(h) MSHA reserves the right to conduct explosion tests with standard bolts, nuts, cap screws, or studs substituted for any special high-tensile strength fastening(s) specified by the applicant.

(i) Coil-thread inserts, if used in holes for fastenings, shall meet the following:

(1) The inserts shall have internal screw threads.

(2) The holes for the inserts shall be drilled and tapped consistent with the insert manufacturer's specifications.

(3) The inserts shall be installed consistent with the insert manufacturer's specifications.

(4) The insert shall be of sufficient length to ensure the minimum thread engagement of fastening specified in §18.31(a)(6) of this part.

[33 FR 4660, Mar. 19, 1968, as amended at 57 FR 61210, Dec. 23, 1992]

§18.33 Finish of surface joints.

Flat surfaces between bolt holes that form any part of a flame-arresting path shall be plane to within a maximum deviation of one-half the maximum clearance specified in §18.31(a)(6). All metal surfaces forming a flame-arresting path shall be finished during the manufacturing process to not more than 250 microinches. A thin film of nonhardening preparation to inhibit rusting may be applied to these finished metal surfaces as long as the final surface can be readily wiped free of any foreign materials.

[57 FR 61210, Dec. 23, 1992]

§18.34 Motors.

Explosion-proof electric motor assemblies intended for use in approved equipment in underground mines that are specifically addressed in part 7 of this chapter shall be approved under part 7 of this chapter after February 22, 1996. Those motor assemblies not specifically addressed under part 7 of this chapter shall be accepted or certified under this part.

(a) *General.* (1) Motors shall have explosion-proof enclosures.

(2) Motors submitted to MSHA for test shall be equipped with unshielded bearings regardless of whether that type of bearing is specified.

(3) MSHA reserves the right to test motors with the maximum clearance specified between the shaft and the mating part which forms the required flame-arresting path. Also reserved is the right to remachine these parts, at the applicant's expense, to specified dimensions to provide the maximum clearance.

NOTE: For example, a shaft with a diameter greater than 2 inches at the flame-arresting portion might require such machining.

(4) Ball and roller bearings and oil seals will not be acceptable as flame-arresting paths; therefore, a separate path shall be provided between the shaft and another part, preferably inby the bearing. The length and clearances of such flame-arresting path shall conform to the requirements of §18.31.

(5) Labyrinths or other arrangements that provide change(s) in direction of escaping gases will be acceptable but the use of small detachable pieces shall not be permitted unless structurally unavoidable. The lengths of flame-arresting path(s) and clearance(s) shall conform to the requirements of §18.31.

(6) Oil seals shall be removed from motors prior to submission for explosion tests.

NOTE: Oil seals will be removed from motors prior to explosion tests and therefore may be omitted from motors submitted for investigation.

(7) Openings for filling and draining bearing lubricants shall be so located as to prevent escape of flame through them.

(8) An outer bearing cap will not be considered as forming any part of a flame-arresting path unless the cap is used as a bearing cartridge.

NOTE: The outer bearing cap will be omitted during explosion tests unless it houses the bearing.

(9) If unavoidable, holes may be made through motor casings for bolts, studs, or screws to hold essential parts such as pole pieces, brush rigging, and bearing cartridges. Such parts shall be attached to the casing by at least two fastenings. The threaded holes in these parts shall be blind, unless the fastenings are inserted from the inside, in which case the fastenings shall not be accessible with the armature of the motor in place.

(b) *Direct-current motors.* For direct-current motors with narrow interpoles,

the distance from the edge of the pole piece to any bolt hole in the frame shall be not less than ⅛ inch. If the distance is ⅛ to ¼ inch, the diametrical clearance for the pole bolt shall not exceed 1/64 inch for not less than ½ inch through the frame. Furthermore, the pole piece shall have the same radius as the inner surface of the frame. Pole pieces may be shimmed as necessary.

(c) *Alternating-current motors.* Stator laminations that form a part of an explosion-proof enclosure will be acceptable provided: (1) The laminations and their end rings are fastened together under pressure; (2) the joint between the end rings and the laminations is not less than ¼ inch, but preferably as close to 1 inch as possible; and (3) it shall be impossible to insert a 0.0015-inch thickness gage to a depth exceeding ⅛ inch between adjacent laminations or between end rings and laminations.

(d) *Small motors (alternating- and direct-current).* Motors having internal free volume not exceeding 350 cubic inches and joints not exceeding 32 inches in outer circumference will be acceptable for investigation if provided with rabbet joints between the stator frame and the end bracket having the following dimensions:

DIMENSIONS OF RABBET JOINTS—INCHES

Minimum total width	Min. width of clamped radial portion	Max. clearance of radial portion	Max. diametrical clearance at axial portion
3/8	3/64	0.0015	0.003
½	3/64	.002	.003
½	3/32	.002	.004

[33 FR 4660, Mar. 19, 1968, as amended at 57 FR 61210, Dec. 23, 1992]

§ 18.35 Portable (trailing) cables and cords.

(a) Portable cables and cords used to conduct electrical energy to face equipment shall conform to the following:

(1) Have each conductor of a current-carrying capacity consistent with the Insulated Power Cable Engineers Association (IPCEA) standards. (See Tables 1 and 2 in Appendix I.)

(2) Have current-carrying conductors not smaller than No. 14 (AWG). Cords with sizes 14 to 10 (AWG) conductors shall be constructed with heavy jackets, the diameters of which are given in Table 6 in Appendix I.

(3) Be accepted as flame resistant under this part or approved under subpart K of part 7 of this chapter.

(4) Have short-circuit protection at the outby (circuit-connecting) end of ungrounded conductors. (See Table 8 in Appendix I.) The fuse rating or trip setting shall be included in the assembler's specifications.

(5) Ordinarily the length of a portable (trailing) cable shall not exceed 500 feet. Where the method of mining requires the length of a portable (trailing) cable to be more than 500 feet, such length of cable shall be permitted only under the following prescribed conditions:

(i) The lengths of portable (trailing) cables shall not exceed those specified in Table 9, Appendix I, titled ''Specifications for Portable Cables Longer Than 500 Feet.''

(ii) Short-circuit protection shall be provided by a protective device with an instantaneous trip setting as near as practicable to the maximum starting-current-inrush value, but the setting shall not exceed the trip value specified in MSHA approval for the equipment for which the portable (trailing) cable furnishes electric power.

(6) Have nominal outside dimensions consistent with IPCEA standards. (See Tables 4, 5, 6, and 7 in Appendix I.)

(7) Have conductors of No. 4 (AWG) minimum for direct-current mobile haulage units or No. 6 (AWG) minimum for alternating-current mobile haulage units.

(8) Have not more than five well-made temporary splices in a single length of portable cable.

(b) Sectionalized portable cables will be acceptable provided the connectors used inby the last open crosscut in a gassy mine meet the requirements of § 18.41.

(c) A portable cable having conductors smaller than No. 6 (AWG), when used with a trolley tap and a rail clamp, shall have well insulated single conductors not smaller than No. 6 (AWG) spliced to the outby end of each conductor. All splices shall be made in a workmanlike manner to insure good electrical conductivity, insulation, and mechanical strength.