Australian Standard®

Methods of testing protective helmets

Method 9: Determination of resistance to localized loading

1 SCOPE. This Standard sets out a method for determining the ability of a protective helmet to distribute the force of an impact.

2 REFERENCED DOCUMENTS. The following documents are referred to in this Standard:

AS
2512 Methods of testing protective helmets
2512.2 Method 2: General requirements for the conditioning and preparation of test specimens and laboratory conditions
2512.3.1 Method 3.1: Determination of impact energy attenuation—Helmet drop test

3 PRINCIPLE. An anvil is dropped towards the outer surface of a helmet positioned on a hemispherical headform. The force imparted to a force transducer mounted in the headform is measured.

4 APPARATUS. The following test apparatus is required: (The arrangement of the apparatus is shown in Figure 1.)

(a) Headform with a hemispherical upper surface of radius 70 mm, made of steel and constructed as shown in Figures 2 and 3.

Measurement of the force generated over a circular area of 100 mm^2 by means of a calibrated force transducer.

(b) Drop anvil complying with the following requirements:

(i) The mass of the anvil and drop assembly shall be 3 $+0.045$ -0 kg.

(ii) The anvil is constructed of steel, 250 mm long with the cross-section as shown in Figure 4.

(iii) The anvil is mounted so that the centre of gravity of the anvil and drop assembly is above the centre of the load measurement area; with the axis horizontal and with the 90 degree edge at the bottom.

(iv) The impacting surface is to be a ground finish and the edge shall have a radius of 10 mm ± 0.5.

(c) Mount as specified in AS 2512.3.

(d) Means of controlling the direction of free fall.

5 PROCEDURE. The procedure shall be as follows:

(a) Condition and prepare the helmets in accordance with AS 2512.2.

(b) Ensure that the laboratory conditions are as specified in AS 2512.2.

(c) Select test points.

(d) Position the helmet on the hemispherical headform.

(e) Drop the impact anvil from the height specified in the product Standard towards the outer surface of the helmet.

(f) Measure the force imparted to the force transducer.

NOTE: The height is measured from the impactors leading edge to the impact point on the outer surface of the helmet unless the test point is a hole. In that case, measure the height of the anvil from the edge of the hole nearest to the anvil.