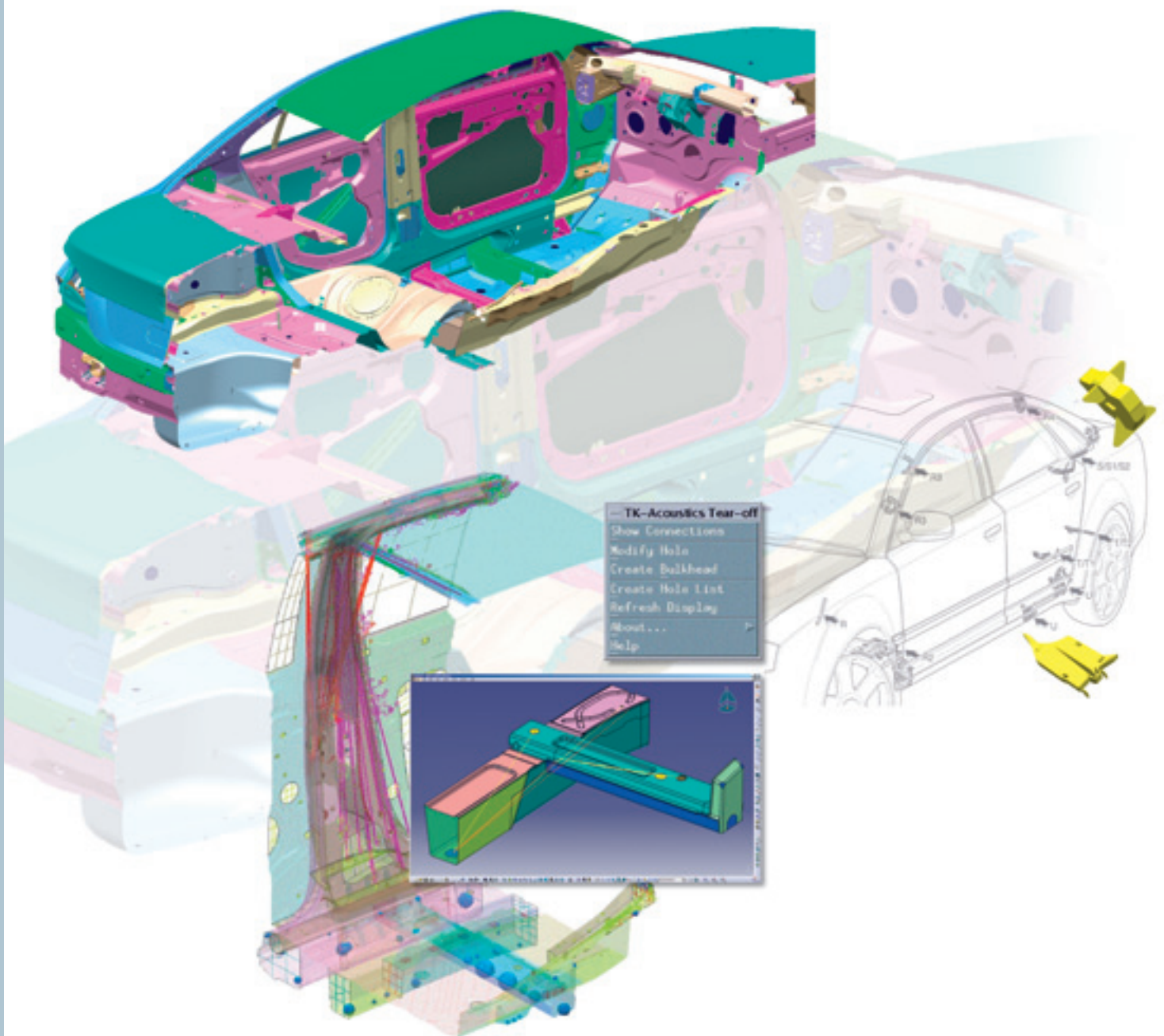


AcousticPathAnalyzer

The Module for Analyzing Acoustic Paths in Car Body Cavities



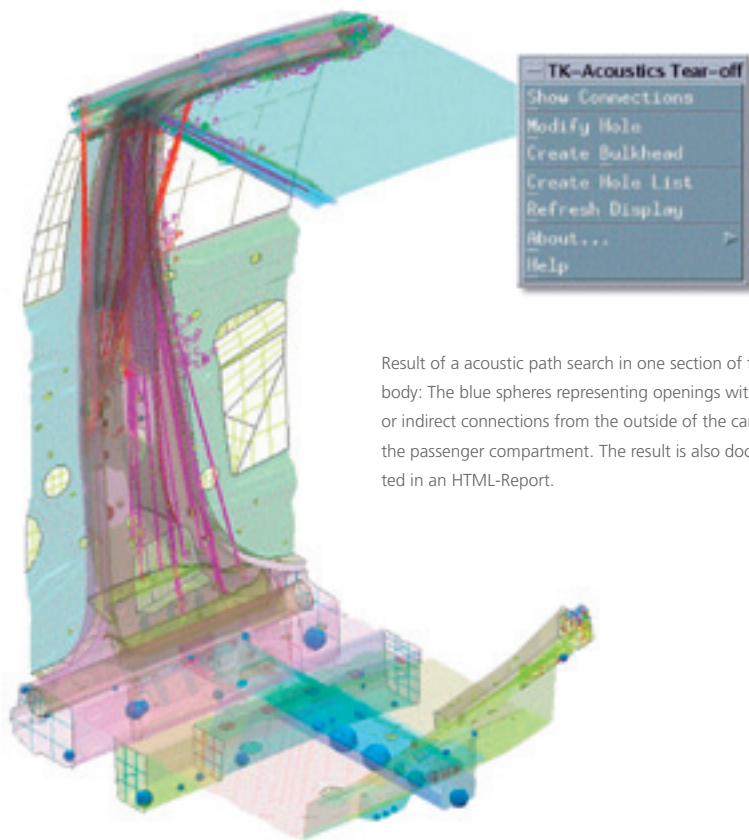
AcousticPathAnalyzer

The acoustic behavior is one major criteria for the quality of a new car. Airborne sound and structure borne noise reaching into the passenger compartment can reduce the comfort of new cars significantly. Due to the geometric complexity of a body-in-white the analysis of all airborne sound passing from outside of the car into the inner areas cannot be effectively done by pure manual methods, i.e. looking at the CAD-geometry, since even small openings has to be taken into account.

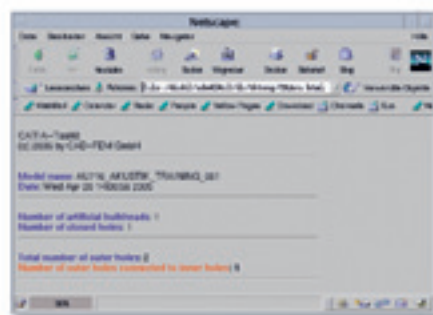
CADFEM's module „AcousticPathAnalyzer“ provides a number of interactive functions to enable and accelerate such a complex analysis of airborne sound paths. The analysis is based on closed cavity models (called "master geometries") created with CATIA Toolkit, a module of the VPS suite of software by CADFEM.

Main features of the AcousticPathAnalyzer:

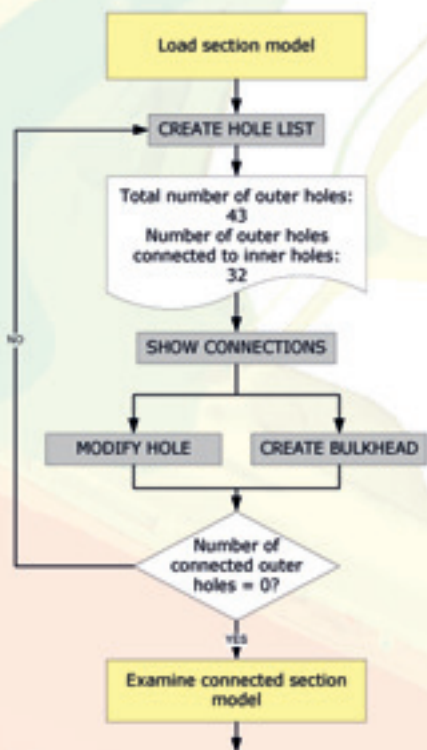
- Interactive path search starting from an opening within the car body. All paths found by the search and cavities are displayed on the screen.
- Interactive modification of the car body openings to simulate different scenarios. Also artificial bulkheads can be placed in the cavities in order to break acoustic paths.
- Analysis of a complete car body. The search result is visualized and also documented in an HTML-report.



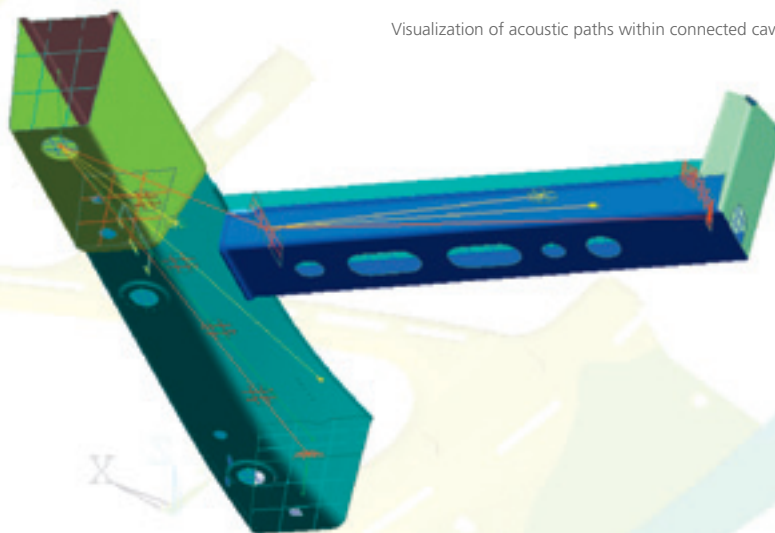
Result of a acoustic path search in one section of the car body: The blue spheres representing openings with direct or indirect connections from the outside of the car into the passenger compartment. The result is also documented in an HTML-Report.



Visualization of acoustic paths within connected cavities



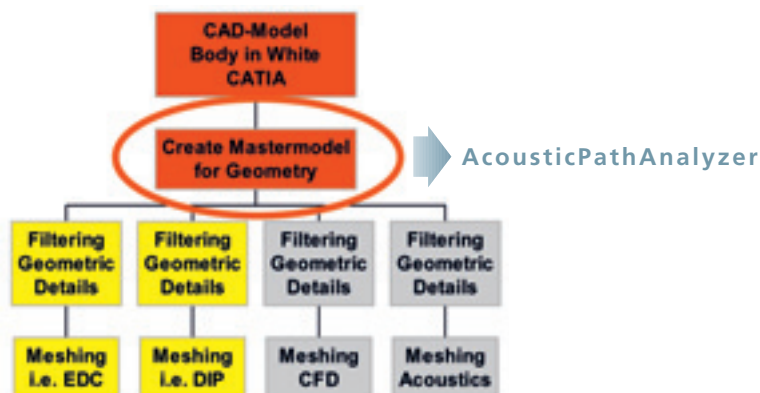
A complete workflow was developed to analyse a complete car body and to simulate different scenarios.



CADFEM services around AcousticPathAnalyzer

CADFEM offers the service to create cavity models required for AcousticPathAnalyzer of complete car bodies on behalf of the customer. The service covers all necessary steps from the collection of the required CATIA-models to the delivery of the modeled cavities for the analysis.

Once the closed volumes of all cavities are created, those volumes can be used in a wide range of application fields. Different types of meshes can easily be created based on the same geometric model. All simulation disciplines which require meshes of car body cavities might take advantage of this so-called "Master-Model Approach", including fluid dynamics, electromagnetics, etc. CADFEM offers customization of the existing functionality of CATIA Toolkit according to your specific needs.



TECHNICAL OVERVIEW OF AcousticPathAnalyzer (VALID OCT. 2007)

- Powerful interactive functionalities for analysis of acoustic paths within car body cavities
- Fully integrated in CATIA
- Interactive path search
- Simulation of different scenarios (e.g. adding bulkheads, closing existing holes, adding additional holes)
- Path search on a complete car body model
- Only basic CATIA-Training required
- Use of AcousticPathAnalyzer requires closed volume models („master geometry“), i.e. created using CATIA Toolkit
- CAD software platform: CATIA V4.2.4, Operating systems: SGI IRIX, SUNOS, HP-UX
- Development of AcousticPathAnalyzer for CATIA V5 started. Lizensing requires some customization to user environment
- Other CAD-systems on demand

THE MODULES OF VirtualPaintShop®:

- VPS/DIP** Simulation of transient air inclusions and resulting carry over of fluids due to immersion in basins
- VPS/EDC** Simulation of electro-deposition coating
- VPS/DRY** Simulation of thermal heat up and cool down of structures; curing of paint layers or adhesives
- VPS/UV** Simulation of ultraviolet curing of coatings
- VPS/ESC** Simulation of electrostatic or pneumatic coat application
- VPS/CP** Simulation of cavity preservation by wax spraying and propagation

CATIA BASED SOLUTIONS

(some modules require customization to customer specifics for implementation)

- CATIA Toolkit** Preparation of Simulation Models for VPS/EDC, VPS/DIP, VPS/ESC, CFD or AcousticPathAnalyzer
- AcousticPathAnalyzer** Simulation of acoustic paths within car body cavities

Further information can be found on www.virtualpaintshop.de

DEVELOPER

CADFEM GmbH
 Marktplatz 2
 85567 Grafing b. München
 Phone +49 (0) 80 92-70 05-0
 Fax +49 (0) 80 92-70 05-77
 E-Mail info@cadfem.de
 www.cadfem.de

EVALUATE BY PILOT PROJECT

For evaluation of the AcousticPath-Analyzer capabilities as well as its suitability for your product and process design environment a pilot project conducted in cooperation with CADFEM is recommended. CADFEM will provide the entire workflow at a real automobile structure out of your current or prospective product line.

CADFEM SERVICES

- Licensing and training on AcousticPathAnalyzer
- Customization for customer-specific requirements
- Projects covering modeling and analyzing of cavities of complete car bodies

AcousticPathAnalyzer FOR CATIA V5

- AcousticPathAnalyzer for CATIA V5 will be available end of 2007. The sophisticated capabilities of CATIA V5 along with CADFEM's experience will allow further analysis techniques and a windows-based user interface.

DISTRIBUTORS

Germany / Switzerland / Austria

CADFEM GmbH
 Marktplatz 2
 85567 Grafing b. München
 Phone +49 (0) 80 92-70 05-0
 Fax +49 (0) 80 92-70 05-77
 E-Mail info@cadfem.de
 www.cadfem.de

Italy

EnginSoft SpA
 Via Malfatti 21
 38100 Trento
 Phone +39 (0) 461-915-391
 Fax +39 (0) 461-915-926
 E-Mail info@enginsoft.it
 www.enginsoft.it

France

ANSYS France
 Les bureaux de Sèvres
 2, rue Troyon
 92316 Sèvres Cedex
 Phone +33 (0) 141-14 83 45
 Fax +33 (0) 141-14 83 46
 E-Mail fradmin@ansys.com
 www.ansys.fr

UK

IDAC Ltd.
 Airport House
 Purley Way
 Croydon, Surrey CR0 0XZ
 Phone +44 (0) 870-1 60 59 00
 Fax +44 (0) 870-1 60 59 10
 E-Mail info@idac.co.uk
 www.idac.co.uk

Czech Republic and Slovakian Republic

SVS FEM s.r.o.
 Skrochova 3886/42
 615 00 Brno, Czech Republic
 Phone +42 (0) 543-254 554
 Fax +42 (0) 543-254 556
 E-Mail info@svsfem.cz
 www.svsfem.cz

Poland

MESco
 ul. Powstancow Slaskich 10
 42-600 Tarnowskie Gory
 Poland
 Phone +48 (0) 32-7 68 36 36
 Fax +48 (0) 32-7 68 36 35
 E-Mail info@mesco.com.pl
 www.mesco.com.pl

Russia

CADFEM GmbH – Repräsentanz Moscow
 Office 1703
 77, Shelskovskoe Shosse
 107497 Moscow
 Phone +7 (0) 95-9 13 23 00
 Fax +7 (0) 95-9 13 23 00
 E-Mail info@cadfem.ru
 www.cadfem.ru

Brazil

TTS – Technology Tools & Services
 Rua do Rocio, 423 10o. Andar cj. 1002.
 04552-000 - São Paulo - SP - Brazil
 Sergio R. Rodrigues
 Phone +55-11-3853-4970
 E-Mail sergio@ttsbr.com.br
 www.ttsbr.com.br

Japan

Cybernet Systems Co. Ltd.
 FUJISOFT Bldg. 3, Kanda-neribeicho
 01-0022 Chiyoda-ku, Tokyo
 Phone +81-3-5297-3208
 Fax +81-3-5297-3637
 E-Mail anssales(at)cybernet.co.jp
 www.cybernet.co.jp/english/

China

CCA Engineering Simulation Software
 (Shanghai) Co., Ltd.
 RM. 918, No.777 Zhao Jia Bang Rd
 200032 Shanghai
 Phone +86-21 6471-6031
 Fax +86-21 6471-6050
 E-Mail info@cca-es.com
 www.cca-es.com

India / Malaysia

CADFEM Engineering Services India PVT Ltd.
 H.No: 48, 1st Floor
 Parkview Enclave, Old Bowenpally
 Hyderabad – 500011
 Phone +91-40-64 54 35 79
 Fax +91-40-64 54 35 79
 E-Mail info@cadfem-india.com
 www.cadfem-india.com

Korea

ATES Co. Ltd.
 #1401 Woolim e-Biz Center II, 184-1
 Guro3 Dong
 Guro-Gu
 Seoul Korea 152-848
 Phone +82-2-890-3800
 Fax +82-2-890-3810
 E-Mail info@ates.co.kr
 www.ates.co.kr

USA and Canada

Mindware Engineering, Inc.
 39555 Orchard Hill Place
 Suite 160
 Novi, MI 48375
 Phone +1 248 380-0808-101
 Fax +1 248 380 0811
 E-Mail info@mindwr.com
 www.mindwr.com
 OZEN Engineering, Inc.
 1210 E. Arques Ave.
 Suite 207/208
 Sunnyvale, CA 94085
 Phone +1-408-732-4665
 Fax +1-408-834-4557
 E-Mail info@ozeninc.com
 www.ozeninc.com

All other countries

CADFEM GmbH
 Marktplatz 2
 85567 Grafing b. München
 Phone +49 (0) 80 92-70 05-0
 Fax +49 (0) 80 92-70 05-77
 E-Mail info@cadfem.de
 www.cadfem.de