www.msha.gov/compliance-and-enforcement/equipment-approval-certification. For information on the availability of this material at NARA, visit *www.archives.gov/federal-register/cfr/ibr-locations* or email *fr.inspection@nara.gov*. The material is available as follows:

(a) International Society of Automation (ISA), 67 T.W. Alexander Drive, P.O. Box 12277, Research Triangle Park, NC 27709; phone: (919) 549–8411; website: *www.isa.org*.

(1) ANSI/ISA 60079–11 (12.02.01)-2014, American National Standard for Explosive Atmospheres—Part 11: Equipment protection by intrinsic safety ''i'', Edition 6.2, Approved March 28, 2014; into § 18.101.

(2) ANSI/ISA 60079–25 (12.02.05)-2011, American National Standard for Explosive Atmospheres—Part 25: Intrinsically safe electrical systems, Approved December 2, 2011; into § 18.101.

(b) UL Solutions, Comm 2000, 151 Eastern Avenue, Bensenville, IL 60106; phone: (888) 853–3503; website: *www.ul.com*.

(1) UL 60079–0, Standard for Safety for Explosive Atmospheres—Part 0: Equipment—General Requirements, Seventh Edition, Dated March 26, 2019, including revisions through April 15, 2020 (ANSI/UL 60079–0); into § 18.101.

(2) UL 60079–1, Standard for Safety for Explosive Atmospheres—Part 1: Equipment Protection by Flameproof Enclosures ''d'', Seventh Edition, Dated September 18, 2015, including revisions through January 23, 2020 (ANSI/UL 60079–1); into § 18.101.

(3) UL 60079–11, Standard for Safety for Explosive Atmospheres—Part 11: Equipment Protection by Intrinsic Safety ''i'', Sixth Edition, Dated February 15, 2013, including revisions through September 14, 2018 (ANSI/UL 60079–11); into § 18.101.

(4) UL 60079–18, Standard for Safety for Explosive Atmospheres—Part 18: Equipment Protection by Encapsulation ''m'', Fourth Edition, Dated December 14, 2015, including revisions through February 7, 2019 (ANSI/UL 60079–18); into § 18.101.

(5) UL 60079–25, Standard for Safety for Explosive Atmospheres—Part 25: Intrinsically Safe Electrical Systems, Second Edition, Dated December 2, 2011, including revisions through June 12, 2020 (ANSI/UL 60079–25); into § 18.101.

(6) UL 60079–28, Standard for Safety for Explosive Atmospheres—Part 28: Protection of Equipment and Transmission Systems Using Optical Radiation, Second Edition, Dated September 15, 2017, including revisions through December 7, 2021 (ANSI/UL 60079–28); into § 18.101.

NOTE 1 TO § 18.102: The voluntary consensus standards listed in this section may also be obtained from the American National Standards Institute (ANSI), 1899 L Street NW, 11th Floor, Washington, DC 20036, phone: (202) 293–8020; website: *www.ansi.org*.

§ 18.103 Review and update of applicable voluntary consensus standards.

(a) MSHA will review more recent editions of voluntary consensus standards listed in § 18.102 to determine whether they can be used in their entirety and without modification, in lieu of the requirements in subparts B through E of this part.

(b) MSHA may review voluntary consensus standards not approved for incorporation by reference (IBR) in § 18.102 to determine whether such standards are suitable for gassy mining environments and whether they provide protection against fire or explosion, if substituted in their entirety and without modification, in lieu of the requirements in subparts B through E of this part.

(c) Following such review and determination, MSHA will use the appropriate rulemaking process to amend the list of voluntary consensus standards approved for IBR in lieu of the requirements in subparts B through E of this part.

PART 19—ELECTRIC CAP LAMPS

Sec.

AUTHORITY: 30 U.S.C. 957, 961.

Secs. 19.1(b) and 19.7(a) also issued under 30 U.S.C. 811.

SOURCE: Schedule 6D, 4 FR 4003, Sept. 21, 1939, unless otherwise noted.

§ 19.1 Purpose.

(a) The purpose of investigations made under this part is to promote the development of electric cap lamps that may be used in mines, especially in mines that may contain dangerous concentrations of methane. Lists of such lamps will be published from time to time in order that State mine-inspection departments, compensation bureaus, mine operators, miners, and others interested in safe equipment for mines may have information in regard to available permissible electric cap lamps. This part supersedes Schedule 6C issued under date of December 21, 1935, and goes into effect August 26, 1939.

(b) Any electric cap lamp that meets the requirements set forth in this part will be termed ''permissible'' by MSHA and, if actively marketed, will be listed as such in publications relating to permissible electric cap lamps. MSHA will test only electrical equipment that in the opinion of its qualified representatives is constructed of suitable materials, is of good quality workmanship, is based on sound engineering principles, and is safe for its intended use. MSHA reserves the right to modify design, construction, and test requirements to obtain the same degree of protection as provided by the tests described in this part.

(c) *Definition of permissible.* Completely assembled and conforming in every respect with the design formally approved by the MSHA under this part. (Approvals under this part are given only to equipment for use in gassy and dusty mines.)

NOTE: Paragraph (b) of this section is issued under the authority of Sec. 101 of the Federal Mine Safety and Health Act of 1977, Pub. L. 91–173 as amended by Pub. L. 95–164, 91 Stat. 1291 (30 U.S.C. 811). All other paragraphs in this section continue under the original authority.

(Sec. 101, Federal Mine Safety and Health Act of 1977, 91 Stat. 1291 (30 U.S.C. 811))

[Sched. 6D, 4 FR 4003, Sept. 21, 1939, as amended by Supp. 1, 20 FR 2718, Apr. 23, 1955; 47 FR 11369, Mar. 16, 1982]

§ 19.2 [Reserved]

§ 19.3 Application procedures and requirements.

(a) Before MSHA will undertake the active investigation leading to approval of any lamp, the applicant shall make application by letter for an investigation leading to approval of the lamp. This application shall be sent to: U.S. Department of Labor, Mine Safety and Health Administration, Approval and Certification Center, 765 Technology Drive, Triadelphia, WV 26059, together with the required drawings, one complete lamp, and instructions for its operation. Fees calculated in accordance with part 5 of this title shall be submitted in accordance with § 5.40.

(b) Where the applicant for approval has used an independent laboratory under part 6 of this chapter to perform, in whole or in part, the necessary testing and evaluation for approval under this part, the applicant must provide to MSHA as part of the approval application:

(1) Written evidence of the laboratory's independence and current recognition by a laboratory accrediting organization;

(2) Complete technical explanation of how the product complies with each requirement in the applicable MSHA product approval requirements;

(3) Identification of components or features of the product that are critical to the safety of the product; and

(4) All documentation, including drawings and specifications, as submitted to the independent laboratory by the applicant and as required by this part.

(c) An applicant may request testing and evaluation to non-MSHA product safety standards which have been determined by MSHA to be equivalent, under § 6.20 of this chapter, to MSHA's

product approval requirements under this part.

[68 FR 36419, June 17, 2003, as amended at 70 FR 46342, Aug. 9, 2005; 73 FR 52211, Sept. 9, 2008]

§ 19.4 Conditions governing investigations.

(a) One complete lamp, with the assembly and detail drawings that show the construction of the lamp and the materials of which it is made, should be submitted at the time the application for test is made. This material should be sent prepaid to the U.S. Department of Labor, Mine Safety and Health Administration, Approval and Certification Center, 765 Technology Drive, Triadelphia, WV 26059.

(b) When this lamp has been inspected by MSHA, the applicant will be notified as to the amount of material that will be required for the tests. In general, the material required will be as follows: (1) Thirty complete lamps; (2) 500 bulbs; (3) 50 feet of cord; (4) a battery discharge rack for 20 batteries; and (5) a 50-bulb rack. Specifications for items (4) and (5) will be furnished by MSHA.

(c) The applicant will be notified of the date on which the tests will start and will be given an opportunity to witness them.

(d) *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.

(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; 73 FR 52211, Sept. 9, 2008]

§ 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,[1] by durability tests of the cord

[1] Batteries are dropped 3 feet, at least 20 times onto an oak floor. Headpieces are

and cord armor,[2] 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.[3]

(2) The minimum candlepower of the beam based upon readings at the design voltage of the bulb shall not be less than 1.

§ 19.7 Protection against explosion hazard.

Unless properly designed, electric cap lamps may present two sources of probable explosion hazards: Ignition of an explosive atmosphere by the heated filament of the bulb in case the bulb glass is accidentally broken, and ignition by sparks or flashes from the battery. MSHA therefore requires the following safeguards:

(a) *Safety device or design.* The headpiece shall have a safety device to prevent the ignition of explosive mixtures of methane and air if the bulb glass surrounding the filament is broken. Alternatively, if the lamp is designed and constructed to prevent the ignition of explosive mixtures of methane and air by protecting the bulb from breakage and preventing exposure of the hot filament, no safety device is required.

(b) *Headpiece lock or seal.* The headpiece shall be provided with a lock or seal to prevent unauthorized removal of the lens and tampering with the safety device, the bulb, or the electrical contacts.

(c) *Locks on charging terminals.* Lamps shall be equipped with a magnetic or other equally effective lock at the battery, the headpiece, or the cord assembly to prevent unauthorized access to live charging terminals.

(d) *Protection of battery terminals.* The battery covers of lamps that are recharged through the cord shall be so constructed and assembled as to prevent unauthorized access to the battery terminals.

(e) *Battery current restricted.* The amount of current flow between the conductors of the cord, if short-circuited just outside of the battery casing or cord armor, shall be limited by the design of the battery or by a fuse to such a value[4] as will not produce sparks that will ignite an explosive mixture of methane and air.

(f) It shall not be possible to obtain a difference of potential between any two accessible points of the cap lamp when assembled for use.

NOTE: Paragraph (a) of this section is issued under the authority of Sec. 101 of the Federal Mine Safety and Health Act of 1977, Pub. L. 91–173 as amended by Pub. L. 95–164, 91 Stat. 1291 (30 U.S.C. 811). All other paragraphs in this section continue under the original authority.

(Sec. 101, Federal Mine Safety and Health Act of 1977, 91 Stat. 1291 (30 U.S.C. 811))

[Sched. 6D, 4 FR 4003, Sept. 21, 1939, as amended at 47 FR 11369, Mar. 16, 1982]

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dropped 6 feet, at least 20 times, onto concrete.

[2] 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.

[3] The minimum allowable angle of 120 degrees will be used in determining the mean candlepower of the beam.

[4] The following maximum short-circuit current values may be used as a guide in the design of cap lamp batteries: 100 amperes for a 4-volt battery; 75 amperes for a 6-volt battery; 50 amperes for an 8-volt battery.

§ 19.8 Protection against bodily hazard.

This hazard is chiefly due to the possible burning of the wearer by electrolyte spilled from the battery. MSHA therefore requires that:

(a) *Spilling of electrolyte.* The lamp shall be so designed and constructed that, when properly filled, the battery will neither leak nor spill electrolyte under actual service conditions. Lamps passing a laboratory spilling test will be considered satisfactory in this respect, contingent upon satisfactory performance in service.

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

§ 19.9 Performance.

In addition to the general design and the safety features, MSHA considers that a lamp of permissible type should meet certain minimum requirements with respect to performance, as follows:

(a) *Time of burning and candlepower.* Permissible electric cap lamps shall burn for at least 10 consecutive hours on one charge of the battery and shall give during that period a mean candlepower of light beam of not less than 1.

(b) *Bulb life.* The average life of the bulbs shall be not less than 200 hours, and at least 92 percent of the bulbs shall have a life of 150 hours. The life of a bulb is the number of hours its main filament will burn in the cap lamp or its equivalent.

The life of a bulb having main filaments in parallel is considered ended when the first filament ceases to burn; the life of a bulb having independent main filament is considered ended when the last filament ceases to burn.

(c) *Bulb uniformity.* (1) The bulbs submitted shall meet the following minimum requirements for variation in current consumption and candlepower:

(2) The current consumption of at least 94 percent of the bulbs shall not exceed the average current by more than 6 percent. The candlepower (s. cp.) of at least 90 percent of the bulbs shall not fall short of the average candlepower by more than 30 percent.

(d) *Corrosion of contacts.* Battery terminals and leads therefrom, as well as the battery gas vents, shall be designed to minimize corrosion of the electrical contacts.

[Sched. 6D, 4 FR 4003, Sept. 21, 1939, as amended at 47 FR 11369, Mar. 16, 1982]

§ 19.10 Material required for MSHA records.

In order that MSHA may know exactly what it has tested and approved, detailed records are kept covering each investigation. These include drawings and actual equipment, as follows:

(a) *Drawings.* The original drawings submitted with the application for the tests and the final drawings, which the manufacturer must submit to MSHA before the approval is granted, to show the details of the lamp as approved. These drawings are used to identify the lamp in the approval and as a means of checking the future commercial product of the manufacturer.

(b) *Actual equipment.* (1) If MSHA so desires, parts of the lamps which are used in the tests will be retained as a permanent record of the investigation and of the lamps submitted.

(2) If the lamp is approved, MSHA will require the manufacturer, as soon as his first manufactured lamps are available, to submit one complete lamp, bearing the approval plate, as a record of his commercial product.

§ 19.11 How approvals are granted.

(a) All approvals are granted by official letter from MSHA. A lamp will be approved under this part only when the testing engineers judge that the lamp has met the requirements of the part and MSHA's records concerning the lamp are complete, including drawings from the manufacturer that show the lamp as it is to be commercially made. No verbal reports of MSHA's decisions, concerning the investigation will be given, and no informal approvals will be granted.

(b) As soon as the manufacturer has received the formal approval he shall be free to advertise his lamps as permissible.

[Sched. 6D, 4 FR 4003, Sept. 21, 1939, as amended by Supp. 1, 20 FR 2718, Apr. 23, 1955]

§ 19.12 Wording, purpose, and use of approval plate.

(a) *Approval plate.* The manufacturer shall attach, stamp, or mold an approval plate on the battery container of each permissible lamp. The plate shall bear the emblem of the Mine Safety and Health Administration and be inscribed as follows: ''Permissible Electric Cap Lamp. Approval No. _____ issued to the _____ Company.'' When deemed necessary, an appropriate caution statement shall be added. The size and position of the approval plate shall be satisfactory to MSHA.

(b) *Purpose of approval plate.* The approval plate is a label which identifies the lamp so that anyone can tell at a glance whether or not the lamp is of the permissible type. By it, the manufacturer can point out that his lamp complies with specifications of MSHA and that it has been judged as suitable for use in gassy mines.

(c) *Use of approval plate.* Permission to place MSHA's approval plate on his lamp obligates the manufacturer to maintain the quality of his product and to see that each lamp is constructed according to the drawings which have been accepted by MSHA for this lamp and which are in MSHA's files. Lamps exhibiting changes in design which have not been approved are not permissible lamps and must not bear MSHA's approval plate.

(d) *Withdrawal of approval.* MSHA reserves the right to rescind, for cause, at any time any approval granted under this part.

[Sched. 6D, 4 FR 4003, Sept. 21, 1939, as amended at 43 FR 12314, Mar. 24, 1978]

§ 19.13 Instructions for handling future changes in lamp design.

All approvals are granted with the understanding that the manufacturer will make his lamp according to the drawings which he has submitted to MSHA and which have been considered and included in the approval. Therefore, when he desires to make any change in the design of the lamp, he should first of all obtain MSHA's approval of the change. The procedure is as follows:

(a)(1) The manufacturer shall write to the U.S. Department of Labor, Mine Safety and Health Administration, Approval and Certification Center, 765 Technology Drive, Triadelphia, WV 26059, requesting an extension of the original approval and stating the change or changes desired. With this letter the manufacturer should submit a revised drawing or drawings showing the changes in detail, and one of each of the changed lamp parts.

(2) Where the applicant for approval has used an independent laboratory under part 6 of this chapter to perform, in whole or in part, the necessary testing and evaluation for approval of changes to an approved product under this part, the applicant must provide to MSHA as part of the approval application:

(i) Written evidence of the laboratory's independence and current recognition by a laboratory accrediting organization;

(ii) Complete technical explanation of how the product complies with each requirement in the applicable MSHA product approval requirements;

(iii) Identification of components or features of the product that are critical to the safety of the product; and

(iv) All documentation, including drawings and specifications, as submitted to the independent laboratory by the applicant and as required by this part.

(b) MSHA will consider the application and inspect the drawings and parts to determine whether it will be necessary to make any tests.

(c) If no tests are necessary, the applicant will be advised of the approval or disapproval of the change by letter from MSHA.

(d) If tests are judged necessary, the applicant will be advised of the material that will be required.

[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; 52 FR 17514, May 8, 1987; 60 FR 35693, July 11, 1995; 68 FR 36419, June 17, 2003; 73 FR 52211, Sept. 9, 2008]

PART 20—ELECTRIC MINE LAMPS OTHER THAN STANDARD CAP LAMPS

Sec.