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# Glass reinforced thermosetting plastic (GRP) pipes — Determination of initial specific ring stiffness using segment test species cut from a pipe



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# National foreword

This Published Document is the UK implementation of ISO/TS 12512:2017.

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# Glass reinforced thermosetting plastic (GRP) pipes — Determination of initial specific ring stiffness using segment test species cut from a pipe

*Tubes en plastique thermodurcissables renforcés de verre (PRV) — Détermination de la rigidité annulaire spécifique initiale et de la résistance à la déflexion annulaire initiale en utilisant des éprouvettes segmentaires découpées dans un tube*



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# Foreword

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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 on 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 the following URL: www.iso.org/iso/foreword.html.

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

# Introduction

This document develops an alternative to the testing of full pipe rings to measure initial specific ring stiffness (ISO 7685). The goal was to use ring segments which ideally would have led to the use of smaller and more easily handled test specimens and standard testing machines. Much work was done on developing equipment for testing ring segments and on the analysis of loading conditions and calculation procedures and conducting testing programs.

There was neither sufficient nor uniform correlation of segment testing results to standard ring testing results to allow the use of segment testing as an alternative stiffness test procedure. There were indications that correlation was perhaps diameter (DN), stiffness class (SN) and pressure class (PN), as well as specimen width, dependent. As initial ring stiffness (SN) is a key classification parameter for GRP pipes this resulted in the segment test being not accepted as a viable alternative stiffness testing procedure.

This document presents the last draft of the segment test method. It was agreed to issue this last draft as a Technical Specification so that the work done would not be lost and perhaps will allow interested parties to continue to develop the analysis of loading conditions, equipment development and calculation procedures. It may also prove useful as a research tool.

# Glass reinforced thermosetting plastic (GRP) pipes — Determination of initial specific ring stiffness using segment test species cut from a pipe

## 1 Scope

This document specifies a method for determining the initial specific ring stiffness of pipes having a nominal size of DN 2000 or larger, using segment test pieces cut from a glass-reinforced thermosetting plastics (GRP) pipe.

## 2 Normative references

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 7685, *Plastics piping systems — Glass-reinforced thermosetting plastics (GRP) pipes — Determination of initial specific ring stiffness*

## 3 Terms and definitions

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

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

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

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

**3.1**
**compressive load**
$F$
load applied to a pipe to cause a diametric deflection

Note 1 to entry: Compressive load is expressed in newtons (N).

**3.2**
**load applied to 79 ° segmental test piece**
$F_{79}$
load applied to 79 ° segmental test piece to cause deflection

Note 1 to entry: Load applied to 79 ° segmental test piece is expressed in newtons (N).

**3.3**
**deflection coefficient applied to 79 ° segmental test piece**
$\xi$
coefficient given by Formula (1):

$$\xi = \left\{1860 + \left(2500 \times y_s / d_m\right)\right\} \times 10^{-5} \quad (1)$$

where