

## 1600 / 1600GN

### COMPRESSION FITTINGS

### FOR "AL-COBRAPEX" MULTILAYER PIPE



#### DESCRIPTION

Tiemme compression fittings for multilayer pipes adapt to any type of heating/cooling and sanitation system, with application in residential, commercial, industrial and agricultural sectors and, in general, with any kind of non-corrosive fluid.

They are characterised by their sealing mechanism which is created by tightening the nut on the fitting body.

When the nut is tightened, the internal cut ferrule is compressed between the nut and the main body of the fitting;

The latter compresses the pipe towards the two O-ring seals on the hose connector of the fitting, to guarantee sealing against the hydraulic pressure of the system.

The fitting is completed by the PTFE ring on the bottom of the body. Since it is a plastic material, it performs a dielectric function, i.e. it prevents the internal aluminium layer of the pipe from coming into contact with the body of the fitting (in brass) and triggering the **galvanic corrosion** process, caused by stray currents (to learn more see the "INFORMATION FROM TIEMME" section of this technical data sheet).

#### PRODUCTION RANGE

Compression fittings for multilayer pipe are available in a wide range of sizes (from  $\varnothing$  14 to  $\varnothing$  32 mm), different shapes (straight, curved, T-shaped etc.), with different types of connections (female threaded connections, male threaded connections, intermediate compression connections etc ...), to meet all kinds of system requirement.

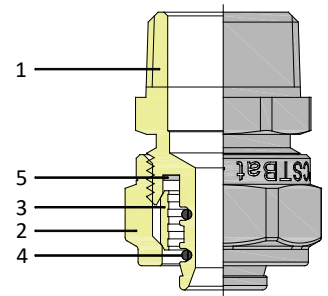
See the MASTER catalogue for the full range.

#### ADVANTAGES / STRENGTHS

- Double gasket and anti-slip profile: to guarantee perfect sealing.
- Complete system with dedicated AL-COBRAPEX pipe and tools (shears, calibrators/deburrers).
- Wide range available, for every installation need.

**CONSTRUCTION SPECIFICATIONS**

- (1) Fitting body: Nickel-plated CW617N brass (1600 series)
- (2) Nut: Yellow/Nickel-plated CW617N brass (1600GN series)
- (3) Ferrule: Nickel-plated CW617N brass (1600 series)
- (4) O-ring seal: Yellow/Nickel-plated CW617N brass (1600GN series)
- (5) Insulating ring: CW617N brass
- Threads: EPDM
- Threads: PTFE
- Threads: F ISO 228
- Threads: M R conical



**TECHNICAL SPECIFICATIONS**

- Maximum working temperature: + 95 °C
- Minimum working temperature: - 20 °C (provided the fluid remains in the liquid phase)
- Maximum Working Pressure: 10 bar (relative to the AL-COBRAPEX multilayer pipe)
- Fluid compatibility: Drinking water, water and glycol solutions (maximum percentage of glycol 30%) non-corrosive fluids \*

\* To check compatibility with fluids or other substances not listed, contact the Tiemme Technical Dept.

**INSTRUCTIONS FOR CORRECT ASSEMBLY**

To obtain a perfect join between fitting/pipe, some simple but important operations must be carried out:

	<p><b>Cutting the pipe:</b> The pipe must be cut perpendicular to its axis. The use of hacksaws or angle grinders must be avoided as they could deform the pipe. Recommended tools: <b>Art. 1495</b></p>																																												
	<p><b>Pipe calibration and flaring:</b> Restore the shape of the pipe using the appropriate calibrator. Take care when carrying out pipe calibration and deburring; the proper tools must be used. Any burr residue could damage the O-rings. The calibrating/deburring tool should be inserted into the pipe and then turned clockwise. Recommended tools: Complete case <b>Art. 1498SET</b></p>																																												
	<p><b>Connecting the pipe to the fitting:</b> Place all the fitting components onto the pipe in the following order: - nut (1) - pipe clamp ferrule (2) Insert the pipe into the fitting until it encounters the insulating ring (3); take care not to move the O-ring seals (4) out of their seat. Connection will be easier if the pipe is lubricated with silicone oil or water. For domestic water distribution applications, make sure that the silicone oil used is suitable for food application. The use of a different lubricant could damage the fitting's seals. Make sure that the oil used is compatible with the construction materials of the fitting.</p> <p><b>Tightening the nut:</b> Tighten the nut on the body as far as possible by hand and then with the help of a wrench, respecting the tightening turns shown in the table:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="background-color: #003366; color: white;">Ø ext. pipe (mm)</th> <th>14</th> <th>16</th> <th>18</th> <th>20</th> <th>25</th> <th>26</th> <th>32</th> </tr> </thead> <tbody> <tr> <th style="background-color: #003366; color: white;">no. of turns</th> <td>1 1/4</td> <td>1 1/4</td> <td>1 1/4</td> <td>1</td> <td>1</td> <td>1</td> <td>1</td> </tr> </tbody> </table>	Ø ext. pipe (mm)	14	16	18	20	25	26	32	no. of turns	1 1/4	1 1/4	1 1/4	1	1	1	1																												
Ø ext. pipe (mm)	14	16	18	20	25	26	32																																						
no. of turns	1 1/4	1 1/4	1 1/4	1	1	1	1																																						
	<p><b>Bending:</b> The pipe can be bent by hand or using the specific tools, depending on the radius required. The table below provides an indication of the minimum bending radii permitted:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2" style="background-color: #003366; color: white;">Ø ext. pipe (mm)</th> <th colspan="4" style="background-color: #003366; color: white;">Bending radius R (mm)</th> </tr> <tr> <th style="background-color: #003366; color: white;">Manual</th> <th style="background-color: #003366; color: white;">Manual with internal spring</th> <th style="background-color: #003366; color: white;">Manual with external spring</th> <th style="background-color: #003366; color: white;">Mechanical</th> </tr> </thead> <tbody> <tr> <td>14</td> <td>70</td> <td>56</td> <td>56</td> <td>41</td> </tr> <tr> <td>16</td> <td>80</td> <td>64</td> <td>64</td> <td>49</td> </tr> <tr> <td>18</td> <td>90</td> <td>72</td> <td>72</td> <td>65</td> </tr> <tr> <td>20</td> <td>100</td> <td>80</td> <td>80</td> <td>80</td> </tr> <tr> <td>25</td> <td>130</td> <td>100</td> <td>-</td> <td>90</td> </tr> <tr> <td>26</td> <td>130</td> <td>100</td> <td>100</td> <td>90</td> </tr> <tr> <td>32</td> <td>160</td> <td>-</td> <td>-</td> <td>120</td> </tr> </tbody> </table> <p>Recommended tools: Pipe-bending spring <b>Art. 1497 - Art. 1497EST</b> / Pipe-bender <b>Art. 1684</b></p>	Ø ext. pipe (mm)	Bending radius R (mm)				Manual	Manual with internal spring	Manual with external spring	Mechanical	14	70	56	56	41	16	80	64	64	49	18	90	72	72	65	20	100	80	80	80	25	130	100	-	90	26	130	100	100	90	32	160	-	-	120
Ø ext. pipe (mm)	Bending radius R (mm)																																												
	Manual	Manual with internal spring	Manual with external spring	Mechanical																																									
14	70	56	56	41																																									
16	80	64	64	49																																									
18	90	72	72	65																																									
20	100	80	80	80																																									
25	130	100	-	90																																									
26	130	100	100	90																																									
32	160	-	-	120																																									

**IMPORTANT:** Carrying out the following operations incorrectly, may compromise the tightness of the joint.  
TIEMME RACCORDERIE S.p.A. will accept no responsibility for breakages and/or accidents resulting from failure to comply with these indications and from improper use of the system. The information shown does not exempt the user from scrupulously following current regulations and good technical standards.

**NEVER:**

- Use incompatible or harmful substances.
- Use these fittings for chased installation.
- Connect the multilayer pipe directly to boilers, water heaters or any other source of heat.

We recommended using a joint with a metal pipe for a length of at least one metre to protect the multilayer pipe from any malfunction of heat generators.

**SOME POSSIBLE CAUSES OF LEAKS:**

- Incorrect tightening of the nut onto the fitting (comply with the indications provided by Tiemme on the number of tightening turns).
- Excessive force used when tightening the nut.
- Breakage or leakage of the O-rings due to pipes not being properly cut, calibrated and deburred.
- Connection with incompatible products.
- Incompatible fluids.
- Excessive use of sealants (e.g. hemp, PTFE tape etc...) on male/female threads could generate tension in the fittings.
- Freezing of the system or excessive internal pressure.
- Storage of materials in unsuitable environments.
- Unpredictable external causes, such as accidental impacts or inappropriate movements.

**LOCALISED PRESSURE DROPS**

The values of the pressure drops of the fittings, expressed in **equivalent metres of pipe (L<sub>eq</sub>)**, are shown below, i.e. the localised pressure drops of the fittings are expressed in an assumed length of the network (AL-COBRAPEX pipe) which determines the actual resistance value.

AL-COBRAPEX pipe	FLUID SPEED (m/s)							
		Values in equivalent metres of pipe (L <sub>eq</sub> )						
Ø 14	0.5	0.29	1.23	1.23	0.44	1.28	0.29	1.23
	0.8	0.32	1.33	1.33	0.48	1.39	0.32	1.33
	1	0.33	1.39	1.39	0.50	1.44	0.33	1.39
	2	0.41	1.72	1.72	0.62	1.79	0.41	1.72
Ø 16	0.5	0.31	1.16	1.25	0.38	1.31	0.31	1.16
	0.8	0.35	1.29	1.39	0.42	1.46	0.31	1.23
	1	0.33	1.23	1.33	0.40	1.40	0.33	1.23
	2	0.43	1.57	1.70	0.51	1.79	0.43	1.57
Ø 18	0.5	0.30	1.21	1.25	0.34	1.33	0.23	1.21
	0.8	0.34	1.37	1.41	0.38	1.49	0.26	1.37
	1	0.33	1.33	1.38	0.38	1.46	0.25	1.33
	2	0.41	1.64	1.69	0.46	1.80	0.31	1.64
Ø 20	0.5	0.31	1.32	1.32	0.40	1.40	0.31	1.32
	0.8	0.36	1.52	1.52	0.46	1.63	0.36	1.52
	1	0.37	1.58	1.58	0.47	1.68	0.37	1.58
	2	0.44	1.88	1.88	0.56	2.00	0.44	1.88
Ø 25	0.5	0.29	1.40	1.45	0.41	1.63	0.29	-
	0.8	0.33	1.60	1.67	0.47	1.87	0.33	-
	1	0.35	1.69	1.76	0.49	1.97	0.35	-
	2	0.40	1.92	2.00	0.56	2.24	0.40	-
Ø 26	0.5	0.29	1.40	1.45	0.41	1.63	0.29	-
	0.8	0.33	1.60	1.67	0.47	1.87	0.33	-
	1	0.35	1.69	1.76	0.49	1.97	0.35	-
	2	0.40	1.92	2.00	0.56	2.24	0.40	-
Ø 32	0.5	0.23	1.56	1.56	0.39	1.56	0.31	-
	0.8	0.27	1.83	1.83	0.46	1.83	0.37	-
	1	0.29	1.96	1.96	0.49	1.96	0.39	-
	2	0.33	2.22	2.22	0.56	2.22	0.44	-

Speed 0.5 - 0.8 m/s: Heating application field

Speed 1 - 2 m/s: Domestic hot water application field

Alternatively, in the case of more complex sizing processes, the pressure drop values can be calculated using the following formula:

$$\Delta p = k * 0,005 * \rho * v^2$$

where:

$\Delta p$  = Localized pressure drop (mbar)

k = Loss factor

$\rho$  = Fluid density (kg/m<sup>3</sup>)

v = Fluid speed (m/s)

The value of loss factor k is shown below

AL-COBRAPEX pipe	Loss factor k						
Ø 14	1.2	5.0	5.0	1.8	5.2	1.2	5.0
Ø 16	1.0	3.7	4.0	1.2	4.2	1.0	3.7
Ø 18	0.8	3.2	3.3	0.9	3.5	0.6	3.2
Ø 20	0.7	3.0	3.0	0.9	3.2	0.7	3.0
Ø 25	0.5	2.4	2.5	0.7	2.8	0.5	-
Ø 26	0.5	2.4	2.5	0.7	2.8	0.5	-
Ø 32	0.3	2.0	2.0	0.5	2.0	0.4	-

**MAIN ACCESSORIES OF THE SYSTEM**

Art. 0600 AL-COBRAPEX Multilayer pipe	Art. 1497 / 1497EST Pipe-bending spring	Art. 1684 Pipe-bender.	Art. 1498SET Case with calibrating/deburring set.
Art. 1498UM Calibrating/deburring tools with fixed handle.	Art. 1498MT Interchangeable T-handle.	Art. 1498US Interchangeable calibrating/deburring tools.	

See the product catalogue for order codes / further details.

**INFORMATION FROM TIEMME**

**GALVANIC CORROSION OR "BATTERY EFFECT":**

The phenomenon of galvanic corrosion occurs when two materials, with a different noble value, are placed in direct contact. A flow of electrons is generated from the less noble material, which oxidises, towards the more noble material which has the greater potential. Less noble materials tend to corrode compared to the more noble materials, so putting a less noble metal into direct contact with a more noble metal will lead to the less noble metal corroding (acting as an anode) and corrosion will be accelerated.

**The use of Tiemme compression fittings guarantees that this phenomenon will not occur.**

In fact, the internal aluminium layer of the pipe does not encounter the fitting (made of brass), as it is separated by an insulating polymer ring.

**ITEM SPECIFICATIONS**

**1600 series**

Compression fitting for “AL-COBRAPEX” multilayer pipe, made up of: nickel-plated CW617N brass body, nickel-plated CW617N brass nut, CW617N brass ferrule, EPDM O-ring seal, PTFE insulating ring, F ISO 228/M R conical threads.

Maximum working temperature: + 95 °C. Minimum working temperature: - 20 °C (provided the fluid remains in the liquid phase). Maximum working pressure: 10 bar (relative to the AL-COBRAPEX multilayer pipe).

Fluid compatibility: drinking water, water and glycol solutions (maximum percentage of glycol 30%), non-corrosive fluids.

Production range: from Ø 14 to Ø 32 mm, different configurations (straight, curved, T-shaped etc...) and with different types of connections (female threaded connections, male threaded connections, intermediate compression connections).

**1600GN series**

Compression fitting for “AL-COBRAPEX” multilayer pipe, made up of: yellow/nickel-plated CW617N brass body, yellow/nickel-plated CW617N brass nut, CW617N brass ferrule, EPDM O-ring seal, PTFE insulating ring, F ISO 228/M R conical threads.

Maximum working temperature: + 95 °C. Minimum working temperature: - 20 °C (provided the fluid remains in the liquid phase). Maximum working pressure: 10 bar (relative to the AL-COBRAPEX multilayer pipe).

Fluid compatibility: drinking water, water and glycol solutions (maximum percentage of glycol 30%), non-corrosive fluids.

Production range: from Ø 14 to Ø 32 mm, different configurations (straight, curved, T-shaped etc...) and with different types of connections (female threaded connections, male threaded connections, intermediate compression connections).

**CERTIFICATIONS**

**1600 series**



**1600GN series**



**ADDITIONAL PRODUCT RELATED INFORMATION**

For information on compression fittings for multilayer pipe over Ø 32 mm (products to complete the range made using 3460 series COBRARING fittings paired with hose connector Art. 1476), see the technical documentation mentioned below:

Type of document	Document code	Useful information available
Technical data sheet	3460	- Construction specifications / technical specifications - Instructions for the correct assembly of COBRARING compression fittings in combination with multilayer pipe, Ø 40 - 50 - 63 - 75 - 90 mm. - Field of application / certifications.