# Production for Small Series and Experimental Parts for Aviation Gas Turbines

## manufacturing and assembly done by COMOTI

Advanced technologies and mechanical processing for aircraft and industrial gas turbines.

Scientific research, design and manufacturing for parts with complex configuration and low rigidity.

Reengineering and repairing different bladed parts as rotors and stators, thrust bearings, heat-exchangers etc).

Various processing of materials like stainless steel, dural, titanium alloy: milling up to 5 axes, CNC turning and so on.

## 3D MODELING

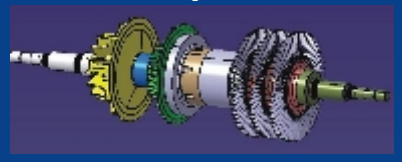
### using CATIA V4 & V5, UNIGRAPHICS and SOLID EDGE V20

Fan Blisk

Turbo Shaft Engine

Combustion Chamber

Centrifugal Impeller

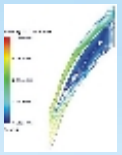


Turbo Compressor Rotor Assembly

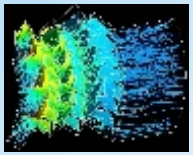
Noise Silencer

## OPTIMIZATION and CFD ANALYSIS

### using Concepts NREC & ANSYS - CFX 11 softwares



Centrifugal Compressor Chanal

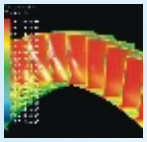


3 Stage Axial Turbine

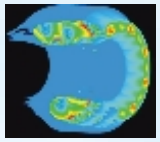
Compressor Diffuser

## CFD THERMAL ANALYSIS

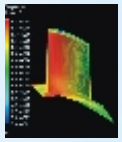
### using ANSYS - CFX 11 software



Turbine Bladed Rotor



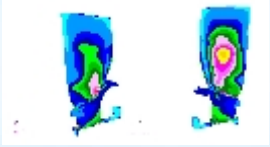
Turbo Shaft Combusted Chamber



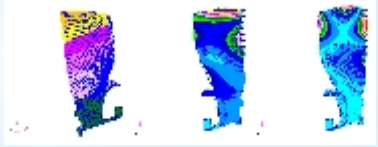
Turbine Blade

## STRESS ANALYSIS

### using NASTRAN PATRAN software



Static stress and displacements validation



Dynamic stress and displacements assesment, mode shapes

# "Marketing studies and plan in order to promote products and services of COMOTI"

- project co-financed by the European Regional Development Fund -

**ASQ MANAGEMENT S.R.L.**

**July 2010**

"This report does not necessarily represent the official position of the European Union or the Romanian Government"

EUROPEAN UNION

ROMANIAN GOVERNMENT

Structural Instruments 2007-2013

# *Research and development activities related to Aircraft Gas Turbines*

## Sectorial Operational Programme

### "Increase of Economic Competitiveness"

- co-financed by the European Regional Development Fund -

# "Investment for your future"


COMOTI
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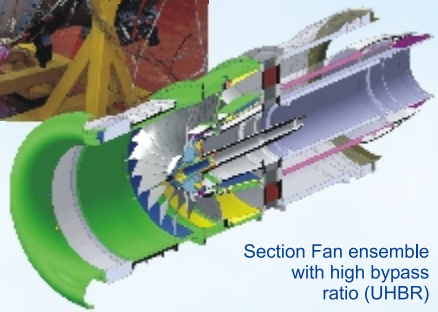
Established in 1985 as the Scientific Research and Engineering Center for Aircraft Engines, within the former INCREST, COMOTI becomes the "Romanian Research and Development Institute for Gas Turbines, COMOTI", as a result of its assessment and certification.

# RESEARCH PROJECTS

## financed by European Commission for future Aircraft Engines

## SILENCE(R)

51 partners, Coordinator: SNECMA MOTEURS - France.
One of the biggest and most important European Project regarding to Aircraft Engines, financed by European Commission in the Program FP-V-GROWTH.

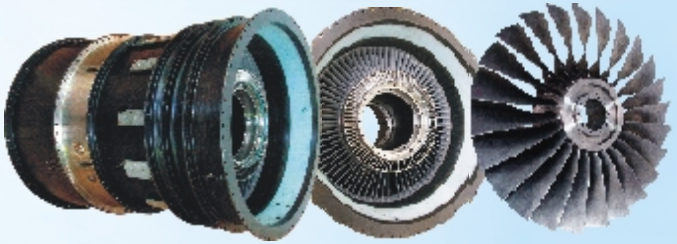


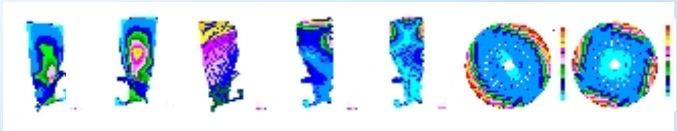
Section Fan ensemble with high bypass ratio (UHBR)

## VITAL

54 partners, Coordinator: SNECMA MOTEURS - France.
Project regarding to Aircraft Engines, financed by European Commission in the Program FP-VI-GROWTH.
Developing new reduction technology regarding noise, weight and emission of $CO_2$ for aircraft engines. Environment friendly air-feed jet.

Parts manufacturing and assembly done by COMOTI including titanium Fan Blisk.

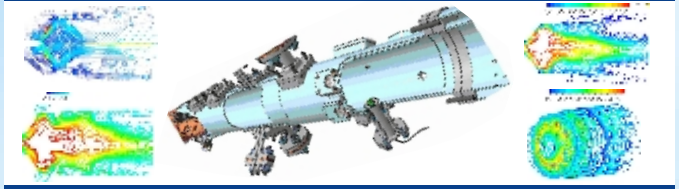




Fan Blisk static and dynamic mechanical analysis done by COMOTI with NASTRAN software

## TEENI

Turboshaft Engine Exhaust Noise Identification.
Project regarding to Aircraft Engines, financed by European Commission in the Program FP-VII-GROWTH.
Designing & manufacturing engine and test rig parts instrumentation & test.



## OPENAIR

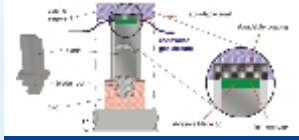
Optimization for low environmental noise impact aircraft.
Project regarding to Aircraft Engines, financed by European Commission in the Program FP-VII-GROWTH.

Composite autoclave technology processing.

CAD & CFD, CAA analysis capabilities: CAM facilities; OGV Prototype.

## ABRANEW

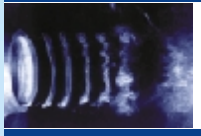
Innovative abradable/abrasive materials for improved energy efficiency in gas turbines.
Project for industrial Gas Turbines, financed by European Commission in the Program FP-V-GROWTH.



Increase of gas turbines efficiency industrial turbojets with inlet temperature above 1,000° C, by reducing the clearing between the rotor blade and its housing, by using abrasive material deposits.

## JEAN

Jet Exhaust Aerodynamics & Noise.
Project regarding to Aircraft Engines, financed by European Commission in the Program FP-V-GROWTH.

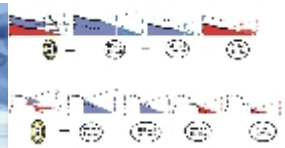


COMOTI's contribution: obtaining the velocities, temperatures and turbulent fluctuations using Vortex Filament Method (VFM).

## CoJeN

Coaxial Jets Noise Calculations.
Project regarding to Aircraft Engines, financed by European Commission in the Program FP-VI-GROWTH.

COMOTI's contribution: obtaining the velocities, temperatures and turbulent fluctuations from the conservation law of momentum and enthalpy - general case (moving air).



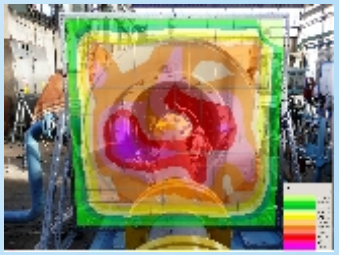
# Acoustic and Vibration Laboratory

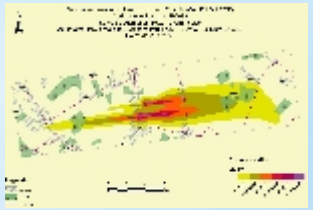
The Acoustic and Vibration Laboratory of Romanian Research and Development Institute for Gas Turbines - COMOTI is certified by The Accreditation Organization from Romania - RENAR according with SR EN ISO/CEI 17025/2005.

The laboratory can perform studies in the following specialized chambers:

- The Anechoic Chamber realized according with ISO 3745;
- The Reverberation Chamber realized according with ISO 3741- Annex D ISO 354;
- The Transmissibility Chambers according with ISO 140/1, /7, /8, STAS 6161/4, STAS 6691.

Measurement and studies for sound intensity mapping of the noise sources.

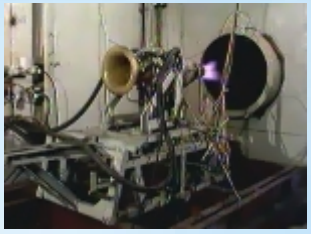




COMOTI in collaboration with ENVISA realized the strategic noise map for International Airport "Henri Coanda" - Otopeni.

# Gas Turbine Test Facilities

Turbo prop test rig.



Turbo jet test rig.

# Combustor Chamber Test Facilities

Laser measurements.

Burning test rig.