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

GB/T 24141.2-2022

**Rubber hoses and tubing for fuel circuits for internal
combustion engines - Specification - Part 2: Gasoline fuels**

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1 Scope

This document specifies the requirements for rubber hoses and pure rubber hoses used in gasoline fuel lines for internal combustion engines. The applicable gasoline fuels include Fuels with oxidizing substances such as methanol and methyl tert-butyl ether and fuels that have been oxidized (acid gases). In addition, this document can be used as a class method, which should be used to enable original equipment manufacturers (OEMs) to select certain applications for which some tests are not covered by the main types specified.

Tests to be "marked" (see example in Appendix G). In this case, rubber hoses and pure rubber hoses should not be accompanied by any indication

GB/T 24141 marks in this document, but can record in detail the OEM's own identification marks displayed on its component drawings.

2 Normative references

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, dated citations documents, only the version corresponding to that date applies to this document; for undated references, the latest edition (including all amendments) applies to this document.

Note. GB/T 3512-2014 Vulcanized rubber or thermoplastic rubber hot air accelerated aging and heat resistance test (ISO 188.2011, IDT)

assemblies-Hydrostatic testing)

Note. GB/T 5563-2013 Hydrostatic test method for rubber and plastic hoses and hose assemblies (ISO 1402.2009, IDT)

ISO 1629 Rubbers and latexes-Nomenclature

Note. GB/T 5576-1997 Rubber and latex nomenclature (idt ISO 1629.1995)

Note. GB/T 1690-2010 Test method for liquid resistance of vulcanized or thermoplastic rubber (ISO 1817:2005, MOD)

Note. GB/T 3672.1-2002 Tolerances for Rubber Products Part 1. Dimensional Tolerances (id. ISO 3302-1:1996)

ISO 4671 Rubber and plastic hoses and hose assemblies Method of measurement of hose dimensions and hose assembly lengths (Rubber and plastic hoses and hose assemblies)

Note. GB/T 9573-2013 Rubber and plastic hoses and hose assemblies-Hose dimensions and hose assembly length measurement methods (ISO 4671:2007, IDT)

ISO 4926 Non-petroleum based fluids for hydraulic braking systems of road vehicles (Road vehicles-Hydraulic braking systems-d) Low temperature flexural properties. When tested according to ISO 10619-2:2011 Method B, a hose or pure rubber hose is pre-filled with Liquid C in ISO 1817, at 21°C±2°C for 72h±2h, then at -40°C±2°C for 72h±2h. The mandrel with a radius of 12 times the nominal inner diameter of the hose or 25 times the nominal inner diameter of the pure rubber hose is also subjected to low temperature treatment, and then still under the low temperature of -40°C±2°C, bend the rubber hose or pure rubber hose, and check if there is no crack at 2 times magnification. At this time, the rubber is soft. The tube or pure rubber tube shall meet the requirements of the burst pressure of test a).

e) Internal cleanliness. When measured according to Appendix A, the insoluble impurities should not exceed 5g/m², and the fuel soluble impurities should not exceed 5g/m².

3g/m².

f) Extractable wax. When measured according to Appendix A, the extractable wax should not exceed 2.5g/m².

g) Tear resistance (applicable only to pure rubber hose). When measured according to Appendix B, the minimum tear strength should be 4.5kN/m.

h) Ozone resistance. when tested under the following conditions according to method 1 of ISO 7326:2006, 2 times magnification inspection, hose or pure There should be no cracks in the hose.

Ozone partial pressure 50mPa±3mPa;

Time 72h±2h;

Temperature 40°C±2°C;

Elongation 20%.

i) Heat aging resistance. When aged in accordance with ISO 188 under one or more of the following time and temperature conditions, all structures shall comply with Requirements for test c) adhesive strength, test d) low temperature flexural performance, and test h) ozone

resistance.

- 1) 1000h at 80 degrees C;
- 2) 1000h at 100 degrees C;
- 3) 1000h at 125 degrees C;
- 4) 168h at 100 degrees C;
- 5) 168h at 125 degrees C;
- 6) 168h at 140 degrees C.

Note. The 1000h test temperature represents the long-term operating temperature, and the 168h test temperature represents the short-term peak operating temperature.

j) Resistance to oil surface contamination. when tested in accordance with Annex C using No. 3 oil of ISO 1817, all structures shall comply with test c)

Requirements for bond strength, test d) low temperature flexural properties and test h) ozone resistance.

k) Resistance to surface contamination of non-petroleum hydraulic (brake/clutch) fluids. when tested in accordance with Appendix C using hydraulic fluids of ISO 4926 All structures shall meet the requirements of test c) adhesive strength, test d) low temperature flexural properties and test h) ozone resistance.

l) Bending resistance (this requirement only applies to straight hoses and pure rubber hoses with a nominal inner diameter less than or equal to 16mm). when pressing When measuring according to ISO 10619-1, the maximum deformation coefficient (T/D) shall not be less than 0.7. Hose with a nominal inner diameter of 11mm and below The core type used for and pure rubber hoses is 140mm in diameter; the core type used for hoses and pure rubber hoses with a nominal inner diameter of 12mm to 16mm The diameter is 220mm.

m) Vacuum resistance (this requirement only applies to straight hoses and pure rubber hoses). When the hose or pure rubber hose is in accordance with ISO 7233.2006 Method A Carry out the test, during 15s to 60s under 0.08MPa absolute pressure, a ball with a diameter of 0.8 times the nominal inner diameter of the hose should be Can pass through the whole hose or pure rubber.

n) Fuel resistance performance. When tested according to SAEJ2260 methanol fuel resistance test method, use one or more of the following test fuels Test at 60 degrees C+/-2 degrees C fuel temperature for 5000h, all structures should meet test c) bond strength, test d) low temperature flexure Performance, test h) ozone resistance, test l) bending resistance and test m) requirements for vacuum resistance.

- 1) A mixture of 85% volume fraction of liquid C (ISO 1817) and 15% volume fraction of

methanol;

2) A mixture of 75% volume fraction of liquid C (ISO 1817) and 25% volume fraction of methanol;

3) A mixture of 50% volume fraction of liquid C (ISO 1817) and 50% volume fraction of methanol;

4) A mixture of 85% volume fraction of methanol and 15% volume fraction of liquid C (ISO 1817);

5) 100% volume fraction methanol;

6) Prepare the mixture in accordance with Appendix D and peroxidize it to a peroxide value of 90. After every 70h test, use the method given in D.5 Recheck the peroxide value of the test fuel. If the peroxide value drops below 80, replace with fresh test fuel.

o) Burn-through resistance. When tested according to SAEJ2027, the hose or pure rubber hose shall withstand flame exposure for at least 60s without pressure loss.

p) Circulating fuel penetration rate (only RP hose and pure rubber hose). measured according to SAEJ1737, at 60°C and 13.8kPa, the permeation rate for a mixture of 75% by volume liquid C (ISO 1817) and 25% by volume methanol should not exceed 60g/m²/24h.

q) Resistance. When measured according to ISO 8031.2009 4.5~4.7, the resistance should not exceed 10Mohm.

r) Copper corrosion and formation of crystalline salts. When tested in accordance with Appendix E, the dark rust on the copper strip shall not be greater than Grade 1 of ASTM D130.

Nor should crystals form on the copper strip, lining material or the bottom of the test tube.

s) Life cycle test (Type 1, Type 2 and Type 3 only). When tested according to Appendix F, the hose or pure rubber hose shall meet the test c) Adhesion requirements for combined strength, test d) low temperature flexural properties and test h) ozone resistance.

7 Test frequency Type test and routine test are specified in Appendix H and Appendix I respectively.

Type tests are the basis for manufacturers to demonstrate that their production methods and hose designs comply with all the requirements of this standard and are carried out every 5 years at most Once, or whenever there is a change in manufacturing methods or materials, the test should be performed.

Routine testing shall be performed on each finished hose or hose assembly prior to dispatch.

Production acceptance tests are those specified in Annex J, which are carried out by the