get it right®

PAM-COMFORT

A SIMULATION-BASED DESIGN SOLUTION FOR VIRTUAL SEAT PROTOTYPING

KEY BENEFITS

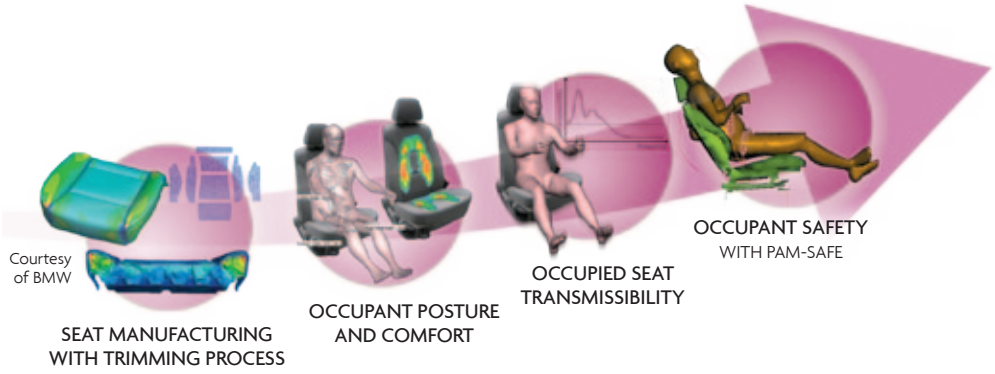
- **Reduce cost and save time**
  - Drastically reduce the number of trial-and-error loops on physical seat prototypes in all development phases.
  - Identify troubles very early, before building physical prototypes.
  - Anticipate the impact of small design changes and of production variations.
- **Improve seat quality and performance**
  - Predict the impact of innovative, light-weight materials on the overall seat performance.
  - Assess a large number of comfort innovations, quantify and validate quickly and very early.
- **Improve synergies within a team or with suppliers and customers**
  - Specify and evaluate the seat performance criteria before building physical prototypes.
  - Manage earlier and more easily conflicting requirements related to seat design (comfort, safety, manufacturing, weight and size reduction...).

"Using PAM-COMFORT, within a short period of time, and with few resources, ***we were able to deliver a new seat design meeting our objectives.****"*

Jérôme Makala, Head of Comfort and Safety Research Department, Renault Group

PAM-COMFORT is a Simulation-Based Design solution dedicated to Virtual Manufacturing and Virtual Testing (static and dynamic) of the soft parts of a seat, through chained simulations.

Using a digital mock-up of the seat and the occupant, PAM-COMFORT predicts detailed information related to seat design and manufacturing, taking into account the complex physics of materials, the multiple contacts, and the time-dependant processes. The physical parameters resulting from each stage of the chain (positions, deflections, strains and stresses) are used as an input to the following one, in order to ensure a high level of precision, whatever the seat and the anthropometry of the occupant.



A USER-FRIENDLY INTERFACE

PAM-COMFORT Graphical User Interface is dedicated to Virtual Seat Manufacturing and Testing and handles all the stages of the simulation chain within a unified seat design environment.

SEVERAL FE SOLVERS

PAM-COMFORT relies on Finite Element Solvers (SMP/DMP) for the simulation of the cushion manufacturing process (trimming), the occupant positioning process and the transmission of the vehicle vibrations to the occupant through the seat.
PAM-COMFORT is fully compatible with PAM-CRASH and PAM-SAFE, and can provide the exact initial conditions for crash simulation, related to the seat and the occupant.

A LIBRARY OF OCCUPANTS

A library of dummies (HPM1, HPM2 and HRMD) and human models (5th, 50th and 95th percentile from various populations), with automated positioning/scaling tools is available.


HRMD


HPM2


5th, 50th and 95th percentile human models with updated anthropometry (v2009) developed in partnership with Hyundai Motor Company

APPLICATIONS FOR SEAT MANUFACTURING

Main detailed design information for seat manufacturing is provided even before any piece of trim or foam is cut or molded:

Foam A-Surface with overbuilts

Flat cover patterns

Wrinkles and bridging gaps

Strains and stresses

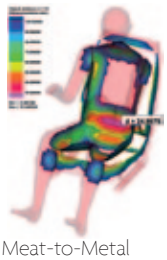
APPLICATIONS FOR SEAT TESTING

PAM-COMFORT provides the main design information related to the seat behavior during occupant sitting and riding, well before a physical prototype is built:

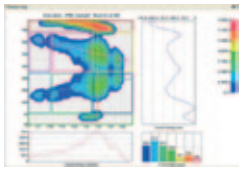
H-Point, thigh and back angles (dummies, human)

Backset (FMVSS 202a)

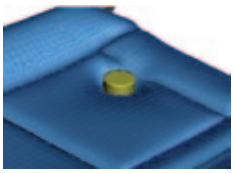
Lumbar Support Prominence with HPMI / ASPECT Dummy



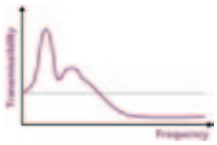
Meat-to-Metal clearance



Seat pressure distribution and comfort score



Indentor loading



Occupied seat transmissibility (dummy, human)

For more information, visit: www.esi-group.com/pam-comfort

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ABOUT ESI GROUP

ESI is a world-leading supplier and pioneer of digital simulation software for prototyping and manufacturing processes that take into account the physics of materials. ESI has developed an extensive suite of coherent, industry-oriented applications to realistically simulate a product's behavior during testing, to fine-tune manufacturing processes in accordance with desired product performance, and to evaluate the environment's impact on product performance. ESI's products represent a unique collaborative and open environment for Simulation-Based Design, enabling virtual prototypes to be improved in a continuous and collaborative manner while eliminating the need for physical prototypes during product development. The company employs over 750 high-level specialists worldwide covering more than 30 countries. ESI Group is listed in compartment C of NYSE Euronext Paris. For further information, visit www.esi-group.com.

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