

Investigation concerning the protection potential of Ribcap in regard to head injuries through Prof. Rémy Willinger



SYSTEMES BIOMECHANIQUES
UNIVERSITE DE STRASBOURG
INSTITUT DE MECANIQUE DES FLUIDES
ET DES SOLIDES - UMR 7507 CNRS
2, rue Boussingault F-67000 STRASBOURG



This document contains an extract from the test documentation of an objective assessment concerning the head protection system: Ribcap. This is based on extensive research in the field of biomechanics for head injuries.

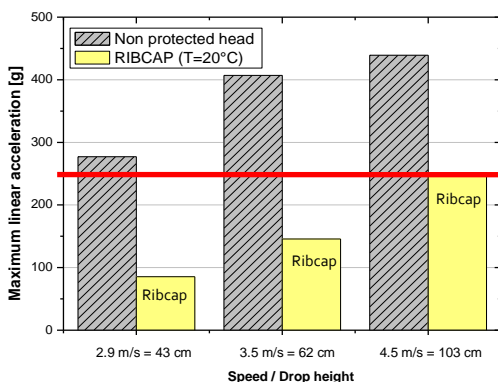
The extensive documentation of the investigation may be obtained at Ribcap or viewed directly under www.biomechanics-strasbourg.com.

Definition

Ribcap is not a helmet but it provides significant head protection and prevents head trauma in a number of head impact situations. This extract of the original document gives an objective head protection evaluation of Ribcap, based on recent human head trauma biomechanics research.

Method

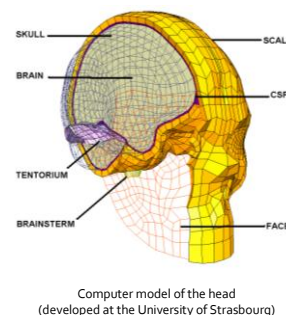
For several years the University of Strasbourg (biomechanics) has been developing a numerical model (computer model) of the human head which illustrates the mechanical response of the head under impact conditions determined by simulation. Here the cranial deformation, the relative displacement occurring between the brain and skull, and the shear stress of the brain are considered. The simulations of a variety of real accidents, such as head injuries as a result of falling, make it possible to establish tolerance limits for different types of injuries.



Test graph of maximum negative acceleration (deceleration) during an impact without and with Ribcap

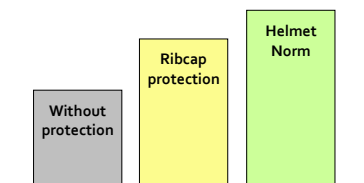
Scientifically defined critical limit of injury risks in impact situations

The critical impact speed can be increased by 55% when protected by Ribcap



Computer model of the head (developed at the University of Strasbourg)

The protective effect in comparison (Comparison is based on the scientifically defined critical limit of injury risks in impact situations)



Conclusion

- Compared to an unprotected head, Ribcap has a significant effect on the biomechanical stress.
- Ribcap prevents head injuries – “in all tested configurations the wearing of a Ribcap presented a significantly lower risk of head injury.”
- During a fall onto a hard surface, the drop height is directly related to the impact speed.
- The critical impact velocity of 2.9 m/s, which presents a large probability of head injury may be increased by wearing Ribcap by 55% on 4.5 m/s.
- Under low temperature conditions (tested at -5°C) Ribcap shows an improved protective effect compared to a test at 20°C.

Ribcap / January 2010



Ribcap AG • Gerbegraben 4 • CH-3110 Münsingen • +41 31 721 45 46 • contact@ribcap.ch • www.ribcap.ch / www.biomechanics-strasbourg.com