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**Protective helmets for motor vehicle
users**

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Safety Appliances Association (JSAA)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS T 8133**:2007 is replaced with this Standard.

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Protective helmets for motor vehicle users

Introduction

This Japanese Industrial Standard was established in 1970 and has gone through eight revisions since then, the last of which was made in 2007. The revision at this time is intended to eliminate ambiguities recognized in the test method and acceptance criteria given in the previous edition.

1 Scope

This Standard specifies the protective helmets (hereafter referred to as “protective helmets”) for riders/drivers and passengers of mopeds, motorcycles (with sidecar), and general four-wheel automobiles.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS B 1501 *Rolling bearings—Balls*

JIS D 1050 *Road vehicles—Techniques of measurement in impact tests—Instrumentation*

JIS G 3101 *Rolled steels for general structure*

JIS G 4401 *Carbon tool steels*

3 Terms and definitions

For the purpose of this Standard, the following terms and definitions apply.

3.1 protective helmet

a head gear worn for the purpose of absorbing the impact energy to the head so as to minimize head injury caused by the impact

3.2 shell

the material which covers the wearer’s head and provides the general form of the helmet

3.3 anti-concussion liner

a material applied over the inner surface of the shell for the purpose of absorbing impact energy

3.4 interior cushion

a material provided in the protective helmet for the purpose of user’s wearing comfort

3.5 supporting device

a device for keeping the protective helmet in an appropriate position on the head, which has two types shown below

It may have an adjustment part or a part for improving fitness.

- a) chin strap: a strap worn under the wearer's chin for keeping the protective helmet in an appropriate position.
- b) opening and closing device without a chin strap: a device attached under the wearer's chin instead of a chin strap, for keeping the protective helmet in position.

3.6 chin cup

an accessory formed to fit the wearer's chin

3.7 chin guard

a part of the protective helmet for covering the lower part of the wearer's face, which is either removable or integrated with the shell

3.8 peak

an extension of the shell above the eyes, that can be either integrated with the shell or detachable from it

3.9 shield

a transparent protection plate situated in front of the wearer's eyes, to cover a part of the wearer's face ¹⁾

3.10 goggles

a transparent ¹⁾ protective part enveloping the eyes

Note ¹⁾ A transparency means a total light transmittance of 70 % or higher.

3.11 base plane of head

a horizontal plane passing through the lower edges of external auditory pores and eye sockets

3.12 base plane of headform

a plane on the headform which corresponds to the base plane of head [see Figure 2 a)]

3.13 reference plane

a plane given on a drawing which is parallel to and at a certain distance, relative to the size of the headform, from the base plane of headform [see Figure 2 a)]

3.14 vertical centre axis

a straight line which passes through the anteroposterior and lateral centre of the reference plane of headform, which is perpendicular to the base plane of headform [see Figure 2 a)]

3.15 central sagittal plane

a plane passing through the vertical centre axis, which divides symmetrically the head, the headform or the protective helmet to be placed [see Figure 2 b)]

3.16 size of headform

the dimensions of the headform to be used for testing a protective helmet (see Annexes B and C)

3.17 size of protective helmet

an inside periphery length of the interior cushion expressed in centimetres

For size-adjustable protective helmets, it is expressed by the smallest and largest periphery lengths of the interior cushion within the adjustable range.

3.18 flip-up helmet

a helmet with a flip-up chin guard which rotates upwards to open the helmet

3.19 breath guard

a mask inserted between the shell of the upper part of the chin guard and buffer material, for keeping the wearer's breath from reaching the inner surface of the shield and thus preventing clouding of the shield

3.20 accessories

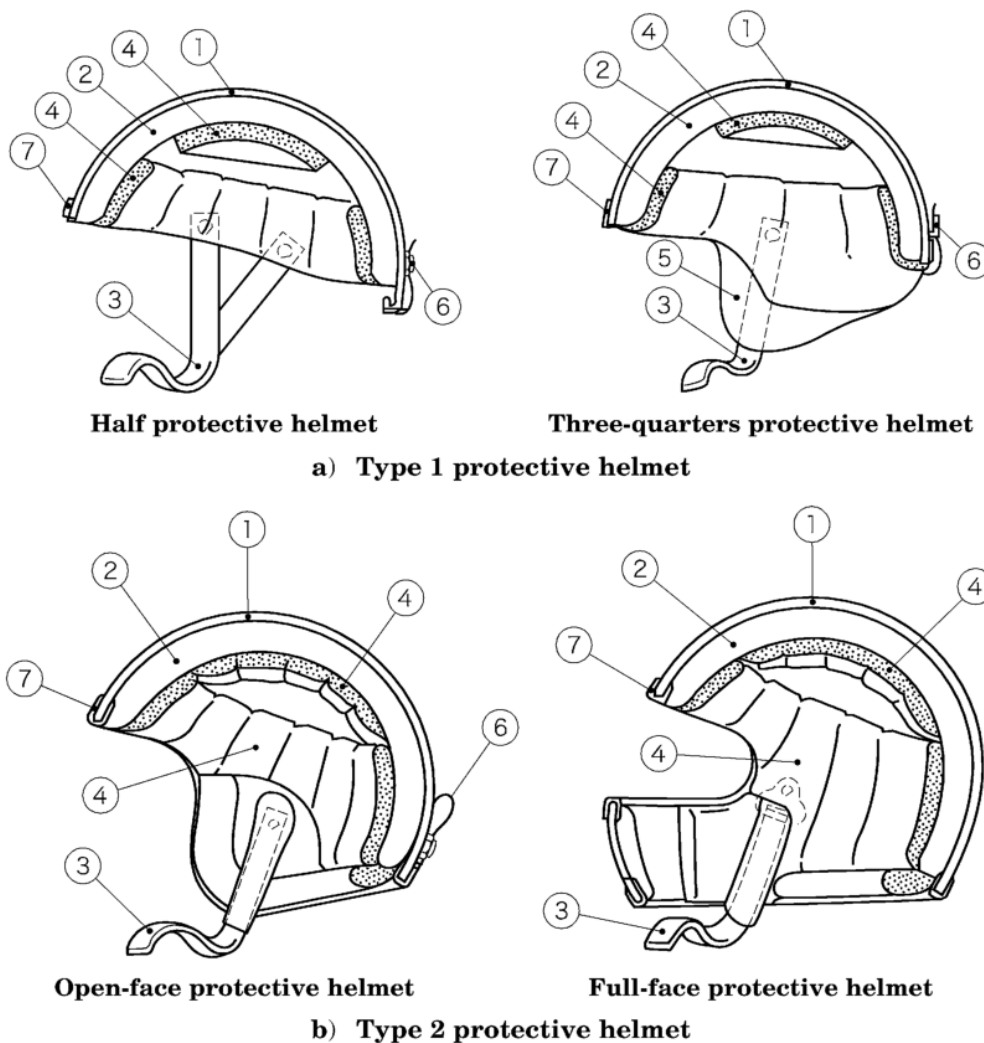
parts which are included in the package of protective helmet, but not initially fitted on

4 Types

Types of protective helmets are as shown in Table 1 according to their performances and shapes (see Figure 1).

Table 1 Types of protective helmets

Type	Performance	Shape	Use
Type 1	Type 1 performance as specified in clause 5	Half type Three-quarters type	Applicable to riders of mopeds, motorcycles with total emission of 0.125 L (125 cc) or less and general four-wheel automobiles, as specified in the Road Traffic Act.
Type 2	Type 2 performance as specified in clause 5	Open-face type Full face type	Mainly applicable to riders of motorcycles as specified in the Road Traffic Act.



No.	Name	No.	Name
①	Shell	⑤	Ear covers
②	Anti-concussion liner	⑥	Goggle clamp
③	Chin strap	⑦	Edge covering
④	Interior cushion		

Figure 1 Constructions of protective helmets (examples)

5 Performance

5.1 Shock absorption

When the test specified in 7.4 is carried out, the shock absorption specified in Table 2 shall be satisfied.

Table 2 Shock absorption requirement

Type	Maximum shock acceleration	Duration of 1 470 m/s ² {150 G} or over
Type 1	2 940 m/s ² {300 G} or less	4 ms or less
Type 2	2 940 m/s ² {300 G} or less	6 ms or less
NOTE : Numeric values in braces show conventionally used values of gravitational acceleration (G).		

5.2 Penetration resistance property

When the test specified in **7.5** is carried out, the tip of the striker shall not touch the headform.

5.3 Strength of supporting device

When the test specified in **7.6.1** or **7.6.2** is carried out, the dynamic elongation shall not exceed 35 mm, and the residual elongation shall not exceed 25 mm. The protective helmet shall be easily removable from the headform.

5.4 Supporting capacity (roll off)

When the test specified in **7.7** is carried out, the protective helmet shall not come off the headform.

5.5 Peripheral visual field

When the test specified in **7.8** is carried out, the following requirements shall be satisfied.

For protective helmets with adjustable peak and chin guard or flip-up helmets, the requirements in **a)** to **c)** shall be satisfied within the adjustable range.

For protective helmets with the breath guard provided on the central part (where the wearer's nose is), the downward peripheral vision may be tested with the breath guard removed.

“With the breath guard removed” means with the breath guard detached if it is detachable, or partially cut off if permanently attached.

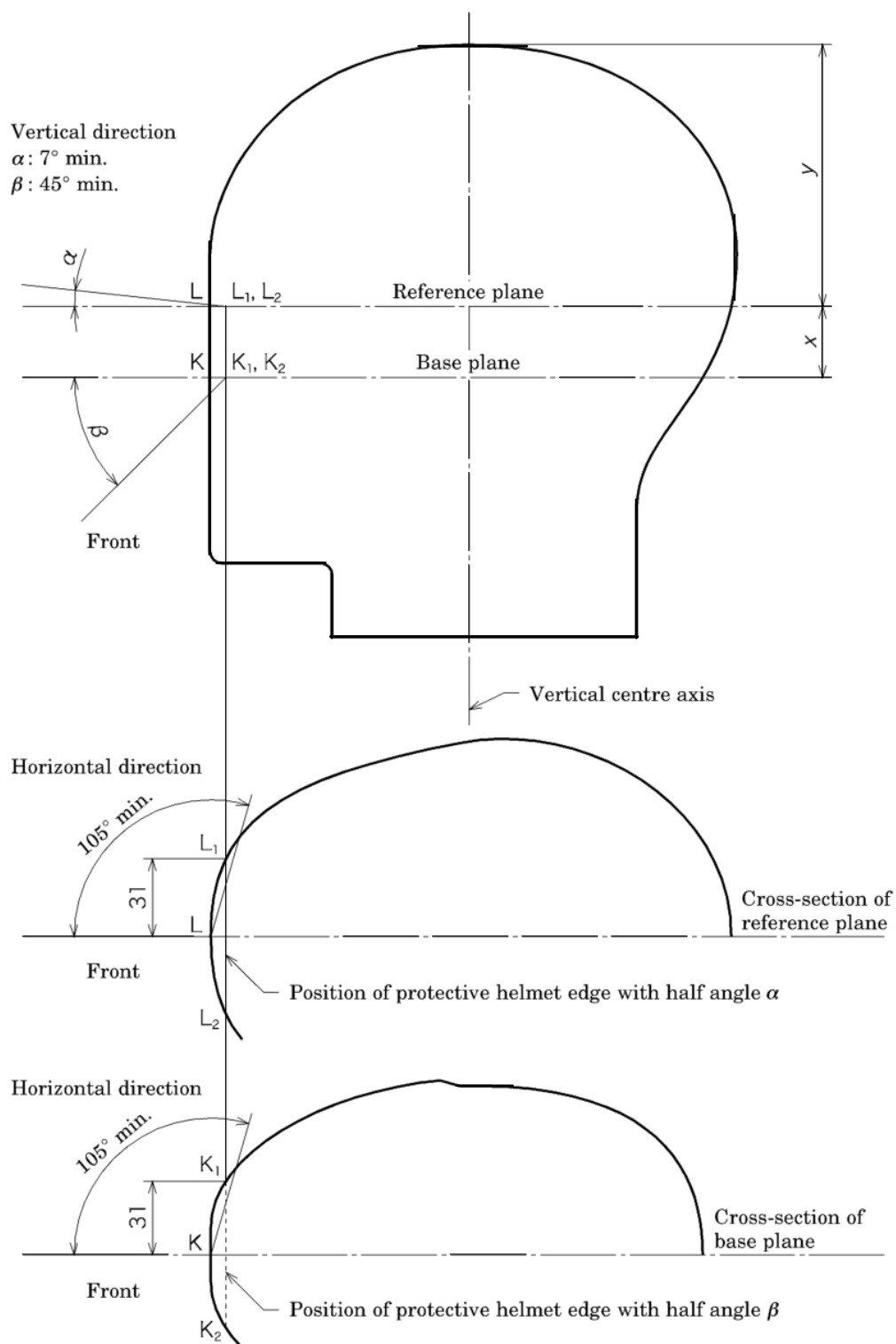
- a) **Horizontal direction** As shown in Figures 2 a) and 2 b), in the two sets of planes each forming a symmetrical V-shape with respect to the line LK on the central sagittal plane of the headform between the reference plane and the base plane, the angle between each V shape and central sagittal plane shall be not less than 105°.
- b) **Upward direction** As shown in Figures 2 a) and 2 c), the angle between the reference plane of the headform and the plane having a straight line L₁ L₂ as a ridge line shall not be less than 7°.

L₁ L₂ shall be located 31 mm to the left and 31 mm to the right of L, respectively, on the reference plane of headform.

- c) **Downward direction** As shown in Figures 2 a) and 2 c), the angle between the base plane of headform and the plane having a straight line K₁ K₂ as a ridge line shall not be less than 45°.

K₁ K₂ shall be located 31 mm to the left and 31 mm to the right of K, respectively, on the base plane of headform.

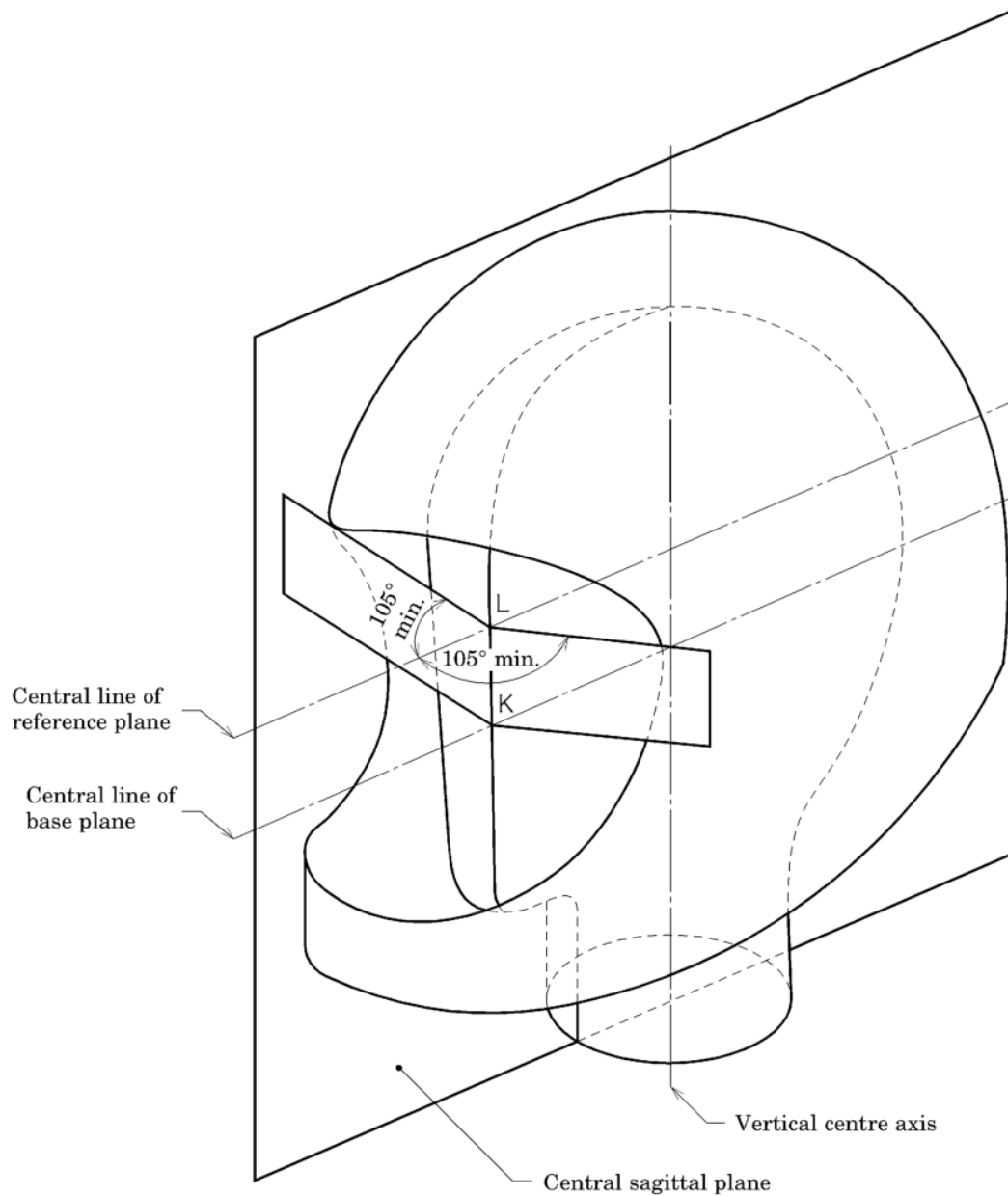
Unit: mm



NOTE : See Figure 4 for x and y .

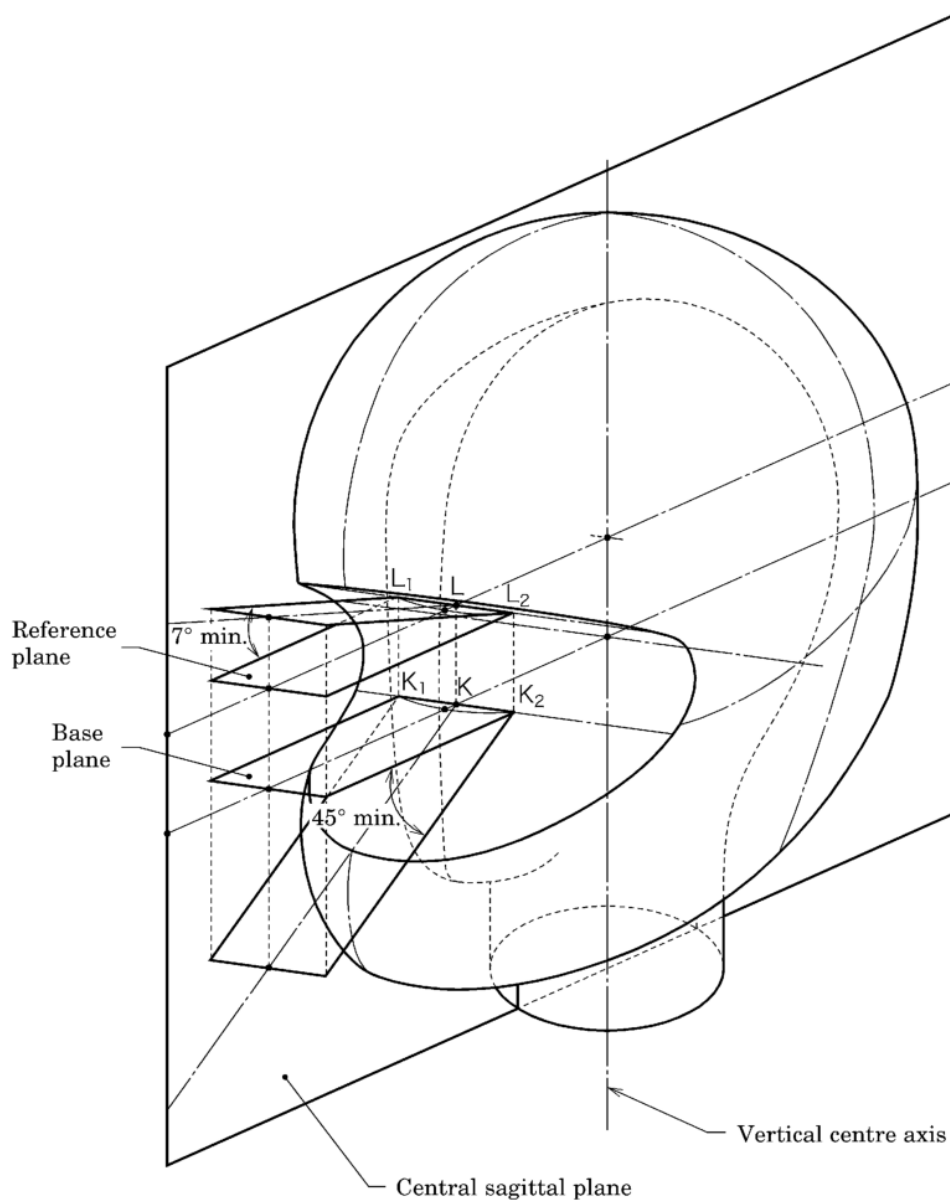
a) Peripheral visual field

Figure 2 Peripheral visual field



b) Peripheral visual field—Horizontal direction

Figure 2 (continued)



c) Peripheral visual field—Vertical direction

Figure 2 (concluded)

5.6 Shield open angle (applicable to protective helmets with a shield)

When the test specified in 7.9 is carried out, the angle between the tangential line MN specified in Figure 3 and the horizontal shall be 5° or over.

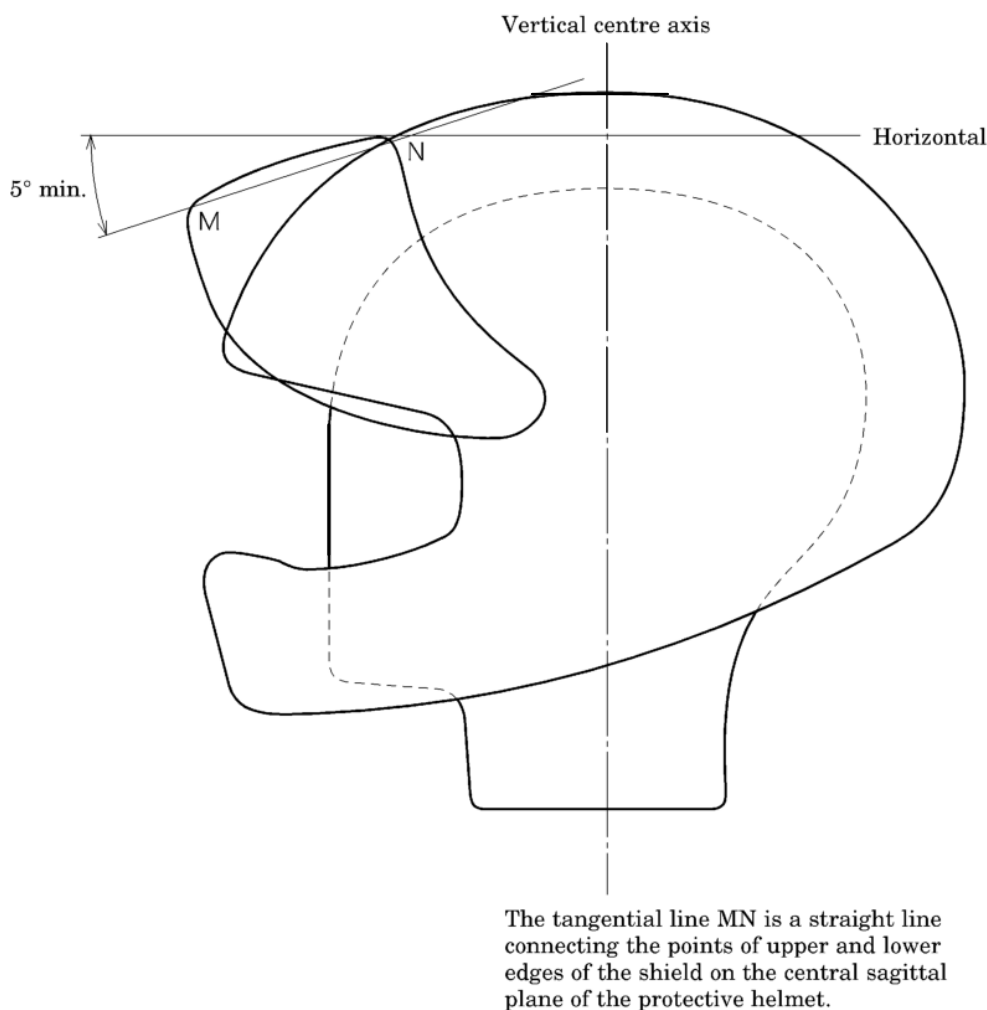


Figure 3 Test of shield open angle

5.7 Shield strength (applicable to protective helmets with a shield)

When the test specified in 7.10 is carried out, a steel ball shall not penetrate the shield mounted on the protective helmet, and shall not break into two or more pieces.

6 General construction

6.1 Basic construction

The protective helmet consists of a shell, anti-concussion liner, interior cushion and supporting device for protection of a wearer's head from impact. The protective helmet shall have sufficient durability to withstand usual handling. The parts of the protective helmet (peak, rivet, vent hole, size adjusting device, edge covering, fastener, etc.) shall be so designed and manufactured as not to injure the wearer in general use, and shall be as follows.

- a) The outer surface of the protective helmet shall be substantially smooth. The helmet shall be made of such materials as to minimize friction with road surface in case of falling, and any protrusion or bump on the helmet surface, if applicable, shall be chamfered so as to obtain smooth corners. The form of the helmet above the reference plane shall be of a continuous convex curved surface except for the case where