

**SPECIFICATION
FOR
FILTERS, AIR, AUTOMOTIVE AND INDUSTRIAL**

(THIS SPECIFICATION IS RELEASED FOR PROCUREMENT PURPOSES UNTIL REVISED OR RESCINDED.)

SCOPE

This specification covers the requirements for air cleaner elements of the dry type for use in single stage and multiple stage air cleaners.

I. CLASSIFICATION

The air cleaner elements are classified according to their general intended use, as defined in ISO 5011:

Type 1 - Automotive Air Cleaner Elements

Type 2 - Industrial Air Cleaner Elements

II. APPLICABLE STANDARDS

The following document of issue on the date of the Invitation for Bids (IFB) shall form a part of this specification to the extent described in Section III. Requirements:

ISO 5011 Inlet Air Cleaning Equipment For Internal Combustion Engines And Compressors – Performance Testing

International Organization for Standards documents may be obtained from: <http://www.iso.org/>

Or

American National Standards Institute, Inc.

Attn.: Customer Service Department

25 W. 43rd Street, 4th Floor

New York, NY 10036 or online at <http://www.ansi.org/>

III. REQUIREMENTS

A. Performance, Type 1 Air Cleaner Elements

1. Restriction and differential pressure test

Elements shall be tested in accordance with paragraph 6.3 of ISO 5011. The performance so determined shall meet the specific requirements of the IFB.

2. Efficiency test

Elements shall be tested in accordance with paragraph 6.4 of ISO 5011. The type of efficiency test performed (full life, incremental, or initial) shall be that type performed by the manufacturer of the OEM model referenced in the IFB. The performance so determined shall meet the specific requirements of the IFB.

3. Capacity test

Elements shall be tested in accordance with paragraph 6.5 of ISO 5011. The performance so determined shall meet the specific requirements of the IFB.

4. Filter element pressure collapse test

Elements shall be tested in accordance with paragraph 6.6 of ISO 5011. The performance so determined shall meet the specific requirements of the IFB.

B. Performance, Type 2 Air Cleaner Elements

1. Restriction and differential pressure test

Elements shall be tested in accordance with paragraph 7.3 of ISO 5011. The performance so determined shall meet the specific requirements of the IFB.

2. Initial efficiency test

Elements shall be tested in accordance with paragraph 7.4 of ISO 5011. The performance so determined shall meet the specific requirements of the IFB.

3. Full-life efficiency and capacity test

Elements shall be tested in accordance with paragraph 7.5 of ISO 5011. The four intermediate test airflow velocities and the terminating condition shall be those set by the manufacturer of the OEM model referenced in the IFB. Performance so determined shall meet the specific requirements of the IFB.

4. Scavenged air cleaner performance tests

For restriction and differential pressure test, elements shall be tested in accordance with paragraph 7.7.3 of ISO 5011. The ratio of the scavenged air flow to the cleaned air flow shall be that set by the manufacturer of the OEM model referenced in the IFB. Performance so determined shall meet the specific requirements of the IFB.

For full-life efficiency and capacity test, elements shall be tested in accordance with paragraph 7.7.4 of ISO 5011. The ratio of the scavenged air flow to the cleaned air flow shall be that set by the manufacturer of the OEM model referenced in the IFB. Performance so determined shall meet the specific requirements of the IFB.

5. Secondary element performance tests

For the specific efficiency test, elements shall be tested in accordance with paragraph 7.9.2 of ISO 5011. The terminating condition shall be that set by the manufacturer of the OEM model referenced in the IFB. Performance so determined shall meet the specific requirements of the IFB.

For the blocking test, elements shall be tested in accordance with paragraph 7.9.4 of ISO 5011. The terminal weight increase and/or differential pressure increase of the secondary element shall be that set by the manufacturer of the OEM model referenced in the IFB. Performance so determined shall meet the specific requirements of the IFB.

C. Workmanship

Materials are to be uniform in quality and free from imperfections or defects which would affect the performance of the air cleaner element. Workmanship shall be such that the elements are free of poorly cemented end caps, surfaces out of alignment or out of contour (visually apparent) and

missing portions of materials. Sheet metal parts shall be free of pipes, blisters, tears, and thinning in excess of 25% of the original metal thickness at drawn section.

Dimensional requirements, if applicable, may be elsewhere specified in the IFB.

IV. WARRANTY

The contractor warrants to the owner that all air cleaner elements furnished under this specification will be new, of good material and workmanship, and agrees to replace promptly any element which by reason of defective material or workmanship shall fail under normal use, free of negligence or accident. Such replacement shall be free of any charge to the owner. In addition, the contractor will repair any engine or equipment damage resulting from the malfunction of the filter or filter element, if it is installed and changed in accordance with the engine or equipment manufacturer's service instruction.

V. SERVICE, PARTS, AND MANUALS

This specification does not require any service, parts, or manuals to be supplied.

VI. ACCEPTANCE EVALUATION AND QUALITY ASSURANCE

A. Test procedures

Tests are to be conducted in accordance with ISO 5011 as provided above. In cases where a required test condition is not defined or specified herein, a justified value thereof will be specified by the state at the time of the request for the test.

For each test, the test dust used is to be "ISO fine" or "ISO coarse," per paragraph 5.1.1 of ISO 5011, whichever was selected and used by the manufacturer of the OEM model referenced in the IFB.

B. Test results

Within fourteen (14) consecutive calendar days of request, at any time from date of bid opening to expiration of contract, certified test results for each filter element so requested shall be submitted to the state. The reported data shall include the make and model of the filter tested, a complete description of the test procedure and the equipment and materials used, and the results of the tests performed. All such tests shall be performed in accordance with this specification and its referenced document(s).

C. Responsibility for inspection

The supplier is responsible for the performance of all requested tests and all inspection requirements as specified herein. The supplier may utilize his own facilities or any commercial laboratory acceptable to the state. The state reserves the right to perform any of the inspections and tests deemed necessary to assure supplies and services conform to prescribed requirements.

D. Failure

Failure of a test sample to pass any specified examination or test may be cause for the state to refuse to accept subsequent lots until it has been proved to the satisfaction of the state that the faults revealed by the tests have been corrected, and furthermore may be cause for the state to take additional action as may be authorized by the contract.

VII. DELIVERY AND PAYMENT

Delivery of and payment for air cleaner elements purchased under this specification shall be in accordance with the terms and conditions of the request for bids. The contractor shall be responsible for any packing, packaging, or protection required to insure safe delivery in an undamaged condition.

VIII. ORDERING DATA (for purchaser's use only)

Purchasers should exercise any desired option offered herein and should specify the following in the requisition and the Invitation For Bids:

1. Title, number, and date of this specification.
2. The O.E.M. manufacturer and part number for each referenced filter element.
3. The performance requirement for each filter, whether such filter is specifically referenced in the IFB or is otherwise incorporated into the contract. Performance requirement may be that of the referenced model, or may be modified to include an allowable performance factor (e.g. minimum 90% of the performance of the referenced model).
4. Dimensional requirements, such as with respect to a specific filter which is known to be satisfactory in an application with extremely limited physical clearance.