1998 ADDENDUM TO STANDARDS FOR PROTECTIVE HEADGEAR

For Children Four years of Age and Younger

For Use in Bicycling

Foreword

This addendum applies to two different helmet standards promulgated by the Snell Memorial Foundation:

1. The 1998 Augmentation to the 1990 Standard for Protective Headgear for Use in Bicycling. (B-90)
2. The 1995 Standard for Protective Headgear for Use in Bicycling (B-95) including the January 1998 addendum.

This addendum incorporates into these two Snell standards the special provisions set by CPSC for helmets intended for use by children under five years of age. Young children's helmets meeting the requirements of the two base standards as modified by this addendum will therefore also meet the performance requirements set by CPSC. However, CPSC also imposes packaging and informational requirements over and above those of these modified standards.

If written assurance is provided that headgear duly Snell certified and labelled to the augmented standard will also satisfy the additional packaging and informational requirements, the Foundation will authorize labelling, packaging and advertising confirming the Foundation's findings that the product indeed "Complies with CPSC Safety Standard for Bicycle Helmets for Persons Age 1 and Older (Extended Head Coverage)."

Introduction

The Consumer Product Safety Commission standard for bicycle helmets establishes performance requirements for two categories of helmet: helmets intended for persons older than one year, and helmets intended for persons older than five years. The first category applies to young children and the second to older children and adults.

The only difference in the requirements for these two categories is in head coverage. The helmets intended for young children are subject to impact testing over a greater area of their surface. The essence of this difference is that these helmets must provide all the protection demanded of helmets intended for adults and, in addition, must also protect their wearers from impacts falling lower on the brow, sides and back of the head.

This difference in head coverage is the only difference in the performance requirements set by CPSC for the two categories of usage. Therefore, this addendum describes an extent of protection and test line satisfying CPSC requirements for children's helmets. The impact test requirements of the base standards apply to the entire portion of the helmet on or above this redefined test line. Unless specifically waived, all other requirements set in the base standards will continue to apply as before.

Extent of Protection

The extent of protection corresponds to that region of the head for which protection is sought. This region is defined according to the geometry of two

reference headforms: 'A' and 'E' which are described in International Standards Organization (ISO) Draft Standard ISO DIS 6220-1983.

This addendum describes a number of planes and points fixed in the geometry of these ISO headforms. Some of these have been taken directly from the ISO DIS 6220-1983. The basic plane corresponds to the anatomical plane (Frankfort plane) that includes the auditory meatuses and the inferior orbital rims. The longitudinal or midsagittal plane is perpendicular to the basic plane and is the plane of symmetry dividing the right half of the headform from the left. The transverse or coronal plane is perpendicular to both the longitudinal and basic planes. It corresponds to the anatomical plane that contains the two auditory meatuses and divides the front from the rear portions of the head. The reference plane is parallel to the basic plane and lies above it at a distance determined by the size of the headform: 24 mm and 26 mm for the 'A' and 'E' headforms respectively.

The following entities have been defined purely for the purposes of this Standard. The reference point is the point on the front of the headform at which the reference and longitudinal planes intersect. The CC_0 plane is parallel to the reference plane and lies above it at a distance determined by the size of the headform: 15 mm and 17 mm 'A' and 'E' headforms respectively.

The CC_1 plane is parallel to the reference plane and lies below it at a distance of 3 mm regardless of headform size. The CC_2 plane is parallel to the reference plane and lies below it at a distance of 30 mm and 32 mm for the 'A' and 'E' headforms respectively.

The CC_3 plane divides the front of the head from the middle and rear portions. It is parallel to the transverse plane and lies behind the reference point at a distance of 48 mm and 52 mm for the 'A' and 'E' headforms respectively. The CC_4 plane divides the back of the head from the front and middle portions. It is parallel to the transverse plane and lies behind the reference point at a distance of 103 mm and 111 mm for the 'A' and 'E' headforms respectively.

The extent of protection provided by the helmet must include the entire region above the CC_0 plane and forward of the CC_3 plane, the entire region above the CC_1 plane and between the CC_3 and CC_4 planes, and, finally, the entire region above the CC_2 plane and behind the CC_4 plane. (See Figure 1.)

Helmet Marking

The requirements and procedures for helmet marking set in the two base standards do not apply to helmets intended for children less than five years of age. Instead, the helmet shall be placed on 'E' headform, or, if the helmet is too small for an appropriate fit, on the ISO 'A'.

The helmet shall be held in place by an applied force of fifty newtons (11.25 lbs) and its positioned adjusted according to the manufacturer's specified helmet positioning index (HPI). If the manufacturer has failed to provide HPI information, the helmets will be positioned according to the technician's best judgement. If the helmets meet certification requirements, those positioning indices will be used in all future testing.

Once the helmet is properly positioned, the intersections of the helmet's

exterior surface with the various headform planes will be traced onto the helmet in the following manner. The level of the CC_0 plane is marked on that portion of the helmet in front of the CC_3 plane. The level of the CC_1 plane is marked on both sides of the helmet between the CC_3 and CC_4 planes. The level of the CC_2 plane is marked on the back of the helmet behind the CC_4 plane. Finally, the segments of the CC_3 plane between the CC_0 and CC_1 planes and the segments of the CC_4 plane between the CC_1 and CC_2 planes shall be marked on the sides of the helmet.

These lines enclose the top of the helmet and mark the boundary of the extent of protection. A test line shall be marked within this boundary so that it is 15 mm from the closest point on the boundary as shown in Figure 1.

If the boundary of the extent of protection falls below the edge of the helmet it need not be a cause for rejection. However, if, in the test technician's judgement, there is insufficient material in the helmet below the test line to withstand impact testing without endangering the test equipment, the helmet may be rejected at this point in the procedures.

Peripheral Vision

The requirements and procedures set for peripheral vision in the base standards do not apply to helmets intended for children less than five years of age. Instead, the helmet will be placed on the appropriate headform and positioned according to the procedures for helmet marking.

The peripheral visual clearance, shown in Figure 2, is the solid angle bounded by the reference plane, the CC_2 plane and two more planes that are perpendicular to

the reference plane and that contain the point on the front of the headform where the longitudinal and reference planes intersect. One of these two planes forms an angle of 105° with the longitudinal plane and lies to the left of the headform. The other forms the same angle to the right of the headform. No part of the helmet may intrude into this clearance.

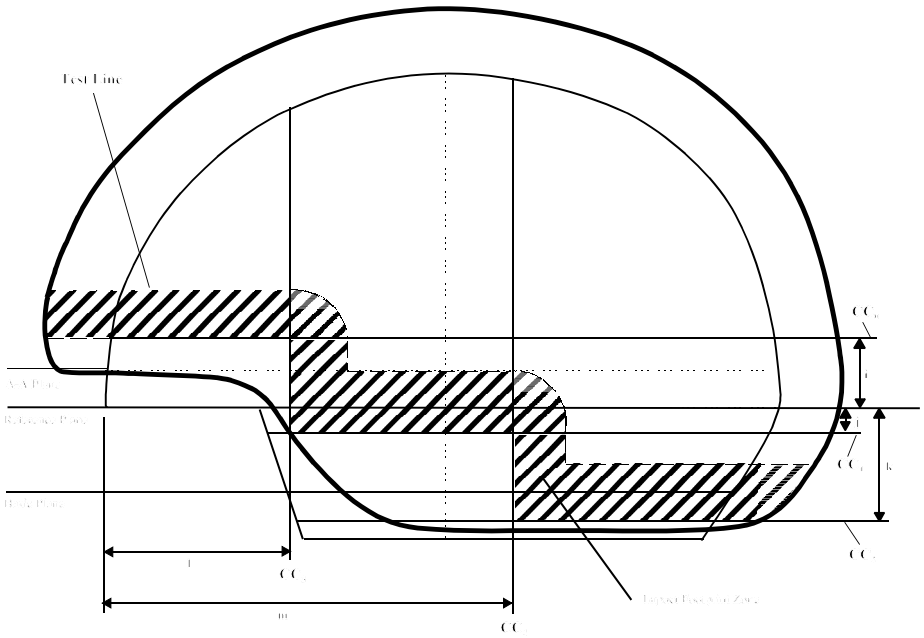

Figure 1 Extent of Protection

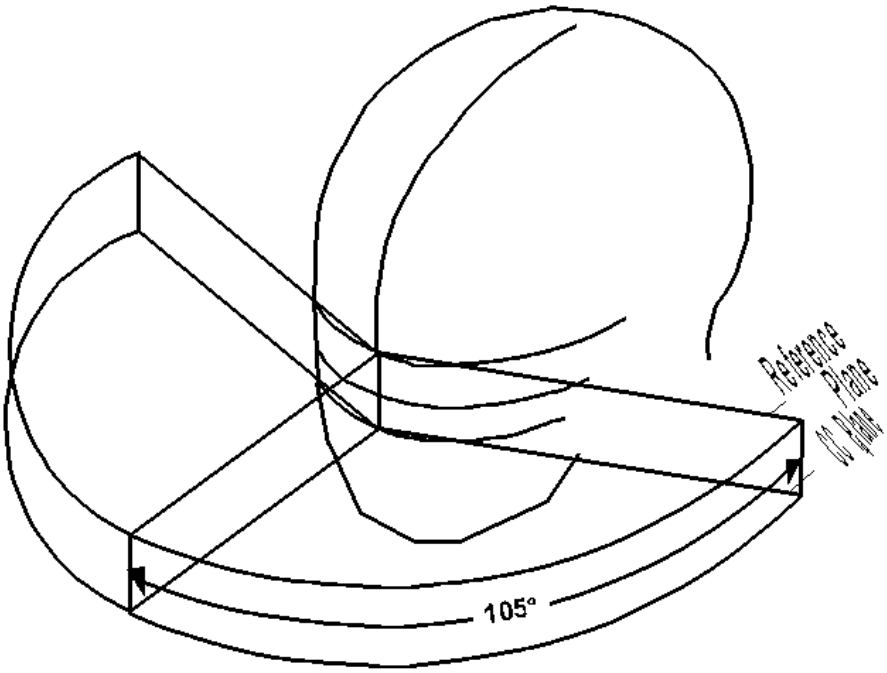

Figure 2 Peripheral Vision