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AUTOMOBILE INDUSTRY STANDARD

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QC/T 1043-2016

Automotive fuel system nylon tube

汽车燃油系统用尼龙管

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Table of Contents

Annex:

References, names and dates of implementation of 35 automotive industry standards

No.	Standard reference	Standard name	Standard reference being substituted	Date of implementation (Year-Month-Day)
326	QC/T 16-2016	General technical specifications for ignition coil	QC/T 16-1992	2016-09-01
327	QC/T 224-2016	Specifications of engine used in motorcycles and mopeds	QC/T 224-2007	2016-09-01
328	QC/T 228-2016	Manipulation inhaul cable of motorcycle and moped	QC/T 228.1-1997, QC/T 228.2-1997, QC/T 228.3-1997, QC/T 228.4-1997, QC/T 228.5-1997, QC/T 228.6-1997, QC/T 228.7-1997, QC/T 228.8-1997, QC/T 228.9-1997, QC/T 228.10-1997	2016-09-01
329	QC/T 307-2016	Technical specifications for vacuum booster	QC/T 307-1999	2016-09-01
330	QC/T 414-2016	Color specification and model preparation method for automobile wires (cables)	QC/T 414-1999, QC/T 730-2005	2016-09-01
331	QC/T 415-2016	Automotive cigarette lighter and cigarette-lighter power socket	QC/T 415-1999	2016-09-01
332	QC/T 469-2016	Automotive engine valve technical conditions	QC/T 469-2002	2016-09-01
333	QC/T 681-2016	Technical conditions for starting relay of motorcycle and moped	QC/T 681-2002	2016-09-01

346	QC/T 1038-2016	Automotive Light Emitting Diodes (LEDs) and Modules		2016-09-01
347	QC/T 1039-2016	Solar sensor for automotive air conditioning		2016-09-01
348	QC/T 1040-2016	Motorcycle and moped electric fuel pump		2016-09-01
349	QC/T 1041-2016	Technical requirements for motorcycle evaporative pollutant control systems (devices) for motorcycles and mopeds		2016-09-01
350	QC/T 1042-2016	Motorcycle and moped vibration comfort test method		2016-09-01
351	QC/T 1043-2016	Nylon tube for automotive fuel system		2016-09-01
352	QC/T 1044-2016	Foot pad for automobile		2016-09-01
353	QC/T 1045-2016	Heat-shrinkable tubing for automotive pipe		2016-09-01
354	QC/T 1046-2016	Heat pipe shrinkage for automobile pipeline protection		2016-09-01
355	QC/T 1047-2016	City bus plastic seat		2016-09-01
356	QC/T 1048-2016	Bus emergency hammer		2016-09-01
357	QC/T 1049-2016	Technical requirements and test methods for matching of automobile rack and pinion hydraulic power steering system		2016-09-01

Automotive fuel system nylon tube

1 Scope

This standard specifies the requirements such as terms and definitions, dimensions and tolerances, materials and colors, technical requirements, test methods, marking, inspection rules, packaging, transportation, storage for single-layer nylon hose and hose assemblies for automotive fuel systems.

This standard applies to single-layer nylon hose and hose assemblies for automotive fuel systems.

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) are applicable to this standard.

GB/T 1033.1-2008 Plastics - Methods for determining the density of non-cellular plastics - Part 1: Immersion method liquid pyknometer method and titration method

GB/T 2828.1-2012 Sampling procedures for inspection by attributes - Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection

GB/T 2918-1998 Plastics - Standard atmospheres for conditioning and testing

GB/T 6003.1-2012 Test sieves - Technical requirements and testing - Part 1: Test sieves of metal wire cloth

GB/T 7528-2011 Rubber and plastics hoses and hose assemblies - Vocabulary

GB/T 19466.3-2004 Plastics - Differential scanning calorimetry (DSC) - Part 3: Determination of temperature and enthalpy of melting and crystallization

QC/T 798-2008 Multi-layers plastic tubing for automotive fuel system

ISO 1874.1:2010 Plastics - Polyamide (PA) moulding and extrusion materials - Part 1: Designation system and basis for specification

Visually check the appearance of the specimen. Take a 100 mm specimen from the inner surface of the tube. Use a cutting tool to cut it off along the axial direction. Check the presence of defects.

7.3 Test of density

Use the method A (impregnation method) in GB/T 1033.1-2008 to carry out test.

7.4 Test of melting temperature

Follow the requirements of GB/T 19466.3-2004 to carry out test.

7.5 Test of extractable components

7.5.1 Test preparation.

Use the wire mesh as specified in GB/T 6003.1-2012 for the extraction. The pore size is 0.5 mm and 3.15 mm, to limit the size of the particles. Use the ethanol which has a purity of more than 99.5% as the extract.

7.5.2 Test device.

The schematic diagram of extractor is as shown in Figure 1.

7.5.3 Test procedure.

The test is carried out as follows:

a) Bake the extraction vessel and the round-bottom flask at 105 °C for 1 h. Move it to room temperature to cool it. Weigh the mass of the extraction vessel m_0, accurate to 0.1 mg;

b) Then put the required specimen into the extraction vessel. Weigh the mass m_1 again. Generally take 7 g ~ 8 g of specimen, accurate to 0.1 mg. Put the extraction vessel into the extractor;

c) In the round-bottom flask, add the extract and zeolite. Move the round-bottom flask in an electric heating jacket. Use a test tube clamp and test tube holder to fix the whole equipment. Correctly install the water inlet and water outlet of the cooler. Open the faucet switch to allow the water to completely flow through the cooler;

d) Turn on the power supply of the electric heating jacket. Adjust the heating power of the electric heating jacket, to ensure that the extractor produces 4 overflows per hour. After one overflow is finished, start time-keeping;

7.6.1.1 Specimen.

Take 5 pieces of nylon hose or assembly of nylon hose which has a free length of 300 mm.

7.6.1.2 Test device.

Testing machine of burst pressure.

7.6.1.3 Test procedure.

Carry out test at the ambient temperature of (23 ± 2) °C. Make the assembly of nylon hose be full of liquid (water of hydraulic oil). Then at the rate of (7 ± 1) MPa/min, apply pressure to the assembly of nylon hose, until it bursts. Record the maximum pressure during the test.

7.6.2 High-temperature burst test.

7.6.2.1 Specimen.

Take 5 pieces of nylon hose or assembly of nylon hose which has a free length of 300 mm.

7.6.2.2 Test device.

Testing machine of burst pressure.

7.6.2.3 Test procedure.

Make the assembly of nylon hose be full of liquid (water of hydraulic oil). Maintain it at (100 ± 5) °C for 1 h. Then at the rate of (7 ± 1) MPa/min, apply pressure to the assembly of nylon hose, until it bursts. Record the maximum pressure during the test.

7.7 Test of impact strength

7.7.1 Specimen.

Randomly take 5 specimens which have a length of at least 50 mm. Carry out test under the following conditions:

a) The impact rate is 3.6 m/s ~ 4 m/s (optimally 3.8 m/s) and impact energy is 7.5 J.

b) The temperature is (23 ± 2) °C and (- 40 ± 3) °C. For the test at -40 °C, the specimen is cooled for at least 4 h;

c) The spacing of the support surfaces of the pendulum impact tester: 40 mm.

7.9 Test of UV durability

Randomly take 3 specimens which have a length of 150 mm. Follow the cycle 1# in Table 4 of ISO 4892.3-2006 to carry out test. The time of exposure is 504 h (42 cycles). Remove the specimen, place it for 30 min. Follow the requirements of 7.7 to carry out the test of impact strength at room-temperature.

Note: Subject to the agreement between the user and the manufacturer, the time of exposure may be as specified by the end user.

7.10 Test of fuel resistance

7.10.1 Test device.

The cycle test device is as shown in 7.10 of QC/T 798.

7.10.2 Test procedure.

The test is carried out as follows:

a) In the temperature control box, it shall place the as large number and length of nylon tubes as possible and connect them to the cycle test device. Use the fuel 0 # diesel to charge the cycle system. Under the following conditions, keep the specimen for 500 h:

- Fuel temperature (40 ± 2) °C;

- Temperature of temperature control box (100 ± 2) °C.

After the test, dismantle the nylon hose from the cycle test device. The surface of the specimen shall not have obvious cracks.

b) Follow the requirements of 7.6.1 to perform burst test at room-temperature.

7.11 Pullout test

7.11.1 Specimen.

Take 3 hose assemblies whose one end is equipped with pipe fitting and a free length of 150 mm.

7.11.2 Test procedure.

The test is carried out as follows:

a) For the ferrule-connected nylon hose, tighten the union nut of the assembly of nylon tube and the pipe joint. The tightening torque is as shown in Table 7;

e) Code of manufacturing date.

9 Inspection rules

9.1 Category of inspection

The inspection is divided into exit-factory inspection and type inspection.

9.2 Exit-factory inspection

9.2.1 Inspection items for exit-factory inspection include appearance, dimension and marking, burst pressure at room-temperature. Based on the production batch, take sufficient specimens. Then follow the requirements of this standard to carry out inspection.

9.2.2 When the ordering organization samples the product for inspection, follow the provisions of GB/T 2828.1-2012. The sampling plan and the acceptance quality level (AQL) are as agreed by the supplier and the purchaser.

9.3 Type inspection

9.3.1 Classification of type inspection.

The type inspection is classified as follows:

a) Trial-type identification of new product or old product after trans-plant production;

b) After formal production, when there are significant changes in structure, materials, processes that may affect product's performance;

c) When the it resumes production after a long-term shutdown;

d) For batched or mass-produced products, not less than once per 6 months;

e) When the exit-factory inspection result is significantly different from the previous type inspection result;

f) When the national quality supervision agency proposes the requirements for type inspection.

9.3.2 Sampling.

The products of the same specification as continuously produced at the same production site, the same raw materials, equipment and processes form a batch. The products to be type-inspected shall be taken from the same batch of products that have been passed the exit-factory inspection. The sampling plan shall be as agreed upon by the supplier and the purchaser.

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