



DPC: 21/30368980 DC

BSI Group Headquarters

389 Chiswick High Road London W4 4AL

Tel: +44 (0)20 8996 9000

Fax: +44 (0)20 8996 7400

www.bsigroup.com

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Title: Draft BS ISO 21052 Restrained joint systems for ductile iron pipelines — Calculation rules for lengths to be restrained.

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This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

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Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
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1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	

DRAFT INTERNATIONAL STANDARD

ISO/DIS 21052

ISO/TC 5/SC 2

Secretariat: **AFNOR**

Voting begins on:
2020-12-29

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Restrained joint systems for ductile iron pipelines — Calculation rules for lengths to be restrained

ICS: 23.040.10

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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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 5, *Ferrous metal pipes and metallic fittings*, Subcommittee SC 2, *Cast iron pipes, fittings and their joints*.

Restrained joint systems for ductile iron pipelines — Calculation rules for lengths to be restrained

1 Scope

This document offers a method of computing the lengths of the pipe that must be restrained on each side (one side in case of Dead end) of the point of application of the thrust force.

The objective in designing a restrained joint thrust restraint system is to determine the length of pipe that must be restrained on each side of the focus of a thrust force. This method takes into account the outside diameter of the pipe, the design internal pressure (to estimate the thrust), depth of cover, the characteristics of the soil surrounding the pipe and trench backfilling methods for a worldwide usage. The characteristics of the restrained joint are not covered by this document but may also be considered to determine the restraining length using any appropriate method.

All types of restrained joint systems, with their operating pressure ratings of ductile iron pipelines complying with ISO 2531, ISO 7186 and ISO 16631 have been considered suitable for this method of computing.

NOTE 1 ISO 10804 Restrained joint systems for ductile iron pipelines - Design rules and type testing, deals with actual design of the joint for various operating pressures of the pipeline.

NOTE 2 National standards or established calculation methods may be used instead of this ISO standard by agreement between the manufacturer and the designer/customer.

2 Normative references

The following referenced documents are indispensable for the application of this document. The latest edition of the referenced documents (including any amendments) applies.

ISO 2531, *Ductile iron pipes, fittings, accessories and their joints for water applications*

ISO 6708, *Pipework components — Definition and selection of DN (nominal size)*

ISO 7186, *Ductile iron products for sewerage applications*

ISO 10803, *Design method for ductile iron pipes*

ISO 10804, *Restrained joint systems for ductile iron pipelines — Design rules and type testing*

ISO 16631, *Ductile iron pipes, fittings, accessories and their joints compatible with plastic (PVC or PE) piping systems, for water applications and for plastic pipeline connections, repair and replacement*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 2531 and the following apply.

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/>

3.1

mechanical flexible joint

flexible joint in which sealing is obtained by applying pressure to the gasket by mechanical means

3.2

push-in flexible joint

flexible joint assembled by pushing the spigot through the gasket into the socket of the mating component

3.3

restrained joint

flexible push-in or mechanical joint in which a means is provided to prevent longitudinal separation of the assembled joint

3.4

allowable operating pressure

PFA

maximum internal pressure, excluding surge, which a component can safely withstand in permanent service

3.5

allowable maximum operating pressure

PMA

maximum internal pressure, including surge, which a component can safely withstand in service

3.6

allowable site test pressure

PEA

Maximum hydrostatic pressure that a newly installed component can withstand for a relatively short duration, when either fixed above ground level or laid and backfilled underground, in order to measure the integrity and tightness of the pipeline

Note 1 to entry: This test pressure is different from the system test pressure, which is related to the design pressure of the pipeline.

3.7

thrust force

unbalanced hydrostatic forces developed at the locations of a pipeline, changing diameter or direction

3.8

bearing resistance

bearing resistance of the soil is realized as passive pressure and is generated as the pipeline attempts to separate and move into the soil

3.9

frictional resistance

any body moving in contact with another body will encounter a resisting force known as friction. All soils have an inherent friction angle referred to as " ϕ ". This friction angle is a result of the interaction of the grains of soil as they move relative to one another and is related to the internal shear strength of the soil. This document distinguishes the frictional resistance depending on the coating system (bonded coatings or loose PE sleeve)

3.10

passive soil pressure

passive soil pressure is the maximum pressure that the soil will impart, on a structure at the prescribe depth. The passive soil pressure is dependent upon the compaction of the soil

3.11

restrained length

the source of restraining forces of an underground pipeline is twofold: first, the static friction between the pipe unit and soil, and second, the restraint provided by the pipe as it bears against the side fill soil along each leg of the fittings. They are presumed to act in the direction opposing impending movement of the fitting