

ISO TC67 SC2 – Pipeline Transportation Systems for the Petroleum and Natural Gas Industries



Jan Oude Hengel

Chairman ISO TC67 SC2



ISO TC67 SC2 Deliverables

- **Consistent set of standards for pipeline systems**
- **Primary focus on materials and components**
- **Response to industry developments (e.g. higher steel grades for linepipe, lifetime extension)**
- **Harmonise with other standards organisations (API, NACE, CEN)**



BRITISH STANDARD

BS EN
14870-1:2004

Petroleum and natural
gas industries —
Induction bends,
fittings and flanges for
pipeline transportation

Membership ISO TC67 SC2

Participating members (25)

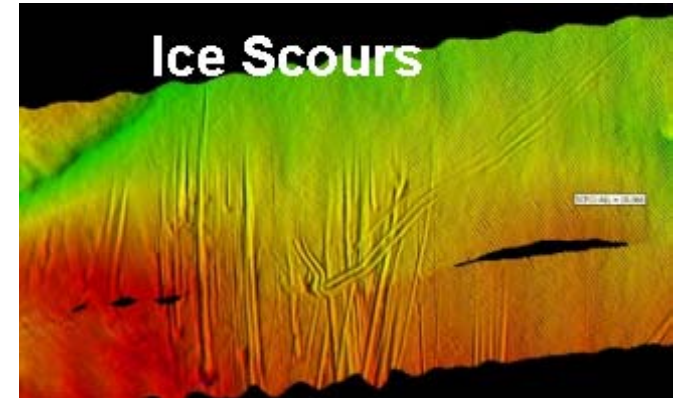
- **Argentina**
- **Australia**
- **Brazil**
- **Canada**
- **Denmark**
- **Finland**
- **France**
- **Germany**
- **India**
- **Indonesia**
- **Iran**
- **Ireland**
- **Italy**
- **Japan**
- **Korea**
- **Mexico,**
- **Netherlands**
- **Norway**
- **Qatar**
- **Romania**
- **Russia**
- **South Africa**
- **Sweden**
- **USA**
- **United Kingdom**

Observing members (7)

- **Kazakhstan**
- **Malaysia**
- **Poland**
- **Serbia**
- **Slovakia**
- **Spain**
- **Switzerland**

Published SC2 Standards

- Pipeline transportation systems (ISO 13623)
- Reliability based limit state methods (ISO 16708)
- Testing procedures for mechanical connectors (ISO 21329)
- Welding of pipelines (ISO 13847)
- Linepipe (ISO 3183)
- Pipeline valves (ISO 14313)
- Subsea pipeline valves (ISO 14723)
- Induction bends, flanges and fittings (ISO 15590-1, -2, -3)



Published Standards (cont.)

- **Cathodic Protection Land and Offshore Pipelines (ISO 15589-1, -2)**
- **External pipeline protective coatings – fusion bonded epoxy coatings (ISO 21809-2)**



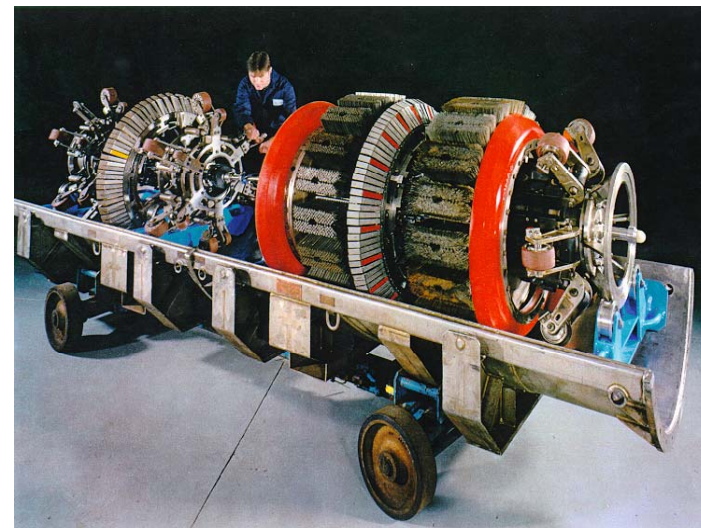
Standards work in progress

- **External pipeline protective coatings – Polyolefin coatings 3 layer PE/PP (ISO/DIS 21809-1)**
- **External pipeline protective coatings – Field joint coatings (ISO/DIS 21809-3)**
- **External pipeline protective coatings – Polyethylene coating 2 layer PE (ISO/DIS 21809-4)**
- **External pipeline protective coatings – External concrete coatings (ISO/CD 21809-5)**



New work items

- **Wet thermal insulation coatings (ISO/NP 596)**
- **Actuation mechanical integrity and sizing for pipeline valves (ISO/NP 12490)**
- **Recommended practice for extension of lifetime for pipeline systems**



ISO 13623 Pipeline systems

- **Rigid pipelines both on land and offshore**
- **All fluids, divided in five categories according to hazard potential**
- **Full lifetime cycle from design to abandonment**
- **Refers to national legislation for public safety and environmental requirements. Minimum safety approach where national requirements have not been specified (location classes)**

INTERNATIONAL
STANDARD

ISO
13623

First edition
2000-04-15

Petroleum and natural gas industries —
Pipeline transportation systems

*Industries du pétrole et du gaz naturel — Systèmes de transport par
conduites*



Reference number
ISO 13623:2000(E)

© ISO 2000

Document provided by ISO/TC 68/SC 10/Working Group 1/ISO 13623:2000(E)
Copyright © 2000 ISO/TC 68/SC 10/Working Group 1/ISO 13623:2000(E)
All rights reserved. No part of this publication may be reproduced without the
written permission of the International Organization for Standardization.

ISO 13623 Pipeline systems (cont)

- **Requirements for system design and pipeline operations**
- **Design factors for pressure containment based on minimum (against nominal) wall thickness**
 - **Savings for large diameter lines with low minus tolerance for pipe**
- **Distance block valve stations for gas lines to be based on risk assessment instead of specified distances**
 - **Allows selection of locations on basis of safety, availability and potential for emission**



ISO 3183:2007 Steel pipe for pipeline transportation systems

- **Developed jointly by ISO TC67 SC2 and API WG210**
- **Second edition (ISO 3183:2007) published March 2007**
- **API and API 5L/ISO 3183 published October 2007 as example of harmonisation and API adoption of ISO style for standards**
- **API 5L/ISO 3183 deviations from ISO 3183:**
 - **Some changes to technical requirements in Annex A**
 - **API Proprietary monogram and marking in Annex O**

INTERNATIONAL
STANDARD

ISO
3183

Second edition
2007-03-15

Petroleum and natural gas industries —
Steel pipe for pipeline transportation
systems

Industries du pétrole et du gaz naturel — Tubes en acier pour
les systèmes de transport par pipelines

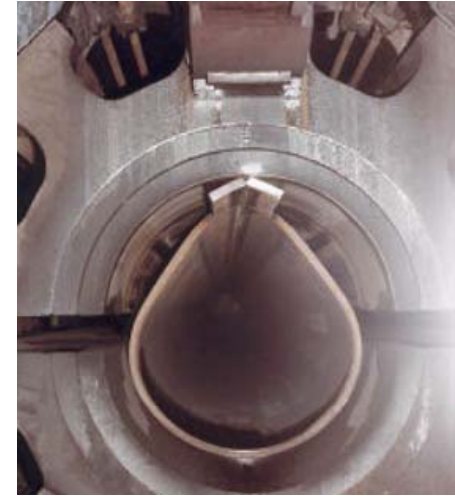


Reference number
ISO 3183:2007(E)

© ISO 2007

ISO 3183:2007 Steel pipe for pipeline transportation systems (Cont)

- **Two product specification levels PSL 1 (up to L485/X70) and PSL 2 (up to L830/X120)**
- **Additional requirements for following applications:**
 - **Annex G Pipe with resistance to ductile fracture propagation in gas lines (PSL 2)**
 - **Annex H Pipe for sour service (PSL 2)**
 - **Annex I Pipe for through flowline applications**
 - **Annex J Pipe for offshore service (PSL 2)**



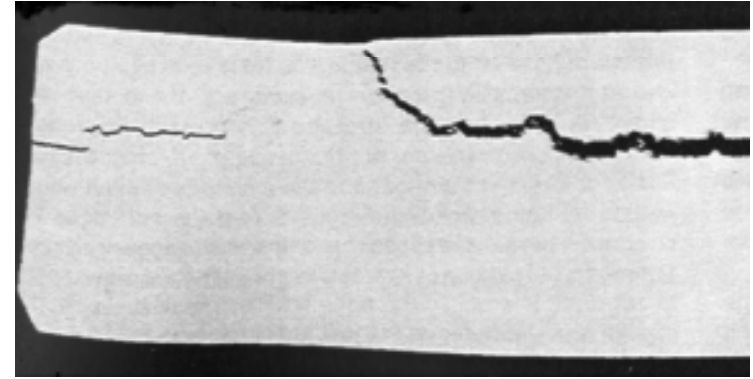
ISO 3183:2007 Annex G Pipe with resistance to ductile fracture propagation

- **Provides methodology for specifying Charpy values**
- **Five approaches included**
 - **EPRG guidelines**
 - **Simplified Battelle method**
 - **Battelle – PRCI approach**
 - **AISI method**
 - **Full scale burst testing**

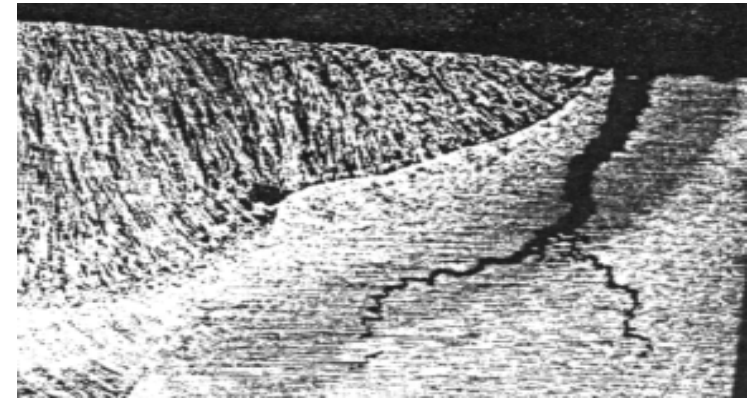


ISO 3183:2007 Annex H Pipe for sour service

- Grades L245 (Grade B) to L 485 (X70)
- Specified steel making requirements
- Tighter compositions than standard PSL2
- Requirements for HIC/SWC and SSC testing



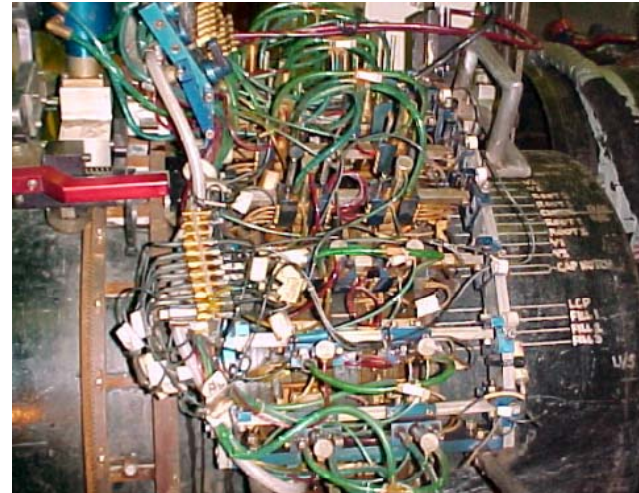
Hydrogen_Induced Cracking



Sulfide Stress Cracking

ISO 3183:2007 Annex J Pipe for Offshore Service

- **Grades L245 (Grade B) to L 555 (X80)**
- **Specified steel making requirements**
- **Tighter compositions than standard PSL2**
- **Increased inspection requirements**
- **Tighter dimensional tolerances**



Adoption and Harmonisation

BRITISH STANDARD

BS EN
14870-1:2004

**Petroleum and natural gas industries —
Induction bends,
fittings and flanges for
pipeline transportation
systems —**

Part 1: Induction bends

The European Standard EN 14870-1:2004 has the status of a
British Standard

ICE 95.020, 02.040.01, 02.040.02

BSi
British Standards

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

Copyright © British Standards Institution
Published by BSI under license with the Intellectual Property Rights Organisation
The information on this page provides a concise summary of the main elements of the standard
For more information on this standard, please refer to the full text of the standard




Specification for Line Pipe

ANSI/API SPECIFICATION 5L
FORTY-FOURTH EDITION, OCTOBER 1, 2007

EFFECTIVE DATE: OCTOBER 1, 2008

CONTAINS API MONOGRAM ANNEX AS PART OF
US NATIONAL ADOPTION

**ISO 3183:2007 (Modified), Petroleum and natural gas
industries—Steel pipe for pipeline transportation
systems**

Conclusions

- **Global participation in the development of ISO TC67 SC2 standards**
- **ISO TC67 SC2 are delivering standards required and used by the industry, and reflecting industry developments**
- **For majority of materials/components (in % of investment) International Standards available**
- **Harmonisation successes**

Value of SC2 standards for China

- **Potential cost savings in particular for large diameter gas pipelines whilst maintaining safety**
- **Advertising compliance with SC2 requirements should provide additional market opportunities**

SC2 welcomes China as P-member

- **Potential cost savings in particular for large diameter gas pipelines whilst maintaining safety**
- **Access to international network of experts in the pipeline industry**
- **Demonstration of capability to supply to SC2 standards should open further market opportunities**
- **SC2 welcomes input from experts from China**