INTERNATIONAL STANDARD ISO 15156-2:2003
TECHNICAL CORRIGENDUM 1

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Petroleum and natural gas industries — Materials for use in H_2S-containing environments in oil and gas production —

Part 2: Cracking-resistant carbon and low alloy steels, and the use of cast irons

TECHNICAL CORRIGENDUM 1

Industries du pétrole et du gaz naturel — Matériaux pour utilisation dans des environnements contenant de l'hydrogène sulfuré (H_2S) dans la production de pétrole et de gaz —

Partie 2: Aciers au carbone et aciers faiblement alliés résistants à la fissuration, et utilisation de fontes

RECTIFICATIF TECHNIQUE 1

Technical Corrigendum 1 to ISO 15156-2 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries.*

ICS 75.180.01 **Ref. No. ISO 15156-2:2003/Cor.1:2005(E)**

Page 2, Table 1 — List of equipment:

Replace Table 1 with the following:

Table 1— List of equipment

ISO 15156-2 is applicable to materials used for the following equipment	Permitted exclusions
Drilling, well construction and well-servicing equipment	Equipment only exposed to drilling fluids of controlled composition[a] Drill bits Blowout Preventer (BOP) shear blades[b] Drilling riser systems Work strings Wireline and wireline equipment[c] Surface and intermediate casing
Wells, including subsurface equipment, gas lift equipment, wellheads and christmas trees	Sucker rod pumps and sucker rods[d] Electric submersible pumps Other artificial lift equipment Slips
Flowlines, gathering lines, field facilities and field processing plants	Crude oil storage and handling facilities operating at a total absolute pressure below 0,45 MPa (65 psi)
Water-handling equipment	Water-handling facilities operating at a total absolute pressure below 0,45 MPa (65 psi) Water injection and water disposal equipment[e]
Natural gas treatment plants	—
Transportation pipelines for liquids, gases and multiphase fluids	Lines handling gas prepared for general commercial and domestic use
For all equipment above	Components loaded only in compression

[a] See A.2.3.2.3 for more information.

[b] See A.2.3.2.1 for more information.

[c] Wireline lubricators and lubricator connecting devices are not permitted exclusions.

[d] For sucker rod pumps and sucker rods, reference can be made to NACE MR0176.

[e] For water injection and water disposal, reference can be made to NACE RP0475.

Page 2, Clause 2, Normative references:

Add the following reference after ISO 15156-1:2001:

ISO 15156-3:2003, *Petroleum and natural gas industries — Materials for use in H_2S-containing environments in oil and gas production — Part 3: Cracking-resistant CRAs (corrosion-resistant alloys) and other alloys*

Page 3, 3.1:
Replace 3.1 with the following:
3.1
Brinell hardness
HBW
hardness value, measured in accordance with ISO 6506-1, normally using a 10-mm diameter tungsten carbide ball and a force of 29,42 kN

NOTE For the purposes of this provision, ASTM E 10 is equivalent to ISO 6506-1.

Page 5, 3.16:
Replace 3.16 with the following:
3.16
Rockwell C hardness
HRC
hardness value, measured in accordance with ISO 6508-1, obtained using a diamond cone indenter and a force of 1 471 N

NOTE For the purposes of this provision, ASTM E 18 is equivalent to ISO 6508-1.

Page 5, 3.23:
Replace 3.23 with the following:
3.23
Vickers hardness
HV
hardness value, measured in accordance with ISO 6507-1, obtained using a diamond pyramid indenter and one of a variety of possible applied loads

NOTE For the purposes of this provision, ASTM E 92 is equivalent to ISO 6507-1.

Page 11, 7.3.3.2 Hardness testing methods for welding procedure qualification:

Replace 7.3.3.2 with the following:

Hardness testing for welding procedure qualification shall normally be carried out using the Vickers HV 10 or HV 5 method in accordance with ISO 6507-1, or the Rockwell method in accordance with ISO 6508-1 or ASTM E18 using the 15N scale.

NOTE For the purposes of this provision, ASTM E 92 is equivalent to ISO 6507-1 and ASTM E 18 is equivalent to ISO 6508-1.

The HRC method may be used for welding procedure qualification if the design stress does not exceed two-thirds of SMYS and the welding procedure specification includes post weld heat treatment. The use of the HRC method for welding procedure qualification in all other cases shall require the agreement of the equipment user.

NOTE Hardness surveys using the Vickers or Rockwell 15N testing method produce a more detailed picture of weld hardness and its variations. Hardness surveys using the HRC testing method might not detect small zones in welds or HAZs where the hardness exceeds the acceptance criteria for the Vickers or Rockwell 15N testing method. The significance of such small hard zones is not well understood.

The use of other hardness testing methods shall require the agreement of the equipment user.

The Vickers or Rockwell 15N hardness testing method shall be used for the qualification of alternative weld hardness acceptance criteria as permitted in 7.3.3.4.

Page 11, 7.3.3.3 Hardness surveys for welding procedure qualification:

Replace 7.3.3.3 with the following:

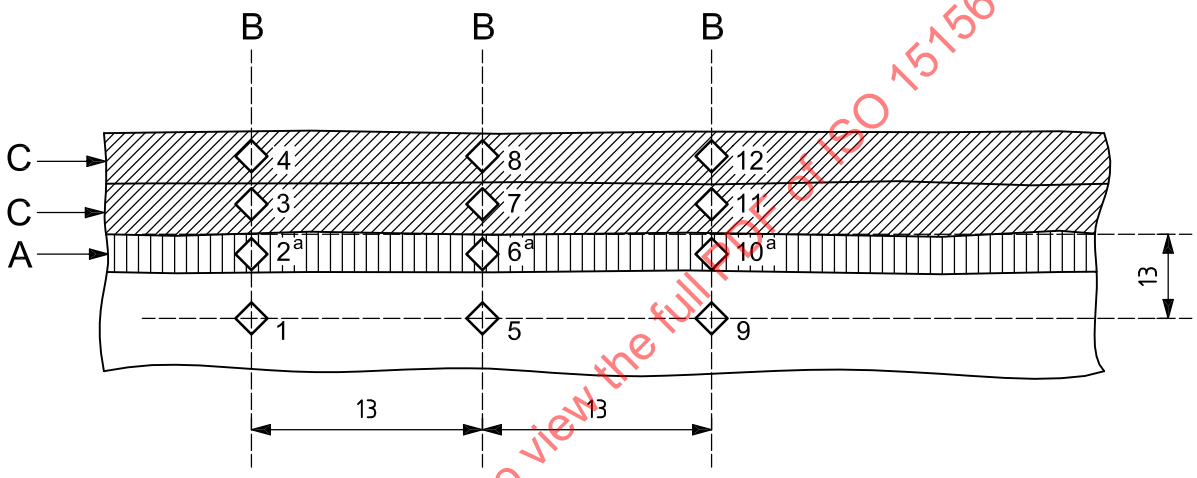
Vickers hardness surveys shall be in accordance with Figure 2 for butt welds, Figure 3 for fillet welds and Figure 4 for repair and partial penetration welds. HRC surveys of butt welds shall be in accordance with Figure 5. Survey requirements for other joint configurations shall be developed from these figures.

Hardness surveys for qualification of overlay welding procedures shall be in accordance with Figure 6.

Page 15, 7.3.3.3 Hardness surveys for welding procedure qualification:

Add the following Figure 6.

Dimensions in millimetres



Key

A weld heat affected zone (visible after etching)

B ———— lines of hardness survey indentations 1 to 12

C layer of weld overlay (visible after etching)

a Using the Vickers or Rockwell 15N measurement methods, hardness impressions 2, 6 and 10 should be entirely within the heat-affected zone and located as close as possible to, but no more than 1 mm from, the fusion boundary between the weld overlay and HAZ.

The Rockwell C hardness measurement method may be used subject to the requirements of 7.3.3.2. HRC hardness impressions in the HAZ shall be located within 2 mm of the fusion boundary

Figure 6 — Weld overlay

Page 18, A.2.1.4 Welding:
Replace A.2.1.4 with the following:

Welding and weld hardness determinations shall be performed in accordance with 7.3.3.

Acceptable maximum hardness values for carbon steel, carbon manganese steel and low alloy steel welds are given in Table A.1.