

Effects of aging and use on Child Restraint Systems





Alianza Española para la Seguridad Vial Infantil
Spanish Alliance for Child Road Safety



What is AESVi?

AESVi is the Alliance of all institutions involved in protecting children while travelling in cars. Composed by:

- **Government**
- **Driver's clubs**
- **Universities**
- **Associations**
- **CRS makers and importers**

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The problem of the accidents

Higher deceleration = higher forces

Forces applied to a child's body in a crash are via the
Child Restraint System



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Why CRS are so important

- CRS are designed **to absorb energy and distribute high forces** over the children's body **without hurting them**.
 - Every child must have a **CRS that fit perfectly**
 - And that is **in good condition**



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Second Hand Car Seats

- **33.2% of the seats purchased in Spain were not new** according to the SFERA Media Group report on the sale of child car seats 2018-2019.
- **"1 in 3 Spaniards already buys more second-hand products than before the pandemic"**

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AESVI Study

- **Analyze the effects of the use and aging of CRS** by testing second hand seats with the most demanding crash test of the approval process
- Find out if **protection in the event of an accident decreases**
- In case of poor results: **alert about the risk of the second-hand market**

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CRS Sample Criteria

- Cost less than 100 euros
- Any brand and in any state of conservation and / or appearance
- Groups most used by families and the most sensitive in terms of security
- Random purchase

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- **Analysis of samples** according to the requirements of the European Regulation ECE R44, in its revisions R44/03 and R44/04
- **Crash tests:** According to the Regulation, a frontal crash test at 50 km/h with the heaviest dummy allowed for each seat was used.

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Findings:

- **80%** of the car seats **did not have the instruction manual**
- **100%** of the car seats presented some type of **deterioration or deficiency**
- **80%** of the car seats presented **losses on absorption materials**

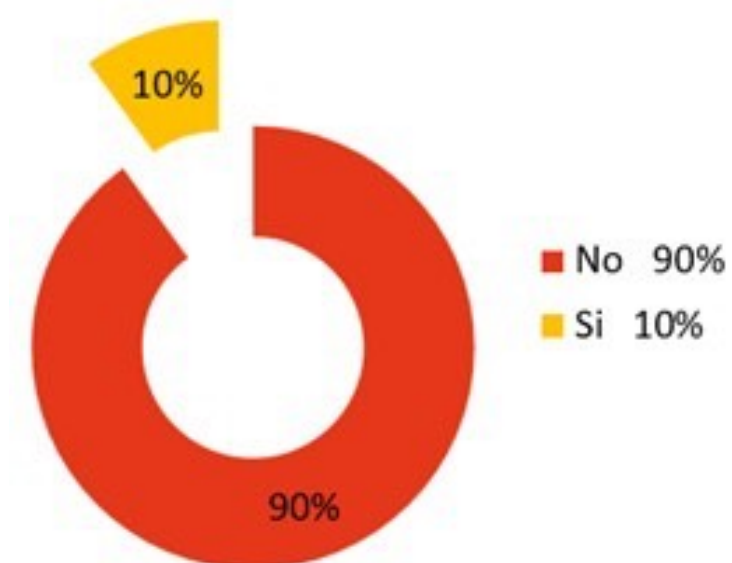
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Crash test results:

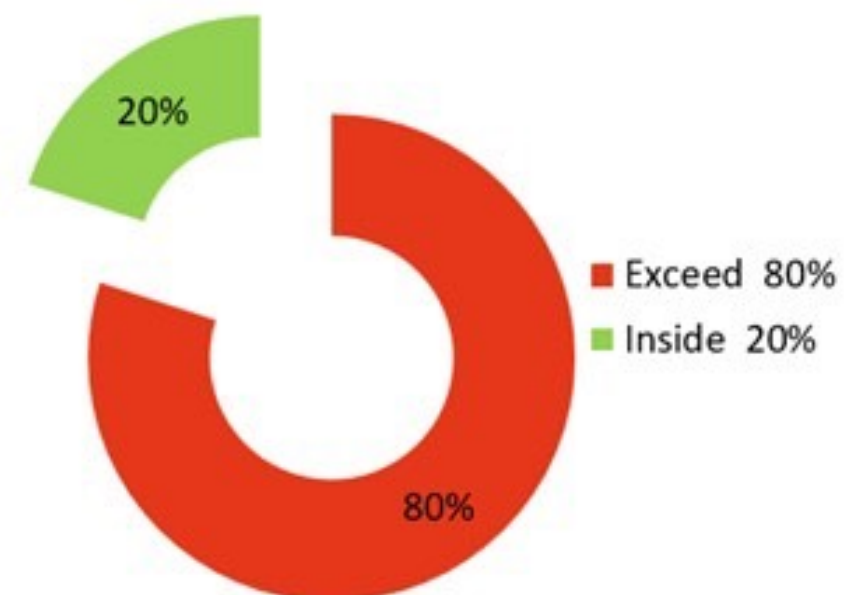
90% of the car seats would not pass the requirements of the ECE R44 standard

70% of CRS had displacements over the limits established by the regulation

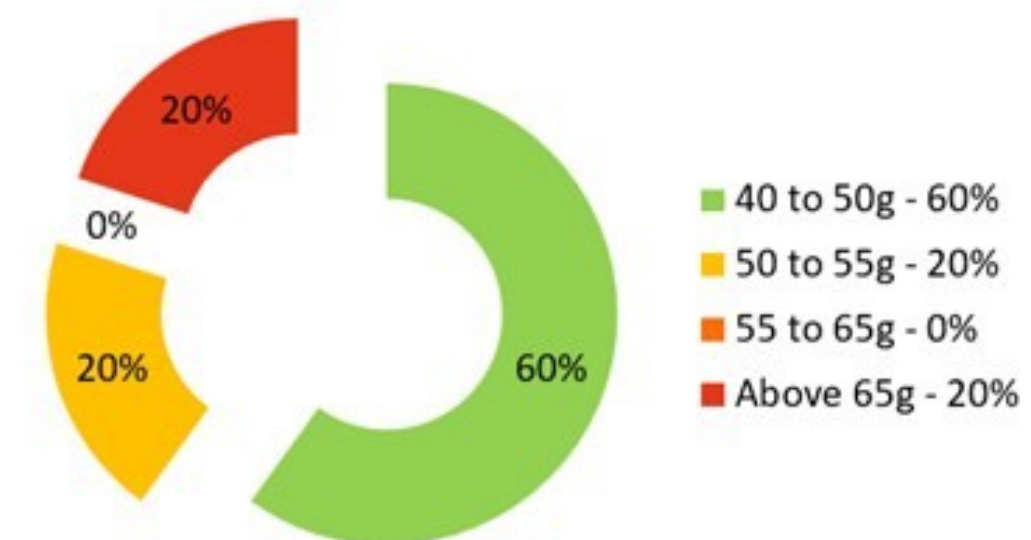
Fulfill R44 Dinamic Requirements



Head Displacement X and Z

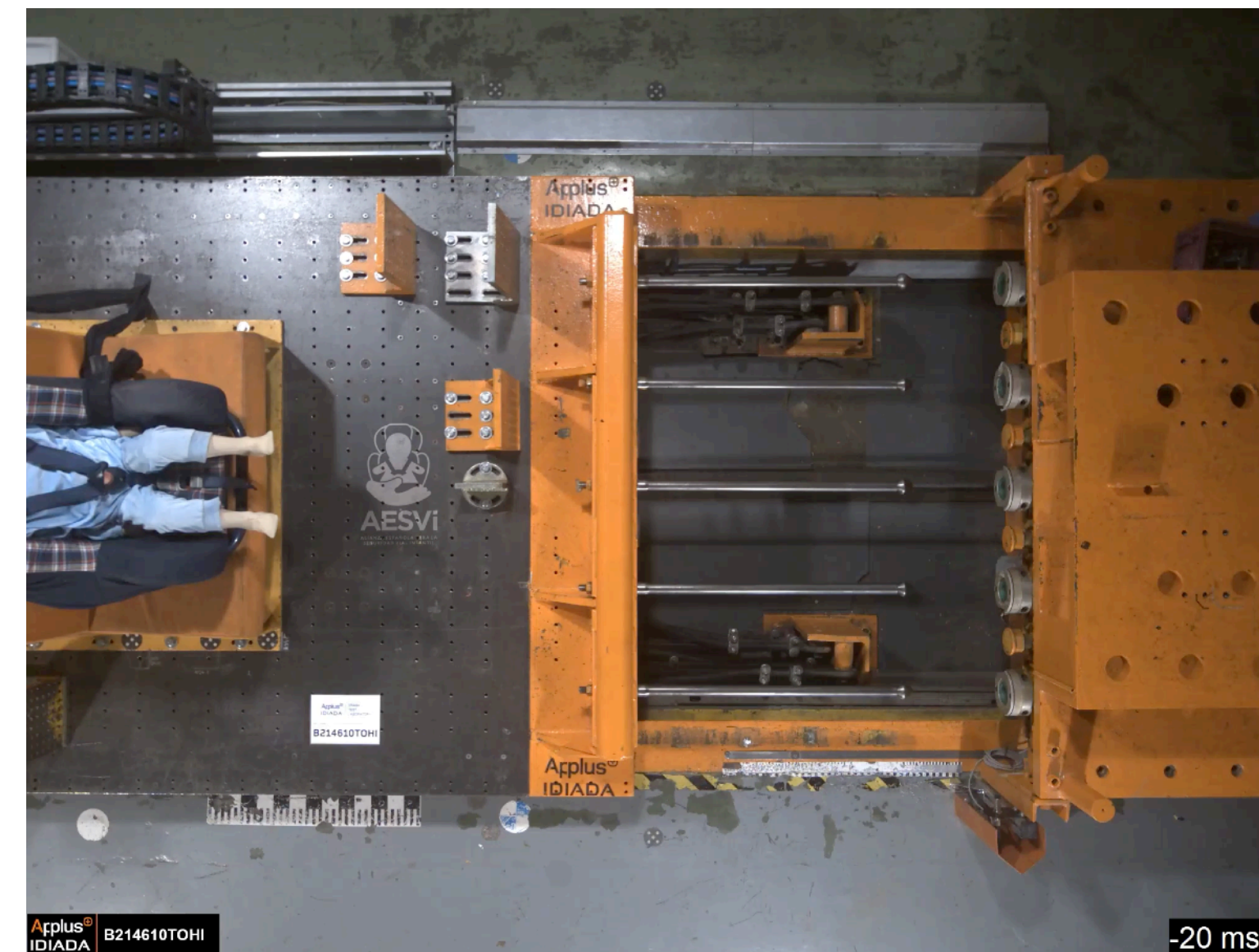
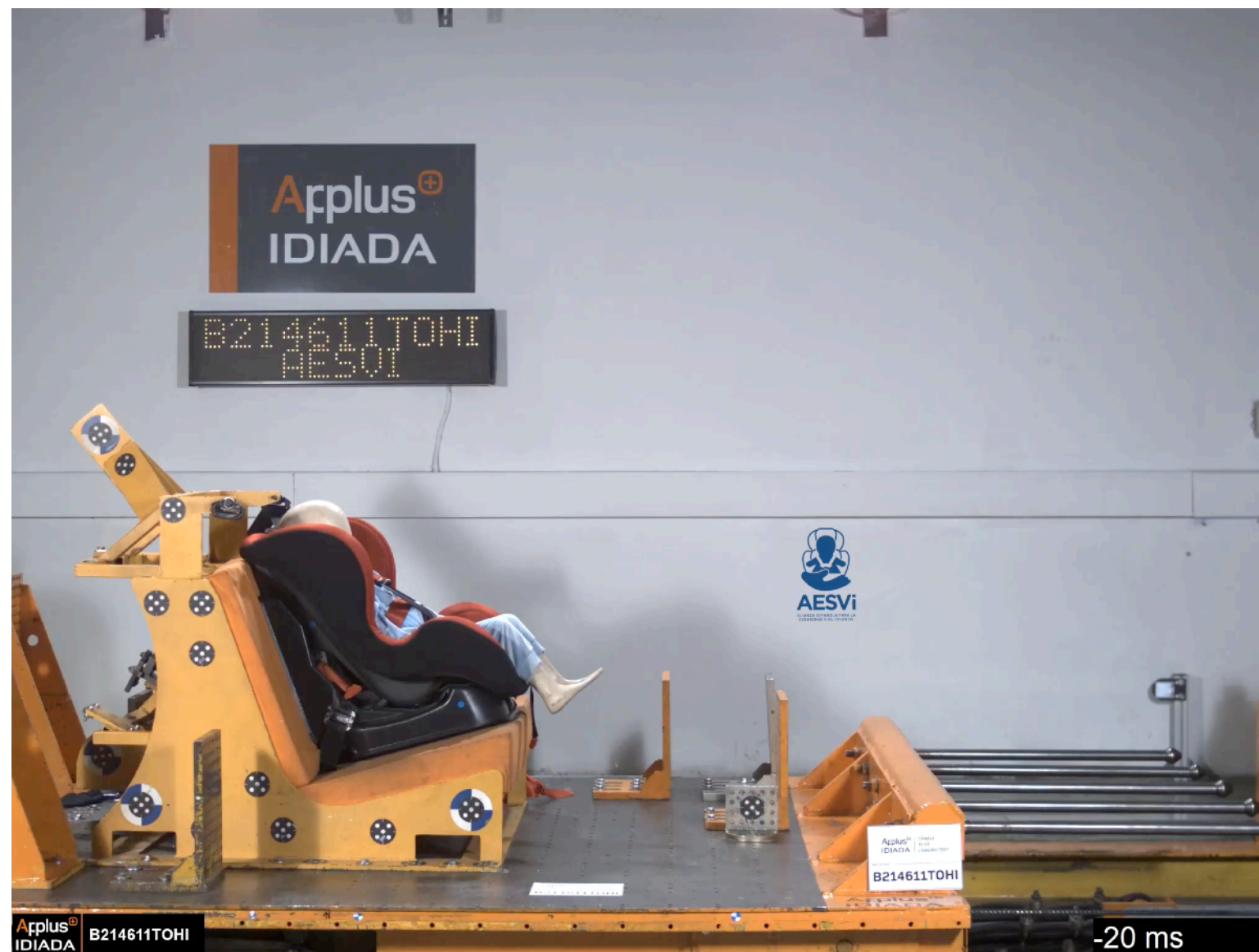


Chest acceleration



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Sample number 06, presented a **very serious dysfunction** that resulted in the **ejection of the dummy**



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Issue

General deterioration of car seats' impact absorption materials

Poor maintenance of the harnesses decreasing the retention efficiency of the dummy at the time of impact

Aging and long use of seat upholstery directly influences energy absorption function

Lack of instructions, labels and deterioration in the marking of the seat

Joie's solution

We only use the highest quality materials in our car seats

Rigorous buckle testing and advising parents not to manipulate harnesses

High quality fabrics and paddings that stand the test of time

Instruction manual storage compartment on every seat and high quality labels that last

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Proposals

- 1. Develop a regulation for the sale of second-hand CRS so that is done with guarantees on the product**
- 2. Prohibit the sale of of second hand child restraint systems as long as there is no regulation**

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