STATIC 152.4 mm 62.053 MPa 2500 m 6 Inch Gas Injection Flowline

Structure Number: WSI 152.2553-RD-4042-6 R1

S.I. Units Pipe Data Sheet, 152.2553-RD-4042-6 R1

Prepared by: Gustavo Dionisio **Checked by:** Victor Carnauba **Approved by:** Igor Pereira

Inside Diameter	152.4 mm	**Service**	Static	**Max. Fluid Temp.**	90 °C
Design Pressure	62.053 MPa	**Conveyed Fluid**	Gas	**Water Depth**	2500 m

Layer	Material	I.D. [mm]	Thick [mm]	O.D. [mm]	Weight [kg/m]
Flexbody	Duplex 2205	152.40	8.40	169.20	18.855
Flexbarrier	PA 12 Natural	169.20	10.00	189.20	5.742
Flexlok	Steel 100ksi YS 125ksi UTS	189.20	11.99	213.18	52.109
Flextape	Tape PA 11 P20 30mil	213.18	1.52	216.22	1.076
Flextensile 1	0.7% C Steel 135ksi MYS 150 UTS	216.22	7.00	230.22	33.244
Flextape	Polypropylene	230.22	0.30	230.81	0.199
Flextape	High Strength Glass Filament	230.81	2.03	234.87	1.932
Flextape	Polypropylene	234.87	0.30	235.47	0.203
Flextensile 2	0.7% C Steel 135ksi MYS 150 UTS	235.47	7.00	249.47	36.063
Flextape	Polypropylene	249.47	0.30	250.06	0.215
Flextape	High Strength Glass Filament	250.06	2.03	254.12	2.092
Flextape	Polypropylene	254.12	0.30	254.71	0.219
Flextape	Tape Polyester Fabric	254.71	0.41	255.53	0.217
Flexshield	PE100 Grade GP100BK	255.53	7.00	269.53	5.642
Flexinsul	PT7000 Insulation (Reinforcing Layer)	269.53	3.50	276.53	2.048
Flextape	Tape Polyester Fabric	276.53	0.41	277.34	0.236
Abrasion	PE100 Grade GP100BK	277.34	7.00	291.34	6.111

Layer	Raw Material	Dimensions	Mfg Pitch	Wires	Angle	Filled
Flexbody	55.0mm x 1.6mm	2.165in x 0.063in			87.9	85.48%
Flexlok (Profile H)	27.3mm x 12.0mm	1.076in x 0.472in			88.2	91.96%
Flextensile 1	12.0mm x 7.0mm	0.472in x 0.276in	1079.8mm	46	33.0	96.90%
Flextensile 2	12.0mm x 7.0mm	0.472in x 0.276in	1267.7mm	51	31.0	96.52%
Flexinsul	50.8mm x 3.5mm	2.000in x 0.138in				90.60%

Outside Diameter	291.34 mm	**Volume (at OD)**	66.381 l/m
Storage Radius, SBR	1.89 m	**Volume (at ID)**	20.095 l/m
Operating Radius, OBR (Dry Bore)[1]	4.60 m	**Wt, Empty in Air**	166.20 kg/m
Operating Radius, OBR (Flooded Bore)[2]	2.40 m	**S/W filled in Air**	186.81 kg/m
Pipe bending stiffness at 23 °C, EI	40.412 kNm²	**Air filled in S/W**	98.14 kg/m
Spooling Tension	11292 N	**S/W filled in S/W**	118.74 kg/m
Therm. Cond./Length, C/L	5.26 w/m°C	**Burst Pressure**	120.75 MPa
Effective Thermal Cond, ke	0.54 w/m°C	**Burst/Design**	1.95
OHTC, Uo {based on ID}	10.99 w/m²°C	**Collapse Pressure (Wet Flexlok)**	30.32 MPa
SWDR with bore empty	3.30 N/m mm	**Collapse Depth (Wet Flexlok)**	3015 m
SWDR with bore filled by SW	4.00 N/m mm	**Collapse/Design (Wet Flexlok)**	1.21
Pipe torsional stiffness (GJ) at 23 °C:		**Failure Tension**	5913.1 kN
Limp direction	1685 kNm²		
Stiff direction	3559 kNm²		
Axial Stiffness	563380 kN		

Notes

[1]OBR (MBR) increased to comply with internal carcass design criteria (0.85) for bent collapse failure mode.

[2]OBR (MBR) for pipe flooded condition in order to comply with Petrobras tensile armour design criteria (0.67) for tensile buckling failure mode.

Pipe Data Sheet revised to adjust correct Spooling Tension value. No structural/layer change.

STATIC 6 in 9000 psi 8202.1 ft 6 Inch Gas Injection Flowline
Structure Number: WSI 152.2553-RD-4042-6 R1
U. S. Units Pipe Data Sheet, 152.2553-RD-4042-6 R1

Prepared by: Gustavo Dionisio **Checked by:** Victor Carnauba **Approved by:** Igor Pereira

Inside Diameter	6 in	**Service**	Static	**Max. Fluid Temp.**	194 °F
Design Pressure	9000 psi	**Conveyed Fluid**	Gas	**Water Depth**	8202.1 ft

Layer	Material	I.D. [in]	Thick [in]	O.D. [in]	Weight [lbm/ft]
Flexbody	Duplex 2205	6.000	0.331	6.661	12.670
Flexbarrier	PA 12 Natural	6.661	0.394	7.449	3.859
Flexlok	Steel 100ksi YS 125ksi UTS	7.449	0.472	8.393	35.015
Flextape	Tape PA 11 P20 30mil	8.393	0.060	8.513	0.723
Flextensile 1	0.7% C Steel 135ksi MYS 150 UTS	8.513	0.276	9.064	22.339
Flextape	Polypropylene	9.064	0.012	9.087	0.134
Flextape	High Strength Glass Filament	9.087	0.080	9.247	1.298
Flextape	Polypropylene	9.247	0.012	9.270	0.136
Flextensile 2	0.7% C Steel 135ksi MYS 150 UTS	9.270	0.276	9.821	24.233
Flextape	Polypropylene	9.821	0.012	9.845	0.145
Flextape	High Strength Glass Filament	9.845	0.080	10.005	1.406
Flextape	Polypropylene	10.005	0.012	10.028	0.147
Flextape	Tape Polyester Fabric	10.028	0.016	10.060	0.146
Flexshield	PE100 Grade GP100BK	10.060	0.276	10.611	3.791
Flexinsul	PT7000 Insulation (Reinforcing Layer)	10.611	0.138	10.887	1.376
Flextape	Tape Polyester Fabric	10.887	0.016	10.919	0.159
Abrasion	PE100 Grade GP100BK	10.919	0.276	11.470	4.106

Layer	Raw Material	Dimensions	Mfg Pitch	Wires	Angle	Filled
Flexbody	55.0mm x 1.6mm	2.165in x 0.063in			87.9	85.48%
Flexlok (Profile H)	27.3mm x 12.0mm	1.076in x 0.472in			88.2	91.96%
Flextensile 1	12.0mm x 7.0mm	0.472in x 0.276in	42.51in	46	33.0	96.90%
Flextensile 2	12.0mm x 7.0mm	0.472in x 0.276in	49.91in	51	31.0	96.52%
Flexinsul	50.8mm x 3.5mm	2.000in x 0.138in				90.60%

Outside Diameter	11.470 in	**Volume (at OD)**	0.715 ft³/ft
Storage Radius, SBR	6.21 ft	**Volume (at ID)**	0.216 ft³/ft
Operating Radius, OBR (Dry Bore)[1]	15.09 ft	**Wt, Empty in Air**	111.68 lb/ft
Operating Radius, OBR (Flooded Bore)[2]	7.87 ft	**S/W filled in Air**	125.53 lb/ft
Pipe bending stiffness at 23 °C, EI	97791 lbf ft²	**Air filled in S/W**	65.95 lb/ft
Spooling Tension	2538 lbf	**S/W filled in S/W**	79.79 lb/ft
Therm. Cond./Length, C/L	3.04 BTU/hrft°F	**Burst Pressure**	17514 psi
Effective Thermal Cond, ke	0.31 BTU/hrft°F	**Burst/Design**	1.95
OHTC, Uo {based on ID}	1.94 BTU/hrft²°F	**Collapse Pressure (Wet Flexlok)**	4398 psi
SWDR with bore empty	5.749 lbf/ft in	**Collapse Depth (Wet Flexlok)**	9893 ft
SWDR with bore filled by SW	6.957 lbf/ft in	**Collapse/Design (Wet Flexlok)**	1.21
Pipe torsional stiffness (GJ) at 23 °C:		**Failure Tension**	1329318 lbf
Limp direction	4077 Kip ft²		
Stiff direction	8612 Kip ft²		
Axial Stiffness	126653 Kip		

Notes

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[2]OBR (MBR) for pipe flooded condition in order to comply with Petrobras tensile armour design criteria (0.67) for tensile buckling failure mode.

Pipe Data Sheet revised to adjust correct Spooling Tension value. No structural/layer change.