

**SPECIFICATION
FOR
FILTERS, AIR (HVAC)**

(THIS SPECIFICATION IS RELEASED FOR PROCUREMENT PURPOSES UNTIL REVISED OR RESCINDED.)

SCOPE

This specification covers various types and sizes of replaceable air filters for use in heating, ventilating and air conditioning systems. Types and sizes listed in this specification are intended to be standard representative filters for each category and are those most often used by state agencies and institutions. This specification is not intended to review all types and sizes commercially available or special requirements.

I. CLASSIFICATION

FILTERS COVERED BY THIS SPECIFICATION ARE OF THE FOLLOWING TYPES:

A. TYPE I – REPLACABLE PANEL DISPOSABLE TYPES

STYLE 1 - PANEL TYPE (THROW AWAY) - CATEGORY DISCONTINUED

STYLE 2 - PANEL TYPE (THROW AWAY) - PROGRESSIVE LOADING - TACKIFIER IMPINGEMENT
CATEGORY DISCONTINUED

STYLE 3 - RING AND LINKED TWO PLY PANEL WITH INTERNAL WIRE FRAME - TACKIFIER
IMPINGEMENT TYPE – MINIMUM MERV 6

STYLE 4 - RING AND LINKED THREE PLY PANEL WITH INTERNAL WIRE FRAME - TACKIFIER
IMPINGEMENT – MINIMUM MERV 7

STYLE 5 - RING AND LINKED FOUR PLY PANEL WITH INTERNAL WIRE FRAME - TACKIFIER
IMPINGEMENT – MINIMUM MERV 8 - NEW

**B. TYPE II - FILTERS FOR WINDOW AIR CONDITIONING UNITS (WASHABLE TYPE)
CATEGORY DISCONTINUED**

C. TYPE III - EXTENDED SURFACE FILTERS (PLEATED PANEL TYPE)

STYLE 1 – MINIMUM MERV 7 EFFICIENCY (PLEATED) – STANDARD CAPACITY WITH MINIMUM
AIR FLOW RESISTANCE

STYLE 2 – MINIMUM MERV 7 EFFICIENCY (PLEATED) – STANDARD CAPACITY WITH
INCREASED MEDIA AREA

STYLE 3 – MINIMUM MERV 7 EFFICIENCY (PLEATED) – HIGH CAPACITY WITH MINIMUM
AIRFLOW RESISTANCE

STYLE 4 – MINIMUM MERV 7 EFFICIENCY (PLEATED) – HIGH CAPACITY WITH MAXIMUM MEDIA
AREA

D. TYPE IV - EXTENDED SURFACE FILTER CARTRIDGE (BAG TYPE WITH HEADER FRAME)

STYLE 1 - FIBERGLASS MEDIA - CATEGORY DISCONTINUED

STYLE 2 - SYNTHETIC MEDIA

GRADE 1 – MINIMUM MERV 15

GRADE 2 – MINIMUM MERV 14

GRADE 3 – MINIMUM MERV 13

GRADE 4 – MINIMUM MERV 12

E. TYPE V - HEPA FILTER 99.97% EFFICIENCY - CATEGORY DISCONTINUED

F. TYPE VI - EXTENDED SURFACE FILTERS – RIGID BOX TYPE

GRADE 1 – (90-95% TESTED EFFICIENCY) – MINIMUM MERV 14

II. APPLICABLE STANDARDS

THE FOLLOWING DOCUMENTS OF ISSUE IN EFFECT ON THE DATE OF THE INVITATION FOR BIDS SHALL FORM A PART OF THIS SPECIFICATION TO THE EXTENT DESCRIBED IN REQUIREMENTS:

ASHRAE-52.1 - GRAVIMETRIC AND DUST-SPOT PROCEDURES FOR TESTING AIR CLEANING DEVICES USED IN GENERAL VENTILATION FOR REMOVING PARTICULATE MATTER

ASHRAE-52.2-2007 and ASHRAE-52.2-2007 ADDENDUM B (INCLUDING APPENDIX J) - METHOD OF TESTING GENERAL VENTILATION AIR-CLEANING DEVICES FOR REMOVAL EFFICIENCY BY PARTICLE SIZE

American Society of Heating, Refrigeration & A/C Engineers, Inc. (ASHRAE)
United Engineering Center, 1791 Tulley Circle, NE, Atlanta, GA 30389

ARI-850 - STANDARD FOR COMMERCIAL AND INDUSTRIAL AIR FILTER EQUIPMENT
Air Conditioning and Refrigeration Institute (ARI)
1815 N. Fort Myer Drive, Arlington, VA 22209

ANSI/UL-900 AIR FILTER UNITS & ANSI/UL-586 HIGH EFFICIENCY PARTICULATE (H.E.P.A.)
Underwriters' Laboratories, Inc. (UL)
Publications Stock, 333 Pfingsten Road, Northbrook, IL 60062

IES RP-CC-001-83-T - RECOMMENDED TENTATIVE PRACTICE FOR TESTING AND CERTIFICATION OF HEPA FILTERS
Institute Of Environmental Sciences
P.O. Box 12233, Research Triangle Park, NC USA 27709

NAFA GUIDE TO AIR FILTRATION, Fourth Edition, 2007
National Air Filtration Association, 1518 K Street N. W. Washington, D.C. 20005

III. REQUIREMENTS

A. TYPE I – REPLACABLE PANEL DISPOSABLE TYPES

TYPE I, STYLE 1 - PANEL TYPE (THROW AWAY) - CATEGORY DISCONTINUED

TYPE I, STYLE 2 - PANEL TYPE (THROW AWAY) - PROGRESSIVE LOADING - TACKIFIER IMPINGEMENT - CATEGORY DISCONTINUED

TYPE I, STYLE 3 – RING AND LINKED RING PANEL, TWO PLY FILTER WITH INTERNAL WIRE FRAME

1. Construction

Style 3 filters shall be disposable panel type with an internal wire frame bonded between two layers of polyester or other suitable filter media.

The wire frame shall have a perimeter wire with wire supports in the center of the opening attached to the perimeter frame. The wire frame shall be not less than 9 gauge steel and sized to fit industry standard filter racks. Fluctuations in filter face velocity or turbulent airflow will have no effect on filter integrity or performance.

The two-ply media shall be heat sealed or otherwise securely fastened together around the outer perimeter of the wire frame and in the center area of the crosswire support. Media shall be void of thin spots and shall provide strength in all directions.

The filter shall fit all standard size holding frames and shall be sized such that the media on the air leaving side wraps around the wire frame and holds it securely in place without holding devices and forms a seal to prevent air by-pass.

The air flow direction shall be clearly indicated by color coding or other clear marking.

The fibers are to be covered with a coating of a tackifier adhesive. The tackifier shall be free of any substance that will corrode clean copper wire when tested in contact with the wire for 15 days at 95 degrees F. and 95% R.H.

The media shall be supported in such a manner as to prevent any slumping or collapse of the media or otherwise be permanently displaced at the specified air velocity and final resistance.

Filters frames if provided shall be of sufficient rigidity for normal operation handling, installation and removal.

The filter shall retain full specified performance, efficiency, structural configuration and strength at all atmospheric relative humidity.

Linked filters provide continuous fanfold instead of individual filters to discourage by-pass air.

A single different model of filter must comply with each of the specific filters identified in the specifications for that category.

The filter shall meet the minimum standards of the Underwriters' Laboratories Standard UL 900 for a Class 2 rating as to flammability.

2. PERFORMANCE

When tested in accordance with ASHRAE-52.2-2007 standard, filters shall be in compliance with the following:

STYLE 3 FILTERS– RING AND LINKED RING PANEL; TWO PLY FILTER WITH INTERNAL WIRE FRAME

NOMINAL FILTER SIZE (INCHES):	24X24X1 deep
AIR FLOW CAPACITY (CFM)	1200
FILTER FACE VELOCITY (FPM)	300
INITIAL RESISTANCE (INCHES W.G.) (MAX)	0.28
RATED FINAL RESISTANCE (INCHES W.G.) (MIN)	1.0
MINIMUM MERV RATING PER ASHRAE 52.2-2007	6

TYPE I, STYLE 4 – RING AND LINKED, THREE PLY PANEL FILTER WITH INTERNAL WIRE FRAME

1. CONSTRUCTION

Style 4 filters shall be identical to Style 3 filters except provided with an internal wire frame sandwiched between three distinct layers of synthetic fibers increasingly density through the filter.

The three-ply media shall be heat sealed or otherwise securely fastened together around the outer perimeter of the wire frame and in the center area of the crosswire support.

The filter shall be of the tackifier impingement type with a coating of adhesive between the layers of media as described under style 3 above.

2. PERFORMANCE

When tested in accordance with ASHRAE-52.2-2007 standard, filters shall be in compliance with the following:

STYLE 4 FILTERS - RING AND LINKED; THREE PLY PANEL FILTER WITH INTERNAL WIRE FRAME WITH OPTION OF LINKING STANDARD SIZES

NOMINAL FILTER SIZE (INCHES):	24X24X1 deep
AIR FLOW CAPACITY (CFM)	2000
FILTER FACE VELOCITY (FPM)	500
INITIAL RESISTANCE (INCHES W.G.) (MAX)	0.040
RATED FINAL RESISTANCE (INCHES W.G.) (MIN.)	1.0
MINIMUM MERV RATING PER ASHRAE 52.2-2007	7

TYPE I, STYLE 5 – RING AND LINKED, FOUR PLY FILTER WITH INTERNAL WIRE FRAME

1. CONSTRUCTION

Style 5 filters shall be identical to Style 3 filters except provided with an internal wire frame sandwiched between four distinct layers of synthetic fibers increasingly dense through the filter.

The four-ply media shall be heat sealed or otherwise securely fastened together around the outer perimeter of the wire frame and in the center area of the crosswire support.

The filter shall be of the tackifier impingement type with a coating of adhesive between the layers of media as described under style 3 above.

2. PERFORMANCE

When tested in accordance with ASHRAE-52.2-2007 standard, filters shall be in compliance with the following:

STYLE 5 FILTERS - RING AND LINKED; FOUR PLY FILTER WITH INTERNAL WIRE FRAME WITH OPTION OF LINKING STANDARD SIZES

NOMINAL FILTER SIZE 9INCHES):	24X24X1 deep
AIR FLOW CAPACITY (CFM)	2000
FILTER FACE VELOCITY (FPM)	500
INITIAL RESISTANCE (INCHES W.G.) (MAX)	0.50
RATED FINAL RESISTANCE (INCHES W.G.) (MIN.)	1.0
MINIMUM MERV RATING PER ASHRAE 52.2-2007	8

B. TYPE II - FILTERS FOR WINDOW AIR CONDITIONING UNITS - CATEGORY DISCONTINUED

C. TYPE III – EXTENDED SURFACE FILTERS (PLEATED PANEL TYPE)

1. DESCRIPTION –

The filter media shall be bonded without staples to a sturdy water resistant coated beverage board filter frame to fit industry standard size filter racks. Industry “chipboard” is not acceptable. The uniform media surface shall be bonded to the frame in such a manner as to prevent any slumping or collapse of the media or otherwise be permanently displaced at the specified air velocity and final resistance. Means shall be provided to identify air flow direction with filter installed.

Pleated filter media shall be provided with integral support to assure against structural failure with resulting loss in filter effectiveness and uniform spacing of the pleats. Filter loading to the final air pressure resistance shall not reduce structural stability of the media to the frame or filter frame to the equipment rack resulting in bypass air or blow out of the filter. Fluctuations in filter face velocity or turbulent airflow will have no effect on filter integrity or performance.

Frames shall be formed to provide positive support for the media pad and sufficient rigidity for normal use, installation and removal. Filters must be installable in owner's existing frames so as to form a tight fit and prevent bypassing of air in service.

The number of pleats per foot as provided on the representative filter requested and deemed compliant to the specifications herein shall be the identical number of pleats per foot for filters offered for that representative filter face size. The number of pleats per foot as provided on other filter face sizes of the representative filter shall be proportional to the gross media provided.

A single different model of filter must comply with each of the specific filters identified in the specifications for that category. Filters bid for a specific style described may not be bid for another style of pleated filters.

The filter shall retain full specified performance, efficiency, structural configuration and strength at all atmospheric relative humidity.

The filter shall meet the minimum standards of the Underwriters' Laboratories Standard UL 900 for a Class 2 rating as to flammability.

2. PERFORMANCE

When tested in accordance with ASHRAE-52.2-2007 standard, filters shall be in compliance with the following:

<u>STYLE 1 – MINIMUM MERV 7 EFFICIENCY (PLEATED) – STANDARD CAPACITY WITH MINIMUM AIR FLOW RESISTANCE</u>			
<u>NOMINAL FILTER SIZE</u>	24X24X1	24X24X2	24X24X4
MINIMUM SQ. Ft. GROSS MEDIA AREA PER SQ. FT. OF NOMINAL FACE SIZE	1.25	2.5	4.6
AIR FLOW CAPACITY (CFM)	1200	2000	2000
SYSTEM VELOCITY (FPM)	300	500	500
INITIAL RESISTANCE (INCHES W.G.) (MAX)	0.4	0.28	0.25
RATED FINAL RESISTANCE (INCHES W.G.) (MIN)	1.0	1.0	1.0
MINIMUM MERV RATING PER ASHRAE 52.2-2007	7	7	7

STYLE 2 – MINIMUM MERV 7 EFFICIENCY (PLEATED) – STANDARD CAPACITY WITH INCREASED MEDIA AREA

NOMINAL FILTER SIZE	24X24X1	24X24X2	24X24X4
MINIMUM SQ. Ft. GROSS MEDIA AREA PER SQ. FT. OF NOMINAL FACE SIZE	1.9	3.0	5.6
AIR FLOW CAPACITY (CFM)	2000	2000	2000
SYSTEM VELOCITY (FPM)	500	500	500
INITIAL RESISTANCE (INCHES W.G.) (MAX)	0.50	0.35	0.30
RATED FINAL RESISTANCE (INCHES W.G.) (MIN)	1.0	1.0	1.0
MINIMUM MERV RATING PER ASHRAE 52.2-2007	7	7	7

STYLE 3 – MINIMUM MERV 7 EFFICIENCY (PLEATED) – HIGH CAPACITY WITH MINIMUM AIR FLOW RESISTANCE

NOMINAL FILTER SIZE	24X24X1	24X24X2	24X24X4
MINIMUM SQ. Ft. GROSS MEDIA AREA PER SQ. FT. OF NOMINAL FACE SIZE	1.8	3.8	6.25
AIR FLOW CAPACITY (CFM)	2000	2000	2000
SYSTEM VELOCITY (FPM)	500	500	500
INITIAL RESISTANCE (INCHES W.G.) (MAX)	0.40	0.30	0.30
RATED FINAL RESISTANCE (INCHES W.G.) (MIN)	1.0	1.0	1.0
MINIMUM MERV RATING PER ASHRAE 52.2-2007	7	7	7

STYLE 4 – MINIMUM MERV 7 EFFICIENCY (PLEATED) – HIGH CAPACITY WITH MAXIMUM MEDIA AREA

NOMINAL FILTER SIZE	24X24X1	24X24X2	24X24X4
MINIMUM SQ. Ft. GROSS MEDIA AREA PER SQ. FT. OF NOMINAL FACE SIZE	1.9	4.2	7.0
AIR FLOW CAPACITY (CFM)	2000	2000	2000
SYSTEM VELOCITY (FPM)	500	500	500
INITIAL RESISTANCE (INCHES W.G.) (MAX)	0.59	0.40	0.45
RATED FINAL RESISTANCE (INCHES W.G.) (MIN)	1.0	1.0	1.0
MINIMUM MERV RATING PER ASHRAE 52.2-2007	7	7	7

D. TYPE IV - EXTENDED SURFACE FILTER CARTRIDGE (BAG OR POCKET TYPE WITH HEADER FRAME)

1. DESCRIPTION

Each filter shall be supported by a rigid corrosion resistant metal header frame to which the filter media is securely attached. Pocket support frames are reinforced to eliminate flexing or buckling in the intended use.

Filter media consist of either a synthetic fiber blend, reinforced by a scrim type backing. Bags shall be assembled to provide a pocket configuration that guarantees complete pocket inflation at rated airflow and uniform loading through the depth of the pocket.

Fastening methods used to maintain shape for full pocket inflation, such as staples, stays, or stitching shall be sealed and edge closure methods shall not cause air leakage for the life of the filter. Media shall be sealed to filter frame.

Filters shall fit existing frames or be adaptable to the existing frames.

The filter media shall be folded in such a manner as to be the approximate size of the header frame and secured with a band that will hold the media in place during the installation of the filter.

The invitation for bids will specify header sizes as required by using agencies, either 13/16" or 1-1/8".

If adapters or clips are required, they shall be approved by the purchaser and shall be included in the bid price.

A single different model of filter must comply with each of the specific filters identified in the specifications for that category.

The entire filter cartridge, filter media and cartridge support structure, shall meet the minimum standards of the Underwriters' Laboratories Standard UL 900 for a Class 2 rating as to flammability. Each filter cartridge shall be clearly marked to show this rating.

2. PERFORMANCE

When tested in accordance with ASHRAE-52.2-2007 standard, filters shall be in compliance with the following:

STYLE 1 – (FIBERGLASS OR SYNTHETIC MEDIA) – CATEGORY DISCONTINUED

STYLE 2 - (SYNTHETIC MEDIA ONLY)

GRADE 1 – MINIMUM MERV 15

NOMINAL FILTER SIZE (INCHES)	24X24X36 deep	24X24X 29" to 30" deep
MINIMUM SURFACE AREA (SQUARE FEET)	96	81
MINIMUM NUMBER OF POCKETS	8	8
AIR FLOW CAPACITY (CFM)	2000	2000
FILTER FACE VELOCITY (FPM)	500	500
INITIAL RESISTANCE (INCHES W.G.) (MAX)	0.42	0.45
RATED FINAL RESISTANCE (INCHES W.G.) (MIN)	1.0	1.0
MINIMUM MERV RATING PER ASHRAE 52.2-2007	15	15

GRADE 2 – MINIMUM MERV 14

NOMINAL FILTER SIZE (INCHES)	24X24X 29" to 30" deep
MINIMUM SURFACE AREA (SQUARE FEET)	96
MINIMUM NUMBER OF POCKETS	8
AIR FLOW CAPACITY (CFM)	2000
FILTER FACE VELOCITY (FPM)	500
INITIAL RESISTANCE (INCHES W.G.) (MAX)	0.42
RATED FINAL RESISTANCE (INCHES W.G.) (MIN)	1.0
MINIMUM MERV RATING PER ASHRAE 52.2-2007	14

GRADE 3 – MINIMUM MERV 13

NOMINAL FILTER SIZE (INCHES)	24X24X 29 to 30" deep
MINIMUM SURFACE AREA (SQUARE FEET)	80
MINIMUM NUMBER OF POCKETS	8
AIR FLOW CAPACITY (CFM)	2000
FILTER FACE VELOCITY (FPM)	500
INITIAL RESISTANCE (INCHES W.G.) (MAX)	0.43
RATED FINAL RESISTANCE (INCHES W.G.) (MIN)	1.0
MINIMUM MERV RATING PER ASHRAE 52.2-2007	13

GRADE 4 – MINIMUM MERV 12

NOMINAL FILTER SIZE (INCHES)	24X24X 29 to 30" deep
MINIMUM SURFACE AREA (SQUARE FEET)	60
MINIMUM NUMBER OF POCKETS	6

AIR FLOW CAPACITY (CFM)	2000
FILTER FACE VELOCITY (FPM)	500
INITIAL RESISTANCE (INCHES W.G.) (MAX)	0.35
RATED FINAL RESISTANCE (INCHES W.G.) (MIN)	1.0
MINIMUM MERV RATING PER ASHRAE 52.2-2007	12

**D. TYPE V - HEPA FILTER, TYPE A, EFFICIENCY OF 99.97% OR GREATER
CATEGORY DISCONTINUED**

**E. TYPE VI – EXTENDED SURFACE FILTERS - RIGID BOX TYPE WITH CORRAGATED
ALUMINUM CELL SEPARATORS**

1. DESCRIPTION

Filters consist of a pleated media pack of boron silica micro-glass fibers with a water resistant binder in a rigid box design with rolled edge corrugated aluminum cell sides. Filter provides mechanical filtration.

Media shall consist of dual density construction or progressively density media matrix. The filter frame cell sides shall be constructed of minimum 24 gauge galvanized steel or corrosion resistant metal. Each corner of the cell side shall be mechanically interlocked, to improve stability and rigidity of the finished filter. A support grid on the downstream side of the filter shall maintain filter integrity and media support. Assembled filter shall be structurally stable to prevent racking. Filters shall be available in single or double header configurations. The media shall be continuously bonded to the support grid, stabilizers and cell sides to prevent leaks.

Filter packs shall be secured to the frame by adhesive and sealant to create a positive bond to the pleat support system. The media is backed on the downstream side by a high strength spun bonded material which provides durability. Media and binders are non-shedding and water-resistant.

Pleating across face area shall be consistent across filter, maintained and supported by corrugated aluminum cell separators throughout the life of the filter. Filter shall be available in a single header, dual header or no header designs. Header shall be approximately 3/16 inch to 1-1/8 inch deep and mechanically attached or integral to filter cell sides. Media must retain its pleated shape and spacing during normal commercial service usage.

Filter sizes shall be available in 12-inch and 6-inch depth designs and variety of widths and heights for most commercial air filtration systems. All filter frames shall be marked with the manufacturer name/trademark, filter model number, nominal size, and filter type.

The entire filter shall meet minimum standards of the Underwriters' Laboratories Standard UL 900 for a Class 1 rating as to flammability.

2. PERFORMANCE

When tested in accordance with ASHRAE-52.2-2007 standard, filters shall be in compliance with the following:

<u>STYLE 1 - MINIMUM MERV 14</u>	
NOMINAL FILTER SIZE (INCHES)	24X24X12 deep
MINIMUM SURFACE AREA (SQUARE FEET)	125
AIR FLOW CAPACITY (CFM)	2000
FILTER FACE VELOCITY (FPM)	500
INITIAL RESISTANCE (INCHES W.G.) (MAXIMUM)	0.62
RATED FINAL RESISTANCE (INCHES W.G.) (MIN)	1.2
MINIMUM MERV RATING PER ASHRAE 52.2-2007	14

F. SIZES

The actual filter dimensions shall not be less than five-eighths of an inch undersize in length or in width from the nominal size. Filters shall not be less than 7/8 inch in thickness for a 1 inch nominal deep filter. Filters shall not be less than 1-3/4 inch for 2 inch and 3-3/4 inch for 4 inch nominal depth filters. Filter nominal sizes shall be the industry standard sizes of the holding frame.

Filters constructed to custom sizes are required to provide identical construction and performance to the standard size filters as manufactured at the factory in compliance to the published product literature and the standard specifications.

G. MARKINGS

Each filter shall bear a label or marking indicating manufacturer's name or product trade name, filter series designation, nominal filter size, MERV rating and third party Listed flammability category. Pad, link and bag filters without frames require markings on filter packaging. All filters are required to have unique part designations for ordering and pricing.

IV. WARRANTY

Bidder shall be responsible for the administration of all warranty claims, including serving as the point of contact for all matters concerning the same. Warranty shall start on date of acceptance of the delivered products by the end user.

Construction and Use Guarantee: Filters furnished under this specification will be new, of good material and workmanship, and shall be replaced promptly any filter or component which by reason of defective material or workmanship shall fail under normal use, free of negligence or accident, during its useful life from date put into use. Guarantee shall include air bypass or leakage through the filter, blow-outs, and other deficiencies or defects. Such replacement shall be free of any charge to the owner.

Performance Guarantee: Filters supplied shall maintain the requested minimum efficiency and performance specifications indicated herein and in accordance with the ASHRAE Standard 52.2-2007 methods of evaluation throughout the time of the filter's service life. Filter service life or useful life shall include operation not to exceed the recommended final air pressure for a filter. Required filter performance is without exception to the contaminants or humidity of the air flow involved.

Filters constructed to custom face sizes are required to provide identical construction and performance to the standard face size filters as manufactured at the factory in compliance with the manufacturers product literature and the specifications covered herein.

All filters failing to meet the Construction, Use and Performance Guarantees shall be returned with full refund to the owner for all monies paid for the filters, cost of installation, cost of freight and any cost of testing.

Any filter offered for which there is concern that a filter construction and performance are not meeting the guarantees and specifications, including the ASHRAE MERV filtration efficiencies may result in the required submittal of filters to the requirements in the Section VI, for Acceptance Evaluation and Quality Assurance as indicated herein. All cost associated with the filter purchase, freight and testing shall be borne by the bidder.

V. SERVICE, PARTS, AND MANUALS

The contractor shall contact the major using agencies to assure that filters are performing satisfactorily every quarter. If requested by the state or a particular using agency, the contractor shall make site visits and offer advice on specific filtration problems related to this contract. Unsatisfactory user comments are to be provided in writing to the Purchase and Contract division's contract administrator within 30 days.

VI. ACCEPTANCE EVALUATION AND QUALITY ASSURANCE

A. ACCEPTANCE EVALUATION

The bidder shall provide the completed product questionnaires and supporting manufacturer's published product literature with specifications for all types of filters bid to this specification. A completed product questionnaire consists of two individual sections; part A for construction and part B for performance details to be accompanied by a certification signed by an officer (such as a Vice President) of the manufacturer (submitted brand name), not a distributor nor vendor. Failure to submit the completed questionnaires and published literature and may reject a filter series offered.

The manufacturer's published literature should indicate the product designation or series, MERV rating, the initial air flow resistance, and the recommended final air flow resistance for the representative filter face size, depth and airflow as specified. The manufacturer's published specifications for the representative filter should apply to all the filters within that series. The filter information provided shall be representative of a complete filter of the manufacturer's current production including integral frame and integral media support, not media only.

B. QUALITY ASSURANCE

The state reserves the right to have the bidder submit any filter to an independent third party laboratory selected by the state to provide a full ASHRAE 52.2 test report for a sample filter for which there is a concern that a filter's construction or performance are not meeting the guarantees and specifications indicated herein during the life of the contract. The sample filter to be tested may be sourced from the customer's inventory of delivered filters or sourced from a distributor or vendor from current supply. All cost associated with the filter purchase, freight and testing shall be borne by the bidder.

The full ASHRAE 52.2 test report shall include the complete twelve (12) particle loading applications over the standard six (6) sets of particle size removal efficiency (PSE) curves for a complete filter. The accurate filtration efficiency curves shall not indicate a reduction in performance by a single MERV number for the initial or any of the supplemental PSE curves. Failure of a filter to provide the specified minimum MERV particle efficiency number on the initial or any supplemental loading curves will indicate non-compliance with the filter specifications stated herein.

The ASHRAE 52.2 test reports obtained from the independent third party test laboratory shall include, but are not limited to, the following data:

1. Identification and description of the complete air filter tested
2. Manufacturer's operating data
3. Test air flow rate and the manufacturer's rated air flow
4. Initial resistance or pressure drop at 100% rated air flow
5. Final resistance or pressure drop at 100% rated air flow
6. MERV efficiency number based upon a mandatory full ASHRAE 52.2 test report
7. How the test laboratory acquired sample filter for testing
8. Identification of test laboratory
9. Date(s) of testing and certification by the appropriate signatures
10. Performance curves including filtration efficiency versus particle sizes
11. Measurement of the gross effective filter media area.

Any contractor filter failing to provide filters that meet the Construction, Use and Performance Guarantees shall take back all filters, and refund the owner all monies paid for the filters, cost of installation, cost of freight and any cost of testing.

C. SAMPLES

Sample filters shall be furnished by the manufacturer as required or requested at the cost of the bidder.

VII. DELIVERY AND PAYMENT

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

VIII. ORDERING DATA (FOR PURCHASE & CONTRACT USE ONLY)

Purchasers should exercise any desired option offered herein and should specify the following in the requisition and invitation for bids.

1. Title, number, and date of this specification.
2. Types, styles, and MERV ratings grades of filters (See I. Classification).
3. Filter face size, depth of media and number of pockets for the bag type.
4. Specific header sizes required for type IV filters. (See III.D.1 Description).

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