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Standard Test Methods for Equipment and Procedures Used in Evaluating the Performance Characteristics of Protective Headgear[1]

This standard is issued under the fixed designation F 1446; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

INTRODUCTION

These test methods specify procedures and equipment used for testing protective headgear. Individual performance standards (standard specifications) will use these procedures and equipment. Impact velocities, pass-fail criteria, and other performance requirements will be specified in individual standard specifications, tailored to the needs of a particular activity (for example, bicycling, skateboarding, skiing, etc.).

It is recognized that it is not possible to write a protective headgear performance standard that will result in headgear that can protect against injury or death in all accidents. It is also recognized that serious injury or death can result from both low- and high-energy impacts, even when protective headgear is worn. Acknowledging these limitations, these test methods were developed using resources in medical, scientific, mechanical engineering, human factors, and biomechanical fields.

These test methods incorporate many aspects of other recognized headgear performance standards. They draw from work done by others where appropriate for these test methods. These standards may be referenced. It should be noted that these test methods specify a laboratory test of completed headgear to measure its ability to reduce head acceleration when impacting various shaped objects.

1. Scope

1.1 These test methods cover laboratory equipment, procedures, and basic requirements pertinent to testing protective headgear. Deviations or additions, or both, to these test methods will be specified, as required, in individual performance standard specifications.

1.2 *Requirements*—The protective headgear is to be tested under specified environmental conditions for the following:

1.2.1 Impact attenuation (the limiting of head acceleration) of the protective headgear.

1.2.2 Strength of the retention system and its attachment.

1.2.3 Special tests for particular protective headgear uses will be specified in the individual standard specifications to be used in conjunction with these test methods.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 These test methods incorporate or reference sections of standards from the following U.S. and foreign standards organizations: DOT, ASTM, ANSI, Snell, E22, BSI, ASA, SP1, and CSA.

2.2 *ISO/DIS Standard:*[2]

6220-1983 Headforms for Use in the Testing of Protective Helmets

2.3 *Federal Motor Vehicle Safety Standard:*[3]

218 S7.1.8 Motorcycle Helmets

2.4 *SAE Standard:*[4]

J211 Recommended Practice for Instrumentation for Impact Tests—Requirements for Channel Class 1000, October 1988

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *basic plane, n*—(Frankfort Horizontal Plane) an anatomical plane that includes the superior rim of the external auditory meatus (upper edge of the external openings of the ear) and the inferior margin of the orbit (the lowest point of the floor of the eye socket). The ISO headforms are marked with a plane corresponding to this basic plane (see Figs. 1 and 2).

[1] These test methods are under the jurisdiction of ASTM Committee F08 on Sports Equipment and Facilities and are the direct responsibility of Subcommittee F08.53 on Headgear and Helmets.

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[2] Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

[3] Available from Department of Transportation, National Highway Traffic Safety Administration, Office of Vehicle Safety Standards, 400 7th St. S.W., Washington, DC 20590.

[4] Available from Society of Automotive Engineers, 400 Commonwealth Dr., Warrendale, PA 15096.

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