EVARID-50F

ADVANCING REAR IMPACT SAFETY

Rear-impact collisions remain one of the most common and consequential crash scenarios, accounting for approximately 30% of injury-related accidents, with the vast majority resulting in neck injuries. However, current safety systems have been predominantly designed and validated using male-based crash test models.

EvaRID-50F is the first 50th percentile female rear-impact crash test dummy (ATD) purpose-built to address this gap. It combines validated biomechanics, advanced instrumentation, and robust physical design to enable more accurate, representative safety evaluation.

DESIGNED FOR ACCURACY AND APPLICATION

EvaRID-50F represents a mid-size female occupant (161.3 cm, ~62.3 kg) with anatomically scaled body segments derived from validated datasets. She is optimized specifically for rear-impact and whiplash analysis for physical sled testing and integrates with the EvaRID-50F FE digital twin for virtual testing environments. This alignment between physical and digital models ensures continuity across modern safety engineering workflows.

ENGINEERING THAT DELIVERS INSIGHT

EvaRID-50F integrates advanced measurement and mechanical systems to provide high-quality, repeatable data to capture acceleration , angular velocity, and force/moment data across 48 channels located in the head, neck, spine, and pelvis.

The design incorporates several key advancements:

- A new head architecture with modular sensor configurations
- An enhanced spine system engineered for durability and repeatability and speed of maintenance
- Improved soft tissue materials for realistic biomechanical response and improved durability
- Representative female mass distribution and seating interaction

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KEY BENEFITS

ACCURATE SAFETY DESIGN

Represents female occupants and improves real-world protection

HIGH-CONFIDENCE DATA

Strong biofidelity enables reliable decisions and reduces costly redesigns

FASTER DEVELOPMENT

Integrated physical and digital twin models streamline workflows and lower costs

DEEPER INSIGHT

Instrumentation enables better optimization of seats and restraint systems

CONSISTENT TEST RESULTS

Durable design ensures repeatability and improves testing efficiency

REGULATORY READINESS

Aligns with emerging standards and reduces compliance risk

HUMANETICS

EVARID-50F

ADVANCING FEMALE REAR IMPACT SAFETY

VALIDATED PERFORMANCE

EvaRID-50F has been evaluated through rear-impact sled testing and benchmarked against female volunteer data. Results demonstrate strong correlation across key kinematic and acceleration responses.

Biofidelity performance consistently achieves BioRank scores around 1.0, indicating good to excellent alignment with human response corridors and providing confidence in both physical testing and model validation.

ALIGNED WITH THE FUTURE OF REGULATION

Global safety organizations are increasingly prioritizing inclusive occupant protection and improved rear-impact assessment. EvaRID-50F is positioned to support these developments:

- Evaluation activities aligned with Euro NCAP regulatory updates
- Targeted inclusion in C-NCAP 2027 protocols
- Growing emphasis on virtual testing integration and equity in safety standards

By enabling more representative testing, EvaRID-50F supports both compliance readiness and forward-looking safety strategies.

WHY EVARID-50F

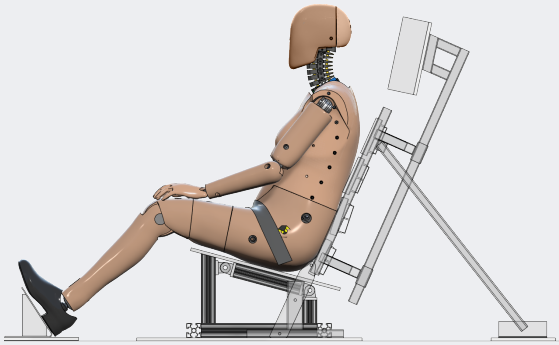
EvaRID-50F delivers measurable value across the automotive ecosystem:

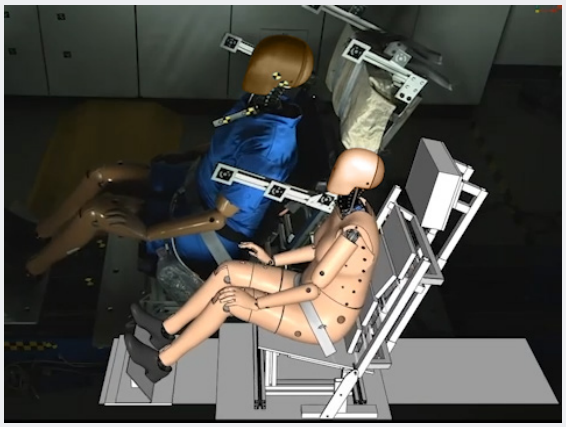
- Improves accuracy of female whiplash injury prediction
- Enables more inclusive safety system design
- Enhances validation of virtual crash test dummy models and physical testing correlation
- Supports regulatory preparedness and global safety alignment

SPECIFICATIONS	
Stature	1618 mm
Total Weight	62.3 kg
Seated Height	844 mm

SIMULATION MODELS

Humanetics offers highly detailed and fully validated digital twin models of our physical crash test dummies, along with FE modeling consultancy services.





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