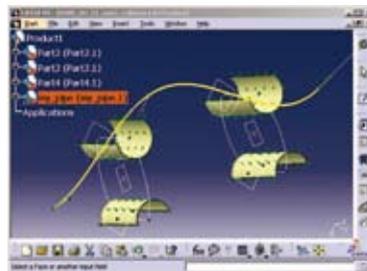
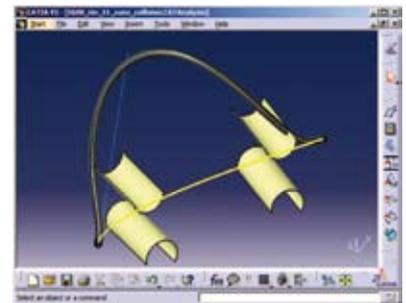
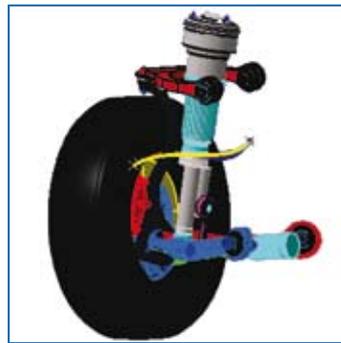
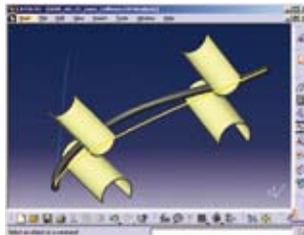
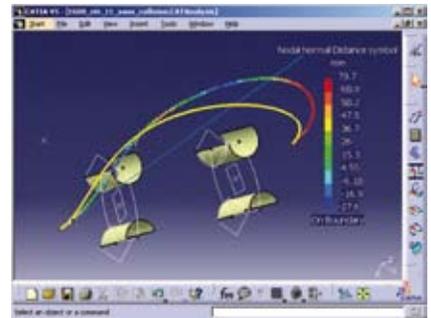


# TEA Pipe

Transparent Extended Analysis for Brake Pipe Analysis



TEA Pipe users can analyze the behavior of brake pipes from CATIA V5 environment.

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**T**aking into account non-linear geometrical behavior, TEA Pipe users can analyze the behavior of brake pipes from CATIA V5 environment. They can easily obtain the deformed shape, curvatures, stresses, collisions information for successive configurations. A variety of pipe details (supports, reinforcements, spirals...) and kinematical descriptions (simple or imported from DMU Kinematic) are available.

## NON LINEAR MECHANICAL ANALYSIS WITH COLLISIONS DETECTION

TEA Pipe provides you with a comprehensive and very powerful software for brake pipes analysis. It allows the use of a Pipe Manufacturer Database. The material behavior can also be defined in a database. The brake pipe connectors, supports... can be defined on points and geometries from your current CATIA V5 models.

Distance measurement between the deformed shape and the surrounding surfaces allows the user to detect possible collisions.

A new pipe shape can be created from the analysis result.

With a simple kinematical definition, the wheel rotation and translation can be taken into account. With the advanced kinematical definition, complex movements can be imported from DMU Kinematics.

With TEA Pipe, the best length and the best connectors positions can be found, while checking collisions or curvatures.

## FOR DESIGNERS AND MECHANICAL ENGINEERS

SAMTECH enables CATIA V5 users to perform advanced non-linear mechanical simulation analyses, allowing Designers, Mechanical Engineers and Stress Engineers to predict the complete functional performances of their products, directly from within their familiar CATIA V5 environment.

The result is a new product for brake pipe analysis named TEA Pipe.

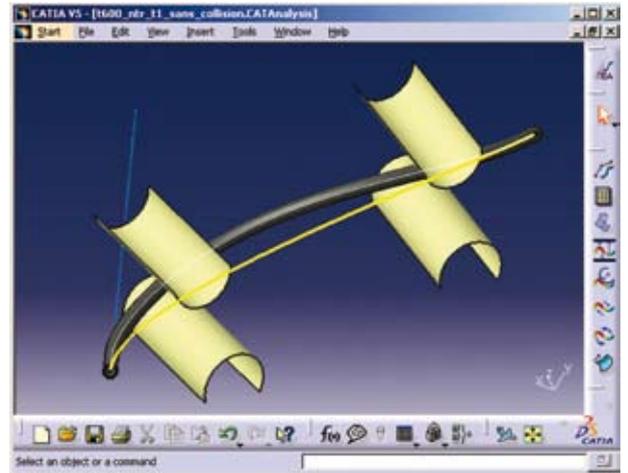
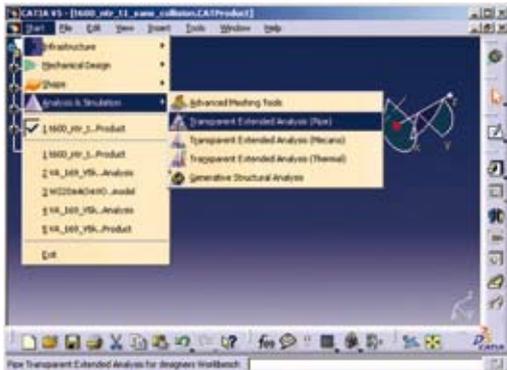
## YOUR BENEFITS: AVOID EXPENSIVE RE DESIGN, REDUCE DESIGN CYCLES

CATIA V5 designers are able to produce quickly brake pipe models by adding specific brake pipe features to an existing model built within their environment.

TEA Pipe speeds up the design work thanks to the use of a single user interface for the geometry definition, the mechanical analysis data definition, the meshing, the launch of the solver and the post-processing.

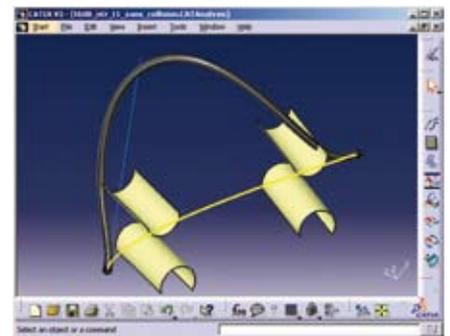
TEA Pipe provides users with extended non-linear mechanical solving capabilities, in a fully associative environment.

With TEA Pipe, SAMTECH answers customer needs from medium and large industries by proposing the transparent use of extended FE mechanical techniques very early in the design process of the brake pipes, to eliminate the expensive iterations during design process.



## BETTER COMPATIBILITY WITH DETAILED ENGINEERING

Users benefit from SAMTECH recognized expertise in detailed engineering and software quality, insofar as with TEA Pipe, users can perform highlevel mechanical simulations within a complete and integrated CAE software for mechanical design.



## AUTOMOTIVE AND TRANSPORT SECTOR

With TEA Pipe, SAMTECH aim is to target design activities of customers from the automotive and more generally, the transport industry (trucks...).

### Pipe Definition

- Pipe length;
- Pipe diameter;
- Pipe connectors (length, position, directions...);
- Pipe material and Pipe Manufacturer Database;
- Pipe auxiliaries:
  - Supports;
  - Reinforcements;
  - Spirals.

## Simple Kinematical Definition

The user must define a Wheel Master Point, able to rotate (steering) and to translate (suspension). The surrounding surfaces and geometries are either fixed or linked to the wheel. Nine standard positions (including three Steering positions and three Suspension positions) are defined for the wheel.

The user can also introduce some user cases (defined by a steering and a suspension value).

## Advanced Kinematical Definition

The surrounding surfaces and geometries movements are defined in DMU Kinematics.

"Measure" points are recorded in DMU Kinematics.

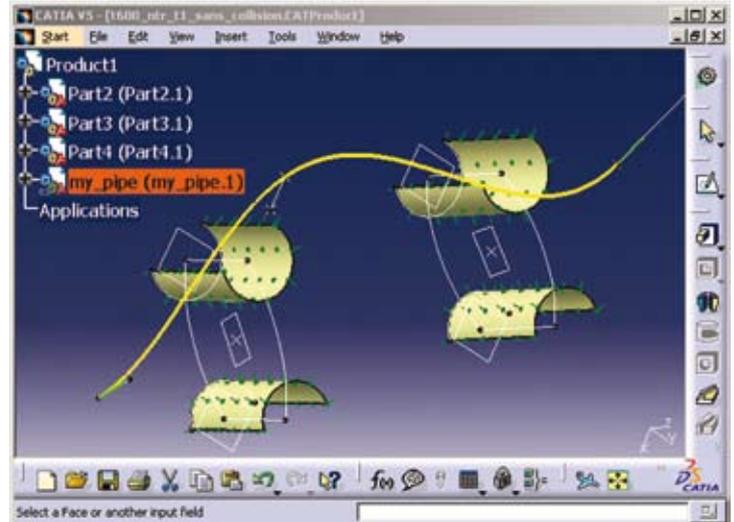
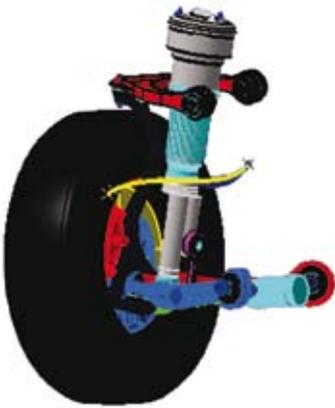
Each TEA Pipe moving object is linked to a DMU Kinematic Measure Point.

## Pipe Optimization

The user must define an objective (for example: minimize Pipe length) and define some constraints (for example: keep the curvature under a given value).

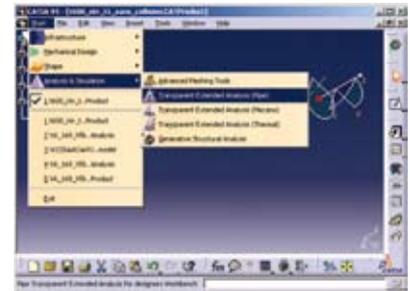
## MODELING ENVIRONMENT

TEA Pipe is perfectly embedded in CATIA V5 for the modeling, the non-linear mechanical analysis and the postprocessing of pipes. Results are post-processed graphically in the form of isovalues or as animations. TEA Pipe benefits of advanced visualization tools of CATIA V5, allowing very efficient and straightforward pre- and post-processing of non-linear mechanical analyses. The results that can be post-processed include deformed mesh, nodal normal distance, curvature, force, moment and successive configurations.



## DOCUMENTATION

For direct access to information, the Users Guide and Help manual are available on the CD-Rom (PDF file).



### Technical Characteristics:

TEA pipe offers non-linear brake pipe analysis directly accessible from CATIA V5 environment. The users benefit from features of SAMCEF Mecano (large deformations, powerful contact algorithms...) and BOSS (optimization).

#### General capabilities

- Solution based on CATIA V5

#### Formulation

- Non linear Finite Elements

#### Transparent Non-Linear Analysis

- Minimum data definition for non-linear pipe analysis
- Automatic choice of solver strategy

- Very robust collision detection algorithms
- Successive configurations

#### Pipe Definition

- Pipe length
- Pipe Diameter
- Pipe Connectors (Length, Position, Directions...)
- Pipe Material and Pipe
- Manufacturer Database
- Pipe Auxiliaries:
  - Supports;
  - Reinforcements;
  - Spirals.

#### Movement Definition

- Simple Kinematical Definition
- One Wheel Master Point, able to rotate (steering) and to translate

(suspension)

- Advanced Kinematical Definition imported from DMU Kinematic.

#### Pipe Optimization

- Parameters: Length, Connector Positions...
- Constraints: Parameter Limits, Curvature, Collisions...
- Objectives: Pipe Length, Minimize bending...

#### Available results

- Deformed Pipe Shape
- Corresponding CATIA V5 pipe shape
- Distance from surrounding surfaces
- Curvature
- Torsion
- Bending

## About SAMTECH

SAMTECH is a European specialist in the development and worldwide marketing of Computer Aided Engineering software, commonly called "simulation" or "Virtual Prototyping" software. It is well established that as well as increasing the quality of the design, such software not only enables drastic reductions in product development cycle and consequently the associated costs, but also dramatically reduces the need for expensive physical testing.

**"General-purpose software tools"**: this SAMTECH offer includes the general linear and implicit non-linear Finite Element Analysis package SAMCEF with the CAD/CAE modeling environment SAMCEF Field, the general explicit and fast dynamics code EUROPLEXUS; the task management and optimization platform BOSS quattro; TEA Mecano and TEA Thermal CAA V5 Based as non-linear thermo-mechanical solution embedded in CATIA V5 and SAMCEF Gateway CAA V5 Based, the SAMCEF integrated interface within CATIA V5.

SAMTECH most recent product, CÆSAM, is a high level CAE centric Application Framework allowing the customization and the management of the whole engineering process, involving any commercial software and in-house skill tools. This environment based on Knowledge Based Engineering concept encapsulates customer skills and knowledge into Analysis Processes and Analysis Methods and ensures reusability of models in order to reduce Time-to-Market.

**"Professional products"**: this SAMTECH offer is based on its general-purpose software tools and is dedicated to specific domains of application such as rotor dynamics (SAMCEF for Rotors), modeling of pipes for automotive industry (TEA Pipe), modeling of high voltage substations, electrical lines (SAMCEF for Power Lines and Substations), prediction of dynamic loads on wind turbine drive trains (SAMCEF for Wind Turbines)...

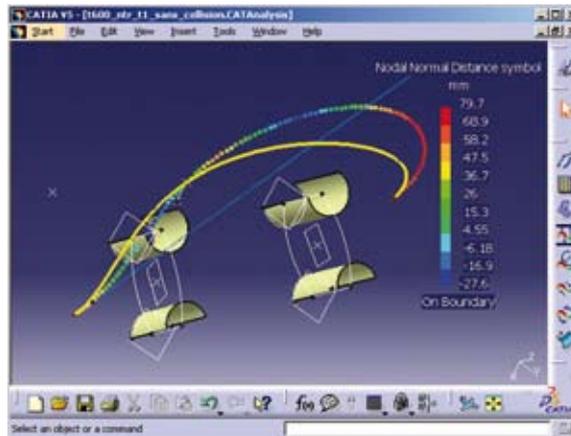
**"Third party and customized solutions"** like the SAFE tool (fatigue analysis of aeronautic structures) and the Application COMPOSITES (analysis of aeronautical structures made of composite materials) from AIRBUS, where SAMTECH provides its clients with services such as development, reengineering, packaging and deployment of proprietary professional solutions on the customer site.

**"Customized multi-physics solutions"**, based on OOFELIE. OPEN ENGINEERING, the SAMTECH subsidiary, which allows SAMTECH to be present in the multi-physics design markets and to provide services for the development of original highly coupled analysis solutions covering specific needs, commercializes OOFELIE.

Visit [www.samcef.com](http://www.samcef.com) for further details on SAMTECH Product/Service offer!

- Need some information about TEA Pipe ?
- Need some information about non-linear modeling and pipe analysis with TEA Pipe ?
- Need some information about SAMTECH expertise ?

**Contact our specialists !**



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