RAMSIS MODUL

SEAT BELT DESIGN

OPTIMIZING SAFETY & COMFORT—DIGITALLY

CAD analysis and optimization of vehicle interiors regarding safety requirements

Modern vehicles are developed for global markets, making seat belt systems a crucial factor in both safety and sales. These must be ergonomic, functional, and compliant with international regulations. The RAMSIS Seat Belt Design module enables a fully digital development process, allowing engineers to optimize belt routing, anchorage, and ergonomic fit directly in CAD.

Human Simulation for Real-World Testing

True safety starts with accurate human modeling.
RAMSIS integrates 3D manikins and global test devices, ensuring precise belt system validation.

- 3D human models representing future (real) occupants of the target market
- Anthropomorphic Test Devices (ATDs) assess crash scenarios and belt performance.
- Gabarit test device ensures compliance with child safety regulations.

Smart Seat Belt Testing & Optimization

Ergonomics Testing

A seat belt should be both safe and comfortable.

With RAMSIS, engineers can:

- Analyze belt routing and anchorage positions in a virtual environment.
- Identify contact points, pressure areas, and detachment risks.
- Measure critical distances to the occupant's shoulder and neck.
- Calculate belt length requirements for different markets.

General Belt Testing

- Evaluate belt length, storage, and routing digitally.
- Simulate belts in fastened and unfastened positions for performance checks.

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Your Advantages

- Optimized Belt Systems in CAD – Ensures ergonomic, safe, and cost-effective designs.
- Reduced Time & Costs – Minimizes physical test stands, simplifies documentation, and improves reproducibility.
- Target Group-Specific Validation – Simulates various occupant sizes and test devices.
- Automated Compliance Testing – Generates legally recognized reports for regulatory approval.

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HUMANETICS

RAMSIS MODUL

SEAT BELT DESIGN

OPTIMIZING SAFETY & COMFORT—DIGITALLY

Ensuring Regulatory Compliance & Crash Safety

Early Compliance Testing (eBTD)

» Automatic positioning of test devices ensures compliance early in design.

» Belt route optimization helps avoid costly redesigns.

Crashworthiness Analysis

» Pre-crash simulations optimize belt safety before an accident.

» ATD models of men, women, and children assess diverse occupant safety.

» Belt clearance measurements reduce injury risks, complying with FMVSS208 standards.

Child Safety Integration

» Gabarit test device ensures compliance with ECE R16 & 77/541/EEC.

» Optimal belt lock positioning and strap length are calculated for child occupants.

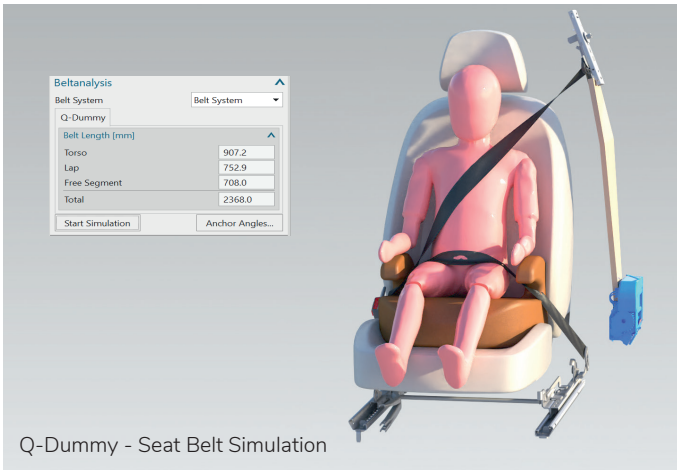
Seamless Integration & Expert Support

» Stand-alone or integrated solutions for flexible implementation.

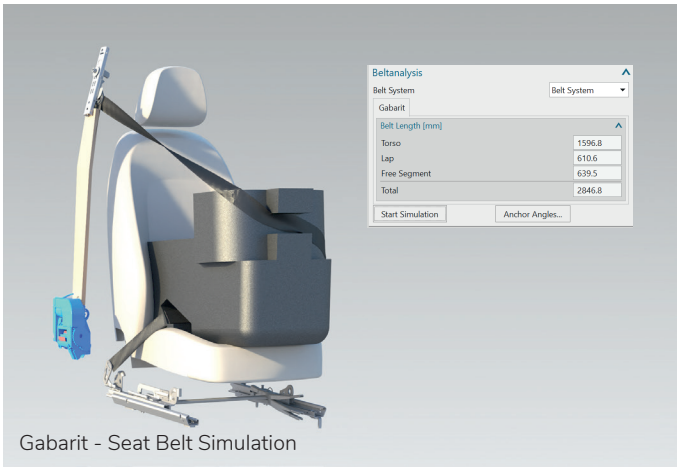
» Integrated in leading CAD systems – Catia V5, 3DExperience, Siemens NX.

» Expert training & support to maximize efficiency.

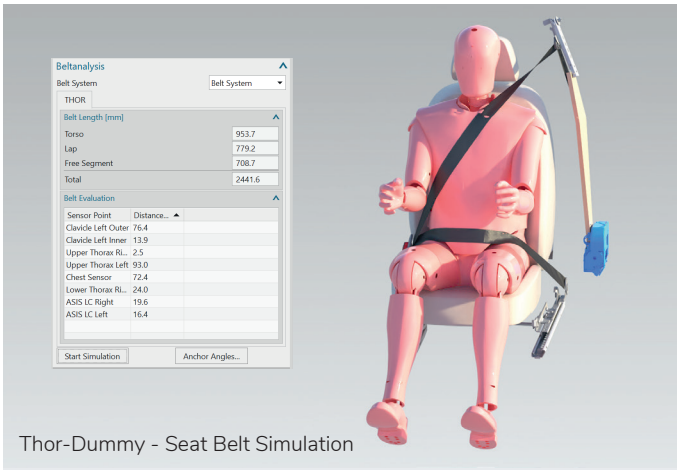
Enhance occupant protection and streamline development with RAMSIS Seat Belt Design.



Q-Dummy - Seat Belt Simulation



Gabarit - Seat Belt Simulation



Thor-Dummy - Seat Belt Simulation