ACRA
Cabine Crashworthiness Prediction

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Evektor

- Founded in 1991
- Design activities from 1992
- Fully private owned company
Scope of Projects

- Design studio
- Design of components
- Design of jigs, fixtures
- Stress analysis
- Plastic parts
- Complete development
- Prototype tooling
- Preliminary design of mechanisms
- FE-analysis including crashes
- Interiors design
- Stamping tools
ACRA Scheme

Methodology of pilot/passenger seat dynamic analyses

Improve survivability of occupants by turnover

Material Research

Analyses – Test Correlation

Automotive Industry Know-how
Regulations and standards

EASA / FAR regulation for seat design and proof

- § 23.561 Emergency landing static condition
- § 23.562 Emergency landing dynamic condition
- § 23.785 Seats
- AC 23-19 and AC 23.562-1 Dynamic testing

FAA is not accepting compliance by analysis alone currently due to „limited experience“.

EASA / FAR regulation for passenger / crew safety by turnover

- § 23.561 Emergency landing condition – Static condition
- AC 23-19 Simplified criteria for aircraft design by aircraft overturn
Research of methodology of aircraft seat dynamic calculation

Goal:

- Solver tests
- Methods of Finite Element Model building
- Comparison of test and simulation

Output

- Methodology of aircraft seat dynamic calculation
Development of methodology for aircraft turnover dynamic calculation

Goal:

• Simplified criteria for aircraft design will be compared with turnover dynamic simulation

• Increasing passenger / crew safety and improve the structural crashworthiness by turnover, especially for small aircraft types
Today's and new seat development process

- Virtual simulations
- Seat design
- Design changes
- Static tests
- Dynamic tests
- Seat Manufacturing
- Seat Production
- Design changes
Research of aircraft material properties

Goal:
• Database of aircraft materials properties for simulations

• true stress / true strain
• strain rate
• damage
ACRA Benefits

- Passenger/crew safety
- Development cost
- Development time

Welcomed partners:
- Material research lab
  - high speed deformation characteristics
- Final small airplane producer
- Dynamic test lab