



BSI Standards Publication

Surfaces for sports areas — Test method for the determination of Head Injury Criterion (HIC) and Critical Fall Height (CFH)

National foreword

This British Standard is the UK implementation of EN 17435:2021.

The UK participation in its preparation was entrusted to Technical Committee PRI/57, Surfaces for sports areas.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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English Version

Surfaces for sports areas - Test method for the determination of Head Injury Criterion (HIC) and Critical Fall Height (CFH)

Sols sportifs - Méthode d'essai pour la détermination
du Critère de blessure à la tête (HIC) et de la Hauteur
de Chute Critique (HCC)

Sportböden - Prüfverfahren für die Bestimmung des
Kopf-Verletzungs-Faktors (HIC) und der kritischen
Fallhöhe (CFH)

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COMITÉ EUROPÉEN DE NORMALISATION
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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

This document (EN 17435:2021) has been prepared by Technical Committee CEN/TC 217 “Surfaces for sports areas”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2022, and conflicting national standards shall be withdrawn at the latest by June 2022.

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Introduction

Sports injuries occur for a variety of reasons; in many contact sports they are as a result of athlete on athlete collisions. Injuries also occur when athletes fall onto the surface on which they are playing. Of these the most severe are likely to be injuries to the head, which can be life changing or even life threatening. Consequently, a test method has been developed to measure the ability of sports surfacing materials to reduce the likelihood of severe head injuries occurring. It is intended that this test method will be specified in standards for sports surfaces used for activities where head impacts with the surface are likely.

The test method is based on work undertaken by CEN committee CEN/TC 136 "Sports, playground and other recreational facilities and equipment". The Head Injury Criterion (HIC) at a tolerance level of 1 000 has been adopted as it is considered to be the upper limit for the brain injury severity unlikely to have disabling or fatal consequences.

By choosing the measurement of HIC as one criterion of sports surfacing athlete protection, the method considers only the kinetic energy of the head when it impacts the surface. This is considered to be the best model available to predict the likelihood of head injury from falls.

The HIC value of 1 000 is merely one data point on a risk severity curve where an HIC of 1 000 is equivalent to a 3 % chance of a critical injury (MAIS¹ 5), a 18 % probability of a severe (MAIS 4) head injury, a 55 % probability of a serious (MAIS 3) head injury, a 89 % probability of a moderate injury (MAIS 2), and a 99,5 % chance of a minor head injury (MAIS 1), to an average male adult.

This method of test and HIC and Critical Fall Height (CFH) performance requirements are specified in product and facility specifications published by CEN and a number of sports governing bodies.

¹ Maximum Abbreviated Injury Scale, first developed by the Association for the Advancement of Automotive Medicine and used extensively in the automotive industry as an indicator of the severity of head-related injuries.