

Dorel Europe Safety Center

Presentation of a Side impact Step 1 proposal

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Target

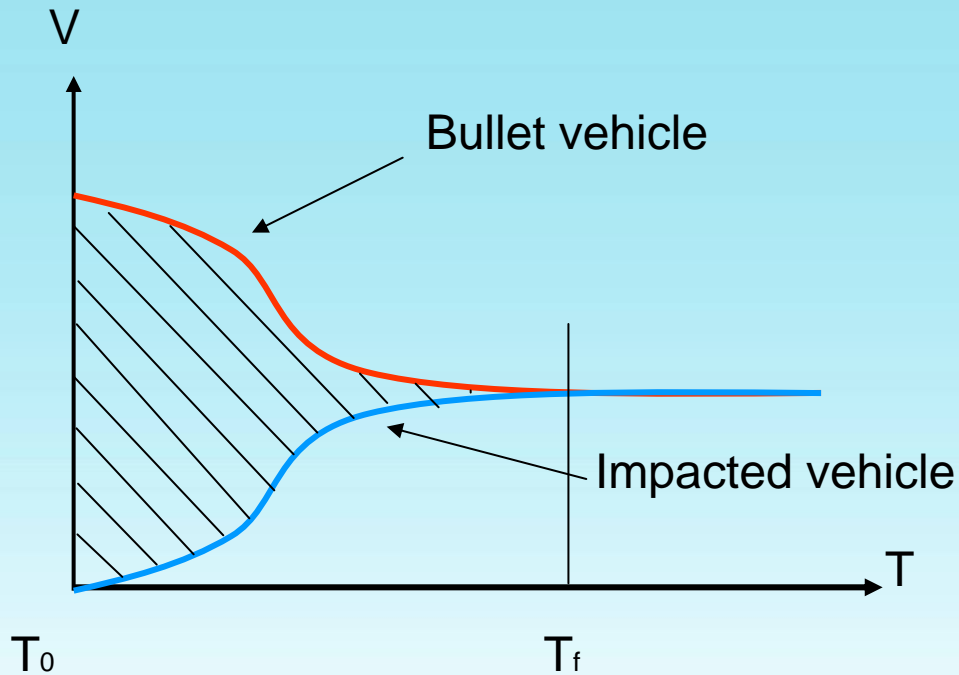
This a follow up of previous meeting.

The target of this presentation is to propose a lateral test procedure for Step 1 approach:

- As realistic as possible regarding ISO PAS document
 - With **intrusion loading**
 - With assessment of occupant kinematics and energy Management
- Simple with small investments

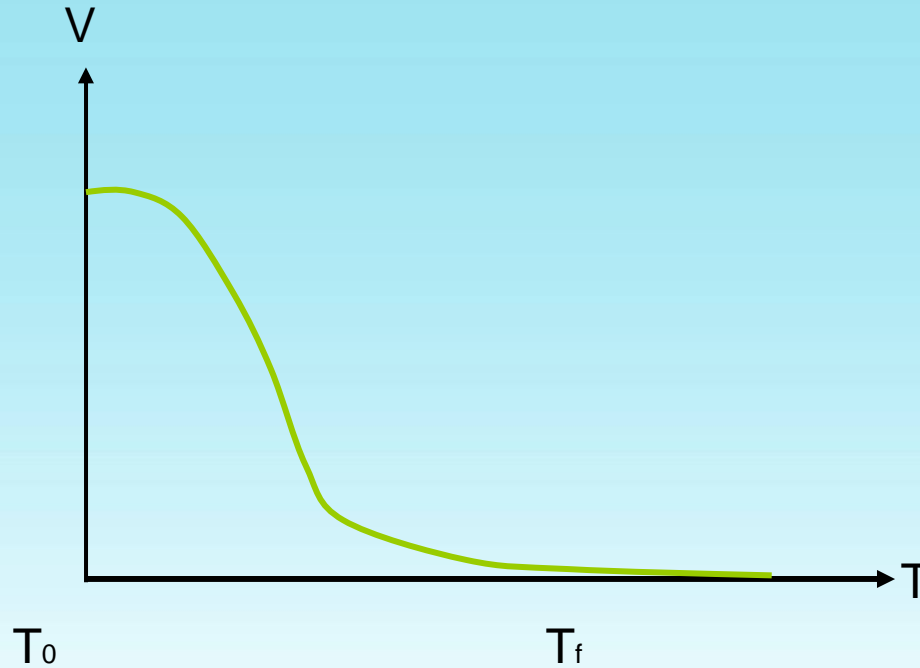
Physics

Velocity change during a lateral impact when the reference is the ground



Physics

Intrusion Velocity during a lateral impact



Concept

To simplify the test methodology :

- Reproduction of the intrusion velocity with a single sled.

Main input parameters from ISO close to R44 Rear impact pulse:

- Intrusion velocity (7 – 10 m/s)
- Intrusion (200 – 300 mm)
- Sled acceleration 10 – 14 g

↪ Proposal : **R44 rear impact with modifications**

Input parameters

- 90° Rotation of the R44 bench on the sled
- Fixed door panel on the wall
 - The best solution would have been to have a fixed bench and a moving door on the sled. Due to time constraint (2 weeks to prepare the bench) this choice has not been made
- Modification of the Isofix anchorages
- R44 rear impact pulse (small decrease of initial velocity in a first step)

Presentation of Dorel Europe test bench

test bench

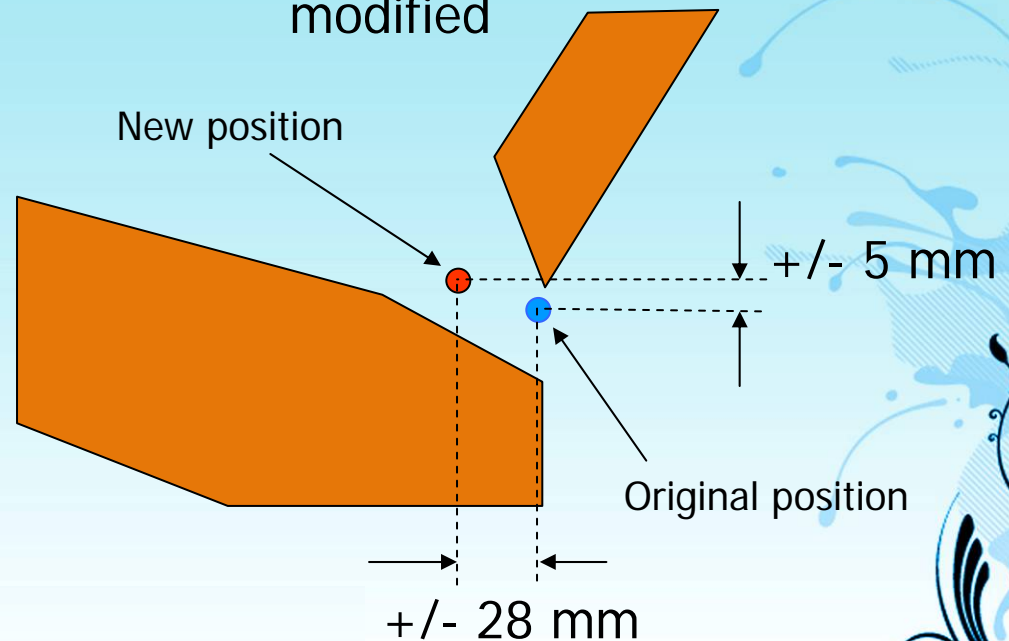
Modifications of the R44 bench



20 cm maximum displacement possibility



To allows displacement, positions of the isofix anchorage have been modified



Modifications of the R44 bench

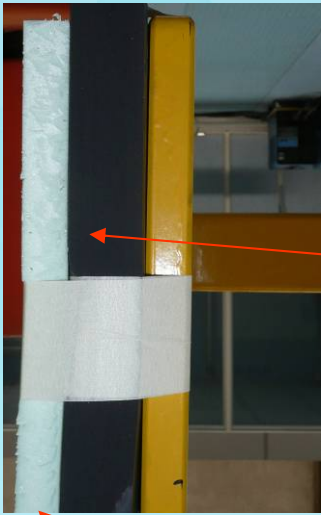


Cutting up of the bench foam to reduce damage possibilities on the cushion

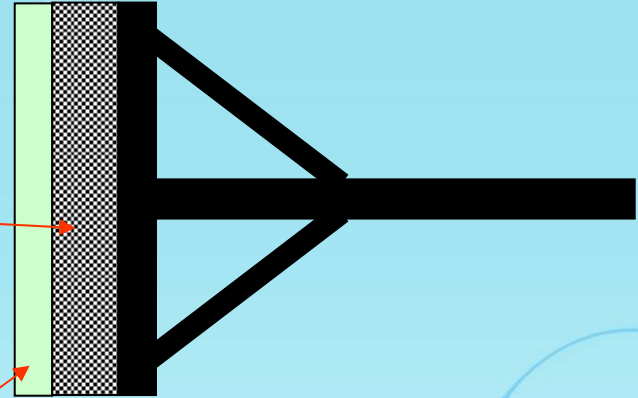
This impactor is fixed on the reaction mass, and the R44 bench is on the sled



Padding material used on the door



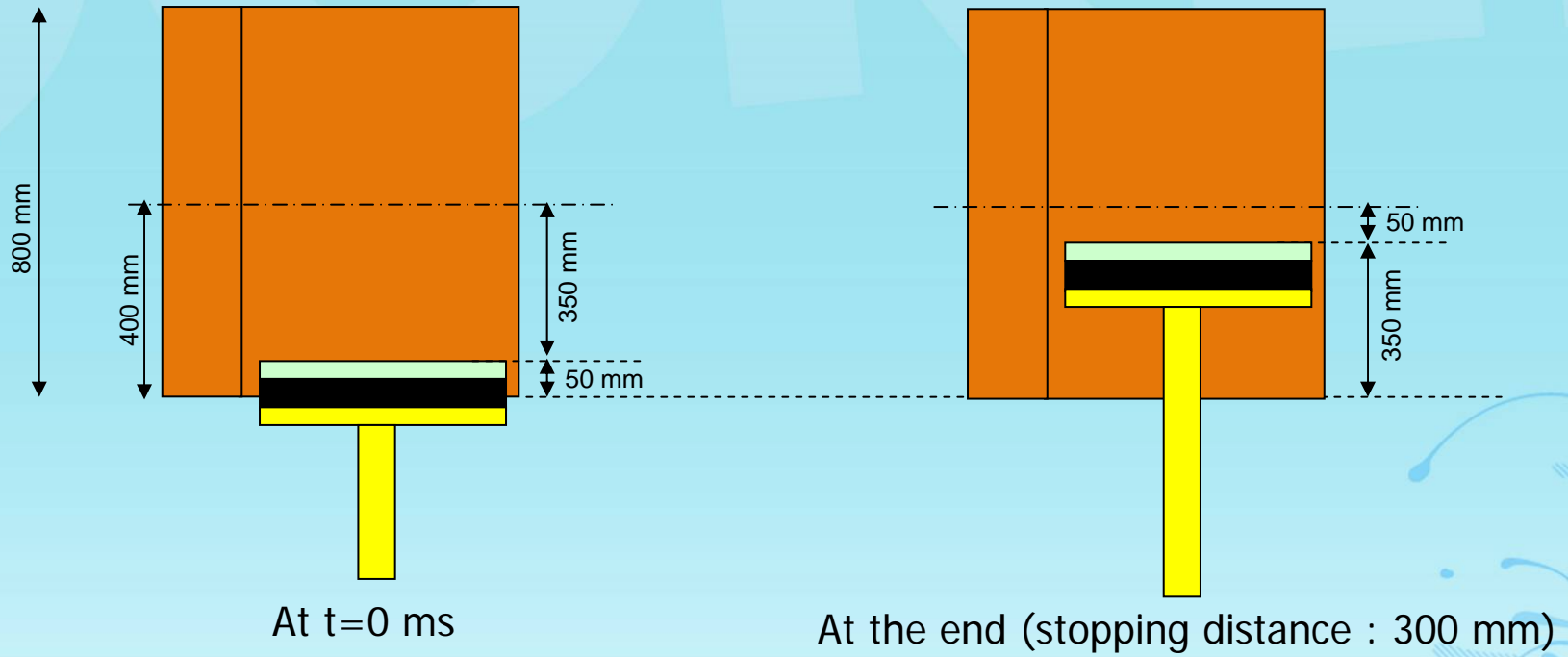
Chloroprene rubber foam
(35 mm)



Styrodur foam
(20 mm)

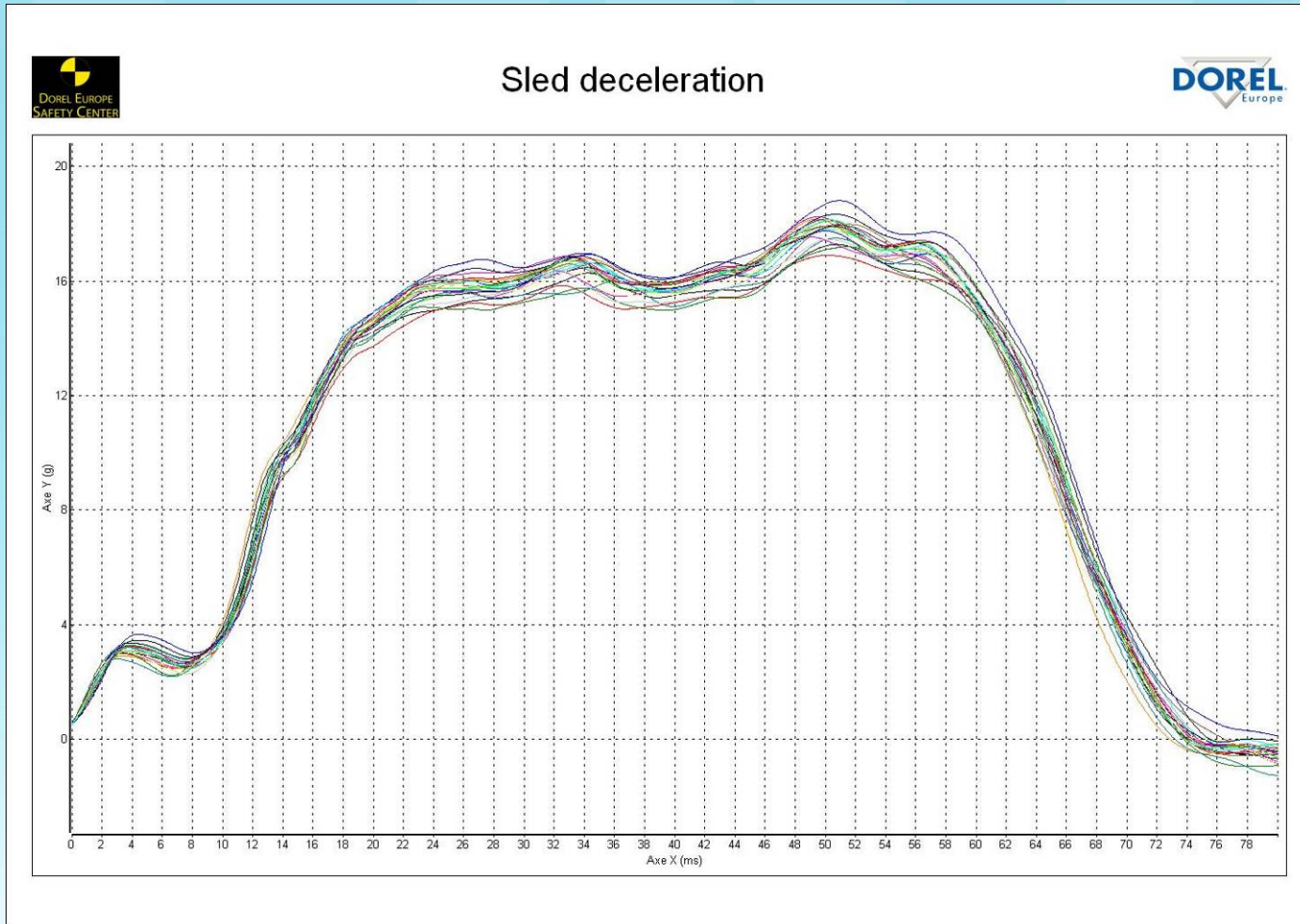
Close to ISO conditions

Door Intrusion

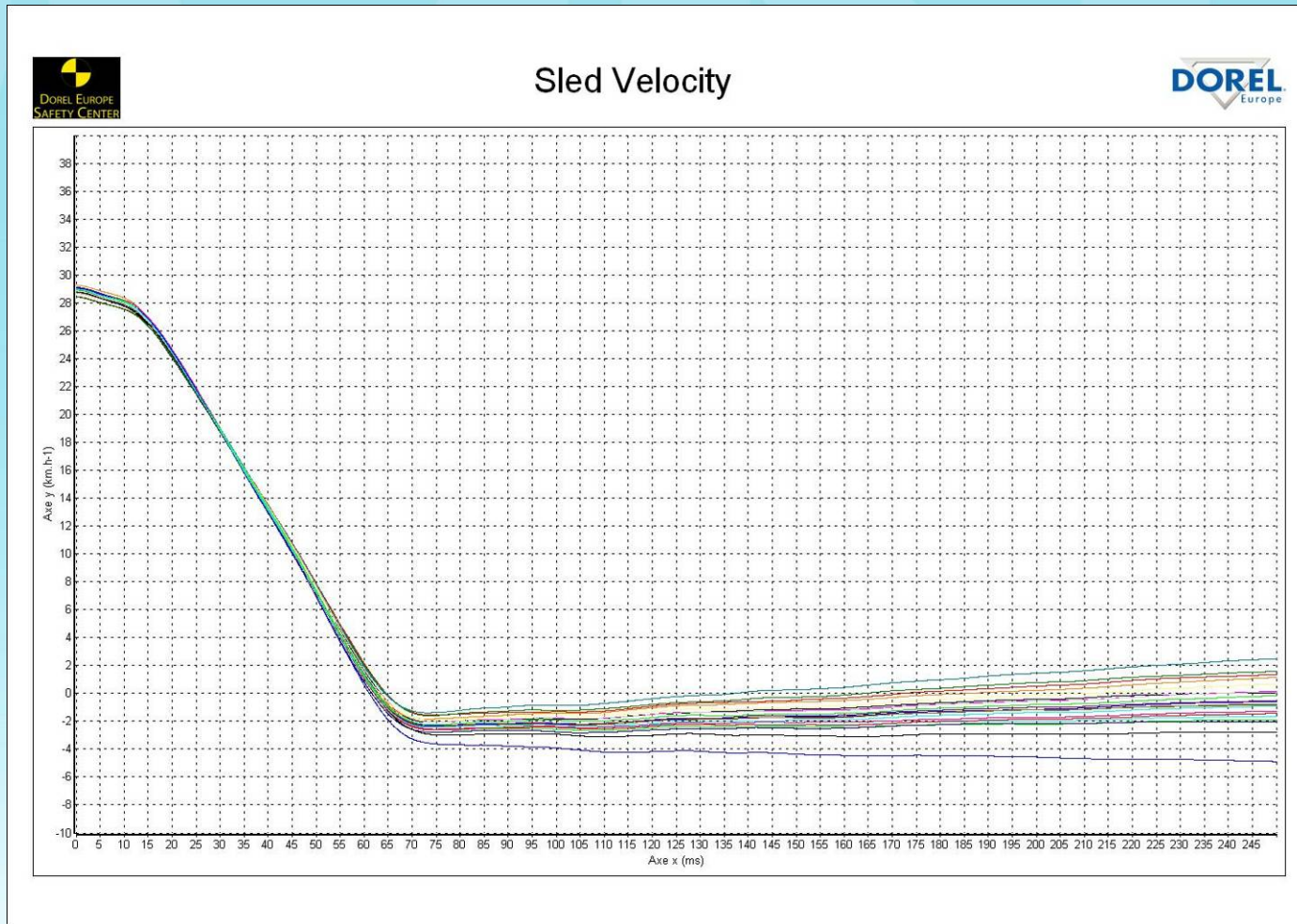


Global results

Repeatability on 21 crash tests (3 type of CRS)



Repeatability on 21 crash tests (3 type of CRS)



Input parameters

	ISO/PAS	Dorel (1st step)
Intrusion velocity	7 - 10 m/s	8 m/s
Extreme position of the door*	-50 mm	-50 mm
Sled Acceleration	10 - 15g	18g

* to the initial center line of the CRS

Presentation of tested seat

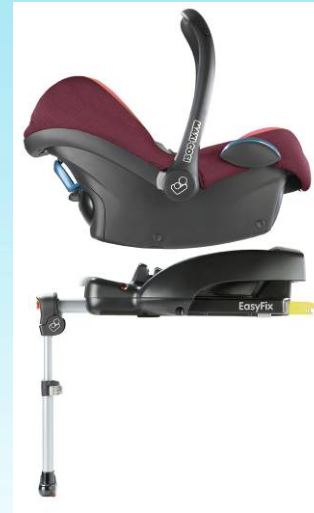
2 different seats installed with isofix

Seat n° A



Group 1 seat

Seat n° B



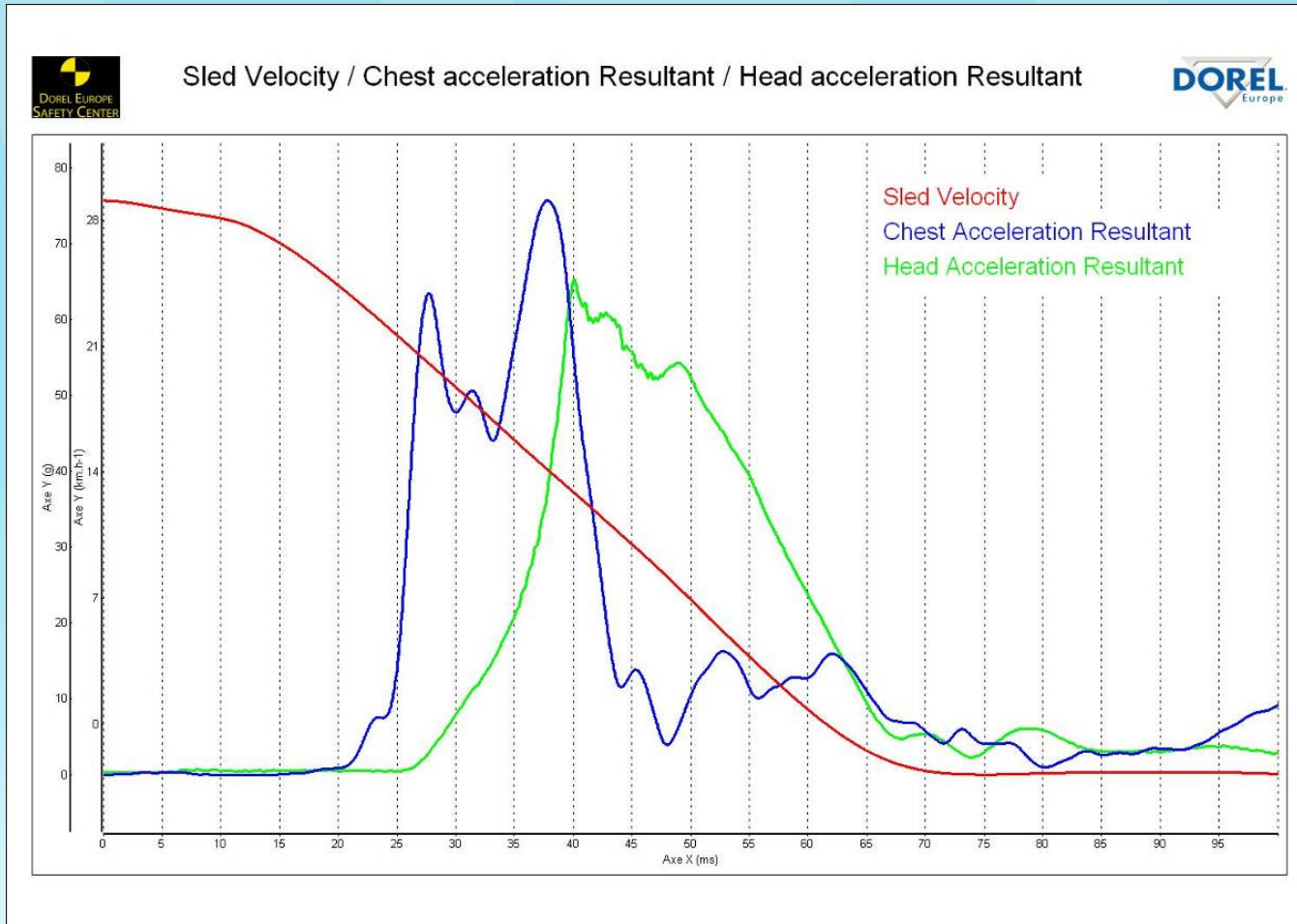
Group 0+ seat

Results on Seat A

with Q3 tested in sitting position



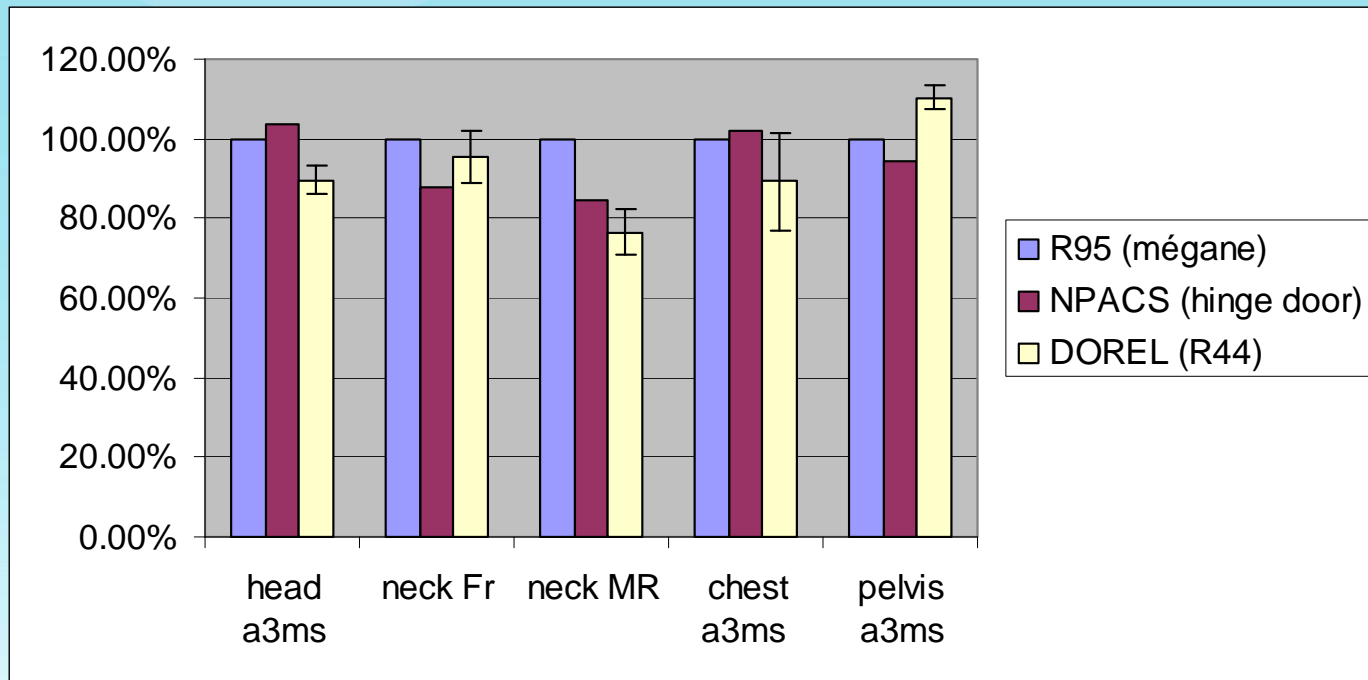
Results on Seat A



Maximum values occur during the deceleration phase

Results on Seat A

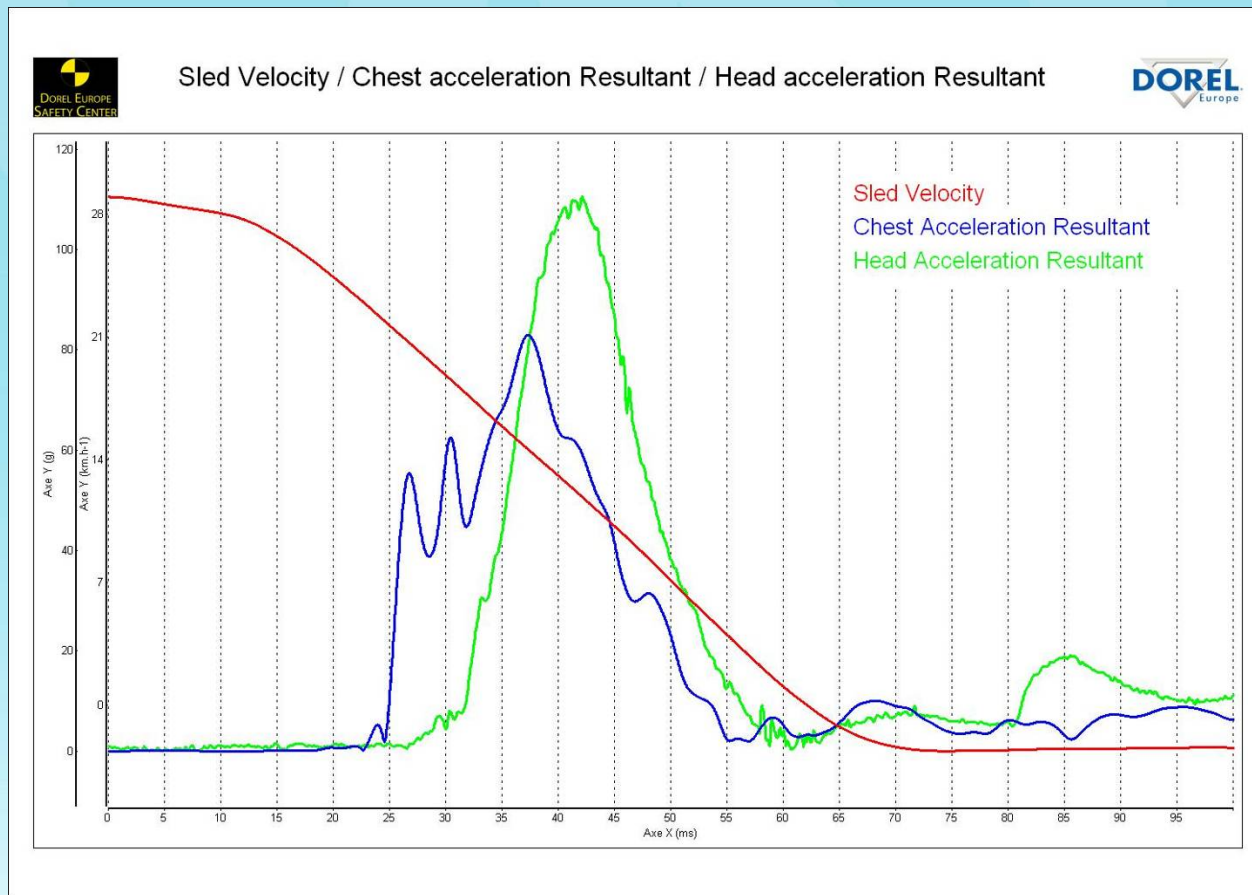
Comparison with R95 (renault mégane) & NPACS



Results on Seat B with Q1.5



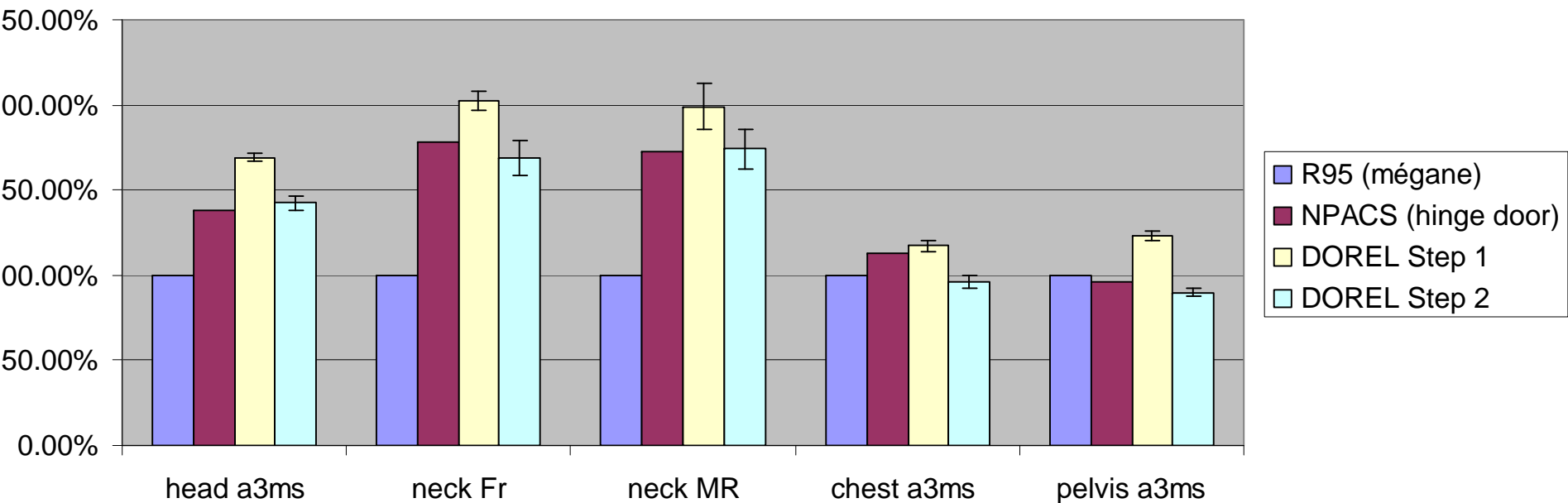
Results on Seat B



Maximum values occur during the deceleration phase

Results on Seat B

Comparison with R95 (renault mégane) & NPACS



In step 2 intrusion velocity was decreased (from 8 m/s to 7 m/s) in line with ISO recommendation

Conclusion

With a simplified test method :

- Intrusion taken into account in line with ISO recommendation and real world
- Good repeatability
 - Input
 - especially for head acceleration)
- Main loading parameters (intrusion velocity) not affected by the CRS
- Good correlation with FF / too much load with RF
- Possibility to use a conventional R44 rig very cheaply (about 10 k€)

Conclusion

Next steps :

- In agreement with ISO there is a need to adapt intrusion velocity to RF or FF configuration (20% difference)
- Influence of different deceleration devices to be investigated.
- Mean to manage isofix anchorages sliding motion ?