

## DYNAMIC DESIGN SOLUTIONS – COMPANY PROFILE

**Dynamic Design Solutions** ("DDS") is an independent and privately owned developer of CAE software tools for validating simulation models, optimizing engineering designs and integrating and automating simulation processes.

### Background and Main Activity

We provide solutions that help FEA and test engineers to improve the fidelity of FE models, identify structural properties, assess uncertainty of variables and incorporate variability into models. These validated models can then be used with more confidence to improve performance under real world conditions.

For more than a decade Dynamic Design Solutions is a technology leader in Finite Element (FE) model updating using static or dynamic reference test data. We service a wide spectrum of industries including aerospace, automotive, defense, marine, manufacturing, power and education. Many prestigious companies and institutions have relied on our unique and proven technologies combined with the best possible support and technical expertise by a dedicated team of specialists.

Founded in 1994, Dynamic Design Solutions is providing advanced but yet easy to use engineering software. The competitive advantages of the company, our products and services are demonstrated by:

- A prestigious and wide customer base of commercial and academic organizations worldwide.
- A unique position in providing analysis solutions that can run stand-alone or integrate commercial FEA models and solvers for model validation, updating or design optimization.
- A platform- and solver independent engineering framework with essential components for graphics, data management, and programming, serves as the basis for developing a growing array of CAE tools.
- A professional and multi-lingual staff of engineers with extensive experience gained from consulting with sophisticated customers.

### Distribution Policy

Our products and services are available directly from Dynamic Design Solutions and from a growing network of Solutions Partners providing localized sales and support.

### Research and Development

Participation in international research projects and our own internal research on the core correlation and updating technology is expected to regularly yield new major functional upgrades and new related products. Our research and development focuses on the following areas:

- **Applications of test-analysis integration.** This includes applications like damage detection, material identification, ...
- **Integration of design and analysis.** This includes applications like design optimization, rapid prototyping, robust design, ...
- **CAE process integration and automation** - Automation of analysis and validation processes involving different distributed analysis and diagnostics tools.
- **CAE database management** - FEA and test data translation, normalization, transformation, and archiving.

Dynamic Design Solutions works with a network of technical advisors from university and industry. Members advise our developers and customers on new technologies and applications.

Dynamic Design Solutions is a third party developer partner of ANSYS Inc., Dassault Systèmes Simulia Corp., ESI Group, MSC Software Inc., and Siemens PLM Software Corp.

Dynamic Design Solutions is a member of the following computer manufacturer and operating system related partner programs:

- HP Solutions Partner Program.
- IBM PartnerWorld for Developers.
- SUN Developer Connection Partner Program.
- Microsoft Developer Network.

Dynamic Design Solutions is a member of NAFEMS, the International Association for the Engineering Analysis community.

Dynamic Design Solutions participated in several collaborative research and development projects at national level (Belgium) and international level (EU framework projects).

## Product Overview

The flagship product of Dynamic Design Solutions is the FEMtools family of products.

FEMtools is a multi-functional, cross-platform and solver-independent family of CAE software programs providing analysis and scripting solutions for many different applications in the areas of FE pre- and postprocessing, structural dynamics simulation, pretest analysis, test-analysis correlation, model updating, uncertainty analysis, design improvement, CAE process integration and simulation data management.

FEMtools seamlessly integrates with standard analysis codes like MSC.Nastran, NX Nastran, ANSYS, ABAQUS and others. Translators for importing static, modal or operational test data are available.

The underlying framework architecture with powerful scripting and API function libraries provides unlimited extension and customization. This makes the software an ideal tool research work and development of process-based applications like material identification and damage identification.

- FEMtools Framework – this is the core platform containing tools for database management, interactive graphics, finite element library and basic solvers, scripting language and API.
- FEMtools Dynamics – Advanced structural dynamics simulations (forced response), superelements, and structural modifications
- FEMtools Correlation – Tools for modal pretest analysis and FEM-FEM or FEM-Test correlation (modal and non-modal).
- FEMtools Model Updating – Tools for sensitivity analysis, automated FE model updating, force identification and uncertainty analysis.
- FEMtools Optimization – Tools for gradient-based optimization, DOE/RSM optimization, and optimization of topology, shape, size and material.

A growing number of third party products and services based on FEMtools Framework and components are becoming available that address specific needs for various applications and industries.

## Services

A dedicated team of specialists at Dynamic Design Solutions continuously improves and extends the FEMtools program. New versions are regularly released. In addition, Dynamic Design Solutions provides the following related services:

- Technology courses
- Training courses
- FEMtools installation and customization
- FEMtools support by e-mail, fax and phone

- Custom FEMtools script development
- Custom software development
- Project research
- FEA data translation services
- Consulting services

### **Technology Courses**

Dynamic Design Solutions regularly organizes technology courses on topics covered by its software. These courses are intended for all who want to improve their understanding of the technology behind the software. The FEMtools software is used for hands-on exercises.

### **Training Courses**

Dynamic Design Solutions and FEMtools Solutions Partners provide introduction and advanced courses, on site or at a central location. In some countries, training courses are also organized by FEMtools Solutions Partners in the local language.

### **Custom Software Development**

Some examples of development projects in which Dynamic Design Solutions participated:

- Applications of solving inverse problems (force identification,...)
- Integration of test and analysis in general (static, dynamic, thermal, acoustics,...)
- Development of special FEA postprocessing tools
- Customized integration of design, analysis and optimization tools
- Development of custom data translators

### **Project Research**

Our engineers are continuously endeavoring to enhance the methods and tools that are used in FEMtools. Furthermore, extensions are developed in FEMtools Script to support special applications.

Dynamic Design Solutions is involved in several advanced research projects. Some of our current research topics are:

- Validation and updating of models for thermal analysis
- Validation and updating of models for acoustic analysis
- Multidisciplinary optimization
- Design space exploration
- Uncertainty assessment
- Statistical sampling techniques
- Probabilistic analysis
- Reliability analysis and robustness analysis
- Modeling knowledge and judgment
- Material identification using mixed numerical-experimental methods
- Model reduction using equivalent properties (e.g. multi-layer panels).
- Modeling of structural joints
- Non-linear dynamics

- Time domain correlation analysis
- Structural damage characterization and identification
- Design optimization using component-based software tools

Organizations interested in joining us in the exploration of these new techniques or to startup projects in these and other related areas (e.g. EU Framework, Eureka, ...) are invited to contact [info@femtools.com](mailto:info@femtools.com).

### **FEA Data Translation Services**

Customers can upload an finite element database in one of a number of popular data formats, and DDS analysts will translate the data into the requested format. This is a cost-effective service to FE analysts that have several analysis codes in-house or that collaborate with analysts using other codes. Email to [info@femtools.com](mailto:info@femtools.com) for more information on this service.

### **Consulting Services**

Using state-of-the-art FE analysis and simulation software, Dynamic Design Solutions can help you meet finite element modeling and analysis deadlines on time. Our consulting team consists of professionals with many years of experience in solving various engineering challenges. They can take time-consuming projects off your hands or tackle special areas where you lack the expertise, such as:

- finite element model updating using test data
- finite element data translation between different formats

Using a network of consultancy partners we can even handle your complete project including design, meshing, analysis, testing and FE model updating.

Please give us some information about yourself and the nature of the problem by sending an email to [info@femtools.com](mailto:info@femtools.com). A team member will contact you to discuss your needs.

## **Contact**

### **Corporate Office Address**

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### **Web Sites**

Company site: <http://www.dds.be>  
Product site: <http://www.femtools.com>

### **E-mail**

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