

Turbulent Oil & Particulate Separator (TOPS) Pipe-in-Pipe (PIP), Top-Intake, Gas-and-Solids Separator System

Reverses flow of well fluids, allowing slugging gases to escape up annulus

Applications

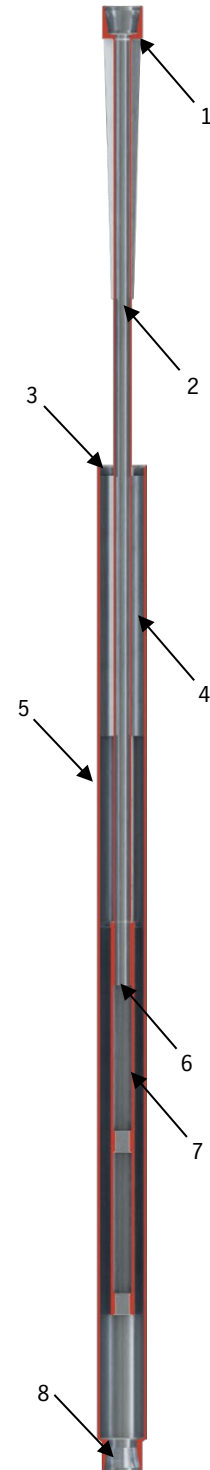
- High-GOR and sand-prone wells
- High-rate, long-stroke wells
- Slugging well conditions

Tool Description

The Weatherford Turbulent Oil and Particulate Separation system is a simple and effective dual-purpose, gas-and-solids separator for a range of applications in rod lift, PCP, and ESP environments. Its large intake induces a reverse-flow condition of well fluids, allowing slugging gas conditions to escape up the annulus. Solids are then separated past the weir plates and into the optional mud joints below.

Tool Attributes

Diagram	Model	Feature
1	35	Top Tubing Connection L80 2-3/8 in. (60.325 mm), EUE Box
	45/55	Top Tubing Connection L80 2-7/8 in. (73.025 mm), EUE Box
2	35	1 in. (25.400 mm) Dip Tube 1.315 in. (33.401 mm) OD XXH
	45	1-1/4 in. (31.750) Dip Tube 1.660 in. (42.164 mm) OD XXH
	55	1-1/2 in. (38.100 mm) Dip Tube 1.900 in. (48.260 mm) OD XXH
3	35	Beveled Top Entry Intake 3.068 in. (77.927 mm)
	45	Beveled Top Entry Intake 4.026 in. (102.260 mm)
	55	Beveled Top Entry Intake 5.063 in. (128.600 mm)
4	35/45/55	Structural Support Plates A36
5	35/45/55	Shroud Assembly SCH40
6	35	Pump Intake Port 0.957 in. (24.308 mm)
	45	Pump Intake Port 1.278 in. (32.461 mm)
	55	Pump Intake Port 1.500 in. (38.100 mm)
7	35/45/55	Solids Deflection Wier A35
8	35	Bottom Mud Joint Connection 2-3/8 in. (60.325) EUE Box
	45/55	Bottom Mud Joint Connection 2-7/8 in. (73.025 mm) EUE Box



The Weatherford TOPS system effectively separates gas and solids for a range rod-lift, PCP, and ESP applications.



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Specifications

Model	EUE Connections	OAL	Dip Tube ID	Max Shroud OD	Tensile Rating	Material	Coating
35	2-3/8 in. (60.325 mm)	30 ft (9.144 m)	0.957 in. (24.308 mm)	3.500 in. (88.900 mm)	47 Klb (20.9 kdaN)	SCH40	ENC
45	2-7/8 in. (73.025 mm)	30 ft (9.144 m)	1.278 in. (32.462 mm)	4.500 in. (114.300 mm)			
55	2-7/8 in. (73.025 mm)	30 ft (9.144 m)	1.500 in. (38.100 mm)	5.563 in. (141.300 mm)			

Estimated Rate Capacities

PIP Series 35									
Casing OD	Casing Weight	Casing ID	Drift	Max Fluid Capacity	Separator Body OD	Separator ID	Separator Intake OD	Dip Tube ID	Dip Tube Capacity
4.5 in. (114.3 mm)	16.9 lb-ft (2.34 kgf-m)	3.740 in. (94.99 mm)	3.615 in. (91.821 mm)	514 bbl/d (81.72 m ³ /d)	3.500 in. (88.9 mm)	3.068 in. (77.93 mm)	1.315 in. (33.40 mm)	0.957 in. (24.31 mm)	630.0 bbl/d (100.16m ³ /d)
	16.6 lb-ft (2.29 kgf-m)	3.740 in. (94.99 mm)	3.629 in. (92.18 mm)	514 bbl/d (81.72 m ³ /d)					
	15.1 lb-ft (2.09 kgf-m)	3.826 in. (97.18 mm)	3.701 in. (94.01 mm)	542 bbl/d (86.17 m ³ /d)					
	13.5 lb-ft (1.87 kgf-m)	3.920 in. (99.57 mm)	3.795 in. (96.39 mm)	572 bbl/d (90.94 m ³ /d)					
	12.6 lb-ft (1.74 kgf-m)	3.958 in. (100.53 mm)	3.833 in. (97.36 mm)	585 bbl/d (93.01 m ³ /d)					
	11.6 lb-ft (1.60 kgf-m)	4.00 in. (101.60 mm)	3.875 in. (98.43 mm)	599 bbl/d (95.23 m ³ /d)					
	10.5 lb-ft (1.45 kgf-m)	4.052 in. (102.92 mm)	3.927 in. (99.75 mm)	616 bbl/d (97.94 m ³ /d)					
	9.5 lb-ft (1.31 kgf-m)	4.090 in. (103.88 mm)	3.965 in. (100.71 mm)	629 bbl/d (100.00 m ³ /d)					



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Estimated Rate Capacities (continued)

PIP Series 45									
Casing OD	Weight	Casing ID	Drift	Max Fluid Capacity	Separator Body OD	Separator ID	Separator Intake OD	Dip Tube ID	Dip Tube Capacity
5.5 in. (139.7 mm)	20 lb-ft (2.76 kgf-m)	4.778 in. (121.36 mm)	4.653 in. (118.19 mm)	842 bbl/d (133.87 m³/d)	4.500 in. (114.30 mm)	4.026 in. (102.26 mm)	1.660 in. (42.16 mm)	1.278 in. (32.46 mm)	1,350 bbl/d (214.63 m³/d)
	17 lb-ft (2.35 kgf-m)	4.892 in. (124.26 mm)	4.767 in. (121.08 mm)	889 bbl/d (141.34 m³/d)					
	15.5 lb-ft (2.14 kgf-m)	4.95 in. (125.73 mm)	4.825 in. (122.56 mm)	913 bbl/d (145.16 m³/d)					
	14 lb-ft (1.94 kgf-m)	5.012 in. (127.31 mm)	4.887 in. (124.13 mm)	939 bbl/d (149.29 m³/d)					
	13 lb-ft (1.79 kgf-m)	5.044 in. (128.12 mm)	4.919 in. (124.94 mm)	952 bbl/d (151.36 m³/d)					

PIP Series 55									
Casing OD	Weight	Casing ID	Drift	Max Fluid Capacity	Separator Body OD	Separator ID	Separator Intake OD	Dip Tube ID	Dip Tube Capacity
7 in. (177.8 mm)	42.7 lb-ft (5.90 kgf-m)	5.750 in. (146.05 mm)	5.625 in. (142.88 mm)	1,272 bbl/d (202.23 m³/d)	5.563 in. (141.30 mm)	5.063 in. (128.60 mm)	1.660 in. (42.16 mm)	1.278 in. (32.46 mm)	1,350 bbl/d (214.63 m³/d)
	41 lb-ft (5.67 kgf-m)	5.820 in. (147.83 mm)	5.695 in. (144.65 mm)	1,306 bbl/d (207.64 m³/d)			1.900 in. (48.26 mm)	1.500 in. (38.10 mm)	1,930 bbl/d (306.85 m³/d)
	38 lb-ft (5.25 kgf-m)	5.920 in. (150.37 mm)	5.795 in. (147.19 mm)	1,319 bbl/d (209.70 m³/d)					
	35 lb-ft (4.84 kgf-m)	6.004 in. (152.50 mm)	5.879 in. (149.33 mm)	1,361 bbl/d (216.38 m³/d)					
	32 lb-ft (4.42 kgf-m)	6.094 in. (154.79 mm)	5.969 in. (151.61 mm)	1,407 bbl/d (223.70 m³/d)					
	29 lb-ft (4.01 kgf-m)	6.184 in. (157.07 mm)	6.059 in. (153.89 mm)	1,453 bbl/d (231.01 m³/d)					
	26 lb-ft (3.59 kgf-m)	6.276 in. (159.41 mm)	6.151 in. (156.24 mm)	1,501 bbl/d (238.64 m³/d)					
	23 lb-ft (3.18 kgf-m)	6.366 in. (161.69 mm)	6.241 in. (158.52 mm)	1,549 bbl/d (246.27 m³/d)					
	20 lb-ft (2.77 kgf-m)	6.456 in. (163.98 mm)	6.331 in. (160.81 mm)	1,598 bbl/d (254.06 m³/d)					
	17 lb-ft (2.35 kgf-m)	6.538 in. (166.06 mm)	6.413 in. (162.89 mm)	1,642 bbl/d (261.06 m³/d)					

