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(c) Down drilling: Drilling shall be done in typical mine floor strata with a pneumatic percussion-type drill. Five holes shall be drilled vertically and five holes shall be drilled at an angle.

(d) At MSHA's discretion drilling in "on site" strata may be acceptable in lieu of strata requirements in paragraphs (a), (b), and (c) of this section. (See § 33.20(a).)

§ 33.38 Electrical parts.

(a) Units with electrical parts and designed to operate as electric face equipment (see definition, § 45.44-1 of this chapter) in gassy coal mines shall meet the requirements of Part 18 of Subchapter D of this chapter (Bureau of Mines Schedule 2, revised, the current revision of which is Schedule 2F), and the examination and testing of the electrical parts shall be entirely separate from the examination and testing of dust-collecting equipment as such.

(b) Units with electrical parts designed to operate only outby the last open crosscut in a gassy coal-mine entry, room, or other opening (including electric-drive units with their controls and push buttons) are not required to comply with the provisions of Part 18 of Subchapter D of this chapter (Bureau of Mines Schedule 2, revised, the current revision of which is Schedule 2F).

(c) Units with electrical parts and designed for operation only in nongassy coal mines are not required to comply with the provisions of Part 18 of Subchapter D of this chapter (Bureau of Mines Schedule 2, revised, the current revision of which is Schedule 2F). (See § 33.11(b).)

PART 35—FIRE-RESISTANT HYDRAULIC FLUIDS

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

SOURCE: Schedule 30, 24 FR 10201, Dec. 17, 1959, unless otherwise noted.

Subpart A—General Provisions

§ 35.1 Purpose.

The regulations in this part set forth the requirements for fire-resistant hydraulic fluids and concentrates for the production thereof to procure their certification as approved for use in machines and devices that are operated in coal mines and procedures for applying for such certification.

[Schedule 30, 24 FR 10201, Dec. 17, 1959, as amended at 52 FR 17515, May 8, 1987]

§ 35.2 Definitions.

As used in this part—

(a) *Permissible*, as applied to hydraulic fluids, means that the fluid conforms to the requirements of this part, and that a certificate of approval to that effect has been issued.

(b) *MSHA* means the United States Department of Labor, Mine Safety and Health Administration.

(c) *Certificate of approval* means a formal document issued by MESA stating that the fluid has met the requirements of this part for fire-resistant hydraulic fluids and authorizing the use of an official identifying marking so indicating.

(d) *Fire-resistant hydraulic fluid* means a fluid of such chemical composition and physical characteristics that it will resist the propagation of flame.

(e) *Concentrate* means a substance in concentrated form that might not be fire resistant as such but when mixed with water or other vehicle in accordance with instructions furnished by the

applicant will constitute a fire-resistant hydraulic fluid.

(f) *Applicant* means an individual, partnership, company, corporation, association, or other organization that manufactures, compounds, refines, or otherwise produces, a fire-resistant hydraulic fluid or a concentrate for the production thereof, and seeks a certificate of approval.

[Sched. 30, 24 FR 10201, Dec. 17, 1959, as amended at 39 FR 24005, June 28, 1974; 43 FR 12317, Mar. 24, 1978]

§ 35.3 Consultation.

By appointment, applicants or their representatives may visit the U.S. Department of Labor, Mine Safety and Health Administration, Approval and Certification Center, 765 Technology Drive, Triadelphia, WV 26059, to discuss with qualified MSHA personnel proposed fluids to be submitted in accordance with the regulations of this part.. No charge is made for such consultation and no written report thereof will be submitted to the applicant.

[Sched. 30, 24 FR 10201, Dec. 17, 1959, as amended at 43 FR 12317, Mar. 24, 1978; 60 FR 35694, July 11, 1995; 73 FR 52213, Sept. 9, 2008]

§ 35.4 Types of hydraulic fluid for which certificates of approval may be granted.

Certificates of approval will be granted for completely compounded or mixed fluids and not for individual ingredients; except that when a concentrate is submitted for testing, complete instructions for mixing with water or other vehicle shall be furnished to MSHA, together with the vehicle other than water, and the approval will cover only the specific mixture that constitutes the hydraulic fluid for use in coal mines.

§ 35.5 [Reserved]

§ 35.6 Application procedures and requirements.

(a)(1) No investigation or testing will be undertaken by MSHA except pursuant to a written application accompanied by all descriptions, specifications, test samples, and related materials. The application and all related matters and correspondence shall be addressed to: U.S. Department of

Labor, Mine Safety and Health Administration, Approval and Certification Center, 765 Technology Drive, Triadelphia, WV 26059. Fees calculated in accordance with part 5 of this title shall be submitted in accordance with §5.40.

(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 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.

(3) 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.

(b) Descriptions and specifications shall be adequate in detail to identify fully the composition of the hydraulic fluid and to disclose its characteristics. Descriptions and specifications shall include:

(1) An identifying name or number of the fluid or concentrate for the production thereof.

(2) Pour point, °F.; freezing point, °F.; color; neutralization number or pH; viscosity at 100 °F., 150 °F., 175 °F. (Saybolt or Furol); viscosity index; specific gravity.

(3) A statement of the water or other vehicle content in percent by weight or volume and how it affects fire resistance of the hydraulic fluid. If water is

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the vehicle, the statement shall include the applicant's method for determining water content quickly in the field.

(c) The application shall state whether the fluid submitted for test is toxic or irritating to the skin and what precautions are necessary in handling it.

(d) The application shall state that the applicant has tested the fluid which he believes to have fire-resistant properties, the basis for such determination, and submit with his application the data resulting from the applicant's use or laboratory tests to determine the fire-resistant properties of the fluid.

(e) The application shall contain evidence that the fluid has lubricating and hydraulic properties and is satisfactory for use in underground mining machinery; and shall state that the fluid, or concentrate for the production thereof, is fully developed and is of the composition that the applicant believes to be a suitable marketable product.

(f) The application shall state the nature, adequacy, and continuity of control of the constituents of the fluid to maintain its fire-resistant characteristics and how each lot will be sampled and tested to maintain its protective qualities. MSHA reserves the right to have its qualified representative(s) inspect the applicant's control-test equipment, procedures, and records, and to interview the personnel who conduct the control tests to satisfy MSHA that the proper procedure is being followed to insure that the fire-resistant qualities of the hydraulic fluid are maintained.

(g) When MSHA notifies the applicant that the application will be accepted, it will also notify him as to the number of samples and related materials that will be required for testing. Ordinarily a 5-gallon sample of hydraulic fluid will be required provided that it is a finished product or, if in concentrate form, enough shall be furnished to make a 5-gallon sample when mixed with water or other vehicle according to the applicant's instructions. All samples and related materials required for testing must be delivered (charges prepaid) to: U.S. Department of Labor, Mine Safety and Health Ad-

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ministration, Approval and Certification Center, 765 Technology Drive, Triadelphia, WV 26059.

[Sched. 30, 24 FR 10201, Dec. 17, 1959, as amended at 43 FR 12317, Mar. 24, 1978; 60 FR 35694, July 11, 1995; 68 FR 36422, June 17, 2003; 70 FR 46344, Aug. 9, 2005; 73 FR 52213, Sept. 9, 2008]

§ 35.7 Date for conducting tests.

The date of acceptance of an application will determine the order of precedence for testing when more than one application is pending, and the applicant will be notified of the date on which tests will begin. However, not more than two fluids will be tested consecutively for one applicant provided other applications are pending. If a fluid fails to meet any of the requirements, it shall lose its order of precedence. If an application is submitted to resume testing after correction of the course of failure, it will be treated as a new application and the order of precedence for testing will be so determined.

§ 35.8 Conduct of investigations, tests, and demonstrations.

Prior to the issuance of a certificate of approval, necessary Government personnel, representatives of the applicant, and such other persons as may be mutually agreed upon, may observe the investigations or tests. MSHA shall hold as confidential and shall not disclose features of this hydraulic fluid such as the chemical analysis, specifications, descriptions, and related material. After issuing a certificate of approval MSHA may conduct such public demonstrations and tests of the approved hydraulic fluid as it deems appropriate. The conduct of all investigations, tests, and demonstrations shall be under the direction and control of MSHA, and any other persons shall be present only as observers.

[Sched. 30, 24 FR 10201, Dec. 17, 1959, as amended at 39 FR 24005, June 28, 1974]

§ 35.9 Certificates of approval.

(a) Upon completion of an investigation of a hydraulic fluid MSHA will issue to the applicant either a certificate of approval or a written notice of disapproval as the case may require. No informal notification of approval

will be issued. If a certificate of approval is issued, no test data or detailed results of tests will accompany it. If a notice of disapproval is issued, it will be accompanied by details of the defect(s), with a view to possible correction. MSHA will not disclose, except to the applicant, any information on a fluid upon which a notice of disapproval has been issued.

(b) A certificate of approval will be accompanied by a list of specifications covering the characteristics of a hydraulic fluid upon which the certificate of approval is based. In addition to the applicant's record of control in maintaining the fire-resistant characteristics, applicants shall keep exact duplicates of the specifications that have been submitted to MSHA and that relate to any fluid which has received a certificate of approval; and these are to be adhered to exactly in production of the certified fluid for commercial purposes.

§ 35.10 Approval labels or markings.

(a) A certificate of approval will be accompanied by a photograph of a design for an approval label or marking, which shall bear the emblem of the Mine Safety and Health Administration and shall be inscribed substantially as follows:

PERMISSIBLE FIRE-RESISTANT HYDRAULIC
FLUID

MSHA Approval No. _____
Issued to _____
(Name of Applicant)

(b) A label so inscribed shall be attached to each fluid container in such a manner that it cannot be easily removed or containers may be so marked with a metal stencil. The letters and numbers shall be at least 1/2 inch in height and of a color which contrasts with that of the container.

(c) For a concentrate the label or marking shall clearly indicate that the certification thereof applies only when the concentrate is used in exact conformance with the instructions on such label or marking. The label or marking shall clearly indicate the exact amount of water or other vehicle to make the fire-resistant hydraulic fluid upon which the certificate of approval was based.

(d) Appropriate instructions and caution statements on the handling of the hydraulic fluid or concentrate shall be included on the approval label or marking.

(e) Use of MSHA's approval label or marking obligates the applicant to whom the certificate of approval was granted to maintain the fire-resistant characteristics of the hydraulic fluid and guarantees that it is manufactured according to the specifications upon which the certificate of approval was based. Use of the approval label or marking is not authorized except on containers of hydraulic fluids that conform strictly with the specifications and characteristics upon which the certificate of approval was based.

[Sched. 30, 24 FR 10201, Dec. 17, 1959, as amended at 43 FR 12317, Mar. 24, 1978]

§ 35.11 Material required for record.

MSHA may retain for record all or part of the material submitted for testing. Any material that MSHA does not require will be returned to the applicant at his expense upon receipt of his written request and shipping instructions not more than 6 months after the termination or completion of the tests. Thereafter MSHA will dispose of such surplus material as it deems appropriate.

§ 35.12 Changes after certification.

If an applicant desires to change any specification or characteristic of a certified hydraulic fluid, he shall first obtain MSHA's approval of the change, pursuant to the following procedures:

(a)(1) Application shall be made, as for an original certificate of approval, requesting that the existing certification be extended to cover the proposed change. The application shall be accompanied by specifications and related material as in the case of an original application.

(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:

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(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) The application and related material(s) will be examined by MSHA to determine whether testing of the modified hydraulic fluid will be required. Testing will be necessary if there is a possibility that the modification may affect adversely the performance characteristics of the fluid. MSHA will inform the applicant in writing whether such testing is required.

(c) If the proposed modification meets the requirements of this part, a formal extension of certification will be issued, accompanied by a list of new and corrected specifications to be added to those already on file, as the basis for the extension of certification.

[Schedule 30, 24 FR 10201, Dec. 17, 1959, as amended at 52 FR 17515, May 8, 1987; 68 FR 36422, June 17, 2003]

§ 35.13 Withdrawal of certification.

MSHA reserves the right to rescind for cause, at any time, any certificate of approval granted under this part.

Subpart B—Test Requirements

§ 35.20 Autogenous-ignition temperature test.

(a) *Purpose.* The purpose of this test, referred to hereinafter as the ignition-temperature test, is to determine the lowest autogenous-ignition temperature of a hydraulic fluid at atmospheric pressure when using the syringe-injection method.

(b) *Description of apparatus—(1) Test flask.* The test flask, which is heated and into which the test sample is injected, shall be a commercial 200 ml. borosilicate glass Erlenmeyer flask.

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(2) *Thermocouples.* Calibrated thermocouples—iron-constantan or chromelalumel—and a potentiometer shall be used for all temperature measurements.

(3) *Syringe.* A hypodermic syringe (0.25 or 1 cc. capacity) equipped with a 2-inch No. 18 stainless steel needle and calibrated in hundredths of a cubic centimeter (0.01 cc.) shall be used to inject samples into the heated test flask.

(4) *Timer.* An electric timer or stopwatch calibrated in not more than 0.2 second intervals shall be used to determine the time lag before ignition.

NOTE: Time lag is the time that elapses between the instant of injection and that of ignition of the test sample, as evidenced by flame.

(5) *Furnace.* The furnace in which the ignition-temperature test is conducted shall consist of a refractory (alundum or equivalent) cylinder 5 inches in internal diameter and 5 inches in height; a transite-ring top and a transite-disk bottom, each of which is attached to a metal cylinder. The furnace is heated by three elements as follows: (i) A circumferential heater embedded in the refractory cylinder; (ii) a top or toroidal-neck heater that surrounds the neck of the test flask; and (iii) a flat base heater on which the test flask rests. The temperature of each heating element shall be controlled independently by an autotransformer. Means shall be provided for applying thermocouples at the neck, mid-section, and base of the test flask, which shall be inserted upright in the furnace.

(c) *Test procedures—(1) Temperature control.* Each autotransformer shall be so adjusted that the temperature at the neck, mid-section, and base of the test flask is uniform within ± 2 °F. of the desired test temperature.

(2) *Sample injection and timing.* A 0.07 cc. test sample shall be injected into the heated test flask with the hypodermic syringe, and the syringe shall be withdrawn immediately. Measurement of time shall start at the instant the sample is injected.

(3) *Observations.* (i) If flame does not result in 5 minutes or more after injection of the test sample, the sample shall be considered nonflammable at the test temperature, and the timer shall be stopped. The test flask shall

then be flushed well with clean dry air and, after a lapse of 15 minutes or more, the test shall be repeated with the test flask temperature raised 50 °F. ± 2 °F. above the first test temperature.

(ii) If ignition (flame) is observed in 5 minutes or less after the injection of the test sample (0.07 cc.), the time lag (time interval) shall be noted. After an ignition occurs the temperature of the test flask shall be reduced 5 °F., and the test procedure repeated in decrements of 5 °F. until ignition no longer occurs and this temperature shall be noted as the first nonignition test temperature for the 0.07 cc. sample.

(iii) The temperature shall be increased 50 °F. ± 2 °F. above the first nonignition test temperature, and the ignition-temperature test procedure shall be repeated with a 0.10 cc. test sample injected into the heated test flask.

(iv) If the lowest temperature at which ignition occurs with the 0.10 cc. sample (in decrements of 5 °F.) is lower than that obtained with the 0.07 cc. sample, the ignition-temperature test procedure shall be repeated using a test sample of 0.12 cc., then 0.15 cc., and so on by increments of 0.03 cc. until the lowest ignition temperature is obtained.

(v) If the lowest temperature at which ignition is obtained with the 0.10 cc. sample is greater than that obtained with the 0.07 cc. sample, the ignition temperature test procedure shall be repeated by reducing the test sample to 0.05 cc. and then to 0.03 cc. until the lowest ignition temperature is obtained.

(d) *Appraisal of test.* A fluid shall be considered fire-resistant, according to the test requirements of this section: *Provided,* That in no instance of the ignition-temperature test procedure, as stated in this section, shall the ignition temperature of the test sample be less than 600 °F.

§ 35.21 Temperature-pressure spray-ignition tests.

(a) *Purpose.* The purpose of this test shall be to determine the flammability of a hydraulic fluid when it is sprayed over three different sources of ignition

which are described in paragraph (b)(4) of this section.

(b) *Description of apparatus.* (1) A 3-quart pressure vessel, with the necessary connections, valves, and heating elements, shall be used for containing and heating the fluid under the test conditions as specified hereinafter.

(2) An atomizing round-spray nozzle, having a discharge orifice of 0.025-inch diameter, capable of discharging 3.28 gallons of water per hour with a spray angle of 90 degrees at a pressure of 100 p.s.i., shall be connected to the pressure vessel.

(3) A commercial pressurized cylinder, containing nitrogen with the customary regulators, valves, tubing, and connectors, shall be used to supply nitrogen to the pressure vessel described in paragraph (b) (1) of this section.

(4) Three igniting devices shall provide three different sources of ignition as follows:

(i) A metal trough with a metal cover in which cotton waste soaked in kerosene is ignited.

(ii) An electric arcing device in which the arc is produced by a 12,000-volt transformer.

(iii) A propane torch—Bernzomatic or equivalent.

(5) A means of measuring distances from the nozzle tip to the igniting device shall be provided.

(c) *Test procedures.* (1) A 2½-quart sample of the fluid shall be poured into the pressure vessel and heated to a temperature of 150 °F. The temperature shall be maintained at not less than 145 °F. or not more than 155 °F. during the test.

(2) Nitrogen shall be introduced into the vessel at 150 p.s.i.g.

(3) The fluid shall be sprayed at each igniting device, described in paragraph (b) (4) of this section, which is moved along the trajectory of the spray. Each igniting device shall be held in the spray at different distances from the nozzle tip for one minute or until the flame or arc is extinguished (if less than one minute) to determine this fire-resistant characteristic of the fluid.

(d) *Appraisal of tests.* If the test procedures in paragraph (c) of this section

do not result in an ignition of any sample of fluid or if an ignition of a sample does not result in flame propagation for a time interval not exceeding 6 seconds at a distance of 18 inches or more from the nozzle tip to the center of each igniting device, it shall be considered fire resistant, according to the test requirements of this section.

§ 35.22 Test to determine effect of evaporation on flammability.

(a) *Purpose.* The purpose of this test shall be to determine the effect of evaporation on the reduction of fire resistance of a hydraulic fluid.

(b) *Description of apparatus*—(1) *Petri dish.* Standard laboratory Petri dishes, approximately 90 mm. by 16 mm., shall be used to contain the test samples.

(2) *Oven.* A gravity convection air oven, capable of maintaining the specified evaporation temperature constant within ± 2 °F., shall be used in the test.

(3) *Pipe cleaner.* An ordinary smoker's pipe cleaner (U.S. Tobacco Co., Dill's or equivalent) shall be used in the test procedure, described in paragraph (c) of this section.

(c) *Test procedures.* (1) Three 30-milliliter samples of the fluid shall be placed in uncovered Petri dishes. Two of these samples shall be inserted in the oven, that shall have been heated to a temperature of 150 °F., ± 2 °F., which shall be maintained throughout this test. The third sample shall remain at room temperature.

(2) An electrically operated cycling device, such as an automobile windshield wiper mechanism, shall be oscillated in a horizontal plane, 25 ± 2 cycles per minute. A pipe cleaner shall be attached to the device so that it will enter and leave a flame of a standard (Bunsen or equivalent) laboratory burner, which is adjusted to provide a nonluminous flame approximately 4 inches in height without forming a sharp inner cone. The cycling device shall be so arranged that when a 2-inch length of pipe cleaner is attached thereto the exposed end shall describe an arc with a radius of 4 inches $\pm \frac{1}{8}$ inch. The cycling device shall be so arranged that when the 2-inch length of pipe cleaner is attached thereto, its midpoint shall be in the center of the flame at one extreme end of the cycle.

(3) Each of five 2-inch lengths of pipe cleaner shall be soaked separately for a period of 2 minutes in the test sample that remained at room temperature. Each pipe cleaner shall then be removed from the test sample and permitted to drain freely until all excess fluid is expelled from it. Each soaked pipe cleaner shall be attached to the cycling device, the mechanism started, and the pipe cleaner permitted to enter and leave the burner flame, as described in paragraph (c) (2) of this section, until a self-sustaining flame shall be observed on the pipe cleaner. The number of cycles necessary to obtain a self-sustaining flame shall be noted and averaged for each of the five soaked pipe cleaners.

(4) After one test sample has remained in the oven for a period of 2 hours, the Petri dish containing it shall be removed from the oven and allowed to cool to room temperature, after which 5 lengths of 2-inch pipe cleaner shall be soaked separately in the test sample for a period of 2 minutes. Then the test procedure stated in paragraph (c) (3) of this section shall be repeated.

(5) After one test sample has remained in the oven for a period of 4 hours, the Petri dish containing it shall be removed from the oven and allowed to cool to room temperature, after which 5 lengths of 2-inch pipe cleaner shall be soaked separately in the test sample for a period of 2 minutes. Then the test procedure stated in paragraph (c) (3) of this section shall be repeated.

(d) *Appraisal of tests.* To be determined as fire resistant according to the test requirements of this section, the three following results shall be achieved:

(1) The average number of cycles before attaining a self-sustaining flame in the test described in paragraph (c) (3) of this section shall be 24 or more.

(2) The average number of cycles before attaining a self-sustaining flame in the test described in paragraph (c) (4) of this section shall be 18 or more.

(3) The average number of cycles before attaining a self-sustaining flame in the test described in paragraph (c) (5) of this section shall be 12 or more.

§ 35.23 Performance required for certification.

To qualify as fire-resistant under the regulations of this part, a hydraulic fluid shall meet each performance requirement and stated in §§ 35.20(d), 35.21(d), and 35.22(d).

PART 36—APPROVAL REQUIREMENTS FOR PERMISSIBLE MOBILE DIESEL-POWERED TRANSPORTATION EQUIPMENT

Subpart A—General Provisions

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

SOURCE: Schedule 31, 26 FR 645, Jan. 24, 1961, unless otherwise noted.

Subpart A—General Provisions

§ 36.1 Purpose.

The regulations in this part set forth the requirements for mobile diesel-powered transportation equipment to procure their approval and certification as permissible; procedures for applying for such certification; and fees.

[61 FR 55525, Oct. 25, 1996]

§ 36.2 Definitions.

The following definitions apply in this part.

Applicant An individual, partnership, company, corporation, association, or other organization, that designs, manufactures, assembles, or controls the assembly and that seeks a certificate of approval or preliminary testing of mobile diesel-powered transportation equipment as permissible.

Certificate of approval. A formal document issued by MSHA stating that the complete assembly has met the requirements of this part for mobile diesel-powered transportation equipment and authorizing the use and attachment of an official approval plate so indicating.

Component. A piece, part, or fixture of mobile diesel-powered transportation equipment that is essential to its operation as a permissible assembly.

Diesel engine. A compression-ignition, internal-combustion engine that utilizes diesel fuel.

Explosion proof. A component or sub-assembly that is so constructed and protected by an enclosure and/or flame arrester (s) that if a flammable mixture of gas is ignited within the enclosure it will withstand the resultant pressure without damage to the enclosure and/or flame arrester(s). Also the enclosure and/or flame arrester(s) shall