www.cometacoustics.com

SPECIFICATIONS

Comet Trim™

Software for Acoustic Characterization of Noise Control Materials

Comet Acoustics® Overview

COMET Acoustics is a computer simulation software for solving sound and vibration problems. COMET offers advanced capabilities that make it the most comprehensive acoustic software available. COMET utilizes boundary and finite element methods as well as analytical techniques to accurately predict the propagation, radiation and transmission of acoustic waves in a variety of media including fluids, foams, and solids.

COMET allows systematic analysis and design improvement of acoustic products at the early stages of product development and as a result reduces the need to rely on costly physical prototypes. The ability to perform the analysis and design at the early state of design process enhances the quality of the product as well as reduces the time for the product to reach the market thereby reducing overall cost.

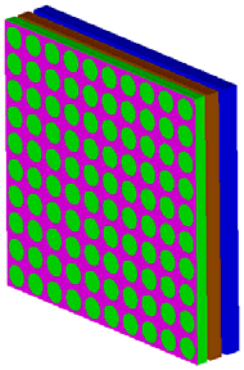
Comet Modules

- **BEAT:** Boundary element based technique for acoustic analysis of fluid and fluid-structure interactions
- **CAPE:** Graphical user interface based process for optimization of automotive interior noise
- **SAFE:** Finite element method for acoustic analysis of structures, elastic porous materials and fluids.
- **SoRT:** Integrated experimental/ numerical technique for complex noise source identification
- **Trim:** Acoustic performance, inverse characterization and optimization analyses of noise control materials
- **Vision:** Graphical user interface for pre– and post-processing

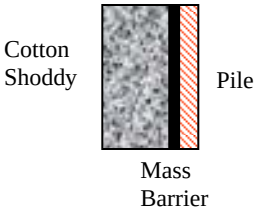
Comet Trim

Transfer impedance method

Trim is an analytical tool for the modeling of planar, multi-layer, noise control treatments. This module can be used for the rapid evaluation of the acoustic characteristics of multi-layered sound absorbents without the use of conventional discretization based modeling. There is no restriction on the number of layers or the upper bound of analysis frequency with Trim. The software allows for both normal and random incidence fields. Additionally the Trim module can be used to inversely characterize macroscopic properties of foam and fiber materials based on measured absorption coefficient and/or transmission loss. Trim also computes acoustic performance sensitivity with respect to macroscopic material properties which can be used to generate noise control treatments with optimal acoustic performance.



Foam layers with perforated facing



Carpet layers

Analysis Types

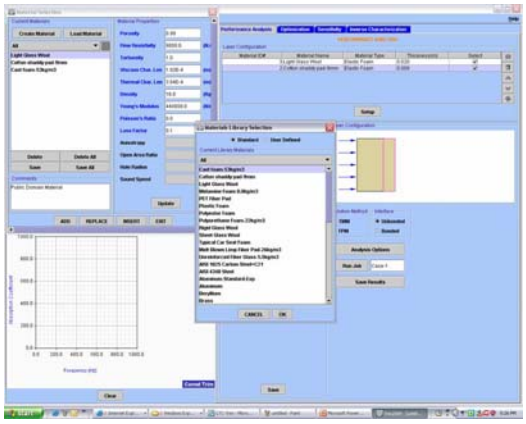
- Performance analysis
- Inverse acoustic material characterization analysis
- Sensitivity analysis
- Optimization analysis

Comet Trim

TECHNICAL SPECIFICATIONS

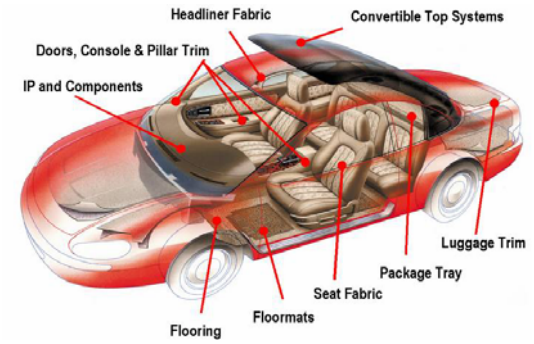
Solution Methods

- Transfer matrix method
- Four pole parameter method



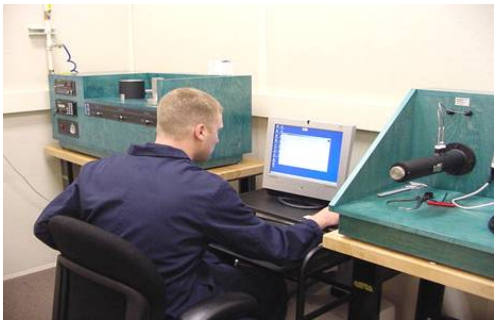
Special Features

- ♦ No discretization (modeling)
- ♦ No upper bound on analysis frequency
- ♦ No limit on the number of material layers
- ♦ Finite dimensional correction
- ♦ Rigid and non-rigid termination conditions
- ♦ Normal and random incident responses
- ♦ Intuitive, easy-to-use graphical user interface
- ♦ Bonded and un-bonded layer interfaces



Layer Types

- Elastic foam
- Rigid foam
- Limp foam
- Fibrous foam
- Air gap
- Elastic panel
- Structural panel
- Perforated panel
- Resistive screen
- Impervious screen



Computed Responses

- ♦ Performance analysis
  - – Sound transmission loss
  - – Absorption coefficient
  - – Complex impedance
  - – Equivalent bulk properties
  - – Wave number
  - – Phase speed
  - – Attenuation
- ♦ Inverse characterization analysis
  - – Macroscopic properties of the material
- ♦ Sensitivity analysis
  - – Sensitivity of absorption and transmission loss with respect to each macroscopic material property
  - – Normalized (relative) sensitivities
- ♦ Optimization analysis
  - – Macroscopic properties associated with the optimal acoustic performance

APPLICATION AREAS

- ♦ Aerospace
- ♦ Automotive
- ♦ Engine & Powertrain
- ♦ Consumer Products
- ♦ Audio/Electronics
- ♦ Acoustic Materials
- ♦ Computers & Peripherals
- ♦ Environmental Noise
- ♦ Exhaust Systems
- ♦ Heavy Equipment
- ♦ HVAC
- ♦ Recreational Vehicles
- ♦ Transducer Design
- ♦ Underwater Acoustics

Data Interfaces

- ♦ **HyperMesh**
- ♦ **I-DEAS**
- ♦ **PATRAN**
- ♦ **ABAQUS**
- ♦ **ANSYS**
- ♦ **NASTRAN**
- ♦ **COSMOS**
- ♦ **STAR-CD**
- ♦ **B & K**

Computer Platforms

- ♦ **Windows XP**
- ♦ **Unix Workstations**
  - **HP**
  - **IBM**
  - **SGI**
  - **Sun**

Comet Technology Corporation
3830 Packard, Suite 110
Ann Arbor, MI 48108
Phone: (734) 973-1600
E-mail: info@cometacoustics.com

Web: www.cometacoustics.com