

ICS 25.040

CCS E 92



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

GB/T 20970-2015

Replacing GB/T 20970-2007

**Petroleum and natural gas industries -- Downhole equipment --
Packers and bridge plugs**

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(English Translation)

Issued on: December 31, 2015

Implemented on: April 1, 2016

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China**

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Foreword

This standard is drafted in accordance with the rules given in GB/T 1.1-2009.

This standard replaces GB/T 20970-2007 "Oil and gas industry downhole tool packer and bridge plug".

The technical differences between this standard and GB/T 20970-2007 are as follows.

- modify the scope of the main content, a clear scope of application (see Chapter 1);
- the definition of "casing" and the like has been removed (see Chapter 3 of the 2007 edition);
- Increased the definition of "well media" to avoid misunderstanding of the media in the well (see 3.1);
- modified the "seal gap" definition, in line with China's national conditions (see 3.2);
- Increased operating temperature and tool cycle temperature during downhole operation (see 4.4);
- design requirements to increase the "design documents" "material" "performance evaluation" of the relevant content, modify the "size design" position (See 5.3);
- Added conditions for the testing and implementation criteria (see 6.4);
- Increased transport and storage content (see Chapter 8).

This standard uses the re-drafting method to amend ISO 14310.:2008 "Oil and Gas Industry Downhole Tool Packers and Bridge Plugs".

This standard is similar to ISO 14310.:2008, the structure of the deletion of Chapter 4 "symbols and abbreviations", followed by chapter number extension.

The technical differences between this standard and ISO 14310.:2008 are as follows.

- on the normative reference documents, this standard has made a technical differences in the adjustment to meet China's technical conditions, adjust the situation the situation is reflected in Chapter 2, "Normative references", as follows.

- Added reference to GB/T 18851.2 (see 6.4.9);
- Added reference to GB/T 230.1 (see 6.4.8);
- Added reference to GB/T 231.1 (see 6.4.8);
- Added reference to GB/T 27025 (see 6.4.14);
- Added references to GB/T 4340.1 (see 6.4.8);
- Added reference to GB/T 531.1 (see 6.4.8);
- Added reference to GB/T 531.2 (see 6.4.8);
- Added reference to NB/T 47013 (see 6.4.9);
- Added references to ASME boilers and pressure vessels Part 5. Nondestructive testing (see 6.4.9);
- Added references to ASME boilers and pressure vessels Part 9. Welding quality requirements (see 6.4.7);
- Added reference to BS2M54, metal heat treatment temperature control specification (see 6.4.4.2.1);
- Added reference to SAEAMS-H-6875A, heat treatment of steel (see 6.4.4.2.1).
- the definition of "casing" and the like has been removed (see Chapter 3 of ISO 143102008);
- Increased the definition of "well media" to avoid misunderstanding of the media in the well (see 3.1);
- modified the "seal gap" definition, in line with China's national conditions (see 3.2);
- to modify the "applicability of the environment" to simplify the requirements of users or buyers, clear and detailed environmental parameters (see 4.5);
- to modify the requirements of the design document, to specify the intended use of the document and the main contents contained (see 5.3.1);
- Added "other physical properties" to supplement the contents of the specification document for non-metallic parts supplied by the supplier or manufacturer (see 5.3.2.3);
- increase the "casing thread should meet the relevant requirements of GB/T 19830", standard test casing thread size (see 5.5.1);
- the revision of the standard confirmation level with the expansion of the product testing requirements, "with expandable seal products in the test device in a (See 5.5.2.3); to simplify the test requirements and improve operability (see 5.5.2.3);
- Change the "path" in the product data list to "path or minimum diameter" to clear the

contents of the inventory data (see 6.2.3);

--- "Recycling method (recyclable type)" is modified to "Unlock or recycle (recyclable) method, including minimum (maximum) release force or recovery Force or pressure ", extended recovery type in line with China's national conditions (see 6.2.3);

--- "see" can be changed to "should be implemented", increase the normative reference file BS2M54, SAEAMS-H-6875A, clear implementation Standard (see 6.4.4.2.1);

- Amend the "see" to "should be met" to increase the normative reference document ASME Boiler and Pressure Vessel Part 9. Welding Quality requirements, clear implementation of standards (see 6.4.7);

--- "see" can be changed to "should be consistent", increase the normative reference documents GB/T 230.1, GB/T 231.1, GB/T 4340.1, GB/T 531.1, JB/T 4730, clear implementation of standards (see 6.4.8);

--- will be "can see" modified to "should be consistent" to increase the normative reference documents GB/T 18851.2, ASME boilers and pressure vessels Part 5. Nondestructive testing, clear implementation of standards (see 6.4.9);

--- "see" see "should be in accordance with", increase the normative reference document GB/T 27025, clear implementation of the standard (see 6.4.14).

Some of the contents of this document may involve patents. The issuer of this document does not assume responsibility for the identification of these patents.

This standard is proposed by the National Petroleum Drilling Equipment and Tools Standardization Technical Committee (SAC/TC96).

This standard is responsible for drafting units. Daqing Oilfield Co., Ltd. Oil Production Engineering Research Institute.

This standard participates in the drafting unit. China Petroleum Exploration and Development Research Institute of oil and gas production equipment, oil industry underground tool quality supervision and inspection Center, Sinopec Petroleum Engineering Technology Research Institute Texas Continental Shelf Oil Engineering Technology Co., Ltd., Baoji Petroleum Machinery Co., Ltd., China National Petroleum Corporation Drilling Engineering Technology Research Institute Jiangnan Machinery Research Institute.

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This standard replaced the previous version of the standard release.

--- GB/T 20970-2007.

Oil and gas industry Downhole tool packer and bridge plug

1 Scope

This standard specifies the requirements for packers and bridge plugs for the oil and gas industry.

This standard applies to packers and bridge plugs used in casing and tubing in the oil and gas industry.

2 Normative reference documents

The following documents are indispensable for the application of this document. For dated references, only the dated edition applies to this article. For undated references, the latest edition (including all modifications) applies to this document.

GB/T 230.1 Metallic materials - Rockwell hardness test - Part 1. Test methods (A, B, C, D, E, F, G, H, K, N, T) ruler) Metallic materials - Brinell hardness test - Part 1. Test methods GB/T 531.1 vulcanized rubber or thermoplastic rubber press hardness test method Part 1. Shore hardness tester (Shore hardness) GB/T 531.2 Vulcanized rubber or thermoplastic rubber - Test method for hardness - Part 2. Portable rubber - International hardness meter method GB/T 2828.1 Sampling inspection procedures Part 1. Batch inspection sampling plan for retrieval by quality limit (AQL) (GB/T 2828.1-2012, ISO 2859-1.:1999, IDT) GB/T 3452.1 O-shaped rubber seals for use in hydraulic applications - Part 1. Dimensions series and tolerances (GB/T 3452.1-2005, ISO 3601-1.:2002, MOD) O/C seals for hydraulic and pneumatic applications - Groove dimensions Metallic materials - Vickers hardness test - Part 1. Test methods GB/T GB/T 9445 non-destructive testing personnel qualification and certification (GB/T 9445-2008, ISO 9712.:2005, IDT) GB/T 18851.2 Non - destructive testing - Penetrant testing - Part 2. Inspection of osmotic materials GB/T 19000 Quality management system foundation and terminology (GB/T 19000-2008, ISO 9000.:2005, IDT) GB/T 19830 oil and gas industry oil and gas wells casing or tubing steel pipe (GB/T 19830-2011, ISO 11960.

2004, IDT)

GB/T 27025 General requirements for testing and calibration laboratory capabilities NB/T 47013 (all parts) Nondestructive testing of pressure equipment ASME boilers and pressure vessels - Part 5. Nondestructive testing (Boiler andPressureVesselCode, Section V, NondestructiveExamination) ASME boilers and pressure vessels - Part 9. Welding quality requirements (Boiler andPressureVesselCode, Section IV, WeldingandBrazingQualifications) BS2M54 metal heat treatment temperature control specification (Specificationfortemperaturecontrolintheheattreatment ofmetals SAEAMS-H-6875A steel heat treatment (HeatTreatmentofSteelRawMaterials)