A person is shown from the side, wearing a white shirt and dark pants, kneeling on a floor and installing white PEX tubing. The tubing is laid out in a grid pattern on a light-colored floor. The background is a plain, light-colored wall.

Hints on Installing Wirsbo-PEX Tubing for Surface-heating and Water-supply Systems

WEIGHT, ACCURACY IN SIZE AND FLEXIBILITY – these are the characteristics that are decisive for ease of pipeline installation.

In general, it is true that plastic pipes are lighter than comparable metal pipes. For example, 400 feet (120 m) of 3/4-inch (20 mm) Wirsbo-PEX tubing with an 3/32-inch (2 mm) wall thickness weighs about 31 pounds (14 kg). Copper tubing of the same size and length used for the same purpose weighs about 240 pounds (110 kg).

Check the Measurements

Accuracy in size, that is, the maintenance of the same inside and outside measurements and the same wall thickness, is a characteristic that can vary substantially depending upon



Plate 10:1

the type and brand of tubing. That is why it is necessary to make an urgent recommendation. Before using any type or brand of tubing that you have not used before, be sure to get a list of the manufacturer's specifications along

with several samples that can be used for testing. Whether or not the connectors fit well on the tubing gives a quite reliable indication of how easy it is to install.

The Forging Pipe

The ease with which plastic tubing can be laid out and shaped according to the existing requirements is probably the greatest advantage of plastic pipes over those made of metal. Still, it is true that there can be substantial differences among the individual types of plastic tubing. An important indication of just how great these differences are can be gained by simply trying to bend a few of the pipes.

In the case of Wirsbo-PEX tubing, there is no need to fear brittleness even in the case of extreme cold down to a temperature of -148°F . (-100°C). $3/4$ -inch (20 mm) tubing with a $3/32$ -inch (2 mm) wall thickness can be

bent cold without difficulty up to 180° degrees with a minimum bending radius of 6 inches (150 mm (center to center)). Hot bending is possible with a minimum of up to half that radius.

In the case of a mistake when bending, such as for example, causing a kink, Wirsbo-PEX tubing behaves very "forgivingly". By carefully heating the tubing with a hot-air gun up to a temperature of about 275°F . (135°C .) and then cooling it down again, the tubing recovers its original shape and strength. As the plastics experts sometimes put it, the tubing material has a thermal memory.

Plate 10:2

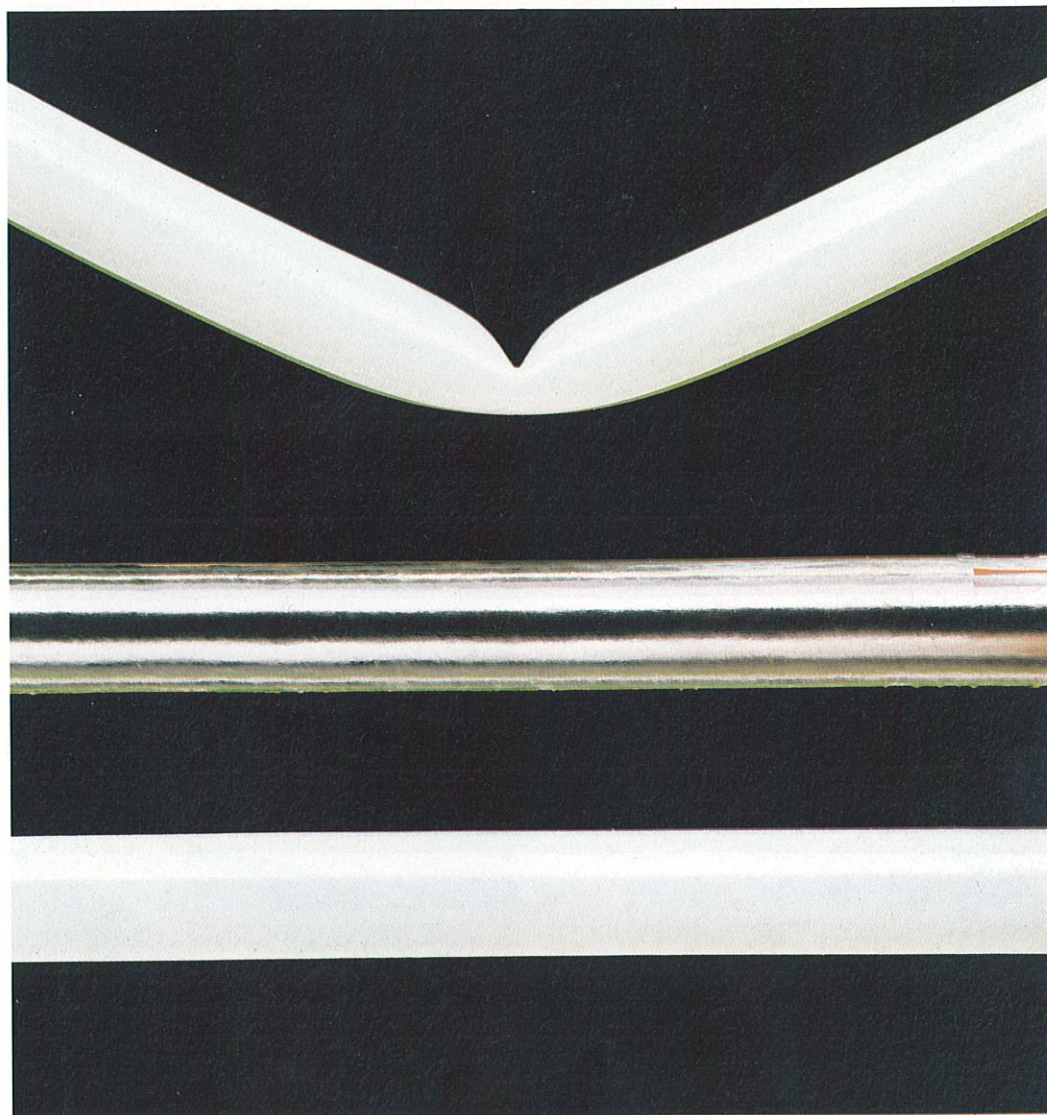




Plate 10:3

ONLY A FEW SIMPLE TOOLS. The person who installs Wirsbo-PEX tubing does not have to bring along a huge box full of tools. What is more, every coil of tubing is accompanied by brief installation instructions.

Only one simple tool is needed for cutting the tubing. It should be noted that in order to ensure optimum sealing with connectors, the cuts should be made at a 90 degree angle.

To prevent dirt from getting into the tubing, open ends should be covered with caps. A supply is packed along with the tubing.

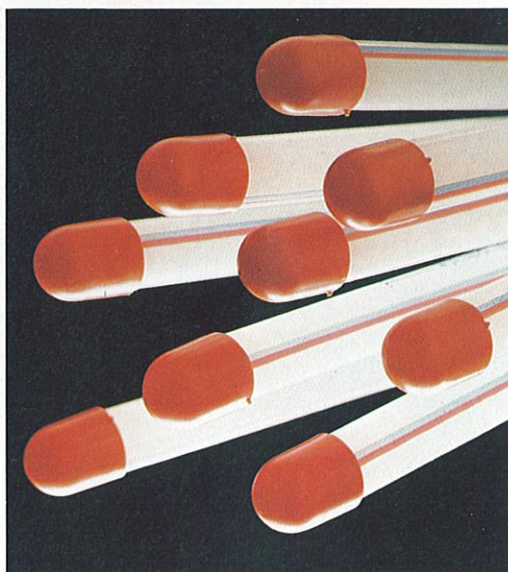


Plate 10:4

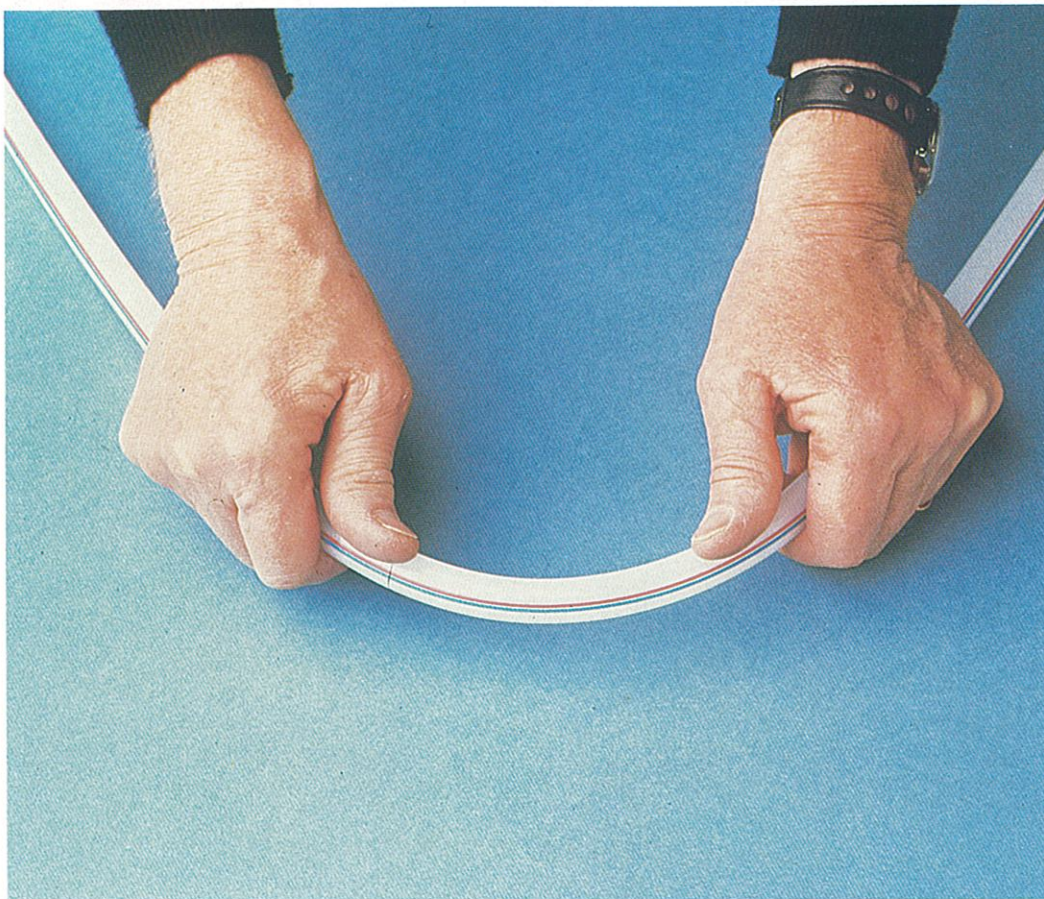


Plate 10:5

Wirsbo-PEX tubing can be bent cold or hot as desired. When the tubing being used has a small diameter, it is possible to bend it by hand.

There are devices (cold-bending tools) available for use for cold bending at 90-degree angles when a small bending radius is required (for 3/8- to 3/4-inch (10 to 20 mm) tubing).

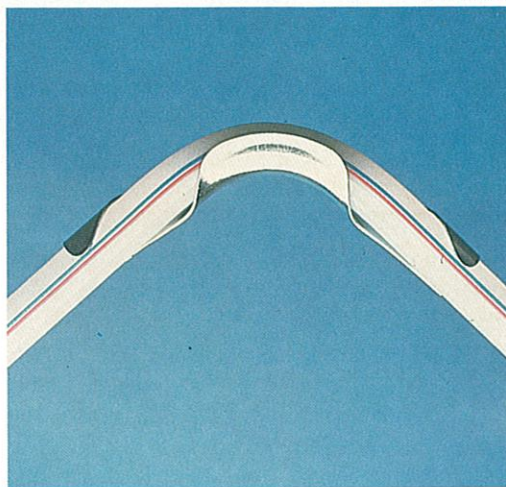


Plate 10:6



Plate 10:7

When not bending, the tubing may not be brought into contact with an open flame. For this reason, a hot-air gun with a so-called “heating jacket” should be used.

This is the method to be used for hot bending. Heat the area to be bent up to about 275°F. (145°C.). (The tubing becomes transparent at that temperature.) Then place the tubing over a simple bending jig or form and create the bend. After that let the tubing cool in water or in the air.

Table 10:1 shows the smallest allowable bending radius for each of the individual tubing sizes and bending methods.

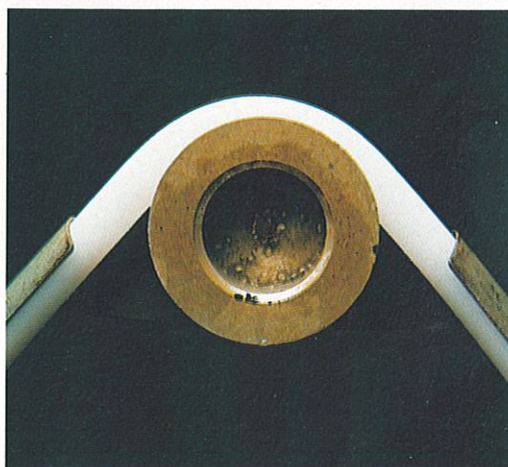


Plate 10:8

Smallest Bending Radius inches and (mm)							
Tubing Size		Hot Bending		Cold Bending			
				Bending Tool			
				with		without	
in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)
0.39	(10)	0.79	(20)	1.18	(30)	1.77	(~45)
0.47	(12)	0.98	(25)	1.18	(30)	2.36	(60)
0.59	(15)	1.34	(34)	1.77	(45)	2.95	(75)
0.63	(16)	1.41	(36)	2.56	(65)	3.07	(78)
0.71	(18)	1.58	(40)	2.76	(70)	3.54	(90)
0.79	(20)	1.77	(45)	3.94	(100)	3.94	(100)
0.87	(22)	1.89	(48)	—	—	4.33	(110)
0.98	(25)	2.01	(51)	—	—	4.92	(125)
1.10	(28)	2.44	(62)	—	—	5.51	(140)

Table 10:1

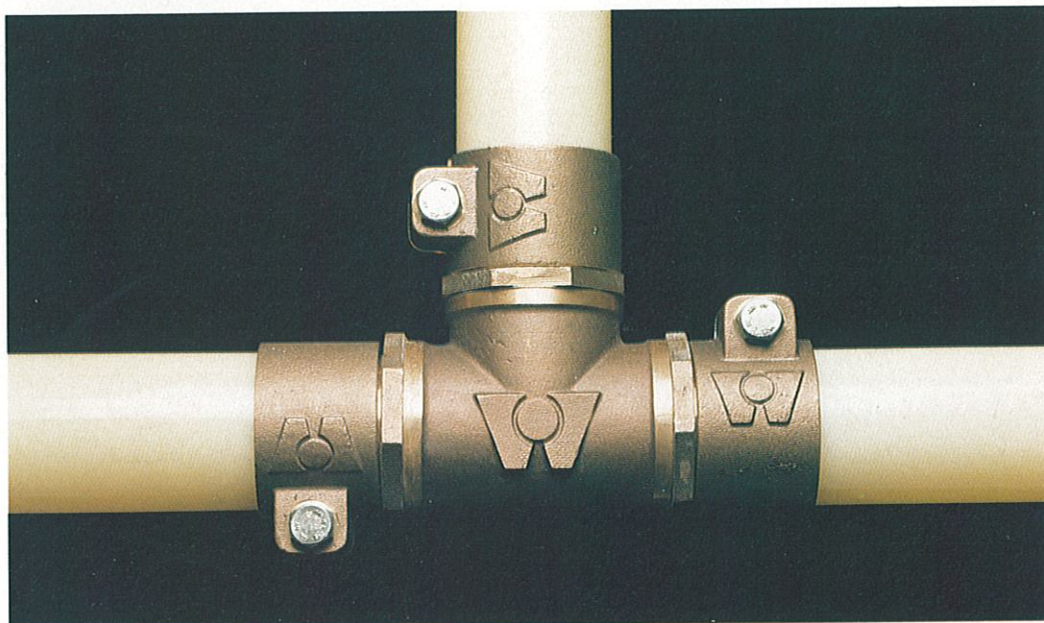


Plate 10:9

When bending tubing with larger diameters than those shown in the table, please ask Wirsbo or your dealer for advice.

Pipe Connectors

Wirsbo-PEX tubing should be connected with compression connectors. There are various versions of that type of connector on the market. Your Wirsbo dealer can make recommendations to help you in making a choice among them.

An insert sleeve should always be used when making a connection. When joining the tubing to valves, one-sided, threaded connectors are permitted. Connections made with them are less bulky. In any case, all the instructions given by the fitting manufacturer should be followed.

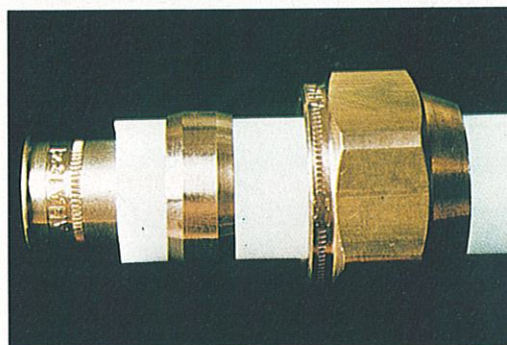


Plate 10:10



Plate 10:11

MUCH LOWER INSTALLATION COSTS are what you get by using Wirsbo-PEX tubing for drinking-water and warm-water systems. You can now make use of the hollow spaces in buildings. If you are looking for places to lay pipelines, take into account the already existing hollow spaces such as shafts, hollow ceilings, walls with furring strips, channels etc. Such hollow spaces allow for both hidden installation and later access to the system.



Plate 10:12



Plate 10:13

Installing Tubing in Conduit

A variant of laying tubing in existing hollow spaces that shares in many of its advantages is the insertion of the tubing into conduit. The conduit to be used for this purpose should be made of thermostabilized PE. Installation in both concrete and cement-block walls are possible uses for this technique. The most important advantages of the conduit technique are the already mentioned possibility of later access and the almost complete exclusion of danger due to water damage.

Conduit can be used from the lowest installation temperature to the highest service temperature without difficulty. In some cases, the hot-water and cold-water pipes can share a common conduit. As long as it is not a circulating system, there will not be any noticeable rise in the temperature of the cold water. The dead-air space in a conduit that is tightly closed at each end has outstanding insulating properties. Additional thermal insulation is only seldom necessary.

With its ideal degree of stiffness and flexibility, Wirsbo-PEX tubing is very good for insertion into conduit. Bends in the conduit are not a problem for this type of installation.

The installation of a junction box at the end of the conduit is advisable.

As a substitute for or extension of a con-

duit, it is also possible to lay the tubing on or between furring strips.

Wherever there are built-in appliances (such as in kitchens), the bases are available for laying pipes.



Plate 10:14



Plate 10:15

When used with an automatic dishwasher, the tubing can be coiled into a loop just before it is connected to the machine. It can then be pulled out for maintenance without disconnecting the tubing.

In floors with a thick, multi-layered construction, the tubing can be installed in a routed groove in one of the layers.

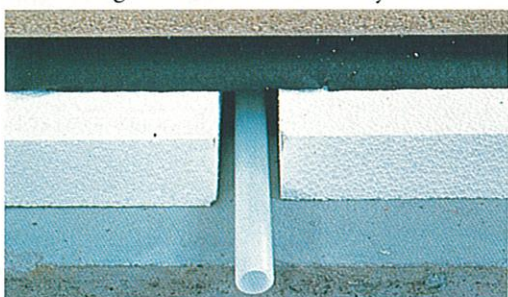


Plate 10:16

In concrete ceilings and in masonry or concrete walls, it is often possible to plan channels or grooves for laying tubing.

When it is available, the hollow area or



Plate 10:17

crawl space underneath the ground floor of a building is suitable for installing pipes. The tubing is laid upon a bed made of foil and in-



sulation and is covered with a second layer of insulation.

Wirsbo-PEX tubing is ideal for installation in concrete. It is corrosion and abrasion resistant even at high flow rates and does not tend



Plate 10:18

toward formation of cracks at bends or curved areas. The degree of expansion is held within limits so that even when installed under thin layers of cement, cracks do not tend to form.



Plate 10:19

WARM FLOORS are not new. Under-floor heating was not invented by modern man. Rather, it was already in existence thousands of years ago. At that time the heat was carried by warm air. Basically, that is all that has changed since then. Today, as you know, one uses water for this purpose since it is technically more effective.

This does not mean that the use of water is entirely without problems. Steel pipes can be attacked by rust. Copper pipes tend toward the formation of fatigue cracks because of their movement during expansion and contraction. Another danger is dependent upon the number of possible leakage points. It is greater when there are a very large number of connectors in the system.

A piping system consisting of plastic tubing as supplied by Wirsbo-PEX tubing provides ideal solutions for all these problems.

The Ideal Curve Is Almost Achieved

There are good reasons why surface heating and especially hot-water under-floor heating are becoming more popular. The cost of heating is continually rising. This fact is forcing a

growing number of people to resort to various methods of insulation. That, in turn, makes it more likely that some form of low-temperature heating method, such as hot-water under-floor heating, will be seriously considered. The trend away from oil makes the use of substitute forms of energy even more inviting. Some of these techniques, such as solar energy or geothermal energy reach their greatest effectiveness exactly in the area of low-temperature heat. For that reason, they are especially attractive for use in surface heating.

The use of under-floor heating also addresses the desire for a greater degree of living comfort. The diagram shown in Plate 10:20 is based upon the results of a study undertaken to discover the ideal temperature distribution throughout the area of a room. The comparison shows that the distribution curve for floor heating comes the closest of all to the ideal heat-distribution curve.

Millions of Feet Per Year

Every year there are millions of feet of Wirsbo-PEX tubing installed for hot and cold wa-

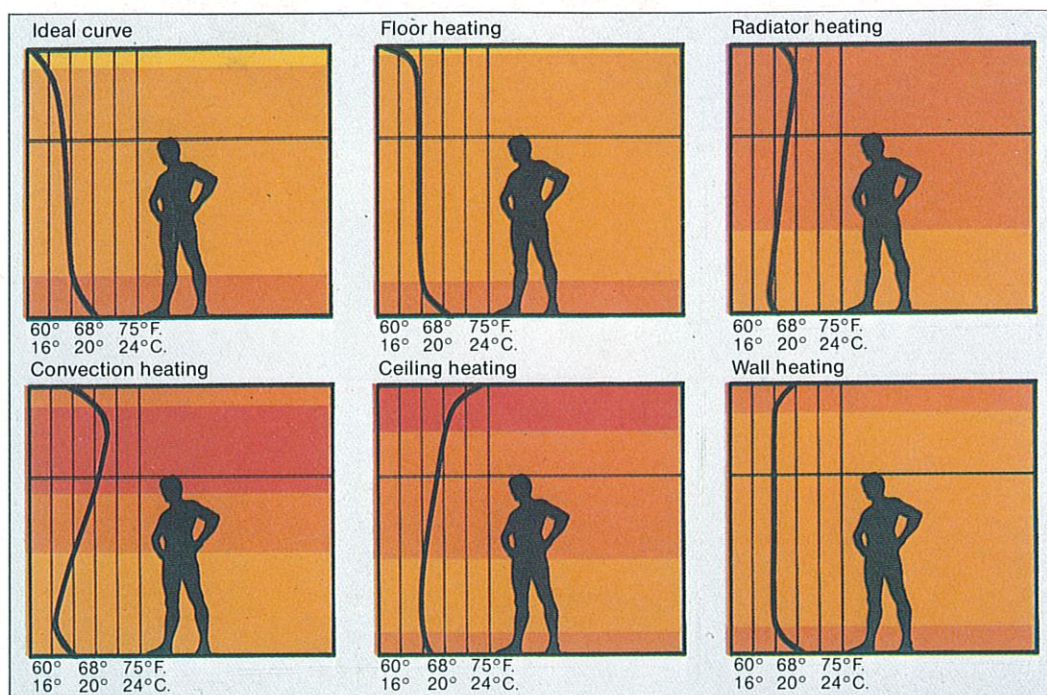


Plate 10:20

ter supply lines and for under-floor heating. In West Germany, Switzerland, Italy, Austria, Holland, Belgium, Spain, Sweden, Norway and Denmark among other countries, an ever-increasing number of people are making the decision to use Wirsbo-PEX tubing for heating systems.

The reasons for this are to be found in a whole list of advantages. Wirsbo-PEX tubing really is corrosion resistant, free of health threatening additives, soft and flexible. Scratches, bends and chemicals that are sometimes found in places where it is used do not affect its durability. The various forces released by thermal expansion are buffered by the tubing material itself. (The tubing and the surrounding concrete are not damaged.) Finally, because of the overall length in which it is produced, installation is possible with a minimum number of joints.

Wirsbo-PEX tubing is the heavyweight among the leading European water-supply and surface-heating systems. Your Wirsbo representatives are more than happy to put their system descriptions, installation instructions and cost estimates at your disposal.



Plate 10:21



Plate 10:22