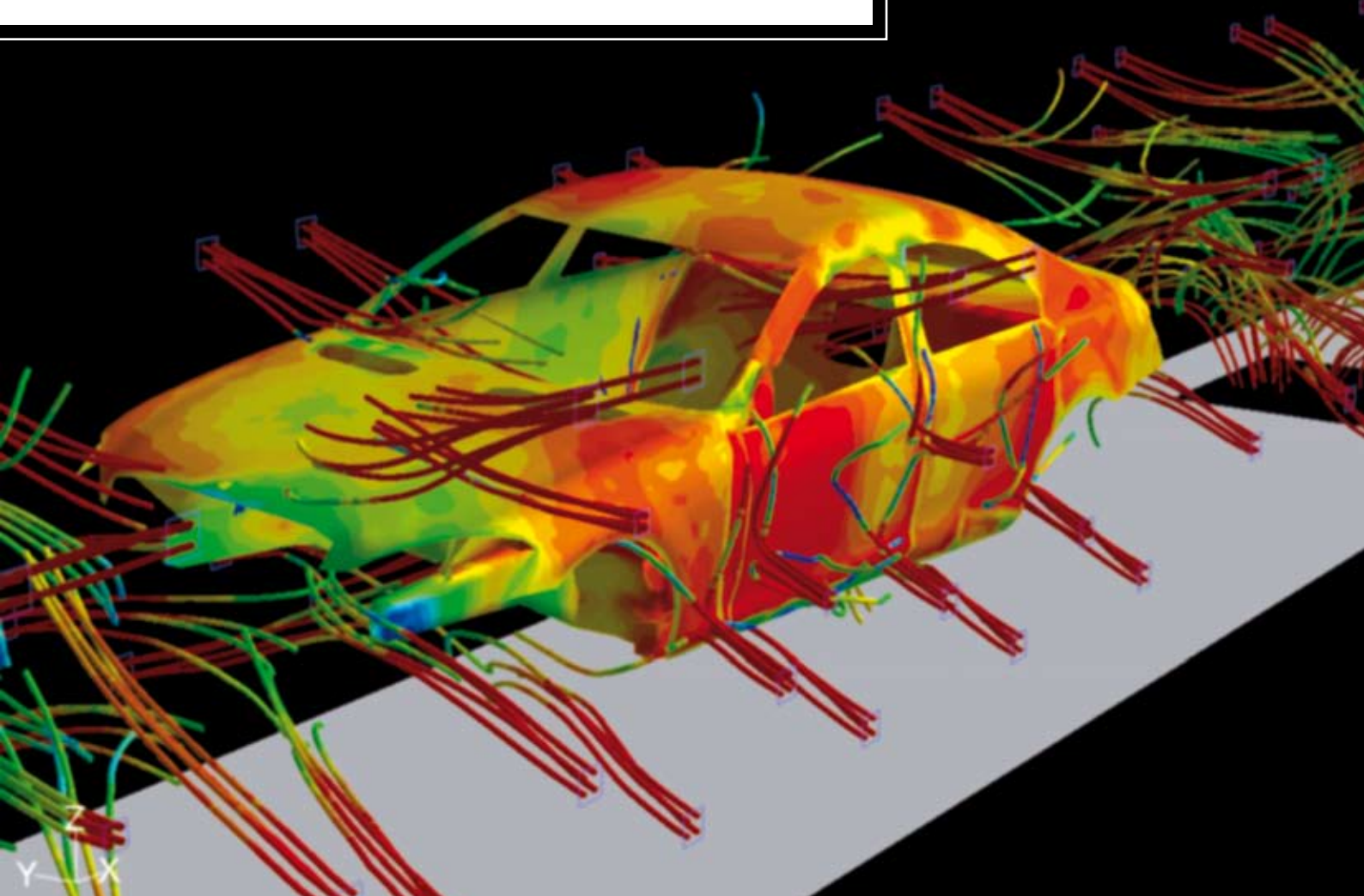


# Services & Solutions

## CFD Oven



Service – when and where you need it.



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# Services & Solutions – *Ecopaint* Simulation CFD Oven

## Description

With *Ecopaint* Simulation CFD Oven it is possible to determine heat up curves at critical points of car bodies in any type of oven, even before car body or oven exists as hardware. The tool needs no calibration. It can be used to optimize nozzle arrangement, air temperature and volume flow.

Physics included by the simulation:

- Flow and turbulence
- Heat transfer (convection, heat conduction, radiation)
- Moving car body (sliding mesh)

## Applications

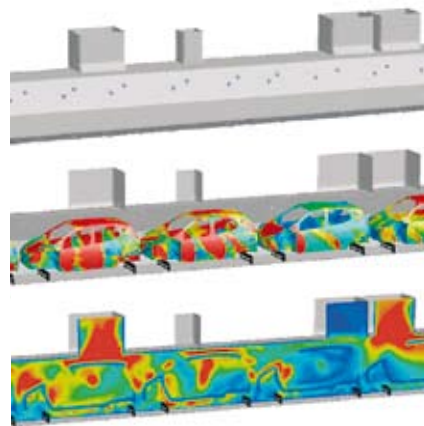
- This tool is recommended for optimizing ovens to achieve faster heat up curves at critical parts or a smoother heat up with less temperature gradients inside the car body.
- The effect of different nozzle arrangements or different process conditions can reliably be evaluated. When introducing a new car model the oven can previously be checked and optimized to avoid costs later in production.
- In new paint shops the tool is recommended, when extraordinary car bodies in terms of size or sheet thickness are used (truck cabs, convertibles, etc.).

## Customer Benefits

- Higher process reliability
- Better quality
- Less energy consumption
- Reduced process time

## Customer Deliverables

- Simulation report
- Presentation with pictures and animations of flow and heat up
- Heat up curves for critical points
- Recommendations for further improvement issued by Dürr's simulation and design departments.



*Simulation of air flow*

# Services & Solutions – *Ecopaint* Simulation CFD Oven

## Model Study Work Flow

1. Define project and body parameters (critical body parts, oven zones)
2. Submission of detailed quotation
3. Verification of parameters on site (if possible)
4. Customer to provide the following information:
  - 3D-CAD data (bodies, skids) in IGES, Parasolid or Step
  - Specification of materials and material properties (density, heat capacity, heat conduction coefficients,...)
  - Design drawings of oven and nozzle layout
5. Specify flow and temperatures at all relevant inlets and outlets.

## Project Time Frame

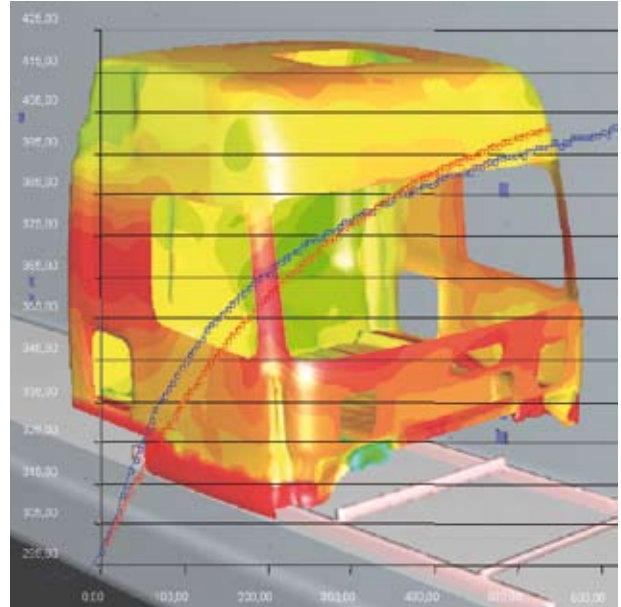
- Approx. 12 weeks (from receipt of all information required)
- Approx. 4 weeks (if only flow & turbulence are to be considered)

## Indication of Budget

The above costs are typical costs. Dürr will quote a valid price in each case in accordance with the individual site specific requirements.

- € 50,000 for a typical simulation of heat up curves
- € 16,000 if only flow and turbulence are to be considered

This is an economic and fast way to compare different nozzle arrangements.



*Heat up curve of truck cab*



*Oven tunnel*

## References

- Daimler AG
- Honda Motors
- Adam Opel AG

# Global Services & Solutions Offering – Your Benefits

- First class service solutions
- Maximizing efficiency and minimizing operating costs
- Full-service revamp solutions
- Superior maintenance, repair and troubleshooting
- Innovative engineering and worldwide experience
- Close to our customers – worldwide
- Competent solutions to reduce energy consumption

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