

**ECLA****EUROPEAN CLASSIFICATION****F16L****PIPES; JOINTS OR FITTINGS FOR PIPES; SUPPORTS FOR PIPES, CABLES OR PROTECTIVE TUBING; MEANS FOR THERMAL INSULATION IN GENERAL**

[N: **WARNING**  
[C0509]

1. The following IPC groups are not used in the internal ECLA classification scheme. Subject matter covered by these groups is classified in the following ECLA groups:

<a href="#">F16L3/21</a>	covered by	<a href="#">F16L3/205B</a> , <a href="#">F16L3/205C</a> ;
<a href="#">F16L13/013</a>	covered by	<a href="#">F16L13/007</a> ;
<a href="#">F16L19/03</a>	covered by	<a href="#">F16L19/02D</a> ;
<a href="#">F16L59/05</a>	covered by	<a href="#">F16L59/02B</a> .

]

**Notes**

1. In this subclass, the following terms are used with the meanings indicated:

- "pipe" means a conduit of closed cross-section, which is specially adapted to convey fluids, materials or objects;
- "hose" means a pipe, as defined above, which has flexibility as an essential characteristic.

2. Attention is drawn to the following places:

[A61M39/00](#) Tube connectors, tube couplings or branch units, specially adapted for medical use

[B05B1/20](#) Perforated pipes

[N: [B60T17/04](#) Arrangement of piping or air hoses in brake systems]

[B63B35/03](#) Pipe-laying vessels

[B64D39/04](#) Adaptation of hose constructions for refuelling aircraft during flight

[N: [B65G51/00](#) Conveying articles through pipes or tubes by fluid flow or pressure]

[N: [B65G53/00](#) Conveying materials in bulk through pipes or tubes]

[B67D5/36](#) Arrangements of hoses in apparatus for transferring liquids, e.g. fuel, from bulk to vehicles or portable containers

[E01D19/10](#) Fastening of pipes or cables to bridges

[E03B](#) Water supply installations

[E03D11/17](#) Means for connecting water-closet bowls to the flushing pipe

[E03D11/18](#) Siphons for water-closets

[E03F3/04](#) Pipes or fittings specially adapted to sewers

[E04D13/08](#) Down pipes for roof drainage; Clamping means therefor

[E04F17/00](#) Vertical ducts, channels in buildings, e.g. chimneys

[E21F1/04](#) Air ducts for ventilation of mines or tunnels; Connections therefor

[E21F17/02](#) Suspension devices for tubes or the like in mines or tunnels

F01N Gas flow silencers or exhaust apparatus for machines or engines  
 [N: [F16B7/00](#) Connections of rods or tubes]  
[F16N21/00](#) Conduits, junctions for lubrication systems  
[F17C3/02](#) Thermal insulation of vessels not under pressure for storing liquefied or solidified gases, e.g. Dewar flask  
 [N: [F17D](#) Pipe-line systems, pipe-lines]  
[F22B37/10](#) Water tubes of steam boilers  
[F23J13/04](#) Joints, connections for chimneys or flues  
[F24H9/12](#) Connecting circulation pipes to heaters  
[F28F9/04](#) Arrangements for sealing elements into header boxes or end plates of heat-exchangers  
[G21C15/22](#) Structural association of coolant tubes with headers or other pipes in nuclear reactors  
[H02G3/04](#) Protective tubing or conduits for electric cables  
[H02G3/26](#) Installations of electric cables or lines, or protective tubing on or in walls, ceilings or floors.

## F16L1/00

**Laying or reclaiming pipes; Repairing or joining pipes on or under water** (soldering or welding [B23K](#); lifting-gear and load-engaging elements [B66](#); hydraulic installations, soil drainage [E02B](#); excavations or underwater constructions [E02D](#); [N: conduits made of concrete in situ [E02D29/10](#)]; machines for digging trenches in combination with pipe-assembly [E02F](#); laying sewer pipes [E03F3/06](#); in earth boreholes or wells [E21B](#); tunnelling [E21D](#); laying electric, or combined optical and electric, cables [H02G](#); making special pipes joint, see the relevant groups for the joints)

- F16L1/024 . Laying or reclaiming pipes on land, e.g. above the ground ([F16L1/12](#) takes precedence)
- F16L1/024D . . [N: above ground ([F16L1/026](#) takes precedence)]
- F16L1/024D2 . . . [N: at a certain height off the ground] [N0106]
- F16L1/026 . . in or on a frozen surface
- F16L1/028 . . in the ground ([F16L1/026](#) takes precedence)
- F16L1/032 . . . the pipes being continuous ([F16L1/038](#) takes precedence)
- F16L1/036 . . . the pipes being composed of sections of short length ([F16L1/038](#) takes precedence)
- F16L1/038 . . . the pipes being made in situ
- F16L1/06 . . Accessories therefor, e.g. anchors
- F16L1/06B . . . [N: fixed on or to vehicles]
- F16L1/09 . . . for bringing two tubular members closer to each other
- F16L1/10 . . . for aligning
- F16L1/11 . . . for the detection or protection of pipes in the ground
- F16L1/12 . Laying or reclaiming pipes on or under water (buoyant hoses [F16L11/133](#))
- F16L1/12A . . [N: Devices for the protection of pipes under water (in general [F16L57/00](#))]
- F16L1/12B . . [N: on or close to the surface]

- F16L1/14 . . . between the surface and the bottom
- F16L1/15 . . . . vertically
- F16L1/16 . . . on the bottom
- F16L1/16B . . . . [N: the pipe being composed of sections of short length]
- F16L1/16D . . . . [N: by varying the apparent weight of the pipe during the laying operation]
- F16L1/16F . . . . [N: by towing the pipe on or near the bottom]
- F16L1/16H . . . . [N: Reclaiming pipes]
- F16L1/16K . . . . [N: under ice]
- F16L1/18 . . . . the pipes being S- or J-shaped and under tension during laying
- F16L1/19 . . . . . the pipes being J-shaped
- F16L1/20 . . . Accessories therefor, e.g. floats, weights, (buoys [B63B22/00](#))
- F16L1/20B . . . . [N: Anchor rods]
- F16L1/20C . . . . [N: fixed on or to vessels]
- F16L1/20C2 . . . . . [N: the pipes being wound spirally prior to laying]
- F16L1/20C4 . . . . . [N: Pipe-laying ships ([F16L1/225](#), [F16L1/23](#) and [F16L1/235](#) take precedence)]
- F16L1/20C6 . . . . . [N: Apparatus for forming or coating the pipes]
- F16L1/20C8 . . . . . [N: Pipe handling apparatus]
- F16L1/20C10 . . . . . [N: Ship positioning or control systems]
- F16L1/225 . . . . Stingers
- F16L1/23 . . . . Pipe tensioning apparatus
- F16L1/235 . . . . Apparatus for controlling the pipe during laying
- F16L1/24 . . . . Floats; Weights [N: (salvaging sunken vessels or other underwater objects [B63C7/00](#); floats per se [B63B22/00](#))]
- F16L1/26 . . . Repairing or joining pipes on or under water (buoyant hoses [F16L11/133](#); joints per se [F16L13/00](#) to [F16L49/00](#); [N: Joining pipes to underwater installations [E21B](#)])
- F16L1/26B . . . . [N: Underwater vehicles moving on the bottom]
- F16L3/00** **Supports for pipes, cables or protective tubing, e.g. hangers, holders, clamps, cleats, clips, brackets (anchors for holding pipes on or under the ground [F16L1/06](#); [N: sound-damping supports [F16L55/033S](#); supports for insulated pipes [F16L59/135](#)])**
- F16L3/00C . . . [N: devices for holding the open end of a hose]
- F16L3/00D . . . [N: for pipes with a rectangular cross-section]
- F16L3/01 . . . for supporting or guiding the pipes, cables or protective tubing, between relatively movable points, e.g. movable channels (hauling- or hoisting-chains with arrangements for holding electric cables, hoses or the like [F16G13/16](#))
- F16L3/01C . . . . [N: using reels (cores for coiled material, e.g. reels, in general [B65H75/00](#))]
- F16L3/015 . . . . [N: using articulated- or supple-guiding elements (arrangements for cranes of means for transmitting pneumatic, hydraulic or electric power to movable parts or devices [B66C13/12](#))]
- F16L3/02 . . . partly surrounding the pipes, cables or protective tubing (bands or chains [F16L3/14](#))

- F16L3/04 . . and pressing it against a wall or other support [N: (staples [F16B15/00](#))]
- F16L3/06 . . with supports for wires
- F16L3/08 . substantially surrounding the pipe, cable or protective tubing
- F16L3/08B . . [N: for pipes being in an angled relationship to each other]
- F16L3/10 . . divided, i.e. with two [N: or more] members engaging the pipe, cable or protective tubing
- F16L3/10B . . . [N: with two members engaging the pipe, cable or tubing, both being made of thin band material completely surrounding the pipe ([F16L3/10D](#) takes precedence)]
- F16L3/10B2 . . . . [N: the members being joined by means of two screws]
- F16L3/10B4 . . . . [N: the members being joined by quick acting means] [N0106]
- F16L3/10D . . . [N: with two members engaging the pipe, cable or tubing, the two members being joined only on one side of the pipe]
- F16L3/10D2 . . . . [N: and being adapted to accomodate pipes of various diameters]
- F16L3/10F . . . [N: one member carrying a substantially radial tightening element]
- F16L3/10H . . . [N: one member being flexible or elastic]
- F16L3/10J . . . [N: with three or more members surrounding the pipe]
- F16L3/10L . . . [N: with two members, the two members being joined with a hinge on one side and fastened together on the other side] [N0904]
- F16L3/10N . . . [N: with two members, the two members being hooked in on one side and fastened together on the other side] [N0904]
- F16L3/10P . . . [N: with two members, the two members being fixed to each other with fastening members on each side] [N0904]
- F16L3/11 . . . and hanging from a pendant ([F16L3/14](#) takes precedence)
- F16L3/12 . . comprising a member substantially surrounding the pipe, cable or protective tubing
- F16L3/12E . . . [N: with a pair of arms moved automatically to closed position by overcenter spring]
- F16L3/12H . . . [N: the ends of the member and the fixing elements being placed on both sides of the pipe] [C0309]
- F16L3/12J . . . [N: with a substantially-radial tightening or securing member]
- F16L3/12K . . . [N: the pipe being fixed by rotation of an element]
- F16L3/12L . . . [N: the pipe being only supported and not fixed]
- F16L3/12M . . . [N: the member having the form of a closed ring, e.g. used for the function of two adjacent pipe sections]
- F16L3/12P . . . [N: elongated supports, e.g. to support a curved pipe]
- F16L3/123 . . . and extending along the attachment surface
- F16L3/123B . . . . [N: the member being of metal, with or without an other layer of other material]
- F16L3/123C . . . . [N: the member being of a material other than metal]
- F16L3/127 . . . and extending away from the attachment surface
- F16L3/13 . . . and engaging it by snap action [N: ([F16L3/12E](#) takes precedence)]
- F16L3/133 . . . and hanging from a pendant ([F16L3/14](#) takes precedence)
- F16L3/137 . . . and consisting of a flexible band
- F16L3/14 . Hangers in the form of bands or chains

- F16L3/16 . with special provision allowing movement of the pipe ([F16L3/01](#) takes precedence; supporting pipes or cables inside other pipes or sleeves [F16L7/00](#))
- F16L3/18 . . allowing movement in axial direction
- F16L3/20 . . allowing movement in transverse direction
- F16L3/202 . . . the transverse movement being converted to a rotational movement ([F16L3/215](#) takes precedence)
- F16L3/205 . . . having supporting springs [N9601]
- F16L3/205B . . . . [N: the axis of each spring being parallel with the direction of the movement of the pipe] [N9601]
- F16L3/205C . . . . [N: the axis of at least one spring being oblique or perpendicular to the direction of the movement of the pipe] [N9601]
- F16L3/21 . . . . providing constant supporting spring force [N0311]
- F16L3/215 . . . the movement being hydraulically or electrically controlled
- F16L3/217 . . . . hydraulically
- F16L3/22 . specially adapted for supporting a number of parallel pipes at intervals
- F16L3/22D . . [N: having brackets connected together by means of a common support]
- F16L3/22F . . [N: having single supports directly connected together]
- F16L3/223 . . each support having one transverse base for supporting the pipes ([F16L3/23](#), [F16L3/237](#) take precedence)
- F16L3/223B . . . [N: each pipe being supported by a common element fastened to the base] [C0309]
- F16L3/227 . . . each pipe being supported by a separate element fastened to the base
- F16L3/23 . . for a bundle of pipes or a plurality of pipes placed side by side in contact with each other ([F16L3/237](#) takes precedence)
- F16L3/233 . . . by means of a flexible band
- F16L3/233B . . . . [N: having a single plastic locking barb] [N9902]
- F16L3/233B2 . . . . . [N: the barb having a plurality of serrations] [N9902]
- F16L3/233C . . . . [N: having two or more locking barbs ([F16L3/233D](#) takes precedence)] [N9902]
- F16L3/233D . . . . [N: having at least one metal locking barb] [N9902]
- F16L3/237 . . for two pipes
- F16L3/24 . with a special member for attachment to profiled girders
- F16L3/26 . specially adapted for supporting the pipes all along their length, e.g. pipe channels or ducts [N: (channels for electric cables formed by wire [H02G3/04F1](#))] [C0309]
- F16L5/00** **Devices for use where pipes, cables or protective tubing pass through walls or partitions** ([N: joining pipes to walls [F16L41/00](#); joining plastic pipes to walls [F16L47/00J](#); passing insulated pipes through walls [59/12F](#); for steam boilers [F22B37/10F](#); arrangements for leading electric cables or lines through walls, floors or ceilings [H02G3/22](#))
- F16L5/02 . Sealing

**Note**

Group [F16L5/14](#) takes precedence over groups [N: [F16L5/02C](#), [F16L5/02H](#), [F16L5/02J](#) and] [F16L5/04](#) to [F16L5/12](#).

- F16L5/02C . . [N: by welding]
- F16L5/02H . . [N: the pipe being movable ([F16L5/10](#) takes precedence)]
- F16L5/02J . . [N: by means of a joint of the quick-acting type]
- F16L5/04 . . to form a firebreak device
- F16L5/06 . . by means of a swivel nut compressing a ring or sleeve
- F16L5/08 . . by means of axial screws compressing a ring or sleeve
- F16L5/10 . . by using sealing rings or sleeves only
- F16L5/12 . . the pipe being cut in two pieces
- F16L5/14 . . for double-walled or multi-channel pipes

**F16L7/00** **Supporting of pipes or cables inside other pipes or sleeves, e.g. for enabling pipes or cables to be inserted or withdrawn from under road or railways without interruption of traffic** (sleeves for supporting pipes, cables or protective tubing, between relatively movable points [F16L3/01](#), [N: fixation devices of optical cables in ducts [G02B6/50T](#), installation of electric cables [H02G1/08](#)] [C0207])

- F16L7/02 . and sealing the pipes or cables inside the other pipes, cables or sleeves

**Guide heading:** **Pipes**

**F16L9/00** **Rigid pipes** [N: (steam boiler tubes [F22B37/10](#))]

- F16L9/00B . [N: with a rectangular cross-section (ducting arrangements in air-conditioning or ventilation [F24F13/02](#))]
- F16L9/00D . [N: specially profiled ([F16L9/00B](#) takes precedence)] [N0207]
- F16L9/01 . of wood ([F16L9/16](#) to [F16L9/22](#) take precedence)
- F16L9/02 . of metal ([F16L9/16](#) to [F16L9/22](#) take precedence; finned pipes [F28F](#))
- F16L9/04 . Reinforced pipes
- F16L9/04B . . . [N: the reinforcement comprising one or more layers of a helically wound cord, wire or strip ([F16L9/04C](#) takes precedence)] [N0106]
- F16L9/04B2 . . . . [N: using profiled strips] [N0106]
- F16L9/04C . . . [N: comprising reinforcement rings] [N0106]
- F16L9/06 . . Corrugated pipes [N: (flexible [F16L11/15](#))]
- F16L9/08 . of concrete, cement, or asbestos cement, with or without reinforcement ([F16L9/16](#) to [F16L9/22](#) take precedence; [N: shaping clay or other ceramic compositions, slag or mixtures containing cementitious material [B28B](#)])
- F16L9/08B . . [N: Reinforced pipes] [N0207]
- F16L9/10 . of glass or ceramics, e.g. clay, clay tile, porcelain ([F16L9/16](#) to [F16L9/22](#) take precedence)

- F16L9/10B . . [N: of glass] [N0106]
- F16L9/12 . of plastics with or without reinforcement ([F16L9/16](#) to [F16L9/22](#) take precedence)
- F16L9/12G . . [N: with three layers]
- F16L9/12J . . [N: with four layers]
- F16L9/12K . . [N: electrically conducting]
- F16L9/127 . . the walls consisting of a single layer
- F16L9/128 . . . Reinforced pipes
- F16L9/133 . . the walls consisting of two layers
- F16L9/14 . Compound tubes, i.e. made of materials not wholly covered by any one of the preceding groups ([F16L9/16](#) to [F16L9/22](#) take precedence)
- F16L9/147 . . comprising only layers of metal and plastics with or without reinforcement
- F16L9/153 . . comprising only layers of metal and concrete with or without reinforcement
- F16L9/16 . wound from sheets or strips, with or without reinforcement [N: making wound paper articles B31C]
- F16L9/16A . . [N: of metal]
- F16L9/17 . obtained by bending a sheet longitudinally and connecting the edges
- F16L9/18 . Double-walled pipes; Multi-channel pipes or pipe assemblies (joints therefor [F16L39/00](#))
- F16L9/19 . . Multi-channel pipes or pipe assemblies [N9601]
- F16L9/20 . . [N: IPC 3] Pipe assemblies
- F16L9/21 . made of sound-absorbing materials or with sound-absorbing structure [N0309]
- F16L9/22 . Pipes composed of a plurality of segments
- F16L11/00** **Hoses, i.e. flexible pipes** (hose-like supports for pipes, cables or protective tubing, between relatively movable points [F16L3/01](#); suction-cleaner hoses [A47L9/24](#))
- F16L11/00D . [N: consisting completely or partially of material other than fibres, plastics or metal]
- F16L11/02 . made of fibres or threads, e.g. of textile [N: which may or may not be impregnated, or provided with an impermeable layer, e.g. fire-hoses]
- F16L11/04 . made of rubber or flexible plastics
- F16L11/04B . . [N: formed by bending a sheet and connecting the edges (covers for the protection of the insulation [F16L59/10](#); Rigid pipes [F16L9/17](#))] [C0309]
- F16L11/04D . . [N: with four or more layers without reinforcement] [N0904]
- F16L11/06 . . with homogeneous wall ([F16L11/11](#) takes precedence)
- F16L11/08 . . with reinforcements embedded in the wall ([F16L11/11](#) takes precedence)
- F16L11/08D . . . [N: comprising one or more layers of a helically wound cord or wire (in combination with braided layers [F16L11/08R](#))]
- F16L11/08D1 . . . . [N: two layers]
- F16L11/08D2 . . . . [N: three or more layers]

F16L11/08H	. . . [N: comprising one or more braided layers (in combination with layers of a helically wound core or wire <a href="#">F16L11/08R</a> )]
F16L11/08H1	. . . . [N: two layers]
F16L11/08H2	. . . . [N: three or more layers]
F16L11/08R	. . . [N: comprising a combination of one or more layers of a helically wound cord or wire with one or more braided layers]
F16L11/10	. . with reinforcements not embedded in the wall ( <a href="#">F16L11/11</a> takes precedence)
F16L11/11	. . with corrugated wall [N: ( <a href="#">F16L11/24</a> takes precedence)]
F16L11/11C	. . . [N: with homogeneous wall]
F16L11/112	. . . having reinforcements embedded in the wall
F16L11/115	. . . having reinforcements not embedded in the wall
F16L11/118	. . . having arrangements for particular purposes, e.g. electrically conducting
F16L11/118B	. . . . [N: electrically conducting]
F16L11/12	. . with arrangements for particular purposes, e.g. specially profiled, with protecting layer, heated, electrically conducting ( <a href="#">F16L11/11</a> takes precedence)
F16L11/12B	. . . [N: specially profiled cross sections] [N0907]
F16L11/12G	. . . [N: Hoses provided with integrated fixing means, e.g. hooks]
F16L11/12K	. . . [N: Distinguishing marks for hoses]
F16L11/12R	. . . [N: non-inflammable or heat-resistant hoses]
F16L11/127	. . . electrically conducting
F16L11/133	. . . buoyant
F16L11/14	. made of rigid material, e.g. metal or hard plastics
F16L11/15	. . corrugated ( <a href="#">F16L11/16</a> takes precedence)
F16L11/16	. . wound from profiled strips or bands
F16L11/18	. . Articulated hoses, e.g. composed of a series of rings.
F16L11/20	. Double-walled hoses, [N: i.e. two concentric hoses] [N9601] [C9701]
F16L11/22	. Multi-channel hoses [N9601]
F16L11/24	. wound from strips or bands ( <a href="#">F16L11/16</a> takes precedence)
F16L11/26	. made of sound-absorbing materials or with sound-absorbing structure [N0309]
<b>Guide heading:</b>	<b>Pipe joints; Hose nipples</b> ([N: hose connections for pneumatic tyre valves <a href="#">B60C29/06C</a> ;] <a href="#">special adaptations of pipe joints for use with watercloset bowls E03D11/13</a> ; [N: for steam boilers <a href="#">F22B37/10H</a> ])
<b>F16L13/00</b>	<b>Non-disconnectible pipe-joints, e.g. soldered, adhesive or caulked joints</b> (joints for rigid pipes of plastics <a href="#">F16L47/00</a> ; [N: non-disconnectible pipe-joints to walls or other pipes, the joined pipe axis being perpendicular to the plane of the wall or to the axis of the other pipe <a href="#">F16L41/08A</a> ])
F16L13/00B	. [N: for pipes having a rectangular cross-section]
F16L13/00C	. [N: Shrunk pipe-joints]



- F16L13/007 . specially adapted for joining pipes of dissimilar materials [N: (disconnectible joints for pipes of dissimilar materials [F16L25/00P](#); joints between metal and plastic pipes [F16L47/00H3](#))]
- F16L13/013 . . Accessories therefor [N0311]
- F16L13/02 . Welded joints [N: (arc welding curved planar seams [B23K9/02C](#))]
- F16L13/02B . . [N: Male-female welded joints ([F16L13/02D](#) and [F16L13/02F](#) take precedence)]
- F16L13/02C . . [N: having an inner or outer ring ([F16L13/02D](#) and [F16L13/02F](#) take precedence)]
- F16L13/02C2 . . . [N: having an inner ring]
- F16L13/02C3 . . . [N: having an outer ring]
- F16L13/02D . . [N: with holes in the sleeve or spigot being filled with weld]
- F16L13/02F . . [N: the pipes having an internal or external coating]
- F16L13/02F2 . . . [N: having an internal coating]
- F16L13/02F3 . . . [N: having an external coating]
- F16L13/02G . . [N: cold welded (non-electric welding without the application of heat [B23K20/00](#))]
- F16L13/02J . . [N: for concrete pipes]
- F16L13/04 . . with arrangements for preventing over-stressing
- F16L13/06 . . . with tension relief of the weld by means of detachable members, e.g. divided tension rings, bolts in flanges
- F16L13/08 . Soldered joints [N: (specially adapted for connecting metal hoses to rigid members [F16L33/26](#); soldering metal [B23K1/00](#))]
- F16L13/10 . Adhesive or cemented joints
- F16L13/10B . . [N: Adhesive joints (for hoses [F16L33/34](#))]
- F16L13/10D . . [N: Tools]
- F16L13/11 . . using materials which fill the space between parts of a joint before hardening [N9106]
- F16L13/11B . . . [N: for concrete pipes] [N9106]
- F16L13/11C . . . [N: for socket pipes] [N9106]
- F16L13/12 . with a seal made of lead, caulked packing, or the like
- F16L13/12B . . [N: for male-female connections ([F16L13/12C](#) and [F16L13/12D](#) take precedence)]
- F16L13/12C . . [N: for concrete pipes]
- F16L13/12D . . [N: Attachments]
- F16L13/12F . . [N: Tools]
- F16L13/14 . made by plastically deforming the material of the pipe, e.g. by flanging, rolling [N: (working of metal tubes without essentially removing material [B21D](#))]
- F16L13/14B . . [N: by crimping or rolling from the outside] [N0801]
- F16L13/14B3 . . . [N: with a sealing element inserted into the female part before crimping or rolling] [N0801]
- F16L13/14B6 . . . [N: with a sealing element placed around the male part before crimping or rolling] [N0801]
- F16L13/14D . . [N: by an axially moveable sleeve] [N0801]
- F16L13/14F . . [N: by radially expanding the inner part ([F16L13/16H](#) and [E21B43/10F](#) take

	precedence)] [N0801]
F16L13/14H	. . [N: specially designed to ensure an intended leakage until correct deformation] [N0801]
F16L13/16	. . the pipe joint consisting of overlapping extremities having mutually co-operating collars
F16L13/16B	. . . [N: the pipe or collar being deformed by crimping or rolling] [N0801]
F16L13/16B2	. . . . [N: one collar being bent over the other] [N0801]
F16L13/16D	. . . [N: the pipe or collar being deformed by an axially movable sleeve] [N0801]
F16L13/16F	. . . [N: Deformed by radially expanding an inner part ( <a href="#">F16L13/16H</a> takes precedence)] [N0801]
F16L13/16H	. . . [N: for screw threaded pipes ( <a href="#">E21B43/10F</a> takes precedence)] [N0801]
<b>F16L15/00</b>	<b>Screw-threaded joints</b> ([N: hose connections with parts screwed directly on or into the hose <a href="#">F16L33/24</a> ; joining pipes to wall <a href="#">F16L41/00</a> ; casing joints used in deep-drilling <a href="#">E21B17/08</a> ; joints sealed primarily by means other than engagement of screw-threads, see the relevant groups characterised by the sealing arrangements); <b>Forms of screw-threads for such joints</b>
F16L15/00B	. [N: with conical threads] [N1010]
F16L15/00B2	. . [N: with more than one threaded section] [N1010]
F16L15/00B4	. . [N: with sealing rings] [N1010]
F16L15/00B6	. . [N: with axial sealings having at least one plastically deformable sealing surface (with sealing rings <a href="#">F16L15/00B4</a> )] [N1010]
F16L15/00D	. [N: for thin-walled pipes having at least their extremities deformed so as to have the shape of screw-threads]
F16L15/00F	. [N: with straight threads] [N1010]
F16L15/00F2	. . [N: with more than one threaded section] [N1010]
F16L15/00F4	. . [N: with sealing rings] [N1010]
F16L15/00F6	. . [N: with axial sealings having at least one plastically deformable sealing surface (with sealing rings <a href="#">F16L15/00F4</a> )] [N1010]
F16L15/02	. allowing substantial longitudinal adjustment by use of a long screw-threaded part
F16L15/04	. with additional sealings
F16L15/06	. characterised by the shape of the screw-thread
F16L15/08	. with supplementary elements ( <a href="#">F16L15/04</a> , [N: <a href="#">F16L41/00</a> and <a href="#">F16L43/02</a> ] take precedence)
<b>F16L17/00</b>	<b>Joints with packing adapted to sealing by fluid pressure</b> ([N: for universal joints with partly spherical engaging surfaces <a href="#">F16L27/067</a> ; joints allowing adjustment or movement only about the axis of one pipe <a href="#">F16L27/08</a> ; joints comprising a flexible connection only <a href="#">F16L27/10</a> ; joints allowing substantial longitudinal adjustment or movement <a href="#">F16L27/12</a> ; for hoses <a href="#">F16L33/16</a> ; couplings of the quick acting type <a href="#">F16L37/00</a> ;] compensating devices <a href="#">F16L51/00</a> ; sealings tightened by external pressure, inflatable packings <a href="#">F16J15/00</a> )

- F16L17/02
  - with sealing rings arranged between outer surface of pipe and inner surface of sleeve or socket
- F16L17/025
  - . the sealing rings having radially directed ribs
- F16L17/03
  - . having annular axial lips
- F16L17/03B
  - . . the sealing rings having only one lip
- F16L17/035
  - . . the sealing rings having two lips parallel to each other
- F16L17/04
  - . with longitudinally split or divided sleeve
- F16L17/06
  - with sealing rings arranged between the end surfaces of the pipes or flanges or arranged in recesses in the pipe ends or flanges
- F16L17/06B
  - . [N: forming a whole with the pipe or joint (for screw-threaded joint [F16L15/06](#))]
- F16L17/067
  - . Plastics sealing rings
- F16L17/073
  - . . the sealing rings having two lips parallel to each other
- F16L17/08
  - . Metal sealing rings
- F16L17/10
  - the packing being sealed by the pressure of a fluid other than the fluid in or surrounding the pipe ([expansion-compensation arrangements for pipe-lines F16L51/00](#))
- F16L19/00**

**Joints in which sealing surfaces are pressed together by means of a member, e.g. a swivel nut, screwed on or into one of the joint parts** ([N: screw-threaded joints [F16L15/00](#);] [F16L17/00](#) takes precedence; if using bolts or equivalent connecting means [F16L23/00](#); [N: electrically insulating [F16L25/02](#); adjustable joints, joints allowing movement [F16L27/00](#); specially adapted for pipes of brittle material [F16L49/06](#)])
- F16L19/00B
  - [N: comprising locking means for the threaded member (locking of screws or nuts per se [F16B39/00](#))]
- F16L19/02
  - Pipe ends provided with collars or flanges, integral with the pipe or not, pressed together by a screwed member
- F16L19/02C
  - . [N: the collar not being integral with the pipe]
- F16L19/02D
  - . [N: using specially adapted sealing means]
- F16L19/02D2
  - . . [N: comprising only sealing rings]
- F16L19/02D3
  - . . [N: without sealing rings]
- F16L19/02F
  - . [N: with specially adapted means for positioning the threaded member behind the collar]
- F16L19/02G
  - . [N: specially adapted for use with attachments, e.g. reduction units, T-pieces, bends or the like (branch units per se [F16L41/02](#); bends per se [F16L43/00](#); pipe units with cleaning aperture per se [F16L45/00](#))]
- F16L19/02H
  - . [N: specially adapted for use with coated pipes]
- F16L19/025
  - . the pipe ends having integral collars or flanges
- F16L19/028
  - . . the collars or flanges being obtained by deformation of the pipe wall
- F16L19/028B
  - . . . [N: and having a bell-mouthed shape]
- F16L19/028C
  - . . . [N: and being formed as a flange]
- F16L19/04
  - using additional rigid rings, sealing directly on at least one pipe end, which is flared either before or during the making of the connection

- F16L19/04B . . [N: the ring being an insert ([F16L19/04C](#) takes precedence)]
- F16L19/04C . . [N: with additional sealing means]
- F16L19/04C2 . . . [N: consisting of cutting edges on one of the connecting parts which penetrate into the wall of the pipe]
- F16L19/04C3 . . . [N: consisting of a soft ring]
- F16L19/04F . . [N: specially adapted for use with attachments, e.g. reduction units, T-pieces, bends or the like (branch units per se [F16L41/02](#); bends per se [F16L43/00](#); pipe units with cleaning aperture per se [F16L45/00](#))]
- F16L19/05 . . with a rigid pressure ring between the screwed member and the exterior of the flared pipe end
- F16L19/05B . . . [N: the pressure ring being rotatably connected to the threaded member]
- F16L19/06 . in which radial clamping is obtained by wedging action on non-deformed pipe ends
- F16L19/06C . . [N: a pressure ring being arranged between the clamping ring and the threaded member or the connecting member]
- F16L19/06G . . [N: specially adapted for use with attachments, e.g. reduction units, T-pieces, bends or the like (branch units per se [F16L41/02](#); bends per se [F16L43/00](#); pipe units with cleaning aperture per se [F16L45/00](#))]
- F16L19/06H . . [N: by means of conical threaded surfaces]
- F16L19/065 . . the wedging action being effected by means of a ring
- F16L19/065B . . . [N: the ring being rotatably connected to one of the connecting parts]
- F16L19/065D . . . [N: integral with one of the connecting parts]
- F16L19/07 . . adapted for use in socket or sleeve connections
- F16L19/075 . . specially adapted for spigot-and-socket joints [N: for pipes of the same diameter]
- F16L19/08 . with metal rings which bite into the wall of the pipe [N: ([F16L19/04C2](#) takes precedence)]
- F16L19/08C . . [N: the longitudinal cross-section of the ring not being modified during clamping]
- F16L19/08C2 . . . [N: with additional sealing means]
- F16L19/10 . . the profile of the ring being altered
- F16L19/10B . . . [N: with more than one ring per pipe end being used]
- F16L19/10G . . . [N: the ring comprising a shoulder against which the pipe end abuts]
- F16L19/12 . . . with additional sealing means
- F16L19/14 . . . the rings being integral with one of the connecting parts
- F16L21/00** **Joints with sleeve or socket** ([F16L13/00](#), [N: [F16L15/00](#)], [F16L17/00](#), [F16L19/00](#), [N: [F16L25/00H](#), [F16L27/00](#), [F16L37/00](#)] take precedence; [N: specially adapted to be made of plastics or to be used with pipes made of plastics [F16L47/06](#); specially adapted for pipes of brittle material [F16L49/08](#); devices for covering leaks in pipes or hoses [F16L55/16](#)])
- F16L21/00B . [N: Sleeves or nipples for pipes of the same diameter; Reduction pieces (with elastic sealing rings [F16L21/02J](#))]
- F16L21/00B2 . . [N: made of elastic material, e.g. partly or completely surrounded by clamping devices (comprising packing adapted to sealing by fluid pressure [F16L17/04](#), [F16L11/20](#); hose clips [F16L33/02](#))]
- F16L21/00C . [N: clamped by a wedging action]

- F16L21/02
  - with elastic sealing rings between pipe and sleeve or between pipe and socket, e.g. with rolling or other prefabricated profiled rings ([F16L21/06](#), [F16L21/08](#) take precedence; [N: sealing ring with radial ribs [F16L17/025](#); sealing ring with axial lips [F16L17/03](#)]; if adjustability is essential [F16L27/00](#)) [C9901]
- F16L21/02J
  - • [N: used with sleeves or nipples for pipes of the same diameter, or with reduction pieces ([F16L21/025](#) takes precedence)]
- F16L21/025
  - • Rolling sealing rings
- F16L21/03
  - • placed in the socket before connection ([N: [F16L21/02J](#),] [F16L21/025](#) take precedence)
- F16L21/035
  - • placed around the spigot end before connection ([N: [F16L21/02J](#),] [F16L21/025](#) take precedence)
- F16L21/04
  - • in which sealing rings are compressed by axially-movable members [N: (for joints using a threaded member [F16L19/07](#); quick acting couplings [F16L37/00](#); devices for covering leaks from inside a pipe [F16L55/16B](#))]
- F16L21/04B
  - • • [N: the members passing through the sealing rings]
- F16L21/05
  - • comprising a first ring being placed on a male part and a second ring in the sleeve or socket
- F16L21/06
  - with a divided sleeve or ring clamping around the pipe-ends (flanged joints [F16L23/00](#); couplings of the quick-acting type [F16L37/00](#))
- F16L21/06B
  - • [N: tightened by tangentially-arranged threaded pins] [N0506]
- F16L21/08
  - with additional locking means ([N: [F16L17/035](#), [F16L17/04B](#), [F16L21/04](#)], [F16L21/06](#) take precedence; [N: screwed joints [F16L19/08](#)]; couplings of the quick-acting type [F16L37/00](#))
- F16L23/00**

**Flanged joints** ([F16L13/00](#), [F16L17/00](#), [F16L19/00](#) take precedence; adjustable joints [F16L27/00](#); for hoses [F16L33/00](#); couplings of the quick-acting type [F16L37/00](#); for double-walled or multi-channel pipes or assemblies [F16L39/00](#); specially adapted for pipes of brittle material pipe [F16L49/00](#))
- F16L23/00H
  - [N: Auxiliary devices]
- F16L23/00J
  - [N: Attachments]
- F16L23/02
  - the flanges being connected by members tensioned axially ([F16L23/12](#) takes precedence)
- F16L23/024
  - • characterised by how the flanges are joined to, or from an extension of, the pipes
- F16L23/026
  - • • by welding
- F16L23/028
  - • • the flanges being held against a shoulder
- F16L23/028B
  - • • • [N: the collar being integral with the pipe]
- F16L23/028D
  - • • • [N: the shoulder not being formed from the pipe]
- F16L23/032
  - • characterised by the shape or composition of the flanges
- F16L23/036
  - • characterised by the tensioning members, e.g. specially adapted bolts or C-clamps
- F16L23/04
  - the flanges being connected by members tensioned in the radial plane ([F16L23/12](#) takes precedence)
- F16L23/06
  - • connected by toggle-action levers (quick acting couplings tightened by toggle-action levers [F16L37/20](#))

- F16L23/08 . . connection by tangentially arranged pin and nut
- F16L23/10 . . . with a pivoting or swinging pin
- F16L23/12 . specially adapted for particular pipes
- F16L23/12B . . [N: with an internal or external coating]
- F16L23/14 . . for rectangular pipes
- F16L23/16 . characterised by the sealing means
- F16L23/16D . . [N: the pipe ends abutting each other]
- F16L23/16G . . [N: comprising a viscous mass, e.g. hardenable]
- F16L23/16L . . [N: in connection with the appearance or detection of leaks]
- F16L23/18 . . the sealing means being rings
- F16L23/20 . . . made exclusively of metal
- F16L23/22 . . . made exclusively of a material other than metal
- F16L23/24 . . specially adapted for unequal expansion of the parts of the joint
- F16L25/00** **Constructive types of pipe joints not provided for in groups [F16L13/00](#) to [F16L23/00](#)** (adjustable joints [F16L27/00](#); couplings of the quick-acting type [F16L37/00](#); specially adapted to be made of plastics or to be used with pipes made of plastics [F16L47/00](#)) [N: Details of pipe joints not otherwise provided for, e.g. electrically conducting or insulating means]
- F16L25/00B . [N: Joints for pipes with a square or rectangular cross-section]
- F16L25/00F . [N: Abutment joints]
- F16L25/00H . [N: Joints for pipes made of reinforced concrete]
- F16L25/00K . [N: Joints for corrugated pipes]
- F16L25/00K2 . . [N: of the quick-acting type] [N0904]
- F16L25/00K4 . . [N: with specially shaped sealing rings] [N0904]
- F16L25/00K6 . . [N: with two corrugated pipes being directly connected to each other] [N0904]
- F16L25/00P . [N: Joints for pipes of dissimilar materials (non-disconnectible joints for pipes of dissimilar materials [F61L13/007](#); joints between metal and plastic pipes [F61L47/00H](#))]
- F16L25/00R . [N: Pipe joints comprising a liquid or fusible seal]
- F16L25/00S . [N: Combination of a quick-acting type coupling and a conventional one]
- F16L25/01 . specially adapted for realising electrical conduction between the two pipe ends of the joint or between parts thereof (electrically-conductive connections between or with tubular conductors [H01R4/60](#)) [N0309]
- F16L25/02 . Electrically insulating joints or couplings ([F16L47/00](#) takes precedence; insulating bodies in general [H01B](#))
- F16L25/02C . . [N: for screw-threaded joints]
- F16L25/02D . . [N: for joints in which sealing surfaces are pressed together by means of a member, e.g. a swivel nut, screwed on or into one of the joint parts]

- F16L25/02F . . [N: for joints with sleeve or socket]
- F16L25/02G . . [N: for flanged joints]
- F16L25/02H . . [N: for branching pipes, for joining pipes to walls]
- F16L25/03 . . in non-disconnectable pipe joints [N0309]
- F16L25/04 . comprising a collar or ring having a threaded pin rigid with the pipe-encircling member
- F16L25/06 . comprising radial locking means
- F16L25/06B . . [N: the locking means being actuated by radial screws]
- F16L25/08 . . in the form of screws, nails or the like
- F16L25/10 . Sleeveless joints between two pipes, one being introduced into the other [N0309]
- F16L25/12 . Joints for pipes being spaced apart axially [N0309]
- F16L25/14 . Joints for pipes of different diameters or cross-section [N0309]
- F16L27/00** **Adjustable joints, Joints allowing movement** (of the quick-acting type [F61L37/50](#); for double-walled or multi-channel pipe assemblies [F16L39/04](#); [N: connecting arrangements or other fittings specially adapted to be made of plastics or to be used with pipes made of plastics [F16L47/00](#); connecting arrangements specially adapted for pipes of brittle material [F16L49/00](#)])
- F16L27/02 . Universal joints, i.e. with mechanical connection allowing angular movement or adjustment of the axes of the parts in any direction [N: articulated hoses made of rigid material [F16L11/18](#)]
- F16L27/02B . . [N: Universal and rotating joints]
- F16L27/02C . . [N: Universal and axially displaceable joints]
- F16L27/04 . . with partly spherical engaging surfaces [N:(with, between the surfaces, a flexible element which undergoes shear and flexure [F16L27/10D](#))]
- F16L27/04D . . . [N: comprising two pipes normally at right angles to each other]
- F16L27/04F . . . [N: specially adapted for tubing between vehicles]
- F16L27/047 . . . held in place by a screwed member having an internal spherical surface
- F16L27/053 . . . held in place by bolts passing through flanges
- F16L27/06 . . . with special sealing means between the engaging surfaces
- F16L27/067 . . . . the sealing means being actuated by the medium pressure
- F16L27/073 . . . . one of the co-operating surfaces forming the sealing means
- F16L27/08 . Allowing adjustment or movement only about the axis of one pipe [N: (Swivel joints in hose lines for flushing boreholes [E21B21/02](#))]
- F16L27/08B . . [N: the fluid passing axially from one joint element to another]
- F16L27/08B2 . . . [N: the joint elements extending coaxially for some distance from their point of separation]
- F16L27/08B2B . . . . [N: with slide bearings]
- F16L27/08B2B2 . . . . . [N: having radial sealing]
- F16L27/08B2B3 . . . . . [N: having axial sealing]
- F16L27/08B2C . . . . [N: with ball or roller bearings]



F16L27/08B2C2	. . . . . [N: having radial bearings (connections of quick-acting couplings maintained by balls or rollers under radial pressure <a href="#">F16L37/22</a> )]
F16L27/08B2C3	. . . . . [N: having axial bearings]
F16L27/08B3	. . . [N: the joint elements being bends]
F16L27/08B3B	. . . . [N: forming an angle of less than 90 degrees]
F16L27/08B3C	. . . . [N: forming an angle of 90 degrees]
F16L27/08C	. . [N: the fluid being turned through an angle when passing from one joint element to another]
F16L27/08C2	. . . [N: with spherical hinge]
F16L27/08C3	. . . [N: with hinge and bellows sealing]
F16L27/08F	. . [N: Arrangements of joints with one another and with pipes or hoses]
F16L27/08F2	. . . [N: between vehicles]
F16L27/087	. . Joints with radial fluid passages
F16L27/093	. . . of the "banjo" type, i.e. pivoting right-angle couplings
F16L27/10	. comprising a flexible connection only, [N: e.g. for damping vibrations]
F16L27/10B	. . [N: introduced in exhaust pipes for hot gases]
F16L27/10F	. . [N: comprising a swivel nut or collar engaging the pipe]
F16L27/10G	. . [N: Flanged joints]
F16L27/10H	. . [N: Joints with sleeve or socket]
F16L27/10J	. . [N: comprising an intermediate resilient element, e.g. a ring]
F16L27/10K	. . [N: Abutment joints]
F16L27/103	. . in which a flexible element, e.g. a rubber-metal laminate, which undergoes constraints consisting of shear and flexure, is sandwiched between partly curved surfaces
F16L27/107	. . the ends of the pipe being interconnected by a flexible sleeve
F16L27/108	. . . the sleeve having the form of a bellows with only one corrugation
F16L27/108B	. . . . [N: the bellows being externally or internally reinforced]
F16L27/11	. . . the sleeve having the form of a bellows with multiple corrugations
F16L27/111	. . . . the bellows being reinforced
F16L27/113	. . the ends of the pipe being interconnected by a rigid sleeve
F16L27/113B	. . . [N: the sleeve being longitudinally divided]
F16L27/113C	. . . [N: the sleeve comprising a screwed member]
F16L27/12	. allowing substantial longitudinal adjustment or movement (by use of screw-thread <a href="#">F16L15/02</a> )
F16L27/12B	. . [N: having axial and rotary movement]
<b>F16L29/00</b>	<b>Joints with fluid cut-off means</b> (quick-acting joints with cut-off means <a href="#">F16L37/28</a> ; [N: valves, taps or cocks in general <a href="#">F16K</a> ])
F16L29/00D	. [N: joints with taps (taps in general <a href="#">F16K5/00</a> )]
F16L29/00F	. [N: joints with cut-off devices which can be perforated (cut-off devices with a breakable closure member in general <a href="#">F16K13/04</a> )]



- F16L29/00G
  - [N: Joints with cut-off devices controlled separately ([F16K29/00D](#) takes precedence; operating means for cut-off devices in general [F16K31/00](#))]
- F16L29/02
  - with a cut-off device in one of the two pipe ends, the cut-off device being automatically opened when the coupling is applied [N: (screw joints without cut-off devices [F16L19/00](#))]
- F16L29/04
  - with a cut-off device in each of the two pipe ends, the cut-off devices being automatically opened when the coupling is applied [N: (screw joints without cut-off devices [F16L19/00](#))]
- F16L31/00**
**Arrangement for connecting hoses to one another or to flexible sleeves ([F16L33/00](#) takes precedence)**
- F16L31/02
  - for branching hoses
- F16L33/00**
**Arrangements for connecting hoses to rigid members (hand tools for inserting fittings into hoses [B25B27/10](#)); Rigid hose connectors, i.e. single members engaging both hoses [N: (hoses or hose couplings specially adapted for suction cleaners [A47L9/24](#))]**
- F16L33/00D
  - [N: comprising elements arranged in the hose walls]
- F16L33/00N
  - [N: for hoses of plastics other than artificial rubber]
- F16L33/01
  - adapted for hoses having a multi-layer wall
- F16L33/02
  - Hose-clips [N: (covering leaks in pipes or hoses [F16L55/16](#))]
- F16L33/02B
  - . [N: with the ends bent around each other]
- F16L33/02C
  - . [N: fixed by bending one end of the strap]
- F16L33/02S
  - . tightened by deforming radially extending loops or folds [N0309]
- F16L33/03
  - . Self-locking elastic clips [N0309]
- F16L33/03S
  - . fixed by means of teeth or hooks [N0309]
- F16L33/04
  - . tightened by tangentially-arranged threaded pin and nut
- F16L33/06
  - . . in which the threaded pin is rigid with the hose-encircling member
- F16L33/08
  - . in which a worm coacts with a part of the hose-encircling member that is toothed like a worm-wheel
- F16L33/08B
  - . . [N: with a scroll-type screw]
- F16L33/10
  - . with a substantially-radial tightening member
- F16L33/12
  - . with a pivoted or swinging tightening or securing member, e.g. toggle lever
- F16L33/14
  - . with a taping-bolt, i.e. winding up the end of the hose-encircling member
- F16L33/16
  - with sealing or securing means using fluid pressure
- F16L33/18
  - characterised by the use of additional sealing means
- F16L33/20
  - Undivided rings, sleeves or like members contracted on the hose or expanded in the hose by means of tools; Arrangements using such members
- F16L33/207
  - . only a sleeve being contracted on the hose

- F16L33/207B . . . [N: the sleeve being a separate connecting member] [N9806]
- F16L33/207B2 . . . . [N: directly connected to the rigid member] [N1010]
- F16L33/207B2B . . . . . [N: by quick acting] [N1010]
- F16L33/207B2D . . . . . [N: by plastic deformation] [N1010]
- F16L33/207B4 . . . . . [N: connected to the rigid member via an intermediate element] [N1010]
- F16L33/213 . . only a sleeve being expanded inside the hose
  
- F16L33/22 . with means not mentioned in the preceding groups for gripping the hose between inner and outer parts
- F16L33/22B . . [N: the external piece comprising segments hingedly connected to an interior part]
- F16L33/22C . . [N: the external piece comprising segments pressed against the hose by wedge shaped elements]
- F16L33/22G . . [N: the sealing surfaces being pressed together by means of a member, e.g. a swivel nut, screwed on or into one of the joint parts]
- F16L33/22G2 . . . [N: a clamping ring being arranged between the threaded member and the connecting member]
- F16L33/22H . . [N: a sleeve being movable axially]
- F16L33/22H2 . . . [N: the sleeve being screwed over the hose]
- F16L33/22J . . [N: the hose being introduced into or onto the connecting member and automatically locked ([F16L37/084](#) takes precedence)] [C9809]
- F16L33/22L . . [N: a flexible wire being coiled upon the hose]
- F16L33/23 . . the outer parts being segmented, the segments being pressed against the hose by tangentially arranged members
  
- F16L33/24 . with parts screwed directly on or into the hose ([F16L33/22](#) takes precedence)
- F16L33/24B . . [N: the inner or outer part being moulded in situ]
  
- F16L33/26 . specially adapted for hoses of metal
  
- F16L33/28 . for hoses with one end terminating in a radial flange or collar
  
- F16L33/30 . comprising parts inside the hoses only ([F16L33/24](#) takes precedence) [N0309]
- F16L33/32 . comprising parts outside the hoses only ([F16L33/24](#) takes precedence) [N0309]
- F16L33/34 . with bonding obtained by vulcanisation, gluing, melting, or the like [N0309]
  
- F16L35/00** **Special arrangements used in connection with end fittings of hoses, e.g. safety or protecting devices**
  
- F16L35/00B . [N: Nozzles]
  
- F16L37/00** **Couplings of the quick-acting type** (radially binding sleeves [F16L17/04](#), [F16L21/06](#); connecting hoses to rigid members [F16L33/00](#); connections made automatically when vehicles are brought together [B60D](#), [B61G](#); specially adapted for lubricating devices [F16N21/00](#))
  
- F16L37/00B . [N: which can be controlled at a distance]

- F16L37/00D . [N: using magnets]
- F16L37/00J . [N: plug-cocks]
- F16L37/00K . [N: for branching pipes; for joining pipes to walls]
- F16L37/02 . in which the connection is maintained only by friction of the parts being joined (F16L37/22 takes precedence)
- F16L37/02B . . [N: with an inner elastic part pressed against an outer part by reason of its elasticity]
- F16L37/04 . . with an elastic outer part pressing against an inner part by reason of its elasticity (with locking members F16L37/08)
- F16L37/05 . . . tightened by the pressure of a mechanical element
- F16L37/06 . . . tightened by fluid pressure
- F16L37/08 . in which the connection between abutting or axially overlapping ends is maintained by locking members (F16L37/22 to F16L37/26 take precedence)
- F16L37/08B . . [N: using an element which is hinged on one end of the pipe-ends and which is maintained in locked position by a screw tightened against the other pipe-end]
- F16L37/084 . . combined with automatic locking [N: (F16L37/22 takes precedence)]
- F16L37/084B . . . [N: by means of a transversally slidable locking member surrounding the tube]
- F16L37/084G . . . [N: by means of a ring which is split into a plurality of component parts which are held in place by means of a resilient ring member]
- F16L37/084J . . . [N: by means of a ring pivoting so as to lie against the tube]
- F16L37/084K . . . [N: by means of retaining members associated with the packing member]
- F16L37/084M . . . [N: by means of hooks (F16L37/096, F16L37/098 take precedence)]
- F16L37/084M2 . . . . [N: rocking freely]
- F16L37/086 . . . by means of latching members pushed radially by spring-like elements [N0309]
- F16L37/088 . . . by means of a split elastic ring
- F16L37/091 . . . by means of a ring provided with teeth or fingers [N0309]
- F16L37/092 . . . by means of elements wedged between the pipe and the frusto-conical surface of the body of the connector
- F16L37/092B . . . . [N: with rings which bite into the wall of the pipe] [N9804]
- F16L37/096 . . . by means of hooks hinged about an axis
- F16L37/098 . . . by means of flexible hooks [N0309]
- F16L37/098B . . . . [N: with a separate member for releasing the coupling] [N0309]
- F16L37/098D . . . . [N: the flexible hook extending radially inwardly from an outer part and engaging a bead, recess or the like on an inner part (F16L37/098B takes precedence)] [N0310]
- F16L37/098D2 . . . . . [N: the flexible hook being progressively compressed by axial tensile loads acting on the coupling] [N0310]
- F16L37/10 . . using a rotary external sleeve or ring on one part
- F16L37/10B . . . [N: in which the coupling is coaxial with the pipe]
- F16L37/10C . . . [N: the connection being maintained by the eccentricity of the two parts of the joint]
- F16L37/10D . . . [N: the rotating sleeve having on its inner surface several axially spaced and circumferentially discontinuous threads which engage with the threads on the

- male part which are also spaced axially and circumferentially discontinuous]
- F16L37/107 . . . Bayonet-type couplings [N0309]
- F16L37/113 . . . the male part having lugs on its periphery penetrating into the corresponding slots provided in the female part [N0309]
- F16L37/12 . . . using hooks, pawls or other movable or insertable locking members [N: (F16L37/084 takes precedence)]
- F16L37/12B . . . [N: using hooks hinged about an axis placed behind a flange and which act behind the other flange]
- F16L37/12F . . . [N: using freely rocking hooks (F16L37/12H takes precedence)]
- F16L37/12H . . . [N: using hooks provided with a screw-thread adapted to engage and mesh with an appropriate corresponding part]
- F16L37/12J . . . [N: using hooks tightened by a wedge section]
- F16L37/12K . . . [N: using a retaining member the extremities of which, e.g. in the form of a U, engage behind a shoulder of both parts]
- F16L37/12L . . . [N: using a retaining member in the form of a wedge]
- F16L37/12N . . . [N: the connection taking place from inside the pipes]
- F16L37/124 . . . using bolts, fixed to a flange, which are able to tilt in slots of another flange, and being maintained there by the tightening of nuts [N0309]
- F16L37/127 . . . using hooks hinged about an axis [N: (F16L37/12H takes precedence)]
- F16L37/133 . . . using flexible hooks [N: (F16L37/12H takes precedence)]
- F16L37/138 . . . using an axially movable sleeve [N0309]
- F16L37/14 . . . Joints secured by inserting between mating surfaces an element, e.g. a piece of wire, a pin, a chain
- F16L37/14B . . . . [N: where the securing element is inserted tangentially] [N0103]
- F16L37/14B1 . . . . . [N: the securing element being U-shaped] [N0103]
- F16L37/14B2 . . . . . [N: the securing element being a rigid pin, screw or the like] [N0103]
- F16L37/14B3 . . . . . [N: the securing element being flexible (F16L37/14B1 takes precedence)] [N0103]
- F16L37/15 . . . . the element being a wedge [N0309]
- F16L37/16 . . . Joints tightened by the action of a wedge-shaped hinged hook
- F16L37/18 . . . Joints tightened by eccentrics or rotatable cams
- F16L37/20 . . . Joints tightened by toggle-action levers
- F16L37/22 . . in which the connection is maintained by means of balls, rollers or helical springs under radial pressure between the parts
- F16L37/23 . . . by means of balls
- F16L37/24 . . in which the connection is made by inserting one member axially into the other and rotating it to a limited extent, e.g. with bayonet action
- F16L37/24D . . . [N: in which the rotation takes place between the eccentric parts]
- F16L37/244 . . the coupling being co-axial with the pipe
- F16L37/244B . . . [N: in which a male cylindrical element is introduced into a female cylindrical element, each element containing several threads axially spaced and circumferentially discontinuous which engage with each other as a result of the rotation of one of the elements]
- F16L37/248 . . . Bayonet-type coupling
- F16L37/252 . . . the male part having lugs on its periphery penetrating in the corresponding slots

- provided in the female part
- F16L37/256 . . the coupling not being coaxial with the pipe
- F16L37/26 . in which the connection is made by transversely moving the parts together, with or without their subsequent rotation
- F16L37/28 . with fluid cut-off means
- F16L37/30 . . with fluid cut-off means in each of two pipe-end fittings
- F16L37/32 . . . at least one of two lift valves being opened automatically when the coupling is applied
- F16L37/33 . . . . the lift valves being of the ball type [N0309]
- F16L37/34 . . . . at least one of the lift valves being of the sleeve type, i.e. a sleeve is telescoped over an inner cylindrical wall
- F16L37/35 . . . . at least one of the valves having an axial bore [N0309]
- F16L37/36 . . . . with two lift valves being actuated to initiate the flow through the coupling after the two coupling parts are locked against withdrawal
- F16L37/367 . . . with two gate valves or sliding valves [N0309]
- F16L37/373 . . . with two taps or cocks [N0309]
- F16L37/38 . . with fluid cut-off means in only one of the two pipe-end fittings
- F16L37/40 . . . with a lift valve being opened automatically when the coupling is applied
- F16L37/407 . . . . the lift valve being of the ball type [N0309]
- F16L37/413 . . . . the lift valve being of the sleeve type, i.e. a sleeve being telescoped over an inner cylindrical wall [N0309]
- F16L37/42 . . . . the valve having an axial bore communicating with lateral apertures
- F16L37/44 . . . with one lift valve being actuated to initiate the flow through the coupling after the two coupling parts are locked against withdrawal
- F16L37/46 . . . with a gate valve or sliding valve
- F16L37/47 . . . with a tap or cock [N0309]
- F16L37/48 . for fastening a pipe on the end of a tap
- F16L37/50 . adjustable; allowing movement of the parts joined [N: (adjustable joints in general [F16L27/00](#); for double-walled or multi-channel pipes or pipe assemblies [F16L39/04](#))]
- F16L37/50D . . [N: allowing substantial longitudinal adjustment or movement (by means of screw-thread [F16L15/02](#))]
- F16L37/52 . . Universal joints, i.e. with a mechanical connection allowing angular movement or adjustment of the axes of the parts in any direction
- F16L37/53 . . allowing adjustment or movement only about the axis of one pipe [N0309]
- F16L37/54 . . for pipes under pressure which are supported only on one side
- F16L37/56 . for double-walled or multi-channel pipes [N: or pipe assemblies] [C9801]
- F16L37/56B . . [N: Concentric pipes] [N0412]
- F16L37/58 . the extremities of the two halves of the joint being pressed against each other without being locked in position
- F16L37/60 . with plug and fixed wall housing [N0309]
- F16L37/62 . pneumatically or hydraulically actuated [N0309]

**F16L39/00****Joints or fittings for double-walled or multi-channel pipes or pipe assemblies**

- F16L39/00B . [N: for concentric pipes] [N9504]
- F16L39/02 . for hoses
- F16L39/04 . allowing adjustment or movement [N: (in general [F16L27/00](#); of the multiline swivel type [F16L39/06](#))] [C0311]
- F16L39/06 . of the multiline swivel type, e.g. comprising a plurality of axially mounted modules [N0309]

**F16L41/00****Branching pipes; Joining pipes to walls** ([F16L39/00](#) takes precedence; joints suitable for connecting together pipe-ends see the relevant groups [N: specially adapted to be made of plastics or to be used with pipes made of plastics [F16L47/00J](#); characterised by couplings of the quick-acting type [F16L37/00K](#);] connections not designed for conveying fluid [F16B9/00](#))

- F16L41/00C . [N: the wall being a pipe plate (details or component parts of steam super heaters [F22G3/00](#); heat exchangers [F28](#))]
- F16L41/00D . [N: of concrete, cement or asbestos-cement]
- F16L41/00F . [N: Joining to walls at other than 90 degrees ([F16L41/00D](#), [F16L41/00J](#) take precedence)]
- F16L41/00G . [N: adjustable and comprising a hollow threaded part in an opening]
- F16L41/00H . [N: adjustable and comprising a bend]
- F16L41/00J . [N: for connecting a measuring instrument (connecting means for pressure measuring apparatus [G01L19/00B](#))]
- F16L41/02 . Branch units, e.g. made in one piece, welded, riveted
- F16L41/02B . . [N: T- or cross-pieces ([F16L41/02G](#), [F16L41/02H](#), [F16L41/02J](#) take precedence)]
- F16L41/02D . . [N: Y- pieces ([F16L41/02G](#), [F16L41/02H](#), [F16L41/02J](#) take precedence)]
- F16L41/02G . . [N: with rectangular cross-section]
- F16L41/02H . . [N: with a layer protecting against erosion]
- F16L41/02J . . [N: of concrete, cement or asbestos-cement]
- F16L41/03 . . comprising junction pieces for four or more pipe members
- F16L41/04 . Tapping pipe walls, i.e. making connections through the walls of pipes while they are carrying fluids; Fittings therefor (apparatus or operations relating to metal-working steps, see the relevant classes for metal-working)
- F16L41/04B . . [N: without removal of material ([F16L41/06B](#) takes precedence)]
- F16L41/06 . . making use of attaching means embracing the pipe
- F16L41/06B . . . [N: without removal of material]
- F16L41/08 . Joining pipes to walls or pipes, the joined pipe axis being perpendicular to the plane of the wall or to the axis of another pipe([F16L41/02](#)takes precedence)

- F16L41/08A . . [N: Non-disconnectible joints, e.g. soldered, adhesive or caulked joints (non-disconnectible pipe joints in general [F16L13/00](#))]
- F16L41/08A1 . . . [N: Soldered joints]
- F16L41/08C . . [N: fixed with screws]
- F16L41/08E . . [N: fixed using an elastic grommet between the extremity of the tube and the wall]
- F16L41/10 . . the extremity of the pipe being screwed into the wall
- F16L41/12 . . using attaching means embracing the pipe
- F16L41/14 . . by screwing an intermediate part against the inside or outside of the wall [N: ([F16L41/08C](#) takes precedence)]
- F16L41/16 . . the branch pipe comprising fluid cut-off means
- F16L41/18 . the branch pipe being movable [N0207]

**F16L43/00** **Bends; Siphons** (with cleaning apertures [F16L45/00](#); [N: expansion-compensation arrangements making use of bends [F16L51/04](#)]; siphons for water-closets [E03D11/18](#); siphons in general [F04F10/00](#) )

- F16L43/00B . [N: made of metal]
- F16L43/00B2 . . [N: and formed from sheet having a circular passage]
- F16L43/00B3 . . [N: having a rectangular cross-section]
- F16L43/00B4 . . [N: Return bends (coiled tube furnaces for thermal non-catalytic cracking of hydrocarbon oils [C10G9/20](#))]
- F16L43/00B6 . . [N: telescopic]
- F16L43/00D . [N: made of concrete, cement or asbestos-cement]
- F16L43/00F . [N: made from plastic material] [N1202]
- F16L43/02 . adapted to make use of special securing means

**F16L45/00** **Pipe units with cleaning aperture and closure therefor**

**F16L47/00** **Connecting arrangements or other fittings specially adapted to be made of plastics or to be used with pipes made of plastics** [N: (rigid pipes of plastics [F16L9/12](#); connections for hoses of plastics [F16L33/00N](#); bends or siphons [F16L43/00F](#))]

- F16L47/00B . [N: the first pipe being joined to the ends of two other pipes placed one inside the other, e.g. gas pipe with protective sheath] [N0309]
- F16L47/02 . Welded joints; Adhesive joints [N: in general [F16L13/00](#)]
- F16L47/03 . . Welded joints with an electrical resistance incorporated in the joint [N0309]
- F16L47/04 . with a swivel nut or collar engaging the pipe [N: (in general [F16L19/00](#))]
- F16L47/06 . with sleeve or socket formed by or in the pipe end [N: in general [F16L21/00](#)]
- F16L47/06C . . [N: with sealing rings arranged between outer surface of pipe and inner surface of sleeve or socket, the sealing rings being placed previously on the male part]
- F16L47/08 . . with sealing rings arranged between the outer surface of one pipe end and the



- er surface of the sleeve or socket, the sealing rings being placed previously in the sleeve or socket [N0309]
- F16L47/10 . . . the sealing rings being maintained in place by additional means [N0309]
  - F16L47/12 . . with additional locking means [N0309]
  - F16L47/14 . Flanged joints [N0309]
  - F16L47/14B . . [N: for rectangular pipes] [N0309]
  - F16L47/16 . Screw-threaded joints [N0309]
  - F16L47/18 . Adjustable joints; Joints allowing movement [N0309]
  - F16L47/20 . based principally on specific properties of plastics [N0309]
  - F16L47/22 . . using shrink-down material [N: (in other than plastic [F16L13/00C](#))] [N0309]
  - F16L47/24 . . for joints between metal and plastic pipes [N0309]
  - F16L47/26 . for branching pipes; for joining pipes to walls; Adaptors therefor [N0309]
  - F16L47/26D . . [N: Reduction units] [N0309]
  - F16L47/28 . . Joining pipes to walls or to other pipes, the axis of the joined pipe being perpendicular to the wall or to the axis of the other pipe [N0309]
  - F16L47/28B . . . [N: with fluid cut-off means in the branching pipe] [N0309]
  - F16L47/30 . . . using attaching means embracing the pipe [N0309]
  - F16L47/32 . . Branch units, e.g. made in one piece, welded, riveted [N0309]
  - F16L47/34 . . Tapping pipes, i.e. making connections through walls of pipes while carrying fluids; Fittings therefor [N0309]
  - F16L47/34B . . . [N: making use of attaching means embracing the pipe] [N0309]
- F16L49/00 Connecting arrangements, e.g. joints, specially adapted for pipes of brittle material, e.g. glass, earthenware [N: (sleeves, nipples or reduction pieces made of elastic material [A61L21/00B2](#))]**
- F16L49/02 . Joints with a sleeve or socket
  - F16L49/04 . Flanged joints
  - F16L49/06 . Joints in which sealing surfaces are pressed together by means of a member, e.g. swivel nut, screwed on, or into, one of the joint parts [N: (in general [F16L19/00](#))] [N0309]
  - F16L49/08 . Adjustable joints; Joints allowing movement [N: (in general [F16L27/00](#))] [N0309]
- F16L51/00 Expansion-compensation arrangements for pipe-lines ([N: hangers or supports for pipes with special provision allowing movement of the pipes [F16L3/16](#);] telescopic pipes [F16L27/12](#))**
- F16L51/00B . [N: for concrete pipe-lines]
  - F16L51/02 . making use of bellows or an expansible folded or corrugated tube [N: (rigid corrugated pipes [F16L9/06](#); corrugated hoses made of rigid material [F16L11/14B](#))]



- F16L51/02B . . [N: having a rectangular cross-section]
- F16L51/02F . . [N: with a single corrugation]
- F16L51/02G . . [N: consisting of flexible rings]
- F16L51/02H . . [N: non-metallic (flexible pipe connections [F16L27/10](#))]
- F16L51/02J . . [N: with several corrugations]
- F16L51/02M . . [N: with interior reinforcement]
- F16L51/02N . . [N: with external reinforcement]
- F16L51/02P . . [N: with the expansion or contraction of each corrugation being limited]
- F16L51/02Q . . [N: consisting of flexible rings]
- F16L51/03 . . comprising two or more bellows
- F16L51/03D . . . [N: for cancelling the axial loading resulting from fluid pressure]
- F16L51/04 . making use of bends, e.g. lyre-shaped

**F16L53/00** **Heating or cooling pipes or pipe systems** (preventing freezing of pipes, thawing frozen pipes [E03B7/12](#), [E03B7/14](#); pipe-line systems, pipe-lines [F17D](#))

- F16L53/00B . [N: Heating of pipes or pipe systems] [N1010]
- F16L53/00B2 . . [N: by means of a hot fluid, e.g. gas, steam or liquid] [N1010]
- F16L53/00B4 . . [N: by electric, magnetic or electromagnetic fields, e.g. using induction, dielectric or microwave heating] [N1010]
- F16L53/00B6 . . [N: by ohmic-resistance heating] [N1010]
- F16L53/00B6B . . . [N: the heating current flowing directly through the pipe to be heated] [N1010]
- F16L53/00B6D . . . [N: using electric heating elements in the form of wires, cables, strips, ribbons or the like] [N1010]

**F16L55/00** **Devices or appurtenances for use in, or in connection with, pipes or pipe systems** (the preceding groups and groups [F16L57/00](#), [F16L59/00](#) take precedence; repairing or joining pipes on or under water [F16L1/26](#); nozzles [B05B](#); cleaning of pipes [B08B9/02](#); [N: arrangements of draining devices for water main or service pipe systems [E03B7/08](#);] devices for preventing bursting of water pipes by freezing [E03B7/10](#); [N: draining devices for hydrants [E03B9/14](#);] for domestic plumbing installations [E03C1/00](#); [N: steam traps for draining of liquids from enclosures containing gases or vapours [F16T](#)]; arrangements for sealing leaky tubes or conduits of heat-exchangers [F28F11/00](#))

- F16L55/00B . [N: Devices restraining ruptured tubes from whipping]
- F16L55/02 . Energy absorbers; Noise absorbers (in valves [F16K47/00](#); [N: springs, shock absorbers, means for damping vibration in general [F16F](#)])
- F16L55/027 . . Throttle passages (influencing fluid flow [F15D1/00](#); control of fluid flow [G05D7/00](#))
- F16L55/027B . . . [N: in the form of perforated plates]
- F16L55/027B2 . . . . [N: placed transversely]
- F16L55/027B4 . . . . [N: placed parallel to the axis of the pipe]
- F16L55/027D . . . [N: using transversal baffles defining a tortuous path]
- F16L55/027G . . . [N: by passing through a mass of particles or a porous member]
- F16L55/027J . . . [N: using a central core throttling the passage]

- F16L55/027L . . . [N: using an element with multiple tubes]
- F16L55/027N . . . [N: using spirally or helically shaped channels]
- F16L55/027Q . . . [N: The regulating element being provided with radial outputs]
- F16L55/027S . . . [N: The fluid flowing two or more times longitudinally in opposite directions, e.g. using parallel or concentric tubes]
- F16L55/033 . . Noise absorbers ([F16L55/027](#) takes precedence)
- F16L55/033B . . . [N: by inserting an elongated element in the pipe]
- F16L55/033D . . . [N: by inserting a body of compressible material in the pipe]
- F16L55/033G . . . [N: by means of an active system]
- F16L55/033J . . . [N: by means of external rings]
- F16L55/033L . . . [N: by means of sound-absorbing materials]
- F16L55/033M . . . [N: by means of a flexible connection]
- F16L55/033N . . . [N: by means of a membrane]
- F16L55/035 . . . in the form of specially adapted hangers or supports [[N0309](#)]
- F16L55/04 . Devices damping pulsations or vibrations in fluids [N: ([F16L55/02](#) takes precedence; counter-acting cavitation in pumps [F04B39/00](#); springs, shock absorbers, means for damping vibration in general [F16F](#); means in valves for absorbing fluid energy [F16K47/00](#))]
- F16L55/04C . . [N: specially adapted for preventing vibrations (flexible pipe connections [F16L27/10](#))]
- F16L55/04D . . [N: specially adapted for protecting instruments from water hammer or vibrations]
- F16L55/045 . . specially adapted to prevent or minimise the effects of water hammer
- F16L55/05 . . . Buffers therefor ([accumulators F15B1/04](#))
- F16L55/052 . . . . Pneumatic reservoirs [[N0309](#)]
- F16L55/053 . . . . . the gas in the reservoir being separated from the fluid in the pipe [[N0309](#)]
- F16L55/054 . . . . . the reservoir being placed in or around the pipe from which it is separated by a sleeve-shaped membrane [[N0309](#)]
- F16L55/055 . . . Valves therefor
- F16L55/07 . Arrangement or mounting of devices, e.g. valves, for venting or aerating or draining (arrangement of draining devices in water supply systems [E03B7/08](#); apparatus for draining [F16K](#), [F16T](#); venting or aerating devices per se [F16K24/00](#))
- F16L55/09 . Air conditioning, e.g. de-watering, in pneumatic systems (in general [F24](#))
- F16L55/10 . Means for stopping flow from or in pipes or hoses ([F16L29/00](#), [F16L37/28](#) take precedence; valves [F16K](#))
- F16L55/10C . . [N: by introduction of paste, powder, particles, or the like]
- F16L55/10D . . [N: Couplings closed automatically when broken]
- F16L55/10F . . [N: Soluble closing devices]
- F16L55/10G . . [N: Couplings closed automatically when disengaging force exceeds preselected value ([F16L55/10D](#) takes precedence)]
- F16L55/10L . . [N: Pivoting closing devices]
- F16L55/10M . . [N: Fluid cut-off devices automatically actuated]
- F16L55/10P . . [N: Fire protection devices (in general [A62C](#))]

F16L55/103	. . . by temporarily freezing liquid sections in the pipe [N0309]
F16L55/105	. . . Closing devices introduced radially into the pipe or hose
F16L55/11	. . . Plugs [N: (F16L55/128 takes precedence)] [C0309]
F16L55/11B	. . . . [N: fixed by screwing or by means of a screw-threaded ring]
F16L55/11D	. . . . [N: glued or welded]
F16L55/11G	. . . . [N: fixed by rotating a limited amplitude]
F16L55/11J	. . . . [N: fixed by means of balls]
F16L55/11L	. . . . [N: the plug being made of elastic material]
F16L55/115	. . . Caps [N: (F16L55/128C takes precedence)] [C0309]
F16L55/115B	. . . . [N: fixed by screwing or by means of a screw-threaded ring]
F16L55/115D	. . . . [N: fixed by rotating a limited amplitude]
F16L55/115G	. . . . [N: using hooks, pawls, or other movable or insertable locking members]
F16L55/12	. . . by introducing into the pipe a member expandable in situ (inflatable cut-off valves F16K7/10)
F16L55/124	. . . . introduced radially into the pipe or hose
F16L55/128	. . . . introduced axially into the pipe or hose
F16L55/128B	. . . . . [N: Plugging pig]
F16L55/128C	. . . . . [N: The closing device being a cap]
F16L55/13	. . . . . the closure device being a plug fixed by plastic deformation [N0309]
F16L55/132	. . . . . the closure device being a plug fixed by radially deforming the packing
F16L55/134	. . . . . . by means of an inflatable packing [N0309]
F16L55/136	. . . . . the closure device being a plug fixed by radially expanding or deforming a split ring, hooks or the like
F16L55/16	. . . Devices for covering leaks in pipes or hoses, e.g. hose-menders
F16L55/16D	. . . [N: by means of a by-pass conduit]
F16L55/16F	. . . [N: by replacement of the damaged part of the pipe]
F16L55/16G	. . . [N: by means of a plug]
F16L55/16J	. . . [N: the material forming the pipe or hose being self-sealing]
F16L55/162	. . . from inside the pipe [N: (F16L55/16G takes precedence)]
F16L55/163	. . . . a ring, a band or a sleeve being pressed against the inner surface of the pipe [N0309]
F16L55/164	. . . . a sealing fluid being introduced in the pipe [N0309]
F16L55/1645	. . . . a sealing material being introduced inside the pipe by means of a tool moving in the pipe [N0310]
F16L55/1645B	. . . . . [N: a part of the tool defining, together with the inner wall of the pipe, an enclosed space into which sealing material is injected] [N0310]
F16L55/165	. . . . a pipe [N: or flexible liner] being inserted in the damaged section [N: protection against corrosion: F16L58/10]
F16L55/165B	. . . . . [N: the flexible liner being everted]
F16L55/165D	. . . . . [N: the flexible liner being pulled into the damaged section]
F16L55/165D2	. . . . . . [N: and being pressed into contact with the pipe by a tool which moves inside along the pipe]
F16L55/165D4	. . . . . . [N: and being inflated]
F16L55/165F	. . . . . [N: a pipe being formed inside the old pipe by winding strip-material]

- F16L55/165H . . . . [N: materials for flexible liners (hoses in general [F16L11/00](#))]
- F16L55/165J . . . . [N: lengths of rigid pipe being inserted ([F16L55/165L](#) takes precedence)]
- F16L55/165L . . . . [N: the old pipe being ruptured prior to insertion of a new pipe]
- F16L55/168 . . from outside the pipe
- F16L55/168B . . . [N: by means of a patch which is fixed on the wall of the pipe by means of an adhesive, a weld or the like]
- F16L55/168D . . . [N: by winding a tape]
- F16L55/17 . . . by means of rings, bands or sleeves pressed against the outside surface of the pipe or hose (hose-clips for connecting hoses to rigid members [F16L33/02](#))
- F16L55/17B . . . . [N: with a substantially radial tightening member]
- F16L55/17D . . . . [N: the ring or the sleeve being tightened by a wedge section]
- F16L55/17G . . . . [N: the ring or the sleeve being tightened by hooks, pawls, or other movable members (coupling of the quick-acting type [F16L37/12](#))]
- F16L55/172 . . . . the ring, band or sleeve being tightened by a tangentially arranged threaded pin and a nut
- F16L55/172B . . . . . [N: in which the threaded pin is rigid with the hose encircling member]
- F16L55/175 . . . by using materials which fill a space around the pipe before hardening
- F16L55/178 . . . by clamping an outer gasket against a joint with sleeve or socket
- F16L55/179 . . specially adapted for bends, branch units, branching pipes or the like; [N: Tools [F16L55/26B](#)] [N0309]
- F16L55/18 . Appliances for use in repairing pipes ([F16L55/10](#) takes precedence; [N: pigs or moles [F16L55/26](#)] [C9701])
- F16L55/24 . Preventing accumulation of dirt or other matter in the pipes, e.g. by traps, by strainers [N: (preventing accumulation in pneumatic conveyers [B65G53/52B](#))]
- F16L55/26 . Pigs or moles, i.e. devices movable in a pipe or conduit with or without self-contained propulsion means (tunnel railway systems [B61B13/10](#); conveying articles through pipes or tubes, e.g. tube mail systems, [B65G51/00](#))
- F16L55/26B . . [N: specially adapted for work at or near a junction between a main and a lateral pipe] [N9701]

### Note

Pigs or moles specially adapted for particular applications are classified in the relevant places for the applications, e.g.

- stopping flow from or in pipes or hoses [F16L55/12](#);
- repairing pipes [F16L55/18](#);
- applying liquids or other fluent materials to the inside of tubes [B05C7/08](#);
- cleaning pipes or tubes or systems of pipes or tubes [B08B9/02](#);
- welding or cutting [B23K37/02](#);
- earth drilling [E21B](#);
- [N: separating products [F17D3/08](#)];
- cleaning chimneys [F23J3/02](#);
- cleaning internal or external surfaces of heat-exchange or heat-transfer conduits [F28G](#);
- measuring, testing [G01](#);
- inspection of vessels in nuclear reactors [G21C17/003](#);
- inspection or maintenance of pipe-lines or tubes in nuclear installations [G21C17/017](#);

- installing electric, or combined optical and electric, cables or lines  
[H02G](#).

[N: **Note**

In groups [F16L55/26](#) to [F16L55/48](#), the indexing codes of R16L101:00 to R16L101:70 are added

]

- F16L55/28 . . . Constructional aspects
- F16L55/30 . . . . of the propulsion means, e.g. towed by cables
- F16L55/32 . . . . . being self-contained
- F16L55/34 . . . . . the pig or mole being moved step by step
- F16L55/36 . . . . . jet driven
- F16L55/38 . . . . . driven by fluid pressure
- F16L55/40 . . . . of the body
- F16L55/42 . . . . . gelled or degradable
- F16L55/44 . . . . . expandable
- F16L55/46 . . . Launching or retrieval of pigs or moles
- F16L55/48 . . . Indicating the position of the pig or mole in the pipe or conduit

#### **F16L57/00**

**Protection of pipes or objects of similar shape against external or internal damage or wear** ([N: protection under water [F16L1/12A](#)]; supporting of pipes inside other pipes or sleeves [F16L7/00](#); used in connection with end fittings of hoses [F16L35/00](#); protection thereof during transport [B65D](#), e.g. [B65D59/00](#); [N: for steam boilers [F22B37/10H](#)])

- F16L57/00D . . [N: specially adapted for the ends of pipes]
- F16L57/02 . . against cracking or buckling [[N0309](#)]
- F16L57/04 . . against fire or other external sources of extreme heat [[N0309](#)]
- F16L57/06 . . against wear ([F16L57/04](#) takes precedence) [[N0309](#)]

#### **F16L58/00**

**Protection of pipes or pipe fittings against corrosion or incrustation** (supporting of pipes inside other pipes or sleeves [F16L7/00](#); compound tubes [F16L9/14](#); cleaning pipes or tubes [B08B9/02](#))

- F16L58/02 . . by means of internal or external coatings (coatings for thermal insulation [F16L59/00](#); methods or machines for applying coatings see the relevant classes, e.g. [B28B21/00](#))
- F16L58/04 . . . Coatings characterised by the materials used ([F16L58/16](#) takes precedence; compositions, see the relevant classes, e.g. [C04B](#))
- F16L58/06 . . . . by cement, concrete, or the like
- F16L58/08 . . . . by metal
- F16L58/10 . . . . by rubber or plastics
- F16L58/10B . . . . . [N: the coating being placed inside the pipe]
- F16L58/10B2 . . . . . [N: the protective layer being fixed by means of anchoring devices]

- F16L58/10B4 . . . . . [N: the coating being a sprayed layer]
- F16L58/10B6 . . . . . [N: the coating being a preformed pipe ([F16L58/10B4](#) takes precedence)]
- F16L58/10B8 . . . . . [N: the coating being an extruded or a fused layer]
- F16L58/10C . . . . . [N: the coating being placed outside the pipe]
- F16L58/10C2 . . . . . [N: the coating being a sheet wrapped around the pipe]
- F16L58/10C4 . . . . . [N: the coating being a sprayed layer]
- F16L58/10C6 . . . . . [N: the coating being a preformed pipe]
- F16L58/10C8 . . . . . [N: the coating being an extruded layer]
- F16L58/12 . . . . . by tar or bitumen
- F16L58/14 . . . . . by ceramic or vitreous materials
- F16L58/16 . . . . . the coating being in the form of a bandage ([apparatus for covering cores by winding B65H81/00](#))
  
- F16L58/18 . . . . . specially adapted for pipe fittings [N: (non-disconnectible joints of coated pipes [F16L13/02F](#); screw joints for coated pipes comprising pipes with collars or flanges [F16L19/02H](#))]
- F16L58/18A . . . . . [N: for non-disconnectible pipe joints (in general [F16L13/00](#))]
- F16L58/18B . . . . . [N: for screw-threaded joints (in general [F16L15/00](#))]
- F16L58/18C . . . . . [N: for joints in which sealing surfaces are pressed together by means of a member, e.g. a swivel nut, screwed on or into one of the joint parts (in general [F16L19/00](#))]
- F16L58/18D . . . . . [N: for joints with sleeve or socket (in general [F16L21/00](#))]
- F16L58/18E . . . . . [N: for flanged joints (in general [F16L23/00](#))]
- F16L58/18F . . . . . [N: for branching pipes; for joining pipes to walls (in general [F16L41/00](#))]
  
- F16L59/00** **Thermal insulation in general**(heat, sound insulation in buildings[E04B](#); heat insulation of steam engines[F01B31/08](#); [N: thermal or acoustic isolation for combustion engines [F02B77/11](#)]; heat insulation in rotary piston machines[F01C21/06](#); heat insulation of pumps[F04C29/04](#); thermal insulation of pressure vessels[F17C1/12](#); vessels not under pressure, with provision for insulation[F17C3/02](#))
  
- F16L59/02 . . . . . Shape or form of insulating materials, with or without coverings integral with the insulating materials (chemical aspects see the relevant classes)
- F16L59/02B . . . . . [N: comprising a single piece or sleeve, e.g. split sleeve, two half sleeves]
- F16L59/02B2 . . . . . [N: with a single slit] [N0904]
- F16L59/02B2B . . . . . [N: with a hinge opposite the slit] [N0904]
- F16L59/02B4 . . . . . [N: composed of two half sleeves] [N0904]
- F16L59/02B6 . . . . . [N: with more than two segments] [N0904]
- F16L59/02C . . . . . [N: Mattresses, mats, blankets or the like]
- F16L59/02D . . . . . [N: Bands, cords, strips or the like for helically winding around a cylindrical object]
- F16L59/02F . . . . . [N: Composition or method of fixing a thermally insulating material]
- F16L59/02G . . . . . [N: layered]
  
- F16L59/04 . . . . . Arrangements using dry fillers, e.g. using slag wool [N: which is added to the object to be insulated by pouring, spreading, spraying or the like]
  
- F16L59/06 . . . . . Arrangements using an air layer or vacuum

- F16L59/065 . . . using vacuum ([F16L59/075 takes precedence](#)) [N0309]
- F16L59/07 . . . the air layer being enclosed by one or more layers of insulation [N0309]
- F16L59/075 . . . the air layer or the vacuum being delimited by longitudinal channels distributed around the circumference of a tube [N0309]
  
- F16L59/08 . Means for preventing radiation, e.g. with metal foil
  
- F16L59/10 . Bandages or covers for the protection of the insulation, e.g. against the influence of the environment or against mechanical damage ([integral with the insulation materials F16L59/02](#))
  
- F16L59/10D . . [N: Rigid covers for tee pieces]
- F16L59/10F . . [N: Flexible covers for flanges, junctions, valves or the like]
- F16L59/11 . . Rigid covers for elbows [N0309]
  
- F16L59/12 . Arrangements for supporting insulation from the wall or body insulated, e.g. by means of spacers between pipe and heat-insulating material; Arrangements specially adapted for supporting insulated bodies [N: ([pipe supports allowing movement in axial direction F16L3/18](#))]
  
- F16L59/12F . . [N: for pipes passing through walls or partitions ([in general F16L5/00](#))]
- F16L59/12H . . [N: Anchoring devices; Fixing arrangements for preventing the relative longitudinal displacement of an inner pipe with respect to an outer pipe, e.g. stress cones]
  
- F16L59/125 . . Helical spacers [N0309]
- F16L59/13 . . Resilient supports [N0309]
- F16L59/135 . . Hangers or supports specially adapted for insulated pipes [N0309]
  
- F16L59/14 . Arrangements for the insulation of pipes or pipe systems ([F16L59/02 to F16L59/12 take precedence](#))
  
- F16L59/14B . . [N: in which the temperature of the medium is below that of the ambient temperature ([rigid pipes of wood F16L9/00D](#); [vacuum insulation F16L59/06C](#))]
  
- F16L59/14F . . [N: Pre-insulated pipes]
- F16L59/14H . . [N: providing fire-resistance ([in general F16L57/00B](#))]
- F16L59/147 . . the insulation being located inwardly of the outer surface of the pipe
- F16L59/15 . . for underground pipes [N0309]
- F16L59/153 . . for flexible pipes
- F16L59/16 . . Arrangements specially adapted to local requirements at flanges, junctions, valves or the like ([means in or on valves for heating or cooling F16K49/00](#))
  
- F16L59/16D . . . [N: Housings for valves, tee pieces, or the like]
- F16L59/16H . . . [N: Branch units ([in general F16L41/02](#)); Insulation forming a whole with branches]
- F16L59/16J . . . [N: Repairing insulated pipes]
- F16L59/16L . . . [N: covering the end of an insulated section]
- F16L59/16N . . . [N: Flexible insulating material or covers for flanges, junctions, valves or the like]
  
- F16L59/18 . . . adapted for joints
- F16L59/18B . . . . [N: Joints in which sealing surfaces are pressed together by means of a member, e.g. a swivel nut, screwed on or into one of the joint parts ([in general F16L19/00](#))]
- F16L59/18D . . . . [N: Joints with sleeve or socket ([in general F16L21/00](#))]



F16L59/18G	. . . .	[N: Flanged joints (in general <a href="#">F16L23/00</a> )]
F16L59/18J	. . . .	[N: Adjustable joints, joints allowing movement (in general <a href="#">F16L27/00</a> )]
F16L59/18L	. . . .	[N: Arrangements for connecting hoses to one another, to flexible sleeves or to rigid members (in general <a href="#">F16L31/00</a> , <a href="#">F16L33/00</a> )]
F16L59/18N	. . . .	[N: Couplings of the quick-acting type (in general <a href="#">F16L37/00</a> )]
F16L59/20	. . . .	for non-disconnectable joints
F16L59/21	. . .	adapted for expansion-compensation devices [N: (in general <a href="#">F16L51/00</a> )] [N0309]
F16L59/22	. . .	adapted for bends