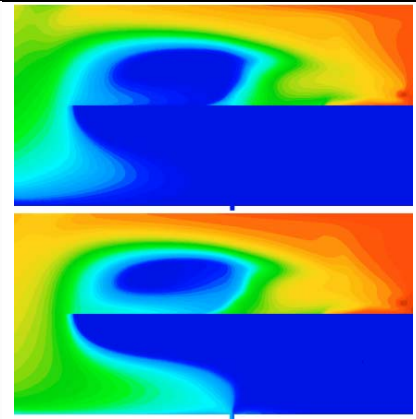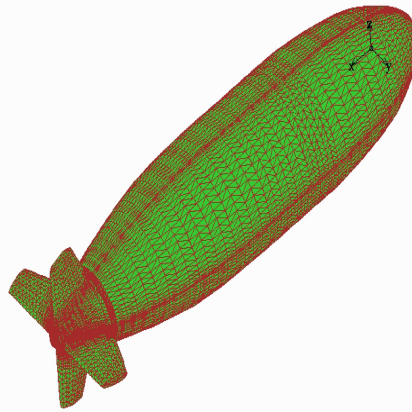# *fluidyn*-MP - NS module

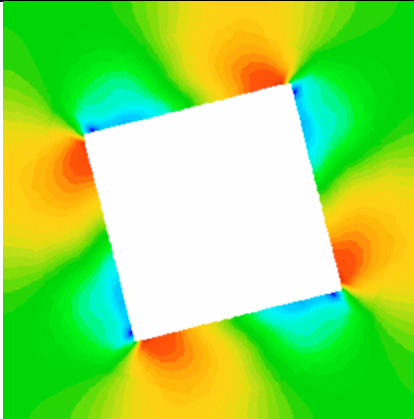Transoft - INTERNATIONAL

INTERNAL OR EXTERNAL FLOWS

fluidyn–**MP NS** is a fluid mechanics simulation software designed to simulate internal or external flows in complex 3D geometries with high precision high order finite volume schemes.

The several numerical schemes available offer an exact representation of all kinds of flows, ranging from incompressible (free surface) to highly compressible (transonic flow) and steady to highly unsteady (explosions).

fluidyn–**MP NS** can simulate industrial flows with the help of a 3D multi-block structured or unstructured (or hybrid) stationary or **moving** mesh.
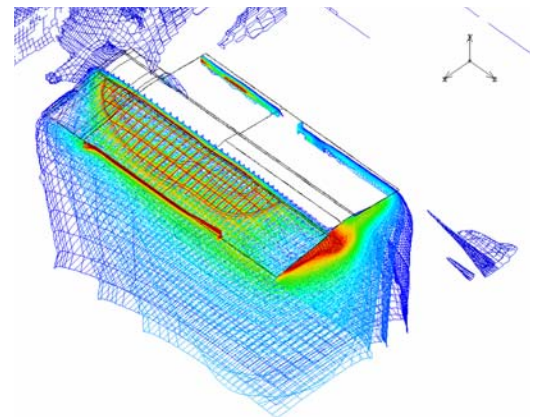
fluidyn–**MP NS** offers an user-friendly graphical interface consisting of pre- and post-processors and a wide range of solvers which have been parallelized thus effectively reducing the computational time.
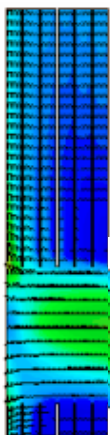
fluidyn–**MP NS** runs on a wide range of platforms including PC (Windows, Linux) as well as UNIX workstations.
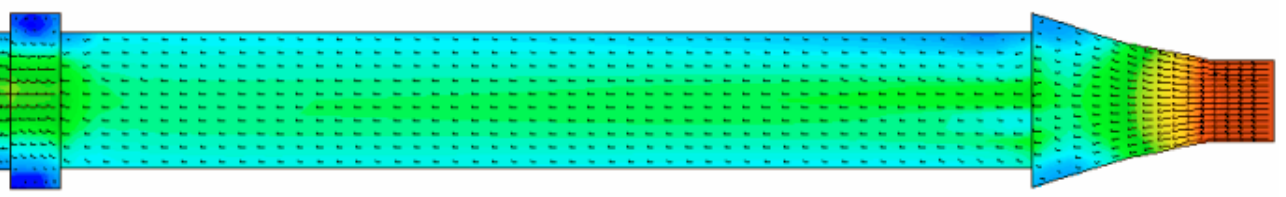
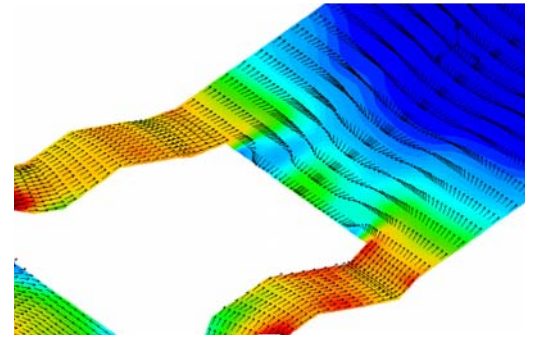## REACTIVE FLOWS – MULTI-SPECIES

- **Convective-diffusive** equations
- **Reactive flows**: Arrhenius law, EBU
- **Turbulent mixing by** Magnussen, eddy dissipation concept (EDC).

TURBULENCE

- k-ε standard, CHEN-KIM correction , RNG, Lam-Bremhost models
- LES models: Sub grid scale model (SGS).

PHYSICAL AND THERMODYNAMIC PROPERTIES – MULTI-SPECIES

- **Ideal** or **real gas** laws, **deflagration** and **detonation**, polynomial equations of state
- Polynomial expression for specific heat, viscosity as functions of temperature
- **Mixing** properties
- User defined properties
- Non-Newtonian fluids.

TWO-PHASE FLOWS

- Euler-Lagrange based on Monte-Carlo method: particles, droplets or bubble flows.
- Euler-Euler method.
- Exchange of mass, heat and momentum, interaction with turbulence and break-up, collision / agglomeration phenomena.
- Free surface: ALE method, VOF method (variable topology mesh)

POROUS MEDIA

- Surface or volume porosities coupled with **Darcy** or **Ergun** laws**.**

PRE-PROCESSOR

Geometry and mesh generation in *fluidyn* **-CAD** and *fluidyn* **- GEN** models, import of meshes produced by other mesh generators, interactive specification of boundary conditions and flow configuration.

POST-PROCESSOR

The user-friendly graphical interface of *fluidyn*-**MP NS** allows result visualisation and interpretation (velocities, pressures, stress, deformations, temperature…) at any point during the calculation as well as the easy creation of images and result animations.

REFERENCES

AIR LIQUIDE, AVENTIS, CEA, CIAT, CITA, Cogentrix, DGA, EADS, EDF, Framatome, IFP, Mitsubishi, RATP, Saint-Gobain, Shell, SNCF, STBFT, Sumitomo, TOTAL, VNF, Zodiac, etc.

Transoft - INTERNATIONAL			
fluidyn-**FRANCE**	*fluidyn*-**UK**	*fluidyn*-**USA**	*fluidyn*-**INDIA**
7 boulevard de la Libération 93200 SAINT-DENIS FRANCE	15/17 Belwell Lane, Four Oaks SUTTON COLDFIELD West Midlands, B74 4AA UNITED KINGDOM	1191 Crestmont Drive LAFAYETTE CA 94549 - 3004 USA	#146, H. S. R. Layout, sector 5 Agara Extension, BANGALORE 5600 34 INDIA
☎ : 33 1 42 43 16 66 ✆ : 33 1 42 43 50 33 contact@fluidyn.com	☎ : 44 1 121 308 8168 ✆ : 44 1 121 323 2009 marketing@fluidyn.com	☎ : 1 925 284 1200 ✆ : 1 925 284 1240: marketing_USA@fluidyn.com	☎ : 91 802 5526507 ✆ : 91 802 5501964 marketasia@fluidyn.com