Where service life of apparatus is—	Where percent relative humidity of inspired air is—	Maximum permissible temperature of inspired air shall not exceed—	
		°F.	°C.
4 hours	0–50	105	41
	50–100	[1] 95	[1] 35

[1] Where percent relative humidity is 50–100 and apparatus is designed for escape only, these maximum permissible temperatures will be increased by 5°C (10°F).

§ 84.104 Gas tightness test; minimum requirements.

(a) Each apparatus will be tested for tightness by persons wearing it in an atmosphere of 1,000 p.p.m. isoamyl acetate.

(b) Six persons will each wear the apparatus in the test concentrations specified in paragraph (a) of this section for 2 minutes and none shall detect the odor or taste of the test vapor.

TABLES TO SUBPART H OF PART 84

TABLE 1—DURATION AND SEQUENCE OF SPECIFIC ACTIVITIES FOR TEST 1, IN MINUTES

[42 CFR part 84, subpart H]

Activity	Service time—							
	3 minutes	5 minutes	10 minutes	15 minutes	30 minutes	45 minutes	1 hour	2, 3, and 4 hours
Sampling and readings	.....	.....	.....	2	2	2	2	Perform 1 hour test 2, 3, or 4 times respectively.
Walks at 4.8 km. (3 miles) per hour.	3	5	3	4	8	12	18	
Sampling and readings	.....	.....	2	2	2	2	2	
Walks at 4.8 km. (3 miles) per hour.	.....	.....	3	5	8	12	18	
Sampling and readings	.....	.....	2	2	2	2	2	
Walks at 4.8 km. (3 miles) per hour.	.....	.....	.....	.....	6	13	16	
Sampling and readings	.....	.....	.....	.....	2	2	2	

TABLE 2—DURATION AND SEQUENCE OF SPECIFIC ACTIVITIES FOR TEST 2, IN MINUTES

[42 CFR part 84, subpart H]

Activity	Service time—							
	3 minutes	5 minutes	10 minutes	15 minutes	30 minutes	45 minutes	1 hour	2, 3 and 4 hours [1]
Sampling and readings	.....	.....	.....	2	2	2	2	2
Walks at 4.8 km. (3 miles) per hour	.....	.....	1	1	3	4	6	10.
Carries 23 kg. (50 pound) weight over overcast	.....	.....	1 time in 2 minutes	1 time in 2 minutes	2 times in 4 minutes	3 times in 6 minutes	4 times in 8 minutes	5 times in 10 minutes.
Walks at 4.8 km. (3 miles) per hour	.....	.....	.....	1	3	3	3	5.
Climbs vertical treadmill [2] (or equivalent)	1	1	1	1	1	1	1	1.
Walks at 4.8 km. (3 miles) per hour	.....	1	1	.....	.....	2	3	5
Climbs vertical treadmill (or equivalent)	.....	1	.....	.....	.....	1	1	1.
Sampling and readings	.....	.....	.....	.....	2	2	2	2.
Walks at 4.8 km. (3 miles) per hour	.....	.....	.....	2	2	3	5	11.
Climbs vertical treadmill (or equivalent)	.....	.....	.....	1	1	1	1	1.

TABLE 2—DURATION AND SEQUENCE OF SPECIFIC ACTIVITIES FOR TEST 2, IN MINUTES—Continued

[42 CFR part 84, subpart H]

Activity	Service time—							
	3 minutes	5 minutes	10 minutes	15 minutes	30 minutes	45 minutes	1 hour	2, 3 and 4 hours [1]
Carries 23 kg. (50 pound) weight over overcast	.....	.....	.....	1 time in 2 minutes	3 times in 6 minutes	4 times in 8 minutes	5 times in 10 minutes	5 times in 10 minutes.
Sampling and readings	.....	.....	2	.....	.....	2	2	2.
Walks at 4.8 km. (3 miles) per hour	.....	.....	.....	1	3	3	3	.....
Climbs vertical treadmill (or equivalent)	.....	.....	1	1	1	1	1	Then repeat above activities once.
Walks at 4.8 km. (3 miles) per hour	.....	.....	2	.....	.....	2	3	
Climbs vertical treadmill (or equivalent)	.....	.....	.....	.....	.....	1	1	.....
Carries 20 kg. (45 pound) weight and walks at 4.8 km. (3 miles) per hour	1	.....	.....	.....	.....	.....	2	.....
Walks at 4.8 km. (3 miles) per hour	1	2	.....	.....	.....	1	4	.....
Sampling and readings	.....	.....	.....	2	2	2	2	.....

[1] Total test time for Test 2 for 2-hour, 3-hour, and 4-hour apparatus is 2 hours.
[2] Treadmill shall be inclined 15° from vertical and operated at a speed of 1 foot per second.

TABLE 3—DURATION AND SEQUENCE OF SPECIFIC ACTIVITIES FOR TEST 3, IN MINUTES

[42 CFR part 84, subpart H]

Activity	Service time—							
	3 minutes	5 minutes	10 minutes	15 minutes	30 minutes	45 minutes	1 hour	2, 3 and 4 hours [1]
Sampling and readings	.....	.....	.....	2	2	2	2	([2])
Walks at 4.8 km. (3 miles) per hour	.....	.....	1	1	2	2	3	.....
Runs at 9.7 km. (6 miles) per hour	1	1	1	1	1	1	1	.....
Pulls 20 kg. (45 pound) weight to 5 feet	.....	15 times in 1 minute	.....	30 times in 2 minutes	30 times in 2 minutes	30 times in 2 minutes	60 times in 6 minutes	.....
Lies on side	1/2	1	1	2	3	4	5	.....
Lies on back	1/2	1	1	2	2	3	3	.....
Crawls on hands and knees	1	1	1	2	2	2	2	.....
Sampling and readings	.....	.....	2	.....	2	2	2	.....
Runs at 9.7 km. (6 miles) per hour	.....	.....	.....	1	1	1	1	.....
Walks at 4.8 km. (3 miles) per hour	.....	.....	.....	.....	2	8	10	.....
Pulls 20 kg. (45 pound) weight to 5 feet	.....	.....	30 times in 2 minutes	.....	60 times in 6 minutes	60 times in 6 minutes	60 times in 6 minutes	.....
Sampling and readings	.....	.....	.....	2	.....	2	2	.....
Walks at 4.8 km. (3 miles) per hour	.....	.....	1	.....	3	4	10	.....
Lies on side	.....	.....	.....	.....	.....	2	4	.....
Lies on back	.....	.....	.....	.....	.....	2	1	.....
Sampling and readings	.....	.....	.....	.....	2	2	2	.....

[1] Total test time for Test 3 for 2-hour, 3-hour, and 4-hour apparatus is 2 hours.
[2] Perform test No. 3 for 1 hr. apparatus; then perform test No. 1 for 1 hour apparatus.

TABLE 4—DURATION AND SEQUENCE OF SPECIFIC ACTIVITIES FOR TEST 4, IN MINUTES

[42 CFR part 84, subpart H]

Activity	Service time—									
	3 minutes	5 minutes	10 minutes	15 minutes	30 minutes	45 minutes	1 hour	2 hours	3 hours	4 hours
Sampling and readings	.....	.....	.....	2	2	2	2	(2)	(3)	(4)
Walks at 4.8 km. (3 miles) per hour	.....	.....	.....	1	2	2	2	.....	.....	.....
Climbs vertical treadmill[1] (or equivalent)	1	1	1	1	1	1	1	.....	.....	.....
Walks at 4.8 km. (3 miles) per hour	.....	1	1	1	2	2	2	.....	.....	.....
Pulls 20 kg. (45 pound) weight to 5 feet	.....	30 times in 2 minutes	30 times in 2 minutes	30 times in 2 minutes	60 times in 5 minutes	60 times in 5 minutes	60 times in 5 minutes	.....	.....	.....
Walks at 4.8 km. (3 miles) per hour	.....	.....	1	1	1	2	3	.....	.....	.....
Carries 23 kg. (50 pound) weight over overcast	.....	.....	.....	1 time in 1 minute	1 time in 1 minute	2 times in 3 minutes	4 times in 8 minutes	.....	.....	.....
Sampling and readings	.....	.....	2	.....	2	2	2	.....	.....	.....
Walks at 4.8 km. (3 miles) per hour	.....	.....	.....	1	3	3	4	.....	.....	.....
Runs at 9.7 km. (6 miles) per hour	.....	1	1	1	1	1	1	.....	.....	.....
Carries 23 kg. (50 pound) weight over overcast	.....	.....	1 time in 1 minute	1 time in 1 minute	2 times in 3 minutes	4 times in 6 minutes	6 times in 9 minutes	.....	.....	.....
Pulls 20 kg (45 pound) weight to 5 feet	15 times in 1 minute	.....	.....	15 times in 1 minute	60 times in 5 minutes	30 times in 2 minutes	36 times in 3 minutes	.....	.....	.....
Sampling and readings	.....	.....	.....	2	2	2	2	.....	.....	.....
Walks at 4.8 km. (3 miles) per hour	1	.....	1	.....	.....	2	6	.....	.....	
Pulls 20 kg. (45 pound) weight to 5 feet	.....	.....	.....	.....	.....	60 times in 5 minutes	60 times in 5 minutes	.....	.....	.....
Carries 20 kg. (45 pound) weight and walks at 4.8 km. (3 miles) per hour	.....	.....	.....	.....	.....	3	3	.....	.....	.....
Sampling and readings	.....	.....	.....	.....	.....	2	2	.....	.....	.....

[1] Treadmill shall be inclined 15° from vertical and operated at a speed of 30 cm. (1 foot) per second.

[2] Perform test No. 1 for 30-minute apparatus; then perform test No. 4 for 1-hour apparatus; then perform test No. 1 for 30-minute apparatus.

[3] Perform test No. 1 for 1-hour apparatus; then perform test No. 4 for 1-hour apparatus; then perform test No. 1 for 1-hour apparatus.

[4] Perform test No. 1 for 1-hour apparatus; then perform test No. 4 for 1-hour apparatus; then perform test No. 1 for 1-hour apparatus twice (i.e., two one-hour tests).

Subpart I—Gas Masks

§ 84.110 Gas masks; description.

(a) Gas masks including all completely assembled air purifying masks designed for use as respiratory protection during entry into atmospheres not immediately dangerous to life or health or escape only from hazardous atmospheres containing adequate oxygen to support life are described as follows:

(1) *Front-mounted or back-mounted gas mask.* A gas mask which consists of a full facepiece, a breathing tube, a canister at the front or back, a canister harness, and associated connections.

(2) *Chin-style gas mask.* A gas mask which consists of a full facepiece, a canister which is usually attached to the facepiece, and associated connections.

(3) *Escape gas mask.* A gas mask designed for use during escape only from hazardous atmospheres which consists of a facepiece or mouthpiece, a canister, and associated connections.

(b) Gas masks shall be further described according to the types of gases or vapors against which they are designed to provide respiratory protection, as follows:

Type of front-mounted or back-mounted gas mask:
- Acid gas [1 2 3]
- Ammonia
- Carbon monoxide
- Organic Vapor [1 2 3]
- Other gas(es) and vapor(s) [1 2 3]
- Combination of two or more of the above gases and vapors.[1 2 3]
- Combination of acid gas, ammonia, carbon monoxide, and organic vapors.[1 2 3]

Type of chin-style gas mask:
- Acid gas [1 2 3]
- Ammonia
- Carbon monoxide
- Organic vapor [1 2 3]
- Other gas(es) and vapor [1 2 3]
- Combination of two or more of the above gases and vapors.[1 2 3]

Type of escape gas mask:
- Acid gas [1 2 3 4]
- Ammonia [4]
- Carbon monoxide
- Organic vapor [1 2 3 4]
- Other gas(s) and vapor(s) [1 2 3 4]
- Combination of two or more of the above gases and vapors. [1 2 3 4]

[1] Approval may be for acid gases or organic vapors as a class or for specific acid gases or organic vapors.

[2] Not for use against gases or vapors with poor warning properties (except where MSHA or Occupational Safety and Health Administration standards permit such use for a specific gas or vapor), or those which generate high heats or reaction with sorbent materials in the canister.

[3] Use of the gas mask may be limited by factors such as lower explosive limit, toxicological effects, and facepiece fit. Limitations on gas mask service life and sorbent capacity limitations shall be specified by the applicant in instructions for selection, use and maintenance of the gas mask.

[4] Eye protection may be required in certain concentrations of gases and vapors.

(c) Gas masks for respiratory protection against gases and vapors other than those specified in paragraph (b) of this section, may be approved upon submittal of an application in writing for approval to the Certification and Quality Assurance Branch listing the gas or vapor and suggested maximum use concentration for the specific type of gas mask. The Institute will consider the application and accept or reject it on the basis of effect on the wearer's health and safety and any field experience in use of gas masks for such exposures. If the application is accepted, the Institute will test such masks in accordance with the requirements of this subpart.

§ 84.111 Gas masks; required components.

(a) Each gas mask described in § 84.110 shall, where its design requires, contain the following component parts:

(1) Facepiece or mouthpiece and noseclip;

(2) Canister or cartridge;

(3) Canister harness;

(4) External check valve; and

(5) Breathing tube.

(b) The components of each gas mask shall meet the minimum construction requirements set forth in subpart G of this part.

§ 84.112 Canisters and cartridges in parallel; resistance requirements.

Where two or more canisters or cartridges are used in parallel, their resistance to airflow shall be essentially equal.