

**Informal Document No. GRSP-47-27**  
**(47th session, 17-21 May 2010,**  
**agenda item 23)**

# **47th GRSP Session**

## **Status report of**

### **Informal Group on CRS**

**Pierre CASTAING**  
Chairman

# Terms of reference of the informal group



- ⚡ The informal group shall consider the development of a new regulation for “Restraining devices for child occupants of power-driven vehicles” for consideration by GRSP.
- ⚡ The basis of the discussion will be informal documents N°. GRSP-42-2 and GRSP-42-27.
- ⚡ A step by step approach shall be implemented
  - Phase1: Develop definitions, performance criteria and test methods for ISOFIX Integral “Universal” CRS
- ⚡ In its work, the informal group will take into consideration amongst others the technical expertise of EEVC WG18, EEVC WG12, ISO TC22/SC12, and NPACS as well as the results of the discussions held in the informal group and at GRSP.
- ⚡ If necessary, the informal group shall develop complementary test methods and propose alternative judgement criteria.
- ⚡ The target completion date for the informal group shall be the forty-sixth session of GRSP (December 2009) for this first phase.

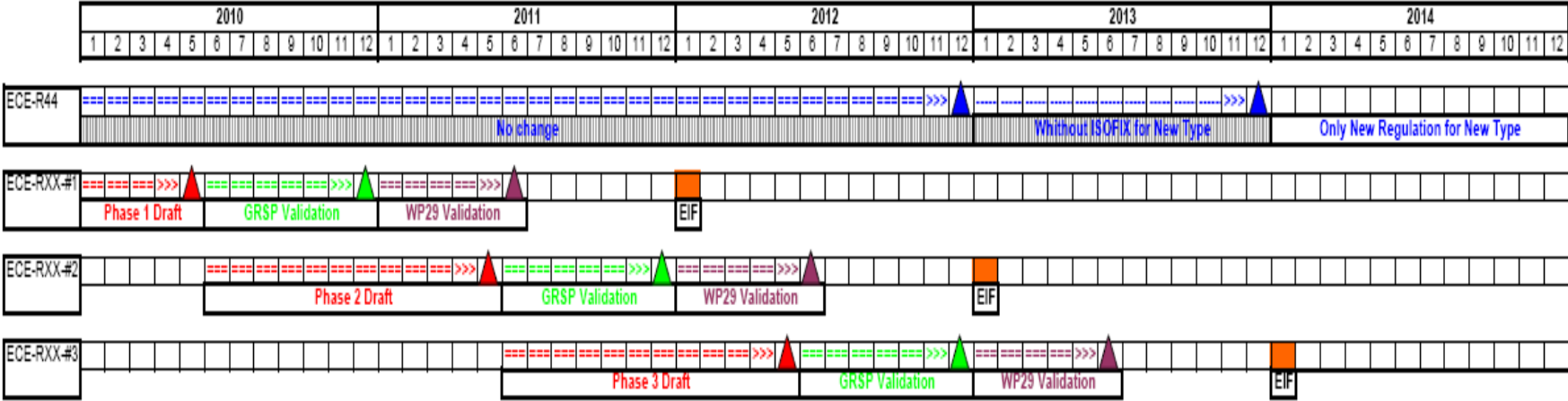
- 18 meetings from January 2008 till April 2010
- First draft regulation covering phase 1 presented as formal document:
  - **ECE/TRANS/WP.29/GRSP/2010/26**
- Amended by informal document:
  - **GRSP-47-06 - Draft amendment to ECE/TRANS/WP.29/GRSP/2010/26**

# Principles of this new regulation



- ⦿ Independent regulation. The ECE R44 remains valid
  - Multi steps approach
  
- ⦿ The scope of this new regulation cover only “ISOFIX – Universal – Integral” CRS in first step
  
- ⦿ New philosophy of classification
  - No groups
  - Classification based on standing height, maximum permissible weight (Child + CRS) and age limit for forward facing use.
  
- ⦿ Use of measurement device for CRS size control
  
- ⦿ Use of the Q dummies for frontal, rear and lateral dynamic impact on a new test bench
  
- ⦿ Use support leg as well as top tether as universal anti rotation device

- ☛ ECE R44 remains valid
- ☛ Multi steps approach
  - Integral CRS + ISOFIX
  - Non integral CRS + ISOFIX
  - Adult safety belt dependent CRS
- ☛ Transitional provisions for “soft landing” between ECE R44 and the different phases of this new regulation



## ⚡ ISOFIX “universal” integral CRS

### – ISOFIX

- 2 lower anchorages + 1 anti rotation device:
  - Top Tether
  - Support leg
- No use of the adult safety belt for the restraint of the child seat

## ⚡ Universal

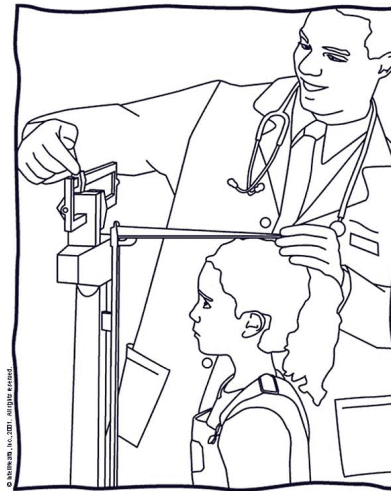
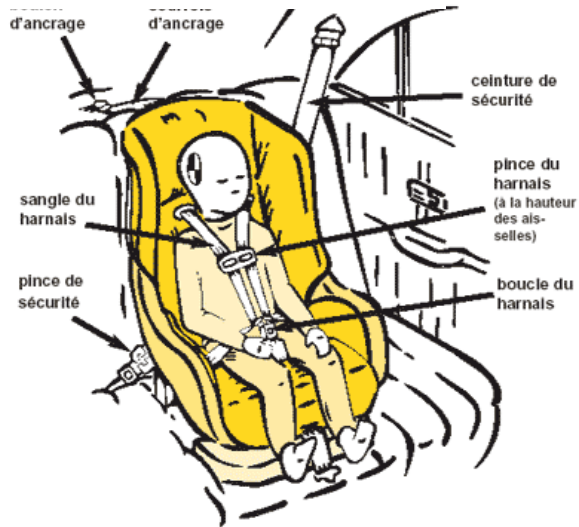
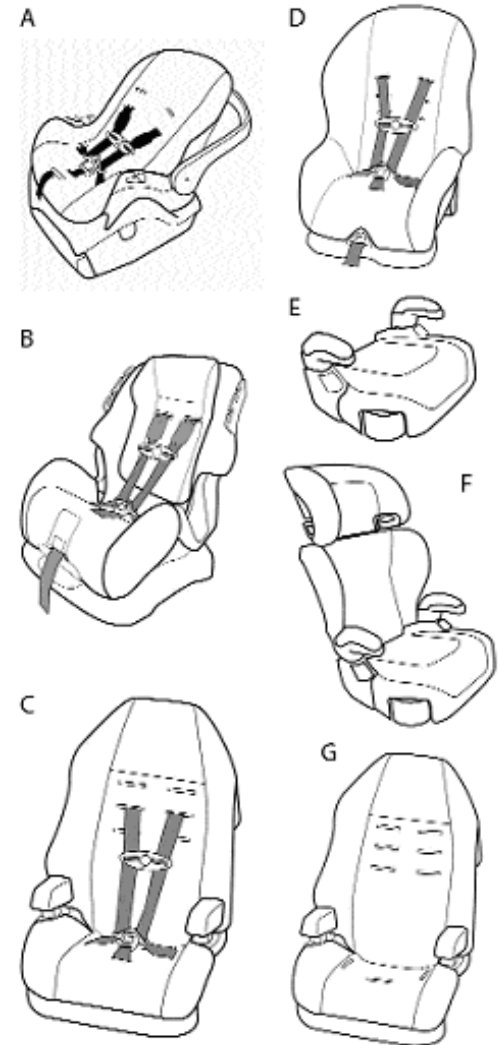
- <F2X ISO fixture for FF & <R2 ISO fixture for RF (\*)
- With top tether or support leg (\*\*)
- Integral
  - Child is restraint only by the CRS restraint system (harness)
  - No use of the adult safety belt for the restraint of the child

(\*)(\*\*) others could fall into “Integral ‘specific vehicle’ ISOFIX” category

# New philosophy of classification

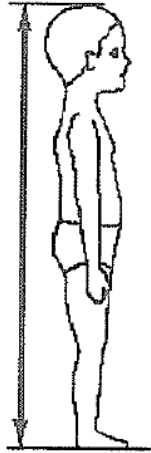


## ⚡ No group approach

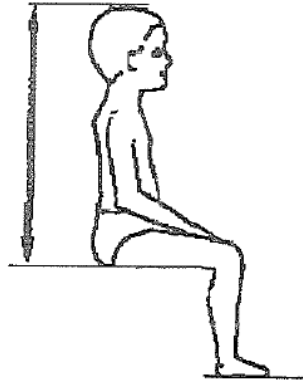


Siège d'enfant/de bébé utilisé face à l'avant

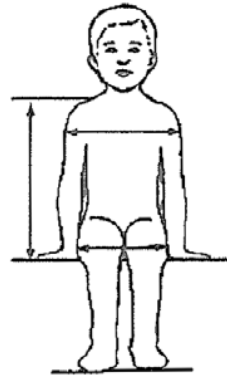
# Classification on standing height



Standing Height



Seating Height



Shoulder Breadth

Hip Breadth

Shoulder Height

## Geometrical dimensions of

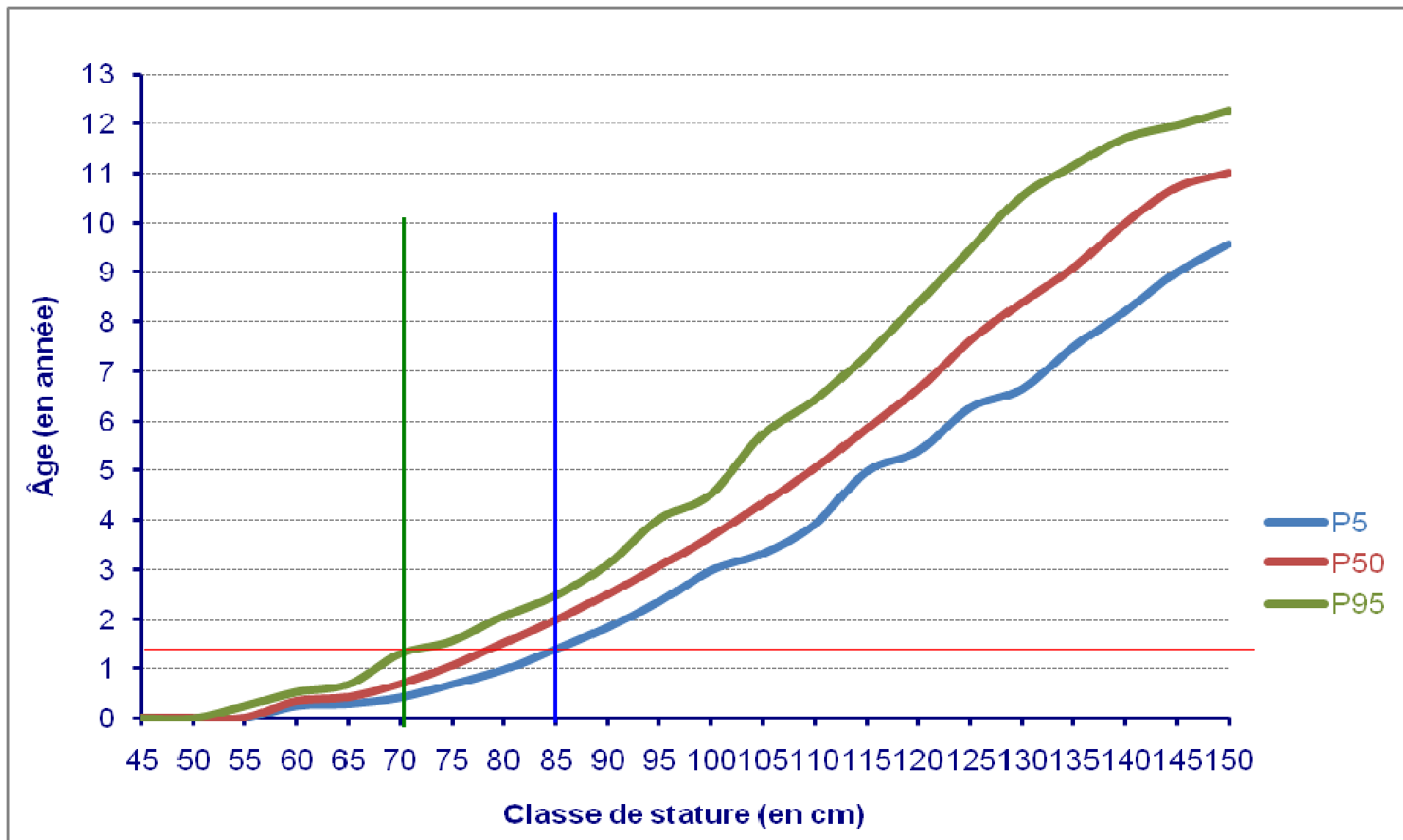
### ①-Size child restraint systems

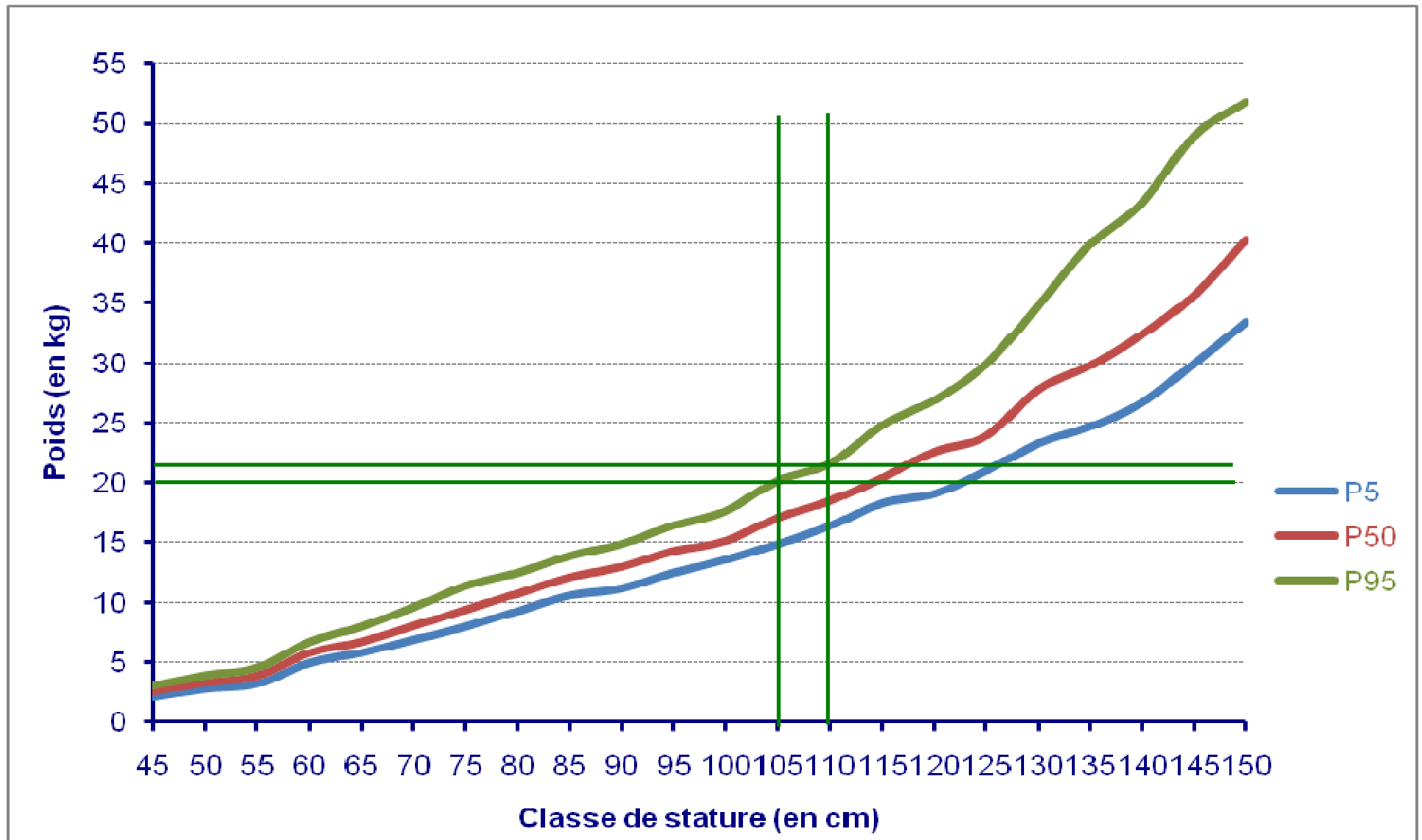
<i>Stature mm</i>	<i>Sitting height mm</i>	<i>Shoulder breadth mm</i>	<i>Hip breadth mm</i>	<i>Shoulder height mm</i>	
Every 50mm	95%ile	95%ile	95%ile	5%ile	95%ile

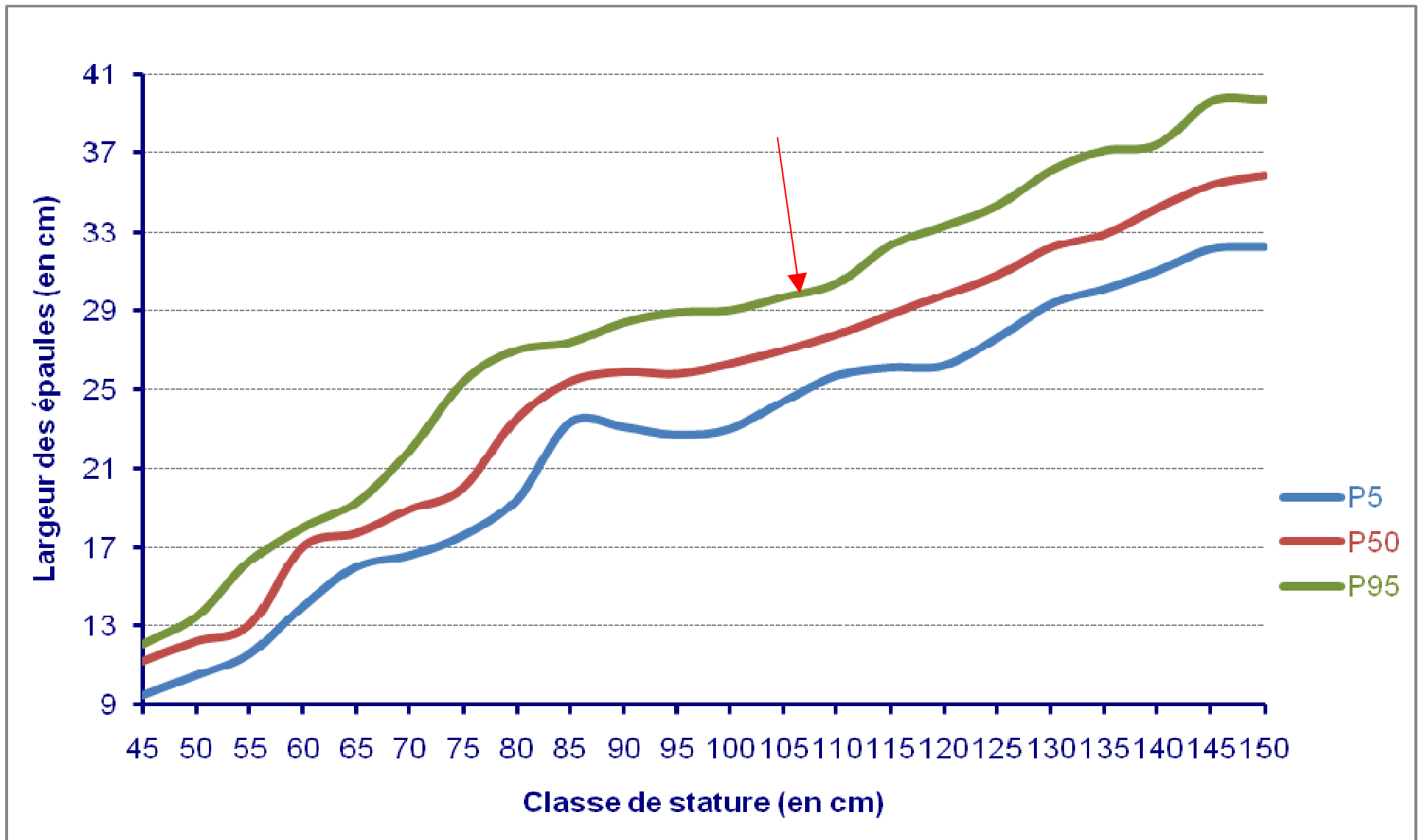




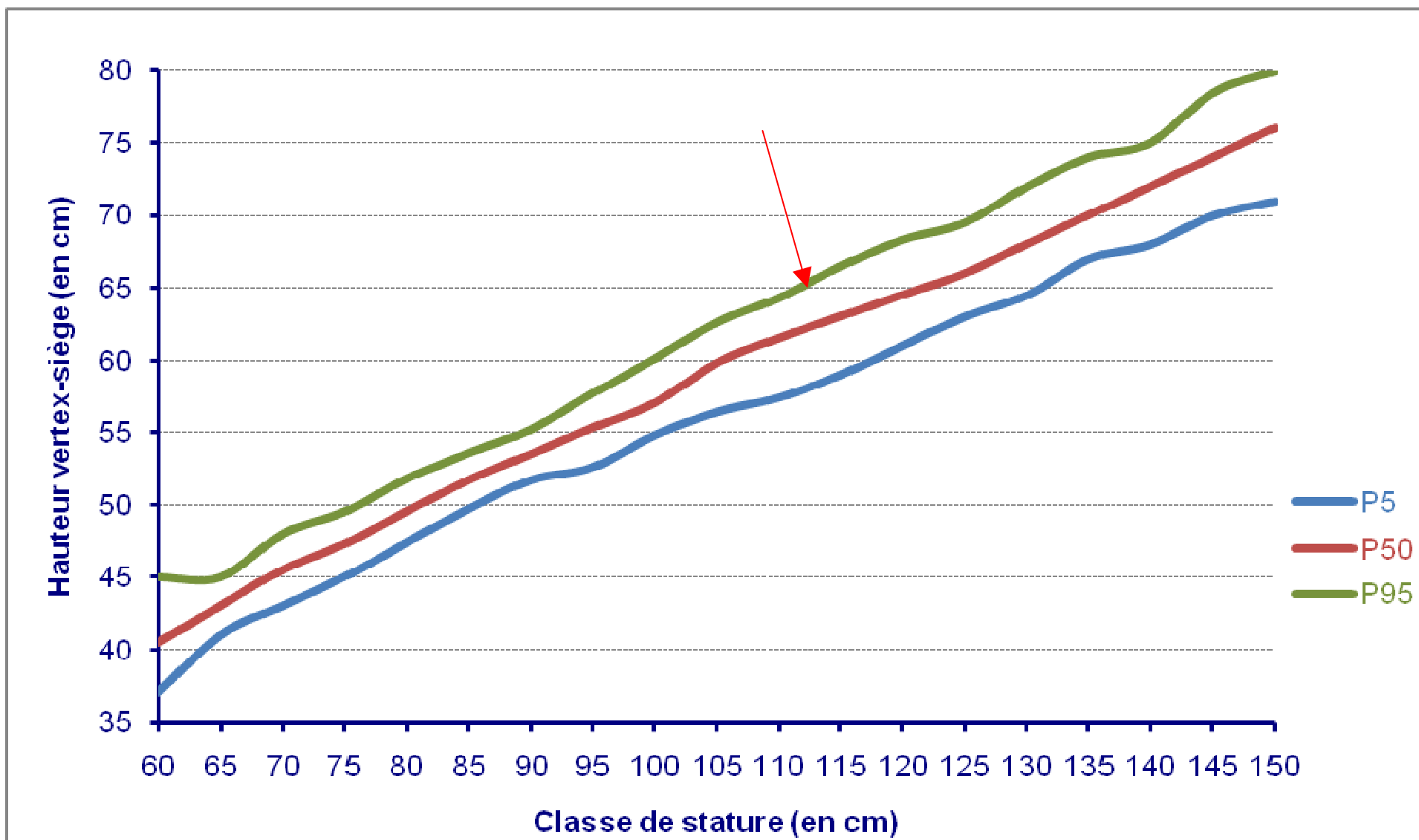
*Source : IFTH – Projet 3D Child*



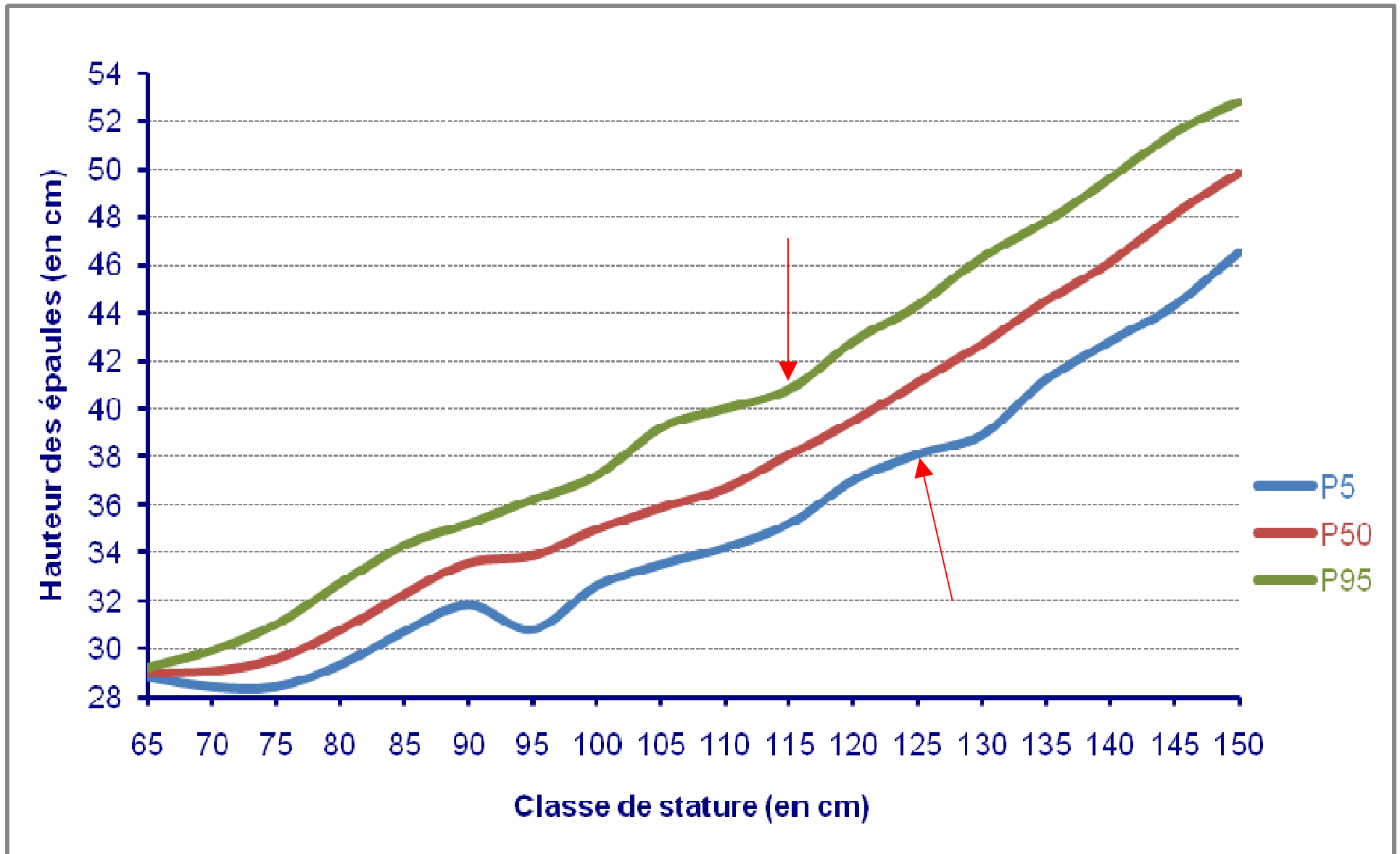


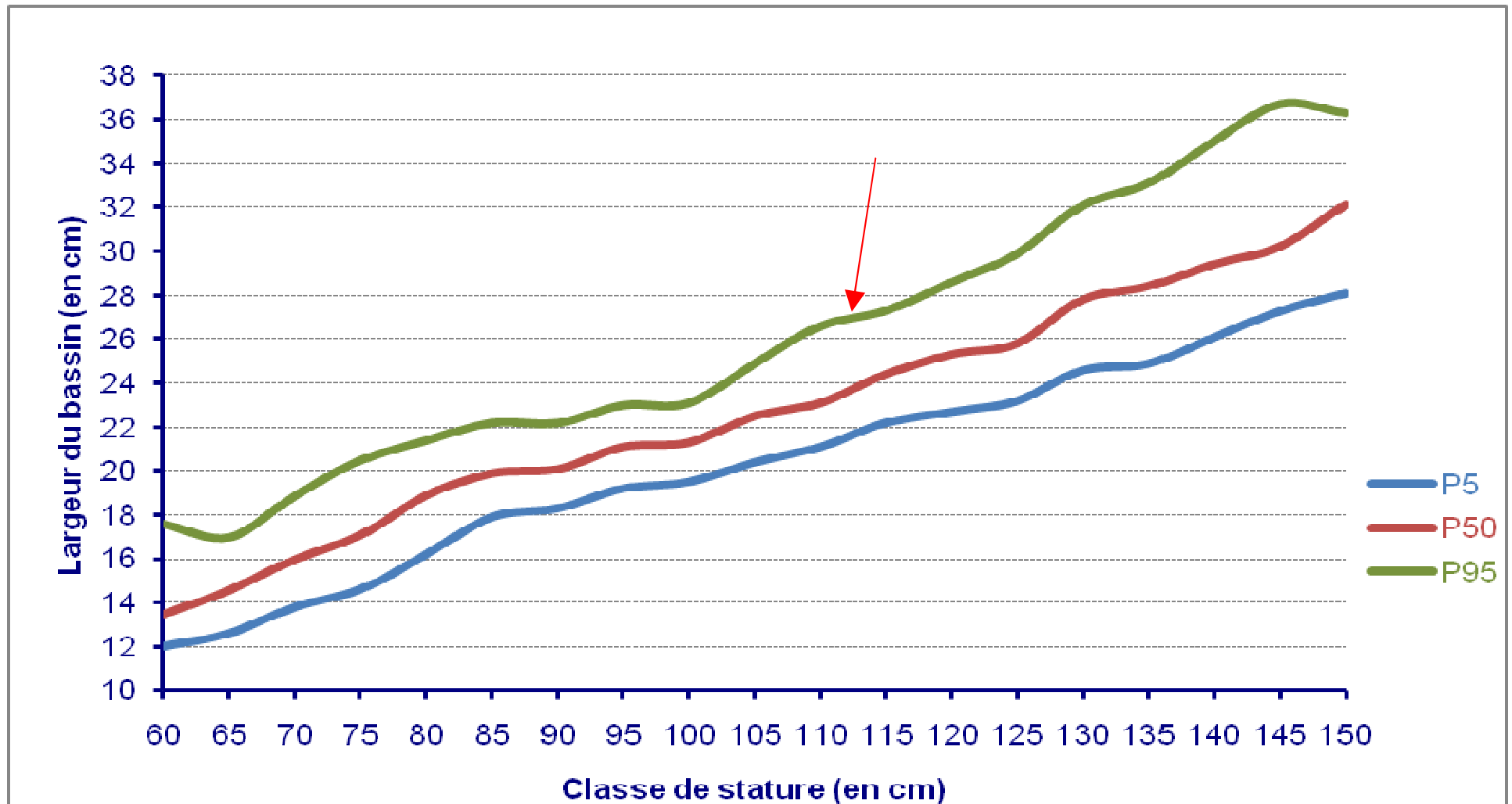


# Seating height / Stature



# Shoulder height / Stature

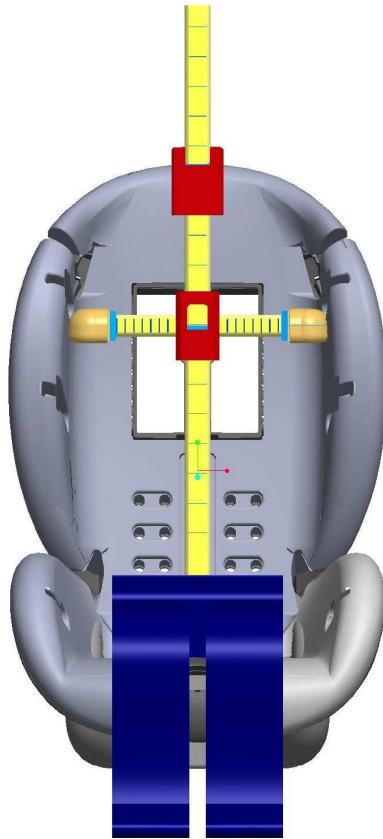




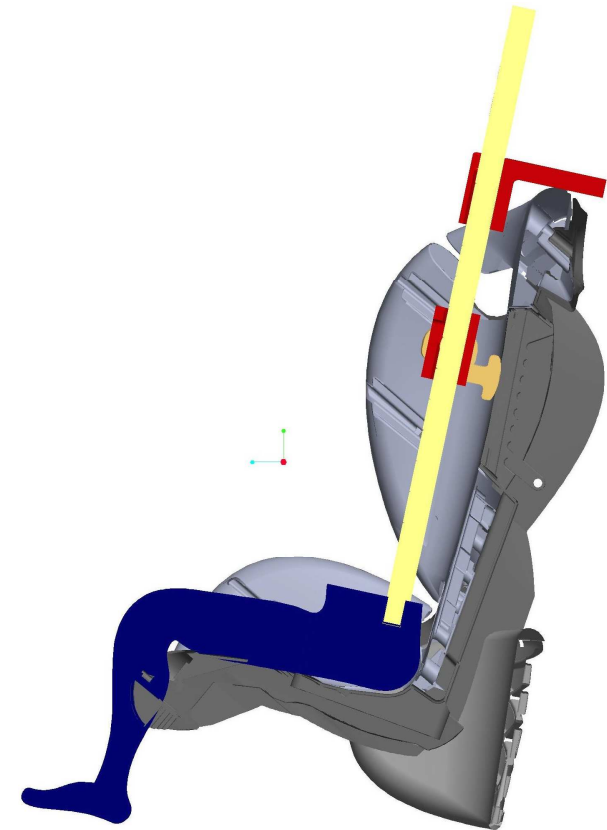
# The measurement device inside a CRS

Based on the range of size declared by the CRS manufacturer

Front



Section





- ⊕ Maximum weight of acceptable children  
= 33 kg – CRS weight. *(info to consumer)*
- ⊕ Maximum stature of acceptable children  
= declared by EM and controlled by TAA.  
*(info to consumer)*
- ⊕ Minimum age of acceptable children  
15 months for FF. *(Mandatory marking)*

- ⚡ This FF CRS is suitable for a child **older than [15th]** with a mass **not exceeding [22]kg** and a stature comprised **between 75 and 125 cms**
- ⚡ This RF CRS is suitable for a child with a mass **not exceeding [18]kg** and a stature comprised **between 40 cms and 95 cms**

- ⚡ Age limit 
- ⚡ Weight limit 
- ⚡ Size limits 

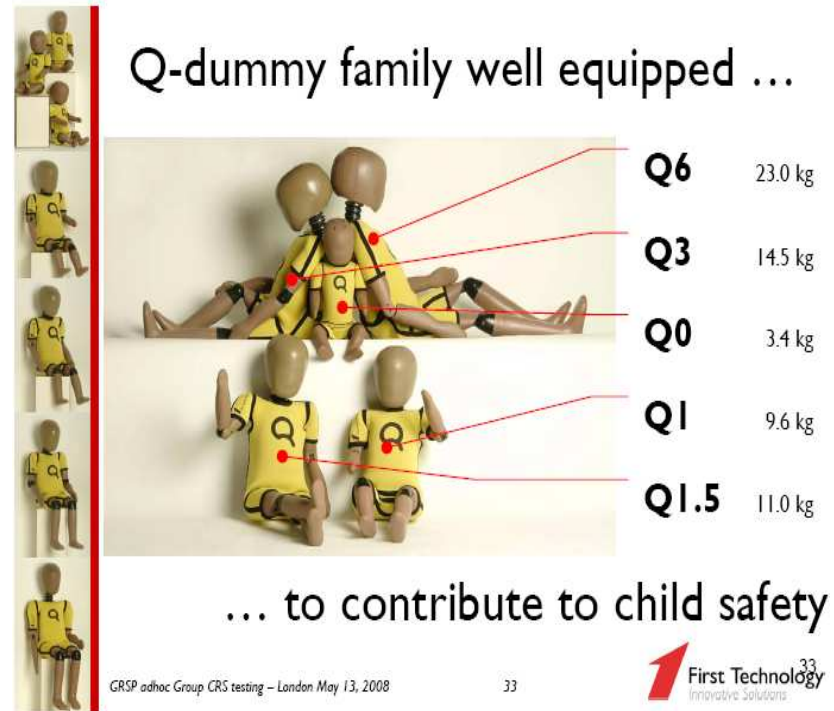
For dynamic behaviour in:

⚡ Frontal impact

⚡ Rear impact

⚡ Lateral impact

Q-dummy family well equipped ...




Q6	23.0 kg
Q3	14.5 kg
Q0	3.4 kg
Q1	9.6 kg
Q1.5	11.0 kg

... to contribute to child safety

GRSP adhoc Group CRS testing – London May 13, 2008

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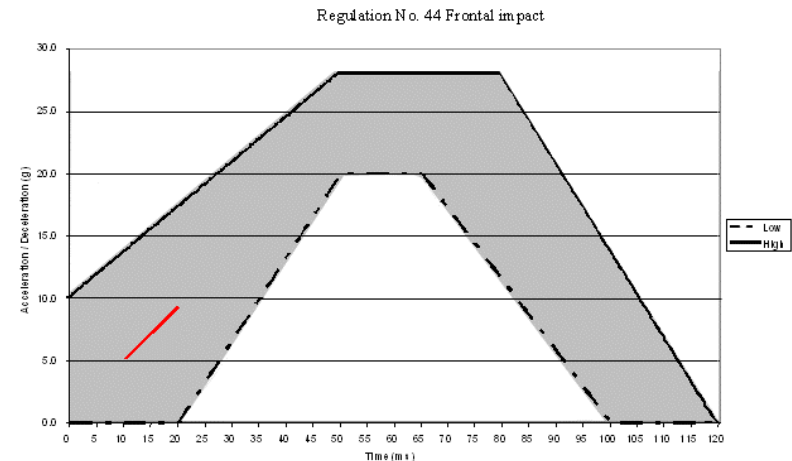
 First Technology<sup>33</sup>  
Innovative Solutions

# Frontal Impact configuration



- ☉ Same as ECE R44 for input pulse.
- ☉ New criteria and requirements for dummies readings
- ☉ Same as ECE R44 for head displacement requirement

For monitoring purpose

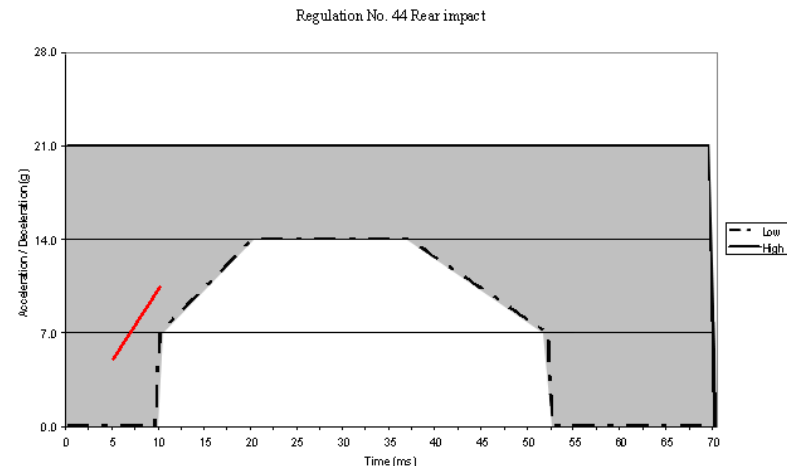


## Injury assessment criteria per dummy

Criterion	Abbreviation
Head Impact Criterion (only in case of hard contact during in-vehicle testing)	HIC
Head Acceleration 3ms	A head 3ms
[ Upper Neck Tension Force	Fz
[ Upper Neck Flexion Moment	My
Thorax Chest Deflection	D chest
Chest Acceleration 3 ms	A chest 3ms

- ☉ Same as ECE R44 for input pulse.
- ☉ New criteria and requirements for dummies readings
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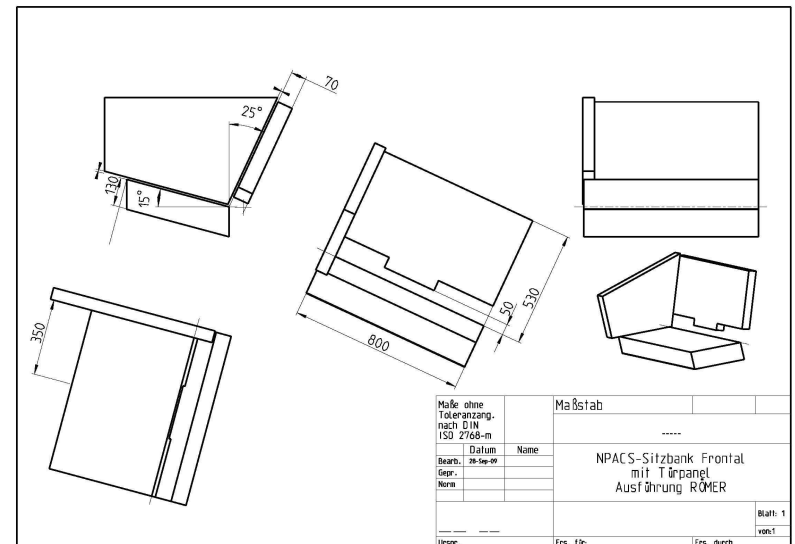
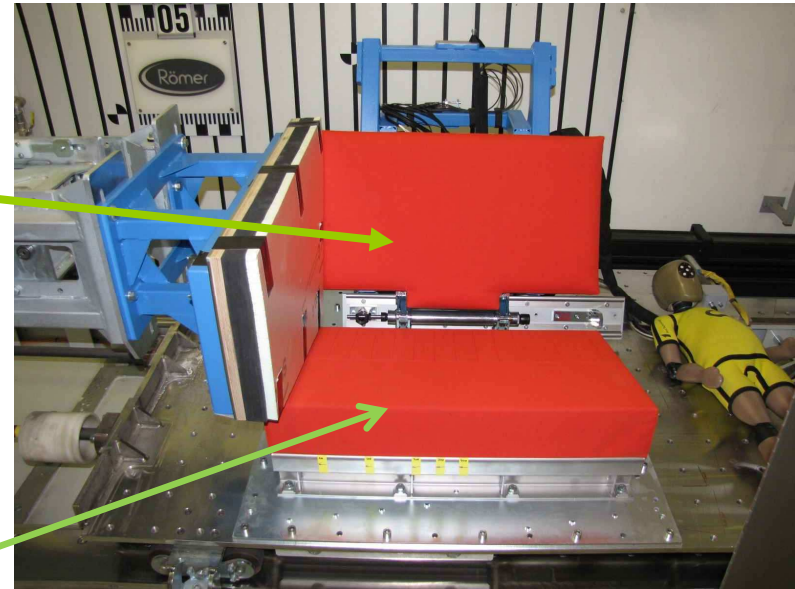
**For monitoring purpose**

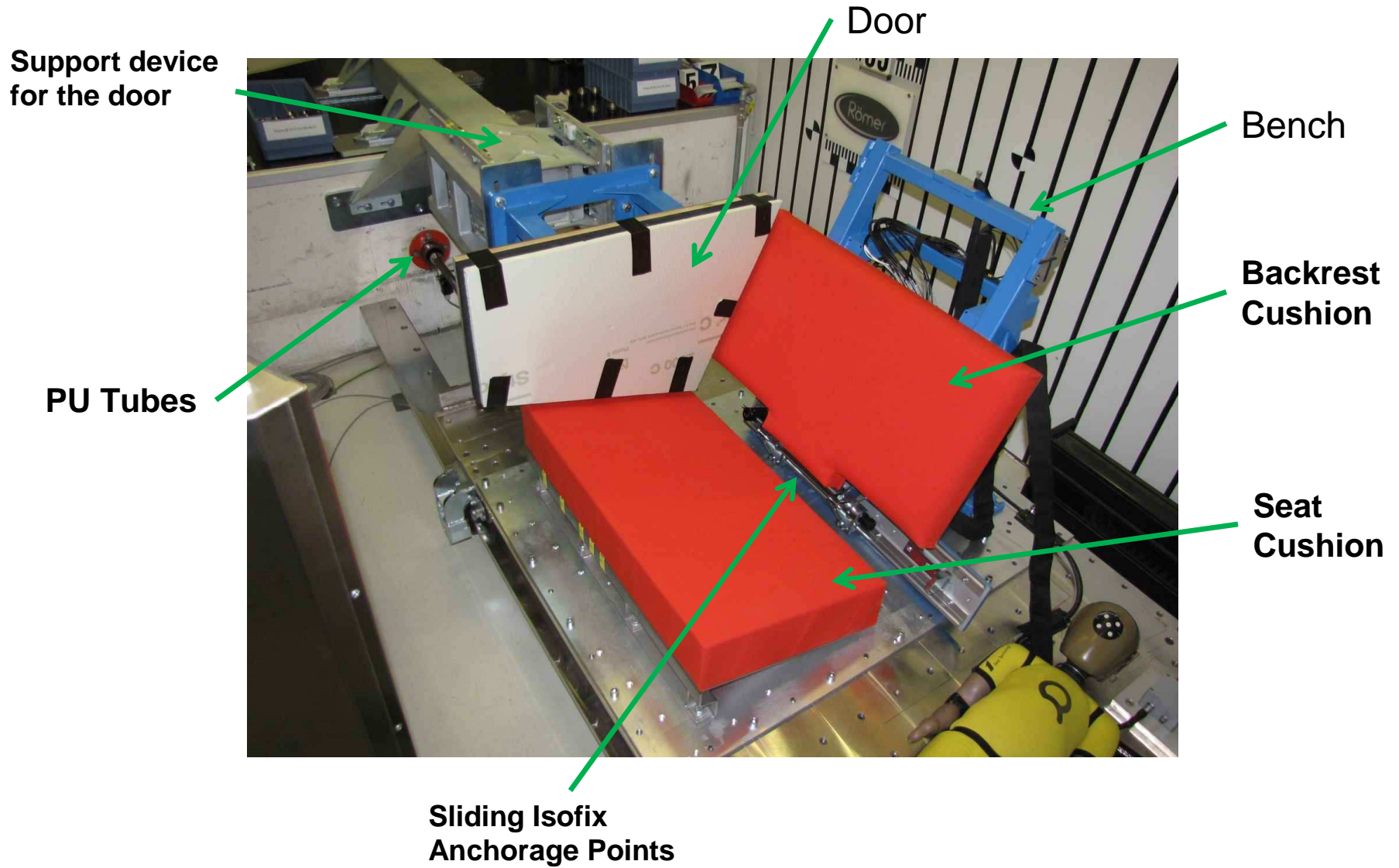


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- ⚡ Test bench according NPACS proposal
- ⚡ Backrest cushion NPACS proposal with a 50 mm cut
- ⚡ Seat cushion NPACS proposal but without gaps
- ⚡ 90° rotation of the test bench for lateral impact

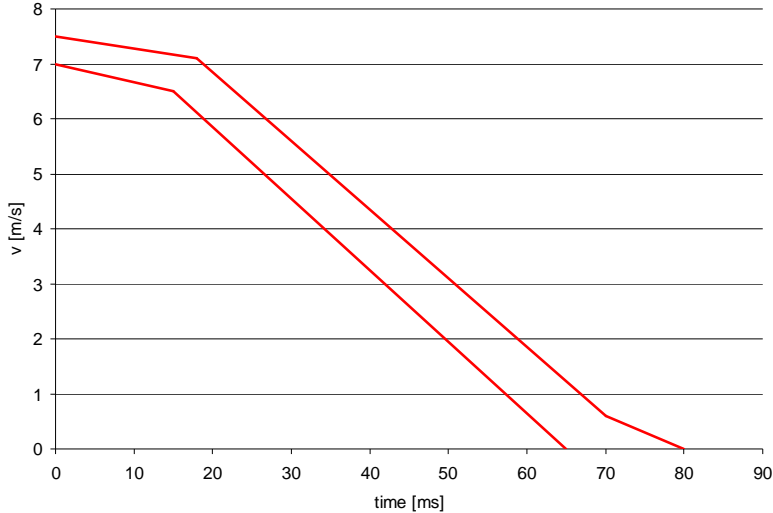




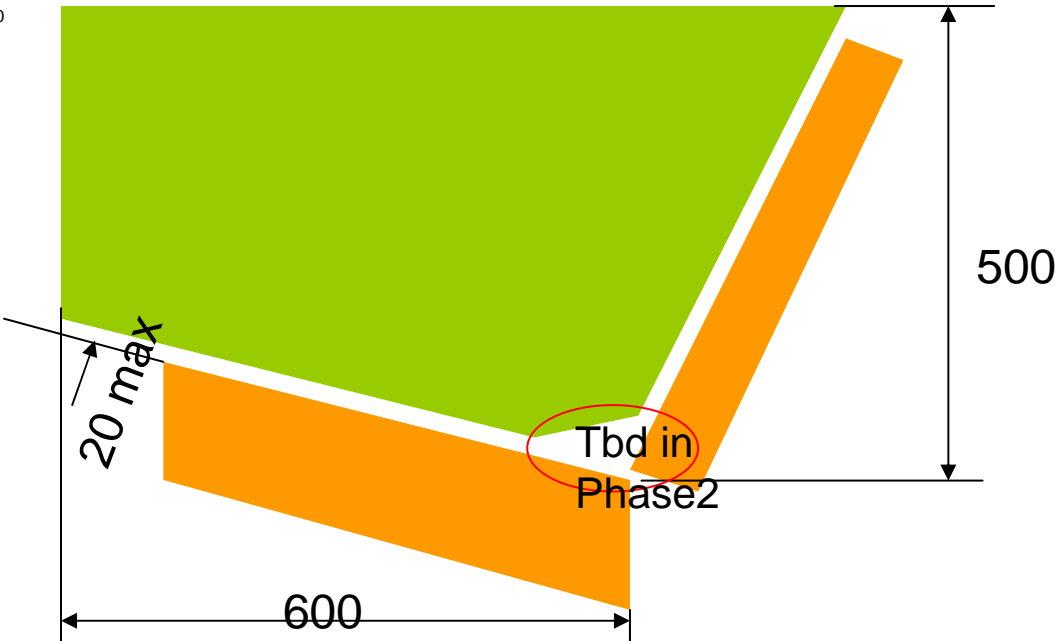
# Door Panel Definition



Relative velocity corridor to be confirmed by evaluation program

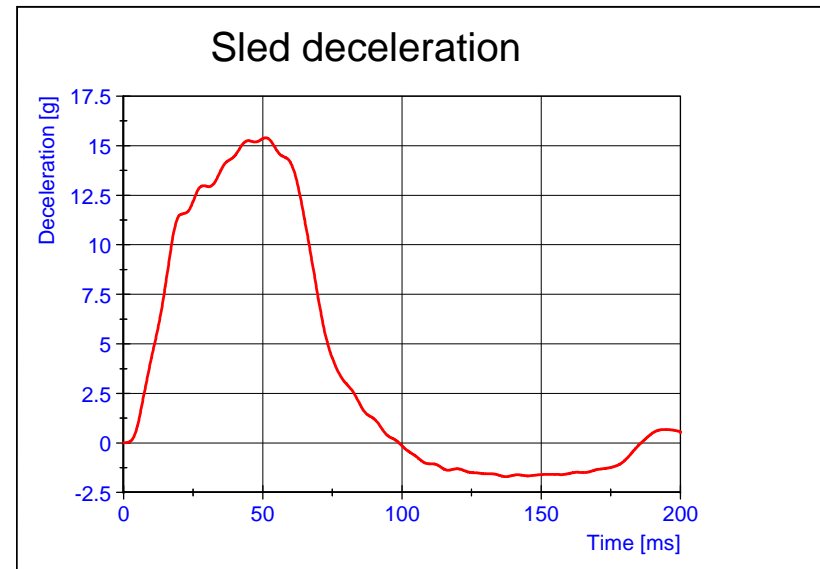
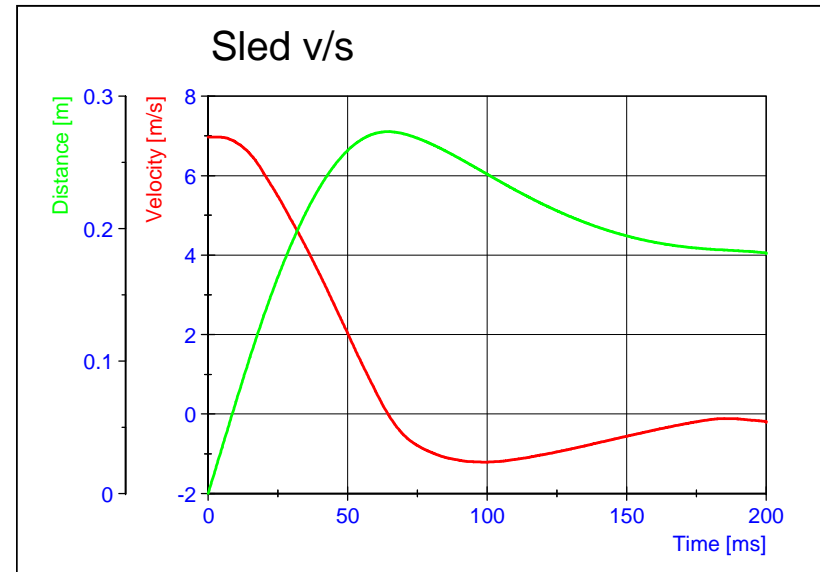


Door Panel Dimensions





	ISO/PDPAS N623E	
Intrusion velocity	7-10 m/s	
Intrusion depth	200-300 mm	
Sled deceleration	10-14 g	
Intrusion surface height	500 mm	



# Forward Facing with TT - Dummy Q3



### ⊕ Floor /support leg interface

#### – Support leg definitions:

- “*Support foot*”
- “*Support leg contact surface*”
- “*Support leg contact volume*”
- “*Vehicle contact area*”
- “*Vehicle contact volume*”

#### – ECE R14 & R16 modification

- *Assessment of “I-Size ready” vehicles*

- ⚡ Age limit [18, 15 or 12 month]
  - Taking into consideration ISO fixtures dimensions
  
- ⚡ Side impact procedure
  - Dummy positioning
  - Pulse corridor
  - Criteria
    - Containment
    - HIC
    - g (3ms) level
  - Requirements

### ⊕ Geometrical characteristics

- Seating height upper limit / Standing height
- Shoulder breadth upper limit / Standing height
- Hip breadth upper limit / Standing height
- Shoulder height upper and lower limits / Standing height
- Measurement tool and tolerances

- ⦿ The Group proposes to GRSP to endorse the draft and to start implementation of Phase 1 and ask for extended mandate to continue with Phase 2:

**“ISOFIX universal non-Integral CRS”**

- ⦿ Next meeting (19th) 30 June (Madrid ?)

