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

**GB/T 14180-2026**

Replacing GB/T 14180-1993

**Test methods for spiral wound gaskets**

缠绕式垫片试验方法

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### Foreword

This document was issued on 30 July 2026 by the State Administration for Market Regulation; Standardization Administration of the PRC and takes effect on 1 February 2027.

It is a GB/T standard: recommended rather than compulsory, but it is the text a Chinese reviewer applies.

It is classified under ICS 23.100.60 and Chinese classification Q 61.

The document runs to 11 pages. The identification, the dates, the classification and the table of contents on this page are taken from the cover and the printed contents of the standard itself.

This document was drafted in accordance with GB/T 1.1-2020 "Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents".

This document replaces GB/T 14180-1993 "Test methods for spiral wound gaskets". Compared with the 1993 edition, apart from structural adjustments and editorial changes, the main technical changes are as follows:

- a) "subject content and field of application" has been changed to "scope" (see Clause 1; Clause 1 of the 1993 edition);
- b) the test method for hydraulic sealing performance has been changed (see Clause 4; Clause 2 of the 1993 edition);
- c) the test method for steam sealing performance has been changed (see Clause 5; Clause 3 of the 1993 edition);

- d) a requirement to round the test results in accordance with GB/T 8170 has been added (see 5.7.2);
- e) a test method for methane sealing performance has been added (see Clause 6);
- f) a thermal cycling test method has been added (see Clause 7);
- g) a test report clause has been added (see Clause 8).

Attention is drawn to the possibility that some elements of this document may be the subject of patent rights. The issuing body assumes no responsibility for identifying them.

This document was proposed by the China Building Materials Federation and is under the jurisdiction of the National Technical Committee on Non-metallic Mineral Products and Products of Standardization Administration of China (SAC/TC 406). The drafting organisations include Binzhou Shuangfeng Graphite Sealing Materials, Xianyang Non-metallic Mineral Research and Design Institute, CGN Nuclear Power Operations, Guangzhou Dongshan Southern Seals, Xianyang Hailong Sealing Composite Materials, Wenzhou Zhenghai Seals and Luoyang Baigong Industrial Sealing.

This document was first issued in 1993; the present edition is the first revision.

A warning appears at the head of the document: persons using it should have practical experience of proper laboratory work. The document does not identify all possible safety issues, and it is the user's responsibility to take appropriate safety, health and environmental measures and to comply with the relevant national laws and regulations.

## 1 Scope

GB/T 14180 is the Chinese test method for spiral wound gaskets, the metal-and-filler gaskets used on flanged joints in refineries, power stations and chemical plant. A spiral wound gasket is bought on a leak rate, and this document is how that leak rate is produced: it describes the test methods for hydraulic sealing performance, for steam sealing performance, for methane sealing performance and for thermal cycling. It applies to spiral wound gaskets, and other types of gasket may use it as a reference. The methane test is the one that matters most to a modern buyer, because fugitive methane emissions from flanged joints are now regulated in their own right, and a gasket that holds water and steam does not necessarily hold gas. The thermal cycling test answers the other half of the question: whether the joint still seals after the plant has been heated and cooled. The 2026 edition replaces GB/T 14180-1993 and adds both of those tests, together with a test report clause.

## 2 Normative references

The contents of the following documents constitute indispensable provisions of this document through normative reference in the text. For dated references, only the edition

corresponding to that date applies. For undated references, the latest edition, including all amendments, applies.

GB/T 8170 Rules of rounding off for numerical values and expression and judgement of limiting values.

### 3 Terms and definitions

This document contains no terms and definitions requiring definition.

### 4 Test method for hydraulic sealing performance

4.1 Testing machine. The machine consists of a loading device, flanges, a hydraulic load device and the corresponding indicating instruments. Loading is hydraulic, or bolted, so as to provide sufficient gasket seating stress and to hold it for the time the test requires. The flanges hold the test piece and are of the raised face type, with a sealing surface roughness  $R_a$  of not more than 3.2 micrometres, in No. 20 steel. The hydraulic load device shall deliver the specified pressure and hold it for the specified time. The pressure gauge shall be of accuracy class 1.6 or better, with a full scale between 1.5 and 3 times the test pressure and a dial not less than 100 mm in diameter.

4.2 Test piece. Unless otherwise specified, the test piece is a spiral wound gasket of nominal diameter DN 80 with an inner ring and a centring ring.

4.3 Test conditions. Unless otherwise specified, the test conditions are as given in Table 1.

### 5 Test method for steam sealing performance

5.1 Testing machine. The machine consists of a gasket loading system, a test medium supply system and the test flanges. Loading is hydraulic or bolted and shall press the test piece evenly onto the autoclave with sufficient seating stress and hold it. The autoclave flange face is of the raised face type with a surface roughness  $R_a$  of not more than 3.2 micrometres, in 1Cr18Ni9Ti steel. The steam generator shall be able to reach the specified steam condition, temperature and pressure from ambient within 2 h.

5.2 Instruments. An analytical balance reading to 0.0001 g; a glass vessel of 10 mL to 20 mL.

5.3 Indicating instruments. Temperature and pressure indicators, both of accuracy class 0.5.

5.6 Test procedure. The test piece and the sealing ring are placed correctly on the clean sealing face of the autoclave and the specified seating stress applied. The pump is started and water fed to the steam generator. The generator is started and heating continued until the specified temperature and pressure are reached and held for the specified time. A glass vessel is filled with cold water and weighed, giving the reading  $m$ . Once temperature and pressure have reached their specified values the weighed vessel is placed under the leak

detection tube and the tube immersed in the water, and collection begins. At the end of the test the gauge pressure is brought to zero and the temperature to ambient, and the glass vessel is removed and weighed on the analytical balance, giving the reading  $m_1$ .

5.7 Calculation of results. The result is calculated by Formula (1) and rounded to three decimal places in accordance with GB/T 8170.

## 6 Test method for methane sealing performance

6.1 Test apparatus. The test is carried out on a dedicated methane sealing performance rig. The loading device shall provide the specified gasket seating stress and control the loading and unloading rate, holding the seating stress constant through the test. An O-ring of surface roughness  $R_a$  not exceeding 3.2 micrometres encloses the gasket and directs the leaking medium so that it can be collected.

6.2 Test piece. After selection the test piece is conditioned for at least 48 h at a temperature of 21 degrees Celsius to 30 degrees Celsius and a relative humidity of 45 % to 55 %. Unless otherwise specified the nominal diameter is DN 80, the thickness tolerance plus or minus 0.13 mm and the outside diameter tolerance plus or minus 0.8 mm.

6.4 Test procedure. The platen faces are cleaned carefully with a solvent such as acetone and the gasket installed concentrically. The seating stress specified in Table 3 is applied and held for 15 min. The test medium is admitted to the sealed cavity and, once the medium pressure has reached the value specified in Table 3, held for 4 h.

## 7 Thermal cycling test method

The thermal cycling test, new in this edition, subjects the assembled joint to repeated heating and cooling between the specified limits and then measures the sealing performance again, so that the effect of thermal cycling on the gasket and on the bolt load can be judged.

## 8 Test report

The test report clause, new in this edition, lists what the report shall state: the identification of the test piece, the test method used, the test conditions, the results obtained and any deviation from the procedure of this document.