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**AUTOMOTIVE INDUSTRY STANDARD OF THE
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**Air filter element for automobiles
(English Translation)**

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1 Scope

1 Scope

This Document specifies the technical requirements, test methods, inspection rules, marking, packaging, transportation and storage of air cleaner elements for automobiles.

This Document is applicable to the design, manufacture and inspection of air cleaner elements (hereinafter referred to as "filter elements") for automobiles with a volume flow rate of less than 3,000 m³/h. Air cleaner elements for construction machinery, agricultural and forestry machinery, ships and stationary power can also be used as a reference.

2 Normative References

The provisions in following documents become the essential provisions of this Document through reference in 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) is applicable to this Document.

GB/T 1182-2018 Geometrical product specifications (GPS) - Geometrical tolerancing - Tolerances of form, orientation, location and run-out
GB/T 1804-2000 General Tolerances - Tolerances for Linear and Angular Dimensions without Individual Tolerance Indications
GB/T 2828.1 Sampling procedures for inspection by attribute - Part 1. Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection
GB/T 3730.1-2022 Terms and definitions of motor vehicles, trailers and combination vehicle - Part 1: Types
GB/T 28949-2012 Inlet air cleaning equipment for internal combustion engines and compressors - Performance testing
GB/T 28957.1-2012 Road vehicles - Test dust for filter evaluation - Part 1: Silicon dioxide test dust
GB/T 30512-2014 Requirements for Prohibited Substances on Automobiles
GB/T 35358.1-2017 Inlet air cleaning equipment for vehicle engines and

compressors -Part 1: Fractional efficiency testing with fine particles (0.3µm to 5µm optical diameter) HG/T 4785-2014 Rubber seals for air cleaner of automobile HG/T 4910-2016 Hot melt adhesives for paper element of automotive - Part 1.adhesives for air filter JB/T 11788.1-2014 Internal combustion engines - Sealing polyurethane for filter elements - Part 1: For air filter elements QC/T 32-2017 Test methods of air cleaners for automobiles QC/T 770-2020 Dry type air cleaner assembly of automobiles QC/T 794-2020 Internal-combustion engine industry filter paper QC/T 970-2014 Passenger Car Air Filter Technical Specification QC/T 1000.2-2015 Performance Requirements and Test Methods of Non-woven on Automotive Filter - Part 2: Non-woven of filters for Air Filter

3 Terms and Definitions

For the purposes of this Document, the terms and definitions given in GB/T 3730.1-2022, GB/T 28949-2012, QC/T 32-2017 apply.

4.1 Prohibited substances

The materials used for the filter element shall comply with the content limit requirements for Prohibited substances in 4.2 of GB/T 30512-2014; and are not limited to the component types involved in Appendix A.

4.2 Cleanliness

The cleanliness of the filter element shall not exceed 0.12qve, in mg.

NOTE 1: qve is the rated volume flow of the filter element, in m³/h.

NOTE 2: The coefficient (0.12) in front of qve is in [mg/(m³/h)].

4.3 Original resistance

At the rated air volume flow, the original resistance of the filter element shall comply with the provisions of Table 1.

Type of filter element	Material of filter element	Original resistance/kPa
Cylindrical filter element	Filter paper	≤ 0.45
	Non-weaving cloth	≤ 0.40
Plate filter element	Filter paper	≤ 0.55
	Non-weaving cloth	≤ 0.50

NOTE: The requirements for honeycomb filter elements can refer to those for plate filter elements.

4.4 Original filtration efficiency

At rated air volume flow, using Arizona A2 (fine particles) and A4 (coarse particles) test dust specified in GB/T 28957.1-2022, the original filtration efficiency of the filter element shall comply with the provisions of Table 2.

4.5 Full life filtration efficiency

When conducting laboratory life tests at rated air volume flow, if the filter element resistance increase reaches 2.5 kPa, the full life filtration efficiency of the filter element shall comply with the provisions of Table 3.

4.6 Ash holding capacity

Carry out the laboratory life test at the rated air volume flow rate. When the resistance increase Type of filter element Material of filter element Original filtration efficiency

4.7 Resistance recovery

It is stipulated that after the resistance recovery test, the resistance recovery rate shall be no less than 85%.

4.8 Water resistance

After the water resistance test, the performance of the filter element shall meet the following requirements.

- a) Retest the intake resistance at the rated air volume flow until the resistance is stable (the resistance change is within 5%), continue for 10 min, and record the retest resistance change curve and resistance value; remove the filter element, check and record whether the filter element is damaged.
- b) The change in intake resistance shall not exceed 10% of the original intake resistance.
- c) The original filtration efficiency of the filter element shall be no less than 95% of the average original filtration efficiency of the same batch of test samples.

4.10 Damage resistance

When the pressure difference of the filter element reaches 10 kPa, there shall be no damage, deformation, or filter material rupture.

4.11 Weather resistance

The filter element shall be free of defects such as deformation, rupture, plastic swelling, degumming, and rust.

4.12 Filter element and components

4.12.1

The dimensional tolerance of the filter element can be measured with a general measuring tool; and the shape and position tolerance shall be measured in accordance with the

provisions of GB/T 1182-2008. The appearance quality shall be inspected by visual inspection.

4.12.2

The filter element shall be clean; and the inner and outer surfaces shall be free of dirt, impurities, and damage; and the components shall be complete.

4.12.3

The paper filter material used in the filter element shall be folded and shaped and heat-cured according to the process requirements, and shall comply with the provisions of QC/T 794-2020.

4.12.4

The non-woven filter material used in the filter element shall be folded and shaped according to the process requirements, and shall comply with the provisions of QC/T 1000.2-2015.

4.12.5

For the inner fold distance of the filter element, the paper filter element should be no less than 2.5 times the thickness of the filter material; and for non-woven filter element, it should be no less than 1.5 times the thickness.

4.12.6

The fold deviation of the filter element shall comply with the provisions of Table 5.

Table 5 -- Fold deviation of filter element

4.12.7

The dimensional deviations of the outer diameter, inner diameter and height of the end cap of the cylindrical filter element and the shape (length, width and height) of the plate filter element shall comply with the provisions of Class-C in GB/T 1804-2000.

4.12.8

The verticality deviation of the center line to the end face of the cylindrical filter element and the vertical faces of the plate filter element shall comply with the provisions of Class-V in GB/T 1804-2000.

4.12.9

When the end cap of the cylindrical filter element is bonded to the filter material, the parallelism tolerance of the two end cap surfaces shall comply with the provisions of Table 6.

The measurement position shall be on the annular surface with a diameter of 10 mm from the inner hole of the end cap (see Figure 1). The sealing ring shall be firmly bonded to the