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Automotive parts — Spin-on type oil filters for gasoline engines

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JAPANESE INDUSTRIAL STANDARD JIS D 3904:1997

Automotive parts—Spin-on type oil filters for gasoline engines

1 Scope This Japanese Industrial Standard specifies spin-on type (1) full-flow oil filters (hereafter referred to as "filter") used for the automotive gasoline engines.

Note (1) A type of oil filters of which the entireness of filter elements are easily and simply interchangeable.

Remarks: The standards cited in this Standard are given in the following:

JIS D 1611 *Automotive parts—Test methods of lubricating oil filters*

JIS Z 8703 *Standard atmospheric conditions for testing*

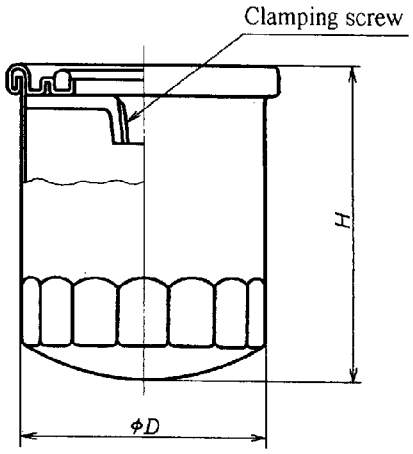
2 Definitions The term used in this Standard is as given in the following, and for the rest of terms, definitions given in **JIS D 1611** applies.

(1) **contaminant capacity ratio** The value when "the total mass of solid in test contaminant added to the filter until the completion of the test" is divided by "the length of the filter housing", and is expressed in gram per millimetre (g/mm).

3 Class The class of the filter shall be as given in Table 1 according to the discrimination of the nominal diameter.

Table 1 Class

Class	Nominal diameter *D* mm
1	90 or less
2	Over 90



4 Clamping screw The clamping screw shall be M20×1.5 or 3/4−16UNF, provided that the screw of 3/4−16UNF should not preferably be used in newly designing.

5 Performance The performance of the filter shall be as given in Table 2.

Table 2 Performance

Item	Performance			Test method
Pressure drop	30 kPa max.			According to **7.2**
Opening pressure of relief valve	Upon agreement between the purchaser and supplier			According to **7.3**
Differential pressure strength of element	It shall withstand the differential pressure of 500 kPa.			According to **7.4**
Filtering efficiency	Class	After 11 h elapsed	After termination of full test time	According to **7.5**
	1	80% min.	90 % min., provided that it may be agreed to be 85 % or more when agreed between the purchaser and supplier.	
	2		90 % min.	
Contaminant capacity ratio	Class1 : 0.25 g/mm min. Class2 : 0.30 g/mm min.			
Impulse resistance	It shall be free from oil spill and breakage.			According to **7.6**
Pressure-proof strength	It shall be free from oil spill and breakage when the oil pressure of 1 500 kPa is applied.			According to **7.7**
Vibration resistance	It shall be free from oil spill and breakage.			According to **7.8**
Drain back oil quantity	Class 1 : 50 mL max., provided that it may be agreed to be 100 mL or less when agreed between the purchaser and supplier. Class 2 : 100 mL max.			According to **7.9**
Bubble ratio	50 % min.			According to **7.10**

6 Appearance The filter shall be of good workmanship in appearance and be free from harmful flaw, crack and other defects.

7 Test method

7.1 General requirements for testing The general requirements for testing shall be as given in the following:

(1) The environments of laboratories for each testing shall be controlled at an ordinary temperature (5 ℃ to 35 ℃) and ordinary humidity (45 % to 85 %) specified in **JIS Z 8703**, unless otherwise specified.

(2) The flow rate for the pressure drop test, and filtering efficiency and contaminant capacity ratio test shall be as given in Table 3.

Table 3 Flow rate

Class	Flow rate L/min
1	10
2	15

7.2 Pressure drop test The pressure drop test shall be carried out in accordance with the requirements of **5** specified in **JIS D 1611**, and the pressure drop shall be measured. With this respect, the test oil shall conform to the requirements of **(1) (a)** of **5.1** specified in **JIS D 1611**, and the flow rate shall conform to Table 3.

7.3 Relief valve performance test The relief valve performance test shall be carried out in accordance with the requirements of **6** specified in **JIS D 1611**, and the opening pressure of the relief valve shall be measured when the flow rate reaches to the designated flow rate. With this respect, the test oil shall conform to the requirements of **(1) (a)** of **5.1** specified in **JIS D 1611**.

7.4 Differential pressure strength test of element The differential pressure strength test of the element shall be carried out in accordance with the requirements of **7.1**, **7.2** and **(1)** of **7.3** out of **7** specified in **JIS D 1611**, and the occurrence of breakage of the filter elements shall be examined.

7.5 Filtering efficiency and contaminant capacity ratio test The filtering efficiency and the contaminant capacity ratio test shall be carried out in accordance with the following:

(1) The test shall be carried out in accordance with the requirements of **8** specified in **JIS D 1611** to obtain the filtering efficiency and contaminant capacity ratio. The test time shall be the duration time until the pressure drop reaches 100 kPa, and the flow rate shall be as specified in Table 3. In the case where the pressure drop does not reach 100 kPa after it passes 66 h, however, the test may discontinue upon agreement between the purchaser and supplier, as necessary.

Further, for the filter with an incorporated relief valve, the test shall be carried out after plugging the relief valve.

(2) The contaminant capacity ratio shall be obtained according to the following formula:

$$C_R = \frac{W_C}{H}$$

where, C_R : Contaminant capacity ratio (g/mm)

W_C: Total mass of solid in test contaminant added to the filter until the completion of the test (g)

H : Length of the filter housing (mm)

7.6 Impulse resistance test The impulse resistance test shall be carried out in accordance with the requirements of **9** specified in **JIS D 1611**, and the occurrence of oil spill from the filter and breakage shall be examined.

7.7 Pressure-proof test The pressure-proof test shall be carried out in accordance with the requirements of **10** specified in **JIS D 1611**, and the occurrence of oil spill from the filter and breakage shall be examined.

7.8 Vibration test The vibration test shall be carried out in accordance with the requirements of **11** specified in **JIS D 1611**, and the occurrence of oil spill from the filter and breakage shall be examined.

7.9 Drain back oil quantity test The drain back oil quantity test shall be carried out in accordance with the requirements of **12** specified in **JIS D 1611**, and the drain back oil quantity shall be measured.

With this respect, the height of oil level shall be 500 mm.

7.10 Bubble test The bubble test shall be carried out in accordance with the requirements of **13** specified in **JIS D 1611**, and the bubble ratio shall be determined.

8 Inspection

8.1 Inspection item The inspection items shall be as given in the following:

(1) **Performance inspection**

(2) **Appearance inspection**

8.2 Inspection method The inspection method shall be the sampling inspection which conforms to the sampling inspection scheme agreed between the purchaser and supplier.

9 Marking The filter shall be marked the manufacturer's name or its identifying brand on its legible place by suitable means not to vanish easily.

Errata for JIS (English edition) are printed in *Standardization Journal*, published monthly by the Japanese Standards Association, and also provided to subscribers of JIS (English edition) in *Monthly Information*.

Errata will be provided upon request, please contact:

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