

ICS 83.140.50
CCS G 43



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

GB/T 23658-2009

**Elastomer seals transport gas and hydrocarbon liquids in pipes
and fittings with seal material requirements**

(English Translation)

Issued on: April 24, 2009

Implemented on: December 1, 2009

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

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Foreword

This standard, through modification, uses the ISO 16010.2005 "Elastomeric seals - Material requirement for seals used in pipes and fittings carrying gaseous fuels and hydrocarbon fluid" (in English).

This standard was redrafted in accordance with ISO 16010.2005.

Due to the special needs of our country's industry, this standard has been modified when adopting international standards. These technical differences are marked by vertical single lines in the margins of the clauses to which they relate. The main technical differences with ISO 16010.2005 are.

- GB/T1690-1992 in Chapter 2 Normative references adopts non-equivalently the corresponding international standards.

- CHANGE the note to clause 4.2.3 "If the seal is appropriate in size, it may use the routine test method as specified in GB/T 6031-1998, but it must use the micro-test method as reference" into "If the seal is appropriate in size, it may use the routine test method as specified in GB/T 6031", because if

measuring the micro-hardness after measuring the routine hardness, it will increase the test burden, which is not necessary.

- In clause 4.2.6, the aging chamber used in the hot air aging test is different from that of ISO 16010.2005. ISO 16010.2005 adopts the method A of ISO 188, which uses a low-speed air circulation aging chamber; however, in order to meet the actual conditions in China, the hot air aging test makes reference to GB/T3512, which equivalently uses the method B of ISO 188, selecting the forced air circulation aging chamber.

For ease of use, this standard also makes the following editorial changes.

- CHANGE "this international standard" into "this standard";
- DELETE the foreword of international standards.

Appendix A and Appendix B of this standard are informative.

This standard was proposed by China Petroleum and Chemical Industry Association.

This standard shall be under the jurisdiction of the National Sealing Products Subcommittee of the National Rubber and Rubber Products Standardization Technical Committee (SAC/TC 35/SC 3).

Elastomeric seals - Material requirement

for seals used in pipes and fittings

carrying gaseous fuels and hydrocarbon fluid

1 Scope

This standard specifies the requirements for the delivery pipes and fittings, auxiliary devices, and elastomeric seals materials for the valves used for the following conditions which have a normal working temperature of -5 °C ~ +50 °C and -15 °C ~ +50 °C under special circumstances.

a) General circumstances (see Table 4, type G series).

- Gas fuels [artificial gas, natural gas and gas-phase liquefied petroleum gas (LPG)];

- Hydrocarbon liquid having aromatic content (volume fraction) less than 30%, including liquid LPG;

- b) Special circumstances (see Table 4, type H). Suitable for conveying compressed gas fuels and hydrocarbon liquids, which has an aromatic content (volume fraction) of more than 30%.

This standard also stipulates general requirements for the finished product seal. The additional requirements for special applications shall be specified in the corresponding product standards. It shall be noted that the performance of the pipe joint is related to the properties of the seal material, the geometry of the seal, and the structure of the pipe joint. If applicable, this standard should be used in conjunction with product standards that specify the performance of the pipe joint.

This standard applies to all pipe joints seals, including cast iron pipes, steel pipes, copper pipes and plastic pipes.

For composite seals, the requirements of 4.2.8 and 4.2.9 apply only to elastomer parts in contact with gaseous fuels or hydrocarbon liquids.

For materials with hardness grades of 80 and 90, elongation at break, compression set, and compressive stress relaxation requirements apply only when the rubber is directly involved in the seal or when the seal is required to be stable over a long period of time.

This standard does not apply to the following occasions.

- The seal made of porous material;
- The seal containing closed-cell material in the structure;
- The seal requiring flame or heat-resistant stress;
- A jointed seal formed by joining the ends of precured profiles.

2 Normative references

The provisions in following documents become the provisions of this Standard through reference in this Standard. For the dated references, the subsequent

amendments (excluding corrections) or revisions do not apply to this Standard;

however, parties who reach an agreement based on this Standard are

encouraged to study if the latest versions of these documents are applicable.

For undated references, the latest edition of the referenced document applies.

GB/T 528 Rubber, vulcanized or thermoplastic - Determination of tensile stress-strain properties (GB/T 528-1998, eqv ISO 37.1994)

GB/T 1685 Rubber, vulcanized or thermoplastic - Determination of stress relaxation in compression at ambient and at elevated temperatures (GB/T 1685-2008, ISO 3384.2005, MOD)

GB/T 1690-1992 Rubber, vulcanized - Determination of the effect of liquids (neq ISO 1817.1985)

GB/T 2941-2006 Rubber - General procedures for preparing and conditioning test pieces for physical test methods (ISO 23529.2004, IDT)

GB/T 3512 Rubber, vulcanized or thermoplastic - Accelerated ageing and heat resistance tests - Air-oven method (GB/T 3512-2001, eqv ISO 188.1998)

GB/T 3672.1 Rubber - Tolerances of products - Part 1. Dimensional tolerances (GB/T 3672.1-2002, ISO 3302-1.1996, IDT)

GB/T 6031 Rubber, vulcanized or thermoplastic-Determination of hardness (hardness between 10 IRHD and 100 IRHD) (GB/T 6031-1998, idt ISO 48.1994)

GB/T 7759 Rubber, vulcanized or thermoplastic - Determination of compression set at ambient elevated or low temperatures (GB/T 7759-1996, eqv ISO 815.1991)

GB/T 7762 Rubber, vulcanized or thermoplastic - Resistance to ozone

4.2.6 Accelerated aging in the air

The test specimen for hardness determination (as shown in 4.2.3) and the test specimen for tensile strength and elongation at break (as shown in 4.2.4) shall be aged in hot air at 70 °C for 7 days as specified in GB/T 3512.