



Safety Helmet saves Construction Worker from Certain Injury

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On a recent Saturday, two Construction Team Inspectors, Denis Howard and Clive Woodington attended an accident at a Sydney demolition site where a structure was in the process of being removed and the building materials recycled. Timber doorframes and header beams had been removed, and this had left a 3-metre vertical, single brick (110mm) thick wall standing without support. Without warning it had collapsed on a worker, flattening him to the ground beneath it.

Miraculously, although the worker was taken to hospital, he survived with only superficial injuries and was released the next day. Upon investigation it became apparent that the worker had in fact taken the full brunt of the collapsing brick wall on the safety helmet he was wearing. Without his safety helmet he would inevitably have had more extensive injuries.

From the picture below it is clear that the helmet performed its role in accordance with the Australian Standard for such helmets even though it almost split in two with the force of the collapsing wall.

Safety Helmets are designed to absorb impact by a combination of three factors: -

- the helmet shell deflects the object and absorbs some of the shock
- sacrificial damage to the harness
- stretching of the harness itself

The aim is for the force to be spread over the surface of the head with the chance of injury lessened.

Three categories of helmets (General, High Temperature and Bushfire) are tested against Australian Standard AS/NZS 1801-1997 for Occupational Protective Helmets. For each model the helmets are conditioned for hot (50 degrees C) and cold (-10 degrees C) as well as wet (room temperature). The major test for helmets is the shock absorption test where, in laboratory conditions, a 5kg mass is dropped from a distance of one metre directly onto the safety helmet (see photograph on page 5).



The aim of this test is not necessarily to determine whether it breaks upon impact, but whether the force transmitted would be enough to injure a person wearing it in the event of an industrial accident. The helmet is also subjected to a penetration test by having a sharp 3kg mass dropped onto it. Other tests conducted on safety helmets include:

- High stability test at 120 degrees to determine shell stability for use in high temperature workplaces such as furnace work and extremely high heat test at 200 degrees to ensure suitability for Bushfire fighting.
- The flammability of accessories such as neck and ear protectors.
- Stiffness testing to ensure the safety helmet won't crush in on the wearer if trapped.
- And checks conducted for smoothness, colour, dimensional requirements and marking of the safety helmet.

In respect of personal protective equipment in many industries such as fire-fighting, construction, quarrying and mineral extraction, these are often the last line of defence and workers have a major expectation that these items will protect them.

In the case of the demolition worker it did exactly that and more.

The Personal Protective Equipment Laboratory at TestSafe Australia is Australia's leading independent laboratory, and covers a broad range of PPE testing, including respiratory protective devices and Safety Helmets. Its clients range from small business to large multinational companies. It is an approved test facility for certification work for SAI-Global, and the PPE staff are active members of the relevant Standards Australia committees.

