

### **3.6.3 Workmanship**

**3.6.3.1 Safety.** Filters shall be free from burrs and sharp edges that might injure personnel, damage filter media, or damage Mission Oriented Protective Posture (MOPP) IV gloves during handling.

**3.6.3.2 Finish.** The filters shall be free from foreign matter (dirt, oil, or viscous materials).

**3.6.3.3 Appearance.** The filter units shall be free from cracked, bent, or dented metal sections, and abraded gaskets.

## **4. VERIFICATION**

**4.1 Classification of inspections.** The inspection requirements specified herein are classified as follows:

- (a) First article inspection (see 4.2)
- (b) Conformance inspection (see 4.3)

### **4.2 First article inspection.**

**4.2.1 Sample.** The first article (FA) sample shall consist of 20 filter sets that are of the type specified in the contract. The FA sample shall be produced using the same methods, materials, equipment, and processes as will be used during regular production.

**4.2.2 Inspections to be performed.** Unless otherwise specified by the terms of the contract, the sample first article items shall be subjected to all of the examinations and tests specified in this specification. Verification of requirements shall be by visual inspection, commercial inspection equipment, demonstration, test data, or by Certificate of Compliance (COC) with supporting evidence or analysis. The Government reserves the right to accept or reject each COC with supporting evidence or analysis.

**4.2.2.1 For examination.** Sample filters shall first be examined for interface and other characteristics in Table I and Figure 1 that may be verified by visual inspection, commercial inspection equipment or simple demonstrations.

#### **4.2.2.2 For test.**

##### **4.2.2.2.1 Carbon testing.**

**4.2.2.2.1.1 Samples for moisture testing.** A sample of adsorbent shall be taken during the filling of the 1<sup>st</sup>, 10<sup>th</sup>, and 20<sup>th</sup> filter. Each carbon sample taken during the filling of those 3 filters shall weigh at least 100 grams (0.22 pounds). Each sample shall be placed in an open container whose diameter is such that the depth of the carbon will be  $3.81 \pm 1.27$  cm ( $1.5 \pm 0.5$ ) inches deep. Those samples of carbon shall be exposed to the same conditions of temperature and humidity as

their associated filters and be used for subsequent moisture testing. Concurrent with or immediately following the packaging of the filters corresponding to each carbon sample, each of 3 carbon samples shall be tested for moisture content in accordance with 4.3.6.10. If any carbon sample fails to meet the moisture requirement in 3.6.1, the first article lot of filters represented by the samples shall be rejected.

**4.2.2.2.1.2 Samples for CK gas life testing.** A sample of adsorbent shall be taken during the filling of each of 8 first article filters, placed in an open container, and exposed to the same conditions of temperature and humidity as its associated filter. Each adsorbent sample taken during the filling of those filters shall weigh at least 100 grams (0.22 pounds). The 8 samples shall then be sealed in their containers and sent to the Government for subsequent CK life testing. The Government will determine the minimum CK gas life in accordance with 4.3.6.4 and EA-DTL-1704. If any sample fails to meet the requirements for CK life in EA-DTL-1704, the first article lot represented shall be rejected.

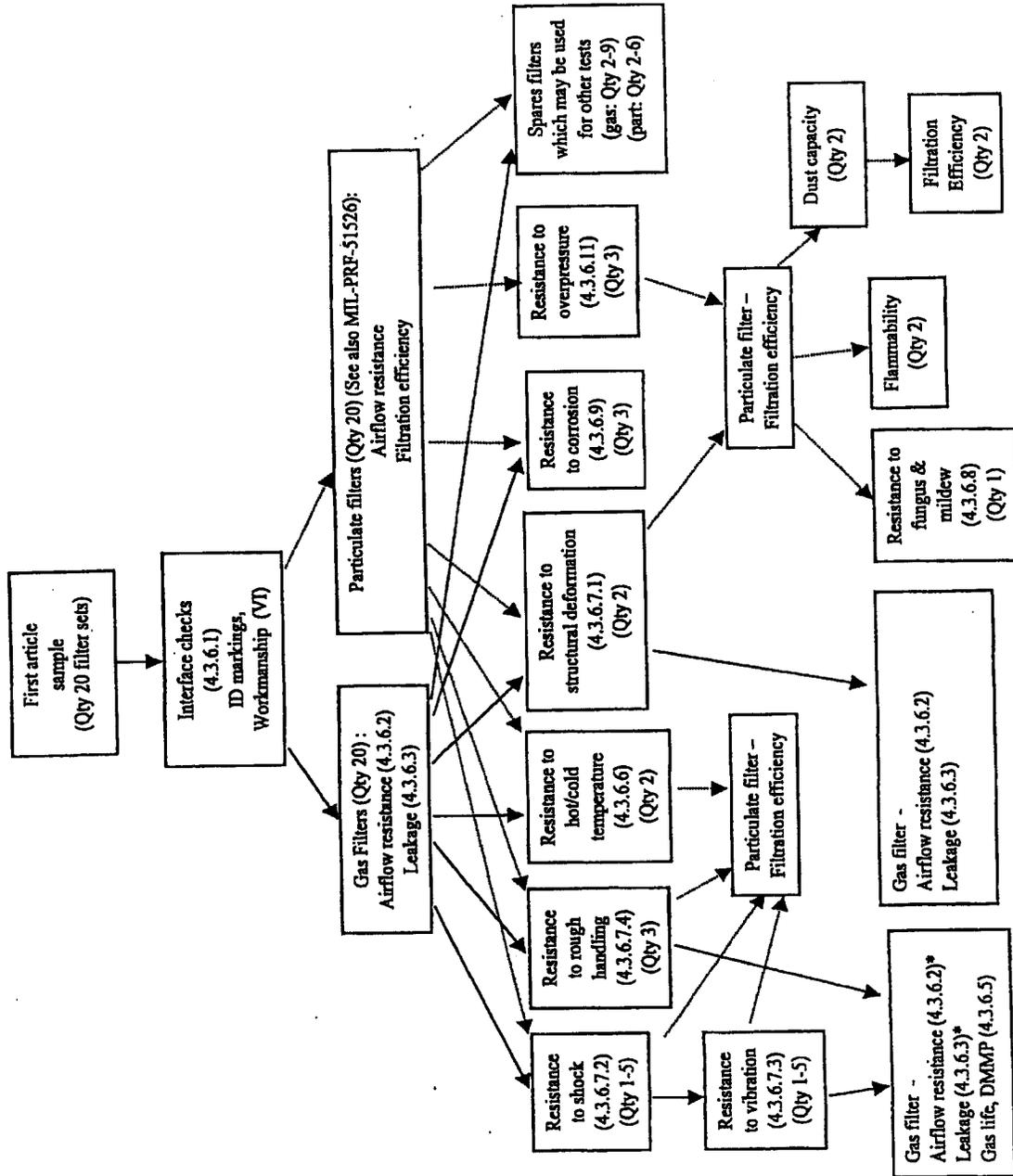
**4.2.2.2.2 Filter testing.** First article samples shall be tested in accordance with Table I and Figure 2. Following interface checks, airflow resistance, leakage testing of sample filters, moisture content testing of adsorbent material, and airflow resistance and filtration efficiency testing of particulate filters, sample filters shall be packaged using the same methods, materials, equipment, and processes as will be used during regular production. Packaged filter sets shall then be forwarded to the Government for environmental tests as depicted in Figure 2.

**4.2.3 Acceptance criteria.** If any first article sample item fails to comply with any of the applicable requirements, the first article sample shall be rejected.

**TABLE I. First Article Tests and Inspection**

Test Description	Requirement Paragraph	Verification Paragraph
Materials	3.1	Certificate of Compliance
Interface requirements	3.3	
Compatibility with filter housing	3.3.1	4.3.6.1
Interchangeability	3.3.2	4.3.6.1
Weight	3.3.3	4.3.6.1
Operating requirements	3.4	
Airflow resistance	3.4.1	4.3.6.2
Leakage	3.4.2	4.3.6.3
Gas life, CK	3.4.3	4.3.6.4
Gas life, DMMP	3.4.4	4.3.6.5
Environmental requirements	3.5	
Resistance to hot/cold temperature	3.5.1	4.3.6.6
Structural integrity	3.5.2	4.3.6.7
Resistance to structural deformation	3.5.2.1	4.3.6.7.1
Resistance to shock	3.5.2.2	4.3.6.7.2
Resistance to vibration	3.5.2.3	4.3.6.7.3
Resistance to rough handling	3.5.2.4	4.3.6.7.4
Resistance to fungus and mildew	3.5.3	4.3.6.8
Resistance to corrosion	3.5.4	4.3.6.9
Resistance to overpressure*	3.5.5	MIL-PRF-51526
Dust capacity*	3.5.6	MIL-PRF-51526
Flammability*	3.5.7	MIL-PRF-51526
Ownership and support	3.6	
Moisture content	3.6.1	4.3.6.10
Identification markings	3.6.2	VI
Workmanship	3.6.3	
Safety	3.6.3.1	VI & demo
Finish	3.6.3.2	VI
Appearance	3.6.3.3	VI

\* Applicable to particulate filter only



\*Optional: also test between shock & vibration

FIGURE 2. First Article Inspection and Test Sequence, Type I and II

### 4.3 Conformance inspection.

**4.3.1 Lotting.** A lot shall consist of a series of filter sets whose separate gas and particulate filters are each produced by one manufacturer, at one plant, from the same materials, under the same manufacturing and process conditions and without a break in production of more than 10 calendar days. The gas and particulate filters in a given lot of filter sets need not be produced from the same manufacturer. Any one lot of gas filters shall contain no more than one lot of adsorbent media. Each lot shall be identified by an alphanumeric lot number. The lot number shall include a manufacturer's identification symbol consisting of 3 alpha characters, a numeric code identifying the year of production, a code or abbreviation that signifies the month of production, and an interfix—serial number. The interfix—serial number shall change if there is a change in the design, manufacturing process, materials, suppliers, production run, or if a new contract is used.

**4.3.2 Sampling.** Inspection and test of random samples shall be conducted in accordance with the classification of characteristics in 4.3.5, and when specified in Table II.

**4.3.3 Inspection procedure.** Every item in the lot shall be inspected for critical characteristics. Sample filters shall be examined and tested in accordance with the classification of characteristics in 4.3.5. If a filter is found that does not conform to any characteristic inspected 100%, such as leakage and pressure drop requirements, the non-conforming filter shall be rejected and removed from the lot. For characteristics other than leakage and pressure drop, failure of any sample filter to conform to any characteristic in the classification of characteristics based on the sampling and acceptance criteria specified therein shall be cause for rejection of the lot represented (see footnote, Table II).

#### 4.3.3.1 Carbon testing.

**4.3.3.1.1 Samples for moisture testing.** A sample of adsorbent shall be taken during the filling of the first and last filter manufactured each day. Each carbon sample taken during the filling of those 2 filters shall weigh at least 100 grams. Each sample shall be placed in an open container whose diameter is such that the depth of the carbon will be  $3.81 \pm 1.27$  cm ( $1.5 \pm 0.5$ ) inches deep. Those samples of carbon shall be exposed to the same conditions of temperature and humidity as their associated filters and be used for subsequent moisture testing. Concurrent with or immediately following the packaging of the filters corresponding to each carbon sample, each carbon sample shall be tested for moisture content in accordance with 4.3.6.10. If any carbon samples fails to meet the moisture requirement in 3.6.1, the production run of filters fabricated that day shall be rejected.

**4.3.3.1.2 Samples for CK life testing.** For each lot, 8 samples of adsorbent, each sample weighing at least 100 grams, shall be taken at random times during the filling of 8 respective filters and placed in an open container. Those samples shall be exposed to the same conditions of temperature and humidity as their associated filters. The 8 samples shall then be sealed in their

containers and sent to the Government for subsequent CK life testing. The Government will determine the minimum CK life in accordance with 4.3.6.4 (EA-DTL-1704).

**4.3.3.1.3 Filter testing.** Each gas filter shall be tested in accordance with tests listed in Classification of Characteristics table in 4.3.5. Any filter samples forwarded to the Government for testing shall be packaged such they will be protected from moisture in the air. Each gas filter shall be tested for airflow resistance (4.3.6.2) and leakage (4.3.6.3). Following leakage and airflow resistance testing, sample filters shall be packaged using the same methods, materials, equipment, and processes as will be used during regular production. After sample gas filters are tested for moisture content in accordance with 4.3.6.10, initial airflow resistance (4.3.6.2), leakage (4.3.6.3), and after sample particulate filters are tested for filtration efficiency in accordance with MIL-PRF-51526, the packaged filter sets shall then be forwarded to the Government for additional tests as depicted in Figure 2.

**4.3.4 Inspection characteristics.** Critical characteristics are those whose nonconformance to specified requirements is likely to result in hazardous or unsafe conditions for individuals using, maintaining, or depending upon the product, characteristics whose nonconformance to specified requirements is likely to prevent performance of the tactical function of a major end item. Major characteristics are those whose nonconformance to specified requirements is likely to result in failure or to reduce materially the usability of the item for its intended purpose. Minor characteristics are those whose nonconformance to specified requirements is not likely to reduce materially the operation or usability of the item for its intended purpose.

**4.3.5 Classification of characteristics.** Conformance examinations and tests shall be as specified in Table III. When specified herein, accept on "0" and reject on "1" attributes sampling inspection shall be performed on the designated characteristics using the stated levels in Table II for selection of sample sizes.

TABLE II. Sampling

Lot size	Inspection levels and sample sizes										
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI
2 to 8	*	*	*	*	*	*	*	*	5	3	2
9 to 15	*	*	*	*	*	*	13	8	5	3	2
16 to 25	*	*	*	*	*	20	13	8	5	3	3
26 to 50	*	*	*	*	32	20	13	8	5	5	5
51 to 90	*	*	*	50	32	20	13	8	7	6	5
91 to 150	*	*	125	50	32	20	13	12	11	7	6
151 to 280	*	*	125	50	32	20	20	19	13	10	7
281 to 500	*	315	125	50	48	47	29	21	16	11	9
501 to 1200	*	315	125	75	73	47	34	27	19	15	11
1201 to 3200	1250	315	125	116	73	53	42	35	23	18	13
3201 to 10000	1250	315	192	116	86	68	50	38	29	22	15
10001 to 35000	1250	315	294	135	108	77	60	46	35	29	15
35001 to 150000	1250	490	294	170	123	96	74	56	40	29	15
150001 to 500000	1250	715	345	200	156	119	90	64	40	29	15
500001 and over	1250	715	435	244	189	143	102	64	40	29	15

\*Indicates one hundred percent inspection. If sample size exceeds lot size, perform one hundred percent inspection.  
 Accept the lot represented on zero nonconforming characteristics and reject the lot represented on one or more nonconforming characteristics for all inspection levels.