

# INTERNATIONAL STANDARD

# ISO 10409

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## **Petroleum and natural gas industries — Application of cement lining to steel tubular goods, handling, installation and joining**

*Industries du pétrole et du gaz naturel — Mise en place des cheminages  
de ciment dans le cas de produits tubulaires en acier, manutention,  
installation et emboîture*



Reference number  
ISO 10409:1993(E)

## Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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International Standard ISO 10409 was prepared by the American Petroleum Institute (API) (as RP 10E, 2nd edition) and was adopted, under a special "fast-track procedure" by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum and natural gas industries*, in parallel with its approval by the ISO member bodies.

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## Introduction

International Standard ISO 10409:1993 reproduces the content of API RP 10E, 2nd edition, 1987. ISO, in endorsing this API document, recognizes that in certain respects the latter does not comply with all current ISO rules on the presentation and content of an International Standard. Therefore, the relevant technical body, within ISO/TC 67, will review ISO 10409:1993 and reissue it, when practicable, in a form complying with these rules.

This standard is not intended to obviate the need for sound engineering judgement as to when and where this standard should be utilized and users of this standard should be aware that additional or differing requirements may be needed to meet the needs for the particular service intended.

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Standards referenced herein may be replaced by other international or national standards that can be shown to meet or exceed the requirements of the referenced standards.

Appendices A and C form an integral part of the requirements of this standard.  
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# Petroleum and natural gas industries — Application of cement lining to steel tubular goods, handling, installation and joining

## 1 Scope

This International Standard lays down the minimum requirements for cement lining of steel pipe and tubing used for shielding the steel from chemical corrosive attack encountered in the handling of oil field brines.

## 2 Requirements

Requirements are specified in:

“API Recommended Practice 10E (RP 10E), Second Edition, July 1, 1987 — *Recommended Practice for Application of Cement Lining To Steel Tubular Goods, Handling, Installation and Joining*”,

which is adopted as ISO 10409.

For the purposes of international standardization, however, modifications shall apply to specific clauses and paragraphs of publication API RP 10E. These modifications are outlined below.

*Page 7*

Information given in the POLICY STATEMENT is relevant to the API publication only.

*Page 8*

**Foreword**, paragraph C.

The referenced standards indicated hereafter are available under the following ISO references:

- API Std 5B as ISO 10422
- API Spec 5L as ISO 3183-1
- API Spec 10 as ISO 10426.

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# Recommended Practice for Application of Cement Lining To Steel Tubular Goods, Handling, Installation and Joining

API RECOMMENDED PRACTICE 10E (RP 10E)  
SECOND EDITION, JULY 1, 1987

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**NOTE:** This is the second edition of this recommended practice. It was authorized for publication as a tentative recommended practice at the 1977 Standardization Conference, and contains changes approved at the 1985 and 1986 Standardization Conferences by letter ballot of the Committee on Standardization of Well Cements.

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## IMPORTANT INFORMATION CONCERNING USE OF ASBESTOS OR ALTERNATIVE MATERIALS

Asbestos is specified or referenced for certain components of the equipment described in some API standards. It has been of great usefulness in minimizing fire hazards associated with petroleum processing. It has also been a universal sealing material, compatible with most petroleum fluid services.

Certain serious adverse health effects are associated with asbestos, among them the serious and often fatal diseases of lung cancer, asbestosis, and mesothelioma (a cancer of the chest and abdominal linings). The degree of exposure to asbestos varies with the product and the work practices involved.

Consult the most recent edition of the U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) Health Standard for Asbestos, 29 *Code of Federal Regulations* Section 1910.1001; the U.S. Environmental Protection Agency's National Emission Standard for Hazardous Air Pollutants concerning Asbestos, 40 *Code of Federal Regulations* Sections

61.140 through 61.156; and the proposed rule by the U.S. Environmental Protection Agency (EPA), proposing labeling requirements and phased banning of asbestos products, published at 51 *Federal Register* 3738-3759 (January 29, 1986).

There are currently in use and under development a number of substitute materials to replace asbestos in certain applications. Manufacturers and users are encouraged to develop and use effective substitute materials which can meet the specifications for, and operating requirements of, the equipment to which they would apply.

**SAFETY AND HEALTH INFORMATION WITH RESPECT TO PARTICULAR PRODUCTS OR MATERIALS CAN BE OBTAINED FROM THE EMPLOYER, THE MANUFACTURER OR SUPPLIER OF THAT PRODUCT OR MATERIAL, OR THE MATERIAL SAFETY DATA SHEET.**

Attention Users: Portions of this publication have been changed from the previous edition. The location of changes have been marked with a bar in the margin, as shown to the left of this paragraph. In some cases the changes are significant, while in other cases the changes reflect minor editorial adjustments. The bar notations in the margins are provided as an aid to users as to those parts of this publication that have been changed from the previous edition, but API makes no warranty as to the accuracy of such bar notations.

## API RECOMMENDED PRACTICE FOR APPLICATION OF CEMENT LINING TO STEEL TUBULAR GOODS, HANDLING, INSTALLATION AND JOINING

### Foreword

a. This recommended practice is under the jurisdiction of the API Committee on Standardization of Well Cements. It was developed through the joint effort of members of National Association of Corrosion Engineers (NACE) T-1G-8 Task Group on Cement Lining of Tubular Goods, and API Task Group on Cement Lining of Steel Pipe. It was also submitted to NACE Unit Committee T-1G for review and comments.

b. The purpose of this recommended practice is to provide standard procedures for the plant application of cement lining to oilfield tubular goods and recommended methods of joining cement-lined pipe.

c. Related publications under the jurisdiction of API Committees on Standardization of Oil Field Equipment and Materials are:

Spec 5A: *Specification for Casing, Tubing and Drill Pipe.*

Spec 5AC: *Specification for Restricted Yield Strength Casing and Tubing.*

Spec 5AX: *Specification for High-Strength Casing, Tubing, and Drill Pipe.*

Std 5B: *Specification for Threading, Gaging, and Thread Inspection of Casing, Tubing and Line Pipe Threads.*

Spec 5L: *Specification for Line Pipe.*

RP 5L2: *Recommended Practice for Internal Coating of Line Pipe For Gas Transmission Service.*

Spec 10: *Specification for Materials and Testing for Well Cements.*

Bul 10C: *Bulletin on Well Cement Nomenclature.*

d. Earlier work investigating the application and use of cement linings in tubular goods was conducted by NACE Technical Unit Committee T-1G (Protective Coatings and Non-Metallic Materials for Oil Field Use). The following report contains committee findings which have been widely used as the basis for cement lining specifications:

NACE Technical Committee Report 1G163 - *Recommended Practices Applicable to Placing Cement Lining in Oil Field Steel Tubular Goods.*

e. ASTM standards\* referenced in this recommended practice are available from American Society for Testing Materials (ASTM), 1916 Race Street, Philadelphia, Pennsylvania 19103.

ASTM C33: *Specifications for Concrete Aggregates (Part 14\*)*

ASTM A53: *Specifications for Welded and Seamless Steel Pipe (Part 1\*)*

ASTM C76: *Specifications for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe (Part 12\*)*

ASTM C109: *Test for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or 50-mm Cube Specimens) (Part 13\*)*

ASTM C150: *Specifications for Portland Cement (Part 13\*)*

ASTM C618: *Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete (Part 14\*)*

f. The following Steel Structures Painting Council (SSPC) Standards and NACE Standards for metal surface preparation are referenced in this recommended practice:

SSPC-SP-19: *Solvent Cleaning.*

SSPC-SP-4: *Flame Cleaning.*

SSPC-SP-6: *Commercial Blast Cleaning (NACE No. 3).*

SSPC-SP-10: *Near-White Blast Cleaning (NACE No. 2).*

g. Beyond the scope of this Recommended Practice, certain standards covering other applications and uses of cement linings may be useful and are listed as follows:

#### American Water Works Association (AWWA)

AWWA Standard C-602 (latest revision): *Cement-Mortar Lining of Water Pipelines in Place.*

AWWA Standard C-205 (latest revision): *Cement-Mortar Protective Lining and Coating for Steel Water Pipe — 4 Inches and Larger — Shop Applied.*

#### American National Standards Institute (ANSI)

ANSI Standard A21.4 (latest revision): *Cement-Mortar Lining for Cast Iron and Ductile Iron Pipe and Fittings for Water.*

\*Current Edition, *Book of ASTM Standards.*