

1.0 PURPOSE

- 1.1. This document establishes MSHA's Standardized Small Scale Flame Test Procedures for Acceptance of Roof-Rib Grid Material.
- 1.2. The purpose of the test is to determine the flame resistant quality of roof-rib grid material.

2.0 SCOPE

This document applies to all applications for MSHA acceptance of roof-rib material and audits involving these products.

3.0 REFERENCES

- 3.1. 30 CFR, Part 7, Subpart A & B
- 3.2. This document describes a modification of the Standardized Small Scale Flame Test Procedures (dated: January 1985) test used for the acceptance of Brattice Cloth, and Ventilation Tubing.
- 3.3. ASAP5001 – Application Procedure For Acceptance of Flame-Resistant Solid Products Taken Into Underground Mines

4.0 DEFINITIONS

- 4.1. Roof-Rib Grid Material – a nonmetallic material used to control spalling and/or sloughing of roofs and ribs in underground mines (see Photo No. 2).

5.0 TEST EQUIPMENT

- 5.1. The test apparatus and related test equipment as described in 30 CFR, Part 7, Subpart B, Section 7.26 (See Figure No. 1 & Photo No. 1).
- 5.2. Roof-rib material horizontal mounting bar (See Photo No. 5).

6.0 TEST SAMPLES

- 6.1. Roof-Rib Grid Material – Vertical Flame Test
 - 6.1.1. Prepare 6 samples of roof-rib grid material 40 inches wide by 48 inches long.

6.1.2. Prior to testing, condition each sample for a minimum of 24 hours at a temperature of $65^{\circ}\text{F} \pm 10^{\circ}\text{F}$, and relative humidity of $55\% \pm 10\%$.

6.2. Roof-Rib Grid Material – Horizontal Flame Test

6.2.1. Prepare 6 samples of roof-rib grid material 24 inches wide by 48 inches long.

6.2.2. Prior to testing, condition each sample for a minimum of 24 hours at a temperature of $65^{\circ}\text{F} \pm 10^{\circ}\text{F}$, and relative humidity of $55\% \pm 10\%$.

7.0 PROCEDURES

7.1. Roof-Rib Grid Material – Vertical Flame Test

7.1.1. For each test, suspend the sample in the gallery by wrapping the roof-rib grid material on a rod and clamping each end and the center. The roof-rib grid material must hang 4 inches from the gallery floor (See Photo No. 3).

7.1.2. Set the methane-fueled impinged jet burner to yield a flame height of 12 inches as measured at the outermost tip of the flame.

7.1.3. Apply the flame to the front, lower edge of the roof-rib grid material and keep it in contact with the material for 25 seconds or until 1 foot of material, measured horizontally is consumed, whichever occurs first. If the material shrinks during application of the burner flame, move the flame to maintain contact with 1 foot of the material. If melting material might clog the burner orifices, rotate the burner slightly during application of the flame.

7.1.4. Test 3 samples in still air and 3 samples with an average of 125 ft./min. of air flowing through the gallery.

7.2. Roof-Rib Grid Material – Horizontal Flame Test

7.2.1. Mount each 24 inch by 48 inch sample on the roof-rib mounting bar and place it on the “J” hooks within the test chamber (See Photo No. 4).

7.2.2. Set the methane-fueled impinged jet burner to yield a flame height of 12 inches as measured at the outermost tip of the flame.

7.2.3. Apply the flame to the front left corner of the sample for 25 seconds. As the sample shrinks, the burner is moved across to cover a 1 foot section of the sample. After 25 seconds has elapsed, the burner is removed.

7.2.4. Test 3 samples in still air and 3 samples with an average of 125 ft./min. of air flowing through the gallery.

8.0 TEST DATA

8.1. Roof-Rib Grid Material – Vertical Flame Test

8.1.1. Record the propagation length and duration of burning for each of the 6 samples. The duration of burning is the total burning time of the specimen during the flame test. This includes the burn time of any material that falls on the floor of the test gallery during the ignition period. However, the suspended specimen is considered as burning only after the igniter is removed. Should burning time of a suspended specimen and specimen on the floor coincide, count the coinciding burning time only once.

8.2. Roof-Rib Grid Material – Horizontal Flame Test

8.2.1. Record the propagation length and duration of burning for each of the 6 samples. The duration of burning is the total burning time of the specimen during the flame test. This includes the burn time of any material that falls on the floor of the test gallery during the ignition period. However, the suspended specimen is considered as burning only after the igniter is removed. Should burning time of a suspended specimen and specimen on the floor coincide, count the coinciding burning time only once.

9.0 PASS/FAIL CRITERIA

9.1. Roof-Rib Grid Material – Vertical Flame Test

9.1.1. The test criteria for passing the flame test are:

1. Flame propagation of less than 4 feet in any of the tests,
2. An average of burning of less than 1 minute in each test set performed with and without air flowing through the test chamber,
3. And, a duration of burning that does not exceed 2 minutes in each one of the tests.

9.2. Roof-Rib Grid Material – Horizontal Flame Test

9.2.1. The test criteria for passing the flame test are:

1. Flame propagation of less than 4 feet in any of the tests,
2. An average of burning of less than 1 minute in each test set performed with and without air flowing through the test chamber,
3. And, a duration of burning that does not exceed 2 minutes in each one of the tests.

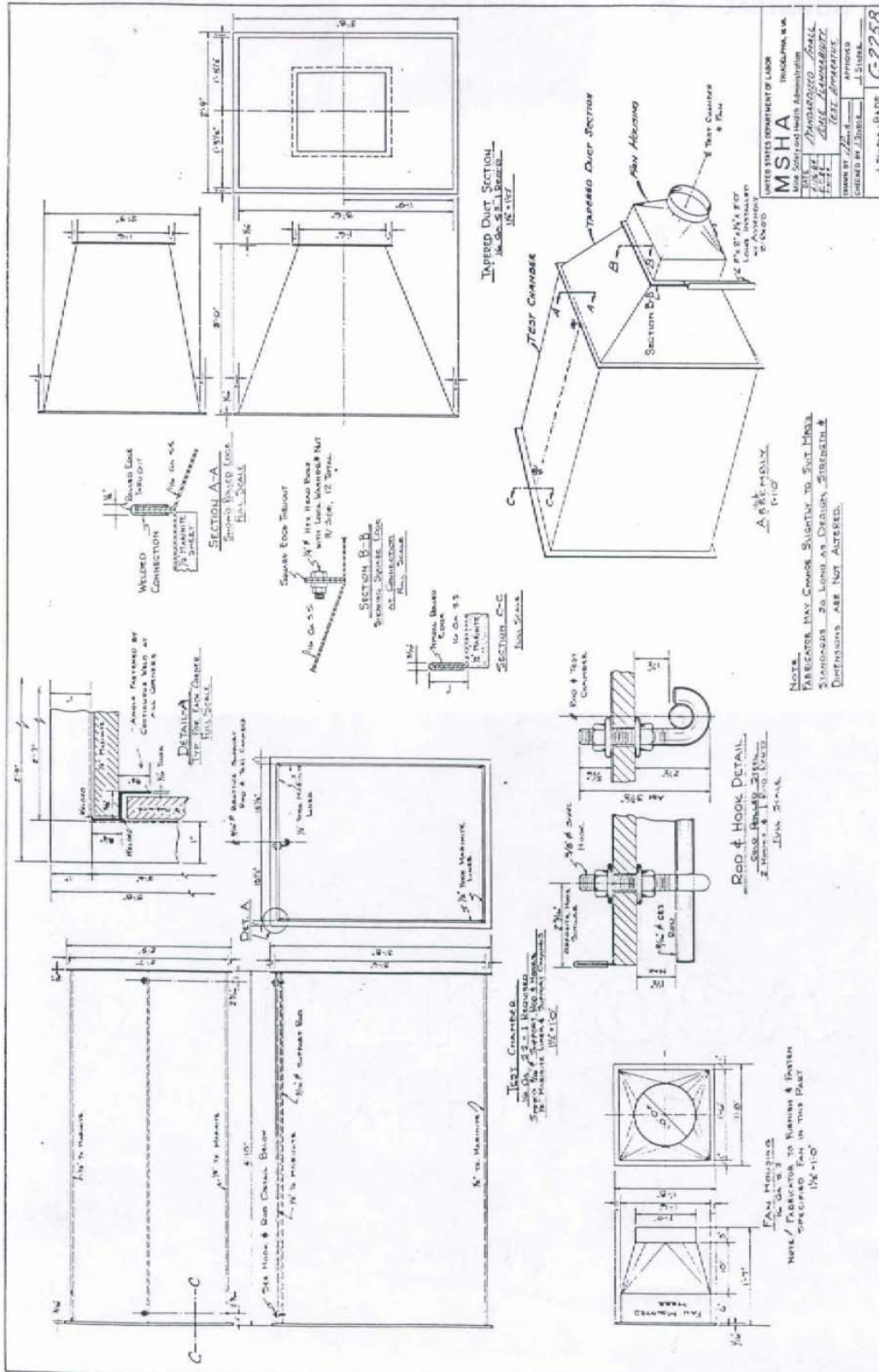


Figure 1 -- Standardized small-scale flammability test



Photo No. 1: 30 CFR, Part 7, Subpart B, Section 7.26 - Standardized Small Scale Flame Test

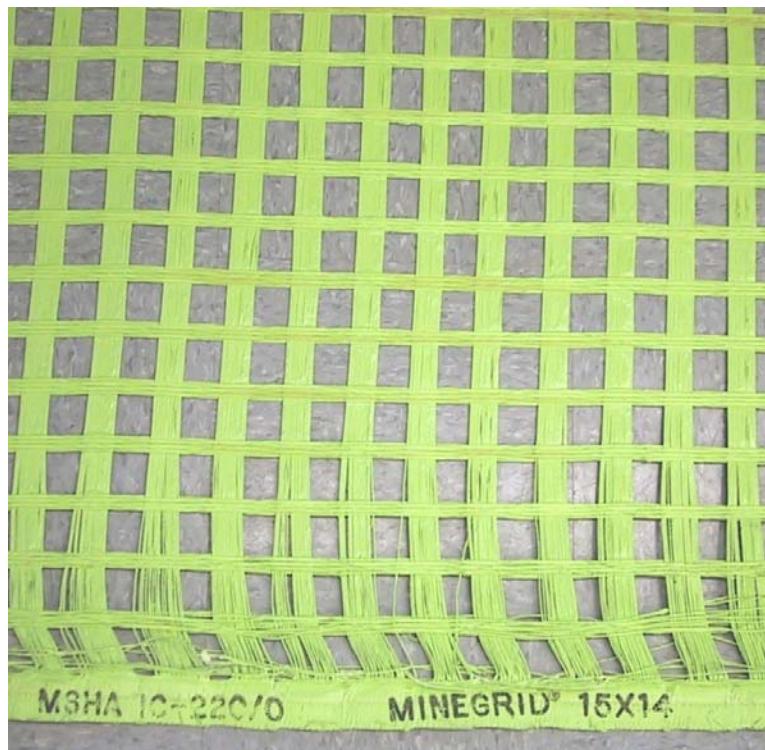


Photo No. 2: MSHA Approved Roof-Rib Grid Material

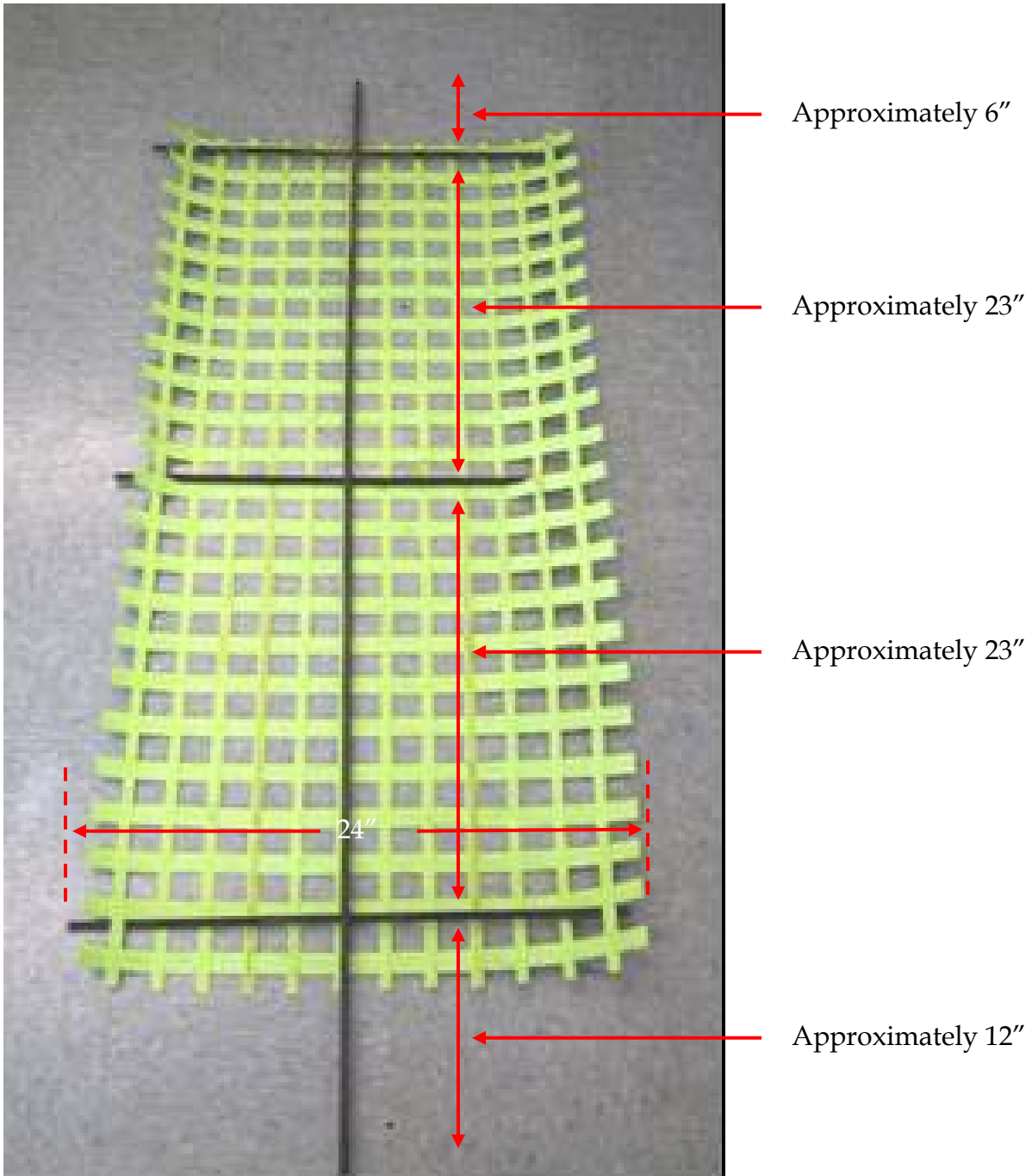


Roof-Rib Grid Material – Vertical Flame Test



Roof-Rib Grid Material – Horizontal Flame Test

Roof-Rib Grid Material Mounting Bar For The Horizontal Flame Test



Mounting bar length is approximately 64 inches