



The European consumer voice in standardisation

Future Child Restraint Systems in Cars

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Raising Standards for Consumers

'Future'

Mid / longer term:

- Ongoing changes in mobility:
 - Über / car sharing: user centered design needed, like foldable or integrated
 - Autonomous vehicles: CRS superfluous?



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'Future' (2)



Short term:

- Regulatory changes
(intro R129 / phase out R44)
- Design targets set by consumer information programs
(ETC, Euro NCAP, ...)

R129 development



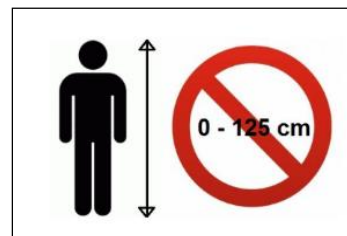
Discussion initiated by ANEC (2008), target:

- Improve protection
- Reduce misuse

Development in phases:

- Phase 1: Integral Harness Isofix ('i-Size')
- Phase 2: non integral (Isofix optional)
 - Booster Seat, with backrest <135cm ¹⁾
- Phase 3: Belted Integral Systems
 - Fall back mode

¹⁾ Booster Cushion, without backrest >125cm NOT in R129 yet



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R44 vs R129



Regulation 44: Child Restraint Systems (CRS)

- Mass based classification
- Fixed weight groups

Designed
around
dummies

Regulation 129: Enhanced Child Restraint Systems (ECRS)

- Stature based classification
- Size ranges (not fixed)

Designed
around
children

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R44 vs R129 time paths

Regulation 44: Child Restraint Systems (CRS)

- **September 2017:**
Isofix withdrawn
 - no new approvals from 1 Sept 2017
 - no extensions from 1 Sept 2020
- **September 2019:**
non-integral withdrawn
 - no new approvals from 1 Sept 2019
 - no extensions from 1 Sept 2023
- **September 2020¹⁾:**
Integral harness withdrawn
 - no new approvals from 1 Sept 2020
 - no extensions from 1 Sept 2022
- **February 2017:**
Booster cushions
only group 3
(for children >125cm and 22kg)

¹⁾ ANEC proposal

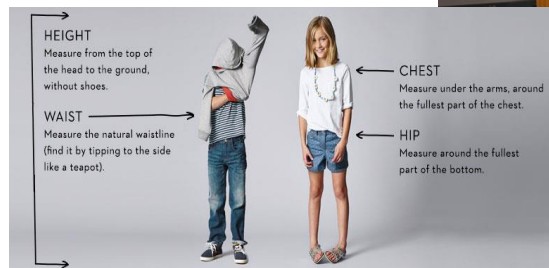
Regulation 129 (i-Size): *Enhanced* Child Restraint Systems (ECRS)

- **June 2013:**
Phase 1
Isofix baby / toddler ECRS <105cm
- **June 2017:**
Phase 2 non-integral
booster with backrest , >100cm
<135cm minimally, Isofix optional
- **June 2018**
Phase 3 adopted:
belted universal baby / toddler seats
entry into force foreseen 29 Dec 2018

R129 achievements (from consumer point of view)



- Focus on i-Size (Isofix)
 - Plug and play
 - Improved car interface
 - Unambiguous labelling
- Stature based classification
 - 95th percentile dimensions
 - Similar to clothing sizes
- Side impact protection
- Rearward facing transport



Reduced misuse

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R129 achievements (2)

(from consumer point of view)

- One belt route for belted ECRS
 - FWF/RWF
 - Integral / non integral
- Reversible switch integral / non-integral
- Harness adjustment without disconnecting
- No kits
 - Support leg, Top tether, Backrest & Anti-rebound bar must be assembled when put to the market
 - Shield must be labelled
- No combined Belt / Isofix installation
- Universal – spec to vehicle only for extension beyond size range



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Not eligible for R129 approval



- For RWF base ('Basis') and wedge ('Keil') must be attached .
- For kids 15 -25kg shoulder pads must be replaced by longer rubber shoulder pads ('Schulterpolster')
- RWF installation with fixing belt ('Befestigungsgurt') requires car front seat to attach.
- For FWF for kids 15-25 kg a 'Safe Stop' (load limiter) must be installed in the harness.

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Not eligible for R129 approval



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R129 Challenges



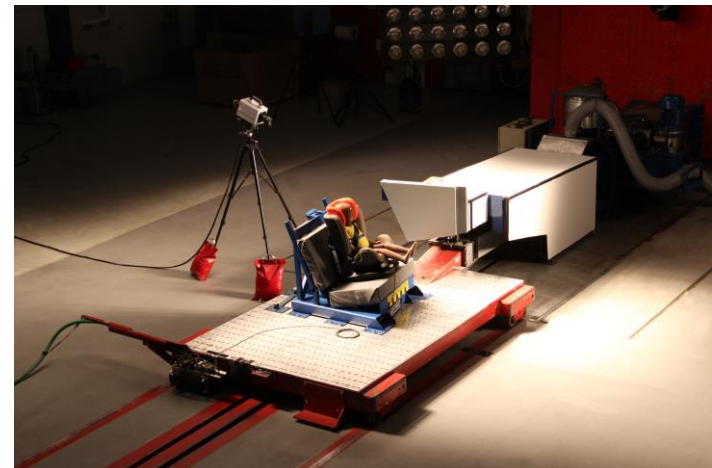
- Simpler Systems
- Longer rearward facing
- Optimise:
 - size ranges
 - mass ratio ECRS / child
- Easy-to-carry-over systems

Consumer Information Programs



ETC (ADAC, ICRT)

- Frontal impact
- Side impact
- Ease of use test
- Hazardous substances
- ...



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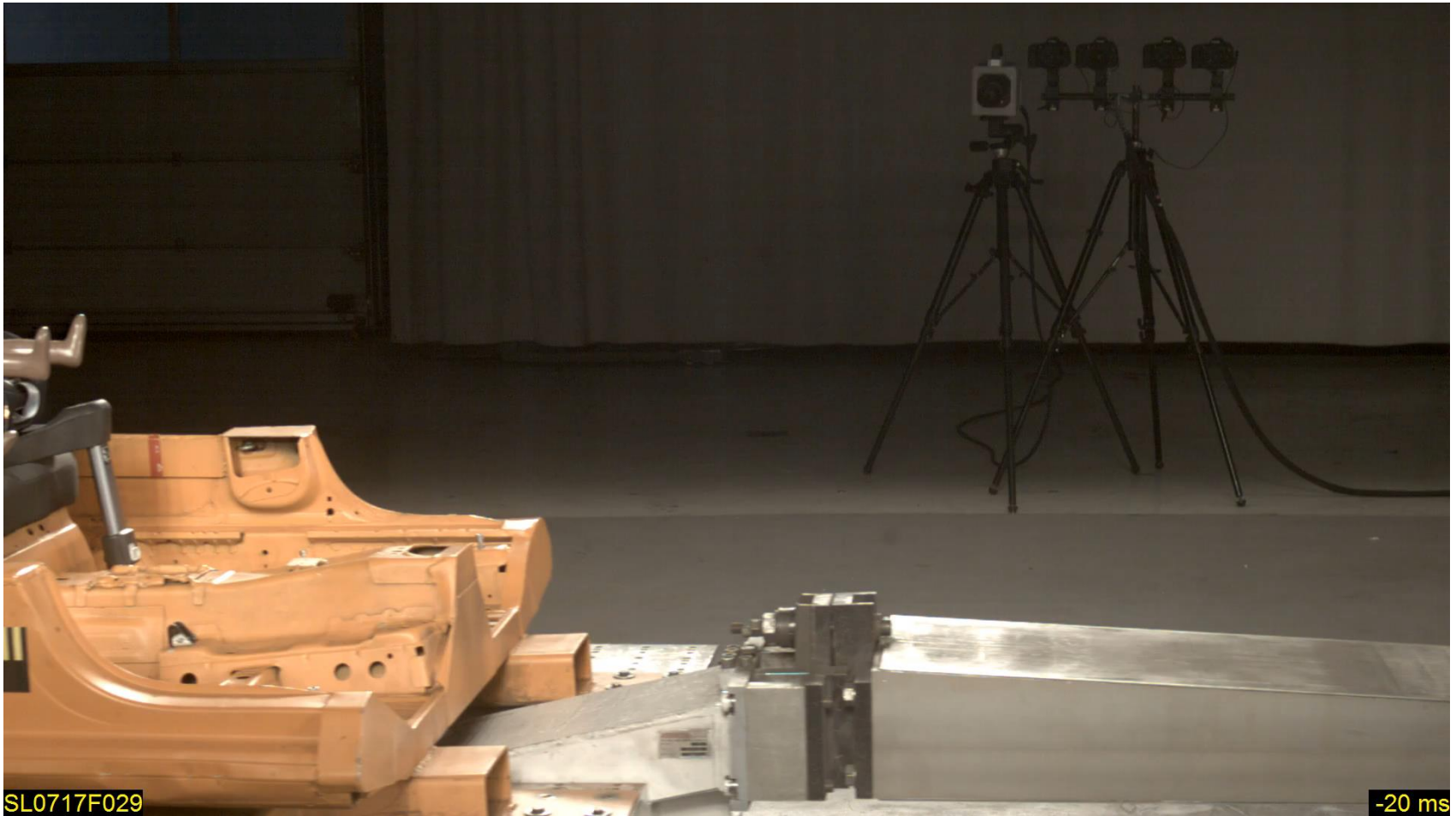
Consumer Information Programs



Tested to date:

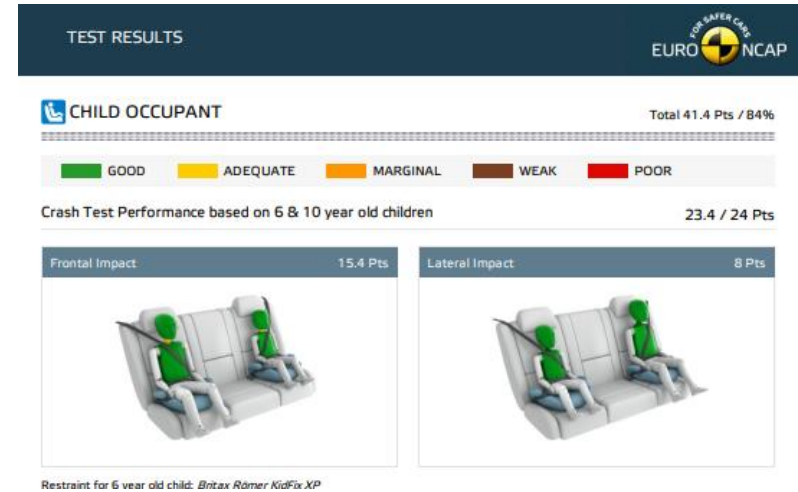
- 42 i-Size integral ECRS
 - 22 baby carriers
 - 12 baby / toddler seats (RWF or RWF/FWF)
 - 7 toddler seats (1 FWF only)
- 2 non-integral ECRS

Consumer Information Programs



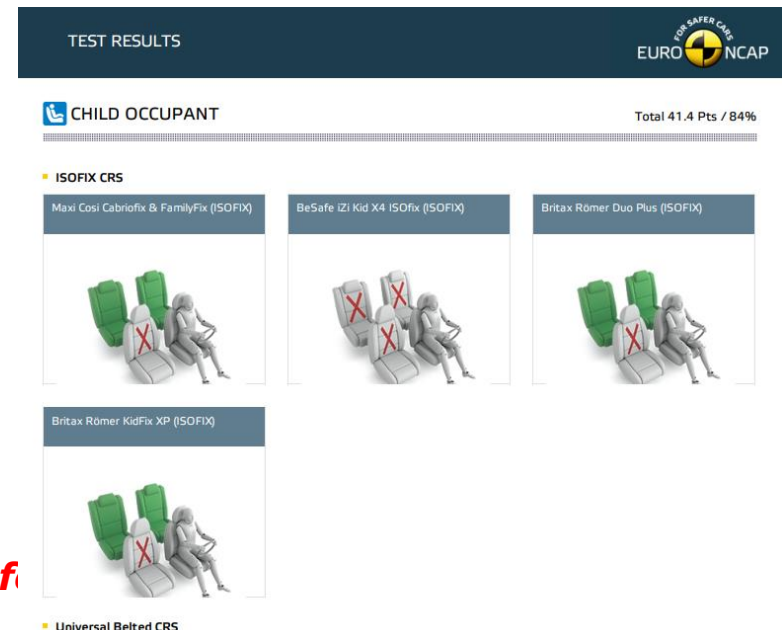
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Consumer Information Programs



- Full scale frontal and side impact with non-integral CRS
- Top pick list
- ...

Raising Standards for



New Technologies



- CRS equipped with airbag

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New Technologies

Sensors and apps: usefull or just gadgets?



Smartphone app – controlled:

- High temperature alarm
- Buckle release alarm

Electric:

- Adjustment of backrest angle
- Isofix and support leg connection
- Heated
- Ventilated
- Big battery in base

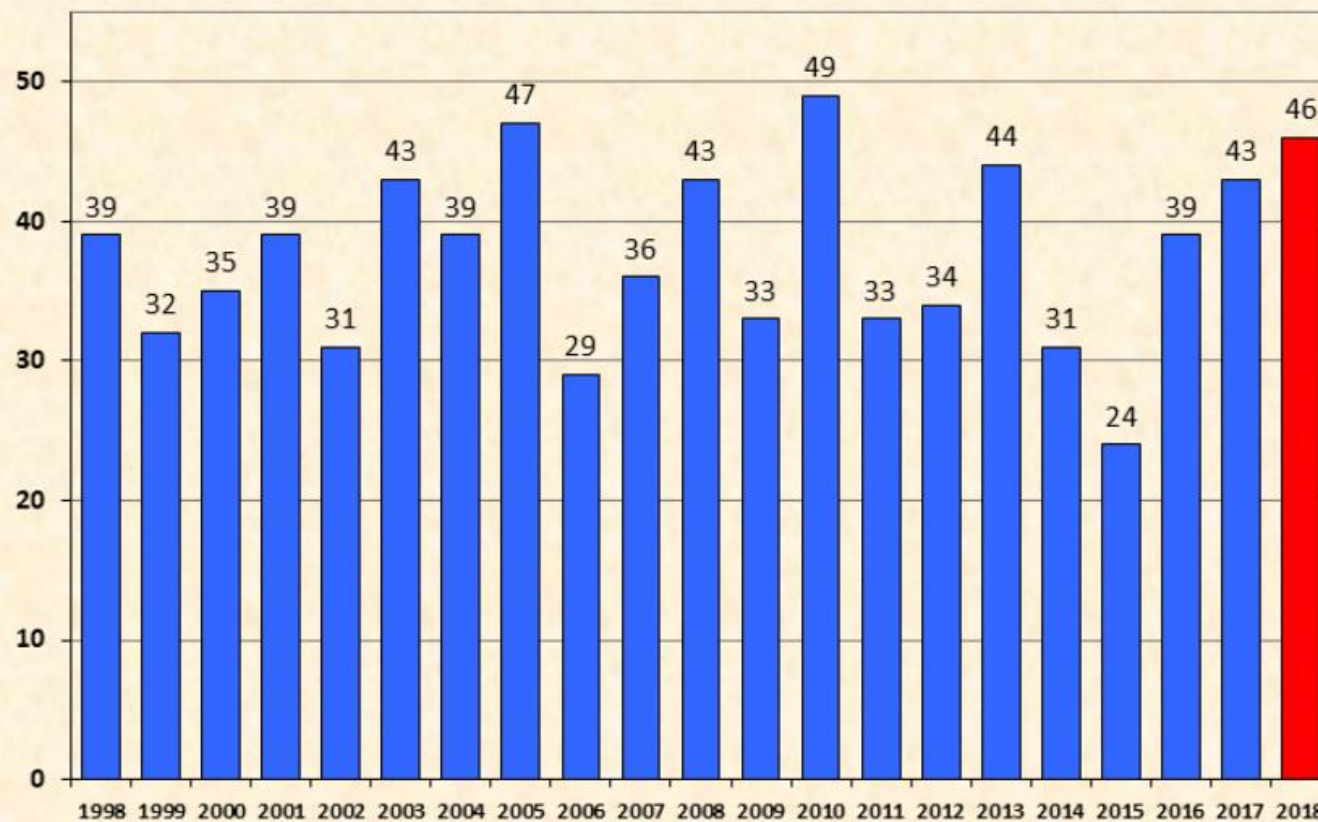


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Heatstroke



U.S. Child Vehicular Heatstroke Deaths



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Heatstroke



Circumstances:

- 54% - child "forgotten" by caregiver
- 27% - child playing in unattended vehicle
- 28% - child intentionally left in vehicle by adult
- 1% - circumstances unknown

U.S. Child Vehicular Heat Stroke Fatalities by Age (1990-2015)

< 1 year	- 32%	(243 fatalities)
1 year	- 23%	(170 fatalities)
2 years	- 19%	(146 fatalities)
3 years	- 13%	(97 fatalities)
4 years	- 7%	(50 fatalities)
5 years	- 3%	(23 fatalities)
6+ years	- 3%	(26 fatalities)



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Heatstroke



Child presence detection:

- In Euro NCAP roadmap
 - Rewarded as of 2022
- To be discussed in ETC



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Trends, Expectations (and a look into the Chrystal Ball)



- Shift to Isofix (i-Size) ECRS
- Integral ECRS: RWF facing dominant
- Belted ECRS only for seating positions without Isofix anchorage points and / or advanced belt systems
- Growing market for easy-to-carry-over systems
- Introduction Child Presence Detection Systems
- Uncertain future booster cushions
- Consumer Organisations remain as Watchdog

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