



# PAM-COMFORT

A SIMULATION-BASED DESIGN SOLUTION FOR VIRTUAL SEAT PROTOTYPING

## KEY BENEFITS

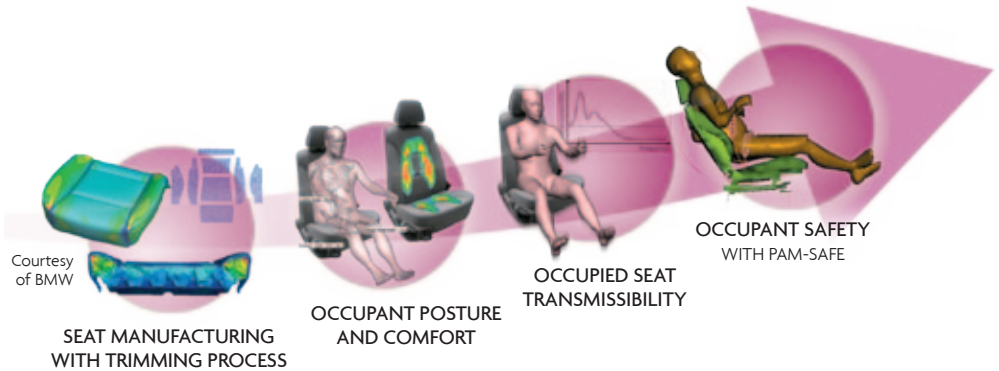
- **Reduce cost and save time**
  - Drastically reduce the number of trial-and-error loops on physical seat prototypes in all development phases.
  - Identify troubles very early, before building physical prototypes.
  - Anticipate the impact of small design changes and of production variations.
- **Improve 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.

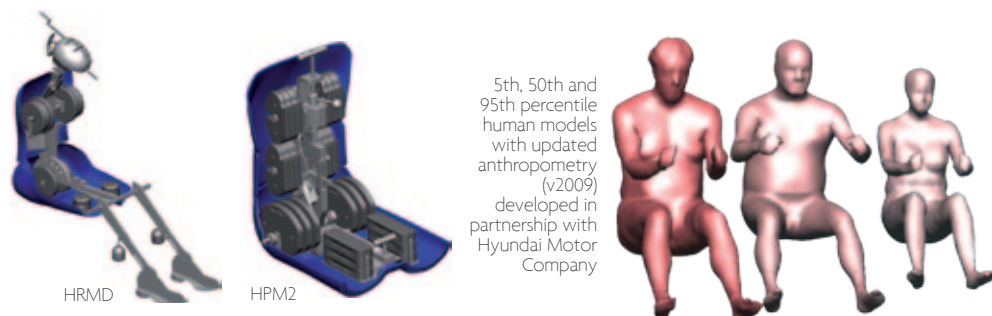
## SEVERAL FE SOLVERS

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.

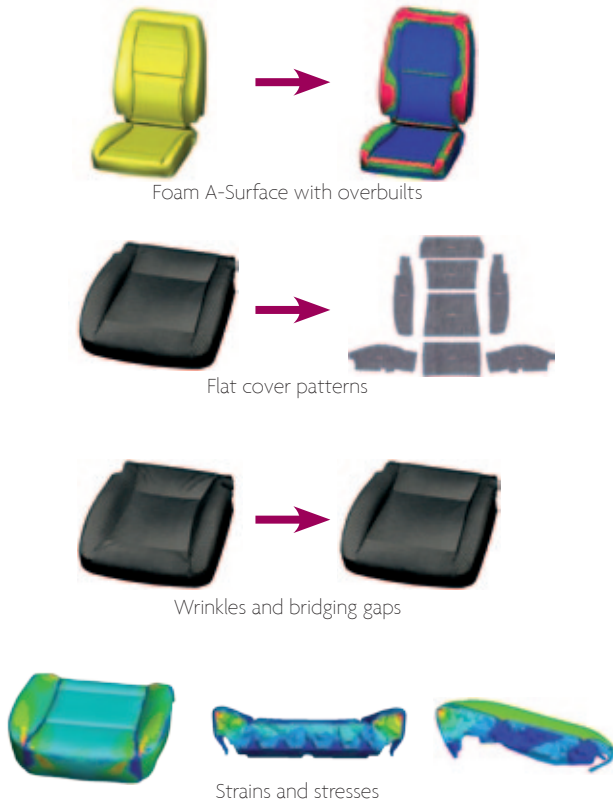
## A LIBRARY OF OCCUPANTS

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.



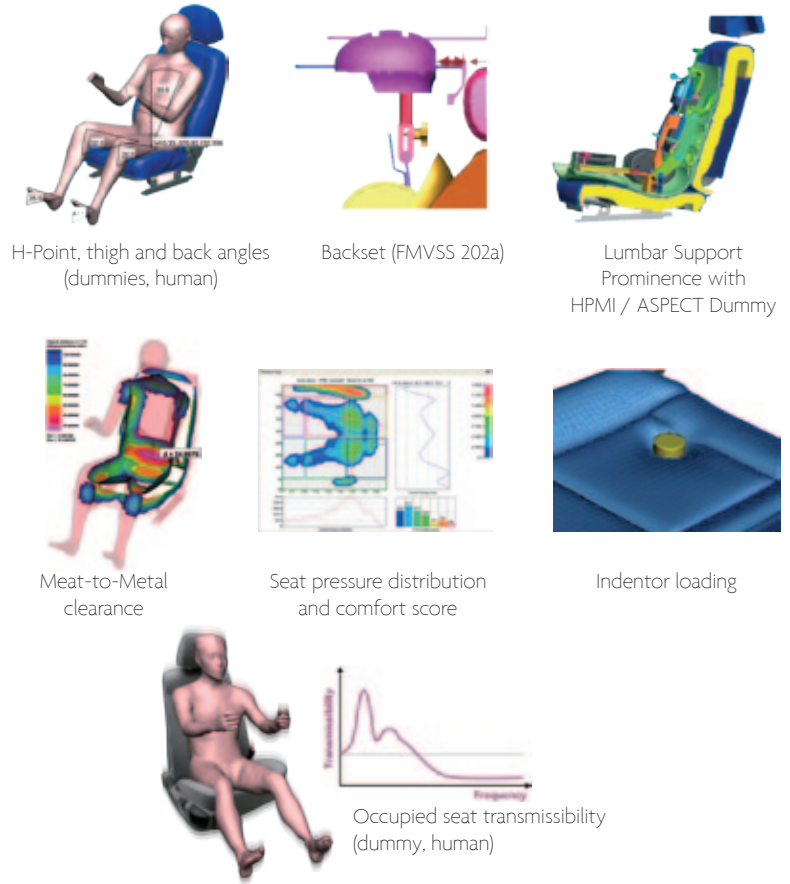
# APPLICATIONS FOR SEAT MANUFACTURING

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



# 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:



For more information, visit: [www.esi-group.com/pam-comfort](http://www.esi-group.com/pam-comfort)

## 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](http://www.esi-group.com).



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