1.0 PURPOSE

To determine if the compound used to encapsulate electrical assemblies, for isolation from potentially explosive atmospheres, can withstand variations in temperature as would normally be encountered in an underground mine environment.

2.0 SCOPE

Encapsulated assemblies and parts evaluated per ACRI2010.

3.0 REFERENCES

3.1. ACRI2001, "Criteria For The Evaluation And Test Of Intrinsically Safe Apparatus And Associated Apparatus"

3.2. ACRI2010, "Encapsulation Criteria"

4.0 DEFINITIONS

None.

5.0 TEST EQUIPMENT

Environmental chamber. This environmental chamber shall be of sufficient size to accommodate the test sample and capable of maintaining a temperature / relative humidity as stated in section 7.

6.0 TEST SAMPLES

One sample of the encapsulated assembly.

7.0 PROCEDURES

7.1. Thermal endurance to heat

7.1.1. The maximum temperature of the encapsulated assembly to be used for the test shall be either:

7.1.1.1. The maximum surface temperature under normal and fault conditions (as defined in ACRI2001); or

7.1.1.2. the maximum temperature at the component surface in the compound under normal operation.

7.1.2. If the maximum temperature of the encapsulated assembly is 75º C or less, the encapsulated assembly shall be subject to continuous storage in an environmental chamber for four weeks at (90 ± 5) % relative humidity at a temperature of (20 ± 2)º C higher than the maximum temperature determined above in 7.1.1, but at least 80° C; or

7.1.3. If the maximum temperature of the encapsulated assembly above is 75º C, the period of four weeks specified above in 7.1.2 shall be replaced by a period of two weeks at (95 ± 2)º C and (90 ± 5) % relative humidity followed by a period of two weeks at a temperature of (20 ± 2)º C higher than the maximum temperature determined above in 7.1.1 with no humidity requirements.

7.2. Thermal endurance to cold

The encapsulated assembly shall be subject to continuous storage for 24 hours in an ambient temperature of at least -25º C, but at most -30º C.

8.0 TEST DATA

8.1. The manufacturer's name and part number of the encapsulation compound.

8.2. The manufacturer’s name and part number of the encapsulated assembly.

8.3. The temperature and relative humidity of the environment during the thermal endurance to heat test, recorded at least hourly.

8.4. The temperature of the environment during the thermal endurance to cold test, recorded at least hourly.

8.5. The physical appearance of the test sample before and after testing.

9.0 PASS/FAIL CRITERIA

9.1. After each test the sample shall be subjected to a visual inspection. No visible damage to the compound that could impair the type of protection shall be evident, for example cracks in the compound, exposure of encapsulated parts, failure of adhesion, inadmissible shrinkage, discoloration, swelling, decomposition or softening. A discoloration on the

surface of the compound is permissible (for example oxidation in the case of epoxy resin).

9.2. In addition, the function of any electrical protective device on which safety depends shall be verified as having operated within its stated parameters.