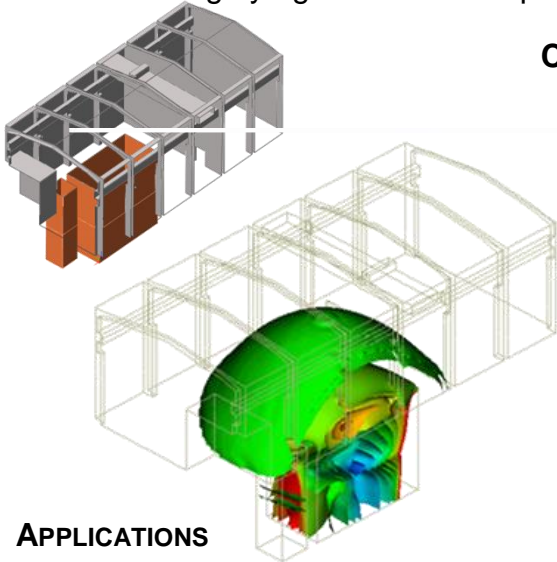


DEFLAGRATIONS / DETONATIONS IN CONFINED SPACES

fluidyn-VENTEX is a numerical tool dedicated to 3D modelling of explosion, deflagrations and detonations in confined or partially confined spaces.

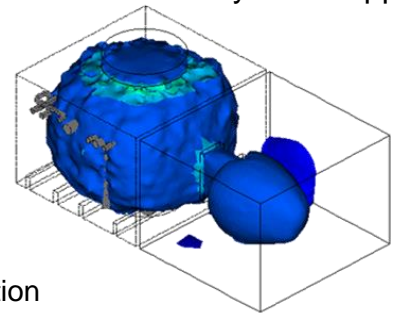
fluidyn-VENTEX can optimize leak sensor network and mitigation devices positioning to help architects and engineers at design stage. It is also used in emergency management by planners, rescuers and fire-fighters.

As part of the *fluidyn* software family, *fluidyn*-VENTEX has seamless coupling with other *fluidyn* modules for gas dispersion indoors or outdoors as well as for transient stress analysis of support structure integrity against heat and pressure load due to explosions.



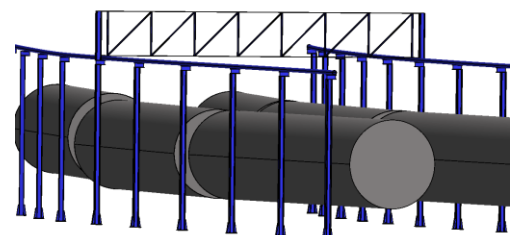
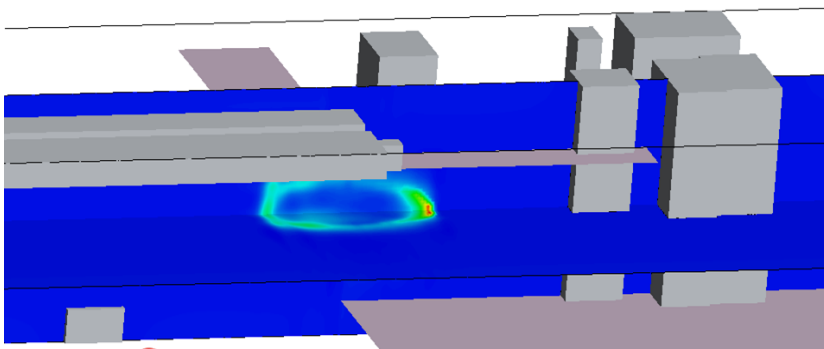
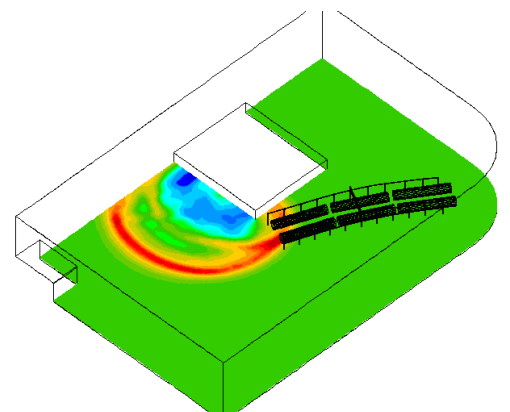
CAPABILITIES

- Deflagration schemes
- Detonation schemes
- Solid propellants explosion
- Gas and liquid explosion
- Hydrogen deflagration/ detonation
- Pressure and combustion waves propagation in anisotropic environments
- Extractor equivalent modelling of obstacle: equipment, pipes.
- Safe time estimate for structural integrity by explicit solver
- Gas leak source localisation in real-time
- Evaluation of explosion accidents chances



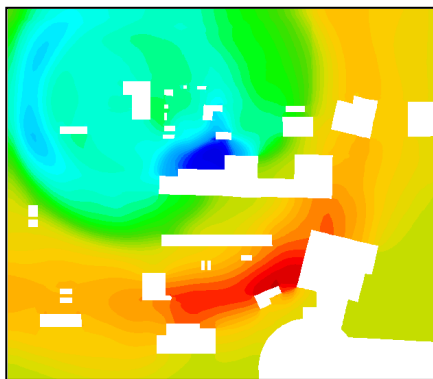
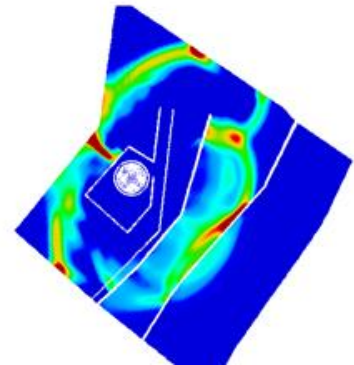
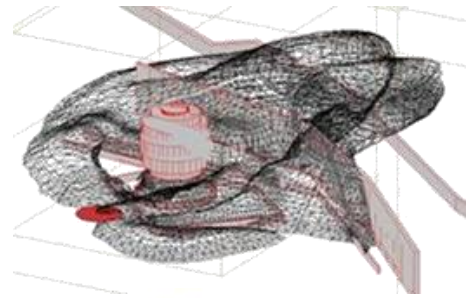
APPLICATIONS

- Evaluation of overpressures expected on sensitive targets
- Evaluation of the mitigation measures efficiency
- Support structure response to pressure and thermal transient loads
- Domino effect and secondary explosion assessment
- Auto-ignition



TECHNICAL ADVANTAGES

- Fast geometry model preparation by integrated CAD built-in primitives
- CAD import from various formats (PDMS, IGES, DXF, STEP, etc.)
- Missing data completed by default assumptions
- Default or user selected optimal mesh
- Unstructured embedded mesh for exact contours of pipes, obstacles
- Results projected on CAD model for faster design analysis & changes
- Explosion by explicit or semi-implicit transient Finite Volume solver
- Structural stress analysis by Finite Element solver
- Deflagration/ detonation model with inbuilt pre validated parameters
- Multiple models to fit various kinds of explosions: BML, JWJ, etc.
- Mitigation devices- blast walls, sprinklers, positioned graphically
- Material properties library with more than 400 solids, liquids, gas



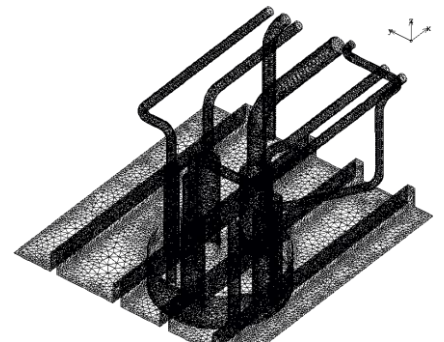
REQUIREMENTS

- Windows or Linux OS parallelized solver
- Data preparation & results on fixed or hand held devices
- Geometry model, interactive graphic construction
- Batch as well as real time support mode
- Equipment library: blowers, exhausts, sprinklers, etc.
- Online data recovery from detectors and sensors
- Design variations tested graphically by optimisation algorithms

COUPLING

As a member of *fluidyn* software family, *fluidyn*-VENTEX can integrate features of other *fluidyn*-modules:

- Ventilation and indoor air circulation, *fluidyn*-VENTCLIM
- Flammable gasevaporation and spread, *fluidyn*-PANACHE
- Real-time simulation of flow and jet dispersion, *fluidyn*-REALTI
- Detailed structural stress analysis, *fluidyn*-ESR



All *fluidyn* software solver features are continuously enhanced with latest developments and systematic validation.

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

fluidyn is still the only software, industrially available offering strong coupling of Finite Volumes and Finite Elements and other support risk analysis empirical models for complex applications.

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