



Frac String Performance Characteristics Sheet

Patent 11,505,999

Pipe Size and Weight: 2 3/8 5.95 IEU
Pipe Grade: S135
Range: 2
Connection: 3.062 X 1.805 FSS-247®

13614 Poplar Circle
Suite 204
Conroe, TX 77304, U.S.A.
Phone: (936) 978-0446
Mobile (713) 703-5399
www.fracstrings.com

Frac String Pipe Body

	New-API	Premium
OD (in)	2.375	2.273
Wall Thickness (in)	0.254	0.203
ID (in)	1.867	1.867
Calculated Plain End weights (lbs/ft)	5.751	4.491
Note: Premium properties are calculated based on uniform OD and wall thickness.		
Cross sectional area pipe body (in ²)	1.692	1.322
Cross sectional area OD (in ²)	4.430	4.059
Cross sectional area ID (in ²)	2.738	2.738
Section Modulus (in ³)	0.813	0.629
Polar Section Modulus (in ³)	1.626	1.258
	New-API	Premium
Torsional Strength (ft-lbs)	10,600	8,200
Tensile Strength (lbs)	228,500	178,400
Pressure Capacity (psi)	25,266	23,101
Collapse Capacity (psi)	25,788	21,976

Connection



FSS-247®

	OD (in)	3.062
	ID (in)	1.805
	Drift (in)	1.773
Frac String with a Material Yield Strength of 135000 psi		
	Pin Tong length (in)	6
	Box Tong length (in)	9
	Thread Compound	NCS-30
	<i>Friction Factor</i>	<i>1.0</i> 1.15
	Torsional Strength (ft-lbs)	7,650 8,800
Severe Service Level Recommended Make-up Torque (ft-lbs)(75%)	5,700	6,600
Standard Service Level Recommended Make-up Torque (ft-lbs)(60%)	4,600	5,300
Min Recommended Make-up Torque (ft-lbs)	3,800	4,400
Operational Torque Must Not Exceed Make-up Torque		
	Balance OD (in)	3.050
	Tensile Strength (lbs)	230,200
	Connection Compressive Strength (lbs)	234,900
	Min OD for Tension and Compression (in)	2.843
	Stretch K value	0.21730

Frac String Properties			Frac String Bend Radius	
API Adjusted weight (kg/m)(lbs/ft)	9.59	6.44	* These calculations are based on new pipe with nominal wall Based on Bending Stress (psi) at Pipe OD 15,000 Radius of Curvature (R) (ft.) (@ OD of pipe) 197.9 BUR (dogleg) deg/100 ft. 29.0	
Make up loss (mm)(in)	70	2.75		
Approximate S/S length (M)(ft)	9.60	31.5		
Working Pressure (kPa)(psi)	103421	15,000		
Fluid Displacement CuM/M(gal/ft)	0.00122	0.099		
Fluid Capacity (CuM/M)(gal/ft)	0.00171	0.137		
Drift Size (mm)(in)	45.03	1.773		

This Performance Sheet was generated by Nels Wickander. **THIS TECHNICAL INFORMATION IS FOR REFERENCE ONLY**

Revision 05 3/27/2026



Combined Loading Chart

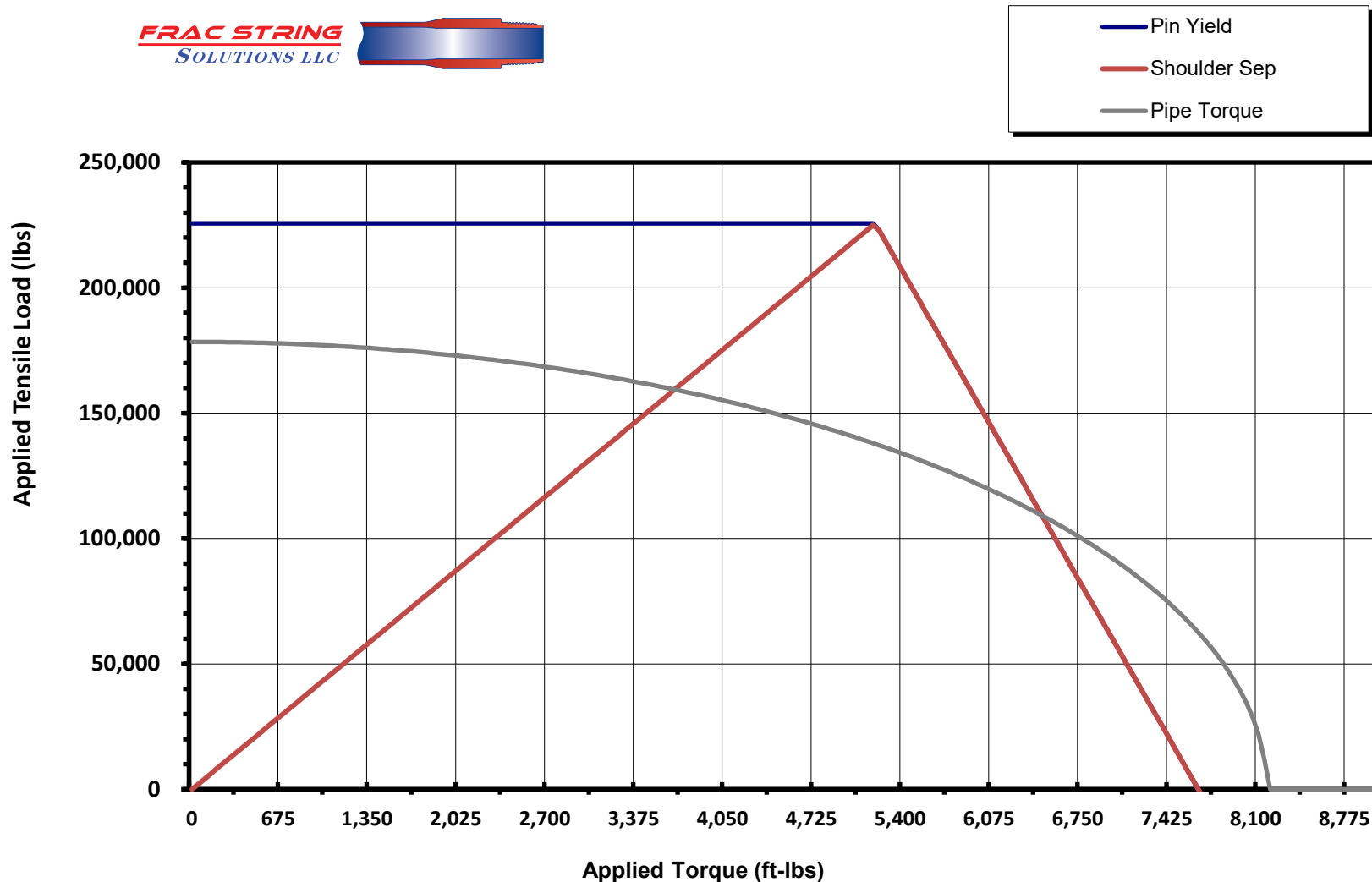
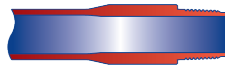
For FSS-247® 3.062 X 1.805 Tool Joint with a Material Strength of 135000 psi, using a Coefficient of Friction of 0.08, NCS30 Thread Compound and a Safety Factor of 1.0.
 On Pipe: 2.375 5.95 S135 Premium Class.

Torque		Tension			MAKEUP TORQUE	
Applied to String	Make Up Torque using NCS30 with FF of 1.15	Limits of Combined Loading on the FSS-247 Connection		Limit with Torque Applied to String		
	1.15	Pin Yield	Shoulder Separation			
Ft-Lbs		Pounds				
250	300	225,678	0	178,410		
500	600	225,678	10,870	178,327		
750	900	225,678	21,740	178,075		
1,000	1,200	225,678	32,610	177,656		
1,250	1,400	225,678	43,480	177,067		
1,500	1,700	225,678	54,350	176,307		
1,750	2,000	225,678	65,220	175,373		
2,000	2,300	225,678	76,090	174,263		
2,250	2,600	225,678	86,960	172,974		
2,500	2,900	225,678	97,830	171,501		
2,750	3,200	225,678	108,700	169,839		
3,000	3,500	225,678	119,570	167,984		
3,250	3,700	225,678	130,440	165,928		
3,500	4,000	225,678	141,310	163,664		
3,750	4,300	225,678	152,180	161,183		
3,800	4,400	225,678	163,050	158,475		MINIMUM
4,000	4,600	225,678	163,050	158,475		
4,250	4,900	225,678	173,920	155,528		
4,500	5,200	225,678	184,790	152,329		
4,600	5,300	225,678	195,660	148,860	RECOMMENDED	
4,750	5,500	225,678	195,660	148,860		
5,000	5,800	225,678	206,530	145,103		
5,250	6,000	225,678	217,400	141,035		
5,400	6,200	220,198	220,198	136,627		
5,500	6,300	220,198	220,198	136,627		
5,750	6,600	197,213	197,213	131,847	MAXIMUM	
6,000	6,900	174,227	174,227	126,651		
6,250	7,200	151,242	151,242	120,985		
6,500	7,500	128,257	128,257	114,782		
6,750	7,800	105,272	105,272	107,947		
7,000	8,100	82,287	82,287	100,353		
7,250	8,300	59,302	59,302	91,810		
7,500	8,600	36,317	36,317	82,022		

TORQUE TENSION COMBINED LOAD CURVE

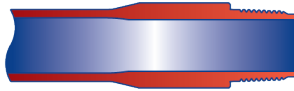
For FSS-247 3.062 X 1.805 Drill Pipe with a Material Strength of 135000 psi, using a Coefficient of Friction of 0.08, NCS30 Thread Compound (FF 1.15) and a Safety Factor of 1.0. On Pipe: 2.375 5.95# S135 Premium Class.

FRAC STRING
SOLUTIONS LLC



FSS-247® 3.062 X 1.805 CONNECTION OD WEAR CURVE

FRAC STRING
SOLUTIONS LLC



— FSS-247® with 1.805 ID
— 80% 2.375 5.95 S135 Prem
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