



# Q10 Upgrade Kit

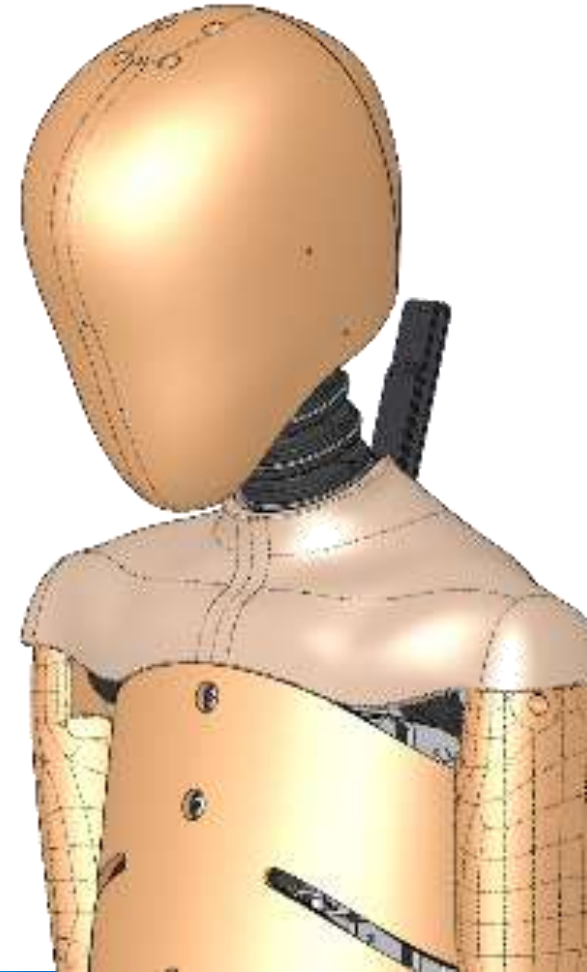
Euro NCAP CSWG Meeting, 20 Sep 2018, Leuven

# Q10 dummy configuration

- Developed in EU EPOCH project
- Drawings and manuals available under UNECE Regulation R129
  - Yet to be made available for M.R. #1
- Euro NCAP configuration
  - No Abdomen Pressure Twin sensor
  - Hip shields instead of hip liner

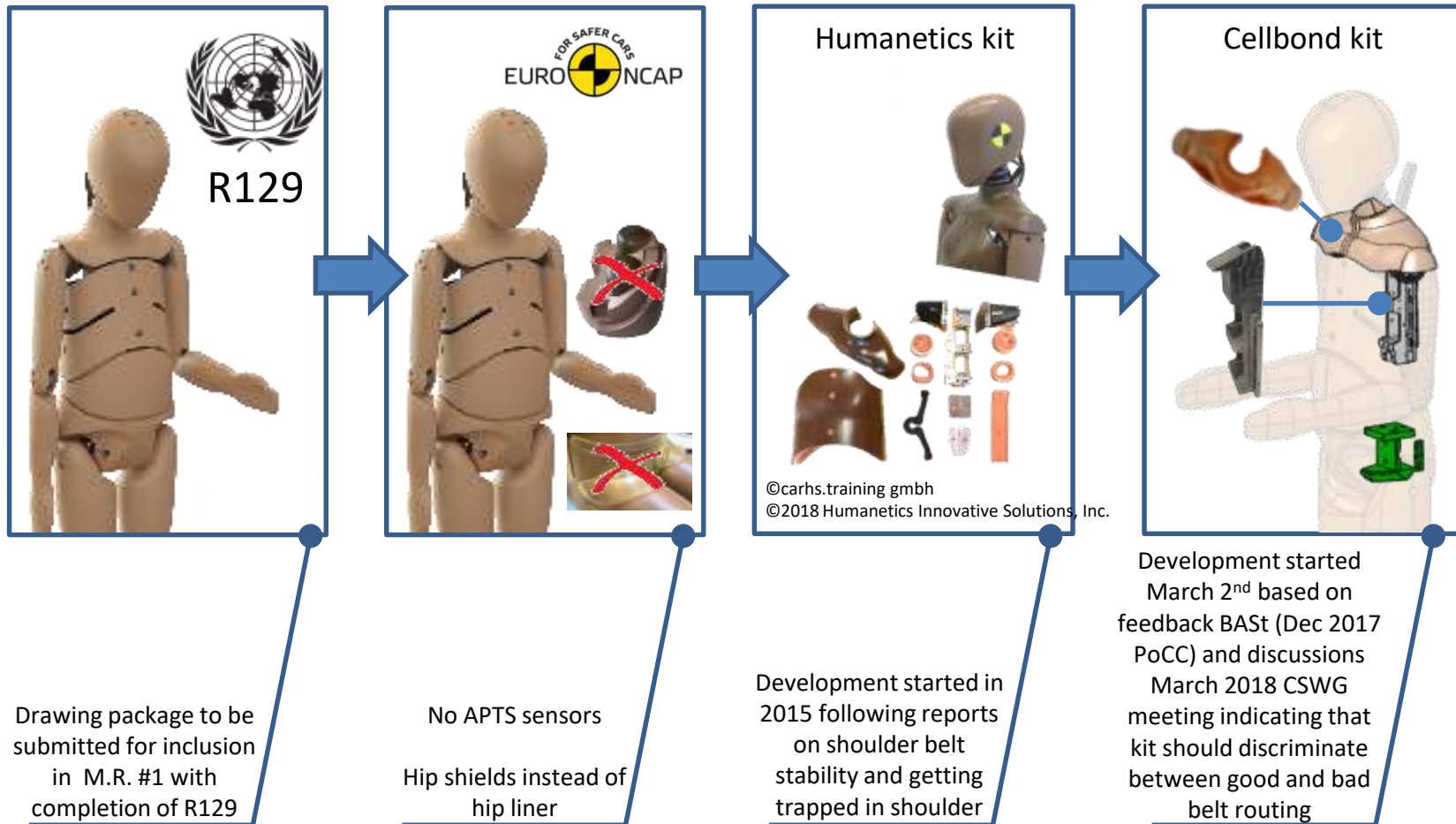
**For the 2020 MPDB protocols Euro NCAP is considering an upgrade kit related to shoulder belt stability**

**This kit might also be introduced in Stiftung Waren Tests during their update planned for 2020**



# Q10 upgrade kit for shoulder belt interaction

## Configuration for 2020 MPDB Test under investigation



# Euro NCAP Update

Child Safety Working Group – March 1<sup>st</sup>

## Q10 upgrade kit Humanetics:

- Neck base forward and chin up
- Continuous shoulder pad
- Shoulder points moved forward
- Soft flesh added to thorax

Evaluation testing in Europe and Japan ongoing

Evaluation testing comparing both designs by BAST planned for May 2018

## First feedback to Euro NCAP Child Safety working Group by ACEA and BAST



- Modified neck base avoids chest chin contact
- Continuous shoulder pad avoids belt trapping
- Soft flesh on thorax and shoulder points shift stabilize belt too much – not desired



Request to Cellbond to design and produce alternative upgrade kit within 2 Months

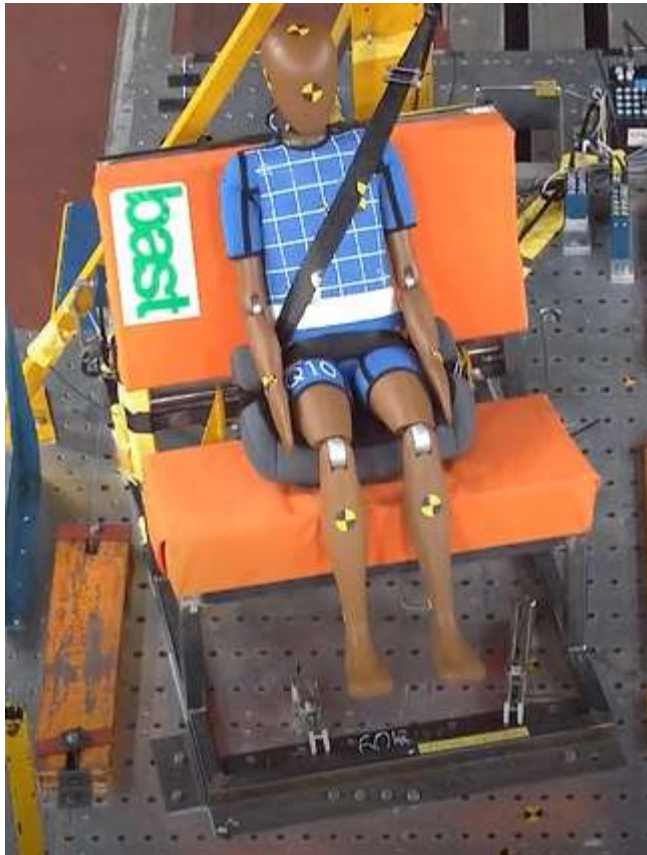
- Neck base forward and chin up
- Continuous shoulder pad



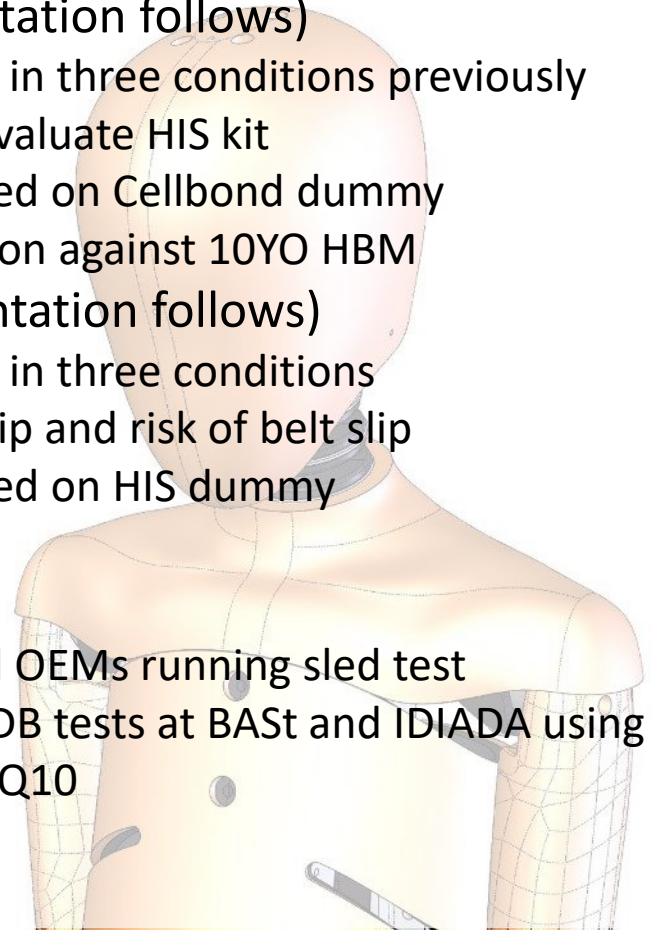
**Decision on Q10 dummy configuration for 2020 protocols expected 2<sup>nd</sup> half 2018**



# Evaluations



- **BASt** (presentation follows)
  - Sled tests in three conditions previously used to evaluate HIS kit
  - Kit installed on Cellbond dummy
  - Comparison against 10YO HBM
- **ACEA** (presentation follows)
  - Sled tests in three conditions
  - No belt slip and risk of belt slip
  - Kit installed on HIS dummy
- **Others**
  - Individual OEMs running sled test
  - 2020 MPDB tests at BASt and IDIADA using Cellbond Q10



# Euro NCAP 2020 MPDB development test

Cellbond child dummies / Q10 including upgrade kit



# Euro NCAP 2020 MPDB development test

Cellbond child dummies / Q10 including upgrade kit

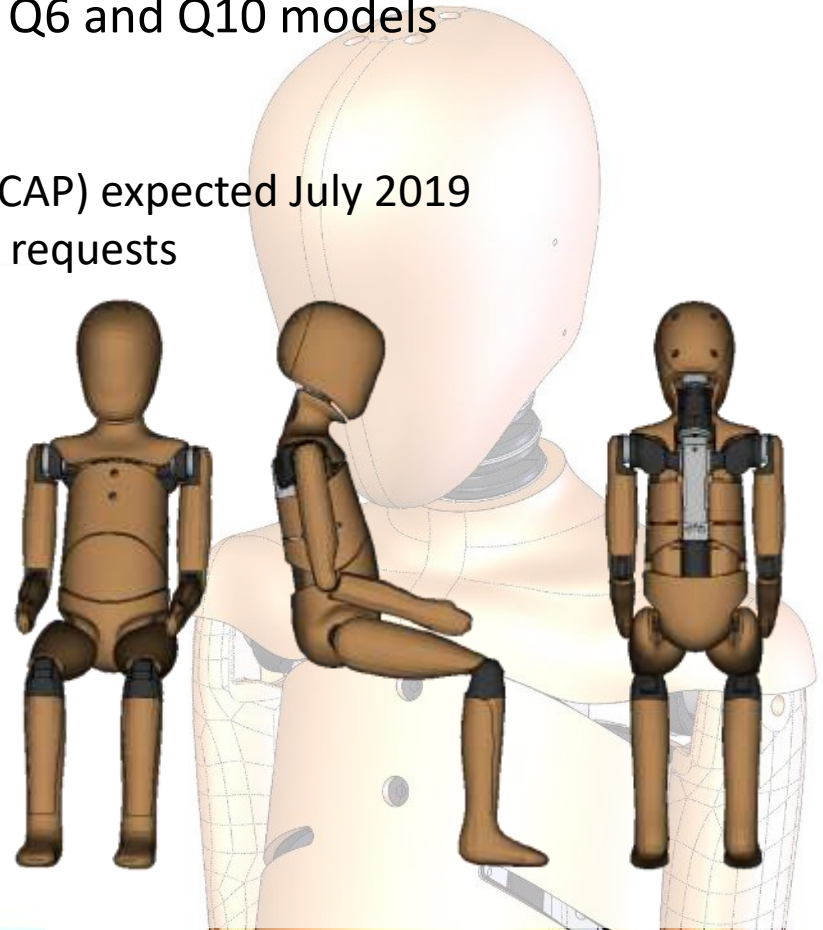




# FE modelling



- Cellbond cooperating with PHITEC on Q6 and Q10 models
  - Developments in LS-Dyna
  - Q6 expected Feb 2019
  - Q10 (assuming configuration 2020 NCAP) expected July 2019
  - Other codes depending on customer requests

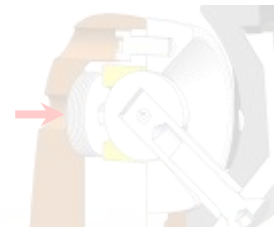
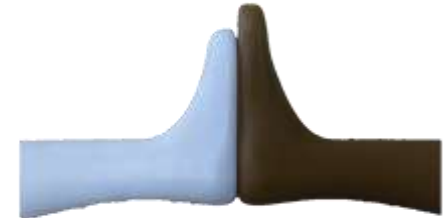




# Other proposals by Cellbond

For discussion

- Reduced foot size
  - 3 cm shorter feet
  - Better positioning
  - Avoid possible extra test
- Femur flesh for stable interaction in pelvis region
- Opening in suit and marker on pelvis for positioning
- Single adjuster for 1-2 g setting



# Reduced foot size

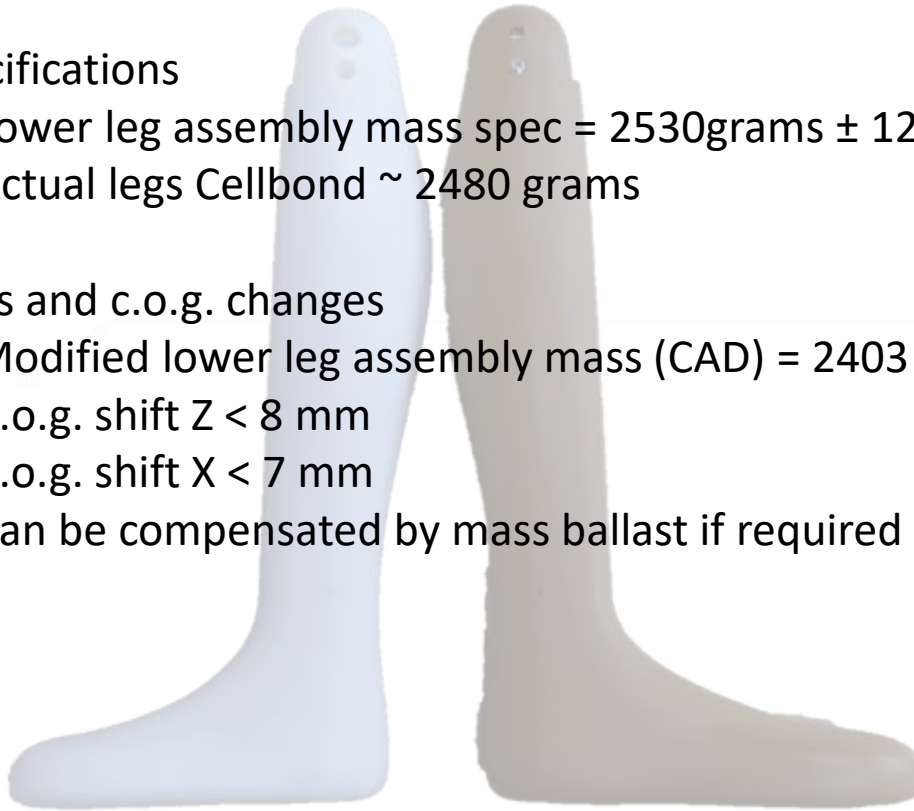


## Specifications

- Lower leg assembly mass spec = 2530grams  $\pm$  120 grams
- Actual legs Cellbond ~ 2480 grams

## Mass and c.o.g. changes

- Modified lower leg assembly mass (CAD) = 2403 grams
- C.o.g. shift Z < 8 mm
- C.o.g. shift X < 7 mm
- Can be compensated by mass ballast if required



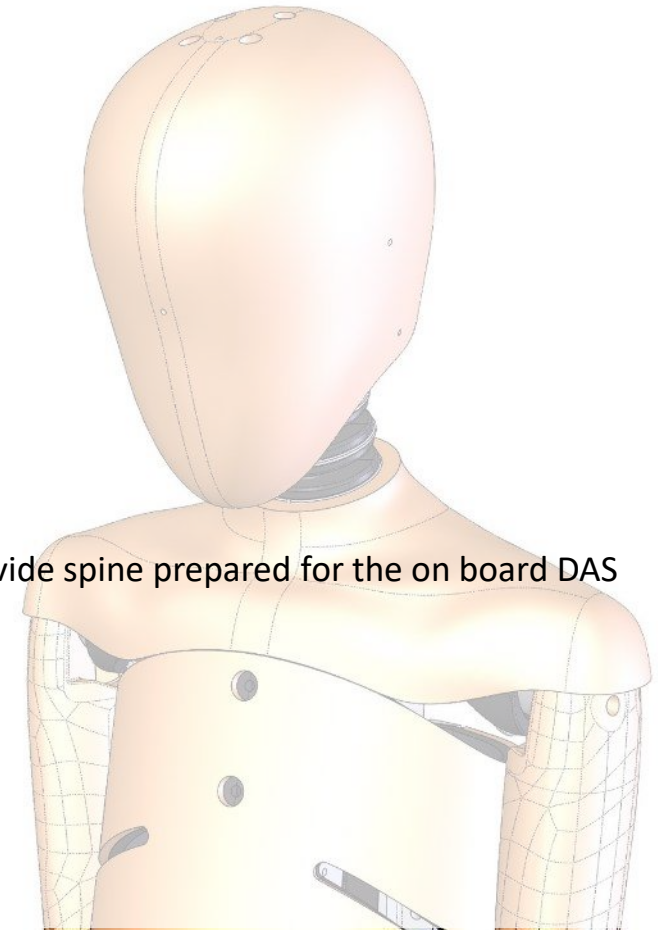
# Parts affected

## Overview



- Continuous shoulder pad
- Scapula's (shoulder bladed)
- Spine\*
  - Increased mass
  - Modified neck base
- Pelvis ballast
- Lower legs
- Suit

\*Cellbond will work with DAS suppliers (Kistler, DTS, Messring) to provide spine prepared for the on board DAS allowing to plug over parts

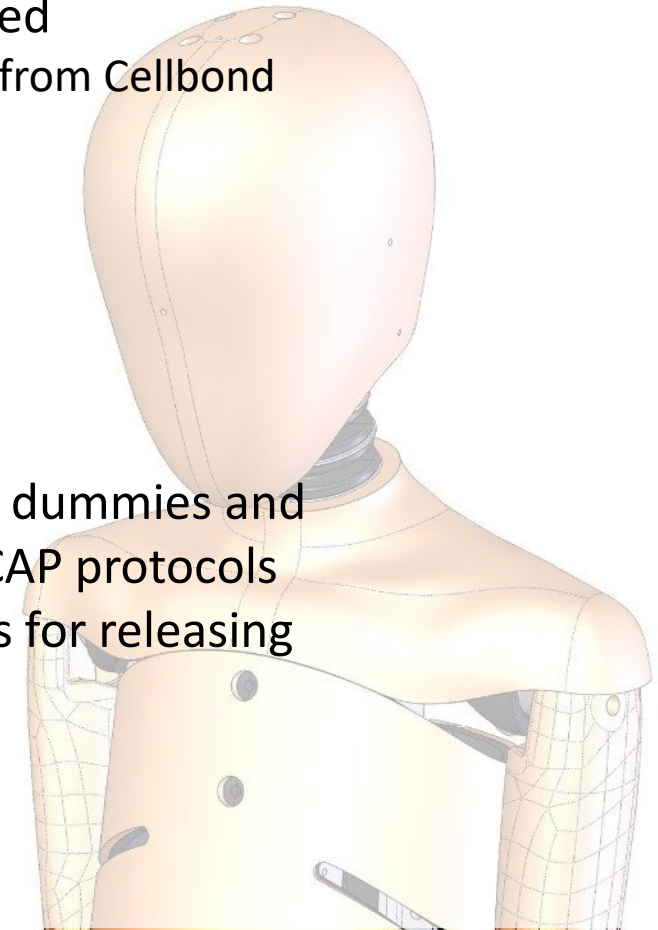




# Drawing package



- Drawings of parts affected can be fully released
  - Same as for barriers developed with support from Cellbond
- No restrictions on
  - IPR
  - Patent
  - © Copyright
- Timing to be agreed
- Given current situation for documentation of dummies and dummy parts included in the various Euro NCAP protocols (as well as UNECE Regulations) the conditions for releasing information are be agreed upon



Thank you for Listening

Any Questions?