

TITLE: INSTALLATION GUIDE OF PLASTIC (PE-X, PB-1, PP-R) AND MULTILAYER (METAL-PLASTIC) PIPE SYSTEMS FOR HOT AND COLD WATER.

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Abstract

Following a brief picture of the Italian market situation and development of the main sectors of application, the paper gives a review of the main Italian and international standards regarding this kind of product. The paper reports on the efforts of a working group, promoted by IIP, composed by representatives of raw material manufacturers, end-users (building companies), Italian plastic pipes manufacturers with the aim of promoting the knowledge and the conformity to the existing norms for plastic pipes for hot and cold water. Moreover, the aim has been to develop a practical tool (Guideline) to give end-users all the necessary information and details about how to handle and use these new pipes systems and the requirements to be respected to assure the promised performance of certificated plastic (PE-X, PB-1, PP-R) and multilayer (metal-plastic) pipes. This information regards all the elements, from the raw material and the criteria for materials acceptance, the reference standards, welding and installation, testing. So the Guideline contains all the technical information to help end-users and installers to understand the assured performances of certified plastic pipes for hot and cold water.

The Italian market

The Italian market of plastic pipes for hot and cold water conveyance has grown at a rate of about 8% in the last few years. This growth has to be supported by useful tools to let people and end-users know the guarantee of performance of these pipes made of PP-R, PB-1, PE-X and multilayer (metal-plastic) materials.

At present in 2003 in Italy about 115 millions of metres of PE-X, PP-R, PVCC and multi-layer pipes have been installed in the different applications (plumbing, radiator heating and floorheating). In Europe, the market share by application goes from 40% in plumbing to 30% in radiator heating and to about 95% in floorheating.

The framework of the Guideline

The framework of the guideline covers all the necessary elements and topics regarding the installation of plastic and multilayer pipe systems for hot and cold water.

The framework-index of the guideline:

- Scope

The guideline refers to utilization of PE-X, PPr, PB and multilayer (metal-plastic) pipes for the fluid (especially hot and cold water) conveyance in the civil and industrial building and it also refers to the use of this kind of pipes in plumbing, radiator heating and floorheating.

The general aim is to give some technical criteria to designers and installation technicians.

- Reference standards

The guide gives general information about the main standards and laws regarding the plastic or multilayer pipes for hot and cold water (i.e. UNI 10954 - “Metal plastic multilayer pipes for piping systems for hot and cold water”), or their installation (i.e. peEN ISO 15874 “Plastics Piping Systems for hot and cold water installation” and UNI ENV 12108 “Sistemi di tubazioni di materia plastica - Guida per l'installazione all'interno degli edifici per i sistemi di tubazioni in pressione per acqua calda e fredda destinata al consumo umano”).

- Characteristics

In this section, the guide reports the main characteristics regarding the different kinds of materials (PE-X, PP-r, PB). After a general description of the raw materials (i.e. technologies for crosslinking of PE, characteristics of Polypropylene random etc), the main characteristics are quoted as MFI (melt flow index) or thermal conductivity and the other characteristics useful to be known for a correct use of this kind of products.

- Fields of application

This paragraph is dedicated to explain the fields of application (hot and cold water systems, floor heating etc) and the main references regarding the applicable class of service condition and design pressure.

- Directions for materials acceptance

It is important that end-users of plastics or metal-plastics pipes know the general information about the quality marks and certification (certification with quality mark UNI-IIP and Piip) as evidence of conformity of this products to the reference standards. This section specifies the kind of quality mark and the control that the end-user can do about it.

- Transport and storage

This section provides all the information and the necessary precautions in order to avoid damages to pipes, fittings and tools for installation during transport and storage especially in the yard (i.e. protection against U.V. rays).

- Installation

The guide provides the necessary instruction for a correct installation of pipes and fittings for:

- the different kinds of utilization
 - hot and cold water conveyance within buildings
 - heating systems (i.e. floor heating or radiator heating).
- the different typologies of installation (i.e. installation into chase or at sight).

Moreover, all the different ways of connection (mechanical connection – press-fittings etc) or welding are represented with many specifications regarding PE-X, PP-R, PB and Multilayer pipes.

- Testing

The aim of testing is to verify the presence of leak in pipes or connections after the installation. All the necessary operations to perform a correct testing are listed in the guideline:

- Preparation of testing
- Inspection
- General suggestion for testing

- Special section

Two special section of the guide are dedicated to:

- Installation and testing of floorheating systems
- Methods of disinfection of the pipes systems for conveyance of water for human consumption

The guide is supplied with many explanatory images and tables (i.e. for classification of service conditions).