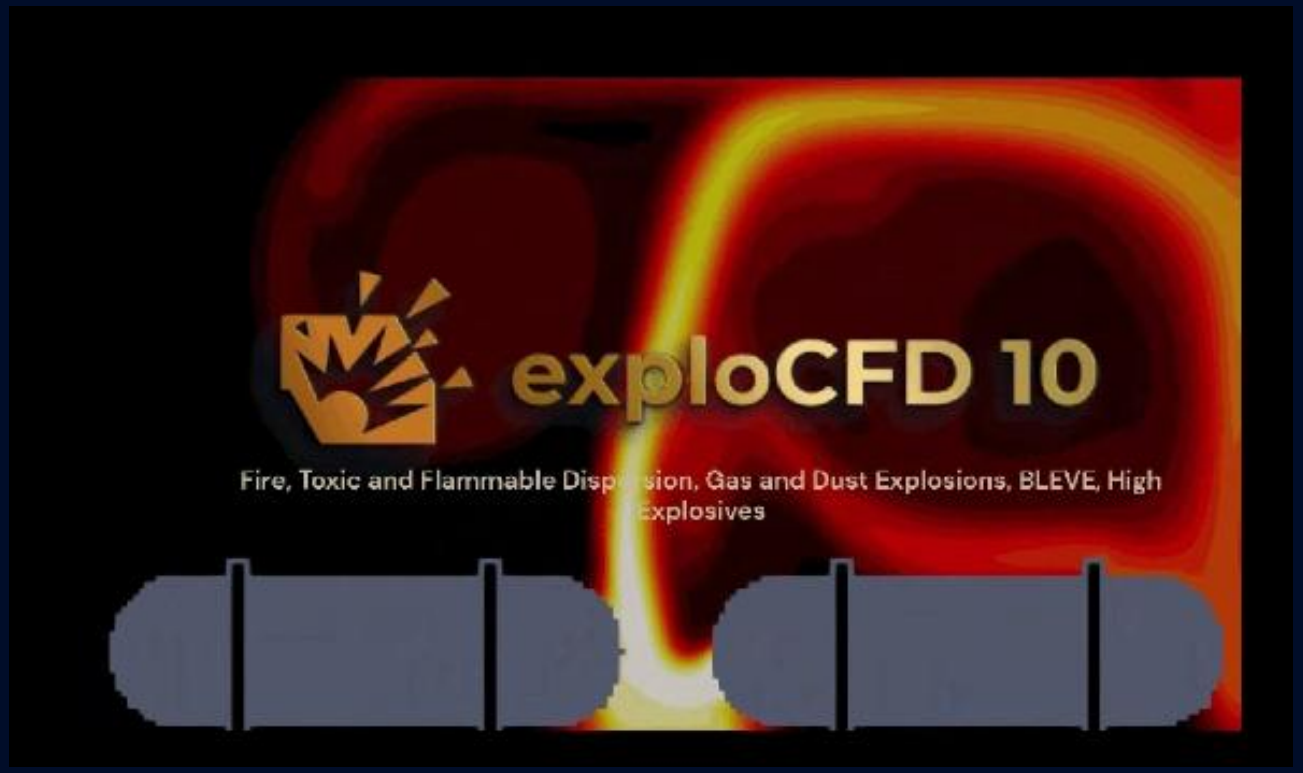
PRODUCT BROCHURE | VERSION 10

exploCFD 10

Fire, Toxic and Flammable Dispersion, Gas and Dust Explosion, BLEVE, High Explosives



Hybrid consequence analysis for explosions, fires and hazardous releases

Beyond simple contours, faster than full 3D CFD

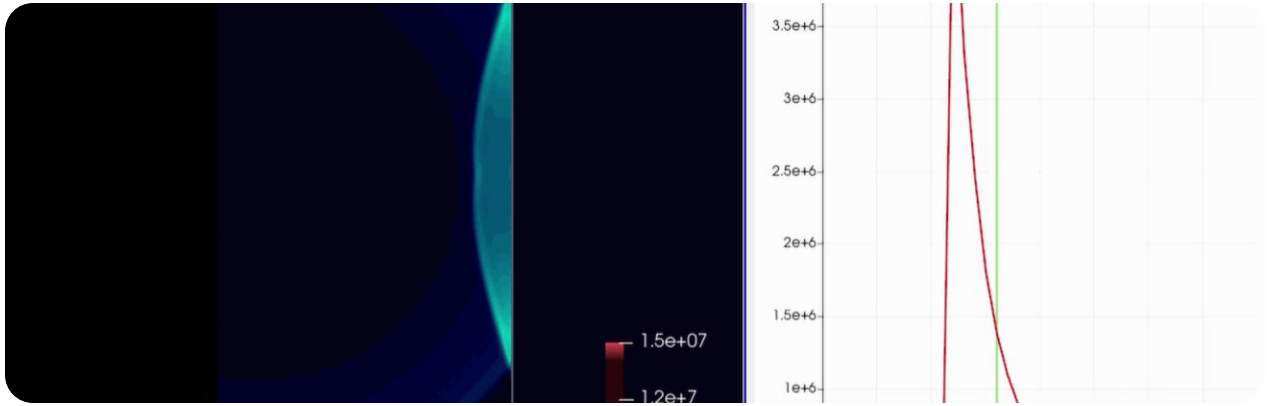
Global AWARDS WINNER 2020 IChemE

IChemE Global Awards 2020
Process Safety Award

WHY EXPLOCFD

Fast answers for complex hazards

exploCFD is a consequence analysis software for modelling industrial explosions, fires, hazardous gas dispersion, BLEVE, BESS hazards and shrapnel/fragment trajectories. It is faster and more accurate than traditional consequence analysis tools.



Rapid model build

Import a site plot-plan PDF, set the scale and resolution, then define walls, buildings and equipment directly from the facility layout. This removes much of the geometry-building burden that slows conventional CFD workflows.

Site-specific consequence insight

Resolve geometry-driven behaviour such as reflections, shielding, channeling and directional loading around walls, openings, pipe racks and equipment. The result is a clearer picture of where hazards travel and what they affect.

Engineering-ready outputs

Evaluate peak overpressure, pressure time histories, impulse, thermal radiation, gas concentration and cloud extent, detection coverage, toxic probit and fragment travel or impact. Export images, animations and reports for design reviews and regulatory communication.

IChemE Global Awards | Process Safety Award 2020, awarded to Advanced Analysis Australia for exploCFD.

WORKFLOW

From plot plan to decision-ready result

exploCFD combines analytical source modelling with numerical propagation through the modelled layout. Computing effort is focused on consequence fields that matter to engineering decisions, while the interface keeps setup practical for project work.

01

Import and define the layout

Bring in a PDF plot plan, set scale and grid resolution, and resolve the walls and obstacles that influence the event.

02

Define the release or explosion

Select the hazard, material and source parameters. Explosion source options include the Confinement Specific Correlation and Baker-Strehlow.

03

Calculate the transient behaviour

Numerically propagate pressure, flow, heat or concentration through the site layout, capturing directional and time-dependent effects.

04

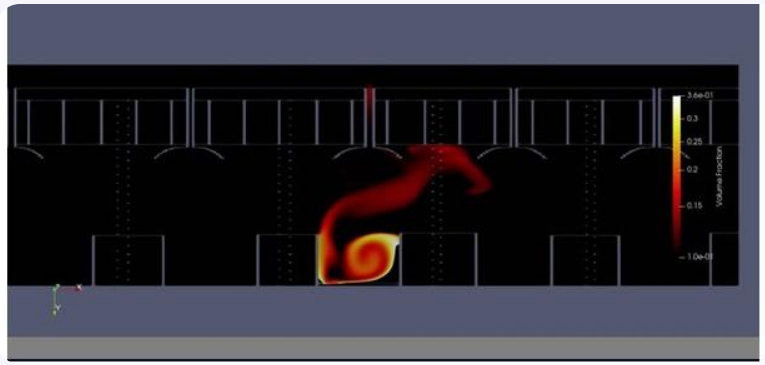
Interpret and communicate

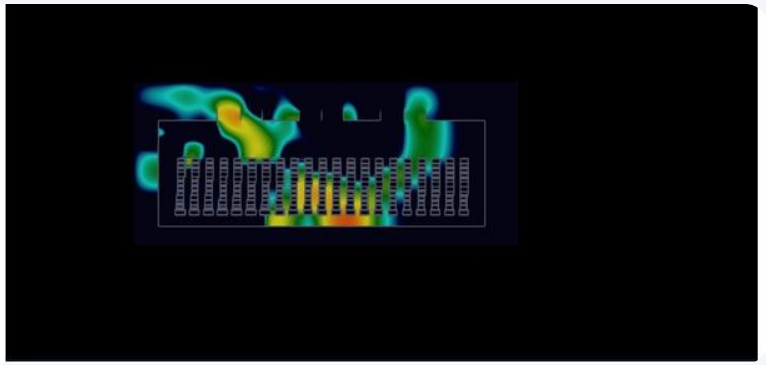
Review contours, time histories and engineering quantities, then export visual and numerical outputs for design, risk and stakeholder review.

LEARN BY DOING | Eight guided tutorials cover setup, plot-plan import, gas and dust explosions, visualisation, impulse, BLEVE and a wall scenario.

CAPABILITIES

One platform. A wide consequence analysis scope.





Dispersion and fire

•Toxic and flammable gas dispersion, including gases, particulates and pollutants
•Evaporating liquid releases including LNG, ammonia and methanol
•Jet and pool fire modelling, thermal radiation and transient heat transfer
•Risk-based fire and gas mapping and detection studies

Explosion and blast

•Gas and dust explosions, including Baker-Strehlow source capability
•BLEVE, vessel rupture, confined-area overpressure, mines and tunnels
•Explosive charges including TNT and ammonium nitrate
•Electrical arc and transformer explosions

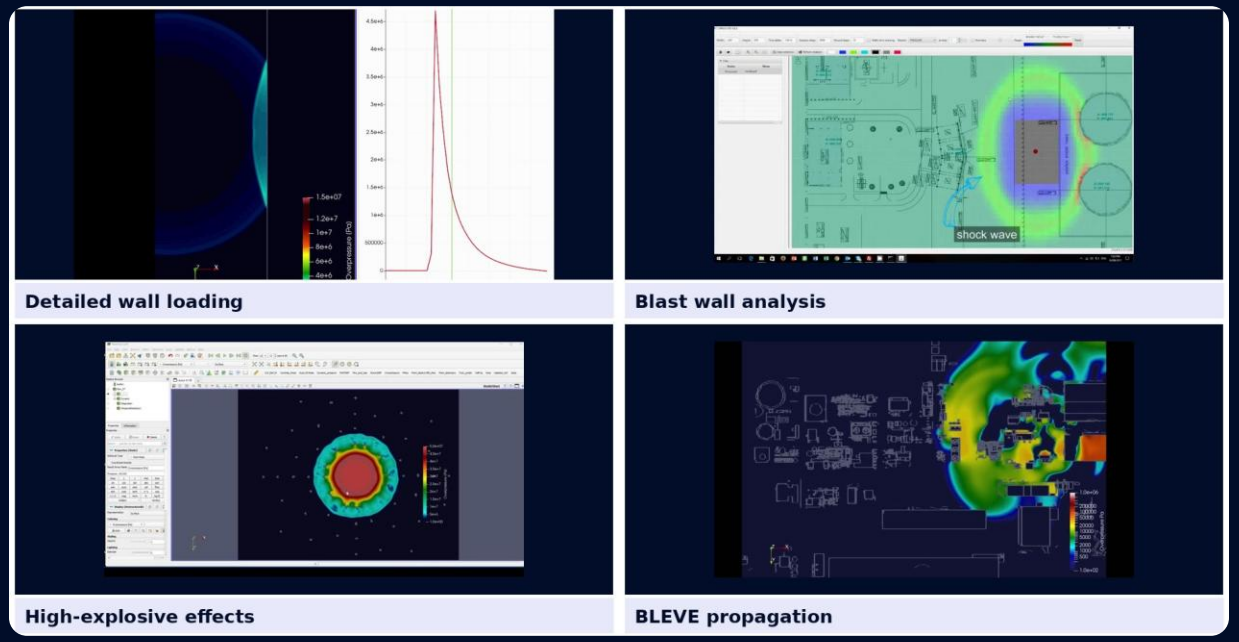
New energy, risk and impact

•Hydrogen leaks and explosions, including validation workflows
•Battery energy storage system vent-gas, fire and explosion hazards
•Explosion risk assessment, toxic probits and accident investigation
•Shrapnel trajectory, travel distance, impact velocity and damage potential

EXPLOSION ANALYSIS

Blast behaviour shaped by the facility

Move beyond symmetric hazard radii when walls, openings, congestion and confinement control the load.



Geometry-aware overpressure

Calculate how pressure waves reflect, diffract and channel through site layouts, producing directional loads and sheltered regions that simple radial contours cannot represent.

Transient loading and impulse

Extract peak pressure, time histories and impulse at selected points or surfaces for screening, blast-wall assessment and transfer into detailed structural or FEA workflows.

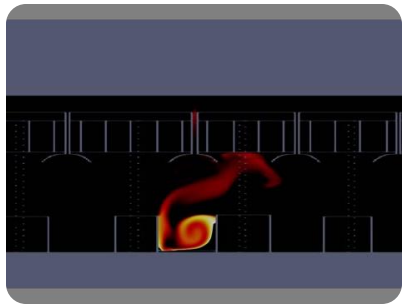
DECISION USE Support building strengthening, equipment relocation, blast-wall design, escalation review and virtual accident investigation with quantified, layout-specific results.

Specialist explosion scenarios

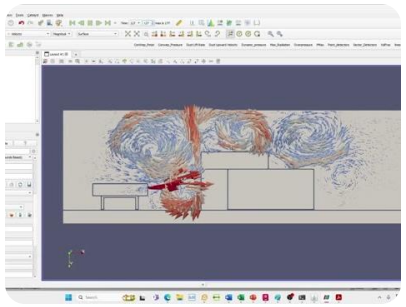
Assess gas and dust explosions, BLEVE, pressure-vessel rupture, confined events, high explosives, ammonium nitrate, mines, tunnels and electrical explosions within one consequence-analysis environment.

DISPERSION AND FIRE

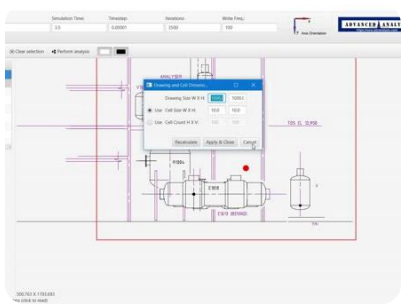
Consequence analysis for evolving energy systems



Evaporation



Ammonia dispersion



Scenario setup

Releases, evaporation and dispersion

Model toxic and flammable releases, wind-driven transport and the evaporation of liquids such as LNG, ammonia and methanol. Visualise concentration fields and cloud extents around real layouts.

Fire and thermal effects

Evaluate fire behaviour, thermal radiation and heat transfer for jet-fire, pool-fire and evolving scenarios, then communicate the spatial and time-dependent results clearly.

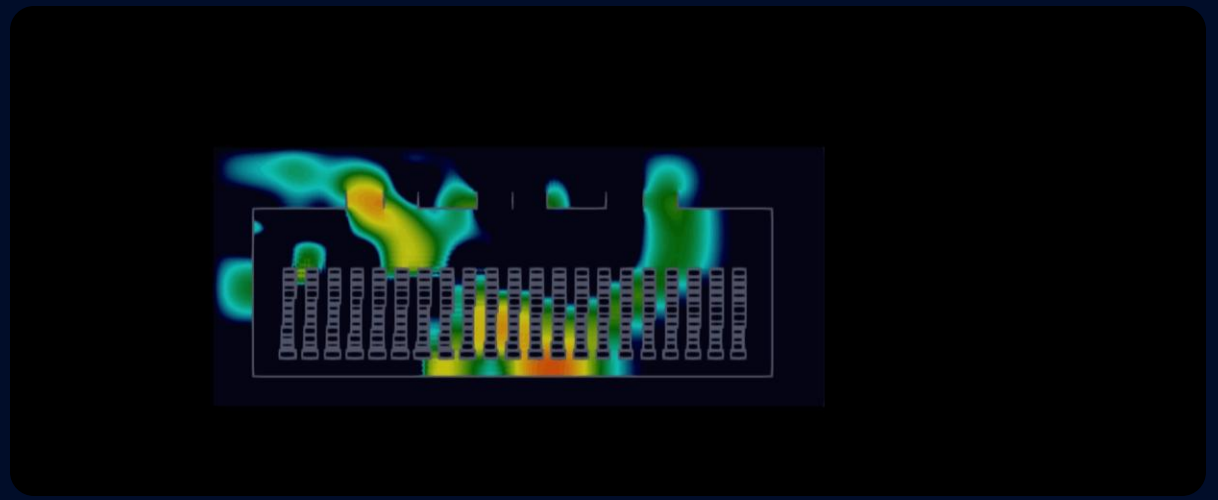
Detection studies

Fire and gas detection studies can combine release scenarios, wind conditions and detector performance to evaluate coverage and support detector placement.

Outputs can communicate concentration fields, cloud extents, thermal radiation and evolving behaviour for design and risk review.

NEW ENERGY

Hydrogen and battery energy storage systems



HYDROGEN

Represent hydrogen-specific dispersion and explosion behaviour using dedicated inputs and validation cases, while retaining geometry-driven shielding and confinement effects.

BATTERY ENERGY STORAGE SYSTEMS

Assess vent-gas dispersion, jet-fire and delayed-ignition or internal-explosion scenarios for BESS rooms and enclosures, including the influence of ventilation and openings.

Geometry remains part of the analysis: shielding, confinement, ventilation and openings influence where hazards travel.

TECHNICAL CREDIBILITY

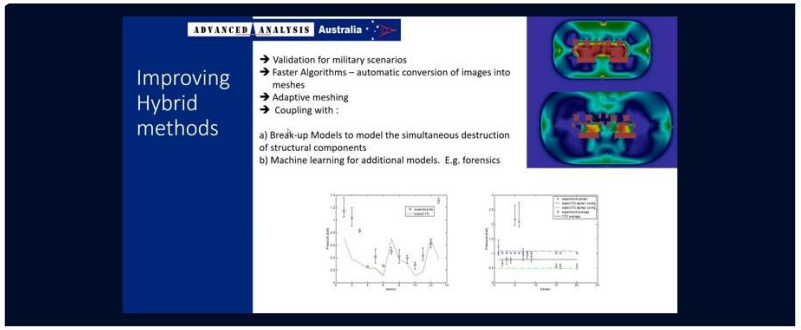
Validated methodology, transparent workflow

>3,500

validation cases

The exploCFD webpage reports more than 3,500 validation cases with realistic geometries.

Users can also run their own validation scenarios.



Hybrid method and validation

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Hybrid analytical-numerical method

The explosion source is defined analytically using validated physical correlations. A numerical finite-volume workflow then propagates the resulting pressure field through the layout, focusing runtime on consequence prediction rather than the full combustion sequence.

Published work covers hydrogen dispersion and explosions, irregular obstacle configurations, high explosives and BLEVE events.

TRAINING AND SUPPORT

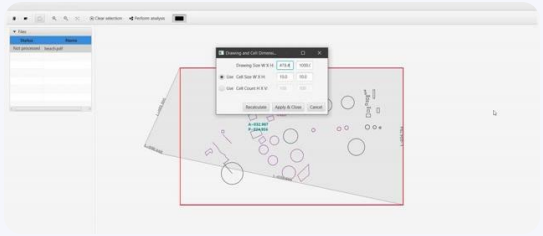
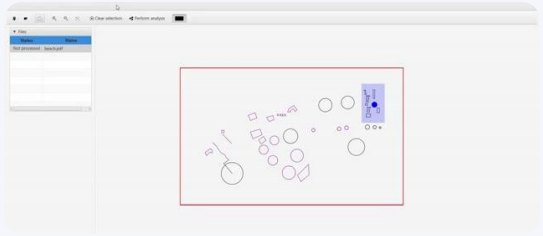
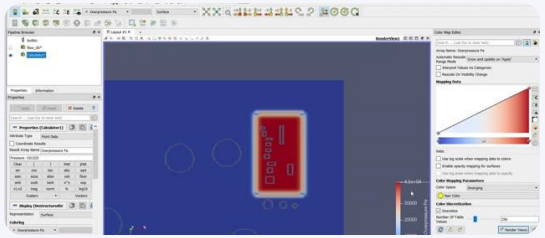
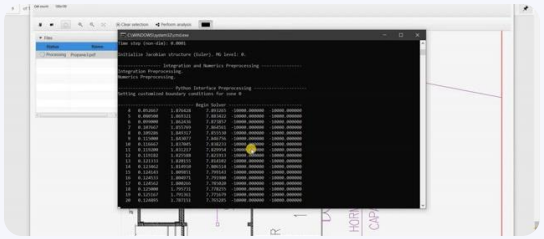
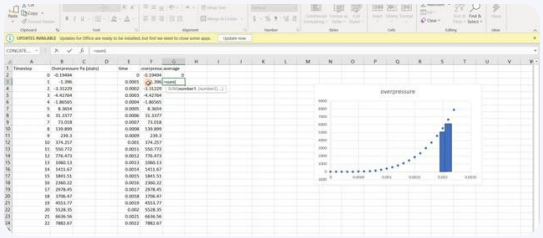
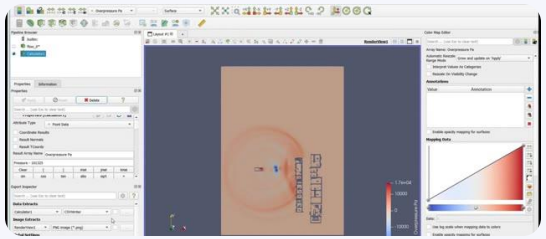
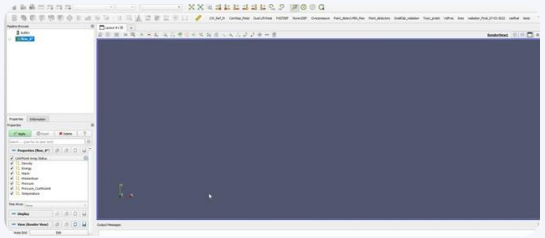
Learn by doing. Supported in practice.

31
embedded videos

8
guided tutorials

23
application demonstrations

The webpage provides 31 embedded videos: eight guided tutorials and 23 application demonstrations. Licence packages include installation guidance, training, access to updated versions and technical support according to the selected plan.

Setup • Plot-plan import • Gas explosion • Dust explosion • Visualisation • Impulse • BLEVE • Wall scenario

EVIDENCE AND RECOGNITION

Selected technical references

See website for a more detailed list

IChemE Global Awards 2020

Process Safety Award, awarded to Advanced Analysis Australia for exploCFD.

01 Roos & Abdel-jawad (2024), Process Safety and Environmental Protection 181, 523-534. DOI 10.1016/j.psep.2023.11.051

02 Roos & Abdel-jawad (2024), Australian Energy Producers Journal 64(1), 258-265. DOI 10.1071/EP23206

03 Abdel-Jawad (2023), MABS26

04 Abdel-Jawad (2021), Process Safety Progress 40(4), 281-288. DOI 10.1002/prs.12247

05 Abdel-Jawad (2021), Process Safety Progress 40(2), e12208. DOI 10.1002/prs.12208

LICENSING

Flexible access. Practical deployment.

exploCFD is installed on the user's PC and is licensed for one user. All plans include the current Version 10 feature set, with training, updates and support as described for the selected licence.

Annual subscription

US$15,000/year

Recurring annual billing. Includes all current features, future updates while active, extensive on-site training and year-round technical support.

Monthly subscription

US$3,000/month

Recurring monthly billing for flexible project access. Includes all current features, future updates while active and web-based training.

Permanent licence

US$30,000 + US$5,000/year maintenance

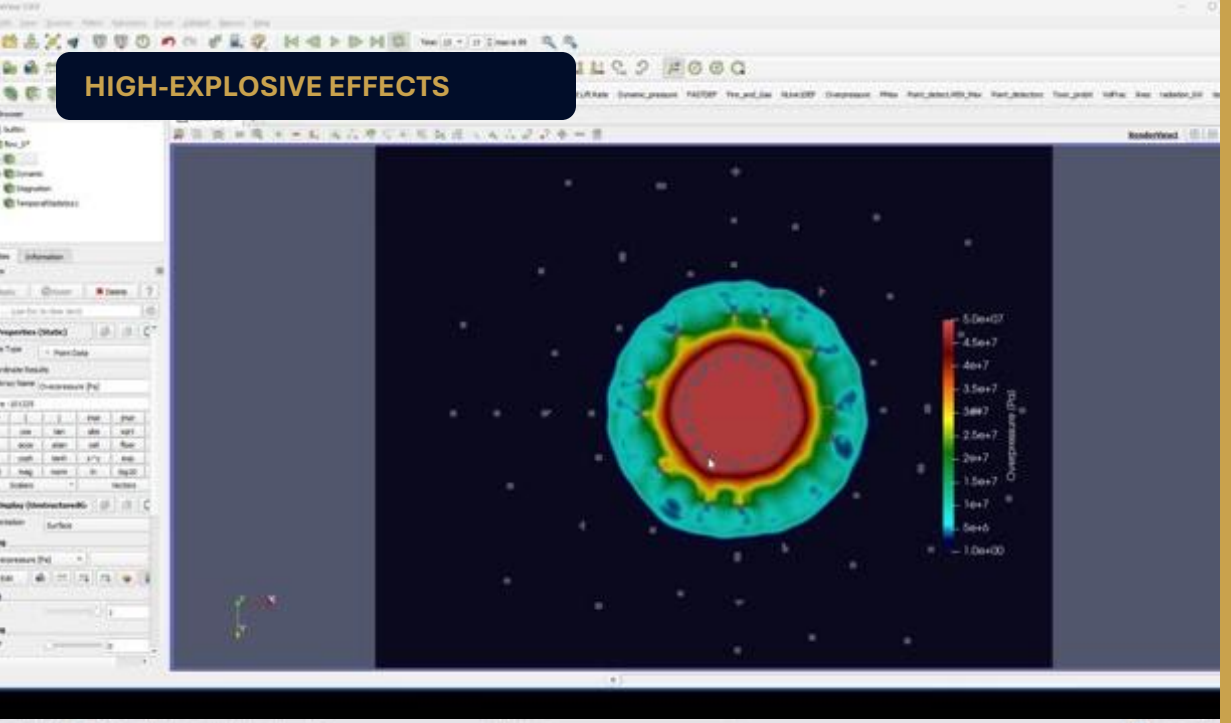
One-time purchase with annual maintenance. Includes all current features, future updates, extensive on-site training and year-round technical support.

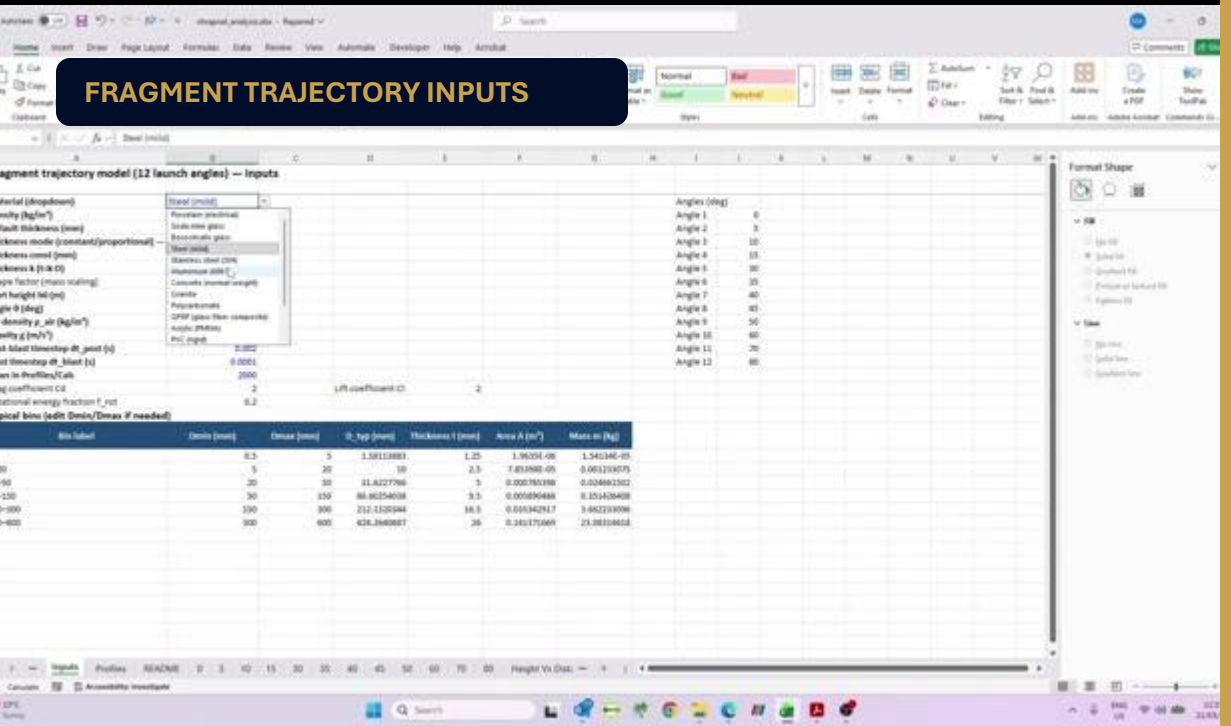
One-week trial

US$990/week

One-time trial intended for small, simple problems. Includes the current feature set and web-based training.

PRICING NOTE Prices shown were displayed on the exploCFD webpage on 19 August 2026. Prices are exclusive of taxes, are subject to change without notice and should be confirmed by quotation before purchase.





NEXT STEP

Talk to Advanced Analysis Australia

about your hazards, workflow or license requirements.

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There is conventional explosion modelling, and then there is exploCFD.