

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.

(e) Permissibility tests will not be made unless the lamp has been completely developed and is in a form that can be marketed.

(f) The results of the tests shall be regarded as confidential by all present at the tests and shall not be made public in any way prior to the formal approval of the lamp by MSHA.

(g) No verbal report of approval or disapproval will be made to the applicant. After MSHA has considered the results of the tests, a formal report of the approval or disapproval will be made to the applicant in writing by Approval and Certification Center. The applicant shall not advertise the lamp as being permissible or as having passed the tests prior to receipt of formal notice of approval.

[Sched. 6D, 4 FR 4003, Sept. 21, 1939, as amended by Supp. 1, 20 FR 2718, Apr. 23, 1955; 43 FR 12314, Mar. 24, 1978; 60 FR 35693, July 11, 1996]

#### **§ 19.5 General requirements for approval.**

Electric cap lamps shall be complete units. They shall be durable in construction, practical in operation, and suitable for the conditions of underground service. They shall offer no probable explosion hazard if used in gassy or dusty mine atmospheres or bodily hazard from the spilling of the battery electrolyte. They shall exhibit, under laboratory test conditions, the various minimum performance requirements specified in this part.

#### **§ 19.6 Specific requirements for approval.**

(a) *Design.* In the determination of the adequacy of the lamp, with respect to design, the following points will be considered: (1) The materials used; (2) construction; (3) weight; (4) amount of light; (5) distribution of light; and (6) exclusion of dust from the headpiece. The suitability of the materials and the construction shall be determined by preliminary inspection, by dropping tests,<sup>1</sup> by durability tests of the cord and cord armor,<sup>2</sup> and by the general behavior of the lamp equipment during the investigation. The amount and distribution of the light shall be judged both by observation of the illumination on a white screen and by photometric measurements.

(b) *Angle of light beam.* MSHA recommends that the angle of the light beam be at least 130 degrees horizontally to insure that the contrast edge of the beam is away from the more sensitive sector of the wearer's vision; however, to allow for manufacturing and assembly tolerances and the use of multiple filament bulbs, MSHA will approve lamps giving a minimum beam angle of 120 degrees. If the bulb has more than one major filament, the one giving the smaller angle will be used in the determination.

(c) *Light distribution, visual.* Excepting special headpieces for inspection purposes, the area illuminated by the beam shall be free from sharp gradations in light intensity and spectral shadows.

(d) *Light distribution, photometric.* (1) Excepting special headpieces for inspection purposes, the maximum candlepower of the light beam shall not be greater than 25 times the average or mean candlepower of the beam.<sup>3</sup>

<sup>1</sup>Batteries are dropped 3 feet, at least 20 times onto an oak floor. Headpieces are dropped 6 feet, at least 20 times, onto concrete.

<sup>2</sup>Ten cords, assembled with the cord armor and outlet of the lamp with which it is to be used, are slatted at least 100,000 times through an arc of 50 degrees at approximately 90 slattings per minute.

<sup>3</sup>The minimum allowable angle of 120 degrees will be used in determining the mean candlepower of the beam.