



## **META**

**The high performance  
multi-disciplinary  
CAE post-processor**



**“We succeeded in reducing significantly the effort, time and cost required for our procedures until reporting”**

META is a thriving multi-purpose post-processor meeting diverging needs from various CAE disciplines.

It owes its success to its impressive performance, innovative features and capabilities of interaction between animations, plots, videos, reports and other objects. Its capability for high level of process automation established META as a standard accelerator of post-processing tasks, from results' visualization, to report generation.

#### Benefits

- A single tool for 3D, 2D post-processing, for all disciplines
- High level of automation for all processes until report generation
- High performance of results reading and graphics display
- Low memory footprint
- Pre-configured, discipline-specific toolbars
- Prompt software updates for the support of the latest solver results versions
- Synergy with ANSA
- Direct coupling with optimizers
- Short learning curve and deployment time
- Virtual reality
- Enhanced collaboration via Remote Desktop Interface

Benefit from the striking performance, the full automation capabilities, and an easy-to-use toolbox.

Take advantage of the powerful platform for handling effectively even the most demanding post-processing tasks, including animations, plots, videos, and reporting.

## Eliminate your results handling efforts, and focus on understanding the behavior of your models

META offers all you need from an advanced yet easy to use post-processing platform. Combining the outstanding performance and smart functionality in handling large models, with the advanced process automation, and the GUI customization capabilities, you will significantly accelerate your post-processing work.

### User interfaces

A flexible and fully customizable interface provides the option to dock existing toolbars anywhere on the working area and even create new ones, to suit your diverse needs. Post-processing work is accelerated significantly through a multiple window environment with window dependent model attributes and smart functionality for the fast handling of entities' visibility.

### 3D field post-processing

The top quality graphics, the high performance and the efficient handling of large, multiple models and data, form a productive working environment. Model management, conducted on entity, property, material, or include level, is greatly assisted by a tree structure hierarchy group tool that reflects the ANSA Part Manager

hierarchy, and provides connections management capabilities.

### Toolbars

User toolbars are custom graphical user interfaces created within META using the dedicated Toolbar Designer. Taking advantage of the automation capabilities of both Python scripts and META sessions, user toolbars can be created as discipline and process-specific to contain only the necessary functions. Additionally, they can be shared among different work-teams. Available with every META installation, numerous tools aid the analyst to complete tasks, from loading data to report generation with minimal user interaction. Such tools are those for Crash and Safety regulations, Collision-Penetration Check, Optimizer Setup, Pedestrian, Bus Rollover, Bore Distortion analysis, CFD Post, Composite

Post, Map Results. The automation capabilities also contribute to the easy and unhindered coupling of META with external optimizers. A simple-to-use toolbar, that streamlines the coupling, is provided with the standard package.

### Automation

META provides advanced capabilities for process automation through Python scripts, as in ANSA. Custom user toolbars and session files, all of which can be created easily and fast through intuitive embedded editors. Based on the integration of these means, standard complicated procedures can run automatically. Typical cases include procedures that run just after a solution is finished on a server, and result in the generation of multi-pages complicated reports at no time and with no errors.

## Explore every detail and study your results with the aid of a full-ranged tools portfolio

As an advanced post-processing platform, META offers you a broad range of functionality. With countless tools including an advanced graph tool, calculations, and correlation studies on loaded results, you will achieve effective interaction between animations, plots, videos, reports, and other objects.

### Supported results

META provides a broad range of functionality that can successfully address even the most demanding post-processing requirements. It supports results from all popular solvers and analysis field. Results from measurements-data from tests are also supported in various formats including direct link to an ASAM ODS server. Data from neutral format files such as ASCII column, Universal and ASCII Patran are also supported.

### 2D plot post-processing

A comprehensive graph tool is integrated within META without the need to start a separate program. As many 2D plot windows as necessary can be opened, each one hosting multiple different plots. This tool supports the direct reading of time history results deriving from all supported solvers as well as measurements like ISO Data, Universal and other format files or common column ASCII files.

Its unparalleled speed in interactive handling of large number of curves, as well as its extensive interoperability with the 3D field module, boosts productivity and

simplifies parallel 3D and 2D post-processing. Information can be passed from one module to the other and curve data can be directly associated to the 3D geometry. Mathematical operations and a broad range of built-in or custom functions can be applied on curves or a field deck.

### Calculations on field results

New stress fields can be calculated in META as a linear combination of existing stress fields or through any mathematical operations applied on loaded results.

Forces on any section can be calculated from original results stemming from NASTRAN, Abaqus, LS-DYNA or PAM-CRASH. NVH analysis is accelerated by the fast calculation of 3D and 2D structural and acoustic responses, the generation of structure-fluid coupling data, and the modal correlation capabilities (MAC calculation). Hybrid modeling is also supported for NVH analysis framed by the creation of modal models and an FRF assembly tool, that also features an embedded genetic optimizer for the optimization of connectors' properties.

### Correlation studies using videos & images

A number of specially developed embedded tools, are available to significantly simplify correlation studies between simulation results and physical test data. Using these tools, the exact and effortless matching of the model's perspective view with that of an image can be achieved, and the synchronisation of the animation simulation with a test video can be set. Additionally, features can be traced on videos and the tracking results can be plotted automatically in a 2D plot.

### Other tools

Other tools such as the multiple clipping-plane cuts with its advanced functionality, the explode feature with the isofunctions tools, the numerous options for parts and models, and the section force calculator, provide the means for a closer insight into the results. Furthermore, a camera tool ensures the accurate management of the perspective view of the model.



courtesy of Volvo Car Corporation

## Take collaboration to new levels and work closer with your colleagues

Maximize cooperation through breakthrough collaboration tools. Use the embedded report composer to generate automatically PowerPoint presentations. Broadcast your work via web browsers, and meet with your global colleagues in the virtual reality world.

### Output options

Geometry and results data can be saved and appended in the native binary format of META. The content of these files can also be viewed with a freely available viewer. Lossy and lossless compression options are available, resulting in significant size reduction which can be higher than 90%. Geometry can be output in various solvers input file format like NASTRAN, PAM-CRASH, LS-DYNA, Abaqus, RADIOSS, ANSYS, or Universal format input file format. Data related to identified entities, as well as curve data can be output in ASCII text, while data from the spreadsheet-form tools can be output both in ASCII, xlsx and HTML format. META also provides image saving for tif, jpg, ppm, png, bmp, Postscript, encapsulated Postscript, vrml, rgb and gif formats and video recording for avi, mpeg and gif formats.

### Reporting

Using the embedded report composer, template based reports in HTML, Postscript, pdf, or MS Office PowerPoint .pptx format can be generated in a direct way.

The reports can be created interactively, taking advantage of the complete Report Composer tool in addition to the interoperability between the different tools of META, or automatically through the use of session files or script.

### Stimulating collaboration

The BETA web interface allows engineers to broadcast their screens via a web browser and share their work. The Remote Desktop Interface offers full broadcasting capabilities, as well as interaction with META functionality on a workstation by several users, operating also from a web browser. The sketch tool extends collaboration further by allowing you to point out areas of interest on the model and communicate your ideas by adding notes in the form of annotations.

### Virtual Reality

META, apart from the vast array of tools and automation capabilities, can render simulation models using Physically Based Rendering (PBR) materials and environment mapping. These, together with the support of the HTC VIVE and

Oculus Rift virtual reality headsets offer to analysts a powerful processing and visualization tool with unprecedented level of realism. Combined with the collaboration capabilities, engineers from remote locations can cooperate in VR rooms, sharing the same model data.

### Advanced filtering and communication of results

META offers extended interactive identification and filtering capabilities on part and element level. Areas of interest and the corresponding Maximum/ Minimum values can be marked and traced easily through the run-time annotation tool and the fast creation of iso-contour lines and surfaces. Advanced filtering is available within several META tools, with which even extreme cases of entities selection and information extraction can be realized with a single click based on combined queries. An overview of hot-spot results as well as spreadsheet properties is achieved through multiple statistics tables, which also provide an efficient means for fast comparison of results.





*physics on screen*

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[www.beta-cae.com](http://www.beta-cae.com)