



Specification

Uponor MLC & SAC Multi-Layer Pipe Systems

To be read with the preliminaries and general conditions

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Always refer to Uponor for the latest specification, technical information, installation instructions, training and method statements

Uponor Multi-Layer Pipe Systems

MLC & SAC pipe systems are suitable for use in 'Open or Closed' water systems intended for domestic hot and cold potable water, heating or chilled water systems and hydronic radiant heating or cooling systems.

Multiple proprietary Uponor connection technologies are available for use on Uponor MLC & SAC pipe systems - metal press fittings (12-50mm) and PPSU composite press fittings (16 – 75mm) for use with hydraulic pressing equipment, metal modular press system (63-110mm), 'Tool Inside' push fit connectors and compression adaptors.

Approvals & Standards

WRAS - 1903901 - Uponor S-Press PLUS, S-Press PLUS PPSU, MLC and SAC 16-32mm
 2010907 - Uponor S-Press 12 & 14mm, MLC
 2109108 - S-Press & RS Modular 40-110mm, MLC
 2101339 - Manifolds and adapters
 2203909 - RTM

Manufacturing is in accordance with the international quality standard ISO 9001 and environmental standard ISO 14001.

Uponor Multilayer Pipe

MLC (Uni-Pipe) Multi Layer Composite

SAC (Uni-Pipe PLUS) Seamless Aluminium Composite

Uponor 5 layer composite pipes consist of an aluminium pipe (100% oxygen proof diffusion barrier, diffusion tight exceeding the requirements of DIN 4726), bonded to an inner layer of Polyethylene – Raised Temperature (PE-RT), and an outer layer of white Polyethylene – Raised Temperature (PE-RT). PE-RT/AL/PE-RT

Uponor SAC pipe (16-32mm) is manufactured using a unique seamless extruded aluminium pipe for its construction.

Uponor MLC (12,14,40-110mm) uses an aluminium pipe which is manufactured using a safety overlap welded construction

Uponor multi-layer pipes are manufactured to parts 1 & 2 of BS EN ISO 21003-1 2008. Pipes are clearly marked at 1m intervals with full production data, in accordance with the requirements of the standard.

Multi-layer pipes in sizes 12,14,16, 20, 25 and 32mm can be supplied in flexible 50m coils as standard, or limited sizes in 100, 120, 200 & 500m.

More rigid straight lengths of 16, 20, 25, 32, 40, 50, 63, 75, 90 and 110mm pipe are available in both 3m or 5m (depending on pipe diameter).

Uponor MLC & SAC pipes are sealed immediately after manufacture with a removable colour coded plug to ensure maximum hygiene as recommended by BS EN 806-5:2012, BS8558:2011 and HTM 04 -01

Operating Conditions (BS EN ISO 21003-1:2008)

- **Heating systems (high temperature radiators)** - where the water temperature does not continuously exceed 80°C, 10 bar (Conditions to application Class 5 - BS EN ISO 21003-1:2008). The maximum short-term malfunction temperature is 100°C for an accumulative 100 hours over the working life of the system.

(Heating systems must be installed with room and water temperature controls in accordance with the current Building Regulations Parts L1 (Energy – Dwellings) and L2 (Energy – Non Dwellings) for England and Wales, or an equivalent national standard for Scotland or Republic of Ireland)

- **Domestic services** - 10°C to 70°C where the water temperature does not continuously exceed 70°C, 10 bar (Conditions to application Class 2 - BS EN ISO 21003-1:2008). The maximum short-term malfunction temperature is 95°C for an accumulative 100 hours over the working life of the system.

Uponor multi-layer pipe can be used for DHW recirculating systems, provided the operating temperatures and pressures do not exceed the maximum conditions detailed under 'Domestic Services'

- **Chilled water** - -10°C to 10°C at a maximum pressure of 10 bar. If risk of damage from freezing, a suitable anti-freeze additive must be used. Any additive must be suitable for use with Polyethylene, PPSU, EPDM and CW625N brass

Pipe Properties

Coefficient of thermal expansion 0.025 mm/(m - K)

$\Delta L = a \times L \times \Delta T$

a - Coefficient of linear expansion,

L - length of the pipe,

ΔT -change of temp

Thermal conductivity- 0.4 W/m*K

Pipe absolute roughness- 0.0004mm

Pre-insulated Pipes

Pre-insulated multi-layer pipes are available in flexible coils, with closed cell polyolefin insulation and a seamless, coloured foil vapour barrier coating.

For information regarding reaction to fire to BS EN 13501-1 please request the full details from Uponor.

S6 (6mm) - 0.04 W/m*K

S6 WLS (6mm) - 0.035 W/m*K

S10 WLS (10mm) - 0.035 W/m*K

S13 (13mm) - 0.04 W/m*K

Uponor multi-layer pipe sizes and weight

Dimension mm (O/D x wall)	Volume l/m	Weight g/m (coil)	Weight Coil with water @ 10°C (g/m)	Weight Kg (5m straight length)	Weight Straight length with water 10°C (Kg/m)
12 x 1.6	0.062	66	128		
14 x 2.0	0.079	91	170		
16 x 2.0	0.113	105	218	0.59	0.231
20 x 2.25	0.189	148	337	0.8	0.349
25 x 2.5	0.314	211	525	1.2	0.554
32 x 3.0	0.531	323	854	1.6	0.854
40 x 4.0	0.8			2.54	1.31
50 x 4.5	1.32			3.73	2.065
63 x 6.0	2.04			6.12	3.267
75 x 7.5	2.827			8.94	4.615
90 x 8.5	4.185			12.73	6.73
110 x 10	6.362			17.99	9.959

Range of fittings and connections

Press – all press connections with 'leak-path' feature and pipe depth 'inspection windows', stainless steel pressing sleeves (1.4301), 2 EPDM sealing rings to BS EN ISO 681-1 and size colour code identification. Threaded female fittings are 'Rp' type BSP BS EN 10226-1:2004, male type threads are 'R' type to BS EN 10226-1:2004. Flat sealing washers are from CNAF compressed fibre.

S-Press PLUS (16-32mm) - Fittings are Tin coated DZR brass body 4MS approved CW625N, cast brass CC770S or PPSU with enhanced flow characteristics and unique detachable size colour coded press identification foil.

S-Press (12,14,40 – 110mm) - Fittings are Tin coated brass body 4MS approved CW617N, cast brass CC754S or PPSU

RTM (Push-fit) – With audible joint identification and 360° visual inspection window. Colour coded Tension Ring spacers for fitting size identification. Fittings are manufactured from Polyphenylsulfone Radel R5100 (PPSU) with 2 EPDM sealing rings to BS EN 681-1 for each connection. Threaded female fittings are BSP 'Rp' type to BS EN 10226-1:2004, male type threads are 'R' type to BS EN 10226-1:2004. Flat sealing washers are from CNAF compressed fibre.

Compression - Uponor MLC pipes may be joined to compression fitting bodies conforming to BS EN 1254. Uponor nut threads according to BS EN ISO 228-1. For connection to ½" and ¾" manifold outlets, Uponor's Eurocone compression manifold adapters must be used. EPDM sealing rings for each compression adapter to BS EN 681-1.

Installation and tooling

For manufacturer's warranties to apply, all products must be installed to Uponor's latest installation instructions (refer to Uponor UK for the latest version)

All installers should hold a current manufacturer's training certificate of not more than two years old.

Correct tooling, as approved by Uponor should be used at all times. All tools should be regularly maintained, calibrated and be of good serviceable quality (safety training MUST be sought).

Pressure Testing

All pressure testing must be carried out by a competent person. Any pressure testing should first be preceded by an initial visual inspection of the complete pipe system and equipment.

Uponor multi-layer pipe systems should be pressure tested in accordance with BS EN 806-4:2010-06 to part 6.1.3.2 procedure A, or Water Regulation (Water Fittings) 1999, using potable cold water accordance with to BS EN 13443-1 before the system is operational.

The maximum test pressure should be 1.1 times MDP at a maximum temperature of ≤ 25 °C

Solid Floors

Uponor multi-layer 'Pipe-in-Conduit' should be used in solid floors to comply with the Water Regulations (water fittings) 1999. No ducting is necessary and pipes can subsequently be withdrawn and replaced if required. Uponor multi-layer pipes are not affected by standard concrete or screeds.

Electrical Continuity

Uponor multi-layer pipework is non-conductive and does not need to be bonded to earth. In new installations which do not use any sections of metal pipes, there is no requirement to bond the pipework to earth. However, it is still necessary to bond all electrical components such as pumps, boilers, heaters and other exposed metallic components of the plumbing and heating system. Uponor multi-layer pipework itself is not suitable for electrical equipotential bonding of a system.

Connection to Boilers, Heaters & Cylinders

Uponor multi-layer pipe should not be directly connected to boilers or heaters, which have a higher constant temperature of 70°C (malfunction temperature 95°C for 100h) for tap water and constant higher temperature of 80°C (malfunction temperature of 100°C for 100h) for heating (please also seek advice from the boiler or heater manufacturer).

Corrosion Inhibitors

Heating systems should be treated in the normal way to prevent corrosion of metallic components within a heating system. Please refer to Uponor for advice on suitable water treatments for use with multi-layer systems.

Fire rating

Uponor multi-layer pipes have been certificated to BS EN 13501-1 Category 'E' and tested to BS EN ISO 11925-2. Building material class B2 in accordance with DIN 4102.

Disinfection

Systems intended for use with potable water should be disinfected following installation. Uponor multi-layer pipe can be treated with short-term chemical disinfection in accordance with the standards HSE L8, BS EN 806-4:2010 and the DVGW work sheet W 290/ W 291 and W 557 (A)

Please refer to Uponor for a list of acceptable chemicals.

Chemical Resistance

Uponor multi-layer pipe has very good resistance to many household chemicals. However, in the event accidental contact with chemicals, the pipework should be washed with clean water. Building materials such as standard concrete, mortar or plaster do not affect the pipes. Solvent based cleaning products, tapes, paints, adhesives or sealing compounds must not come into contact with Uponor multi-layer pipework, unless approved by Uponor.

Limitation of use

Uponor multi-layer pipework **MUST NOT** be used for the following applications:

- Domestic gas
- Heating Oil
- Compressed Air systems
- Swimming Pool Water
- Fire control systems
- Uponor MLC pipes must not be stored or installed where they are exposed to direct sunlight.
- Water from private water supplies must provide a water report for approval.

(Please refer to Uponor for approval in applications other than heating, cooling or domestic water supply).

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