EC 7th Framework Project – EPOCh Dissemination Forum

EPOCh Recommendations for Dummy Design Specification

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Introduction

EPOCh recommendations for Dummy Development

1	General Specifications

2	Detailed Specifications

3	Instrumentation Specifications

4	Items that may be considered

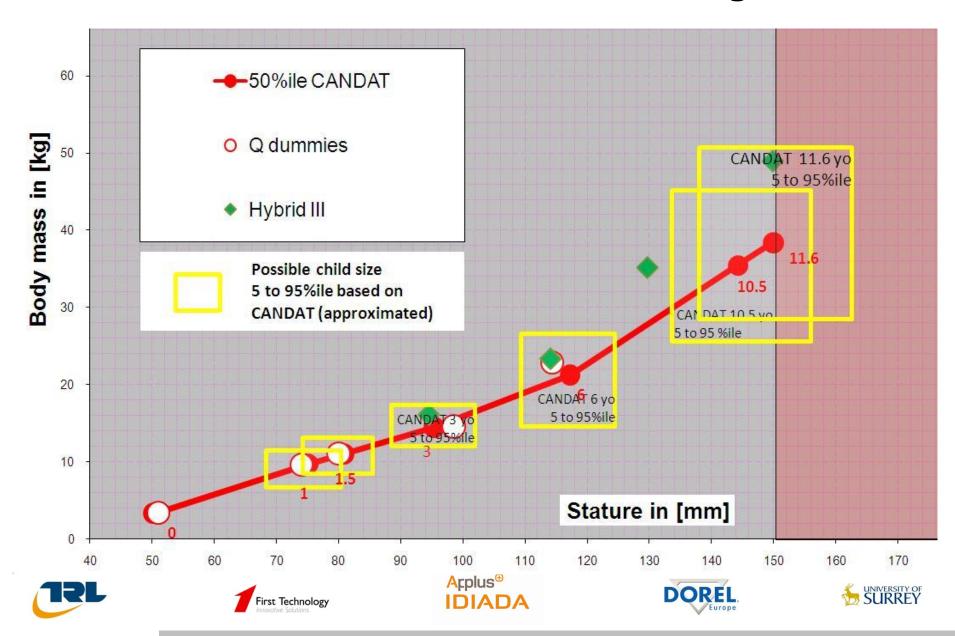| **5**	Items outside the scope of EPOCh

5th to 95th% information related to child age

General Specifications

Size and Durability

- Allow assessment of CRS for children up to 1500mm
    - 12 year old 50th percentile
    - Basic anthropometry from CANDAT
- Be robust enough to assess CRSs in front impact
    - with CRSs approved to ECE Regulation
    - when loading does not exceed 150% of IARVs (assuming the scaling works and there are no surprises with the larger dummy)

- Be robust enough to assess CRSs in side impact
    - with intrusion severity in region of NPACS/ISO
    - with CRSs approved to ECE Regulation
    - when loading does not exceed 150% of IARVs

General Specifications

Physical Capability

- Omni-directional (emphasis on frontal impact, as current Q dummies)

- Sit at different angles without complicated set-up between testing

  - Standing pelvis

- The pelvis is shaped to reproduce that of a 12 yo child

- Dummy should interact appropriately with restraint system

  - That is – no trapping of belts in joints or grooves

- Submarining - Design concept study will be carried out to ensure:

  - Dummy will allow sliding of belt over the pelvis where appropriate in a front impact test

  - Belt does not get snagged-up in the dummy joints

General Specifications

- **Repeatability**
  - During calibration type tests – C of V ≤ 7%

- **Reproducibility**
  - During calibration type tests – C of V ≤ 10%

Detailed Specifications

- Biofidelity targets
  - Based largely on scaled European corridors
- Detailed anthropometry
  - scans of 12 year old children (possibility)
  - Published literature

- Current Q-family methods for:
  - Appearance
  - Performance (where appropriate for age)
  - Handling
  - Certification (frequency to be determined by practical experience)

Detailed Specifications

- Markers for visual analysis
  - External marking of head COG, side and top
  - Side marker to mark the knee
  - Markers in the moulds to show ankle and wrist positions

Instrumentation Specifications

- Head protection

  - Linear accelerations and angular rate sensors

  - The excursion of the head needs to be measured in front impact

  - The containment of the head needs to be measured in side impact

- Neck protection

  - Neck forces and moments

- Abdomen protection

  - The dummy needs to be capable of determining when it is submarining

  - Pelvis linear acceleration and angular rate sensors

- Chest protection

  - Linear accelerations

  - Rib compression in x and y directions

Instrumentation Specifications

- Dummy pre-test set-up assessment – not linked to dynamic data acquisition)
  - Tilt Sensors
    - Head
    - Thorax
    - Pelvis

Final Items

Items that may be considered	Items outside the scope of EPOCh	
▪ Space for onboard DAS	▪ Link pre-test set-up instrumentation to dynamic data acquisition ▪ Q12s ▪ Harmonisation between American and European dummies	▪ Any Questions?

For more information
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Enabling Protection for Older Children