

# CEN/TC 158 - WG11 report

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# Summary

- Two meetings
  - 1<sup>st</sup> of October 2013, Paris, France N128
  - 16-17<sup>th</sup> of March 2014, Milan, Italy N143
- Focus have been on a new rotational test method (EN13087-11).
- Other topics that have been discussed are:
  - Penetration test block in EN13087-3
  - French proposal on for inadvertent buckle release (EN13087-5)



# Participants at last WG 11 meeting

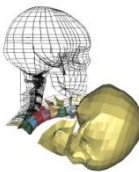
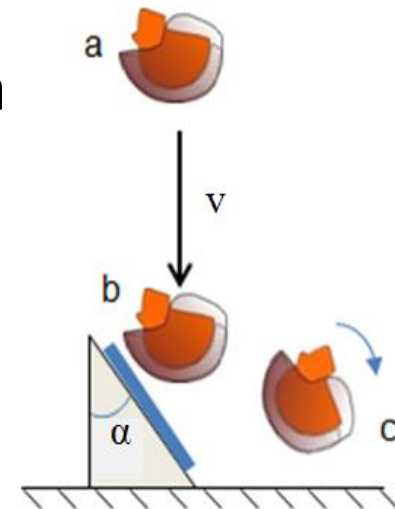
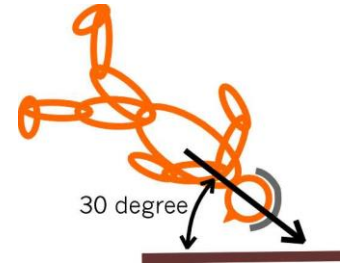
- **Peter Halldin – Sweden, CONVENER**
- **Björn Nilsson – Sweden, SECRETARY**
- Thomas Buron – Decathlon, France
- Danielle Garbetta – Dainese, Italy
- Luca Cenedese – Newton Test Lab, Italy
- Remy Willinger – Strassbourg University, France
- Anna Haupt – Hövding, Sweden
- Jan Ivens – Leuven University, Belgium
- Adrian McGoldrick – Ireland, Medical officer and Convener of WG5 (**only 17<sup>th</sup>**)
- Roy Burek, UK – Charles Owens, Manufacturer of helmets for horse riders, member of WG5
- Pascal Bour – France, UTAC Notified Body (soon to be member of WG 11)
- Marta Beltramello, Italy, KASK, Manufacturer ski, safety, cyclist helmets (**only 17<sup>th</sup>**)
- Angelo Gotti, Italy, KASK, Manufacturer ski, safety, cyclist helmets (**only 17<sup>th</sup>**)



# Work item prEN 13087-11

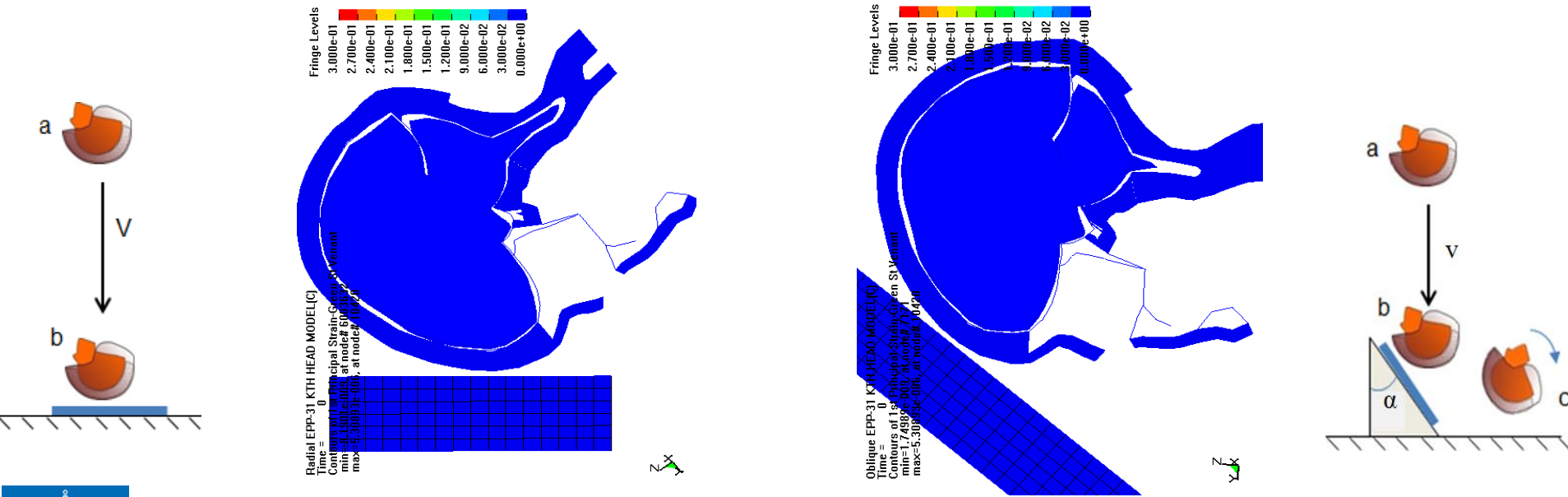
## Rotational test methods

- Within WG11 continue the work aimed to define a method to measure rotational energy absorption in tangential impacts.
  - The first version of the test method designed for *bike* and *equestrian* helmets.
  - Impact conditions based on *real accident* data
    - 5-10m/s, 30-60degrees, hard impact surface
  - The test must be *simple, robust and cost effective*.
  - The work within this work item can be used also for improvement of pure radial impacts.

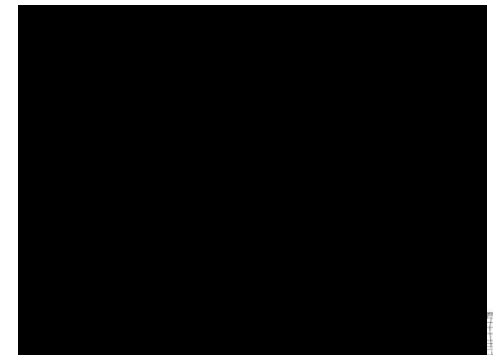
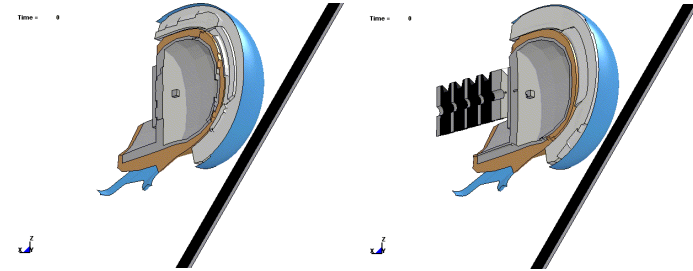
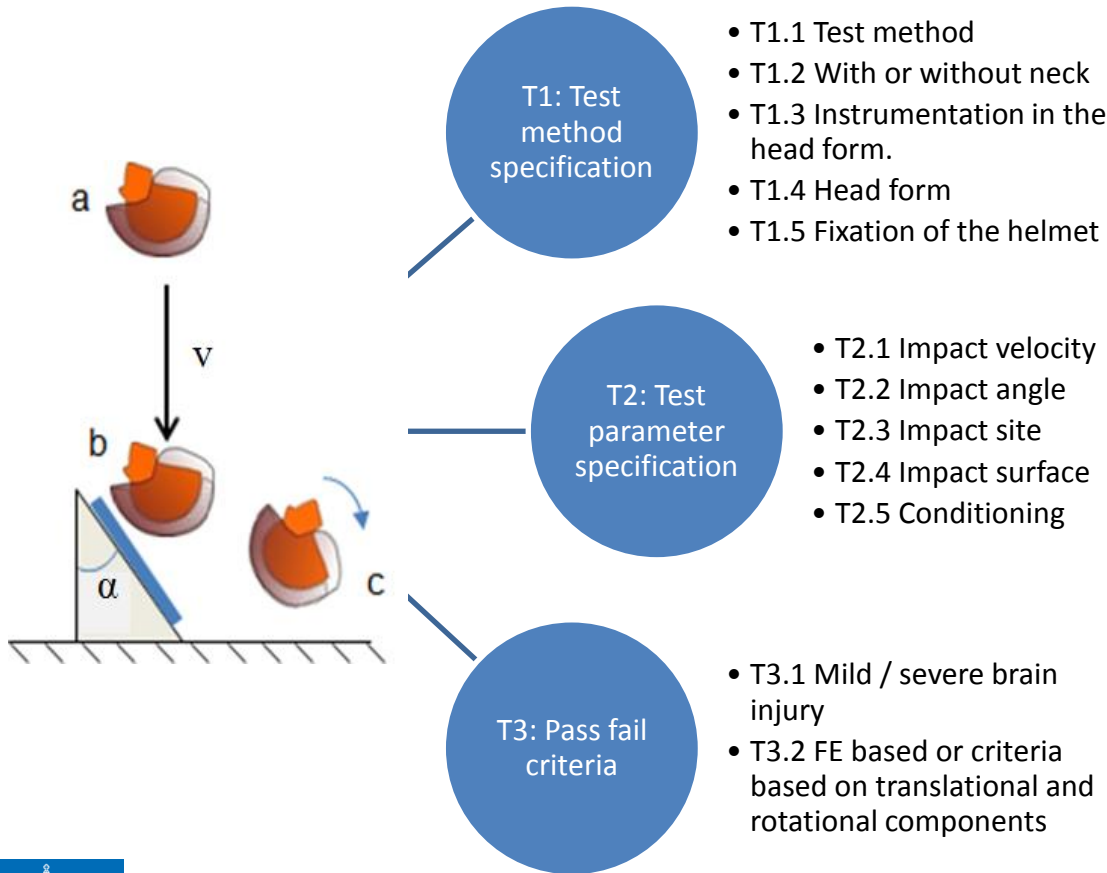


# Why do we need a new test method?

1. The brain is sensitive for rotational motion.
2. Angled/oblique impacts are more common than pure radial/linear impacts .

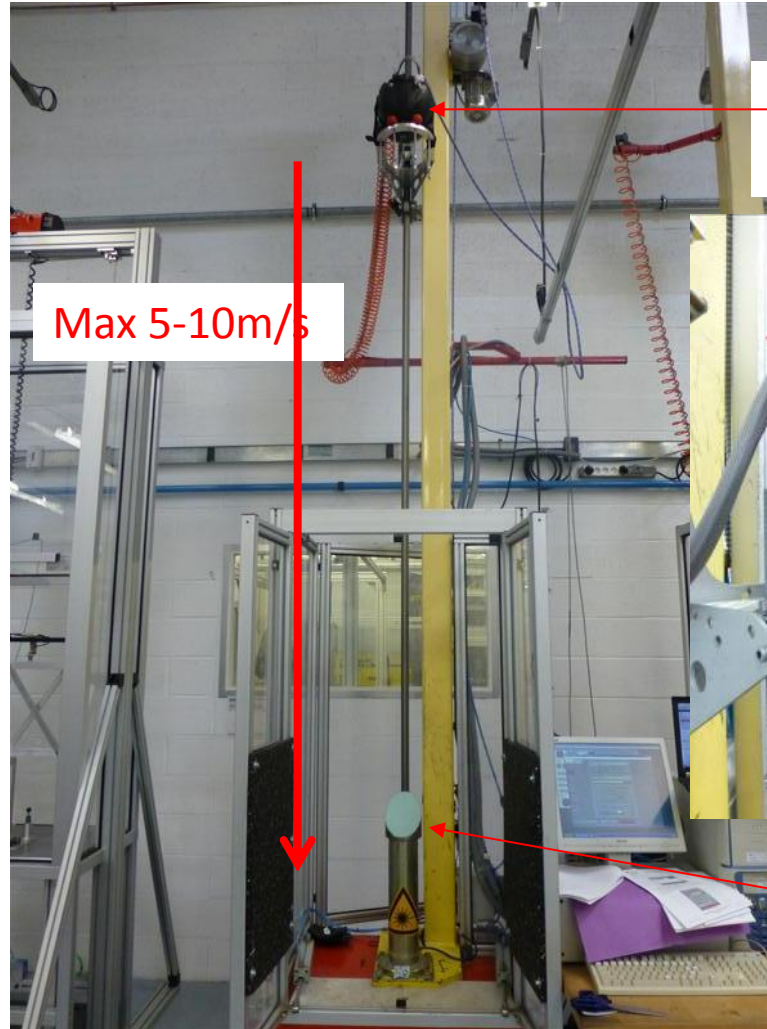


# The fundamentals for a new test method



# WG11 proposal for the new oblique test method

Built around existing test rig from AD Engineering or Cadex

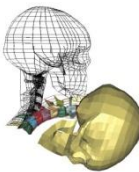


Hybrid III head form and helmet



30-60° anvil with abrasive paper

Standard helmet drop test machine adapted for rotational impact



# Example of test with the new oblique test method

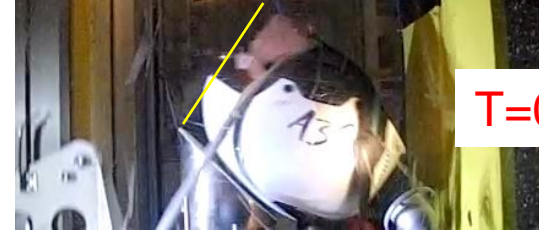
- 50% HIII head form equipped with triax+3ARS
- Impact velocity: 7m/s
- Impact angle: 45 degrees
- Impact surface: Steel covered with grinding paper



T=0.000



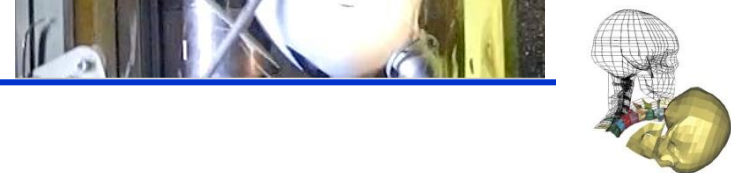
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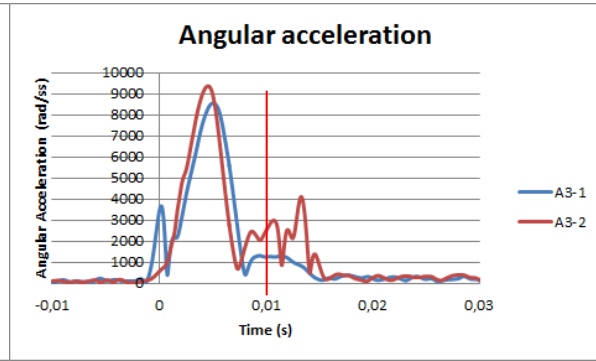
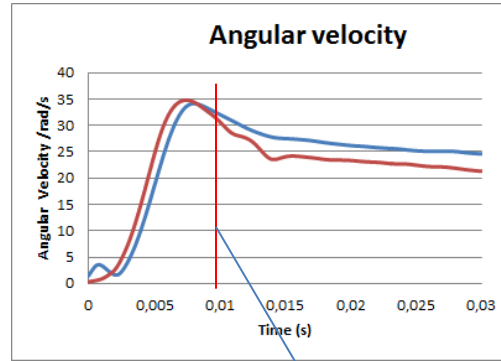
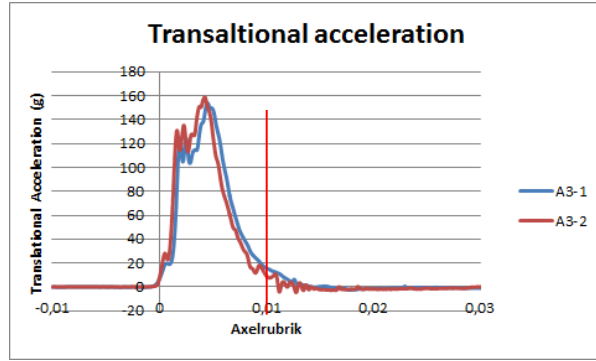
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Results from two identical ski helmets

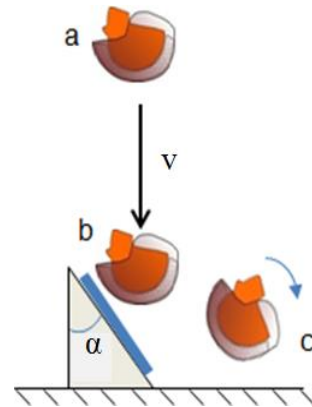


11 degrees



# Proposal so far by WG11 per March 2014

- Free falling head against angled plate (30-60 degree) using existing test drop tower from CADEX or AD Engineering.
- **No neck** (Could be changed to HIII neck if arguments shown that HIII neck is more human like than the free falling head the first 10ms)
- Headform: HIII head
- **Head instrumentation: 9-acc-array** (until ARS are proven to work)
- Pass/Fail criteria: Derived from 6 DOF accelerations or a FE based criteria.
- Three different impact points/area and impact directions.



# Draft plan for the future

- 2014
  - Write draft standard proposal
  - Build prototype of test rig
  - 0-serie tests -> modifications
- 2015
  - Pass/fail criteria
  - Final tuning
- 2016
  - Final first version of the test method ready.



Next WG11 meeting in Stockholm, Monday  
6<sup>th</sup> October 13.00-Tuesday 7<sup>th</sup> October 13.00.

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