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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 46322-2025

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

球墨铸铁管自锚接口系统 自锚长度计算方法

(English Translation)

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References

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is modified to adopt ISO 21052:2021 "Calculation method for self-anchoring length of self-anchoring joint system for ductile iron pipe".

Compared with ISO 21052:2021, this document has undergone many structural adjustments. A table comparing the changes in structural numbering between the two documents is provided.

See Appendix A.

The technical differences between this document and ISO 21052:2011, and the reasons therefor, are as follows.

---The standard for conveying media for ductile iron pipes has been expanded to include "conveying media of different uses and types" to adapt to the needs of my country's industry.

Features;

---ISO 2531 has been replaced with the normatively referenced GB/T 13295 (see Chapter 1, Chapter 3, 8.1.1) to adapt to Chinese technology.

condition;

---ISO 7186 (see Chapter 1, 8.1.1) has been replaced with the normatively referenced GB/T 26081 to adapt to my country's technical conditions;

---ISO 16631, which was referenced in ISO 21052:2021, has been removed to better reflect the needs of the Chinese market and the current state of the industry;

---The normative reference GB/T 43492 (see Chapter 1, 8.1.1) has been added to meet the application requirements of prefabricated insulation products in my country;

---Definitions for mechanical flexible joints, slide-in flexible joints, self-anchoring joints, and maximum design pressure have been removed. The system test pressure has also been removed.

The English abbreviations and annotations in the definition of force (see section 3.1 of ISO 21052:2021) should be adapted to suit my country's national conditions;

---The calculation methods, unit expressions, and informative guidelines in the symbolic meaning have been removed (see section 3.2 of ISO 21052:2021) to conform to my National Standards Drafting Specifications;

---The symbols for the unit frictional resistance of the larger and smaller diameter sections of the tapered tube have been added (see Table 1) to enhance the standard's reliability.

Operability;

---An effective area coefficient α has been added, and the signs and calculation formulas for F_s and $(F_s)_b$ have been changed (see Table 1 and Chapter 6) to enhance the standard.

Operability;

---The source of the system test pressure value has been changed, and the design safety factor has been set at 1.5 (see 6.1.1) to adapt to my country's technical conditions.

Components, and improve the rationality of the design;

---Requirements and suggestions for the combined design of anchor blocks and self-anchored pipes have been added (see 8.3) to meet the needs of actual engineering design;

---The exposed support pier laying mode (see 9.3 of ISO 21052:2021) has been removed to meet my country's technical requirements.

The following editorial changes have been made to this document.

--- Symbols that did not appear in this file have been removed;

---Adjust the informative information on the pier design to footnotes;

---The information regarding the mechanical principles, calculation principles of key parameters, and related assumptions for self-anchoring length design has been adjusted and added as footnotes;

---Information explaining the safe and conservative calculation methods specified in this document has been changed to a footnote;

---Comments for the backfill type have been removed;

---The derivation process and explanation of the principles behind the calculation formulas have been changed to footnotes;

---The example of how to round the self-anchor length to a multiple of the single branch pipe length has been adjusted to an example;

---Information such as the mechanical analysis of the combined design of the anchor pier and self-anchoring pipe has been adjusted to footnotes;

---Information regarding the impact of future excavation on the stability of the self-anchoring pipe design system has been moved to footnotes;

---Based on commonly used pipe dimensions in my country, Appendix C (Informative) "Dimensions and Units of Common Pipe Levels under Full Water Condition" has been revised.

weight".

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Iron and Steel Association.

This document is under the jurisdiction of the National Steel Standardization Technical Committee (SAC/TC183).

1 Scope

This document specifies the self-anchoring joint system for ductile iron pipes used for balancing different purposes and types of media transported under pressure.

The design method for the self-anchoring length of hydraulic thrust includes general provisions, effects on pipelines, calculation of self-anchoring length, engineering design, and installation.

Require.

The calculation method presented in this document takes into account common pipe path variations, including diameter changes and blind ends at the pipe terminals, as well as external pipe conditions.

The methods described in this document do not include the following. pipe diameter, system test pressure (for estimating thrust), overburden depth, soil properties around the pipe, and trench backfilling methods.

The performance requirements of self-anchored interfaces should be considered appropriately when calculating the self-anchor length.

The methods described in this document are applicable to various types of self-anchoring interface systems conforming to GB/T 13295, GB/T 26081 or GB/T 43492.

The methods described in this document are not applicable to self-anchoring interface systems using anti-slip and anti-detachment sealing rings conforming to HG/T 6183-2023.

Note: GB/T 36173 provides specific design rules for self-anchoring interfaces of pipelines under various working pressures.