

§ 22.6

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.

(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

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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 designed 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: