



**Mandals Tubeman M has been specifically designed for trenchless rehabilitation of industrial pressure pipelines transporting sewage, drain water, hydrocarbons, such as fuels, gasoline, natural gas, oil, and other non-aggressive liquids and gases. The liner is designed for medium pressure systems.**

With Mandals Tubeman M we offer a more sustainable solution for the rehabilitation of old pipelines with minimal disruption to traffic, pedestrians, and the environment in general, with an improved CO<sub>2</sub> footprint and HSE performance. The hose liner is flexible in terms of the diameter variation of the original pipe, effortlessly passing bends even at long section lengths. Tubeman M has a lower pressure series in Tubeman L.

### Installation

Mandals AS supplies the liner leak-proof tested, and tape wrapped in a "U"-shape. Prior to installation a regular cleaning procedure is required of the host pipe and condition controlled by CCTV inspection.

The liner is pulled through the host pipe by using a winch and can be installed in pipes having bends up to 45° (R/D ≥ 5)<sup>1</sup>. No steaming is needed to cure the liner, only a small amount of pressure is required to break the tape. Thereafter the liner is re-coupled and connected again to the existing infrastructure and the system is ready to be put back into operation.

### Features

- Resistant to a wide range of chemicals.
- Full diameter recovery after pressure release.
- Excellent hydrolysis and fungus resistance.
- Outstanding wear and tear properties.
- Service Lifetime will depend on several important factors such as proper and correct installation, condition of the existing pipe, type of medium pumped through the liner, temperature, etc.

### Construction

- Mandals Tubeman M is a loose-fit, non-interactive liner which will absorb all internal pressure while in operation.
- The reinforcement is made of a seamless fabric with aramid as load-carrying fibers (one or two layers)
- The "extrusion through the weave" production technology gives excellent bonding between the thermoplastic polyurethane cover and lining as well as firmly encapsulating the circular woven aramid reinforcement.
- The liner is in compliance with ISO11295:2022, ISO11299-1:2018 Lining with inserted hoses and ASTM F3708-25

### Properties

- Length up to 400m.
- Color options: Black (standard).
- Different coupling options available.
- Max. recommended operational temperature is +30°C (86°F), but the actual fluid transferred will determine whether that temperature is appropriate. For higher temperature requirements, special polymer grades can be considered.

### Tubeman M

Article Number	-	TMM150	TMM200	TMM250	TMM300	TMM350
Nominal Pipe size DN	mm Inch	150 6	200 8	250 10	300 12	350 14
Inner Diameter	mm Inch	123 4.84	154 6.07	212 8.35	258 10.16	297 11.70
Wall Thickness	mm Inch	4.6 0.18	4.6 0.18	4.8 0.19	4.8 0.19	5.0 0.20
Nominal Weight	kg/m lbs/ft	2.10 1.40	2.9 1.93	3.8 2.51	4.5 3.00	5.3 3.56
Burst Pressure (BP)	bar psi	140 2030	100 1450	75 1088	64 928	50 725
MOP Water <sup>1</sup>	bar psi	56 812	40 580	30 435	26 377	20 290
MOP Oil/Gas <sup>1</sup>	bar psi	35 507	25 362	18 261	16 232	12 174
Actual Total Tensile Strength	x1000 kg x1000 lbs	45 100	62 137	77 172	95 211	109 242
Length Extension	%	<1	<1	<1	<1	<1
Outer Diameter at 10% of BP <sup>2</sup>	mm Inch	137 5.39	181 7.13	231 9.09	283 11.14	329 12.95
Outer Diameter at MAOP Water <sup>2</sup>	mm Inch	140 5.51	184 7.24	234 9.21	290 11.42	335 13.19
Outer Diameter at MAOP Oil/Gas <sup>2</sup>	mm Inch	139 5.47	183 7.20	233 9.17	287 11.30	332 13.07

**Note:** <sup>1</sup>The sharpest bend angle and corresponding R/D ratio of the pipeline system will impact and set the Maximum Operating Pressure (MOP). A 45° bend (R/D = 5.5) will entail a 45% reduction of MOP of the rehabilitated pipeline system. <sup>2</sup>Tolerances according to ASTM F3708-25. For questions about chemical resistance please check mandals.com/support.