

Australian/New Zealand Standard™

Methods of testing protective helmets

Method 2: General requirements for the conditioning and preparation of test specimens and laboratory conditions

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee CS-097, Testing of Helmets and Visors, to supersede AS/NZS 2512.2:1998. *Method of testing protective helmets, Part 2: General requirements for the conditioning and preparation of test specimens and laboratory conditions.*

This Standard is republished without technical alteration.

METHOD

1 SCOPE

This Standard sets out the conditioning procedures for protective helmets that are to be tested, the ways in which the helmets are prepared for testing, and the laboratory conditions for testing.

2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS/NZS

2512 Methods of testing protective helmets

2512.1 Method 1: Definitions and headforms

ISO

5272 Toluene for industrial use—Specifications

3 DEFINITIONS

For the purpose of this Standard, the definitions given in AS/NZS 2512.1 apply.

4 CONDITIONING

Prior to testing, helmets shall be conditioned as follows:

- (a) *Ambient temperature* At least one helmet shall be conditioned by being exposed to a temperature of 18°C to 25°C for 4 h to 30 h.
- (b) *Low temperature* At least one helmet shall be conditioned by being exposed to a temperature of $-10 \pm 2^\circ\text{C}$ for 4 h to 30 h in a controlled environmental temperature apparatus.

- (c) *High temperature* At least one helmet shall be conditioned by being exposed to a temperature of $50 \pm 2^\circ\text{C}$ for 4 h to 30 h in a circulating air oven.
- (d) *Water immersion* At least one helmet shall be immersed in water at a temperature of 18°C to 25°C for 4 h to 30 h.
- (e) *Solvent* Where specified, test helmets shall be treated as follows:
 - (i) The entire exterior surface of the helmet shall be treated with approximately 25 mL of the conditioning solvent, being a mixture of 50 percent toluene (any grade in accordance with ISO 5272) and 50 percent iso-octane.
 - (ii) The solvent shall be applied initially to the exterior surface of the helmet in the areas within 50 mm of the retention system fixing points for not less than 5 s each, and then to the remainder of the exterior surface for not less than 10 s.
 - (iii) At least 30 min shall elapse before further conditioning and testing.

NOTES:

- 1 As the solvent components have high and different evaporation rates, it is necessary to store the solvent in a non-permeable container and to use the solvent before evaporation losses change the proportions of the components.
- 2 Application may be by means of a cotton cloth approximately 150 mm square, which has been soaked in the solvent.
- 3 Appropriate precautions need to be taken in handling the solvent, by avoiding inhalation, contact with the skin or eyes, and use near any ignition source.

If during testing the time out of the conditioning environments specified in Items (a) to (d) for a test helmet exceeds 5 min, the helmet shall be returned to the conditioning environment for a minimum of 3 min for each 1 min out of the conditioning environment or 4 h, whichever is the lesser, before testing is resumed.

5 DETERMINATION OF THE TEST LINE

The test line of the helmet shall be determined as follows:

- (a) Place the complete helmet to be tested on a reference headform of the largest size which it fits when the headband is adjusted to its largest setting, or if no headband is provided, the largest size corresponding to the interior circumference of the helmet at the AA' line. Ensure that the reference headform is firmly seated with the basic and reference planes horizontal.
- (b) Apply a static force of 45.0 ± 0.5 N to the apex of the helmet. Centre the helmet laterally and seat it firmly on the reference headform according to its helmet positioning index.

The helmet positioning index is determined by positioning the helmet on the headform in the manner in which it is intended to be worn. The helmet should not be tilted artificially forward or rearward on the headform in order to cover the test line, when a user would not normally wear the helmet in such a position.

- (c) Maintaining the above force and position, draw the test line as defined in AS/NZS 2512.1 on the outer surface of the helmet.

6 POSITIONING FOR TESTING

The helmet shall be placed on a test headform of the same size designation as the reference headform used for determining the test line, in a position that conforms to its helmet positioning index. The helmet shall be secured so that it does not shift position prior to testing.