

ICS 19.100
CCS J 04



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

GB/T 45377-2025

**Non-destructive testing - Long-range inspection of
above-ground pipelines and plant piping using guided wave
testing with axial propagation**

无损检测 地面管线及厂区管道轴向长距离导波检测

(English Translation)

Issued on: March 28, 2025

Implemented on: March 28, 2025

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

Preface
1 Scope
2 Normative references
3 Terms and Definitions
4 General Principles
5 Factors affecting the implementation of ultrasonic guided wave testing
6 Testing Equipment
7 Testing Procedure
8 Test data quality requirements
9 Detection
10 Supplementary testing
11 Test Report
Appendix A (Informative) Selection of guided wave modes
Reference

Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is modified to adopt ISO 18211:2016 "Non-destructive testing of surface pipelines and plant pipelines - axial long-distance guided wave testing".

This document has the following structural adjustments compared to ISO 18211:2016.

--- Chapter 3, 3.14~3.17 correspond to 3.15~3.18 in Chapter 3 of ISO 18211:2016, and 3.14 is deleted;

--- Chapters 4 to 11 correspond to Chapters 5 to 12 of ISO 18211:2016, and Chapter 4 is deleted.

The technical differences between this document and ISO 18211:2016 and their reasons are as follows.

--- Changed the term "total pipe wall cross-section TCS" to "cross-section" (see 3.3), To adapt to my country's national conditions;

- Changed the English equivalent of the term "datumpoint" to "datum" (see 3.5) to eliminate ambiguity;
- The term "secondary mode" (see 3.14 of ISO 18211:2016) has been deleted and is not cited in the entire text;
- Deleted the personnel requirements (see Chapter 4 of ISO 18211:2016) to adapt to my country's technical conditions and increase operability. The following editorial changes were made to this document.
- Added the reference document GB/T 31211.1 (see 6.4) on the performance verification method of waveguide equipment to increase the operability of the verification.

1 Scope

This document specifies the use of ultrasonic guided waves propagating axially along the entire circumferential section to measure the surface pipelines and plant areas made of carbon steel and low alloy steel.

A method for long-distance detection of corrosion or erosion damage in pipelines.

This document applies to the following types of pipes.

- Ground coating pipeline;
- Ground pipelines with insulation layer;
- Coated pipelines in factory areas;
- Insulated pipes in the factory area.

Note: Guided wave testing (GWT) is a rapid method for checking surface pipelines, plant pipelines and pipelines with casings crossing roads, and for determining areas of possible corrosion or erosion.

The pipeline section with casing (without asphalt or plastic coating) crossing the road is the section where the outer wall of the pipeline is not Special buried pipes subject to soil pressure, this document applies to such pipes. Other types of pipes are not included in the above list due to their increased complexity. Use dedicated detection methods.

2 Normative references

This document has no normative references.

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Axial direction

Along the major axis of the pipe.

3.3 Cross-section

The area between the inner diameter and the outer diameter of the pipe on a plane perpendicular to the axis of the pipe.

3.4 Cross-section change

The equivalent change in cross-section calculated assuming that the indication is entirely caused by the change in cross-section (3.3).

3.5 Datum

A reference point used to report the test position (3.15) and to establish a correlation between the test result and the corresponding position of the test object.