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Pipes and joints made of oriented unplasticized poly(vinyl chloride) (PVC-O) for the conveyance of water under pressure

Part 3: Fittings

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National foreword

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Pipes and joints made of oriented unplasticized poly(vinyl chloride) (PVC-O) for the conveyance of water under pressure —

Part 3: **Fittings**

Tubes et assemblages en poly(chlorure de vinyle) non plastifié orienté (PVC-O) pour le transport de l'eau sous pression —

Partie 3: Raccords

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by 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*.

A list of all parts in the ISO 16422 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

Molecular orientation of thermoplastics results in the improvement of physical and mechanical properties. Orientation is carried out at temperatures well above the glass transition temperature.

Orientation of PVC-U pipe-material can be induced by different processes.

In general, the following production process is common. A thick-wall tube is extruded (feedstock) and conditioned at the desired temperature. The orientation process is activated in circumferential and axial directions under controlled conditions.

After the orientation process, the pipe is cooled down quickly to ambient temperature.

The orientation of the molecules creates a laminar structure in the material of the pipe wall. This structure gives the ability to withstand brittle failure emanating from minor flaws in the material matrix or from scratches at the surface of the pipe wall.

Improved hoop strength allows reduced wall thickness with material and energy savings. Improved resistance to impact and fatigue also result.

The classification depends on the material compound/formulation and stretch ratios used. Therefore, with the classification, these characteristics can be specified or determined.

The ISO 16422 series, of which this document is Part 3, specifies the requirements for a piping system made from oriented unplasticized poly(vinyl chloride) (PVC-O) and its components. The piping system is intended to be used for water supply, pressurized drainage and sewerage and irrigation systems to be used underground or above ground where protected to direct sunlight.

In respect of potential adverse effects on the quality of water intended for human consumption, caused by the products covered by this document, the following points are relevant:

— this document provides no information as to whether or not the products can be used without restriction;

— requirements and test methods for PVC-O material and components, other than fittings, are specified in ISO 16422-1 and ISO 16422-2. For other components (not manufactured from PVC-O) reference is made to the following documents: ISO 1452-3 (PVC-U) and EN 12842 (Cast Iron). Characteristics for fitness for purpose (mainly for joints) are specified in ISO 16422-5.

The future documents ISO 16422-1, ISO 16422-2 and ISO 16422-5 are intended to cancel and replace ISO 16422:2014.

This document is a completely new part of the ISO 16422 series since PCV-O fittings were not included in ISO 16422:2014.

This document is specifically focussed on fittings, as opposed to more general specifications, which are now covered in the various other parts of the ISO 16422 series.

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TECHNICAL SPECIFICATION **ISO/TS 16422-3:2023**

Pipes and joints made of oriented unplasticized poly(vinyl chloride) (PVC-O) for the conveyance of water under pressure —

Part 3: **Fittings**

1 Scope

This document specifies the characteristics of solid-wall oriented unplasticized poly(vinyl chloride) (PVC-O) fittings for piping systems intended to be used underground or above ground where protected from direct sunlight, for water supply, buried drainage, sewerage, treated wastewater and irrigation under pressure. This document is applicable to double sockets, repair couplings, reducers and to non-end load bearing elbows only. This document is not applicable to tees, flange adaptors, etc.

NOTE For double sockets, repair couplings, and reducers, there are no special fittings designs for end-load bearing applications. However, restrained gaskets can be used for end-load bearing applications. In this case, the requirements of ISO 16422-5 are applicable.

This document also specifies the test parameters for the test methods referred to in this document.

In conjunction with ISO 16422-1 and ISO 16422-5, this document is applicable to oriented PVC-O pipes with or without an integral socket, intended to be used for the following:

a) water mains and services lines;

b) conveyance of water for both outside and inside buildings;

c) drainage, sewerage and treated wastewater under pressure;

d) irrigation under pressure.

This document is applicable to piping systems intended for the supply of water under pressure up to and including 25 °C (cold water), intended for human consumption and for general purposes as well as for wastewater under pressure.

This document is also applicable to components for the conveyance of water and wastewater up to and including 45 °C. For temperatures between 25 °C and 45 °C, see ISO 16422-2, Figure C.1.

The piping system according to this document is intended for the conveyance of cold water up to pressure of 25 bar[1)] and especially in those applications where special performance requirements are needed, such as impact loads and pressure fluctuations, up to pressure of 25 bar.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 16422-1:-,[2)] *Pipes and joints made of oriented unplasticized poly(vinyl chloride) (PVC-O) for the conveyance of water under pressure — Part 1: General*

1) 1 bar =0,1 MPa=10^5 Pa; 1 MPa= 1 N/mm^2.

2) Under preparation. Stage at the time of publication: ISO/DIS 16422-1:2023.

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