



**C L E P A**  
European Association of  
Automotive Suppliers

**DOREL JUVENILE**  
Care for Precious Life

# Q10 Abdominal penetration

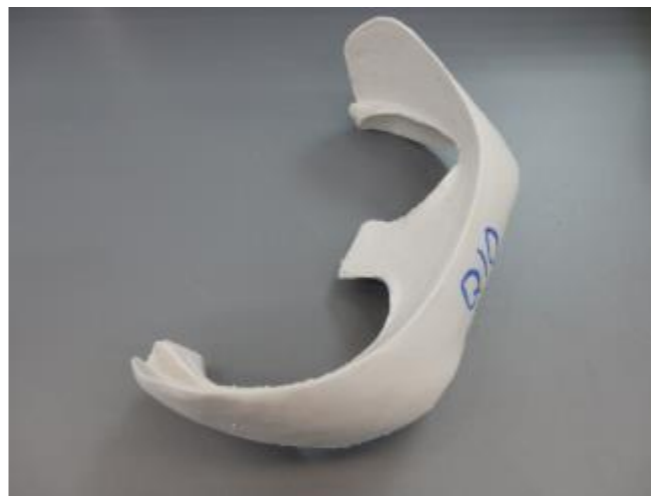
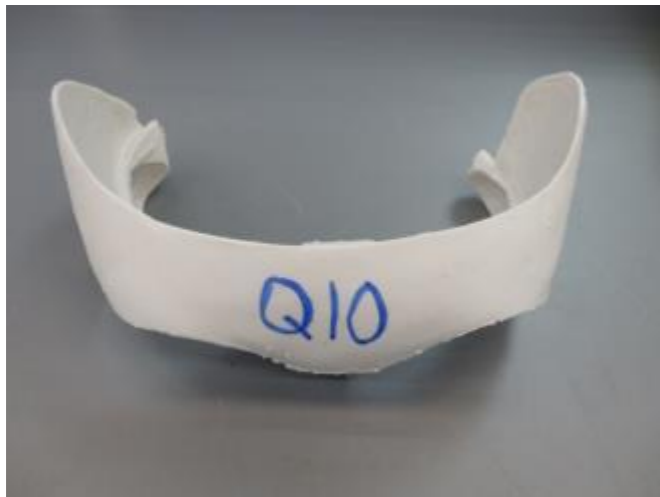
## Tests results with insert proposal

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# Q10 Silicone Insert

- Based on work perform on Q6 dummy (see doc. [CRS-50-10e](#)).
- Silicone insert in made for Q10





# Q10 Silicone Insert



- Remark : due to the zipper (not extensible) it's difficult to place the silicone insert under the suit

# Test condition

- Q10 used on the R129 test bench in R129 frontal impact
- With abdominal sensors
- Submarining checked with high speed camera
- 2 variations on dummy were tested :

Normal Q10 dummy with external plastic insert from HUMANETICS.

Q10 dummy with silicone insert from DOREL without plastic insert from HUMANETICS.





# Test condition

- Headrest is added in the R129 bench to avoid whiplash on Q10 dummy when sitting on the R129 bench without CRS



# Test Results on dummy variation

Test configuration	With booster cushion	Abdominal pressure (max in bar)	Submarining
Normal Q10 (with plastic insert from HUMANETICS)	No	0.4	No
Q10 with Silicone insert from DOREL	No	<b>2.53</b>	<b>Yes</b>

# Test Results on dummy variation



Normal Q10



Q10 with silicone insert from DOREL



Max pelvis forward movement at 88 ms.



Max pelvis forward movement at 115 ms



# Verification with booster seat (R44 approval)

Test configuration	Dummy configuration	Abdominal pressure (max in bar)	Submarining
Inflatable Group 2 / 3 booster seat * <b>LPP</b>	Normal Q10	0.48	No
	Q10 with silicone insert	<b>3.64</b>	<b>Yes</b>
Normal Group 2 / 3 booster seat (no use of ISOFIX connectors) <b>HPP</b>	Normal Q10	0.71	No
	Q10 with silicone insert	0.64	No

- no submarining with P10 in R44 test condition

With normal Q10 dummy we can not see any submarining effect.

With Q10 equipped with silicone insert, we can see difference between LPP & HPP.



# Verification with booster seat (R44 approval)



Inflatable Group 2 / 3 booster seat with normal dummy

# Verification with booster seat (R44 approval)



Inflatable Group 2 / 3 booster seat with normal dummy



# Verification with booster seat (R44 approval)



Inflatable Group 2 / 3 booster seat with dummy and silicone insert



# Verification with booster seat (R44 approval)



Inflatable Group 2 / 3 booster seat with dummy and silicone insert

# Verification with booster seat (R44 approval)



Normal Group 2 / 3 booster seat with normal dummy



# Verification with booster seat (R44 approval)



Normal Group 2 / 3 booster seat with normal dummy



# Verification with booster seat (R44 approval)



Normal Group 2 / 3 booster seat with dummy and silicone insert

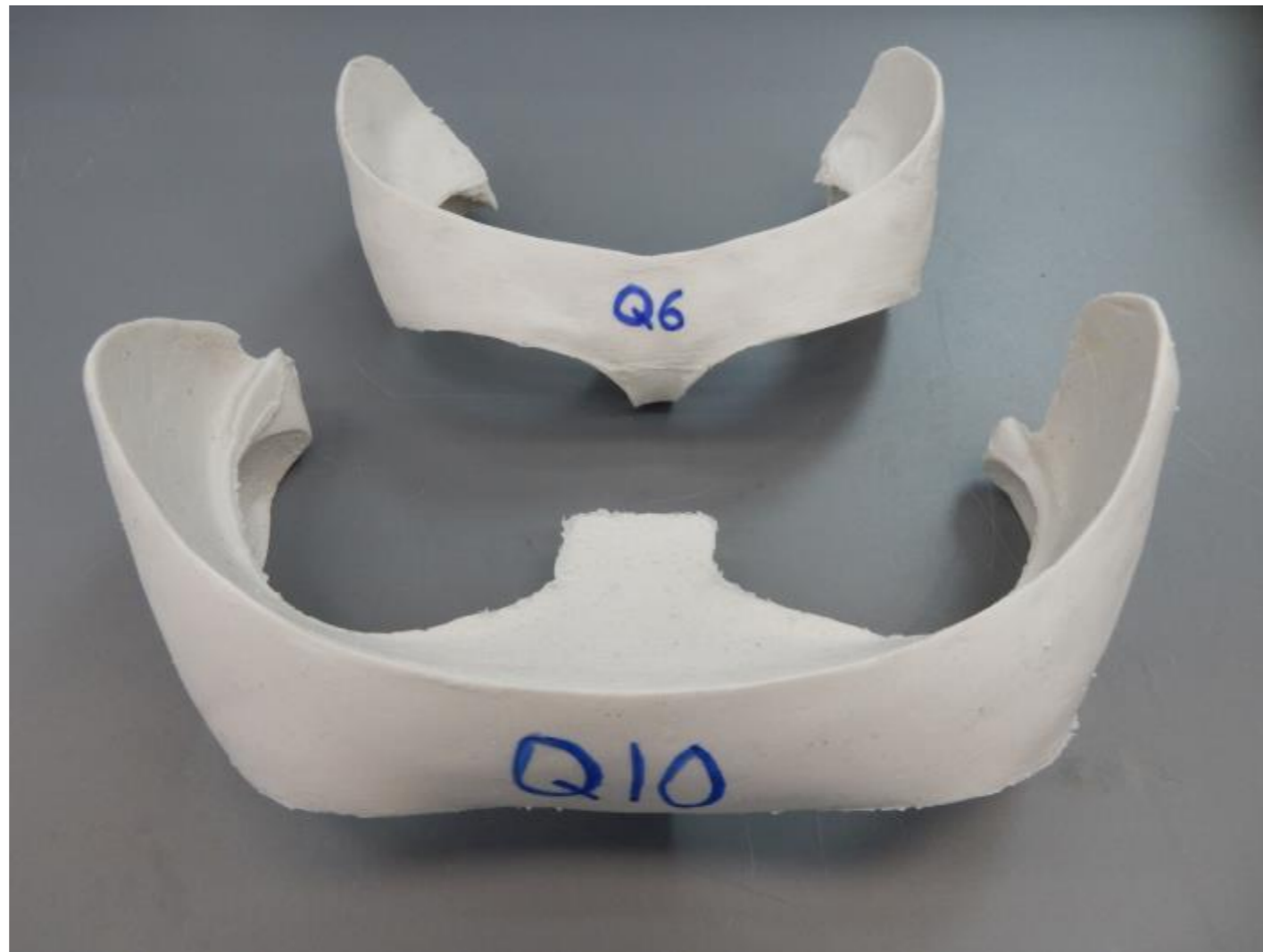
# Verification with booster seat (R44 approval)



Normal Group 2 / 3 booster seat with dummy and silicone insert

# Conclusion (same as testing with Q6)

- No need to change the R129 pulse & the R129 test bench
- An adapted insert on the Q10 can change the kinematics of the dummies during the crash in order to have submarining & abdominal pressure.







# QUESTIONS?



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