

MediTrac[®] by OmegaFlex.
Corrugated stainless steel tubing system for
Medical Gas Pipeline Systems.

MediTrac[®] is a new concept in piping for medical gas pipeline systems (MGPS), which has been specially designed to conform to HTM 02 01 (the UK specification for MGPS), and the corresponding European and International standard (BS EN ISO 7396-1:2016). **MediTrac[®]** offers a number of economic and technical advantages over traditional copper pipework.

MediTrac[®] is a corrugated stainless steel tubing system, using end fittings made from brass. **MediTrac[®]** is manufactured in the USA by OmegaFlex Inc., and supplied in Europe through OmegaFlex Limited. OmegaFlex Inc and OmegaFlex Ltd are both registered in accordance with BS EN ISO 9001, as required by HTM 02 01 paragraph 13.14 and 13.15.

HTM 02-01 recognises stainless steel as a suitable material for MGPS, (see HTM 02-01 para 13.16), and brass as a suitable material for end fittings (HTM 02 01 para 13.18). The end fittings are attached by mechanical means without any hot work. Mechanical fittings are recognised in HTM 02 01 para 13.22.

BS EN ISO 7396-1:2016 also recognises alternatives to copper for MGPS. Evidence that **MediTrac[®]** provides an equivalent degree of safety to that provided by copper systems, as required by BS EN ISO 7396-1:2016 para 4.2. has been provided by independent on site testing by TÜV Bavaria. Copies of the relevant reports are available on request. The stainless steel and brass materials used in **MediTrac[®]** systems are compatible with oxygen as required by BS EN ISO 7396-1:2016 para 4.3 and BS EN ISO 15001:2010. The end fittings used on **MediTrac[®]** do not contain any non-metallic gaskets or seals, as required by HTM 02-01 para 13.39, and **MediTrac[®]** pipelines are fully electrically conductive, to facilitate the necessary electrical bonding of the system, as required by BS EN ISO 7396-1:2016 para 11.1.5 and HTM 02 01 para 2.48.

Dimensions and Pressures.

For compressed medical gases (other than air or nitrogen for driving surgical tools).

Nominal size	8	12	15	22	28
Outside diameter over jacket (mm)	12	17	22	28	35
Recommended bend radius (mm)	76	76	76	76	127
Minimum bend radius (mm)	25	25	25	25	76
Typical operating pressure (kPa gauge)	400	400	400	400	400
Maximum test pressure (kPa gauge)	1200	1200	1200	1200	1200
Minimum burst pressure (MPa)	15	20	15	10	9

For all applications on compressed air or nitrogen for driving surgical tools at 700 kPa nominal distribution pressure, or for information on larger sizes than those shown above, please refer to OmegaFlex.

For Vacuum service only.

Nominal size	8	12	15	22	28	32	40	50
Outside diameter over jacket (mm)	12	17	22	28	35	42	49	63
Recommended bend radius (mm)	76	76	76	76	127	127	127	153
Minimum bend radius (mm)	25	25	25	25	76	76	76	102
Typical operating pressure (kPa absolute)	40	40	40	40	40	40	40	40
Minimum burst pressure (MPa)	15	20	15	10	9	8	7	6

Features and benefits of MediTrac®.

MediTrac® is a pliable corrugated stainless steel tube with an external polyethylene cover. It is supplied on easy to handle disposable drums in long continuous lengths, and can be bent to tight radii by hand without any tooling. This allows much faster installation on site than copper, since far fewer joints are required along the length of the pipeline. The joints which remain, such as to connect the pipe to valves and terminal units, require no hot work or inert gas shielding, and take far less time to complete than traditional brazed joints in copper pipes.

The end fittings for **MediTrac®** are mechanically assembled all metal fittings. (Mechanical pipeline joints are recognised in HTM 02 01 para 13.22 and 13.39, and BS EN ISO 7396-1:2016 para 11.3.1.). The end fittings on **MediTrac®** provide a reliable gas-tight metal to metal seal by flaring the end of the tube during assembly. No special tooling is needed. The pipe is cut by hand with a wheeled pipe cutter and the end fittings are assembled on site quickly and simply with a spanner. No hot work is involved, and therefore the need for purging the inside of the pipeline with inert gas during assembly does not arise, and there are no discoloured or heat-affected zones in the pipeline.

If required, completed end fitting assemblies can be disassembled for visual inspection. All the components of the joint can be re-assembled to re-make the joint with full performance integrity. (Contrast this with the requirement relating to copper pipe systems that a number of brazed joints must be cut out and sectioned for inspection, see HTM 02 01 para 13.36).

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MediTrac® pipe is delivered to site with internal cleanliness for oxygen service in accordance with BS EN ISO 15001:2010 para 4.1, and is internally free of toxic residues and of particulate matter, and is supplied end capped and labelled as medical gas pipe, as required by HTM 02 01 para 13.19 and BS EN ISO 7396-1:2016 para 4.3.7.

The end fittings are cleaned and degreased for oxygen service in accordance with BS EN ISO 15001:2010 para 4.1, are free of particulate matter and toxic residues, and are packed and labelled as medical gas fittings, as required by HTM 02 01 para 13.20 and BS EN ISO 7396-1:2016 para 4.3.7.

MediTrac® is suitable to be installed in close proximity to strong magnetic or electro-magnetic fields (see BS EN ISO 7396-1:2016 para 4.3.8).

BS EN ISO 7396-1:2016 para 11.1.4 requires that MGPS shall be separated from electrical services, (either by being run in a separate compartment, or by being separated by more than 50mm), but where local regulations permit, and installation conditions require the pipe to be installed in close proximity to other services, the cover provides the necessary external electrical insulation and corrosion protection without the need for additional insulating wrapping (see HTM 02 01 para 13.8).

The polyethylene cover on **MediTrac®** also provides the necessary protection to permit the enclosure of the pipe within stud or plasterboard walls, or directly in plaster wall finishes without the need for additional wrapping. (HTM 02 01 paragraphs 13.10, 13.11 c, and 13.12.) Where **MediTrac®** pipes pass through walls, partitions or floors, the holes should be sleeved and fire stopped as usual, in accordance with HTM 02 01 para 13.11 a.

Compatibility with existing systems.

MediTrac® assemblies are attached to components such as valves or regulators by means of threaded fittings. Different threads are available to suit local regulations and to avoid cross-connection. On-site attachment to components made from stainless steel, brass, bronze or gunmetal presents no difficulties. (Note that in traditional copper pipe MGPS, joints between the copper pipe and components made from brass, gunmetal or bronze are not normally allowed to be made on site – see HTM 02 01 paragraphs 13.22 to 13.28.)

Where it is necessary to join **MediTrac®** to a copper pipe, or to pre-piped headwalls or bed head trunking, the joint to the copper side of the system is achieved by means of a mechanical joint (a compression fitting), in accordance with HTM 02 01 paragraphs 13.39 and 13.60 c, and BS EN ISO 7396-1:2016 para 11.3.1, avoiding the need for hot work and inert gas shielding of the pipeline.

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Pipeline supports.

MediTrac® can be supported using the same types of pipe clip as are used on copper pipe systems, but the clips need to be one size larger for **MediTrac®** than for the equivalent nominal size of copper tube. The polyethylene cover on **MediTrac®** means that there is no need for any additional treatment of the clips to prevent electrolytic action between the pipe and the supports (BS EN ISO 7396-1:2016 para 11.2.3). The maximum interval between supporting clips is 1.5 metres for sizes up to DN15, and 2.0 metres for DN 22 and DN 28, in accordance with HTM 02 01 para 13.44 (table 26), and BS EN ISO 7396-1:2016 para 11.2.1 (table 3).

BS 8313.

For installations where BS 8313 applies, please note the following:

Installation in non-ventilated spaces: **MediTrac®** is an all-welded stainless steel pipe, and therefore is permitted to be located in non-ventilated spaces in accordance with BS 8313 paragraph 12.3.1, Note 3. The end fittings should be located in ventilated places, but since **MediTrac®** is available in long continuous lengths, fittings are normally required only where **MediTrac®** is connected to other pipeline components such as valves or terminal units.

In relation to BS 8313 paragraph 12.3.4a, the outer cover of **MediTrac®**, (which is an extrusion covering the stainless steel corrugated pipe), constitutes a continuous gas-tight sleeve, which is ventilated at the end fittings. The performance of the cover as a gas-tight sleeve has been independently tested and verified by BSI Product Services.

In relation to paragraph 7.2.1a, (separation from other services), the outer cover of **MediTrac®** is an electrical insulator, which can provide an alternative to physical separation from electrical services in cases where space is limited, and where other applicable regulations permit such use.

Resistance to fire and high temperatures:

In relation to paragraphs 7.2.4 and 7.2.5, the melting point of the relevant components of the **MediTrac®** system is above 800°C, and therefore the pipes are allowed to be run in ducts whilst conveying flammable or oxidising gases, if required.

Continuous lengths of **MediTrac®** without end fittings withstand at least 120 minutes without leakage when tested in accordance with BS 476 part 20. At 120 minutes, the temperature is approximately 1050°C. (The melting point of the stainless steel used in **MediTrac®** is over 1400°C.)

MediTrac® assemblies (corrugated tube plus attached fittings) withstand a minimum of 30 minutes without leakage when fire tested in accordance with BS 476 part 20. At 30 minutes, the temperature is approximately 840°C (see the EN 1363-1 standard temperature-time curve). The melting temperature of the material used for the end fittings is approximately 900°C. For comparison, note that according to BS EN ISO 7396-1:2016 para 11.3.1; brazed joints in copper MGPS are only required to maintain their mechanical integrity up to 600°C.

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Reaction to fire.

The indicative classification for **MediTrac®** is B-s1,d0 according to EN 13501-1.
(A separate data sheet on the fire performance of **MediTrac®** is available on request.)

CE marking.

BS EN ISO 7396-1:2016 is harmonised to EU Directive 93/42/EEC on Medical Devices, which allows MGPS which conform to this standard to be CE marked, if required.

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