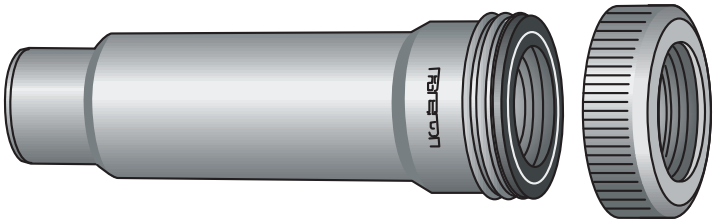
Expansion joint - horizontal M/F



Installation of the expansion joint in the PVC drainage systems:

■ In branches or bends, the most correct technical solution is inserting a horizontal expansion joint (A;B;C) into the piping whenever the section between two fixed points is higher than 2÷3 m, and always when connecting washing-machines, dishwashers and kitchen sinks.

■ A vertical expansion joint (D) should be inserted onto each level of the vertical columns above the branch that connects to the bend and the toilet bowl. Alternatively, a branch equipped with an expander (E or F) can be used to directly connect to the column.

Typical problems of the drainage system

The main problems which can affect the drainage system are:

■ CLOGGING often occurs as a result of an inadequate diameter, that not allowing the regular disposal of sewage, it prevents the correct passage of the liquid which normally makes the internal self-cleaning of the walls: a reduced cross-section prevents disposal whilst an excessive cross-section causes the deposit of sediments that might lead to the gradual shrinking of the section until it is blocked. This phenomenon can also occur due to small slopes, abrupt deviations and inadequate confluence.

■ SMELL EMISSION is another problem strictly linked to the ventilation system: the descent of sewage can cause the leakage of gases conveyed through the drain pipes of the lower floors or the emptying by suction of the drain pipes located upstream. The misplacement of the vent can cause the emission of odours into the environment: this must be at least 2 ml. above the ground floor of high houses, at least 20 cm above the roof cover and always 1 ml. above the architrave of the nearest window.

■ LINEAR EXPANSION is a problem which affects all plastic and metal systems, depending on the coefficient of linear thermal expansion that is a given characteristic of each material. In order to assess the elongation of each single system section, the thermal expansions of different materials are compared in graph A. It is clear that, as concernins the effects of thermal expansion containment, PVC is the least subjected to changes of size which are in the range of:

- 0.07 mm each 1 ml. of pipe

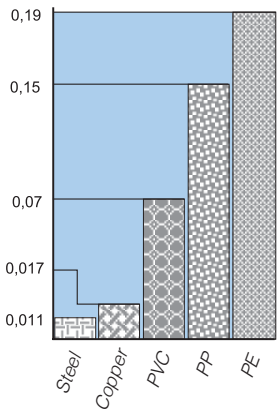
- for 1 °C of heat gradient

4 ml. piping installed at 0 °C that reaches the temperature of 42 °C, is subject to an elongation of around 12 mm (e.g. upright column).

However, in the case of a kitchen drain where boiling water is poured (around 90 C° for the thermal expansion which occurs inside the sink pipe) in a room temperature pipe (20 °C) on a 3 ml. length of tube it will increase in length by around 15 mm.

Pict.7

Graph A
Linear thermal expansion expressed in mm. x m. x °C



Example of expansion calculation:

T = max operating temperature (e.g. 90°C)

T1 = mounting temperature or minimum operating temperature if below (e.g 20°C)

0,07 = linear thermal expansion of PVC expressed in mm x m x °C (Pict. 7)

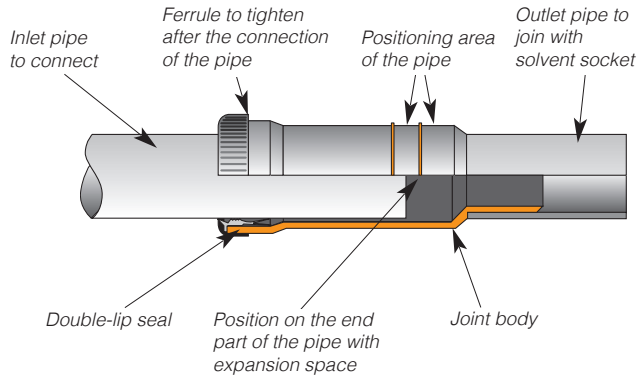
L = length of the section in question (e.g. 3 linear metres)

(T - T1) x 0.07 x L

specifically in the case under examination: (90-20) x 0.07 x 3 = 15 mm

The following general rules can be gathered from the example shown below:

1) in branches or bends (Pict. 9) the most correct solution is inserting a horizontal expansion joint into the piping (Pict. 8) whenever the section between two fixed points F (Pict. 9) exceeds 2 ÷ 3 metres and always when connecting washing-machines and dishwashers (branches subjected to continuous discharge of hot water).



Pict.8

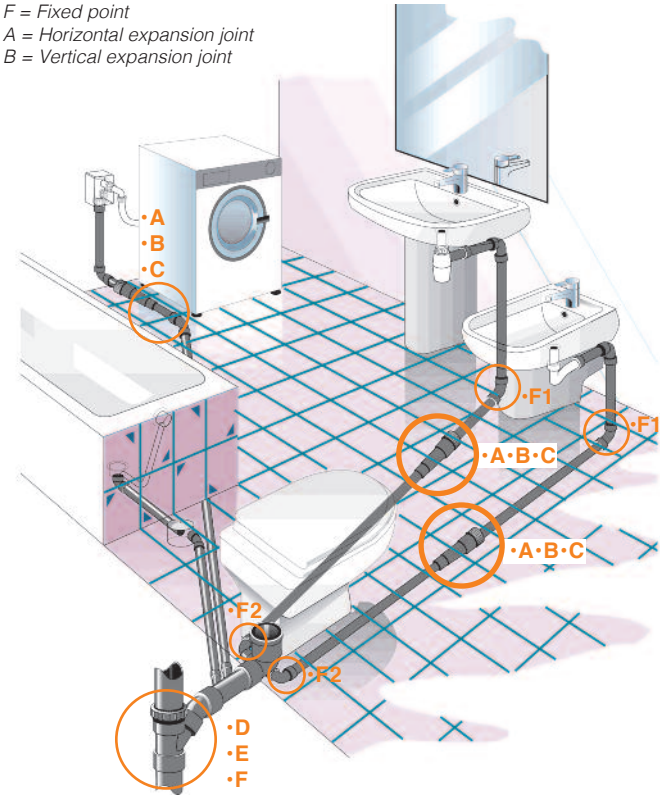
2) A vertical expansion joint should be inserted on each level (every 3 ÷ 4 metres) of the upright columns above the branch which receives the bend and the toilet bowl. Alternatively, a branch equipped with an expander can be used for direct connection to the column (Pict. 10).

3) During the installation of the expansion joint, the following requirements must be observed:
a) after having treated the joint seal with REDI greaser, apply also the grease to the pipe and insert it into the relative slot. Before tightening the locking ring nut, feed the pipe until it has its end part in the field marked out by two lines, superimposed on the joint body (Pict. 9).

c) install the pipe placed behind the wall without immersing it in the cement, using for the filling of the section fine grained-stabilised material in order to allow for any adjustment caused by expansion.

d) during the installation of the branch with joint B (Pict. 9) a fixed point of the column is normally created; the socket of the branch equipped with a seal must remain protected by the casting in order to allow the descending column to expand.

F = Fixed point
A = Horizontal expansion joint
B = Vertical expansion joint



Pict.9

Pict.10
Vertical expansion-joint and insertion according to the mounting diagram