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Technical specification of honeycomb metal substrate for exhaust catalytic converter

排气催化转化器用金属蜂窝载体技术条件

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Number, name and date of implementation of 22 automotive industry standards

No.	Standard number	Standard name	Number of standard replaced	Date of implementation
301	QC/T 727-2017	Instrument for automobile and motorcycle	QC/T 727-2007	2017-10-01
302	QC/T 803-2017	Oxygen sensor for automobile	QC/T 803.1-2008	2017-10-01
303	QC/T 1072-2017	Gear position sensor for automobiles		2017-10-01
304	QC/T 1073.1-2017	Accelerometers for automobiles - Part 1: Linear accelerometers		2017-10-01
305	QC/T 1074-2017	Technical specifications for automotive parts remanufacturing products		2017-10-01
306	QC/T 1075-2017	Technical conditions for metal honeycomb carrier of exhaust catalytic converter		2017-10-01
307	QC/T 777-2017	Technical conditions for electromagnetic fan clutch of automobile	QC/T 777-2007	2017-10-01
308	QC/T 1076-2017	Performance requirements and test methods for continuously variable transmission (CVT)		2017-10-01
309	QC/T 1077-2017	Terminology and definitions for classification of automatic control transmission for automobile		2017-10-01
310	QC/T 1078-2017	Advertising vehicle		2017-10-01
311	QC/T 1079-2017	Suction & delivery vehicle		2017-10-01
312	QC/T 1080-2017	Mobile loudspeaker for popularization of science		2017-10-01
313	QC/T 1081-2017	Electric power steering device for automobile		2017-10-01
314	QC/T 1082-2017	Motor for electric power steering device of automobile		2017-10-01
315	QC/T 1083-2017	Controller for electric power steering device of automobile		2017-10-01
316	QC/T 1084-2017	Sensor for electric power steering device of automobile		2017-10-01
317	QC/T 1085-2017	X-ray testing for light-alloy wheel of motorcycle		2017-10-01
318	QC/T 1086-2017	Technical conditions for range extenders for electric vehicles		2017-10-01

Table of Contents

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1 Scope

This Standard specifies the technical requirements, materials, test methods, inspection rules, marking, packaging, transportation and storage of the honeycomb metal substrate for exhaust catalytic converter.

This Standard applies to the honeycomb metal substrate for exhaust catalytic converter of Class M and Class N motor vehicles.

2 Normative references

The following documents are essential for the application of this Standard. For dated references, only the dated editions apply to this Standard. For undated references, the latest editions (including all amendments) apply to this Standard.

GB/T 31942 *FeCrAl foil for metallic honeycomb substrates*

3 Terms and definitions

The following terms and definitions apply to this Standard.

3.1 Honeycombed structure

A honeycomb-like spatial structure composed of a plurality of spatial channels surrounded by thin walls having a certain outer shape, such as a cylindrical shape.

3.2 Honeycomb metal substrate (hereinafter referred to as substrate)

A place where the metal material is fabricated into a honeycombed structure and a housing, providing a purification reaction of the engine exhaust.

3.3 Density of cells

The end face of the honeycombed structure, excluding the outermost layer and the surrounding layer of the middle hole, the number of holes per unit area may be expressed in metric (or British) area units.

3.4 Net volume of substrate

The volume of the honeycombed structure contained in a single substrate, and the substrate housing is not counted. If a single substrate contains multiple relatively independent honeycombed structures, the void volume between each honeycombed structure shall be excluded.

3.5 Total volume of substrate

The volume of space enclosed by the substrate size.

3.6 Substrate size

The outer size of the substrate.

3.7 Substrate mass

The total mass of the housing of the substrate before coating the catalyst and the honeycombed structure fixed to the interior thereof.

3.8 Catalytic converter

A device mounted in an exhaust system of an automobile to perform oxidation and/or reduction reaction by a catalyst to reduce the emission of harmful substances such as CO, HC, NO_x, and PM in the exhaust gas.

3.9 Manifold catalytic converter for petrol vehicles (hereinafter referred to as manifold catalytic converter)

A catalytic converter assembly component that is mounted in the engine compartment of a petrol vehicle and consists of an engine exhaust manifold and a catalytic converter, and the junction of each branch of the engine manifold to the inlet end of the catalytic converter is not more than 400mm.

3.10 Under-floor catalytic converter for petrol vehicles (hereinafter referred to as under-floor catalytic converter)

A catalytic converter assembly that is mounted under the petrol vehicle chassis and at a distance of more than 400mm from the engine exhaust manifold.

3.11 Aftertreatment devices for diesel vehicle exhaust

A device mounted in the exhaust system of a diesel engine that can reduce the emission of pollutants in the exhaust gas through various physical and chemical functions.

d) Other phenomena that affect normal use.

4.5 Vibration durability

4.5.1 The substrate shall be subjected to a thermal vibration test in accordance with 5.3 of this Standard.

4.5.2 Before and after the thermal vibration test, the differential pressure of the front and rear end faces under the substrate airspeed of (60,000±600)h^{-1} is measured at normal temperature, and the change of the differential pressure value shall not exceed 15%.

4.5.3 After the thermal vibration test, the substrate shall not exhibit obvious deformation of the honeycomb, falling off or detachment of the honeycombed structure and the housing, severe deformation of the outer contour, and other damages. Other forms of damage may be specified in detail by the company's technical requirements.

4.6 Temperature shock durability

4.6.1 The substrate shall be subjected to a temperature shock test in accordance with 5.4 of this Standard.

4.6.2 Before and after the temperature shock test, the differential pressure of the front and rear end faces under the substrate airspeed of (60,000±600)h^{-1} is measured at normal temperature, and the change of the differential pressure value shall not exceed 15%.

4.6.3 After the temperature shock test, the substrate shall not exhibit obvious deformation of the honeycomb, falling off or detachment of the honeycombed structure and the housing, severe deformation of the outer contour, and other damages. Other forms of damage may be specified in detail by the company's technical requirements.

5 Test methods

5.1 General

5.1.1 Before the test, it shall be confirmed that the substrate is in a brand new state in which the catalyst is not coated.

5.1.2 MEASURE, RECORD and CONFIRM that the initial state of the test sample meets the specifications of 4.2.

5.1.3 According to the different classification categories of the substrate application environment, there are differences in different types of test conditions.

end faces of the substrate at the airspeed of (60,000±600)h^{-1} is measured at normal temperature, and check the integrity of the substrate.

6 Inspection rules

6.1 Inspection category

The inspection of the substrate is divided into exit-factory inspection and type inspection.

6.2 Exit-factory inspection

6.2.1 Each product shall be inspected at the factory before leaving the factory, and shall be inspected by the quality inspection department of the factory, and a certificate of conformity shall be issued.

6.2.2 The inspection items and requirements shall comply with the provisions of 4.1 to 4.3.

6.3 Type inspection

In case of any of the following circumstances, the product shall be subject to type inspection:

a) new product finalization;
b) continuously produced products, once every two years;
c) re-production when the production interval is more than one year;
d) when there are major changes in product design processes, materials, etc.;
e) when there is a problem with the quality of the product; and
f) other time when it is deemed necessary.

6.3.1 Sampling method

The type inspection adopts random sampling. Three products are randomly selected from the products qualified for exit-factory inspection, and the sampling base is not less than 100.

6.3.2 Inspection item.

The test items as required in 4.4 to 4.6.

6.3.3 Determination rule.

6.3.3.1 The type inspection results shall comply with the corresponding provisions of 4 Technical requirements.

6.3.3.2 In the type inspection, if any inspection item is unqualified, it shall be