



International  
Standard

**ISO 16422-1**

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

**Part 1:  
General**

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

*Partie 1: Généralités*

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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 document 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](http://www.iso.org/directives)).

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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](http://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*.

This first edition of ISO 16422-1, together with ISO 16422-2 and ISO 16422-5, cancels and replaces the second edition of ISO 16422:2014, which has been technically revised.

The main changes are as follows:

- ISO 16422:2014 has been split into several parts, under the general title "*Pipes and joints made of oriented unplasticized poly(vinyl chloride) (PVC-O) for the conveyance of water under pressure*". The information previously included in ISO 16422:2014 has been divided into ISO 16422-1 (this document), ISO 16422-2 and ISO 16422-5.

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](http://www.iso.org/members.html).

## 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 primarily in circumferential direction under controlled conditions. Axial orientation can also be activated in the product.
- 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. It also results in improved resistance to impact and fatigue.

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

Regarding potential adverse effects on the quality of water intended for human consumption caused by the products covered by this document, this document provides no information as to whether or not the products can be used without restriction.

Requirements and test methods for PVC-O components are specified in this document, as well as in ISO 16422-2 and ISO/TS 16422-3.

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