

Translated English of Chinese Standard: Q/BQB262-2020

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ENTERPRISE STANDARD OF

BAOSHAN IRON AND STEEL CO., LTD

Q/BQB 262-2020

Replacing Q/BQB 262-2018

Tubing and Casing for H₂S-Containing Environment

抗 H₂S 腐蚀油管和套管

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Introduction

This Standard is the enterprise standard of Baoshan Iron and Steel Co., Ltd. This Standard is compiled with reference to API SPEC 5CT:2018, combined with the actual situation of the company's products and quality assurance features.

This Standard is applicable to seamless tubing and casing used in sour oil and gas environments containing H₂S in oil and gas exploitation in the petroleum and natural gas industry. Users of this standard should understand that higher or different requirements may be required in individual applications. For a specific order, it is the purchaser's responsibility to determine these additional requirements based on the intended use and design requirements. The formulation and publication of this Standard does not intend to restrict suppliers from supplying for individual purposes or prohibit purchasers from accepting other equipment or engineering solutions in any way.

It is the responsibility of the steel pipe user to select the appropriate material for the anticipated use environment. When using this Standard to select appropriate materials in the hydrogen sulfide-containing environment oil and gas industrial production system, various factors that affect the material performance shall be considered comprehensively. The international standard ISO 15156 *Petroleum and Natural Gas Industries - Materials for Use in H₂S-Containing Environments in Oil and Gas Production*, or national standard GB/T 20972 *Petroleum and Natural Gas Industries - Materials for Use in H₂S-Containing Environments in Oil and Gas Production*.

This Standard does not provide employers, manufacturers, or suppliers with the obligation to warn, train or equip their employees about their health and safety risks and preventive measures, nor do they assume the responsibilities under local, provincial, and national laws and regulations.

Information about the safety, health risks and the corresponding preventive measures involved in special materials and working conditions shall be obtained from the employer, manufacturer or supplier of the material, or in the material safety data sheet.

The content of this Standard cannot be interpreted as implying or otherwise granting any right to manufacture, sell or use any method, equipment or product included in the patent certificate. Nothing in this Standard can be construed as an excuse for anyone's infringement of the authorized power of the patent certificate.

Tubing and Casing for H₂S-Containing Environment

1 Scope

This Standard specifies the delivery technical conditions of tubing and casing for H₂S-containing environment produced by Baoshan Iron and Steel Co., Ltd.

This Standard applies to seamless tubing and casing (hereinafter referred to as tubing and casing) used in acid oil and gas environments containing H₂S in oil and gas exploration of the petroleum and natural gas industry.

The steel grades of tubing and casing in this Standard include: BG80S, BG80SS, BG90S, BG90SS, BG95S, BG95SS, BG110S, BG110SS, BG110TS, BG110TSS.

The tubing and casing specified in this Standard include three product specification levels (PSL1, PSL2, PSL3).

2 Normative References

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) is applicable to this document.

API SPEC 5CT:2018 Specification for Casing and Tubing

NACE TM0177-2016 Laboratory Testing of Metals for Resistance to Sulfide Stress Cracking and Stress Corrosion Cracking in H₂S Environments

3 General

Unless otherwise specified in this Standard, this Standard adopts the corresponding provisions of steel grade of API SPEC 5CT:2018 standard given in Table 1. Generally, the products are supplied according to the requirements for the steel grade of Level-PSL1 of API SPEC 5CT:2018 standard in Table 1. When the contract indicates that the product specification level is PSL2 or PSL3, the products shall also be supplied according to the Level PSL2 or PSL3 of the corresponding steel grade of the API SPEC 5CT:2018 standard given in Table 1, but at this time it shall be negotiated by the supplier and the purchaser and indicated in the contract the specific requirements for

of Table 3. The elongation after break shall meet the requirements of the corresponding steel grade (see Table 1) specified in API SPEC 5CT:2018.

7.3 Maximum hardness

The full wall thickness hardness test shall be carried out. The average hardness value of each position in each quadrant, and the allowable change of hardness value within the same quadrant shall comply with the provisions of Table 3.

7.4 Requirements for Charpy V-notch impact test

The casing body and coupling blank shall be subjected to Charpy V-notch impact test; and the test temperature shall be 0°C. The orientation, size and minimum energy absorption requirements of all steel grades shall comply with the provisions of Table 4.

7.5 Requirements for sulfide stress corrosion cracking test

7.5.1 The Method-A or Method-D in NACE TM 0177-2016 standard shall be used for the sulfide stress corrosion cracking test. If the user does not specify the test method, it shall be selected by the supplier: for the casing body with the characteristic value of strength grade of 110 steel grade and its corresponding coupling material, the Method-D is preferably used for the sulfide stress corrosion cracking test. The other products preferentially adopt Method-A for sulfide stress corrosion cracking test.

7.5.2 When there is a dispute between the supplier and the purchaser on the test result, the test result of Method-D shall prevail, except for the case where the steel pipe size is not sufficient to prepare the specimen according to the Method-D.

7.5.3 When using Method-A, the product shall comply with the provisions of Table 5. When using Method-D, the K_{1SSC} average value of at least three valid specimens and the K_{1SSC} single value of all valid specimens shall comply with the provisions of Table 6. Solution-B is used for products with steel grades of BG110TS and BG110TSS.

7.5.4 For products with steel grades of BG80S/SS, BG90S/SS, BG95S/SS, if the supplier can guarantee that the test is qualified, the test can be exempted from being carried out. For products with steel grades of BG110S/SS and BG110TS/TSS, this test can be exempted from being carried out after obtaining the consent of the purchaser.

7.6 Special requirements

According to the requirements of the purchaser and the negotiation between the supplier and the purchaser, the hardenability, surface hardness, change in hardness value, grain size, anti-collapse performance tests (only for the steel grades of BG110TS, BG110TSS) or other items tests can be carried out. The specific requirements are determined by both parties through negotiation.

Level-PSL1 of L80-1 steel grade in API SPEC 5CT:2018. The tubing, casing and coupling blanks with steel grades of BG90S, BG90SS, BG95S, BG95SS, BG110S, BG110SS, BG110TS, BG110TSS shall be subjected to non-destructive testing according to the requirements of Level-PSL1 of P110 steel grade in API SPEC 5CT:2018. Couplings shall also undergo magnetic particle inspection on the inner and outer surfaces one by one.

After negotiation between the supplier and the purchaser and indicated in the contract, non-destructive testing can also be carried out in accordance with the requirements of Level-PSL2 or Level-PSL3 of the corresponding steel grade (see Table 1) in the API SPEC 5CT:2018 standard.

10.4 Full wall thickness hardness test

The full wall thickness hardness test shall be carried out in the four quadrants. The sampling location and the number of samples shall comply with the provisions of Table 8. If any average hardness exceeds the specified maximum hardness, the surface of the hardness ring shall be re-ground to be lower than the initial hardness indentation plane and re-inspected. If the result of the re-inspection meets the specified requirements, then such batch judged to be qualified. The supplier may re-heat the unqualified products in the re-inspection, and submit them for testing and acceptance as a new batch.

10.5 Other inspection and test items, and the number of specimens

Other inspection and test items and the number of specimens shall comply with the provisions of Table 9.

10.6 Test method, sampling location, evaluation of test results and reinspection rules

Unless otherwise specified in this Standard, the test method, sampling location, evaluation of test results, re-inspection rules, etc. shall comply with the provisions of the corresponding steel grade (see Table 1) in API SPEC 5CT:2018.

Table 8

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