

## 1.0 PURPOSE

The purpose of this standard test procedure (STP) is to determine the maximum surface operating temperature of polycarbonate lenses or components.

## 2.0 SCOPE

This STP encompasses enclosures submitted to MSHA for evaluation under 30 CFR, Part 18.

## 3.0 REFERENCES

Criteria for the Evaluation of a Window or Lens on an Explosion-Proof (X/P) Enclosure, ACRI2102.

## 4.0 DEFINITIONS

N/A.

## 5.0 TEST EQUIPMENT

5.1. Meter and or data acquisition system

5.2. Thermocouple

5.3. Suitable rated power supply or variable transformer

## 6.0 TEST SAMPLES

Four (4) samples of the polycarbonate lens or component to be tested are required. The test shall be conducted with the sample assembled in the frame or assembly in which used. No "equivalent thereof" samples or assemblies shall be used.

## 7.0 PROCEDURES

7.1. Verify that the lens is assembled in accordance with the assembly specifications.

7.2. Attach the thermocouples in a secure manner to three (3) points on the polycarbonate material, nearest the source of heat. The method of attachment will vary, but may include the use of gravity, natural spring of the wire, heat transfer compound, etc.

- 7.3. If using the data acquisition system program, record the temperature at a minimum of every fifteen (15) minutes.
- 7.4. Locate the sample to be tested in “still air” so that temperatures will not be affected by air currents. The sample shall be tested in the position of normal usage. If there is no normal position, the sample shall be tested with the polycarbonate facing up for one (1) test, facing down for one (1) test, and facing perpendicular for two (2) tests.
- 7.5. The equipment shall be tested with the voltage increased to 120% of the nominal rated voltage.
- 7.6. Energize the equipment and record the start time on the surface temperature test sheet.
- 7.7. The test shall be conducted for eight (8) consecutive hours.
- 7.8. Record the finish time and results of the test noting any failures on the surface temperature test sheet.
- 7.9. Continue the procedure until all four (4) samples have been tested.

## 8.0 TEST DATA

- 8.1. Type of attachment used to secure thermocouple to the polycarbonate test sample.
- 8.2. Location of the thermocouple on the polycarbonate test sample. A pictorial diagram may be helpful in this identification.
- 8.3. Note the time and temperature on the surface temperature test sheet each time a measurement is made.
- 8.4 Ambient temperature at time of test
- 8.4. Do not leave any blanks on the test sheet (see Appendix 1)

## 9.0 PASS/FAIL CRITERIA

- 9.1. The surface operating temperature of the polycarbonate material must not exceed 115 degrees C (240 degrees F) as stated in the Criteria for the Evaluation of a Window or Lens on an Explosion-Proof (X/P) Enclosure, ACRI2102.

- 9.2. The polycarbonate material shall not warp, crack, craze or show any evidence of deformation.

## Appendix 1

U.S. Department of Labor  
Mine Safety and Health Administration  
Approval and Certification Center  
Electrical Safety Division  
Triadelphia, WV 26059

Date: \_\_\_\_\_ MR: \_\_\_\_\_

To: \_\_\_\_\_ PAR: \_\_\_\_\_

From: \_\_\_\_\_ MFG: \_\_\_\_\_

Enclosure Type: \_\_\_\_\_

Subject: Surface Temperature Tests

Reference: Title 30 CFR, Part 18.23, ASTP2130

Input: Voltage \_\_\_\_\_, Phase \_\_\_\_\_, Frequency \_\_\_\_\_, Current \_\_\_\_\_, Power \_\_\_\_\_

Bulb Size: Voltage \_\_\_\_\_, Wattage \_\_\_\_\_

Sketch of Temperature Measuring Points

Instrumentation: \_\_\_\_\_

Temperature in degrees C or F

Time, Hour	Ambient Temperature	Measuring Point Number									
		1	2	3	4	5	6	7	8	9	10
0											
1/2											
1											
2											
3											

TITLE: Polycarbonate Surface Temperature Test

MSHA Mine Safety and Health Administration, Approval & Certification Center

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4											
5											
6											
7											
8											

Comments:

Pass/Fail Criteria: