

Road vehicles — Air filters — Specification

TECHNICAL COMMITTEE REPRESENTATION

The following organizations were represented on the Technical Committee:

Toyota Kenya Ltd
D.T Dobie
Mitsumoto
Isuzu E.A
Kenya Association of Bus Manufacturers (KABM)
Kenya Motor Repairers Association (KEMRA)
Nissan
Numerical Machining Complex (NMC)
Gede Enterprises
Mobius Motors
KUMPIA
Kenya Industrial Research and development Institute (KIRDI)
Technical University of Kenya (TUK)
Motorwise Valuers
Kenya Auto Bazaar Association
Honda (Nairobi)
Egerton University
Olive Technical Services Ltd
Kenya Jua Kali Association
MCI Ltd
Kenya Bureau of Standards — Secretariat

REVISION OF KENYA STANDARDS

In order to keep abreast of progress in industry, Kenya Standards shall be regularly reviewed. Suggestions for improvements to published standards, addressed to the Managing Director, Kenya Bureau of Standards, are welcome.

© Kenya Bureau of Standards, 2020

Copyright. Users are reminded that by virtue of Section 25 of the Copyright Act, Cap. 12 of 2001 of the Laws of Kenya, copyright subsists in all Kenya Standards and except as provided under Section 26 of this Act, no Kenya Standard produced by Kenya Bureau of Standards may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing from the Managing Director.

Road vehicles — Air filters — Specification

KENYA BUREAU OF STANDARDS (KEBS)

Head Office: P.O. Box 54974, Nairobi-00200, Tel.: (+254 020) 605490, 602350, Fax: (+254 020) 604031
E-Mail: info@kebs.org, Web: <http://www.kebs.org>

Coast Region

P.O. Box 99376, Mombasa-80100
Tel.: (+254 041) 229563, 230939/40
Fax: (+254 041) 229448

Lake Region

P.O. Box 2949, Kisumu-40100
Tel.: (+254 057) 23549, 22396
Fax: (+254 057) 21814

Rift Valley Region

P.O. Box 2138, Nakuru-20100
Tel.: (+254 051) 210553, 210555

Foreword

This Kenya Standard was prepared by the Road Vehicles Technical Committee under the supervision of the Standards Projects Committee and is in accordance with the procedures of the Kenya Bureau of Standards.

This standard covers performance requirements for air filters.

Taking into consideration the views of consumers, it was felt necessary to revise this standard to improve the quality of air filters used in Kenya.

In the preparation of this standard reference was made to the following document:

BS 1701, Inlet air cleaning equipment for internal combustion engines and compressors — Performance testing.

Acknowledgement is hereby made for the assistance received from this source.

Road vehicles —Air filters — Specification

1 Scope

This Kenya Standard specifies materials, performance requirements, and methods of test for road vehicles air filters.

2 Materials

2.1 The use of dissimilar metals in the filter assembly, especially brass, copper or steel in contact with aluminium alloy shall be avoided.

2.2 The filter shall be capable of withstanding flame due to engine backfires in spark-ignition engines without damage.

2.3 The filtering media shall be paper with a maximum pore size of 2.5 microns, or any other suitable material giving the same filtering capacity.

2.4 Adhesive coatings and bonding materials on the filtering media shall have a flash point of not less than 170°C.

2.5 The cell sides shall be made of material sheet (metal or plastic) and shall provide positive support for the filtering media. They shall have adequate rigidity for normal handling and installation.

3 Tests

3.1 Pressure drop test

When tested in accordance with Annex A, the initial pressure drop across the filter shall not exceed 0.003 Mpa.

3.2 Mean dust retaining efficiency

When tested in accordance with Annex B, the mean dust retaining efficiency shall be not less than 95%.

3.3 Dust holding capacity test

When tested in accordance with Annex C, the dust holding capacity shall be not less than 250 g/m².

4 Marking

4.1 The filter and filter packaging shall be legibly and indelibly marked on the outer casing with the following:

- i) Manufacturers' name and/or registered trade mark;
- ii) Country of origin;
- iii) Manufacturers' part number.

4.2 Additional markings indicated on the filter or package shall necessitate additional verifications that the filters comply with the claims indicated.

Annex A (normative)

Determination of pressure drop

- A.1** The test shall be carried out with the filter in a level position in the rig shown in Figure A.1.
- A.2** The filter shall be thoroughly cleaned and then air shall be drawn through it at its rated capacity until two consecutive readings, at intervals of not less than 15 min, show no loss in weight.
- A.3** The aspirated air shall be clean and free from fumes. Its temperature shall be maintained at $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$ and relative humidity at $55^{\circ}\text{C} \pm 5\%$.
- A.4** The test shall be carried out without dust being fed into the filter, and initial pressure drop shall be determined at 100 %, 80 %, 60 %, 40 %, 20 % and 10 % of the maximum rate of air flow.
- A.5** In each case the air flow shall be maintained for 5 min before the pressure drop is ascertained.

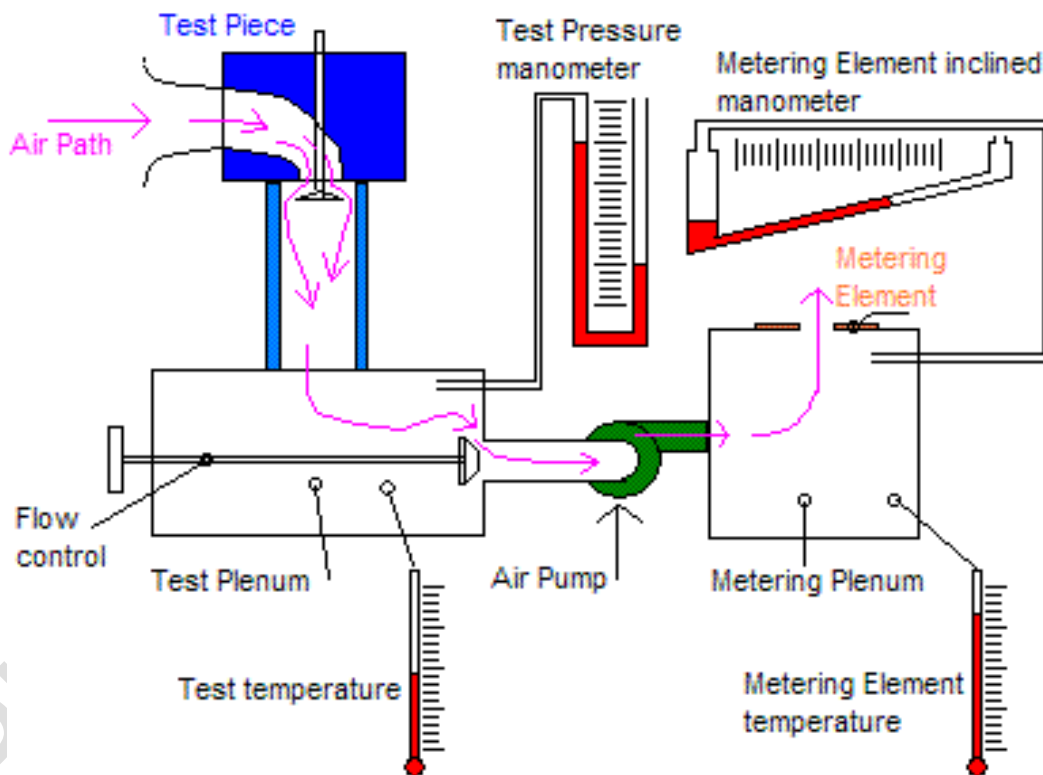


Figure A.1 – Test rig for filters

Annex B (normative)

Determination of the mean dust retaining efficiency

- B.1** The test shall be conducted with the filter in a level position in the rig shown in Figure A.1.
- B.2** The filter shall be cleaned thoroughly and then air shall be drawn through it at its rated capacity until; two consecutive readings, at intervals of not less than 15 min, show no loss in weight.
- B.3** The aspirated air shall be clean and free from fumes. Its temperature shall be maintained at 25 °C ± 3 °C and relative humidity at 55 % ± 5 %
- B.4** The filter shall be weighed and together with the dust feed gear, installed in a level position on the test rig.
- B.5** The dust feed gear shall be charged with the required amount of test dust, averaging 10 microns in size, and weighed to the nearest 0.1 g.
- B.6** The exhaustor shall be started and the air flow through the filter adjusted to the maximum air flow of the filter under the test. This air flow shall be maintained for 10 min from the beginning of the test.
- B.7** The time and the aspirated air temperature (wet and dry bulbs) shall be recorded at the start and at the end of each cycle.
- B.8** The design dust/air ration, shall be maintained throughout the test within limits of ± 5 % and the total amount of dust charged to the dust feed gear shall be fed to the filter in the time specified. The dust feed apparatus shall be calibrated prior to each test, to ensure that the above limits are maintained.
- B.9** The test shall consist of two-hour cycles, each as given in Table B.1.

Table B.1 — Two-hour cycle

Air flow (percentage of filter rated capacity)	Time (minutes)
100	15
20	15
80	30
10	15
50	15
80	30

At the end of each two-hour cycle, the pressure drop at maximum air shall be recorded. The dust retaining efficiency shall be determined as quickly as possible in the following manner:

All the dust on the exterior of the filter and any which may have settled in the test chamber shall be collected, by carefully brushing into a suitable container. The dust collected shall then be weighed to the nearest 0.1 g, and shall not exceed 1 % by weight of the total dust feed.

- B.10** The filter efficiency shall be calculated as follows:

$$\text{Efficiency \%} = \frac{B - A}{C} \times 100$$

where,

A = weight of filter before test,
 B = weight of the filter after test, and
 C = weight of the dust fed to the filter.

i.e. weight of dust in dust-feed gear at the start of the test less the amount of dust in the dust-feed gear at the end of the test and less the amount of dust left in the dust chamber or inlet and that collected from the exterior of the filter housing.

Annex C
(normative)

Dust holding capacity test

C.1 The test shall be conducted as in Annex B.

C.2 The dust holding capacity in g/m^2 is the weight in grammes of dust which can be accommodated during the test at the design dust/air ration, while maintaining the specified efficiency given in 3.2 and without exceeding the pressure drop of 0.015 KPa divided by the area of the filter element.