

§ 22.3 [Reserved]

§ 22.4 Applications.

Before MSHA will undertake the active investigation leading to approval of any methane detector, the manufacturer shall make application by letter for an investigation leading to approval of his detector. This application, in duplicate, accompanied by a check, bank draft, or money order, payable to the U.S. Mine Safety and Health Administration, to cover all the necessary fees, shall be sent to Approval and Certification Center, RR 1, Box 251, Industrial Park Road, Triadelphia, WV 26059, together with the required drawings, one complete detector, and instructions for its operation.

[Supp. 1, 20 FR 2575, Apr. 19, 1955, as amended at 43 FR 12315, Mar. 24, 1978; 60 FR 35694, July 11, 1995]

§ 22.5 Conditions governing investigations.

(a) One complete detector, with assembly and detail drawings that show the construction of the device and the materials of which it is made, should be forwarded prepaid to Approval and Certification Center, RR 1, Box 251, Industrial Park Road, Triadelphia, WV 26059, at the time the application for tests is made.

(b) When this has been inspected by MSHA, the applicant will be notified as to the amount of material that will be required for the tests. The manufacturer will be notified of the date on which the tests will be started and will be given an opportunity to witness the tests.

(c) *Observers at formal investigations and demonstrations.* No one shall be present during any part of the formal investigation conducted by MSHA which leads to approval for permissibility except the necessary Government personnel, representatives of the applicant, and such other persons as may be mutually agreed upon by the applicant and MSHA. Upon granting approval for permissibility, MSHA will announce that such approval has been granted to the device and may thereafter conduct, from time to time in its discretion, public demonstrations of the tests conducted on the approved device. Those who attend any part of the

investigation, or any public demonstration, shall be present solely as observers; the conduct of the investigation and of any public demonstration shall be controlled by MSHA. Results of chemical analyses of material and all information contained in the drawings, specifications, and instructions shall be deemed confidential and their disclosure will be appropriately safeguarded by MSHA.

[Sched. 8C, Oct. 31, 1935, as amended by Supp. 1, 20 FR 2575, Apr. 19, 1955; 43 FR 12315, Mar. 24, 1978; 60 FR 35694, July 11, 1995]

§ 22.6 General requirements.

Methane detectors approved under this part shall be portable. They shall be durable in construction, practical in operation, and suitable for service conditions underground. They shall offer no probable explosion hazard if used in gaseous mine atmospheres nor any bodily hazard, such as spilling of battery electrolyte. They shall exhibit under laboratory test conditions various requirements of minimum performance that are specified in this part.

§ 22.7 Specific requirements.

(a) *Design.* In the determination of adequacy of design, the following points will be considered: (1) Materials used, (2) construction, (3) accuracy, (4) size and shape, (5) range of detection (or indication), (6) life of the active parts, and (7) attention required. The suitability of the materials and the construction shall be determined by preliminary inspection, by dropping tests, by laboratory and field tests in gas and air mixtures, and by the general behavior of the equipment during the investigation.

(b) *Safety against explosion hazard—(1) Detectors.* Detectors shall be constructed so that they will not cause external ignitions when used in gaseous mine atmospheres.

(2) *Seals or locks.* All parts through which external ignitions might result shall be covered and protected adequately. All covers shall be sealed adequately or equipped with magnetic or other equally reliable locks to prevent their being opened by unauthorized persons.

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(3) *Glasses.* Glasses or glass windows shall be of good-quality glass and protected adequately against breakage. Unguarded windows may be considered adequate in this respect, provided they are of small diameter and are of reasonably thick glass.

(4) *Battery.* If the detector is equipped with a battery, it shall be of such design that it will not produce sparks that will ignite an explosive mixture of methane and air.

(5) *Detectors of the flame type.* Methane detectors of the flame type shall be subject to the requirements of the flame-lamp schedule then in force.

(c) *Safety against bodily hazard.* Bodily hazard with battery-type detectors is due chiefly to possible burning of the user by electrolyte that has spilled from the battery. MSHA, therefore, requires that:

(1) *Spilling of electrolyte.* The battery shall be so designed and constructed that when properly filled it will not spill electrolyte under actual service conditions.

(2) *Corrosion of battery container.* The material of which the container is made shall resist corrosion under conditions of use.

(d) *Performance.* In addition to the general design and safety features, MSHA considers that permissible types of methane detectors should meet certain minimum requirements with respect to their performance, as follows:

(1) *Detectors.* (i) When the detector is operated according to the manufacturer's instructions, it shall be possible to detect at least 1 percent methane in air, and increasing percentages up to 5 percent shall be shown by continuously increasing evidence.

(ii) The average number of determinations that may be made in approximately 2-percent methane mixtures without recharging a battery or replacing a chemical accessory shall not be less than 25, and the average number of such determinations that may be made without replacing any other part shall be not less than 100.

(2) *Indicating detectors.* Indicating detectors shall give indications of as low as 0.25 percent methane. Detectors having an upper scale limit of 2 percent may be approved, but it is recommended that the detector be de-

signed to give indications of as high as 4 percent methane. The indications for these percentages shall be within the limits of error specified in the following table:

ALLOWABLE VARIATIONS IN SCALE READING
[In percent]

Methane in mixtures	Minimum indication	Maximum indication
0.25	0.10	0.40
.50	.35	.65
1.00	.80	1.20
2.00	1.80	2.20
3.00	2.70	3.30
4.00	3.70	4.30

(i) Tests shall be made at several percentages within the range of the indicating detector and at temperatures between the limits of 50° and 70 °F. by increments of 5°. Ten determinations shall be made at each percentage. Neither the average of the 10 readings nor more than 2 readings for each percentage shall exceed the limits of error given in the table.

(ii) The average number of determinations that may be made with an indicating detector without replacement of any part shall be not less than 30, and the average number that may be made without recharging the battery shall be not less than 15.

(iii) The scale shall not be subdivided into smaller divisions than the general accuracy of the indicating detector warrants.

(3) *Mechanical strength.* Detectors and indicating detectors shall be subjected to the following mechanical tests: Four of each of those parts or groups of assembled parts that are not normally strapped to the user shall be dropped 20 times on a wood floor from a height of 3 feet. Parts that are strapped to the user may be subjected to a jarring or bumping test to demonstrate adequate strength. The average number of times that any one of the detectors can be dropped before breakage or material distortion of essential parts shall be not less than 10.

(e) *Attachments for illumination.* If detectors are provided with attachments for illuminating purposes, such attachments shall be subject to the same requirements as those applying to that type of lamp under the lamp schedule then in force.