

## CONTINUITY AND RESISTANCE TEST

### 30 CFR § 56.12028 Testing grounding systems.

Continuity and resistance of grounding systems shall be tested immediately after installation, repair, and modification; and annually thereafter. A record of the resistance measured during the most recent tests shall be made available on a request by the Secretary or his duly authorized representative.

### PROGRAM POLICY MANUAL

#### 56/57.12028 Testing Grounding Systems

This intent of this standard is to ensure that continuity and resistance tests of grounding systems are conducted on a specific schedule. These tests will alert the mine operator if a problem exists in the grounding system which may not allow the circuit protective devices to quickly operate when faults occur. With the exception of fixed installations, numerous fatalities and injuries have occurred due to high resistance or lack of continuity in equipment ground systems. These accidents could have been prevented by proper testing and maintenance of grounding systems.

Grounding systems typically include the following:

1. ***equipment grounding conductors*** - the conductors used to connect the metal frames or enclosures of electrical equipment to the grounding electrode conductor;
2. ***grounding electrode conductor*** - the conductors connecting the grounding electrode to the equipment grounding conductor; and
3. ***grounding electrodes*** - usually driven rods connected to each other by suitable means, buried metal, or other effective methods located at the source, to provide a low resistance earth connection.

Operators shall conduct the following tests:

1. ***Equipment grounding conductors*** - continuity and resistance must be tested immediately after installation, repair, or modification, and annually if conductors are subjected to vibration, flexing or corrosive environments;
2. ***Grounding electrode conductor*** - continuity and resistance must be tested immediately after installation, repair, or modification, and annually if conductors are subjected to vibration, flexing or corrosive environments; and
3. ***Grounding electrodes*** - resistance must be tested immediately after installation, repair, or modification, and annually thereafter.

Conductors in fixed installations, such as rigid conduit, armored cable, raceways, cable trays, etc., that are not subjected to vibrations, flexing or corrosive environments may be examined annually by visual observation to check for damage in lieu of the annual resistance test. When

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operators elect to conduct this visual examination as a method of compliance with 30 CFR 56/57.12028, MSHA will require that a record be maintained of the most recent annual visual examination.

The grounding conductors in trailing cables, power cables, and cords that supply power to tools and portable or mobile equipment must be tested as prescribed in the regulation. This requirement does not apply to double insulated tools or circuits protected by ground-fault-circuit interrupters that trip a 5 milli-amperes or less.

Testing of equipment grounding conductors and grounding electrode conductors is not required if a fail-safe ground wire monitor is used to continuously monitor the grounding circuit and which will cause the circuit protective devices to operate when the grounding conductor continuity is broken.

A record of the most recent resistance tests conducted must be kept and made available to the Secretary or his authorized representative upon request. When a record of testing is required by the standard, MSHA intends that the test results be recorded in resistance value in ohms.