
**Glass-reinforced thermosetting
plastics (GRP) pipes and fittings — Test
methods for leaktightness and proof of
structural design of flexible joints**

*Tubes et raccords en plastiques thermodurcissables renforcés de verre
(PRV) — Méthodes d'essai pour l'étanchéité et preuve de conception
structurelle de joint flexible*

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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. www.iso.org/directives

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 138, *Plastics pipes, fittings and valves for the transport of fluids*, Subcommittee SC 6, *Reinforced plastics pipes and fittings for all applications*.

This second edition cancels and replaces the first edition (ISO 8639:2000), which has been technically revised. The modifications are:

- changed title and scope to cover the proof of structural design of flexible joints;
- changed scope to mention that the test procedure is a destructive test;
- changed testing sequences from mandatory to suggested;
- changed wording from misalignment to deformation;
- clarified support conditions;
- additional test sequence for the proof of the structural design ([Clause 8](#));
- changes in [Table 1](#) with additional testing sequences for the proof of the structural design of flexible joints;

Introduction

In a pipework system, pipes and fittings of different nominal pressures and stiffnesses may be used.

Any joint made between pipes and/or fittings should be designed such that its performance is equal to or better than the requirements of the pipeline, but not necessarily of the components being joined.

The requirements for assembly of the joint are not included in this International Standard, but they should be in accordance with the manufacturer's recommendations.

The material-dependent parameters and/or performance requirements are stated in the referring specification.

Glass-reinforced thermosetting plastics (GRP) pipes and fittings — Test methods for leaktightness and proof of structural design of flexible joints

1 Scope

This International Standard specifies test methods for flexible non-thrust resistant socket-and-spigot joints with elastomeric sealing elements for buried and above ground glass-reinforced thermosetting plastics (GRP) pipeline applications. It covers methods of test for the leaktightness and resistance to damage of the joint only, when subject to specified combinations of longitudinal extension (draw), angular movement (angular deflection), compression (deformation) perpendicular to the pipe axis and internal pressure. This International Standard is applicable to joints for either pressure or non-pressure applications.

NOTE The joints tested in accordance with this International Standard are subjected to conditions which measure their ability to function and thereby prove the design of the joint, especially for type test purposes.

These test procedures are applicable to joints for pipes and fittings of all nominal sizes. The tests are suitable for the evaluation of joints intended for applications in which the liquids are conveyed at temperatures specified in the referring standards.

The test procedures in this International Standard are damaging to the test piece which will not be suitable for reuse after these tests. The test procedure shall be applied for type testing purposes.

2 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

2.1

pressure

hydrostatic gage pressure

2.2

angular deflection

angle between the axes of the joint and the consecutive pipe(s), expressed in degrees (°)

2.3

draw

longitudinal movement of the pipe relative to the socket (joint), expressed in millimetres (mm)

2.4

total draw

sum of the draw, and the additional longitudinal movement, of joint components due to the presence of angular deflection, expressed in millimetres (mm)

2.5

deformation

pipe deformation in the coupling as a result of a vertical force on the pipe and a supported coupling causing a step between the two pipe spigots at the loading position in millimeters (mm)

3 Principle

A test piece comprising two pieces of pipe jointed together, by incorporation of a socket or inclusion of a double-socket coupler, is subjected to specified combinations of draw, angular deflection and