIN. I.D.		THREAD CONNECTION		PRODUCT NUMBER
in.	mm	in.	mm	in.	mm	in	mm	
7	177.8	6.25	158.75	5.00	127	5 ½ ST &C	139.7	T444-70B-005





TCS COMPRESSION PACKER

The TCS Compression Packer is an inexpensive means of isolating the casing string from the open hole formation or used with theTWS Casing Packer for zone isolation. The TCS is set by applying sufficient weight to shear the setting screws energizing the packing elements.

- ♦ LARGE BORE DESIGN
- ♦ DOUBLE ELEMENT DESIGN FOR OPEN HOLE FORMATIONS
- ♦ SIMPLE OPERATION/ ECONOMICAL

CASING SIZE		CAS WEI	SING GHT	TUBING SIZE		MAX. O.D.		MIN. I.D.		PRODUCT NUMBER
in.	mm	lbs/ft	kg/m	in.	mm	in.	mm	in.	mm	
4-1/2	114.3	9.5-13.5	14.2-20.9	2-7/8 EUE 8RD	73.0	3.750	95.25	2.50	63.5	T444-45A-000
5.0	127	11.5-15	17.14-22.3	2-7/8 EUE 8RD	73.0	4.000	101.6	2.50	63.5	T444-50A-000
5.0	127	18-20.8	26.8-31.0	2-7/8 EUE 8RD	73.0	4.125	104.8	2.50	63.5	T444-50B-000
5-1/2	139.7	13-20	19.3-29.8	3-1/2 EUE 8RD	88.9	4.625	117.4	3.0	76.2	T444-55A-000
5-1/2	139.7	20-23	29.8-34.2	3-1/2 EUE 8RD	88.9	4.500	114.3	3.0	76.2	T444-55B-000
5-1/2	139.7	13-15.5	19.3-23.1	4 NU 8RD	101.6	4.781	121.4	3.50	88.9	T444-56A-000
5-1/2	139.7	17-20	25.3-29.8	4 NU 8RD	101.6	4.650	118.1	3.50	88.9	T444-56B-000
7.0	177.8	17-38	25.3-56.5	4-1/2 8RD CSG	114.3	5.750	146	4.0	101.6	T444-70A-000
7.0	177.8	17-29	25.3-43.2	5.0 8RD CSG	127	5.969	151.6	4.5	114.3	T444-71B-000
7.0	177.8	17-23	25.3-34.2	5-1/2 8RD CSG	139.7	6.187	157.1	5.0	127	T444-72B-000
7-5/8	193.7	20-33.7	29.8-50.2	4-1/2 8RD CSG	114.3	6.625	168.3	4.0	101.69	T444-75A-000
7-5/8	193.7	20-33.7	29.8-50.2	5-1/2 8RD CSG	139.7	6.625	168.3	5.0	127	T444-76A-000
8-5/8	219.1	24-40	35.7-59.5	4-1/2 8RD CSG	114.3	7.50	190.5	4.0	101.6	T444-84A-000
8-5/8	219.1	24-40	35.7-59.5	5-1/2 8RD CSG	139.7	7.50	190.5	5.0	127	T444-85A-000
8-5/8	219.1	24-40	35.7-59.5	6-5/8 8RD CSG	168.3	7.50	190.5	5.50	139.7	T444-86A-000
8-5/8	219.1	32 PPF	47.6	7.0 8RD CSG	177.8	7.656	194.5	6.50	165.1	T444-87B-000
9-5/8	244.5	32.3-43.5	48.1-64.7	7.0 8RD CSG	177.8	8.50	215.9	6.50	165.1	T444-97A-000
9-5/8	244.5	40-55.5	59.5-82.6	7.0 8RD CSG	177.8	8.25	209.6	6.50	165.1	T444-97B-000
10-3/4	273.1	40-55.5	59.5-82.6	7.0 8RD CSG	177.8	9.50	241.3	6.50	165.1	T444-10A-000
10-3/4	273.1	40-55.5	59.5-82.6	7-5/8 8RD CSG	193.7	9.50	241.3	7.0	177.8	T444-101A-000

TECHNICAL DATA





API CASING DATA

O.D. mm	WEIGHT kg/m	I.D. DRIFT AREA mm I.D. mm sq		AREA mm sq.	CAPACITY m3/100m
	10.04	10709	103.91	9032.24	.273
	12.86	104.75	101.57	8580.63	.262
	14.14	103.89	100.71	8451.60	.259
111.00	15.62	102.90	99.72	8322.56	.254
(4-1/2 ")	16.37	102.26	99.09	8258.05	.251
()	17.26	101.60	98.43	8129.02	.246
	18.75	100.53	97.36	7935.47	.242
	20.09	99.57	96.39	7806.44	.237
	24.70	97.18	94.01	7419.34	.226
	11.90	119.28	116.10	11161.27	.340
	17.11	115.82	112.65	10516.11	.321
107.00	19.34	114.15	110.97	10193.53	.312
(6")	19.58	113.79	110.62	10193.53	.310
(0)	22.32	11.96	108.79	9870.95	.300
	26.78	108.61	105.44	9290.30	.283
	31.25	105.51	102.34	8709.66	.266
	13.39	131.88	128.70	13677.39	.417
	19.34	128.12	124.94	12903.20	.393
	20.83	127.30	124.13	12709.65	.388
400 70	22.32	126.34	123.16	12516.10	.382
(5-1/2")	22.44	125.98	122.81	12451.59	.380
(0 1/2)	23.06	125.73	122.56	12387.07	.378
	25.30	124.26	121.08	12193.52	.369
	29.76	121.36	118.19	11548.36	.353
	34.22	118.62	115.70	11032.24	.337
	17.86	159.69	156.51	20064.48	.612
	19.34	158.88	155.70	19806.41	.604
	25.30	155.83	152.65	19096.74	.582
	27.28	154.56	151.38	18774.16	.572
	28.94	154.05	150.88	18645.12	.568
	29.76	153.64	150.47	18516.09	.564
169.29	32.74	152.12	148.95	18193.51	.555
(6-5/8")	35.71	150.39	147.22	17741.90	.542
. ,	37.50	151.51	148.34	18064.48	.550
	38.69	148.72	145.54	17419.32	.531
	39.43	148.26	145.08	17290.29	.526
	41.66	147.09	143.92	16967.71	.518
	43.15	146.41	143.23	16838.68	.514
	47.62	144.15	141.10	16322.55	.498
	50.59	142.11	138.94	15870.94	.483
	19.34	168.96	165.79	22387.05	.682
	25.30	166.07	162.89	21677.38	.660
	28.88	164.08	161.16	21161.25	.645
177.80	29.76	163.98	160.81	21096.73	.644
(7")	32.74	162.51	159.33	20709.64	.631
	34.22	161.70	158.52	20580.60	.626
	35.71	160.93	157.76	20322.54	.620
	38.69	159.41	156.24	19935.44	.609
	41.66	157.84	154.66	19548.35	.596

O.D. WEIGHT mm kg/m		I.D. mm	DRIFT I.D. mm	AREA mm sq.	CAPACITY m3/100m
	43.15	157.07	153.90	19354.80	.591
	43.90	156.67	153.49	19290.28	.588
	44.64	156.31	153.14	19225.77	.585
	47.62	154.79	151.61	18838.67	.574
177.80	50.15	153.62	150.44	18516.09	.564
(7")	50.59	153.42	150.24	18516.09	.563
	52.08	152.50	149.33	18258.03	.556
	52.53	152.40	149.23	18253.03	.556
	56.54	150.37	147.19	17741.90	.540
	59.52	148.23	145.06	17290.29	.526
	29.76	180.98	177.80	25741.88	.784
	31.56	179.96	176.78	25419.30	.774
	35.71	178.44	175.26	25032.21	.762
	39.28	177.01	173.84	24645.11	.750
193.68	44.19	174.63	171.45	23935.44	.730
(7-5/8")	50.15	171.83	168.66	23161.24	.708
	53.57	170.31	167.13	22774.15	.695
	56.54	169.04	165.86	22451.57	.684
	58.03	168.29	165.10	22258.02	.677
	66.96	163.70	160.53	21032.22	.641
	29.76	208.05	204.88	33999.93	1.037
	35.71	205.66	202.49	33225.74	1.013
	38.02	205.00	201.83	33032.19	1.006
	38.63	204.85	201.68	32967.68	1.005
	41.66	203.63	200.46	32580.58	.992
	43.67	202.72	199.54	32258.00	.983
219.08	47.62	201.19	198.02	31806.39	.970
(8-5/8")	48.21	201.09	197.92	31806.39	.968
	53.57	198.76	195.58	31032.20	.946
	56.54	197.49	194.36	30645.10	.933
	59.52	196.22	193.04	30258.00	.922
	65.47	193.68	190.50	29483.81	.898
	72.91	190.78	187.60	28580.59	.871
	48.06	228.63	224.66	41032.18	1.251
	53.57	226.59	222.63	40322.50	1.229
	56.54	225.68	221.72	39999.92	1.220
	59.52	224.41	220.45	39548.31	1.205
244.48	62.50	233.49	219.53	39225.73	1.196
(5-5/6)	64.73	222.38	318.41	38838.63	1.184
	69.94	220.50	216.54	38193.47	1.164
	79.61	216.79	213.08	36967.67	1.126
	86.30	214.25	210.54	36064.44	1.099
	48.73	258.89	254.91	52645.06	1.604
	60.26	255.27	251.31	51161.19	1.560
070.05	67.70	252.73	248.77	50193.45	1.529
(10-3/4")	75.89	250.19	246.23	49161.19	1.499
(82.58	247.90	243.94	48257.97	1.471
	90.32	245.36	241.40	47290.23	1.440
	97.76	242.82	238.86	46322.49	1.412



API CASING DATA

O.D. in.	WEIGHT Ib/ft	I.D. in.	DRIFT I.D. in.	AREA sq. in.	CAPACITY bbl/100
	6.75	4.216	4.091	14.0	1.72
	8.64	4.124	3.999	13.3	1.65
	9.50	4.090	3.965	13.1	1.63
	10.50	4.051	3.926	12.9	1.60
4-1/2	11.00	4.026	3.901	12.8	1.58
	11.60	4.00	3.875	12.6	1.55
	12.60	3.958	3.833	12.3	1.52
	13.50	3.920	3.795	12.1	1.49
	16.60	3.826	3.701	11.5	1.42
	8.00	4.696	4.571	17.3	2.14
	11.50	4.560	4.435	16.3	2.02
	13.00	4.494	4.369	15.8	1.96
6	13.16	4.480	4.355	15.8	1.95
	15.00	4.408	4.283	15.3	1.89
	18.00	4.276	4.151	14.4	1.78
	21.00	4.154	4.029	13.5	1.68
	9.00	5.192	5.067	21.2	2.62
	13.00	5.044	4.919	20.0	2.47
	14.00	5.012	4.887	19.7	2.44
	15.00	4.974	4.849	19.4	2.40
5-1/2	15.08	4.960	4.835	19.3	2.39
	15.50	4.950	4.825	19.2	2.38
	17.00	4.892	4.767	18.9	2.32
	20.00	4.778	4.653	17.9	2.22
	23.00	4.670	4.555	17.1	2.12
	12.00	6.287	6.162	31.1	3.85
	13.00	6.255	6.130	30.7	3.80
	17.00	6.135	6.010	29.6	3.66
	18.33	6.085	5.960	29.1	3.60
	19.45	6.065	5.940	28.9	3.57
	20.00	6.049	5.924	28.7	3.55
	22.00	5.989	5.864	28.2	3.49
6-5/8	24.00	5.921	5.796	27.5	3.41
	25.20	5.965	5.840	28.0	3.46
	26.00	5.855	5.730	27.0	3.34
	26.50	5.837	5.712	26.8	3.31
	28.00	5.791	5.666	26.3	3.26
	29.00	5.764	5.639	26.1	3.23
	32.00	5.675	5.550	25.3	3.13
	34.00	5.595	5.470	24.6	3.04
	13.00	6.652	6.527	34.7	4.29
	17.00	6.538	6.413	33.6	4.15
	19.41	6.460	6.345	32.8	4.06
	20.00	6.456	6.331	32.7	4.05
7	22.00	6.398	6.273	32.1	3.97
	23.00	6.366	6.241	31.9	3.94
	24.00	6.336	6.211	31.5	3.90
	26.00	6.276	6.151	30.9	3.83
	28.00	6.214	6.089	30.3	3.75

O.D. in.	O.D. WEIGHT I.D. in. Ib/ft in.			AREA sq. in.	CAPACITY bbl/100
	29.00	6.184	6.059	30.0	3.72
	29.50	6.168	6.043	29.9	3.70
	30.00	6.154	6.029	29.8	3.68
	32.00	6.094	5.969	29.2	3.61
7	33.70	6.048	5.923	28.7	3.55
'	34.00	6.040	5.915	28.7	3.54
	35.00	6.004	5.879	28.3	3.50
	35.30	6.000	5.875	28.3	3.50
	38.00	5.920	5.795	27.5	3.40
	40.00	5.836	5.711	26.8	3.31
	20.00	7.125	7.000	39.9	4.93
	21.21	7.085	6.960	39.4	4.87
	24.00	7.025	6.900	38.8	4.79
	26.40	6.969	6.844	38.2	4.72
7-5/8	29.70	6.875	6.750	37.1	4.59
1 0/0	33.70	6.765	6.640	35.9	4.45
	36.00	6.705	6.580	35.3	4.37
	38.00	6.655	6.530	34.8	4.30
	39.00	6.625	6.500	34.5	4.26
	45.00	6.445	6.320	32.6	4.03
	20.00	8.191	8.066	52.7	6.52
	24.00	8.097	7.972	51.5	6.37
	25.55	8.071	7.946	51.2	6.33
	25.96	8.065	7.940	51.1	6.32
	28.00	8.017	7.892	50.5	6.24
	29.35	7.981	7.856	50.0	6.18
8-5/8	32.00	7.921	7.796	49.3	6.10
	32.40	7.917	7.792	49.3	6.09
	36.00	7.825	7.700	48.1	5.95
	38.00	7.775	7.652	47.5	5.87
	40.00	7.725	7.600	46.9	5.80
	44.00	7.625	7.500	45.7	5.65
	49.00	0.001	0.045	44.3	5.4ŏ
	32.30	9.001	0.040	62.5	7.72
	28.00	0.921	0.700	62.0	7.67
	40.00	0.000	8.670	61.3	7.58
9-5/8	40.00	8 700	8.643	60.8	7.50
5-5/0	42.00	8 755	8 500	60.2	7.45
	47.00	8 681	8 525	59.2	7 32
	53 50	8 535	8 389	57.3	7.08
	58.00	8 435	8 289	55.9	6.91
	32.75	10 192	10.036	81.6	10.09
	40 50	10.152	9 894	79.3	9.81
	45.50	9,950	9,794	77.8	9,62
10-3/4	51.00	9,850	9,794	76.2	9,43
	55.50	9.760	9.604	74.8	9.25
	60.70	9.660	9.504	73.3	9.06
	65.70	9.560	9.404	71.8	8.88





EXAMPLE: TO PULL 12,010 LBS. OF 2-7/8 6.4 PPF TUBING AT 9,010 FT

1) FOLLOW 9,010 FT DEPTH LINE TO 12,010 LBS FORCE LINE AND READ OVER TO 2-7/8 CHART SCALE

2) READ 29 INCHES STRETCH IN TUBING LENGTH

CHART IS FOR TENSION OR COMPRESSION