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Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes — System design of above ground pipe and joint installations without end thrust

National foreword

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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).

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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.

This document was prepared by Technical Committee ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 6, *Reinforced plastics pipes and fittings for all applications*.

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

While pipes manufactured according to ISO 23856 are typically utilized in buried installations, there are circumstances where installing above ground is the preferred practice. These can include terrain not suitable for burial (e.g. rock), road or river crossings, unsuitable soils and installation on steep slopes.

For information on subjects such as shipping, handling, inspecting, rigid connections, thrust restraint and joining pipes, refer to ISO/TS 10465-1 which addresses the buried installation of GRP pipes. The guidelines and information on these subjects are also applicable to pipes used above ground. The information in this document is intended to supplement ISO/TS 10465-1 with practices and guidelines specific to above ground installation.

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TECHNICAL SPECIFICATION **ISO/TS 10986:2021**

Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes — System design of above ground pipe and joint installations without end thrust

1 Scope

This document addresses the system design of pipe and joints of above ground installations without end-thrust as specified in systems standard ISO 23856. It is directed to pipelines with a minimum stiffness of SN 5000 laid in a straight line between thrust blocks. It is based on the safety concepts described in ISO TS 20656-1, with consequence class 2 (CC2) as default. For other consequence classes, certain details specified in this document can need to be modified. This document is directed to double bell coupling. However, much of the information can be adapted and utilized for other flexible joints systems.

This document does not cover fittings nor detailled engineering work like thrust blocks, support and anchor designs.

As installation is not included in the scope of this document and to assist system design, Annex A provides a pressure testing and inspection procedure. However, to ensure the use of clearly defined field test data in system design, Annex A can be used normatively by agreement between purchaser and supplier. An example of recording above ground joint deflection data is given in Annex B.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

4 Angular deflection of joints

4.1 General

The angular deflection at flexible joints shall be controlled to avoid excessive loads on the pipeline and its supporting structures. Above ground installations do not benefit from the stabilizing support that is given by the soil in buried installations, and they are therefore more susceptible to problems of joint misalignment. For this reason, control and measurement of joint angular deflection is of great importantance. It is necessary to limit angular deflections to lower values than those normally permitted for buried applications.

There are two types of deflection to consider: pipe-to-pipe angular deflection and coupling-to-pipe deflection, as shown in Figure 1. Both need to be considered as coupling-to-pipe angular deflection can be larger than the pipe-to-pipe angular deflection.

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