
**Plastics piping systems for hot and cold
water installations — Polyethylene of
raised temperature resistance (PE-RT) —**

**Part 7:
Guidance for the assessment of
conformity**

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*Systèmes de canalisations en plastique pour les installations d'eau
chaude et froide — Polyéthylène de meilleure résistance à la
température (PE-RT) —*

ISO/TS 22391-7:2011
Partie 7: Guide pour l'évaluation de la conformité

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

- an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;
- an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TS 22391-7 was prepared by the European Committee for Standardization (CEN) Technical Committee TC 155, *Plastics piping systems and ducting systems*, in collaboration with ISO Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 2, *Plastics pipes and fittings for water supplies*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

ISO 22391 consists of the following parts, under the general title *Plastics piping systems for hot and cold water installations — Polyethylene of raised temperature resistance (PE-RT)*:

- *Part 1: General*
- *Part 2: Pipes*
- *Part 3: Fittings*
- *Part 5: Fitness for purpose of the system*
- *Part 7: Guidance for the assessment of conformity [Technical Specification]*

Introduction

At the date of publication of this part of ISO 22391, System Standards for piping systems of other plastics materials used for the same application are the following:

ISO 15874 (all parts), *Plastics piping systems for hot and cold water installations — Polypropylene (PP)*

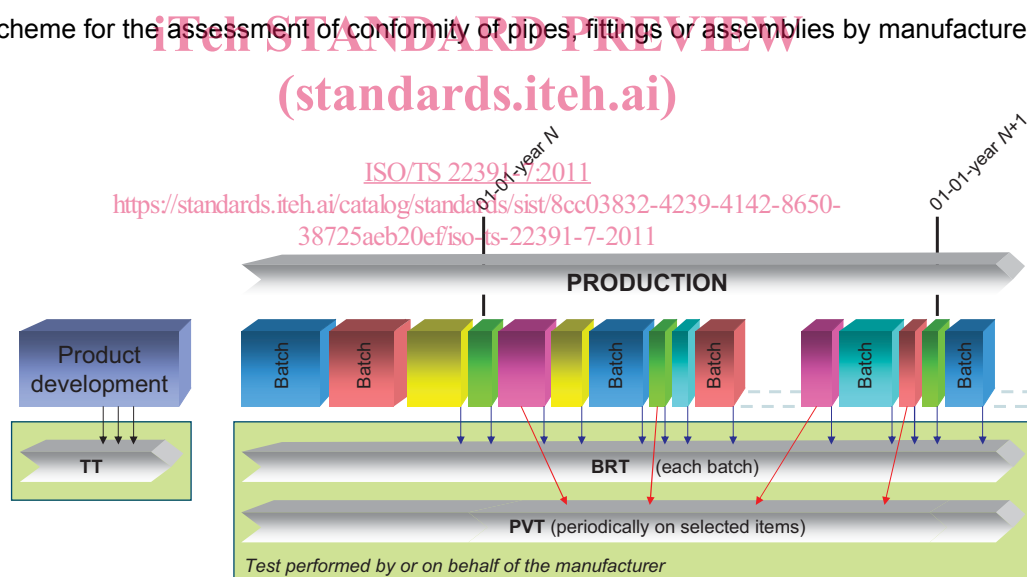
ISO 15875 (all parts), *Plastics piping systems for hot and cold water installations — Crosslinked polyethylene (PE-X)*

ISO 15876 (all parts), *Plastics piping systems for hot and cold water installations — Polybutylene (PB)*

ISO 15877 (all parts), *Plastics piping systems for hot and cold water installations — Chlorinated poly(vinyl chloride) (PVC-C)*

Figures 1 and 2 are intended to provide general information on the concept of testing and organization of those tests used for the purpose of the assessment of conformity. For each kind of test, i.e. type test (TT), batch release test (BRT), process verification test (PVT), and audit test (AT), this part of ISO 22391 details the applicable characteristics to be assessed as well as the frequency and sampling of testing.

A typical scheme for the assessment of conformity of pipes, fittings or assemblies by manufacturers is given in Figure 1.

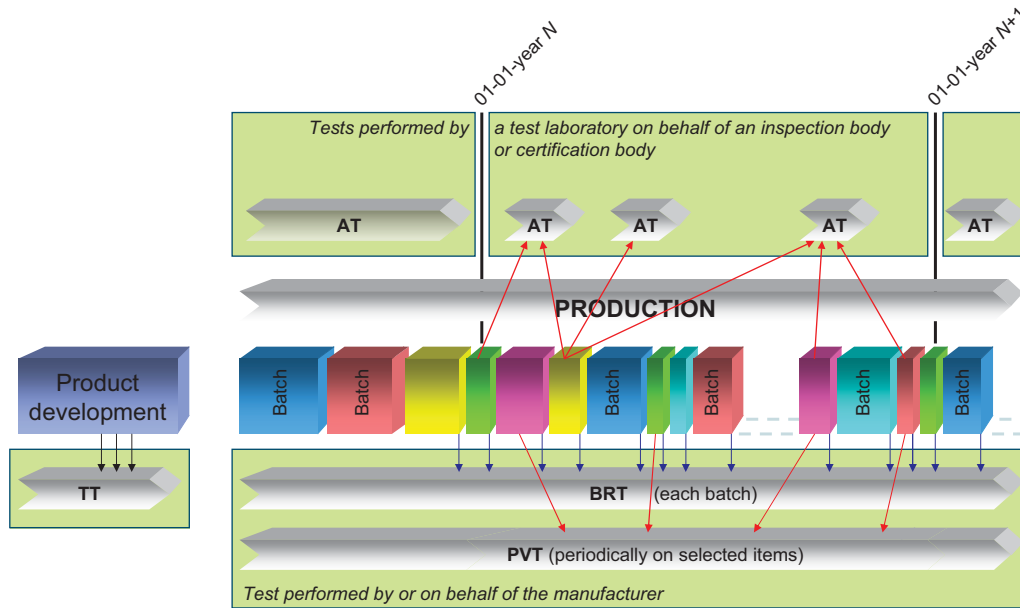


Key

- BRT batch release test
- PVT process verification test
- TT type testing

Figure 1 — Typical scheme for the assessment of conformity by a manufacturer

A typical scheme for the assessment of conformity of pipes, fittings or assemblies by manufacturers, including certification, is given in Figure 2.



- Key**
- AT audit test
 - BRT batch release test
 - PVT process verification test
 - TT type testing

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Figure 2 — Typical scheme for the assessment of conformity by a manufacturer, including certification

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This part of ISO 22391 specifies the requirements for a piping system when made from polyethylene (PE-RT). The piping system is intended to be used for hot and cold water installations and heating system installations.

See the foreword for a complete listing of all available parts of ISO 22391.

This part of ISO 22391 gives guidance for the assessment of conformity of materials, components, joints, and assemblies. It is intended for use by certification bodies, inspection bodies, testing laboratories, and manufacturers.

Plastics piping systems for hot and cold water installations — Polyethylene of raised temperature resistance (PE-RT) —

Part 7: Guidance for the assessment of conformity

1 Scope

This part of ISO 22391 gives guidance on the assessment of conformity of products and assemblies in accordance with other applicable part(s) of ISO 22391 intended to be included in the manufacturer's quality plan as part of the quality management system and for the establishment of certification procedures.

In conjunction with the other parts, this part of ISO 22391 is applicable to hot and cold water installations within buildings for the conveyance of water, whether or not intended for human consumption (domestic systems), under design pressures and temperatures appropriate to the class of application.

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2 Normative references (standards.iteh.ai)

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

ISO 3951-1, *Sampling procedures for inspection by variables — Part 1: Specification for single sampling plans indexed by acceptance quality limit (AQL) for lot-by-lot inspection for a single quality characteristic and a single AQL*

ISO 3951-2, *Sampling procedures for inspection by variables — Part 2: General specification for single sampling plans indexed by acceptance quality limit (AQL) for lot-by-lot inspection of independent quality characteristics*

ISO 3951-3, *Sampling procedures for inspection by variables — Part 3: Double sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

ISO 3951-5, *Sampling procedures for inspection by variables — Part 5: Sequential sampling plans indexed by acceptance quality limit (AQL) for inspection by variables (known standard deviation)*

ISO 22391-1:2009, *Plastics piping systems for hot and cold water installations — Polyethylene of raised temperature resistance (PE-RT) — Part 1: General*

ISO 22391-2:2009, *Plastics piping systems for hot and cold water installations — Polyethylene of raised temperature resistance (PE-RT) — Part 2: Pipes*

ISO 22391-3:2009, *Plastics piping systems for hot and cold water installations — Polyethylene of raised temperature resistance (PE-RT) — Part 3: Fittings*

ISO 22391-5:2009, *Plastics piping systems for hot and cold water installations — Polyethylene of raised temperature resistance (PE-RT) — Part 5: Fitness for purpose of the system*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 22391-1, ISO 22391-2, ISO 22391-3 and the following apply.

3.1 certification body

impartial body, governmental or non-governmental, possessing the necessary competence and responsibility to carry out certification of conformity according to given rules of procedure and management

NOTE A certification body is preferably compliant with ISO/IEC 17021^[5].

3.2 inspection body

body, that performs inspection

NOTE 1 A body can be an organization, or part of an organization.

[ISO/IEC 17020:1998^[4], 2.2]

NOTE 2 An inspection body is preferably compliant with ISO/IEC 17020^[4].

3.3 testing laboratory

laboratory which measures, tests, calibrates or otherwise determines the characteristics of the performance of materials and products

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NOTE 1 In the context of this part of ISO/TS 22391, the materials and products can be subjected to type testing, batch release testing, process verification testing, audit testing, and witness testing, as applicable.

NOTE 2 A testing laboratory is preferably compliant with ISO/IEC 17025^[6].

3.4 quality management system

management system to direct and control an organization with regard to quality

[ISO 9000:2005^[2], 3.2.3]

NOTE Requirements for quality management systems are given in ISO 9001^[3].

3.5 quality plan

document setting out the specific quality practices, resources and sequence of activities relevant to a particular product or range of products

3.6 type testing

TT testing performed to prove that the material, component, joint or assembly is capable of conforming to the requirements given in the relevant standard

NOTE The type test results remain valid until there is a change in the material or product or assembly provided that process verification tests are done regularly.

3.7**batch release test****BRT**

test performed by or on behalf of the manufacturer on a batch of components, which has to be satisfactorily completed before the batch can be released

3.8**process verification test****PVT**

test performed by or on behalf of the manufacturer on materials, components, joints or assemblies at specific intervals to confirm that the process continues to be capable of producing components which conform to the requirements given in the relevant standard

NOTE Such tests are not required to release batches of products and are carried out as a measure of process control.

3.9**audit test****AT**

test performed by a test laboratory on behalf of an inspection body or certification body to confirm that the material, component, joint or assembly continues to conform to the requirements given in the relevant standard and to provide information to assess the effectiveness of the quality management system

3.10**indirect test****IT**

test performed by or on behalf of the manufacturer, different from the test specified for that particular characteristic, having previously verified its correlation with the specified test

3.11**witness test****WT**

testing accepted by an inspection or a certification body for type testing and/or audit testing, which is carried out by or on behalf of the manufacturer and supervised by a representative of the inspection or certification body, qualified in testing

3.12**material**

generic term for compounds grouped by families, expressed by generic names, e.g. polypropylene, stainless steel, brass or EPDM

NOTE Definition from European Commission, Directorate-General for Enterprise and Industry, Sub-group on Product Testing Procedures (EC, DG ENT and IND, SG PTP).

3.13**compound**

clearly defined homogeneous mixture of base polymer with additives, i.e. antioxidants, pigments, stabilizers and others, at a dosage level necessary for the processing and the intended use of the final product

3.14**material batch**

clearly identified quantity of a given homogeneous compound manufactured under uniform conditions, and defined and identified by the compound manufacturer

3.15**product**

pipe or fitting of a clearly identified type intended to be a part of a piping system which the manufacturer puts on the market

3.16
product batch

clearly identified collection of units, manufactured consecutively or continuously under the same conditions, using material or compound conforming to the same specification

NOTE The product batch is defined and identified by the product manufacturer.

3.17
lot

clearly identifiable sub-division of a batch for inspection purposes

3.18
sample

one or more units of product drawn from a batch or lot, selected at random without regard to their quality

NOTE The number of units of product in the sample is the sample size.

3.19
acceptable quality limit
AQL

quality level that is the worst tolerable process average when a continuing series of lots is submitted for acceptance sampling

NOTE 1 See ISO 2859-1, ISO 3951-1, ISO 3951-2, ISO 3951-3, and ISO 3951-5.

NOTE 2 The designation of an AQL does not imply that a manufacturer has the right knowingly to supply any non-conforming unit of product.

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3.20
inspection level

relationship between the lot or batch size and the sample size

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NOTE See ISO 2859-1.

3.21
limiting quality

<acceptance sampling> quality level, when a lot is considered in isolation, which, for the purposes of acceptance sampling inspection, is limited to a low probability of acceptance

NOTE See ISO 2859-2^[1].

3.22
group

collection of similar components from which samples are selected for testing purposes

3.23
single component

single part as a final product or a part of an assembled final product

3.24
assembled component

assembled final product using two or more single parts

3.25
assembly

product that can be dismantled into a set of components

EXAMPLE A test piece consisting of various products.

3.26**sampling plan**

specification of the type of sampling to be used combined with the operational specification of the entities or increments to be taken, the samples to be constituted and the measurements or tests to be made

EXAMPLE A specific plan which indicates the number of units of products or assemblies to be inspected.

3.27**product type**

generic description of a product

EXAMPLE A pipe or fitting or their main parts, of the same design, from a particular compound.

3.28**cavity**

(moulding) space within a mould to be filled to form the moulded product

EXAMPLE That part of an injection mould which gives the form to the injection-moulded product.

4 Abbreviated terms

To avoid misunderstanding, the abbreviations in this clause are defined as being the same in each language. For the same reason, the terms are given in three languages, English, French, and German.

EXAMPLE In the French language, the abbreviation for the French equivalent of "acceptable quality level" (AQL) is NQA; however, for the purposes of this part of ISO 22391, the abbreviation of the English term (AQL) is adopted.

	EN	FR	DE
AQL	acceptance quality limit	niveau de qualité acceptable	annehmbare Qualitätsgrenzlage
AT	audit test	essai d'audit	Überwachungsprüfung
BRT	batch release test	essai de libération de campagne de fabrication	Freigabepfung einer Charge
IT	indirect test	essai indirect	indirekte Prüfung
PVT	process verification test	essai de vérification du procédé de fabrication	Prozessüberprüfung
TT	type test	essai de type	Typprüfung
WT	witness testing	essai témoin	Prüfung unter Aufsicht

5 General

5.1 Materials, products and joints/assemblies shall conform to the requirements given in ISO 22391-1, ISO 22391-2, ISO 22391-3, and ISO 22391-5.

5.2 Products and assemblies shall be produced by the manufacturer under a quality management system which includes a quality plan.

It is recommended that the quality management system conform to or be no less stringent than the relevant requirements of ISO 9001^[3].

5.3 For the effect on water quality, attention is drawn to the requirements of national regulations (see the introduction).