SP PIPE

SP INSTALLATION INSTRUCTIONS

The updated installation instructions detailed in this guide are intended to replace the manufacturer's installation instructions of March 1991.

The guide is based on the cumulative know-how developed over the years at SP installations around the world. The instructions reflect more than a decade of experience at actual building sites. An entire new section of the guide has been added to cover SP press fittings with pressing sleeves, an outstandingly durable and highly reliable pipe connector technology.

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1---GENERAL INFORMATION

A. SP is a rigid pipe that can be shaped and bent (somewhat like copper pipe). The pipe is currently made in the following diameters:

PIPE	OUTER DIAMETER	PIPE THICKNESS	INNER DIAMETER	COMMENT
16 X 2	16 mm	2 mm	12 mm	Equivalent to ½"
20 X 2	20 mm	2 mm	16 mm	Equivalent to ¾"
25 X 2.5	25 mm	2.5 mm	20 mm	Equivalent to 1"
32 X 3	32 mm	3 mm	26 mm	Equivalent to 1 ¼"

B. The maximum allowable working pressure is 10 bar, at a maximum temperature of 95^{o} C.

C. SP is supplied in different colors for easier identification and marking (there is no difference in the qualities of the pipe in the various colors, except that the black pipe is specially adapted for installations with exposure to sunlight).

Recommended uses:

ORANGE: Hot water and central heating systems.

BLUE: Cold water.

BLACK: Installations exposed to sunlight, like solar heating systems; also suitable for hot and cold water in covered systems.

WHITE: Radiator heating systems or under-the-floor systems and exposed indoor installations.

Any of these pipes (all colors) may be used for compressed air systems.

Note: These uses for the colors, excluding black, are recommendations only.

D. SP pipes comes in rolls of standard lengths: 50 or 100 meters.

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E. Identifying marks: SP pipes are marked every meter as follows:

[meter in length] [production date] [DD x dd] [P –95^{o}C 10 bar] [PEX AL\PEX] [SP METZERPLAS]

DD = outer diameter dd = pipe thickness

In addition, the following symbols appear:

- Israel Standards Institute symbol
- METZERPLAS logo

F. The SP piping system includes all the necessary end fittings and connectors required for installation of water, heating, compressed air, or solar systems, etc.

G. All the threaded fittings use standard BSP threading.

H. Use only original fittings supplied by METZERPLAS via the authorized distributor. Use of any other fittings voids the manufacturer's warranty on the pipe.

The manufacturer supplies two types of fittings:

- Threaded fittings (see Sections 7, 8, 9, and 10 below);
- Press fittings with pressing sleeve, which are fitted using a special pressure tool (see Sections 3, 4, 5 and 6 below).

Different kinds of fittings should not be used within the same dwelling, except in exposed installations like water meters, central controls, connections to hot water tanks, and so forth.

The manufacturer's service people are available to provide consultation and instructions to users, regarding both general installation and use, and inspection at building sites during installation and final testing.

For more information, contact the manufacturer as noted on the last page of this guide.

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1--METZERPLAS provides a 10-year warranty for pipes and fittings installed in accordance with the instructions in this guide by manufacturer-authorized personnel, as detailed in the manufacturer's letter of warranty, which may be obtained from the manufacturer or the distributor.

> **Note:** Any installation done not in accordance with the instructions provided in this manufacturer's installation guide and/or any use of fittings other than those specified in this guide will void the manufacturer's warranty. The manufacturer is not responsible for any damage resulting from incorrect installation or use.

2---PIPE STORAGE

Rolls of SP pipe and SP fittings should be kept in a storeroom or shed. They should not (except for black SP) be exposed to sunlight for longer than one day.

Store the pipefittings in bags, a separate one for each type of fitting. The bags should be impermeable to dirt, contamination and sunlight.

3---INSTALLATION OF END FITTINGS

A. Threaded fittings

Each size of pipe has fittings appropriate for its diameter. Some diameters have two types of end fittings distinguished by different thread diameter.

For example: The 16 X 2 pipe has an end fitting with ½' threading and another with ¾" threading. Choose the appropriate one for the connection to be made, and avoid insofar as possible the use of additional fittings to match diameters for the connection.

B. Placement of end fittings

1... Cut SP pipe with blade at a 90^{o} angle to the longwise plane of the pipe.
2... Insert the short end of the reamer into the pipe with a twisting motion, rounding the opening and making inner phase with the 2 diagonal blades of the reamer.
3... Revolve the reamer clockwise into the pipe, as far as the line in the middle of the window. Check integrity of bevel and remove any waste material.
4... Insert tightening nut as illustrated. Mark a line using the XX measure from the table below and place the nut over the pipe end, the pipe should be inserted as far as this line. Moisten the tip of the insert and push it into the pipe with a turning motion taking care not to damage the seals. **Make sure to insert the pipe all the way to the marker line.**
5... This is how it should look before tightening.

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6... Place the required fitting on the outer seal of the insert and tighten with a suitable wrench.

End fitting	16 – ½”	16 – ¾”	20 – ¾”	25 – ¾”	25 – 1”
XX measure in mm	10	10	10	23	13.5

4---INSTALLATION OF HOT AND COLD WATER PLUMBING SYSTEMS

Threaded fittings

The installation method covers use of both single and double tap connectors. Central connectors supplied by the manufacturer may also be used, in accordance with designer’s instructions.

The pipe may be connected in one of two ways:

Covered installations (see Section 5).

Exposed installations (see Section 11).

Note: This pipe should not be used for grounding electricity.
Follow these instructions for either type of connection:

A. Avoid any damage to the outer layer of the pipe during installation.
Do not install a pipe if the outer layer is damaged!

B. **Angles**

SP pipe can be bent and shaped to different angles by hand or using an internal or external spring that protects the diameter of the pipe during bending. The appropriate copper pipe bending equipment may also be used.

The minimum permissible bending radius is 5 times the diameter of the pipe. If a more acute angle is required use elbow connectors supplied by the manufacturer. Do not use a broken or over-bent (strained) pipe.

C. **Branching**

1... The manufacturer supplies T-joints suitable for all diameters of SP pipes for exposed installations.
2... Double tap connectors may be used for branched fittings when doing exposed installation.
3... Manifolds can be used as central connectors.

D. **Tap connectors**

Use only the appropriate tap connectors and flanges supplied by the manufacturer; these may be connected directly.

Do not use T fittings or angles as tap connectors.

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5---INSTALLATION OF COVERED SYSTEMS

Threaded fittings

A. General information

A1... Pipe fittings

For use in piping installed inside the wall, the only approved fittings are those marked SP and supplied by METZERPLAS.

A large variety of fittings with standard threading are available for greater convenience in installation: ½", ¾", and 1" BSP.

During installation, be sure to use the reamer as shown in the illustrations in Section 3 above, and make sure that the fitting has been inserted all the way past the two inner seals. Tighten the nut firmly to the joint using the appropriate wrenches.

A2... Branches

The method used with SP fittings permits the use of branched tap connectors, and T fittings can be connected to the tap connectors to permit additional branching.

Angling the pipe may be done manually or by using an inner or outer spring that preserves the pipe's diameter during bending and prevents damage to the pipe.

The minimum permissible radius of an angle in the pipe is 5 times its diameter. Do not install a "broken" or over-bent (strained) pipe. Do not use metal angles or metal fittings inside a wall.

A3... Insulation

To avoid heat loss, hot and cold water pipes should never be placed close together.

Insulation for the hot water pipes should be indicated by the planner. A conduit pipe or other insulation may be used.

A4... SP installations (pipes and/or fittings) must not be covered with cement, plaster, flooring, etc. until after completion of pressure checks and any other checks required before handing over the system (see Section 13, below).

Plain sections of pipe (without any fittings) up to 10 cm in length can be covered with cement to make sure the pipe stays in place during pressure checks.

As soon as all the checks are completed all of the pipe should be cemented in place to prevent unintended mechanical damage to the installed pipe.

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B. Types of installations

General information

With all types of installations, the layout of pipes should conform to the approved plans in order to permit later location of all components so that they are accessible for maintenance.

Separate pipes must not be placed side by side; allow at least 5 cm between parallel lines of pipe.

B1... Pipes underneath flooring

Water pipes under the floor should be laid parallel to the walls, not diagonally. Pipes under the floor should be protected by concrete, conduit pipe, or other protection before sand filler is added. Do not connect two sections of pipe underneath a floor.

B2... Installing pipes in bathrooms, showers, toilet areas and kitchen cabinets

---Hot and cold water supply pipes may be installed under the floor in showers and bathrooms.
---In residential installations, hot and cold water pipes should not be installed behind or under the toilet.
---Water pipes should not be installed behind kitchen cabinets, except for pipes supplying the kitchen sink; these should be placed in straight lines perpendicular to the cabinets.

B3... Plasterboard walls

Installation behind plasterboard (sheetrock) requires that pipes be anchored with plastic Omega or Combi clamps, supplied by the manufacturer, or other suitable clamps. Clamps should be placed at reasonable intervals, a maximum of 1 meter apart. Avoid flattening the pipe when clamping
Where a pipe passes through metal beams, the pipe must be protected by a conduit pipe.
Tap connectors should be flanged to a heavy board between beams. The board should be solidly attached to the beams.

6---PRACTICAL PRINCIPLES FOR PLANNING AND USING SP PIPES AND THREADED FITTINGS

A... Serial installation with double connectors: several taps on one line.

B... Serial installation with double fittings on one line in a closed circle, to maintain pressure when several faucets are used at once.

C... Heating system installation with centralized connection: hot water running to and from each radiator using paired pipes.

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7---INSTALLATION OF END FITTINGS

Press fittings with pressing sleeve

SP Press fittings with pressing sleeve provide a method of connecting and installing SP pipe that is highly reliable and durable. Proper installation requires use of a special pressure device that presses the sleeve with mechanical force independent of the strength of the installer-technician. Because this method is so reliable, these fittings may also be installed in covered systems and utilize T joints underneath plaster and flooring, as with metal pipes (see Section 9 below). During installation, be sure to follow these instructions closely:

7a... Each diameter of pipe has end fittings to match that diameter. Some of these provide for connections to a different diameter: there is a wide variety available based on the diameter of the desired connection.

For example: There is a T connector with 3 connections to a 16 pipe, and there is a T connector with 2 two 16-pipe connections and one 20-pipe connection. Choose the fitting with the appropriate connectors for the diameter of pipe being connected.
In covered installations, do not attempt to accommodate different diameters by using additional threaded fittings (nipple, bushing, socket, etc.). Use only the tools supplied by the manufacturer.

7b...Installing end fittings

1..... Cut the pipe at right angles with a pipe cutter.

2..... Insert the short end of the reamer with a twisting motion into the pipe and rotate clockwise to bevel the inside edge evenly with the two diagonal blades.

3..... Continue inserting the reamer, rotating clockwise, to the line at the midpoint of the window.

Put the end of the pipe into the sleeve all the way to the end. (The pipe should be visible through the opening at the end of the sleeve.)

4.....Press the sleeve using the pressing device. (Before pressing, make sure that the device is adjusted for the proper pipe diameter.)

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8---INSTALLATION OF A HOT & COLD WATER PLUMBING SYSTEM

Press fittings with pressing sleeve

The installation method includes using single and double tap connectors. A centralized connection supplied by the manufacturer may also be used in accordance with the plans and instructions for the particular installation.

The pipe may be installed in one of two ways:

Covered installations (see Section 9 below)

Exposed installations (see Section 11 below)

Note: This pipe cannot be used for grounding electricity.

In both types of installation, the following instructions must be carefully followed:

A... The outer layer of the pipe must not be damaged during installation.

Do not use a pipe if its outer layer is damaged.

B... Angles

Pipes may be bent manually or using an inner or outer spring that maintains the diameter of the pipe during bending and prevents damage to the pipe.

The radius of the angle must be at least 5 times the diameter of the pipe. If a more acute angle is required, use the elbows supplied by the manufacturer. Do not install a “broken” or over-bent (strained) pipe.

C... Branching

1...The manufacturer provides T connections suitable for all diameters of SP pipe for both covered and exposed installations.

2... Double tap connectors may be used to branch the pipe in either exposed or covered installations.

3... Manifolds can be used as central connectors.

D... Tap connectors

Use only the appropriate tap connectors and clamps supplied by the manufacturer. Pipes attach directly to these. Do not use elbows or T joints as tap connectors.

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9---INSTALLATION OF COVERED SYSTEMS

Press fittings with pressing sleeve

A...General information

A1... Pipe fittings

For installing SP pipes inside walls or under floors, the only fittings approved for covered installations are branch (T) connectors and tap connectors bearing the SP symbol and supplied by METZERPLAS. For your convenience, a wide variety of fittings is available, including tap connectors and threaded 1/", ¾", and 1" BSP fittings for connection to external supply systems.

When installing SP, make sure to use the reamer and pressing device supplied by the manufacturer, as shown in the illustrations in Section 7 above.

Do not use any type of threaded fittings for installations under flooring or plaster.

A2... Branching and bending

The method used with SP fittings permits the use of branched or T tap connectors. The pipe may be angled by bending manually or using an inner or outer spring that protects the pipe diameter during bending and prevents breakage of the pipe.

The radius of the angle must be at least 5 times the diameter of the pipe.

Do not install a "broken" or over-bent (strained) pipe.

Do not use metal elbows inside walls.

A3... Insulation

To avoid heat loss, hot and cold water pipes should never be placed close together.

Insulation for the hot water pipes should be indicated by the planner. A conduit pipe or other insulation may be used.

A4... Covering the pipes

SP installations (pipes and/or fittings) must not be covered with cement, plaster, flooring, etc. until after completion of pressure checks and any other checks required before handing over the system (see Section 13, below).

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Plain sections of pipe (without any fittings) up to 10 cm in length can be covered with cement to make sure the pipe stays in place during pressure checks.

As soon as all the checks are completed all of the pipe should be cemented in place to prevent unintended mechanical damage to the installed pipe.

B...Types of systems

General information

With all types of installations, the layout of pipes should conform to the approved plans in order to permit later location of all components so that they are accessible for maintenance.

Separate pipes must not be placed side by side; allow at least 5 cm between parallel lines of pipe.

B1... Pipes underneath flooring

Water pipes under the floor should be laid parallel to the walls, not diagonally.

Pipes under the floor should be protected by concrete, flume pipe, or other protection before sand filler is added.

Pipes with branched (T) connections installed underneath flooring should be placed in straight lines at uniform distances of about 30 cm from the wall.

B2... Installing pipes in bathrooms and showers or near toilets

---Hot and cold water supply pipes may be installed under the floor in showers and bathrooms.

---Branched (T) pipes may be installed in walls only.

---In residential installations, hot and cold water pipes should not be installed behind or under the toilet.

B3... Plasterboard walls

Installation behind plasterboard (sheetrock) requires that pipes be anchored with plastic Omega or Combi clamps supplied by the manufacturer, or other suitable clamps. Clamps should be placed at reasonable intervals, a maximum of 1 meter apart. Avoid flattening the pipe when clamping

Where a pipe passes through metal beams the pipe must be protected by a conduit pipe.

Tap connectors should be flanged to a heavy board between beams. The board should be solidly attached to the beams.

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10---PRACTICAL PRINCIPLES FOR PLANNING AND USING SP PIPES

Press fittings with pressing sleeves

A.... Serial installation with double connectors: several taps on one line.

B... Serial installation with double fittings: on one line in a closed circle to maintain pressure when several faucets are used at once.

C... Heating system installation with centralized connection: hot water running to and from each radiator using paired pipes.

11---INSTALLATION OF EXPOSED SYSTEMS

When installing an exposed system -- a solar-heated system, compressed air, water supply, etc. – the following should be carefully observed:

A... Either of two types of fittings may be used, but do not mix the two types in a single system.

B... Pipes should not be touching one another; make sure pipes laid parallel to each other are separated by at least 5 cm.

D... If pipes are to be exposed to sunlight, use black SP only.

E... Bending of pipes in exposed systems may be done using a spring designed for that purpose or using a standard bending tool appropriate for the diameter of pipe, or with angle fittings.

F... Pipe should be anchored with plastic clamps at intervals of 1 meter. Use Omega or Combi clamps supplied by the manufacturer and sized to fit the diameter of the pipe. Avoid flattening the pipe when clamping.

G... Exposed hot water pipes must be insulated wherever they are exposed and accessible to people.

12---INSTALLATION OF HEATING SYSTEMS

When installing heating systems using pipes under the flooring or behind plaster, pay careful attention to the following:

A... Either of two types of fittings may be used; do not mix the two types in a single system.

B... Use only the parts supplied by the manufacturer especially for direct connection of pipes to split outlets.

C... Leave long ends in places intended for connecting radiators or blowers, etc., to avoid having to add another piece of pipe in order to extend it.

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D... Make sure the system includes reliable means for protecting and regulating the planned water temperature.

Note:
If threaded fittings are used, do not connect two sections of pipe under a floor or behind plaster, and do not use T joints to branch pipes that will be covered.

13--- TESTS AND REQUIREMENTS FOR HANDING OVER THE SYSTEM

A... General Information

The system for hot and cold water supply or for central heating will be handed over once all plumbing work has been completed. Transferring the system can be effected based on satisfactory results of visual tests, tests of system operation and pressure tests.

B... Visual testing

Visual testing of all pipes, connectors and fittings must be completed as follows, before testing pressure:

When installation is complete, check that performance complies with the specifications in this guide. Check that all connections are strong and properly sealed, and that all bending of pipes was properly performed to prevent pipe flattening. Make absolutely sure that all the requirements detailed herein have been adhered to.

C... Testing the system’s operation

Fill the system with water and check that water reaches all consumption points at the proper flow rate and pressure.

D... Pressure testing

A pressure test must be performed on every system when installation is complete. A pressure test may be made immediately on completion of installation (after visual testing).

Testing is done at normal water temperatures. The test pressure must be 1.5 times that of the nearby municipal water supply serving the building, but not less than 15 bar.

At first, the pipes will fill with water and all air will be expelled. Then pressure is raised to the level required for the test, and the valve between the pressure pump and the network is closed.

The system can be considered in conformance if, for one hour, the pressure does not drop by more 0.5 atm and no leaks are found in the system.

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E... After testing

After testing, make sure the pipes are connected to the water supply and that it remains under pressure during all subsequent stages of the building's construction. Maintaining the pipes under pressure insures that if any pipe sustains damage before the building is completed, the location of the damage will be identified promptly and repaired immediately, thus preventing unpleasant surprises from undetected damage later on.

14---PERFORMING REPAIRS AFTER TESTING

14.1 Threaded fittings should be repaired using one of the following three methods:

A... Tighten loose connectors if a leak has appeared at the point of connection.

B... Replace the insert if the leak is between the fitting and the pipe (make sure that the pipe is inserted to the end of the nut).

C... Replace any defective section of pipe – if, for example, the outer layer of pipe is damaged or exposed, if the pipe shows a "strain," etc.

14.2 For press fittings with a pressing sleeve:

A... Replace the section of pipe with the leaky fitting.

B... Replace any damaged pipe as in 14.1-C above.

After completing any repair or replacement of pipe or fitting, pressure testing must be conducted again, as outlined in Section 13-D above.

15---Address and telephone numbers for the manufacturer

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