

## 1.0 PURPOSE

- 1.1. This Standard Test Procedure is used by the Electrical Safety Division to determine if a representative sample of a tracking tag meets requirements of 30 CFR Parts 23.6 and 23.8(a).
- 1.2. To provide a person knowledgeable in the appropriate technical field with a written procedure that will assure consistent repeatable test data and results independent of the person conducting the test.

## 2.0 SCOPE

This Standard Test Procedure (STP) applies to the testing of intrinsically safe machine mounted and/or asset tracking tags approved or evaluated per 30 CFR Part 23. Tracking tags that do not rely on energy current limiting components, spacing, or dust-tightness for intrinsic safety are not subject to this impact test.

## 3.0 REFERENCES

- 3.1. 30 CFR Part 23.6 and 23.8(a)
- 3.2. ASTP2226 Drop Test for Portable Intrinsically Safe Apparatus

## 4.0 DEFINITIONS

- 4.1. Machine mounted tracking tag - An electronic tracking device used to monitor the location of a machine or asset.
- 4.2. Significant Damage - Any breakage, disconnection, short circuit, or similar type of damage that would affect the safety of the intrinsically safe apparatus.
- 4.3. Superficial Damage - Minor damage, chipping of paint, or other similar damage that would not affect the safety of the intrinsically safe apparatus.

## 5.0 TEST EQUIPMENT

- 5.1. Drop Weight (4 lbs.) and Test Apparatus; see Figure 1.
- 5.2. Restricted Access Accessory, if necessary (see Figure 2).
- 5.3. Digital Thermometer. Minimum resolution of 0.2 degree Celsius (°C) and minimum range from 0 to 40 °C (Fluke 2170A).

## 6.0 TEST SAMPLES

One (1) sample of the tracking tag in its marketable form shall be used. If the ASTP2226 drop test was performed, the same sample shall be used in the ASTP2246 impact test.

## 7.0 PROCEDURES

- 7.1. Photograph the sample. The photograph can be added to the test sheet as a reference and used for comparison to the after impact photographs.
- 7.2. Before testing, inspect the sample for any significant damage. A sample having significant damage shall be rejected and replaced by an acceptable sample. Superficial damage shall be noted, but not considered cause for rejection. Record a narrative description of superficial damage on the test sheet. Close up photographs showing any damage may be added to the test sheet.
- 7.3. Conduct the test in an ambient temperature of 25 ( $\pm$  10) °C. Record the ambient temperature on the test sheet.
- 7.4. Verify that the enclosure and the contents are assembled in accordance with the manufacturer's assembly instructions.
- 7.5. Position the tracking tag in the Drop Weight Test Apparatus. The point of impact shall be the center of the side being tested.
- 7.6. Mount the Drop Weight in the Apparatus.
- 7.7. Position the Drop Weight six inches above the tag.
- 7.8. Where needed, use the Restricted Access Accessory to apply the previously described Drop Weight to the desired area.
- 7.9. Position the Restricted Access Accessory in the support. The support cannot grip the accessory; it may only keep it in alignment.
- 7.10. Perform the impact test on each side of the enclosure.

- 7.11. After each impact, inspect the sample for any significant or superficial damage. Record a narrative description of any superficial damage on the test sheet. Photographs of the damage may be added to the test sheet.
- 7.12. If a determination of significant damage can not be made by visual inspection, additional testing shall be conducted after the impact test to ensure that intrinsic safety and suitability for underground use (including dust tight integrity) has not been compromised.
- 7.13. Any detachable components of the intrinsically safe apparatus, such as rechargeable battery packs that rely on integral energy limiting components, or accessories where intrinsic safety is dependent on circuit spacing or a dust tight enclosure, shall undergo an additional series of impact tests as detailed in Sections 7.1 through 7.13.

## 8.0 TEST DATA

- 8.1. Ambient temperature.
- 8.2. Test equipment identification (e.g. model number, part number, serial number, and calibration due date if applicable), to include use of Restricted Access Accessory if applicable.
- 8.3. Before impact test photographs and after impact test damage photographs (if applicable).
- 8.4. Sample identification (e.g. manufacturer, model number, part number, serial number).
- 8.5. Impact surface. A numbered photograph or pictorial sketch of the test sample may be used.
- 8.6. Results of the visual inspection after each impact. Include an explanation for failure, if applicable.
- 8.7. Any additional information, comments, or observations about the test and the rationale for any additional testing conducted.

## 9.0 PASS/FAIL CRITERIA

- 9.1. No significant damage shall be incurred by any sample tested that would affect the intrinsic safety and suitability for underground use of the test sample.
- 9.2. For equipment requiring a dust tight enclosure to exclude coal dust entry, the enclosure of the sample shall continue to be dust tight after the impact test.
- 9.3. There shall be no separation or ejection of the battery or batteries from the apparatus.

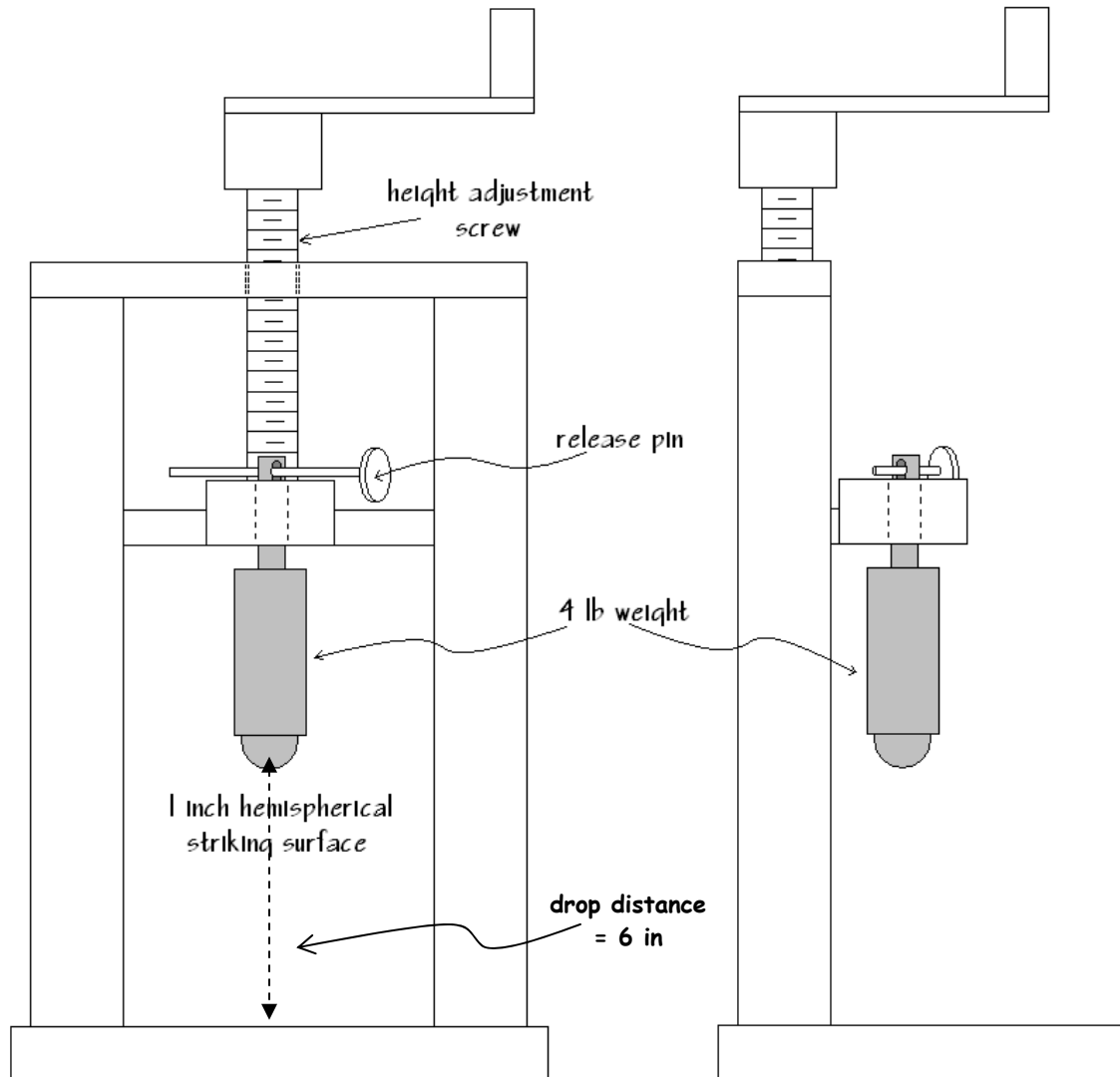


Figure 1 - Drop Weight Test Apparatus

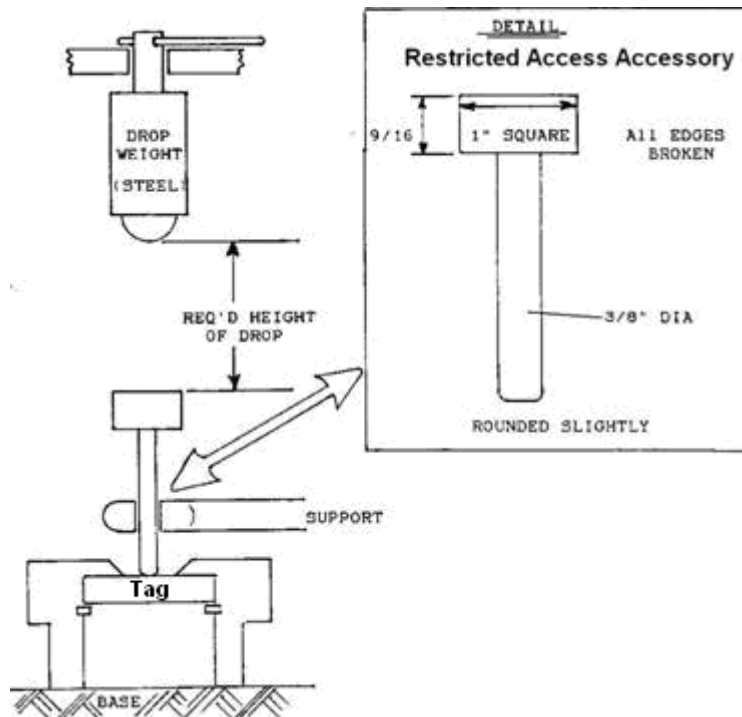


Figure 2 - Drop Weight Test Apparatus with Restricted Access Accessory