

**Sucker Rod String: Guide** 

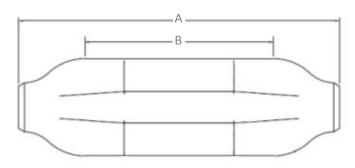
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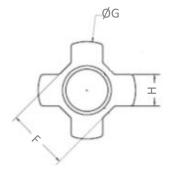
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## TenFlow™ Sucker Rod Guide

TenFlow™ is a Tenaris proprietary Beam Pumping injected sucker rod guide designed to maximize the Erodible Wear Volume (EWV) minimizing the flow turbulence.

## **Dimensions:**





Nominal sizes		Dimensions										
Tubing	Guide Length	Rod	А		В		F		ØG		Н	
			in		in	mm	in	mm	in	mm	in	mm
2 3/8"		3/4"			3.07	78	1.22	31	1.85	47	0.63	16
2 3/0		7/8"					1.30	33				
	5"	3/4"	5.5	140		68 68	1.22	31	2.30	58.5	0.75	19
2 7/8"		7/8"			2.68		1.34	34				
		1"					1.45	37				
2 3/8"		3/4"			4.52		1.22	31	2.30	47 58.5	0.63	16
2 3/0	7"	7/8"					1.30	33				10
		3/4"					1.22	31				19
2 7/8"		7/8"					1.34	34				
		1"	7.6	193			1.45	37				
		3/4"			4.41	112	1.22	31	2.64	67	0.75	19
3 ½"		7/8"					1.34	34				
3 72		1"					1.45	37				
		1 1/8"					1.57	40				
2 7/8"	9″	3/4"		224	5.87	149	1.22	31	2.30	58.5	0.75	19
		7/8"	8.8				1.34	34				
		1"					1.45	37				

Nominal sizes			Guide total volume		Erodible volu		Coupling used to compare	Tubing arc	
Tubing	Guide Length	Rod	cm <sup>3</sup>	in <sup>3</sup>	cm <sup>3</sup> in <sup>3</sup>			scavenged	
2.2/0//		3/4"	105.0	6.4	15.9	1.0	3/4"FS	159°	
2 3/8"		7/8"	100.4	6.1	16.4	1.0	7/8" SH	159°	
	5"	3/4"	156.1	9.5	58.1	3.5	3/4" FS	168°	
2 7/8"		7/8"	149.5	9.1	40.7	2.5	7/8" FS	168°	
		1"	143.8	8.8	24.0	1.5	1" SH	168°	
2 3/8"	7"	3/4"	156.6	9.6	25.5	1.6	3/4"FS	159°	
		7/8"	146.5	8.9	25.5	1.6	7/8" SH	159°	
			3/4"	229.6	14.0	87.7	5.4	3/4" FS	168°
2 7/8"		7/8"	221.2	13.5	62.6	3.8	7/8" FS	168°	
		1"	211.9	12.9	37.0	2.3	1" SH	168°	
		3/4"	277.8	17.0	134.0	8.2	3/4" FS	132°	
3 ½"			7/8"	268.3	16.4	107.0	6.5	7/8" FS	132°
			1"	260.5	15.9	55.7	3.4	1" FS	132°
		1 1/8"	253.3	15.5	46.4	2.8	1 1/8" SH	132°	
2 7/8"	9″	3/4"	284.8	17.4	111.6	6.8	3/4" FS	168°	
		7/8"	273.8	16.7	79.8	4.9	7/8" FS	168°	
		1"	262.3	16.0	47.6	2.9	1" FS	168°	

## **Materials:**

Typical values for Polyphenylene sulfide (PPS) 40% and 30% glass reinforced are displayed in the following table

Property	Test Standard	PPS30 (**)	PPS40 (**)	
Density	ISO 1183	1.58 g/cm <sup>3</sup>	1.65 g/cm <sup>3</sup>	
Tensile strength	ISO 527-2/1A	170 MPa	195 MPa	
Elongation at break	ISO 527-2/1A	1.9 %	1.9 %	
Tensile Modulus	ISO 527-2/1A	12000 MPa	14700 MPa	
Unnotched Charpy impact stength @23°C	ISO 179/1eU	34 kJ/m2	53 kJ/m <sup>2</sup>	
Unnotched Charpy impact stength @-40°C	ISO 179/1eU	34 kJ/m2	53 kJ/m <sup>2</sup>	
Notched Charpy impact stength @23°C	ISO 180/1eA	9 kJ/m2	10 kJ/m²	
Notched Charpy impact stength @-40°C	ISO 179/1eA	9 kJ/m2	10 kJ/m <sup>2</sup>	

Typical values for Polyphthalamide polymer (PPA) unfilled (0%) and with a 33% glass reinforced are displayed in the following table

.Property	Test Standard	PPA00 (**)	PPA33 (**)
Density	ISO 1183	1.1 g/cm <sup>3</sup>	1.44 g/cm <sup>3</sup>
Tensile strength	ASTM D638	55MPa	193 MPa
Elongation at break	ASTM D638	10%	2.1 %
Tensile Modulus	ASTM D638	1793 MPa	13100 MPa

<sup>\*\*</sup> Values shown have been taken from a reduced number of tests and shall not be used to establish specifications.

## **Rod guide properties:**

Property	PPS40	PPS30	PPA00	PPA33
Color	White	Grey	Natural	Black
Maximum Service Temperature*	200°C	200°C	165°C	165°C
Dynamic Friction Coeficient	0.30	0.28	0.22	0.25
Fiberglass Content	40%	30%	0%	33%

<sup>\*</sup>Maximum temperature limitation is dependent on well conditions. Please contact Tenaris' Technical Sales Representative for further assistance.

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