



COMPLETION SERVICES

SECTION 7

Subsurface Safety



SUBSURFACE SAFETY

FlowSafe™ Tubing-Retrievable Safety Valve	95
FlowSafe™ Wireline-Retrievable Safety Valve	97
FlowSafe™ Safety Valve Lock Mandrels	99
Superior Landing Nipples	101

FlowSafe™ Tubing-Retrievable Safety Valve

Superior Completion Services' **FlowSafe™ Tubing-Retrievable Safety Valve (TRSV)** is a flapper-type, equalizing or non-equalizing, surface-controlled subsurface safety valve (SCSSV) installed in the production string. The valve is designed to provide subsurface isolation to minimize loss of production and protect human life. It also reduces the potential for environmental discharge or damage to production equipment resulting from an uncontrolled surface or subsurface event.

The **FlowSafe™ SCSSV** is hydraulically controlled from the surface through a control line connected to the well control/emergency shutdown system. The FlowSafe™ TR Safety Valve is designed to facilitate easy installation of secondary FlowSafe™ Wireline-Retrievable (WR) Insert Safety Valve to provide continuous fail-safe operation.

APPLICATIONS

- Production and cement through applications
- Any area in which the integrity of the wellhead can be compromised

Features and Benefits

- Hydraulically controlled
- Single rod piston design
- Certified per API 14A specifications
- Maximized flow-through ID design
- Self-equalized through flapper option
- Non-elastomeric seals
- Metal-to-metal body joints
- Secondary lockout/communication
- Inverted dual ferrule control line connection
- Optimized design helps eliminate sand fouling
- Compact design and minimal number of parts increases reliability
- Minimized number of potential leak paths
- Premium metallurgies available for varied environments



FlowSafe™ Tubing-Retrievable Safety Valve

TECHNICAL DATA

FlowSafe™ Tubing-Retrievable Safety Valves												
FLOWSAFE™ TR 5,000-PSI SAFETY VALVES												
Tubing Size		Model	Maximum OD		Polished Bores				Working Pressure		Tensile Strength**	
inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa	lb	kg
2 3/8	60.3	BT(E)-5	3.625	92.08	1.875	47.6		55.6			167,191	75,837
2 7/8	73.3	BT(E)-5	4.610	117.1	2.313	58.7	2.188	86.0			186,180	84,450
3 1/2	88.9	BT(E)-5	5.175	131.4	2.813	71.4	2.750	69.9	5,000	34,474	302,760	137,330
4 1/2	114.3	BT(E)-5	6.908	175.4	3.813	96.9	3.688	93.7			425,740	193,112
4 1/2	114.3	BTSP(E)-5	6.550	166.4	3.813	96.9	3.688	93.7			380,007	172,368
5 1/2	139.3	BTSP(E)-5	7.686	195.2	4.563	115.9					602,970	272,502
7	177.8	BTSP(E)-5	9.203	238.8	5.963	151.0					886,905	402,293
FLOWSAFE™ TR 7,500-PSI SAFETY VALVES												
Tubing Size		Model	Maximum OD		Polished Bores				Working Pressure		Tensile Strength**	
inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa	lb	kg
4 1/2	114.3	BTSP(E)-7.5	6.915	175.6	3.813	96.9	3.688	93.7			535,980	243,116
5 1/2	139.3	BTSP(E)-7.5	8.107	205.9	4.563	115.9			7,500	51,710	780,264	353,922
7	177.8	BTSP(E)-7.5	9.537	242.2	5.963	151.0					1,353,420	613,901
FLOWSAFE™ TR 10,000-PSI SAFETY VALVES												
Tubing Size		Model	Maximum OD		Polished Bores				Working Pressure		Tensile Strength**	
inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa	lb	kg
2 3/8	60.3	BT(E)-10	3.625	92.1	1.875	47.6					198,485	90,031
2 7/8	70.3	BT(E)-10	5.130	130.3	2.313	58.7	2.188	55.6			282,132	128,427
3 1/2	88.9	BT(E)-10	5.540	140.7	2.813	71.4	2.750	69.9			374,733	169,979
3 1/2	88.9	BT(E)-10	5.540	140.7	2.653	71.4			10,000	68,948	374,733	169,979
4 1/2	114.3	BTSP(E)-10	7.350	186.7	3.813	96.9	3.688	93.7			468,509	212,512
5 1/2	139.7	BTSP(E)-10	8.592	218.2	4.563	115.9					780,264	353,922
7	177.8	BTSP(E)-10	9.982	253.5	5.963	151.0					1,455,058	660,003

- The data provided above is not inclusive of all pressure ratings and ODs available in the tubing sizes listed. For additional information, contact your Superior Completion Services representative.
- The tensile ratings listed are specific to the metallurgy for the valves listed and are exclusive of end connections. Tensile calculations are performed at ambient temperatures. Additional information is available upon request.

REFERENCES

The FlowSafe™ SCSSV brochure
FlowSafe™ WR Safety Valve data sheet

FlowSafe™ Wireline-Retrievable Safety Valve

Superior Completion Services' **FlowSafe™ Wireline-Retrievable (WR) Safety Valve** is a flapper-type, equalizing or non-equalizing, surface-controlled subsurface safety valve (SCSSV). The valve is designed to provide subsurface isolation to minimize loss of production and protect human life. It also reduces the potential for environmental discharge or damage to production equipment resulting from an uncontrolled surface or subsurface event.

The FlowSafe™ WR Safety Valve can be installed as a primary safety valve landed in a hydraulic nipple. It can also be used to remediate a failed Tubing-Retrievable as an Insert Wireline Safety Valve.

APPLICATIONS

- Offshore environments and onshore wells located in environmentally sensitive areas
- Any area in which the integrity of the wellhead can be compromised

Features and Benefits

- Hydraulically controlled
- Certified per API 14A specifications
- Maximized flow-through ID design
- Self-equalized through flapper option
- Optimized design helps eliminate sand fouling
- Compact design and minimal number of parts increases reliability
- Replacement for an existing TR safety valve
- Facilitates flow assurance well design criteria
- Minimized number of potential leak paths
- Premium metallurgies available for varied environments



FlowSafe™ Wireline-Retrievable Safety Valve

TECHNICAL DATA

FlowSafe™ Wireline-Retrievable Safety Valve										
Tubing Size		Model	Inside Diameter		Polished Bores				Working Pressure	
inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
2 3/8	60.33	BW(E)-5/10	0.810	20.57	1.875	47.6				
2 7/8	73.03	BW(E)-5/10	11.25	28.58	2.313	58.7	2.188	55.6		
3 1/2	88.90	BW(E)-5/10	1.500	38.10	2.813	71.4	2.750	69.9	5,000 or	34,474 or
4 1/2	114.30	BW(E)-5/10	2.125	53.98	3.813	96.9	3.688	93.7	10,000	68,948
5 1/2	139.3	BW(E)-5/10	2.600	66.04	4.563	115.9				
7	177.8	BW(E)-5/10	3.500	88.90	5.963	151.0	6.000	152.0		

FlowSafe™ Wireline-Retrievable Safety Valve Hydraulic Nipple										
Tubing Size		Model	Inside Diameter		Polished Bores				Working Pressure	
inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
2 3/8	60.33	BW(E)-5/10	1.875	47.6						
2 7/8	73.03	BW(E)-5/10	2.188	55.6	2.313	58.7				
3 1/2	88.90	BW(E)-5/10	2.563	65.1	2.813	71.4	2.750	69.9	5,000 or	34,474 or
4 1/2	114.30	BW(E)-5/10	3.750	95.25	3.813	96.9	3.688	93.7	10,000	68,948
5 1/2	139.3	BW(E)-5/10	4.563	115.9						
7	177.8	BW(E)-5/10	5.963	151.0	6.000	152.0				

The data provided above is not inclusive of all pressure ratings and ODs available in the tubing sizes listed. For additional information, contact your Superior Completion Services representative.

REFERENCES

FlowSafe™ TR safety valve data sheet

FlowSafe™ SCSSV brochure

FlowSafe™ Safety Valve Lock Mandrels

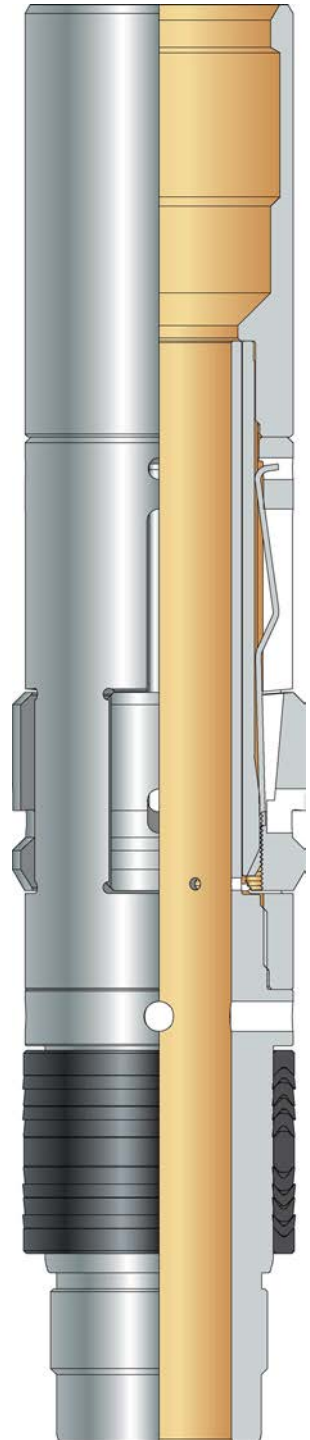
Superior Completion Services' **FlowSafe™ Safety Valve Lock** mandrels are designed specifically for Wireline Safety Valve applications. These feature Industry standard profiles and offer 10K pressure ratings from below with an ID that matches the WLSV. These are manufactured under API Q1 and built to API 14L standards.

APPLICATIONS

- Insert Wireline Safety Valve
- Wireline Safety Valve with Hydraulic Nipple
- Standard lock applications where a reduced ID is acceptable

Features and Benefits

- API 14L Certified
- Rated to full working pressure for the Safety Valve
- Validation Grade up to V1
- Metallurgy selected for application



FlowSafe™ Safety Valve Lock Mandrels

TECHNICAL DATA

FlowSafe™ Wireline Retrievable Safety Valve Lock Mandrels										
Tubing Size		Model	Inside Diameter		Polished Bores				Working Pressure	
inch	mm		inch	mm	inch	mm	inch	mm	psi	MPa
2 3/8	60.33	SESX/SESR	0.810	20.57	1.875	47.6				
2 7/8	73.03	SESX/SESR	11.25	28.58	2.313	58.7	2.188	55.6		
3 1/2	88.90	SESX/SESR	1.500	38.10	2.813	71.4	2.750	69.9	5,000 or	34,474 or
4 1/2	114.30	SESX/SESR	2.125	53.98	3.813	96.9	3.688	93.7	10,000	68,948
5 1/2	139.3	SESRT	2.600	66.04	4.563	115.9				
7	177.8	SESRT	3.500	88.90	5.963	151.0	6.000	152.0		

REFERENCES

FlowSafe™ TR safety valve data sheet

FlowSafe™ SCSSV brochure

Superior Landing Nipples

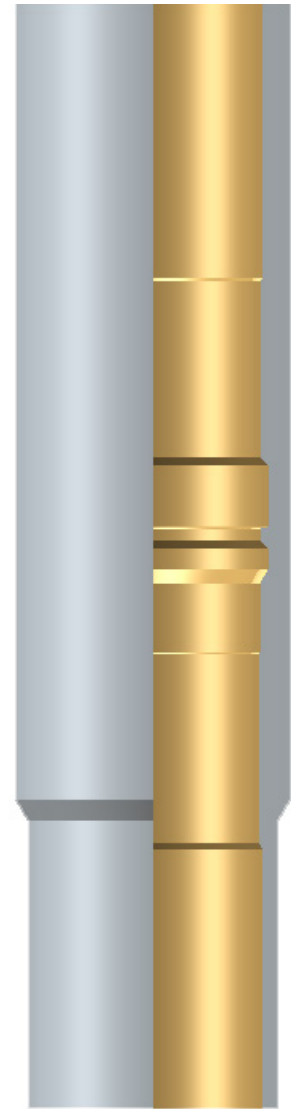
Superior Completion Services offers a complete line of industry standard **Landing Nipples**. The nipples are available in a standard commodity line manufactured under API Q1 quality standards and a premium line of certified nipples manufactured under API 14L standards. These nipples are compatible with industry standard locks made for the selected profile and other standard flow control accessories. Nipples are available in standard 4130-45 series alloys, 9 or 13 chrome, Inconel and material to match service environment.

APPLICATIONS

- Land Blanking Plugs
- Land Gauge Hangers
- Land Velocity Valves
- Land Chokes
- Land Equalizing Check Valves

Features and Benefits

- Available in Commodity and Certified types
- Full line of industry standard profiles and sealbores
- Available with Selective and No-Go varieties
- Designed for standard and heavy wall tubing sizes
- Available in standard and premium thread varieties
- Compatible with standard slickline flow control accessory tools



Superior Landing Nipples

TECHNICAL DATA

Superior Landing Nipples										
Tubing Size		Model	Weight		Polished Bores				Working Pressure	
inch	mm		inch	kg/m	inch	mm	No Go ID	mm	psi	MPa
2 3/8	60.33	SEX	4.600	6.85	1.875	47.63				
		SEXN	4.6	6.85	1.875	47.63	1.791	45.49		
		SESR	5.960	8.86	1.710	43.43				
2 7/8	73.03	SEX	6.400	9.53	2.313	58.75				
		SEXN	6.400	9.53	2.313	58.75	2.205	56.0	5,000 or	34,474 or
		SESR	8.700	12.96	2.125	53.98			10,000	68,948
3 1/2	88.90	SEX	9.300	13.84	2.813	71.45				
		SEXN	9.300	13.85	2.813	71.45	2.665	67.7		
		SESR	12.95	19.29	2.562	65.07				
4 1/2	114.30	SEX	12.750	18.99	3.813	96.85				
		SEXN	12.75	18.99	3.813	96.85	3.725	94.6		
		SESR	15.5	23.09	3.688	93.68				

* Note - this is not a complete listing of availability.