

## OmniMarker™ II Electronic Marker

### Construction and Testing

Conformance testing for the Omni Marker II has been carried out both in house at Greenlee and at Intertek Building & Construction (B&C) laboratory, 130 Derry Court, York, Pennsylvania.

### Materials

#### *Mouldings*

- Base material; HDPE with Masterbatch pigment, UV and heat stabilisers where required.
- Hot plate welding process is same as older markers. 100% leak test during pilot production.
- Weld is protected in a similar design to the older markers by overlapping plastic lip.

#### *Copper wire*

- Copper round wire with Polyurethane coating. UL Class 155.

#### *PCB Material*

- Fully impregnated, glass reinforced, FR4 - TG 170°C, 1 oz Copper.
- Solder alloy: CVP 390 sac305. Lead Free. Halogen Free. Reach / RoHS compliant.

#### *Capacitors*

- NP0 (COG) low temperature co-efficient, zero (<0.1%) ageing and 1% or better tolerance parts.

### Testing

#### *Thermal Cycling*

- Functional testing has been carried out between -30 C and +65 C: Pass.

#### *Drop Testing*

- IEC 60068-2-32 "Free Fall": 10 ft (3 m) drops onto concrete: two samples of each version (20 markers in total), were dropped five times each in random orientation (100 drops in total). All were visibly inspected before being leak tested, checked for resonance frequency and that the gimbal mechanism allows the coil to be horizontal within acceptable tolerance: Pass.

#### *Single Point Crush Testing*

- 35 lb (16 kg) applied by 3/16 in. (4.75 mm) radius loading nose to main shell and joint shall cause less than 0.25 in. (6.3 mm) deflection. Pass.

#### *Deformity (compression)*

- 400 lb (181 kg) force distributed by large (1.5 in., 40 mm) aggregate for one hour shall not compromise the chassis. Minor scuff marks only.

#### *Puncture Testing*

- 15 lb (7 kg) applied by 1/64 (0.4 mm) radius loading nose shall not compromise chassis. Dent observed that did not penetrate the shell nor compromise self-levelling capability.

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Notes: All tests were performed at room temperature unless otherwise specified.