CPC  COOPERATIVE PATENT CLASSIFICATION

F  MECHANICAL ENGINEERING; LIGHTING; HEATING; WEAPONS; BLASTING
(NOTE omitted)

ENGINEERING IN GENERAL

F16  ENGINEERING ELEMENTS AND UNITS; GENERAL MEASURES FOR PRODUCING AND MAINTAINING EFFECTIVE FUNCTIONING OF MACHINES OR INSTALLATIONS; THERMAL INSULATION IN GENERAL

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

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:
   - A61M 39/00  Tube connectors, tube couplings or branch units, specially adapted for medical use
   - B05B 1/20  Perforated pipes
   - B66T 17/04  (Arrangement of piping or air hoses in brake systems)
   - B63B 35/03  Pipe-laying vessels
   - B64D 39/04  Adaptation of hose constructions for refuelling aircraft during flight
   - [B65G 51/00]  (Conveying articles through pipes or tubes by fluid flow or pressure)
   - [B65G 53/00]  (Conveying materials in bulk through pipes or tubes)
   - B67D 7/38  Arrangements of hoses in apparatus for transferring liquids, e.g. fuel, from bulk to vehicles or portable containers

   - E01D 19/10  Fastening of pipes or cables to bridges
   - E03B  Water supply installations
   - E03D 11/17  Means for connecting water-closet bowls to the flushing pipe
   - E03D 11/18  Siphons for water-closets
   - E03F 3/04  Pipes or fittings specially adapted to sewers
   - E04D 13/08  Down pipes for roof drainage; Clamping means therefor
   - E04F 17/00  Vertical ducts, channels in buildings, e.g. chimneys
   - E21F 1/04  Air ducts for ventilation of mines or tunnels; Connections therefor
   - E21F 17/02  Suspension devices for tubes or the like in mines or tunnels
   - F01N  Gas flow silencers or exhaust apparatus for machines or engines
   - [F16B 7/00]  (Connections of rods or tubes)
   - F16N 21/00  Conduits, junctions for lubrication systems
   - F17C 3/02  Thermal insulation of vessels not under pressure for storing liquefied or solidified gases, e.g. Dewar flask
   - [F17D]  (Pipe-line systems, pipe-lines)
   - F22B 37/10  Water tubes of steam boilers
   - F23J 13/04  Joints, connections for chimneys or flues
   - F23H 9/12  Connecting circulation pipes to heaters
   - F28F 9/04  Arrangements for sealing elements into header boxes or end plates of heat-exchangers
   - G21C 15/22  Structural association of coolant tubes with headers or other pipes in nuclear reactors
   - H02G 3/04  Protective tubing or conduits for electric cables
   - H02G 3/26  Installations of electric cables or lines, or protective tubing on or in walls,ceilings or floors.

WARNINGS

1. The following IPC groups are not in the CPC scheme. The subject matter for these IPC groups is classified in the following CPC groups:
   - F16L 19/03  covered by  F16L 19/0212
   - F16L 59/05  covered by  F16L 59/021
   - F16L 101/14  covered by  F16L 2101/10

2. In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.
Laying or reclaiming pipes; Repairing or joining pipes on or under water

1/00 Laying or reclaiming pipes; Repairing or joining pipes on or under water
1/024 . Laying or reclaiming pipes on land, e.g. above the ground (F16L 1/12 takes precedence)
1/0243 . [above ground (F16L 1/026 takes precedence)]
1/0246 . . . [at a certain height off the ground]
1/026 . . . in or on a frozen surface
1/028 . . . in the ground (F16L 1/026 takes precedence)
1/032 . . . the pipes being continuous (F16L 1/038 takes precedence)
1/036 . . . the pipes being composed of sections of short length (F16L 1/038 takes precedence)
1/038 . . . the pipes being made in situ
1/06 . . . Accessories therefor, e.g. anchors
1/065 . . . [fixed on or to vehicles]
1/09 . . . for bringing two tubular members closer to each other
1/10 . . . for aligning
1/11 . . . for the detection or protection of pipes in the ground
1/12 . . Laying or reclaiming pipes on or under water
1/123 . . . (Devices for the protection of pipes under water)
1/126 . . . (on or close to the surface)
1/14 . . . between the surface and the bottom
1/15 . . . vertically
1/16 . . . on the bottom
1/161 . . . [the pipe being composed of sections of short length]
1/163 . . . [by varying the apparent weight of the pipe during the laying operation]
1/165 . . . [by towing the pipe on or near the bottom]
1/166 . . . [Reclaiming pipes]
1/168 . . . [under ice]
1/18 . . . the pipes being S- or J-shaped and under tension during laying
1/19 . . . the pipes being J-shaped
1/20 . . . Accessories therefor, e.g. floats, weights
1/201 . . . [Anchor rods]
1/202 . . . [fixed on or to vessels]
1/203 . . . [the pipes being wound spirally prior to laying]
1/205 . . . [Pipe-laying ships (F16L 1/225, F16L 1/23 and F16L 1/235 take precedence)]
1/206 . . . [Apparatus for forming or coating the pipes]
1/207 . . . [Pipe handling apparatus]
1/225 . . . Stingers
1/23 . . . Pipe tensioning apparatus
1/235 . . . Apparatus for controlling the pipe during laying
1/24 . . . Floats; Weights
1/26 . . . Repairing or joining pipes on or under water
1/265 . . . [Underwater vehicles moving on the bottom]

Supports for pipes, cables or protective tubing, e.g. hangers, holders, clamps, cleats, clips, brackets (anchors for holding pipes on or under the ground F16L 1/06; (sound-damping supports F16L 55/035; supports for insulated pipes F16L 59/135))

3/00 Supports for pipes, cables or protective tubing, e.g. hangers, holders, clamps, cleats, clips, brackets (anchors for holding pipes on or under the ground F16L 1/06; (sound-damping supports F16L 55/035; supports for insulated pipes F16L 59/135))
3/003 . . . [devices for holding the open end of a hose]
3/006 . . . [for pipes with a rectangular cross-section]
3/01 . . . for supporting or guiding the pipes, cables or protective tubing, between relatively movable points, e.g. movable channels
3/012 . . . [using reels (cores for coiled material, e.g. reels, in general B65H 75/00)]
3/015 . . . using articulated- or supple-guiding elements
3/02 . . . partly surrounding the pipes, cables or protective tubing (bands or chains F16L 3/14)
3/04 . . . and pressing it against a wall or other support
3/06 . . . with supports for wires
3/08 . . . substantially surrounding the pipe, cable or protective tubing
3/085 . . . [for pipes being in an angled relationship to each other]
3/10 . . . divided, i.e. with two [or more] members engaging the pipe, cable or protective tubing
3/1008 . . . [with two members engaging the pipe, cable or tubing, both being made of thin band material completely surrounding the pipe (F16L 3/1033 takes precedence)]
3/1016 . . . [the members being joined by means of two screws]
3/1025 . . . [the members being joined by quick acting means]
3/1033 . . . [with two members engaging the pipe, cable or tubing, the two members being joined only on one side of the pipe]
3/1041 . . . [and being adapted to accommodate pipes of various diameters]
3/105 . . . [one member carrying a substantially radial tightening element]
3/1058 . . . [one member being flexible or elastic]
3/1066 . . . [with three or more members surrounding the pipe]
3/1075 . . . [with two members, the two members being joined with a hinge on one side and fastened together on the other side]
3/1083 . . . [with two members, the two members being hooked on in one side and fastened together on the other side]
3/1091 . . . [with two members, the two members being fixed to each other with fastening members on each side]
3/11 . . . and hanging from a pendant (F16L 3/14 takes precedence)
3/12 . . . comprising a member substantially surrounding the pipe, cable or protective tubing
3/1203 . . . [with a pair of arms moved automatically to a closed position by overcenter spring]
3/1207 . . . [the ends of the member and the fixing elements being placed on both sides of the pipe]
3/1211 . . . [with a substantially-radial tightening or securing member]
3/1215 . . . [the pipe being fixed by rotation of an element]
3/1218 . . . [the pipe being only supported and not fixed]
3/1222 . . . [the member having the form of a closed ring, e.g. used for the function of two adjacent pipe sections]
3/1226 . . . [elongated supports, e.g. to support a curved pipe]
3/123 . . . and extending along the attachment surface
3/1233 . . . [the member being of metal, with or without another layer of other material]
3/1236 . . . [the member being of a material other than metal]
... and extending away from the attachment surface
3/13 . . . and engaging it by snap action { (F16L 3/1203 takes precedence) }
3/133 . . . and hanging from a pendant { (E16L 3/14 takes precedence) }
3/137 . . . and consisting of a flexible band
3/14 . Hangers in the form of bands or chains
3/16 . with special provision allowing movement of the pipe { (E16L 3/01 takes precedence; supporting pipes or cables inside other pipes or sleeves F16L 7/00) }
3/18 . . . allowing movement in axial direction
3/20 . . . allowing movement in transverse direction
3/202 . . . the transverse movement being converted to a rotational movement { (F16L 3/215 takes precedence) }
3/205 . . . having supporting springs
3/2053 . . . { [the axis of each spring being parallel with the direction of the movement of the pipe] }
3/2056 . . . { [the axis of at least one spring being oblique or perpendicular to the direction of the movement of the pipe] }
3/21 . . . providing constant supporting spring force
3/215 . . . the movement being hydraulically or electrically controlled
3/217 . . . hydraulically
3/22 . specially adapted for supporting a number of parallel pipes at intervals
3/221 . . . { [having brackets connected together by means of a common support] }
3/222 . . . { [having single supports directly connected together] }
3/223 . . . each support having one transverse base for supporting the pipes { (F16L 3/23; F16L 3/237 take precedence) }
3/2235 . . . { [each pipe being supported by a common element fastened to the base] }
3/227 . . . each pipe being supported by a separate element fastened to the base
3/23 . . . for a bundle of pipes or a plurality of pipes placed side by side in contact with each other { (E16L 3/237 takes precedence) }
3/233 . . . by means of a flexible band
3/2332 . . . { [having a single plastic locking barb] }
3/2334 . . . { [the barb having a plurality of serrations] }
3/2336 . . . { [having two or more locking bars { (F16L 3/2338 takes precedence) ] }
3/2338 . . . { [having at least one metal locking barb] }
3/237 . . . for two pipes
3/24 . . . with a special member for attachment to profiled girders

**WARNING**


**WARNING**


All groups listed in this Warning should be considered in order to perform a complete search.

3/2431 . . . { [the special member being inserted in the profiled girder] }

**WARNING**

Group F16L 3/245 is incomplete pending reclassification of documents from group F16L 3/24.

Groups F16L 3/245 and F16L 3/24 should be considered in order to perform a complete search.

3/26 . . . specially adapted for supporting the pipes all along their length, e.g. pipe channels or ducts { (channels for electric cables formed by wire H02G 3/0443) }

5/00 Devices for use where pipes, cables or protective tubing pass through walls or partitions { (passing insulated pipes through walls F16L 5/9/121; arrangements for leading electric cables or lines through walls, floors or ceilings H02G 3/22) }

5/02 . Sealing

**NOTE**


5/022 . . . { [by welding] }
5/025 . . . { [the pipe being movable (F16L 5/10 takes precedence) ] }
5/027 . . . { [by means of a joint of the quick-acting type] }
5/04 . . . to form a firebreak device
5/06 . . . by means of a swivel nut compressing a ring or sleeve
5/08 . . . by means of axial screws compressing a ring or sleeve
5/10 . . . by using sealing rings or sleeves only
5/12 . . . the pipe being cut in two pieces
5/14 . . . for double-walled or multi-channel pipes

7/00 Supporting of pipes or cables inside other pipes or sleeves, e.g. for enabling pipes or cables to be inserted or withdrawn from under roads or railways without interruption of traffic (sleeves for supporting pipes, cables or protective tubing, between relatively movable points F16L 3/01, [fixation devices of optical cables in ducts G02B 6/508, installation of electric cables H02G 1/08])

7/02 . . . and sealing the pipes or cables inside the other pipes, cables or sleeves

**Pipes**

9/00 Rigid pipes
**Pipes**

9/003. [with a rectangular cross-section (ducting arrangements in air-conditioning or ventilation F24F 13/03)]

9/006. [specially profiled (F16L 9/003 takes precedence)]

9/01. of wood (F16L 9/16 - F16L 9/22 take precedence)

9/02. of metal (F16L 9/16 - F16L 9/22 take precedence)

9/04. . Reinforced pipes

9/042. . . . [the reinforcement comprising one or more layers of a helically wound cord, wire or strip (F16L 9/047 takes precedence)]

9/045. . . . [using profiled strips]

9/047. . . . [comprising reinforcement rings]

9/06. . . Corrugated pipes

9/08. . of concrete, cement, or asbestos cement, with or without reinforcement (F16L 9/16 - F16L 9/22 take precedence)

9/085. . . . [Reinforced pipes]

9/10. . of glass or ceramics, e.g. clay, clay tile, porcelain (F16L 9/16 - F16L 9/22 take precedence)

9/105. . . . [of glass]

9/12. . of plastics with or without reinforcement (F16L 9/16 - F16L 9/22 take precedence)

9/121. . . . [with three layers]

9/123. . . . [with four layers]

9/125. . . . [electrically conducting]

9/127. . . . the walls consisting of a single layer

9/128. . . . Reinforced pipes

9/133. . . . the walls consisting of two layers

9/14. . Compound tubes, i.e. made of materials not wholly covered by any one of the preceding groups (F16L 9/16 - F16L 9/22 take precedence)

9/147. . . . comprising only layers of metal and plastics with or without reinforcement

9/153. . . . comprising only layers of metal and concrete with or without reinforcement

9/16. . wound from sheets or strips, with or without reinforcement

9/165. . . . [of metal]

9/17. . obtained by bending a sheet longitudinally and connecting the edges

9/18. . Double-walled pipes; Multi-channel pipes or pipe assemblies

9/19. . . Multi-channel pipes or pipe assemblies

9/20. . . . [Pipe assemblies]

9/21. . made of sound-absorbing materials or with sound-absorbing structure

9/22. . Pipes composed of a plurality of segments

11/00 Hoses, i.e. flexible pipes

11/005. . [consisting completely or partially of material other than fibres, plastics or metal]

11/02. . made of fibres or threads, e.g. of textile (which may or may not be impregnated, or provided with an impermeable layer, e.g. fire-hoses)

11/04. . made of rubber or flexible plastics

11/042. . . [formed by bending a sheet and connecting the edges (covers for the protection of the insulation F16L 59/10; rigid pipes F16L 9/17)]

11/045. . . . [with four or more layers without reinforcement]

2011/047 . . . . [with a diffusion barrier layer]

11/06. . with homogeneous wall (F16L 11/11 takes precedence)

11/08. . . . with reinforcements embedded in the wall (F16L 11/11 takes precedence)

11/081. . . . [comprising one or more layers of a helically wound cord or wire (in combination with braided layers F16L 11/088)]

11/082. . . . [two layers]

11/083. . . . . [three or more layers]

11/085. . . . [comprising one or more braided layers (in combination with layers of a helically wound core or wire F16L 11/088)]

11/086. . . . [two layers]

11/087. . . . [three or more layers]

11/088. . . . [comprising a combination of one or more layers of a helically wound cord or wire with one or more braided layers]

11/10. . with reinforcements not embedded in the wall (F16L 11/11 takes precedence)

11/11. . with corrugated wall ([F16L 11/11 takes precedence])

11/111. . . [with homogeneous wall]

11/112. . . having reinforcements embedded in the wall

11/115. . . having reinforcements not embedded in the wall

11/118. . . having arrangements for particular purposes, e.g. electrically conducting

11/1185. . . . [electrically conducting]

11/12. . with arrangements for particular purposes, e.g. specially profiled, with protecting layer, heated, electrically conducting (F16L 11/11 takes precedence)

11/121. . . . [specially profiled cross sections]

11/122. . . . [Hoses provided with integrated fixing means, e.g. hooks]

11/124. . . . [Distinguishing marks for hoses]

11/125. . . . [non-inflammable or heat-resistant hoses]

11/127. . . . electrically conducting

11/133. . . . buoyant

11/14. . made of rigid material, e.g. metal or hard plastics

11/15. . corrugated (F16L 11/16 takes precedence)

11/16. . wound from profiled strips or bands

11/18. . Articulated hoses, e.g. composed of a series of rings

11/20. . Double-walled hoses , i.e. two concentric hoses

11/22. . Multi-channel hoses

11/24. . wound from strips or bands (F16L 11/16 takes precedence)

11/26. . made of sound-absorbing materials or with sound-absorbing structure

**Pipe joints; Hose nipples** ([hose connections for pneumatic tyre valves B60C 29/066;} special adaptations of pipe joints for use with watercloset bowls E03D 11/13; (for steam boilers F22B 37/107)]

13/00 Non-disconnectible pipe-joints, e.g. soldered, adhesive or caulked joints (joints for rigid pipes of plastics F16L 47/00; (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 F16L 41/082)]

13/002. . . [for pipes having a rectangular cross-section]

13/004. [Shrunk pipe-joints]

13/007. [specially adapted for joining pipes of dissimilar materials ([joints between metal and plastic pipes F16L 47/24)]

13/013. . . Accessories therefor

13/02. . . Welded joints
Pipe joints; Hose nipples  

13/0209 [Male-female welded joints (F16L 13/0245 and F16L 13/0254 take precedence)]

13/0218 [having an inner or outer ring (F16L 13/0245 and F16L 13/0254 take precedence)]

13/0227 [having an inner ring]

13/0236 [having an outer ring]

13/0245 [with holes in the sleeve or spigot being filled with weld]

13/0254 [the pipes having an internal or external coating]

13/0263 [having an internal coating]

13/0272 [having an external coating]

13/0281 [cold welded (non-electric welding without the application of heat B23K 20/00)]

13/029 [for concrete pipes]

13/04 with arrangements for preventing overpressuring

13/06 with tension relief of the weld by means of detachable members, e.g. divided tension rings, bolts in flanges

13/08 Soldered joints (specially adapted for connecting metal hoses to rigid members F16L 33/26)

13/10 Adhesive or cemented joints

13/103 Adhesive joints (for hoses F16L 33/34)

13/106 Tools

13/11 using materials which fill the space between parts of a joint before hardening

13/113 for concrete pipes

13/116 for socket pipes

13/12 with a seal made of lead, caulked packing, or the like

13/122 for male-female connections (F16L 13/124 and F16L 13/126 take precedence)

13/124 for concrete pipes

13/126 Attachments

13/128 Tools

13/14 made by plastically deforming the material of the pipe, e.g. by flanging, rolling

13/141 by crimping or rolling from the outside

13/142 with a sealing element inserted into the female part before crimping or rolling

13/143 with a sealing element placed around the male part before crimping or rolling

2013/145 Tools specially adapted therefor

13/146 by an axially movable sleeve

13/147 by radially expanding the inner part (F16L 13/168 and E21B 43/103 take precedence)

13/148 specially designed to ensure an intended leakage until correct deformation

13/16 the pipe joint consisting of overlapping extremities having mutually co-operating collars

13/161 the pipe or collar being deformed by crimping or rolling

13/163 one collar being bent over the other

13/165 the pipe or collar being deformed by an axially movable sleeve

13/166 Deformed by radially expanding an inner part (F16L 13/168 takes precedence)

13/168 [for screw threaded pipes (E21B 43/103 takes precedence)]

15/00 Screw-threaded joints (hose connections with parts screwed directly on or into the hose F16L 33/24; joining pipes to wall F16L 41/00); Forms of screw-threads for such joints

15/001 with conical threads

15/002 with more then one threaded section

15/003 with sealing rings

15/004 with axial sealings having at least one plastically deformable sealing surface (with sealing rings F16L 15/003)

15/005 for thin-walled pipes having at least their extremities deformed so as to have the shape of screw-threads

15/006 with straight threads

15/007 with more than one threaded section

15/008 with sealing rings

15/009 with axial sealings having at least one plastically deformable sealing surface (with sealing rings F16L 15/008)

15/01 allowing substantial longitudinal adjustment by use of a long screw-threaded part

15/02 with additional sealings

15/04 characterised by the shape of the screw-thread

15/06 with supplementary elements (F16L 15/04, F16L 41/00 and F16L 43/02 take precedence)

17/00 Joints with packing adapted to sealing by fluid pressure

17/020 with sealing rings arranged between outer surface of pipe and inner surface of sleeve or socket

17/025 the sealing rings having radially directed ribs

17/03 having annular axial lips

17/032 the sealing rings having only one lip

17/035 the sealing rings having two lips parallel to each other

17/04 with longitudinally split or divided sleeve

17/06 with sealing rings arranged between the end surfaces of the pipes or flanges or arranged in recesses in the pipe ends or flanges

17/063 forming a whole with the pipe or joint (screw-threaded joint F16L 15/06)

17/067 Plastics sealing rings

17/073 the sealing rings having two lips parallel to each other

17/08 Metal sealing rings

17/10 the packing being sealed by the pressure of a fluid other than the fluid in or surrounding the pipe

19/00 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 (screw-threaded joints F16L 15/00; F16L 17/00 takes precedence; if using bolts or equivalent connecting means F16L 25/00; electrically insulating F16L 25/02; adjustable joints, joints allowing movement F16L 27/00; specially adapted for pipes of brittle material F16L 49/00)

19/005 comprising locking means for the threaded member (locking of screws or nuts per se F16B 39/00)

19/02 Pipe ends provided with collars or flanges, integral with the pipe or not, pressed together by a screwed member

19/0206 the collar not being integral with the pipe

19/0212 using specially adapted sealing means

19/0218 comprising only sealing rings

19/0225 without sealing rings
Pipe joints; Hose nipples

19/0231 . . . (with specially adapted means for positioning the threaded member behind the collar)
19/0237 . . . (specially adapted for use with attachments, e.g. reduction units, T-pieces, bends or the like (branch units per se F16L 41/02; bends per se F16L 43/00; pipe units with cleaning aperture per se F16L 45/00))
19/0243 . . . (specially adapted for use with coated pipes)
19/025 . . . the pipe ends having integral collars or flanges
19/028 . . . the collars or flanges being obtained by deformation of the pipe wall
19/0283 . . . (and having a bell-mouthed shape)
19/0286 . . . (and being formed as a flange)
19/04 . . . using additional rigid rings, sealing directly on at least one pipe end, which is flared either before or during the making of the connection
19/041 . . . (the ring being an insert (F16L 19/043 takes precedence))
19/043 . . . (with additional sealing means)
19/045 . . . (consisting of cutting edges on one of the connecting parts which penetrate into the wall of the pipe)
19/046 . . . (consisting of a soft ring)
19/048 . . . (specially adapted for use with attachments, e.g. reduction units, T-pieces, bends or the like (branch units per se F16L 41/02; bends per se F16L 43/00; pipe units with cleaning aperture per se F16L 45/00))
19/05 . . . with a rigid pressure ring between the screwed member and the exterior of the flared pipe end
19/055 . . . (the pressure ring being rotatably connected to the threaded member)
19/06 . . . in which radial clamping is obtained by wedging action on non-deformed pipe ends
19/061 . . . (a pressure ring being arranged between the clamping ring and the threaded member or the connecting member)
19/062 . . . (specially adapted for use with attachments, e.g. reduction units, T-pieces, bends or the like (branch units per se F16L 41/02; bends per se F16L 43/00; pipe units with cleaning aperture per se F16L 45/00))
19/063 . . . (by means of conical threaded surfaces)
19/065 . . . the wedging action being effected by means of a ring
19/0653 . . . (the ring being rotatably connected to one of the connecting parts)
19/0656 . . . (integral with one of the connecting parts)
19/07 . . . adapted for use in socket or sleeve connections
19/075 . . . (specially adapted for spigot-and-socket joints (for pipes of the same diameter)
19/08 . . . with metal rings which bite into the wall of the pipe (F16L 19/045 takes precedence)
19/083 . . . (the longitudinal cross-section of the ring not being modified during clamping)
19/086 . . . (with additional sealing means)
19/10 . . . the profile of the ring being altered
19/103 . . . (with more than one ring per pipe end being used)
19/106 . . . (the ring comprising a shoulder against which the pipe end abuts)
19/12 . . . (with additional sealing means

19/14 . . . (the rings being integral with one of the connecting parts

21/00 Joints with sleeve or socket (F16L 13/00, (F16L 15/00), F16L 17/00, F16L 19/00, (F16L 25/0027, F16L 27/00, F16L 37/00) take precedence ; (specially adapted to be made of plastics or to be used with pipes made of plastics F16L 47/06; specially adapted for pipes of brittle material F16L 49/02))
21/002 . . . (Sleeves or nipples for pipes of the same diameter; Reduction pieces (with elastic sealing rings F16L 21/022))
21/005 . . . (made of elastic material, e.g. partly or completely surrounded by clamping devices (comprising packing adapted to sealing by fluid pressure F16L 17/04, F16L 11/20; hose clips F16L 33/00))
21/007 . . . (clamped by a wedging action)
21/02 . . . with elastic sealing rings between pipe and sleeve or between pipe and socket, e.g. with rolling or other prefabricated profiled rings (F16L 21/06, F16L 21/08 take precedence ; sealing ring with radial ribs F16L 17/025; sealing ring with axial lips F16L 17/013; if adjustability is essential F16L 27/00)
21/022 . . . (used with sleeves or nipples for pipes of the same diameter, or with reduction pieces (F16L 21/025 takes precedence))
21/025 . . . Rolling sealing rings
21/03 . . . placed in the socket before connection ((F16L 21/022, F16L 21/025 take precedence)
21/035 . . . placed around the spigot end before connection ((F16L 21/022, F16L 21/025 take precedence)
21/04 . . . in which sealing rings are compressed by axially-movable members ((for joints using a threaded member F16L 19/07; quick acting couplings F16L 37/00; devices for covering leaks from inside a pipe F16L 55/162))
21/045 . . . (the members passing through the sealing rings)
21/05 . . . comprising a first ring being placed on a male part and a second ring in the sleeve or socket
21/06 . . . with a divided sleeve or ring clamping around the pipe-ends (flanged joints F16L 23/00; couplings of the quick-acting type F16L 37/00)
21/065 . . . (tightened by tangentially-arranged threaded pins)
21/08 . . . with additional locking means ((F16L 17/035, F16L 17/04, F16L 21/04), F16L 21/06 take precedence; (screwed joints F16L 19/08; couplings of the quick-acting type F16L 37/00))
23/00 Flanged joints (F16L 13/00, F16L 17/00, F16L 19/00 take precedence; adjustable joints F16L 27/00; for hoses F16L 33/00; couplings of the quick-acting type F16L 37/00; for double-walled or multi-channel pipes or assemblies F16L 39/00; connecting arrangements or other fittings specially adapted to be made of plastics or to be used with pipes made of plastics F16L 47/00; specially adapted for pipes of brittle material pipe F16L 49/00)
23/003 . . . (Auxiliary devices)
23/006 . . . (Attachments)
23/002 . . . (the flanges being connected by members tensioned axially (F16L 23/12 takes precedence)
Pipe joints; Hose nipples

23/024 . . . characterised by how the flanges are joined to, or form an extension of, the pipes
23/026 . . . by welding
23/028 . . . the flanges being held against a shoulder
23/0283 . . . [the collar being integral with the pipe]
23/0286 . . . [the shoulder not being formed from the pipe]
23/032 . . . characterised by the shape or composition of the flanges
23/036 . . . characterised by the tensioning members, e.g. specially adapted bolts or C-clamps
23/04 . . . the flanges being connected by members tensioned in the radial plane (F16L 23/12 takes precedence)
23/06 . . . connected by toggle-action levers (quick acting couplings tightened by toggle-action levers F16L 37/20)
23/08 . . . connection by tangentially arranged pin and nut
23/10 . . . with a pivoting or swinging pin
23/12 . . . specially adapted for particular pipes
23/125 . . . [with an internal or external coating]
23/14 . . . for rectangular pipes
23/16 . . . characterised by the sealing means
23/162 . . . [the pin ends abutting each other]
23/165 . . . [comprising a viscous mass, e.g. hardenable]
23/167 . . . [in connection with the appearance or detection of leaks]
23/18 . . . the sealing means being rings
23/20 . . . made exclusively of metal
23/22 . . . made exclusively of a material other than metal
23/24 . . . specially adapted for unequal expansion of the parts of the joint

25/00 Constructive types of pipe joints not provided for in groups F16L 13/00 - F16L 23/00 (adjustable or allowing movement F16L 27/00; with fluid cut-off means F16L 29/00; quick-acting F16L 37/00; for double-walled or multi-channel pipes F16L 39/00; connecting arrangements or other fittings specially adapted to be made of plastics or to be used with pipes made of plastics F16L 47/00; specially adapted for pipes of brittle material F16L 49/00) ; Details of pipe joints not otherwise provided for, e.g. electrically conducting or insulating means

25/0009 Joints for pipes with a square or rectangular cross-section
25/0018 Abutment joints
25/0027 Joints for pipes made of reinforced concrete
25/0036 Joints for corrugated pipes
25/0045 of the quick-acting type
25/0054 with specially shaped sealing rings
25/0063 with two corrugated pipes being directly connected to each other
25/0072 Joints for pipes of dissimilar materials (non-disconnectable joints for pipes of dissimilar materials F16L 13/007 joints between metal and plastic pipes F16L 47/24)]
25/0081 Pipe joints comprising a liquid or fusible seal
25/009 Combination of a quick-acting type coupling and a conventional one
25/01 specially adapted for realising electrical conduction between the two pipe ends of the joint or between parts thereof
25/02 Electrically insulating joints or couplings
25/021 [for screw-threaded joints]

25/023 [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]
25/025 [for joints with sleeve or socket]
25/026 [for flanged joints]
25/028 [for branching pipes, for joining pipes to walls]
25/03 in non-disconnectable pipe joints
25/04 comprising a collar or ring having a threaded pin rigid with the pipe-encircling member
25/06 comprising radial sealing means
25/065 [the locking means being acted upon by radial screws]
25/08 in the form of screws, nails or the like
25/10 Sleeveless joints between two pipes, one being introduced into the other
25/12 Joints for pipes being spaced apart axially
25/14 Joints for pipes of different diameters or cross-section

27/00 Adjustable joints, Joints allowing movement (of the quick-acting type F16L 37/22; for double-walled or multi-channel pipe assemblies F16L 39/04; connecting arrangements or other fittings specially adapted to be made of plastics or to be used with pipes made of plastics F16L 47/00; connecting arrangements specially adapted for pipes of brittle material F16L 49/00)]
27/02 Universal joints, i.e. with mechanical connection allowing angular movement or adjustment of the axes of the parts in any direction
27/023 Universal and rotating joints
27/026 Universal and axially displacable joints
27/04 with partly spherical engaging surfaces
27/042 comprising two pipes normally at right angles to each other
27/044 specially adapted for tubing between vehicles
27/047 held in place by a screwed member having an internal spherical surface
27/053 held in place by bolts passing through flanges
27/06 with special sealing means between the engaging surfaces
27/067 the sealing means being actuated by the medium pressure
27/073 one of the cooperating surfaces forming the sealing means
27/078 allowing adjustment or movement only about the axis of one pipe
27/0804 the fluid passing axially from one joint element to another
27/0808 the joint elements extending coaxially for some distance from their point of separation
27/0812 [with slide bearings]
27/0816 [having radial sealing]
27/082 [having axial sealing]
27/0824 [with ball or roller bearings]
27/0828 [having radial bearings (connections of quick-acting couplings maintained by balls or rollers under radial pressure F16L 37/22)]
27/0832 [having axial bearings]
27/0837 [the joint elements being bends]
27/0841 forming an angle of less than 90 degrees
27/0845 forming an angle of 90 degrees
Pipe joints; Hose nipples

F16L

27/0849 . . [the fluid being turned through an angle when passing from one joint element to another)
27/0853 . . [with spherical hinge]
27/0857 . . [with hinge and bellows sealing]
27/0861 . . [Arrangements of joints with one another and with pipes or hoses]
27/0865 . . [between vehicles]
27/087 . . Joints with radial fluid passages
27/093 . . of the "banjo" type, i.e. pivoting right-angle couplings
27/10 . . comprising a flexible connection only (e.g. for damping vibrations)
27/1004 . . [introduced in exhaust pipes for hot gases]
27/1008 . . [comprising a swivel nut or collar engaging the pipe]
27/1012 . . [Flanged joints]
27/1017 . . [Joints with sleeve or socket]
27/1021 . . [comprising an intermediate resilient element, e.g. a ring]
27/1025 . . [Abutment joints]
27/103 . . [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]
27/107 . . the ends of the pipe being interconnected by a flexible sleeve
27/108 . . the sleeve having the form of a bellows with only one corrugation
27/1085 . . . [the bellows being externally or internally reinforced]
27/11 . . the sleeve having the form of a bellows with multiple corrugations
27/111 . . . the bellows being reinforced
27/113 . . . the ends of the pipe being interconnected by a rigid sleeve
27/1133 . . . [the sleeve being longitudinally divided]
27/1136 . . . [the sleeve comprising a screwed member]
27/12 . . allowing substantial longitudinal adjustment or movement (by use of screw-thread F16L 15/02)

WARNING
Group F16L 27/12 is impacted by reclassification into groups F16L 27/127, F16L 27/1273, F16L 27/1274, F16L 27/1275, and F16L 27/12751. All groups listed in this WARNING should be considered in order to perform a complete search.

27/125 . . [having longitudinal and rotary movement]

WARNING
Group F16L 27/125 is impacted by reclassification into groups F16L 27/127, F16L 27/1273, F16L 27/1274, F16L 27/1275, and F16L 27/12751. All groups listed in this WARNING should be considered in order to perform a complete search.

27/127 . . [with means for locking the longitudinal adjustment or movement in the final mounted position]

WARNING
Groups F16L 27/127, F16L 27/1273, F16L 27/1274, F16L 27/1275, and F16L 27/12751 are incomplete pending reclassification of documents from groups F16L 27/12 and F16L 27/125. All groups listed in this WARNING should be considered in order to perform a complete search.

27/1273 . . . [by quick-acting means]
27/1274 . . . [by means of a swivel nut]
27/1275 . . . [by means of at least an external threaded bolt]
27/12751 . . . . . [the threaded bolt extending longitudinally]

29/00 Joints with fluid cut-off means (quick-acting joints with cut-off means (F16L 37/28)
29/002 . . [joints with taps (taps in general F16K 5/00)]
29/005 . . [joints with cut-off devices which can be perforated (cut-off devices with a breakable closure member in general F16K 13/04)]
29/007 . . [Joints with cut-off devices controlled separately (takes precedence; operating means for cut-off devices in general F16K 31/00)]
29/02 . . with a cut-off device in one of the two pipe ends, the cut-off device being automatically opened when the coupling is applied
29/04 . . with a cut-off device in each of the two pipe ends, the cut-off devices being automatically opened when the coupling is applied

31/00 Arrangements for connecting hoses to one another or to flexible sleeves (F16L 33/00 takes precedence)
31/02 . . for branching hoses

33/00 Arrangements for connecting hoses to rigid members; Rigid hose connectors, i.e. single members engaging both hoses
33/003 . . [comprising elements arranged in the hose walls]
33/006 . . [for hoses of plastics other than artificial rubber]
33/01 . . adapted for hoses having a multi-layer wall
33/02 . . Hose-clips
33/021 . . . [with the ends bent around each other]
33/023 . . . [fixed by bending one end of the strap]
33/025 . . . tightened by deforming radially extending loops or folds
33/03 . . Self-locking elastic clips
33/035 . . fixed by means of teeth or hooks
33/04 . . tightened by tangentially-arranged threaded pin and nut
33/06 . . . in which the threaded pin is rigid with the hose-encircling member
33/08 . . . in which a worm coacts with a part of the hose-encircling member that is toothed like a worm-wheel
33/085 . . . . [with a scroll-type screw]
33/10 . . . with a substantially-radial tightening member
33/12 . . . with a pivoted or swinging tightening or securing member, e.g. toggle lever
33/14 . . . with a tapping-bolt, i.e. winding up the end of the hose-encircling member
33/16 . . . with sealing or securing means using fluid pressure
Pipe joints; Hose nipples

33/18 . . . . . . characterised by the use of additional sealing means
33/20 . . . Undivided rings, sleeves or like members contracted on the hose or expanded in the hose by means of tools; Arrangements using such members
33/207 . . . . only a sleeve being contracted on the hose
33/2071 . . . . [the sleeve being a separate connecting member]
33/2073 . . . . . . [directly connected to the rigid member]
33/2075 . . . . . . [by quick acting]
33/2076 . . . . . . [by plastic deformation]
33/2078 . . . . . . [connected to the rigid member via an intermediate element]
33/213 . . . . only a sleeve being expanded inside the hose
33/22 . . . . with means not mentioned in the preceding groups for gripping the hose between inner and outer parts
33/221 . . . . [the external piece comprising segments hingedly connected to an interior part]
33/222 . . . . [the external piece comprising segments pressed against the hose by wedge shaped elements]
33/223 . . . . [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]
33/224 . . . . [a clamping ring being arranged between the threaded member and the connecting member]
33/225 . . . . [a sleeve being movable axially]
33/226 . . . . . [the sleeve being screwed over the hose]
33/227 . . . . [the hose being introduced into or onto the connecting member and automatically locked (F16L 37/084 takes precedence)]
33/228 . . . . [a flexible wire being coiled upon the hose]
33/23 . . . . the outer parts being segmented, the segments being pressed against the hose by tangentially arranged members
33/24 . . . . with parts screwed directly on or into the hose (F16L 33/22 takes precedence)
33/245 . . . . [the inner or outer part being moulded in situ]
33/26 . . . . specially adapted for hoses of metal
33/28 . . . . for hoses with one end terminating in a radial flange or collar
33/30 . . . . comprising parts inside the hoses only (F16L 33/24 takes precedence)
33/32 . . . . comprising parts outside the hoses only (F16L 33/24 takes precedence)
33/34 . . . . with bonding obtained by vulcanisation, gluing, melting, or the like
35/00 Special arrangements used in connection with end fittings of hoses, e.g. safety or protecting devices
35/005 . . . . [Nozzles]
37/00 Couplings of the quick-acting type (radially binding sleeves F16L 17/04, F16L 21/06; connecting hoses to rigid members F16L 33/00; connections made automatically when vehicles are brought together B60D, B61G; specially adapted for lubricating devices F16N 21/00)
37/002 . . . . [which can be controlled at a distance]
37/004 . . . . [using magnets]
37/006 . . . . [plug-cocks]
37/008 . . . . [for branching pipes; for joining pipes to walls]
37/00 . . . in which the connection is maintained only by friction of the parts being joined (F16L 37/22 takes precedence)
37/025 . . . . [with an inner elastic part pressed against an outer part by reason of its elasticity]
37/04 . . . with an elastic outer part pressing against an inner part by reason of its elasticity (with locking members F16L 37/08)
37/05 . . . . . tightened by the pressure of a mechanical element
37/06 . . . . . tightened by fluid pressure
37/08 . . . . in which the connection between abutting or axially overlapping ends is maintained by locking members (F16L 37/22 - F16L 37/26 take precedence)
37/082 . . . . [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]
37/084 . . . . combined with automatic locking
37/0841 . . . . . [by means of a transversally slidable locking member surrounding the tube]
37/0842 . . . . . [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]
37/0844 . . . . . [by means of a ring pivoting so as to lie against the tube]
37/0845 . . . . . [by means of retaining members associated with the packing member]
37/0847 . . . . . [by means of hooks (F16L 37/096, F16L 37/098 take precedence)]
37/0848 . . . . . [rocking freely]
37/086 . . . . by means of latching members pushed radially by spring-like elements
37/088 . . . . by means of a split elastic ring

WARNING
Group F16L 37/088 is impacted by reclassification into groups F16L 37/0885 and F16L 37/0887.
Groups F16L 37/088, F16L 37/0885, and F16L 37/0887 should be considered in order to perform a complete search.

Group F16L 37/0885 is incomplete pending reclassification of documents from group F16L 37/088.
Groups F16L 37/0885 and F16L 37/088 should be considered in order to perform a complete search.

37/0887 . . . . [with access to the split elastic ring from a radial or tangential opening in the coupling]

WARNING
Group F16L 37/0887 is incomplete pending reclassification of documents from group F16L 37/088.
Groups F16L 37/0887 and F16L 37/088 should be considered in order to perform a complete search.

37/091 . . . . by means of a ring provided with teeth or fingers
37/0915 . . . . [with a separate member for releasing the coupling]
Pipe joints; Hose nipples

37/092 . . . by means of elements wedged between the pipe and the frusto-conical surface of the body of the connector

**WARNING**

Group F16L 37/092 is impacted by reclassification into groups F16L 37/0926 and F16L 37/0927.

Groups F16L 37/092, F16L 37/0926, and F16L 37/0927 should be considered in order to perform a complete search.

37/0925 . . . [with rings which bite into the wall of the pipe]

**WARNING**

Group F16L 37/0925 is impacted by reclassification into groups F16L 37/0926 and F16L 37/0927.

Groups F16L 37/0925, F16L 37/0926, and F16L 37/0927 should be considered in order to perform a complete search.

37/0926 . . . [with an inner support sleeve arranged within the pipe]

**WARNING**

Group F16L 37/0926 is incomplete pending reclassification of documents from groups F16L 37/092 and F16L 37/0925.

Groups F16L 37/0926, F16L 37/0925, and F16L 37/0927 should be considered in order to perform a complete search.

37/0927 . . . [the wedge element being axially displaceable for releasing the coupling]

**WARNING**

Group F16L 37/0927 is incomplete pending reclassification of documents from groups F16L 37/092 and F16L 37/0925.

Groups F16L 37/0927, F16L 37/0925, and F16L 37/0926 should be considered in order to perform a complete search.

37/096 . . . by means of hooks hinged about an axis

37/098 . . . by means of flexible hooks

37/0982 . . . [with a separate member for releasing the coupling]

37/0985 . . . [the flexible hook extending radially inwardly from an outer part and engaging a bead, recess or the like on an inner part (F16L 37/0982 takes precedence)]

37/0987 . . . . . . [the flexible hook being progressively compressed by axial tensile loads acting on the coupling]

37/10 . . . using a rotary external sleeve or ring on one part

37/101 . . . [in which the coupling is coaxial with the pipe]

37/103 . . . [the connection being maintained by the eccentricity of the two parts of the joint]

37/105 . . . [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 discontinuously]

37/107 . . . Bayonet-type couplings

37/113 . . . the male part having lugs on its periphery penetrating into the corresponding slots provided in the female part

37/12 . . . using hooks, pawls or other movable or insertable locking members (F16L 37/084 takes precedence)

37/1205 . . . [using hooks hinged about an axis placed behind a flange and which act behind the other flange]

37/121 . . . [using freely rocking hooks (F16L 37/1215 takes precedence)]

37/1215 . . . [using hooks provided with a screw-thread adapted to engage and mesh with an appropriate corresponding part]

37/122 . . . [using hooks tightened by a wedge section]

37/1225 . . . [using a retaining member the extremities of which, e.g. in the form of a U, engage behind a shoulder of both parts]

37/123 . . . [using a retaining member in the form of a wedge]

37/1235 . . . [the connection taking place from inside the pipe]

37/124 . . . 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

37/127 . . . using hooks hinged about an axis

37/133 . . . using flexible hooks ((F16L 37/1215 takes precedence)

37/138 . . . using an axially movable sleeve

37/14 . . . Joints secured by inserting between mating surfaces an element, e.g. a piece of wire, a pin, a chain

37/142 . . . [where the securing element is inserted tangentially]

37/144 . . . . . . [the securing element being U-shaped]

37/146 . . . . . . [the securing element being a rigid pin, screw or the like]

37/148 . . . . . . [the securing element being flexible (F16L 37/144 takes precedence)]

37/15 . . . the element being a wedge

37/16 . . . Joints tightened by the action of a wedge-shaped hinged hooks

37/18 . . . Joints tightened by eccentrics or rotatable hooks

37/20 . . . Joints tightened by toggle-action levers

37/22 . . . in which the connection is maintained by means of balls, rollers or helical springs under radial pressure between the parts

37/23 . . . by means of balls

37/24 . . . in which the connection is made by inserting one member axially into the other and rotating it a limited extent, e.g. with bayonet action

37/242 . . . [in which the rotation takes place between the eccentric parts]

37/244 . . . the coupling being co-axial with the pipe
Pipe joints; Hose nipples

F16L

37/245 . . . (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)

37/248 . . . Bayonet-type couplings
37/252 . . . the male part having lugs on its periphery penetrating in the corresponding slots provided in the female part

37/256 . . . the coupling not being coaxial with the pipe
37/26 . . . in which the connection is made by transversely moving the parts together, with or without their subsequent rotation

37/28 . . . with fluid cut-off means
37/30 . . . with fluid cut-off means in each of two pipe-end fittings

37/32 . . . at least one of two lift valves being opened automatically when the coupling is applied
37/33 . . . the lift valves being of the ball type
37/34 . . . at least one of the lift valves being of the sleeve type, i.e. a sleeve is telescoped over an inner cylindrical wall

37/35 . . . at least one of the valves having an axial bore
37/36 . . . with two lift valves being actuated to initiate the flow through the coupling after the two coupling parts are locked against withdrawal

37/367 . . . with two gate valves or sliding valves
37/373 . . . with two taps or cocks
37/38 . . . with fluid cut-off means in only one of the two pipe-end fittings

37/40 . . . with a lift valve being opened automatically when the coupling is applied
37/407 . . . the lift valve being of the ball type
37/413 . . . the lift valve being of the sleeve type, i.e. a sleeve being telescoped over an inner cylindrical wall

37/42 . . . the valve having an axial bore communicating with lateral apertures
37/44 . . . with one lift valve being actuated to initiate the flow through the coupling after the two coupling parts are locked against withdrawal

37/46 . . . with a gate valve or sliding valve
37/47 . . . with a tap or cock
37/48 . . . for fastening a pipe on the end of a tap
37/50 . . . adjustable; allowing movement of the parts joined

37/505 . . . (allowing substantial longitudinal adjustment or movement (by means of screw-thread F16L 15/02))

37/52 . . . Universal joints, i.e. with a mechanical connection allowing angular movement or adjustment of the axes of the parts in any direction

37/53 . . . allowing adjustment or movement only about the axis of one pipe
37/54 . . . for pipes under pressure which are supported only on one side
37/56 . . . for double-walled or multi-channel pipes [or pipe assemblies]
37/565 . . . [Concentric pipes]

37/58 . . . the extremities of the two halves of the joint being pressed against each other without being locked in position
37/60 . . . with plug and fixed wall housing

37/62 . . . pneumatically or hydraulically actuated

37/69 . . . Joints or fittings for double-walled or multi-channel pipes or pipe assemblies
37/6905 . . . (for concentric pipes)
37/6902 . . . for hoses
37/6904 . . . allowing adjustment or movement {of the multiline swivel type F16L 39/006}
37/6906 . . . of the multiline swivel type, e.g. comprising a plurality of axially mounted modules

41/00 Branching pipes; Joining pipes to walls
(F16L 39/00 takes precedence ; characterised by couplings of the quick-acting type F16L 37/008; specially adapted to be made of plastics or to be used with pipes made of plastics F16L 47/26)

41/001 . . . [the wall being a pipe plate (details or component parts of steam super heaters F22G 3/00; heat exchangers F28)]
41/002 . . . [of concrete, cement or asbestos-cement]
41/004 . . . [Joining to walls at other than 90 degrees (F16L 41/02; F16L 41/008 take precedence)]
41/005 . . . [adjustable and comprising a hollow threaded part in an opening]
41/007 . . . [adjustable and comprising a bend]
41/008 . . . [for connecting a measuring instrument (connecting means for pressure measuring apparatus G01L 19/0007)]
41/01 . . . Branch units, e.g. made in one piece, welded, riveted
41/021 . . . (T- or cross-pieces (F16L 41/025, F16L 41/026, F16L 41/028 take precedence)]
41/023 . . . [Y-pieces (F16L 41/025, F16L 41/026, F16L 41/028 take precedence)]
41/025 . . . [with rectangular cross-section]
41/026 . . . [with a layer protecting against erosion]
41/028 . . . [of concrete, cement or asbestos-cement]
41/03 . . . comprising junction pieces for four or more pipe members
41/04 . . . Tapping pipe walls, i.e. making connections through the walls of pipes while they are carrying fluids; Fittings therefor
41/045 . . . [without removal of material (F16L 41/065 takes precedence)]
41/06 . . . making use of attaching means embracing the pipe
41/065 . . . [without removal of material]
41/08 . . . 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 (F16L 41/02 takes precedence)
41/082 . . . [Non-disconnectible joints, e.g. soldered, adhesive or caulked joints]
41/084 . . . [Soldered joints]
41/086 . . . [fixed with screws]
41/088 . . . [fixed using an elastic grommet between the extremity of the tube and the wall]
41/10 . . . the extremity of the pipe being screwed into the wall
41/12 . . . using attaching means embracing the pipe
41/14 . . . by screwing an intermediate part against the inside or outside of the wall (F16L 41/086 takes precedence)
41/16 . . . the branch pipe comprising fluid cut-off means
41/18 . . . the branch pipe being movable
43/00 Bends; Siphons (with cleaning apertures F16L 45/00)
43/001 . (made of metal)
43/002 . . [and formed from sheet having a circular passage]
43/003 . . [having a rectangular cross-section]
43/005 . . [Return bends (coiled tube furnaces for thermal non-catalytic cracking of hydrocarbon oils C10G 9/20)]
43/006 . . [telescopic]
43/007 . (made of concrete, cement or asbestos-cement)
43/008 . (made from plastic material)
43/02 . adapted to make use of special securing means

45/00 Pipe units with cleaning aperture and closure therefor
47/00 Connecting arrangements or other fittings specially adapted to be made of plastics or to be used with pipes made of plastics ((connections for hoses of plastics F16L 33/006])
47/005 . [the first pipe being joined to the ends of two other pipes placed one inside the other, e.g. gas pipe with protective sheath]
47/02 . Welded joints; Adhesive joints
47/03 . . Welded joints with an electrical resistance incorporated in the joint
47/04 . with a swivel nut or collar engaging the pipe

WARNING:
Group F16L 47/04 is impacted by reclassification into group F16L 47/041.
Groups F16L 47/04 and F16L 47/041 should be considered in order to perform a complete search.

47/041 . . [the plastic pipe end being flared either before or during the making of the connection]

WARNING:
Group F16L 47/041 is incomplete pending reclassification of documents from group F16L 47/04.
Groups F16L 47/041 and F16L 47/04 should be considered in order to perform a complete search.

47/06 . with sleeve or socket formed by or in the pipe end
47/065 . . [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]
47/08 . . with sealing rings arranged between the outer surface of one pipe end and the inner surface of the sleeve or socket, the sealing rings being placed previously in the sleeve or socket
47/10 . . . the sealing rings being maintained in place by additional means
47/12 . . with additional locking means
47/14 . Flanged joints
47/145 . . [for rectangular pipes]
47/16 . Screw-threaded joints
47/18 . Adjustable joints; Joints allowing movement
47/20 . based principally on specific properties of plastics
47/22 . . using shrink-down material
47/24 . . for joints between metal and plastics pipes

47/26 . . for branching pipes; for joining pipes to walls; Adaptors therefor
47/265 . . [Reduction units]
47/28 . 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
47/285 . . [with fluid cut-off means in the branching pipe]
47/30 . . . using attaching means embracing the pipe
47/32 . . Branch units, e.g. made in one piece, welded, riveted
47/34 . . Tapping pipes, i.e. making connections through walls of pipes while carrying fluids; Fittings therefor
47/345 . . . [making use of attaching means embracing the pipe]

49/00 Connecting arrangements, e.g. joints, specially adapted for pipes of brittle material, e.g. glass, earthenware
49/02 . Joints with a sleeve or socket
49/04 . Flanged joints
49/06 . 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
49/08 . Adjustable joints; Joints allowing movement

51/00 Expansion-compensation arrangements for pipelines (telescopic pipes F16L 27/12)
51/005 . . [for concrete pipe-lines]
51/02 . making use of bellows or an expansible folded or corrugated tube
51/021 . . [having a rectangular cross-section]
51/022 . . [with a single corrugation]
51/023 . . [consisting of flexible rings]
51/024 . . . [non-metallic (flexible pipe connections F16L 27/10)]
51/025 . . . [with several corrugations]
51/026 . . . [with interior reinforcement]
51/027 . . . [with external reinforcement]
51/028 . . . [with the expansion or contraction of each corrugation being limited]
51/029 . . . [consisting of flexible rings]
51/03 . . comprising two or more bellows
51/035 . . . [for cancelling the axial loading resulting from fluid pressure]
51/04 . . making use of bends, e.g. lyre-shaped

53/00 Heating of pipes or pipe systems; Cooling of pipes or pipe systems

WARNING:
Group F16L 53/00 is impacted by reclassification into groups F16L 53/70 and F16L 53/75.
Groups F16L 53/00, F16L 53/70, and F16L 53/75 should be considered in order to perform a complete search.

53/0 . . Heating of pipes or pipe systems
53/30 . . Heating of pipes or pipe systems
53/32 . . using hot fluids
53/34 . . using electric, magnetic or electromagnetic fields, e.g. using induction, dielectric or microwave heating
53/35 . . Ohmic-resistance heating
Pipe joints; Hose nipples

53/37 . . . the heating current flowing directly through the pipe to be heated
53/38 . . . using elongate electric heating elements, e.g. wires or ribbons
53/70 . . . Cooling of pipes or pipe systems

**WARNING**
Group F16L 53/70 is incomplete pending reclassification of documents from group F16L 53/00.
Groups F16L 53/00 and F16L 53/70 should be considered in order to perform a complete search.

53/75 . . . using cooling fins

**WARNING**
Group F16L 53/75 is incomplete pending reclassification of documents from group F16L 53/00.
Groups F16L 53/00 and F16L 53/75 should be considered in order to perform a complete search.

55/00 Devices or appurtenances for use in, or in connection with, pipes or pipe systems (the preceding groups and groups F16L 57/00, F16L 59/00 take precedence; repairing or joining pipes on or under water F16L 1/26; nozzles B05B; cleaning of pipes B08B 9/02; arrangements of draining devices for water main or service pipe systems E03B 7/08; devices for preventing bursting of water pipes by freezing E03B 7/10; devices for domestic plumbing installations E03C 9/14; steam traps for draining of liquids F16T, F16L 59/00; arrangements of draining devices (cleaning of)
55/005 . . . [Devices restraining ruptured tubes from whipping]
55/02 . . . Energy absorbers; Noise absorbers (in valves F16K 47/00)
55/027 . . . Throttle passages
55/02709 . . . [in the form of perforated plates]
55/02718 . . . [placed transversely]
55/02727 . . . [placed parallel to the axis of the pipe]
55/02736 . . . [using transversal baffles defining a tortuous path]
55/02745 . . . [by passing through a mass of particles or a porous member]
55/02754 . . . [using a central core throttling the passage]
55/02763 . . . [using an element with multiple tubes]
55/02772 . . . [using spirally or helically shaped channels]
55/02781 . . . [The regulating element being provided with radial outputs]
55/0279 . . . [The fluid flowing two or more times longitudinally in opposite directions, e.g. using parallel or concentric tubes]
55/033 . . . Noise absorbers (F16L 55/027 takes precedence)
55/0331 . . . [by inserting an elongated element in the pipe]
55/0332 . . . [by inserting a body of compressible material in the pipe]
55/0333 . . . [by means of an active system]
55/0335 . . . [by means of external rings]
55/0336 . . . [by means of sound-absorbing materials]
55/0337 . . . [by means of a flexible connection]
55/0338 . . . [by means of a membrane]
55/035 . . . in the form of specially adapted hangers or supports
55/04 . . . Devices damping pulsations or vibrations in fluids (F16L 55/02 takes precedence)
55/041 . . . [specially adapted for preventing vibrations (flexible pipe connections F16L 27/10)]
55/043 . . . [specially adapted for protecting instruments from water hammer or vibrations]
55/045 . . . specially adapted to prevent or minimise the effects of water hammer
55/05 . . . Buffers therefor
55/052 . . . . Pneumatic reservoirs
55/053 . . . . the gas in the reservoir being separated from the fluid in the pipe
55/054 . . . . the reservoir being placed in or around the pipe from which it is separated by a sleeve-shaped membrane
55/055 . . . . Valves therefor
55/07 . . . Arrangement or mounting of devices, e.g. valves, for venting or aerating or draining (apparatus for draining F16T)
55/09 . . . Air conditioning, e.g. de-watering, in pneumatic systems
55/10 . . . Means for stopping flow from or in pipes or hoses (F16L 29/00, F16L 37/28 take precedence; valves F16K)
55/1003 . . . [by introduction of paste, powder, particles, or the like]
55/1007 . . . [Couplings closed automatically when broken]
55/1011 . . . [Soluble closing devices]
55/1015 . . . [Couplings closed automatically when disengaging force exceeds preselected value (F16L 55/1007 takes precedence)]
55/1018 . . . [Pivoting closing devices]
55/1022 . . . [Fluid cut-off devices automatically actuated]
55/1026 . . . [Fire protection devices (in general A62C)]
55/103 . . . by temporarily freezing liquid sections in the pipe
55/105 . . . Closing devices introduced radially into the pipe or hose
55/11 . . . Plugs ((F16L 55/128 takes precedence)
55/1108 . . . [fixed by screwing or by means of a screw-threaded ring]
55/1116 . . . [glued or welded]
55/1125 . . . [fixed by rotating a limited amplitude]
55/1133 . . . [fixed by means of balls]
55/1141 . . . [the plug being made of elastic material]
55/115 . . . Caps ((F16L 55/1286 takes precedence)]
55/1152 . . . [fixed by screwing or by means of a screw-threaded ring]
55/1155 . . . [fixed by rotating a limited amplitude]
55/1157 . . . [using hooks, pawls, or other movable or insertable locking members]
55/12 . . . by introducing into the pipe a member expandable in situ (inflatable cut-off valves F16K 7/10)
55/124 . . . introduced radially into the pipe or hose
55/128 . . . introduced axially into the pipe or hose
55/1283 . . . [Plugging pig]
55/1286 . . . [The closing device being a cap]
55/13 . . . the closure device being a plug fixed by plastic deformation
55/132 . . . the closure device being a plug fixed by radially deforming the packing
Pipe joints; Hose nipples

55/134 . . . . by means of an inflatable packing
55/136 . . . . the closure device being a plug fixed by radially expanding or deforming a split ring, hooks or the like
55/16 . Devices for covering leaks in pipes or hoses, e.g. hose-menders
55/1604 . . [by means of a by-pass conduit]
55/1608 . . [by replacement of the damaged part of the pipe]
55/1612 . . [by means of a plug]
55/1616 . . [the material forming the pipe or hose being self-scaling]
55/162 . . . from inside the pipe ([F16L 55/1612 takes precedence])
55/163 . . . a ring, a band or a sleeve being pressed against the inner surface of the pipe
55/164 . . . a sealing fluid being introduced in the pipe (F16L 55/1645 takes precedence)
55/1645 . . . a sealing material being introduced inside the pipe by means of a tool moving in the pipe
55/16455 . . . [a part of the tool defining, together with the inner wall of the pipe, an enclosed space into which sealing material is injected]
55/165 . . . a pipe [or flexible liner] being inserted in the damaged section
55/1651 . . . [the flexible liner being everted]
55/1652 . . . [the flexible liner being pulled into the damaged section]
55/1653 . . . [and being pressed into contact with the pipe by a tool which moves inside along the pipe]
55/1654 . . . [and being inflated]
55/1655 . . . [a pipe being formed inside the old pipe by winding strip-material]
55/1656 . . . [materials for flexible liners (hoses in general F16L 11/00)]
55/1657 . . . [lengths of rigid pipe being inserted (F16L 55/1658 takes precedence)]
55/1658 . . . [the old pipe being ruptured prior to insertion of a new pipe]
55/168 . . . from outside the pipe
55/1683 . . . [by means of a patch which is fixed on the wall of the pipe by means of an adhesive, a weld or the like]
55/1686 . . . [by winding a tape]
55/17 . . . by means of rings, bands or sleeves pressed against the outside surface of the pipe or hose
55/1705 . . . [with a substantially radial tightening member]
55/171 . . . [the ring or the sleeve being tightened by a wedge section]
55/1715 . . . [the ring or the sleeve being tightened by hooks, paws, or other movable members (coupling of the quick-acting type F16L 37/12)]
55/172 . . . the ring, band or sleeve being tightened by a tangentially arranged threaded pin and a nut
55/1725 . . . [in which the threaded pin is rigid with the hose encircling member]
55/175 . . . by using materials which fill a space around the pipe before hardening
55/178 . . . by clamping an outer gasket against a joint with sleeve or socket
55/179 . . . specially adapted for bends, branch units, branching pipes or the like
55/18 . Appliances for use in repairing pipes (F16L 55/10 takes precedence)
55/24 . Preventing accumulation of dirt or other matter in the pipes, e.g. by traps, by strainers
55/26 . Pigs or moles, i.e. devices movable in a pipe or conduit with or without self-contained propulsion means

NOTES

1. 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 F16L 55/12
   • repairing pipes F16L 55/18
   • applying liquids or other fluent materials to the inside of tubes B05C 7/08
   • cleaning pipes or tubes or systems of pipes or tubes B08B 9/02
   • welding or cutting B23K 37/02
   • earth drilling E21B
   • separating products F17D 3/08
   • cleaning chimneys F23J 3/02
   • cleaning internal or external surfaces of heat-exchange or heat-transfer conduits F28G
   • measuring, testing G01
   • inspection of vessels in nuclear reactors G21C 17/003
   • inspection or maintenance of pipeline systems in nuclear installations G21C 17/001
   • cleaning pipes or tubes in nuclear installations G21C 17/001
   • earth drilling E21B
   • cleaning chimneys F23J 3/02
   • cleaning internal or external surfaces of heat-exchange or heat-transfer conduits F28G
   • measuring, testing G01
   • inspection of vessels in nuclear reactors G21C 17/003
   • inspection or maintenance of pipeline systems in nuclear installations G21C 17/001
   • cleaning pipes or tubes in nuclear installations G21C 17/001

2. In this group, it is desirable to add the indexing codes of group F16L 2101/00.

55/265 . . . [specially adapted for work at or near a junction between a main and a lateral pipe]
55/28 . . . Constructional aspects
55/30 . . . of the propulsion means, e.g. towed by cables
55/32 . . . being self-contained
55/34 . . . the pig or mole being moved step by step
55/36 . . . jet driven
55/38 . . . driven by fluid pressure
55/40 . . . of the body
55/42 . . . gelled or degradable
55/44 . . . expandable
55/46 . . . Launching or retrieval of pigs or moles
55/48 . . . Indicating the position of the pig or mole in the pipe or conduit

57/00 Protection of pipes or objects of similar shape against external or internal damage or wear ([protection under water F16L 1/123] supporting of pipes inside other pipes or sleeves F16L 7/00; used in connection with end fittings of hoses F16L 35/00; protection thereof during transport B65D 59/00)
57/005 . . [specially adapted for the ends of pipes]
57/02 . . against cracking or buckling
57/04 . . against fire or other external sources of extreme heat
57/06 . . against wear (F16L 57/04 takes precedence)

58/00 Protection of pipes or pipe fittings against corrosion or incrustation (compound tubes F16L 9/14)
58/02 . . by means of internal or external coatings
Pipe joints; Hose nipples

58/04 . . . Coatings characterised by the materials used (F16L. 58/16 takes precedence)
58/06 . . . by cement, concrete, or the like
58/08 . . . by metal
58/10 . . . by rubber or plastics
58/1009 . . . [the coating being placed inside the pipe]
58/1018 . . . [the protective layer being fixed by means of anchoring devices]
58/1027 . . . [the coating being a sprayed layer]
58/1036 . . . [the coating being a preformed pipe (F16L. 58/1027 takes precedence)]
58/1045 . . . [the coating being an extruded or a fused layer]
58/1054 . . . [the coating being placed outside the pipe]
58/1063 . . . [the coating being a sheet wrapped around the pipe]
58/1072 . . . [the coating being a sprayed layer]
58/1081 . . . [the coating being a preformed pipe]
58/109 . . . [the coating being an extruded layer]
58/12 . . . by tar or bitumen
58/14 . . . by ceramic or vitreous materials
58/16 . . . the coating being in the form of a bandage
58/18 . . . specially adapted for pipe fittings
58/181 . . . [for non-disconnectible pipe joints (in general F16L. 13/00)]
58/182 . . . [for screw-threaded joints (in general F16L. 15/00)]
58/184 . . . [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 F16L. 19/00)]
58/185 . . . [for joints with sleeve or socket (in general F16L. 21/00)]
58/187 . . . [for flanged joints (in general F16L. 23/00)]
58/188 . . . [for branching pipes; for joining pipes to walls (in general F16L. 41/00)]

59/00 Thermal insulation in general
59/02 . . . Shape or form of insulting materials, with or without coverings integral with the insulating materials (chemical aspects see the relevant classes)
59/021 . . . [comprising a single piece or sleeve, e.g. split sleeve, two half sleeves]
59/022 . . . [with a single slit]
59/023 . . . [with a hinge opposite the slit]
59/024 . . . [composed of two half sleeves]
59/025 . . . [with more than two segments]
59/026 . . . [Mattresses, mats, blankets or the like]
59/027 . . . [Bands, cords, strips or the like for helically winding around a cylindrical object]
59/028 . . . [Composition or method of fixing a thermally insulting material]
59/029 . . . [layered]
59/04 . . . Arrangements using dry fillers, e.g. using slag wool [which is added to the object to be insulated by pouring, spreading, spraying or the like]
59/06 . . . Arrangements using an air layer or vacuum
59/065 . . . using vacuum (F16L. 59/075 takes precedence)
59/07 . . . the air layer being enclosed by one or more layers of insulation
59/075 . . . the air layer or the vacuum being delimited by longitudinal channels distributed around the circumference of a tube
59/08 . . . Means for preventing radiation, e.g. with metal foil
59/10 . . . 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 F16L. 59/02)
59/103 . . . [Rigid covers for tee pieces]
59/106 . . . [Flexible covers for flanges, junctions, valves or the like]
59/11 . . . Rigid covers for elbows
59/12 . . . 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
59/121 . . . [for pipes passing through walls or partitions]
59/123 . . . [Anchoring devices; Fixing arrangements for preventing the relative longitudinal displacement of an inner pipe with respect to an outer pipe, e.g. stress cones]
59/125 . . . Helical spacers
59/13 . . . Resilient supports
59/135 . . . Hangers or supports specially adapted for insulated pipes
59/14 . . . Arrangements for the insulation of pipes or pipe systems (F16L. 59/02. F16L. 59/12 take precedence)
59/141 . . . [in which the temperature of the medium is below that of the ambient temperature (rigid pipes of wood F16L. 90/06; vacuum insulation F16L. 59/065)]
59/143 . . . [Pre-insulated pipes]
59/145 . . . [providing fire-resistance (in general F16L. 57/04)]
59/147 . . . the insulation being located inwardly of the outer surface of the pipe
59/15 . . . for underground pipes
59/153 . . . for flexible pipes
59/16 . . . Arrangements specially adapted to local requirements at flanges, junctions, valves or the like
59/161 . . . [Housings for valves, tee pieces, or the like]
59/163 . . . [Branch units (in general F16L. 41/02); Insulation forming a whole with branches]
59/165 . . . [Repairing insulated pipes]
59/166 . . . [covering the end of an insulated section]
59/168 . . . [Flexible insulating material or covers for flanges, junctions, valves or the like]
59/18 . . . adapted for joints
59/181 . . . [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 F16L. 19/00)]
59/182 . . . [Joints with sleeve or socket (in general F16L. 21/00)]
59/184 . . . [Flanged joints (in general F16L. 23/00)]
59/185 . . . [Adjustable joints, joint allowing movement (in general F16L. 27/00)]
59/187 . . . [Arrangements for connecting hoses to another, to flexible sleeves or to rigid members (in general F16L. 31/00, F16L. 33/00)]
59/188 . . . [Couplings of the quick-acting type (in general F16L. 37/00)]
59/20 . . . for non-disconnectable joints
59/21 . . . adapted for expansion-compensation devices
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