

Device for jump jointing piping elements and device for assembling pipes incorporating such a jointing device.

The invention relates to a device for jump jointing piping elements and also to a device for assembling pipes incorporating such a jointing device.

Jump jointing devices of this type generally comprise a jointing sleeve tube formed from an outer casing surrounding the end zones opposite the piping elements and in which casing internal annular grooves are arranged for receiving sealing joints designed to interact with the corresponding ends of the piping elements to be joined.

The sleeve tube is generally made of a rigid material pressed on to the corresponding end zones of the piping elements.

Jointing devices of this type present numerous disadvantages, due in particular to the fact that they are not adapted to absorb the relative displacements of the piping elements that they are designed to join, particularly under the effect of the expansion of said elements, which are consequently subjected to considerable stresses.

Attempts have been made to remedy this disadvantage by using an elastically deformable jointing sleeve tube tightly fixed on to the end zone opposite said piping elements in order to absorb the relative displacements of these elements.

This element, however, is sensitive to the pressure prevailing inside the piping and is consequently susceptible to deformation and therefore likely to sustain a relatively large loss of pressure at the joint.

The object of the invention is to remedy the disadvantages of the known jointing devices by creating a device for jointing piping elements which, whilst capable of absorbing the relative displacements between the piping elements, does not give rise to any appreciable loss of pressure in the fluid flowing in said piping elements.

The subject of the invention therefore is a device for jump jointing piping elements having relative displacements in at least one direction, comprising a sealing sleeve tube made of elastically

deformable material designed to be tightly fixed on the end zones opposite said piping elements, characterised in that it further comprises a pipe lining forming a piping element located in the sleeve tube with its opposing end zones each mounted in a piping element with clearance for absorbing the relative displacements of said piping elements, said pipe lining comprising an intermediate portion extending between its end zones and defining externally a supporting surface for said sleeve tube.

The invention may further comprise one or more of the following characteristics:

- the end zones of the pipe lining are each mounted so that they are axially displaceable in a corresponding piping element, with a view to absorbing the relative axial displacements of said piping elements;
- the end zones of the pipe lining are each mounted so that they are angularly displaceable in a corresponding piping element, with a view to absorbing the relative radial displacements of said piping elements;
- at least the end zone upstream of the pipe lining, viewed in the direction of flow of a fluid product in said piping elements, has a widened shape for guiding said fluid;
- the free ends of the pipe lining each comprise a truncated outer surface for sliding on the inside wall of a corresponding piping element;
- the end zones opposite the piping elements each comprise an internal bore for receiving a corresponding end zone of the pipe lining;
- the wall of the intermediate portion of the pipe lining comprises a thickened portion defining said supporting surface for said sleeve tube;
- the pipe lining is made from a rigid material; and
- the sleeve tube comprises a bellows for absorbing the relative displacements of said piping elements.

The invention also has as its subject matter a device for the jump-joint assembling of pipes having relative displacements in at least one direction, said device forming a separate single assembly designed to be mounted on ends opposite said pipes, characterised in that it comprises

a device for jointing piping elements as defined above, provided with means of fixing the opposing end zones of said piping elements on the ends opposite said pipes.

A better understanding of the invention will be obtained by reading the following description, given solely by way of example, and referring to the drawings attached, in which:

- figure 1 is a view in longitudinal section of a device for jointing piping elements according to the invention, in which the piping elements are shown in a position in which they present maximum relative axial and radial displacements;
- figure 2 shows the device in figure 1 in a position in which the piping elements present a minimum axial displacement and a maximum radial displacement; and
- figure 3 is a diagrammatic sectional view of a device for assembling pipes according to the invention.

Figure 1 shows a length of piping formed from two piping elements 10, 12 joined by a jointing device according to the invention, indicated by the reference number 14.

The piping to which the length of pipe shown in this figure belongs is formed, for example, by the piping of a device for removing rainwater from the surface of a building roof. The said piping conventionally extends between the roof and rainwater recovery equipment situated at ground level.

By reason of its structure and in particular owing to its relatively large length, the piping is susceptible to deformation, particularly due to expansion, which gives rise to relative axial and radial displacements of the piping elements 10 and 12.

In order to absorb these displacements, the jointing device 14 comprises a sleeve tube 16, fixed by its two opposing ends 18 and 20 on the opposite end zones 21 and 22 of the piping elements 10 and 12, together with a pipe lining 24 located in the sleeve tube with its opposing end zones 26 and 28 each mounted with clearance in a corresponding piping element 10 and 12.

The sleeve tube 16 is made of an elastically deformable material, in particular an elastomer, and comprises a bellows assembly arranged in its constituent wall between the two end zones 18 and 20. It is pressed on to each end zone 21 and 22 of the piping elements 10 and 12 and fixed thereto by means of clamping collars, such as 31.

The pipe lining 24 is made of a rigid material, in particular polyethylene, and comprises the two end zones 26 and 28, together with a middle zone 30 extending between these end zones 26 and 28.

The end zones 26 and 28 each have a widened, truncated shape with a cross-section increasingly evenly in the direction of their free end and engage in a bore 32 provided in each piping element 10 and 12.

The inside diameter of each bore 32 is slightly greater than the diameter of the corresponding end section of the pipe lining 24.

Furthermore, it will be seen from the figures that the free ends of the pipe lining each comprise a truncated surface 34 defining a slide surface on the inside wall of the bore 32.

In addition, the intermediate portion 30 of the pipe lining 24 comprises a thickened wall, the outside surface of which defines a supporting surface for the sleeve tube 16, and has an inside surface of generally cylindrical shape.

As already mentioned previously, the piping elements 10 and 12 have relative displacements in more than one direction. Figure 1 shows the piping elements 10 and 12 in a position corresponding to the maximum relative axial and radial displacements, and figure 2 shows the piping elements in a position corresponding to the maximum radial displacement and the minimum axial displacement.

During the displacement of the piping elements the sleeve tube 16 is deformed so as to compensate for the displacement of the said elements 10, 12 and to preserve the tightness of the joint. Similarly, the pipe lining 24 is displaced into the bores 32 as a function of the axial displacement and is oriented as a function of the radial displacement of the piping elements 10 and 12.

Thus, when the piping elements 10 and 12 are close together, as shown in figure 2, the sleeve tube 16 therefore being compressed, the latter comes to rest on the outer surface of the middle portion of the pipe lining 24, thereby allowing the sleeve tube 16 to retain its cylindrical shape.

In addition, due to the widened shape of its end zones 26 and 28, and to the cylindrical shape of the inside surface of the middle portion 30, the pipe lining 24 ensures that fluid is guided between the piping elements 10 and 12 without any significant loss of pressure.

It will be appreciated therefore that whatever the relative position of the piping elements, the tightness of the assembly is preserved without giving rise to any loss of pressure in the fluid.

Of course, the dimensions of the sleeve tube 16 and of the pipe lining 24 are adapted to absorb predetermined displacements as a function of the characteristics of the piping to which they are mounted.

In the embodiment just described, the jointing device is mounted by arranging cylindrical bores in the end zones opposite the piping elements to be joined.

It is possible, however, as shown in figure 3, to provide such a device forming a single assembly designed to be fixed between two pipes to be assembled.

To do this, means of fixing are provided at the two opposing ends 36, 38 of the piping elements 10 and 12, on the ends opposite the pipes to be assembled (not shown).

These means of fixing may consist of any type of fixing means appropriate to the use envisaged, in particular fixings by means of clamps 40, as shown in figure 3, or by means of collars.

In the embodiments described above, the piping elements joined by means of the device according to the invention have equal diameters.

It will, of course, be appreciated that this device can also be applied to the jointing of piping elements having different diameters, by providing a sleeve tube and a pipe lining having appropriate diameters that differ in their end zone.



CLAIMS

1. Device for jump jointing piping elements (10, 12) having relative displacements in at least one direction, comprising a sealing sleeve tube (16) made of elastically deformable material designed to be tightly fixed on the end zones (21, 22) opposite said piping elements (10, 12), characterised in that it further comprises a pipe lining (24) forming piping element located in the sleeve tube (16) with its opposing end zones (26, 28) each mounted in a piping element (10, 12) with clearance for absorbing the relative displacements of said piping elements, said pipe lining (24) comprising an intermediate portion (30) extending between its end zones (26, 28) and defining externally a supporting surface for said sleeve tube (16).
2. Jointing device according to claim 1, characterised in that the opposing end zones (26, 28) of the pipe lining (24) are each mounted so that they are axially displaceable in a corresponding piping element (10, 12), with a view to absorbing the relative axial displacements of said piping elements (10, 12).
3. Jointing device according to either of claims 1 or 2, characterised in that the opposing end zones (26, 28) of the pipe lining (24) are each mounted so that they are angularly displaceable in a corresponding piping element (10, 12), with a view to absorbing the relative radial displacements of said piping elements (10, 12).
4. Jointing device according to claim 3, characterised in that at least the end zone upstream of the pipe lining (26), viewed in the direction of flow of a fluid product in said piping elements (10, 12), has a widened shape for guiding said fluid.
5. Jointing device according to any of claims 1 to 4, characterised in that the opposing free ends (26, 28) of the pipe lining each comprise a truncated outer surface (34) for sliding on the inside wall of a corresponding piping element.
6. Jointing device according to any of claims 1 to 5, characterised in that the end zones (21, 22) opposite the piping elements each comprise an internal bore for receiving a corresponding end zone (26, 28) of the pipe lining (24).
7. Jointing device according to any of claims 1 to 6, characterised in that the wall of the intermediate portion (30) of the pipe lining comprises a thickened portion defining said supporting surface for said sleeve tube (16).



8. Jointing device according to any of claims 1 to 7, characterised in that the pipe lining (24) is made of a rigid material.
9. Jointing device according to any of claims 1 to 8, characterised in that the sleeve tube (16) comprises a bellows for absorbing the relative displacements of said piping elements (10, 12).
10. Device for the jump-joint assembling of pipes having relative displacements in at least one direction, said device forming a separate single assembly designed to be mounted on ends opposite said pipes, characterised in that it comprises a device (14) for jointing piping elements (10, 12) according to any of claims 1 to 9, and that it comprises means (40) of fixing the opposing end zones (36, 38) of said piping elements (10, 12) on the ends opposite said pipes.