



STANDARDS FOR
PROTECTIVE HEADGEAR
1962

SNELL MEMORIAL FOUNDATION
SAN FRANCISCO, CALIFORNIA

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FOREWORD

The 1962 Standards for Protective Headgear represent an expansion of the criteria established by the Snell Memorial Foundation for the design of racing crash helmets. Since the 1959 Standards were published, numerous consumer groups with activities not related to the sphere of automotive racing have evinced interest in the field of head protection. The common concern of all these groups is the hazard of exposure of the head to the transfer of impact energy. The ill effects of such transfer are independent of the way in which the impact energy is generated. The inadequately protected head cannot distinguish the kinetic energy of an impact against a rock, tree, rollbar or ski pole from that of a falling object dropped from a height. As a consequence, the basic problems of head protection are common to most of these interested groups. Certain consumer groups may have specialized, unique additional requirements. In such cases the necessary test criteria may be developed and issued in appropriate appendix form from time to time.

In the present expansion of the Snell Foundation Standards, it was felt that where several test conditions might be employed for essentially the same purpose, the most severe of such would be adopted on the premise that maximum possible protection should be the desired goal. The state of the art of protective headgear manufacture has advanced appreciably since the 1959 Standards were published, thus allowing the current revision to be more demanding in the severity of its test requirements.

The Foundation does not presume to recommend specific products or impose its specifications upon either manufacturer or consumer. It offers its test facilities to bona fide manufacturers and makes available

to any interested consumer group a means of identifying those products which have successfully met its standards. The Foundation neither has nor will accept any power of enforcement upon any consumer group.

It must be understood that the protection given by any protective head-gear is necessarily less than complete, and that the wearing of such may not entirely prevent head injury or even death in certain severe accidents. The best helmet is but one link in a long chain of safety which may include such factors as seat belts, restraining harnesses, proper training and conditioning, and most importantly adequate safety education. The weakening of any one link in this chain tends to destroy the basic value of the entire chain.

The attention of the consumer must be called to the fact that of necessity helmets are constructed so that the energy of a severe blow is absorbed in the partial destruction of the helmet. This damage may not be readily apparent and it is strongly recommended by the Foundation that consumer groups require that any helmet involved in a significant accident be returned to the manufacturer for competent inspection. If such inspection is not readily available, the helmet should be replaced.

CONSTRUCTION

a). **General:** The helmet shall consist of a hard, smooth shell lined with protective padding material or fitted with other means of energy absorption and shall be strongly attached to a strap designed to fasten under the wearer's chin. The assembled helmet shall have a smooth external surface without reinforcing ridges or other rigid external projections except that a goggle clip may be used at the rear of the helmet if desired, and a ledge may be moulded at the front edge to support a visor. Such goggle clips shall not project more than three-sixteenths of an inch from the outer surface of the shell. Such ledge, if included, shall not project more than three-eighths of an inch from the outer surface of the shell, and shall not extend more than five inches from the midpoint in front towards either side.

b). **Shell:** The shell of the helmet shall be as nearly uniform in thickness and strength as is possible using normal manufacturing methods and shall not be specially reinforced at the test points. Ventilation holes, if used, shall not exceed one-half inch in diameter. Ventilation slots, if used, shall be placed over the ear area only, and must terminate in a rounded opening without any squaring of edges. Such slots shall not exceed one-quarter inch in width.

c). **Helmet Height:** The vertical dimension from the lower edge of the head band or other head fitting to the outside of the crown of the shell, at the midpoint of the helmet in a longitudinal axis shall not be less than five inches.

d). **Extent and Form of Protective Material:** The helmet shall be so constructed that any protective padding materials used shall cover the entire inner surface of the shell to a minimum lower trim line determined in the following fashion. At the midpoint in the front of the shell, the protective material shall extend to within five-eighths inch of the shell edge. Using this as a reference point, with the helmet in a normal upright position, the remainder of the protective material must extend to a plane running perpendicular to the vertical axis of the helmet and through the front reference point.

The lower limit of protective padding material delineated above is to be considered an absolute minimum; any additional extension below this plane is to be considered highly desirable. Specifically, if shell extensions are used below the lower edge of the head fitting, they should be lined with protective padding material similar to that used in the upper part of the shell, and of comparable thickness, except that cut-out areas may be used to clear the ears.

Over the entire area covered by such protective lining substance, the material used must be of uniform construction and of thickness at least equal to its thickness at the rear of the helmet. No gaps in the protective padding materials shall be of greater width than one-quarter inch except corresponding to ventilation holes, which may be used up to one-half inch diameter. No part of this protective padding material shall be readily detachable.

e.) **Headband or Other Head Fitting:** The headband or other head fitting shall not project below the lower edge of the shell at any point and shall be suspended or well-cushioned from the shell itself. Attention is drawn to the necessity of protecting certain materials which may be used for this purpose against the effect of oil or grease from the wearer's hair.

f.) **Harness:** The head fitting shall consist of a sweat resistant material. The manufacturers shall insure that the materials used in the harness are not of a kind known to cause skin diseases. In the case of a material not in general use for this purpose, advice as to its suitability should be sought from a competent medical authority.

g.) **Finish:** All edges of the shell shall be smooth and rounded, and there shall be no metallic parts or other rigid projections on the inside of the shell which could injure the wearer's head in the event of a crash.

SAMPLING FOR CERTIFICATION

Samples of helmets for testing shall be made by taking at random three helmets of the same fabrication as offered for sale. No helmet which has been subjected to any test described in this standard shall actually be offered for sale after testing.

LABELING AND MARKING

There shall be securely attached to each helmet offered for sale a label bearing an inscription to the following effect:

(1) For maximum protection this helmet must be of good fit and the chin strap must be securely fastened.

(2) This helmet is so constructed that the energy of a severe blow is absorbed through the partial destruction of this shell and/or lining, although damage may not be visible to the naked eye. If it suffers such an impact, it should be either returned to the manufacturer for competent inspection or discarded and replaced by a new one.

Helmets which comply with the requirements of this standard shall be marked as follows:

(a) With the name, trademark, or other means of identification of the manufacturer.

(b) With the month and year of manufacture.

(c) With the certification mark of the Snell Memorial Foundation, which may be used by the manufacturer only under license from the Snell Memorial Foundation. Particulars of the conditions under which licenses are granted may be obtained from the Foundation.

In addition, the manufacturer's name or trademark and the month and year of manufacture must be indelibly marked in an agreed code on the inside of the helmet in a position where this marking is protected from obliteration.

TESTING

All helmets certified by the Snell Memorial Foundation must pass the following tests of shock absorption, harness and strap strength, and resistance to penetration. In addition to the initial testing prior to certification, random samples will be obtained by the Foundation from the open market, such samples to be replaced to the vendor by the manufacturer and these will be tested by the Foundation in similar fashion. Subsequent to certification, such random sample testing as is deemed necessary may be done by the Foundation or by an independent laboratory acceptable to the Foundation.

I. Shock Absorption Test: A test shall be instituted to establish a performance level in attenuating acceleration as a measure of the shock-absorption property of the complete helmet. The helmet, mounted on an instrumented, 12 pound K-1A magnesium alloy head form, will be subjected to impacts on front, rear and side with a mass whose surface configuration shall be of spherical nature having a radius of 1.9 inch. The impacting energy shall be 120 foot pounds.

At this energy level "bottoming" shall not occur, nor shall the imparted acceleration exceed 400 G's. In this test the head form shall be suspended in such a manner as to approximate a free mass.

The helmet must withstand a minimum of two such blows at each test site without failing the above conditions.

The helmets shall be conditioned before testing as follows:

a.) One helmet shall be conditioned in a thermostatically controlled oven maintained at a temperature of 125° plus or minus 5° F. for not less than four nor more than six hours, and subjected to impact testing within two minutes after removal. The humidity of the oven will be controlled at 50%.

b.) A second helmet shall be refrigerated at a temperature of 0° plus or minus 5° F. for not less than four nor more than six hours, and subjected to impact testing within two minutes after removal.

c). A third helmet shall be placed under a water spray, at room temperature, with the flow rate of 15 gallons per hour over the outer surface of the helmet for a period of not less than four nor greater than six hours, and tested while wet.

II. Test for Attachment of Harness: The fastened chin strap will be subjected to a test of tensile strength. The helmet shall be supported on a head form so that the points of attachment of the chin strap will be subject to the same test as the strap itself. The strap and its attachments shall support a weight of 300 pounds without parting and without greater than one inch increase in the vertical distance of the chin strap from the helmet crown.

III. Test for Resistance to Penetration: After the preceding tests, sufficient exposure of the inner shell surface shall be made so as to allow unpadded shell to rest upon a rigid head form. A striker weighing 4 pounds and having a conical point with an included angle of 60 degrees, and a maximum tip radius of 0.020 inch, is dropped a clear distance of 3 feet so as to strike the crown of the helmet in the vertical axis of the head form.

The head form shall contain a cylindrical cavity 1.75 inches in diameter whose vertical axis shall be centered with that of the striking point. This cavity shall contain a means of recording the instantaneous vertical deflection of the inner surface of the shell within three-eighths inch of the axis.

When tested in the above fashion, the maximum vertical deflection shall not exceed three-eighths inch.