# *fluidyn*-VENTFIRE

FIRE IN CONFINED SPACES

fluidyn-**VENTFIRE** is a numerical tool dedicated to 3D modelling of fires in semi-confined and confined spaces.

fluidyn-**VENTFIRE** is designed to be used in design by architects and engineers and in emergency management by emergency planners, rescuers, and fire-fighters.

As part of the Fluidyn family, *fluidyn*-**VENTFIRE** is integrated with other fluidyn modules for real time atmospheric airflow around buildings as well as for transient simulation of structural integrity for heat flux and for any gas or solid explosions
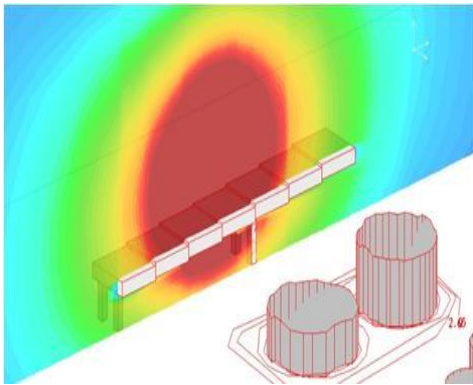

CAPABILITIES

- Pool fires
- Jet fires
- Solid fires
- Smoke dispersion
- Fire propagation in confined or partially confined buildings
- Real-time evaluation of fire propagation
- Structural resistance and deformation
- Fire source localisation in real-time from sensor readings
- Evaluation of fire accidents
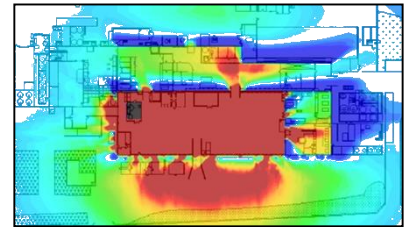
APPLICATIONS

- Parkings, office buildings
- Warehouses, offshore platforms & industrial units
- Rail, road tunnels, mines and galleries
- Escape paths
- Optimized layout of sensor network
- Addition to real-time emergency systems
- Assessment of mitigation measures
- Assessment of consequences on buildings and structures integrity
- Evaluation of fire accidents to determine the possible cause of fire

www.fluidyn.com
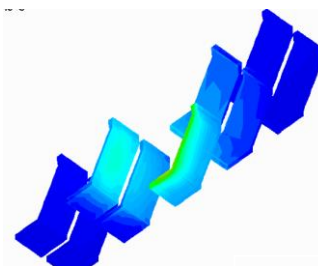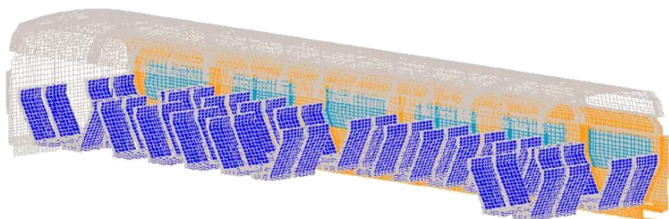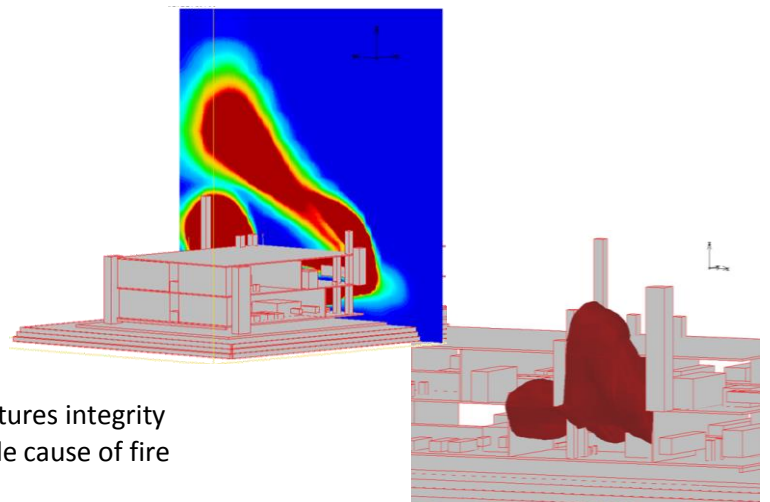
TECHNICAL ADVANTAGES

- Fast model preparation by data input on integrated CAD with built-in primitives
- Automatic or manual mesh
- CAD import from various formats (PDMS, IGES, DXF, STEP, etc.)
- Results projected on CAD model for faster design changes
- Detector network optimisation by inverse solver
- Real time fire source detection by fast Lagrangian solver
- Fire propagation by semi-implicit transient Finite Volume method
- Structural resistance to fire by Finite Element solver
- Preprocessing by default assumptions for missing data
- Pool or jet fires modelled with inbuilt appropriate parameters
- Optimal meshing by default besides user control, if required
- Multiple models for various kinds of fires: BML, EDC, EBU, etc.
- Mitigation devices- firewalls, sprinklers, positioned graphically
- Material properties library with more than 400 solids, liquids, gas
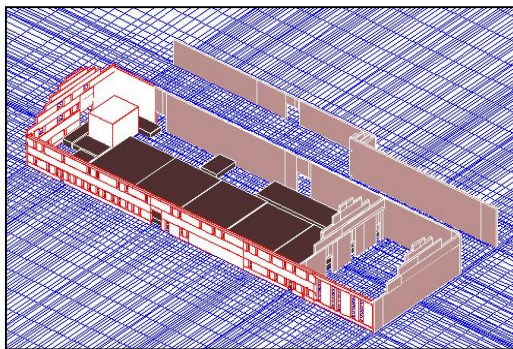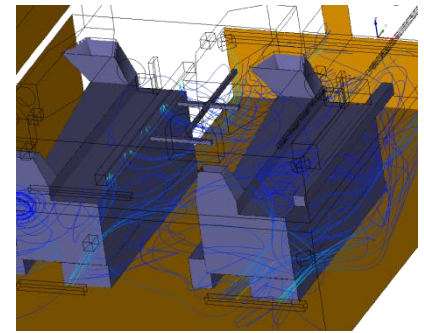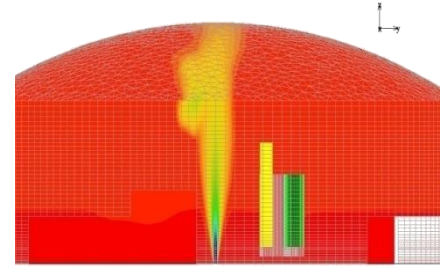
REQUIREMENTS

- Windows or Linux OS
- Parallelized solver
- Construction
- Batch as well as real time support mode
- Equipment library : blowers, exhausts, sprinklers, etc.
- Online real time connection from detectors and sensors
- Preprocessing and results visualisationon handheld devices
- Design variations tested graphically by optimisation algorithms

COUPLING

As a module of the *fluidyn*–MP software, *fluidyn*–VENTFIRE can include features of other *fluidyn*–modules :

- Real time update of airflow conditions around buildings, *fluidyn*–REALTI
- Solid flame radiation in 3D by ray tracing in solid angle, *fluidyn*–PANFIRE
- Ventilation and indoor air circulation, *fluidyn*–VENTCLIM
- External air flow & smoke spread by *fluidyn*–PANACHE
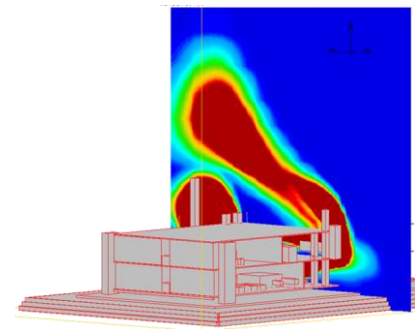
All *fluidyn*–MP software solvers are in constant development and constant validation.

The software are optimized and used since 1994 for many complex applications in nuclear and defence applications.

fluidyn–MP is still the only software, industrially available offering strong coupling of Finite Volumes and Finite Elements for complex applications.

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