

**§ 27.37 Tests to determine adequacy of safety devices for bulbs.**

The glass envelope of bulbs with the filament incandescent at normal operating voltage shall be broken in flammable methane-air or natural gas-air mixtures in a gallery to determine that the safety device will prevent ignition of the flammable mixtures.

**§ 27.38 Tests to determine adequacy of windows and lenses.**

*Impact tests.* A 4-pound cylindrical weight with a one-inch diameter hemispherical striking surface will be dropped (free fall) to strike the window or lens in its mounting or the equivalent thereof at or near the center. At least three out of four samples shall withstand the impact according to the following table:

Overall lens diameter (inches)	Height of fall (inches)
Less than 4 .....	6
4 to 5 .....	9
5 to 6 .....	15
Greater than 6 .....	24

Lenses or windows of smaller diameter than 1 inch may be tested by alternate methods at the discretion of MSHA.

**§ 27.39 Tests to determine resistance to vibration.**

(a) *Laboratory tests for reliability and durability.* Components, subassemblies, or assemblies that are to be mounted on permissible and approved equipment shall be subjected to two separate vibration tests, each of one-hour duration. The first test shall be conducted at a frequency of 30 cycles per second with a total movement per cycle of 1/16-inch. The second test shall be conducted at a frequency of 15 cycles per second with a total movement per cycle of 1/8-inch. Components, subassemblies, and assemblies shall be secured to the vibration testing equipment in their normal operating positions (with shock mounts, if regularly provided with shock mounts). Each component, subassembly and assembly shall function normally during and after each vibration test.

NOTE: The vibrating equipment is designed to impart a circular motion in a plane inclined 45° to the vertical or horizontal.

(b) *Field tests.* MSHA reserves the right to conduct tests to determine resistance to vibration in underground workings to verify the reliability and durability of a methane-monitoring system or component(s) thereof where installed in connection with a piece of mining equipment.

**§ 27.40 Test to determine resistance to dust.**

Components, subassemblies, or assemblies, the normal functioning of which might be affected by dust, such as coal or rock dust, shall be tested in an atmosphere containing an average concentration (50 million minus 40 micron particles per cubic foot) of such dust(s) for a continuous period of 4 hours. The component, subassembly, or assembly shall function normally after being subjected to this test.

NOTE: Dust measurements, when necessary, shall be made by impinger sampling and light-field counting technique.

**§ 27.41 Test to determine resistance to moisture.**

Components, subassemblies, or assemblies, the normal functioning of which might be affected by moisture, shall be tested in atmospheres of high relative humidity (80 percent or more at 65°-75 °F.) for continuous operating and idle periods of 4 hours each. The component or subassembly or assembly shall function normally after being subjected to those tests.

**PART 28—FUSES FOR USE WITH DIRECT CURRENT IN PROVIDING SHORT-CIRCUIT PROTECTION FOR TRAILING CABLES IN COAL MINES**

**Subpart A—General Provisions**

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- 28.1 Purpose.
- 28.2 Approved fuses.
- 28.3 Installation, use, and maintenance of approved fuses.
- 28.4 Definitions.

**Subpart B—Application for Approval**

- 28.10 Application procedures.