

Explosive Engineering, Precision Energetics

Event Horizon is a wholly UK owned and operated engineering company with a specialisation in the use of energetic materials and systems.

We have extensive experience in a wide range of fields including energetics, aerospace, compositional analysis (incl S3), electronic design, explosive disposal, and special effects.

Our in-house design, prototyping, testing and manufacturing facilities allow us to rapidly deliver capability across the whole life cycle without reliance on third parties.

Event Horizon provides a safe and comprehensive package, delivered by experts. We pride ourselves on carrying out work which other companies find too difficult or awkward.

Company Background

Event Horizon maintains:

- Health and Safety Executive licences to manage storage and manufacture explosives under Explosives Regulations 2014;
- Authority from the Home Secretary to possess and manage Section 5 prohibited weapons;
- Certification for ISO9001:2015 Quality Management System accredited by UKAS;
- Civilian Test, Evaluation, Research & Proof (TERP) Range Authorisation through DSTL;
- All staff are at-least SC security cleared;
- Company membership to Institute of Explosives Engineers;
- Cyber-Essentials Plus IT system (process adherence to ISO27001).

4 Sites:

- Ashcott, Street, Cheddar, and Holman Test Mine



Event Horizon

Company founded in 1998 and now operates from four sites in the South-West of UK

Cheddar

Site operated from 2005

- Manufacturing,
- Test
- Storage
- Ongoing upgrades to facilities and capabilities



Ashcott

Main company site from 2011

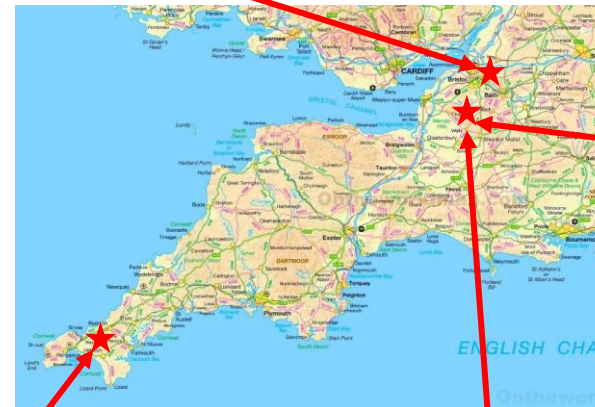
- Design
- Manufacturing
- Research and Test
- Provision of training courses
- 25m indoor range commissioned in 2021
- Innovation Station building in construction



Holman Test Mine

Operated from 2018

- Environmental Test facility
- Underground Test Ranges
- Ongoing upgrades to site and facilities



Street, Nr Glastonbury

Manufacture assembly site

- Brand new (24) construction
- 1500 Sq ft facility
- Fully spec'd to allow rapid assembly of components.



FACILITIES – Ashcott site

General:

- Main offices
- Conference rooms
- Secure meeting room

Licensed areas:

- HSE licensed explosives labs

Auxiliary:

- Design capability
- Electronic prototyping
- Software development
- Manufacturing capability
- Chemical analysis capability
- Laboratories and blast room
- Indoor ballistic test range
- CNC & fabrication workshops

COMMERCIAL IN CONFIDENCE



Event Horizon, Ashcott Facility

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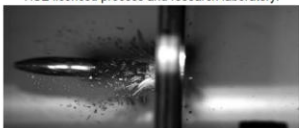


Event Horizon own and maintains the Ashcott Facility, located in Somerset. The site occupies over 5 acres of land for use in research, test and processing of explosives. Facilities include:

- Fully equipped Laboratory with DSC, GC and Fume extraction;
- HSE licenced process and research laboratory;
- Fully alarmed HSE licenced explosive storage;
- Equipment to carry out EMTAP, STANAG and UN Series 1 & 3 testing with ranges available at our sister sites in Somerset and Cornwall;
- 20m Indoor Range with Control Room;
- Electronics Laboratory;
- Conference and Lecture Room Facilities;
- Workshops with CNC equipped machinery;
- Design, development and test facilities for manufacture of energetic components;
- Comprehensive high-speed data acquisition and measurement capability.



HSE licenced process and research laboratory.



High-speed data acquisition.



Design, development and test facilities for manufacture of energetic components.

EVENT HORIZON PYROTECHNICS LTD
The Old Brewery, Stagman Lane, Ashcott,
Somerset. TA7 9QW.
+44 (0) 1458 210 280
info@precisionenergetics.co.uk
www.precisionenergetics.co.uk



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FACILITIES - Cheddar factory site

HSE Licensed areas:

- Control Room
- HSE licensed process buildings
 - Explosive composition manufacture (Melt Cast, Cast Cure, and Pressable)
 - CNC machining of explosives
 - 180 & 10t single axis die press
- Testing grounds
 - 12m drop tower
 - Remote rig operation
- HSE licensed Storage Magazines
- Disposal / Demil capability



COMMERCIAL IN CONFIDENCE



Event Horizon, Cheddar Facility

Document Number	EH17022R006
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Event Horizon owns and maintains the Cheddar Facility, located in Somerset. The site occupies over 10 acres of land for use in research, test and processing of explosives. Facilities include:

- Control room with full welfare facilities;
- Fully alarmed HSE licenced explosive storage;
- Two HSE licenced factory process buildings;
- Two HSE licenced factory process areas;
- 12m drop rig for UN Series 4(b) tests;
- Facilities to complete UN Series 5 & 6 tests;
- Remotely operated Hydraulic presses;
- Thermal Proving Ovens.



Remotely operated precision 180t and 10t presses.

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FACILITIES - Holman Test Mine site

General:

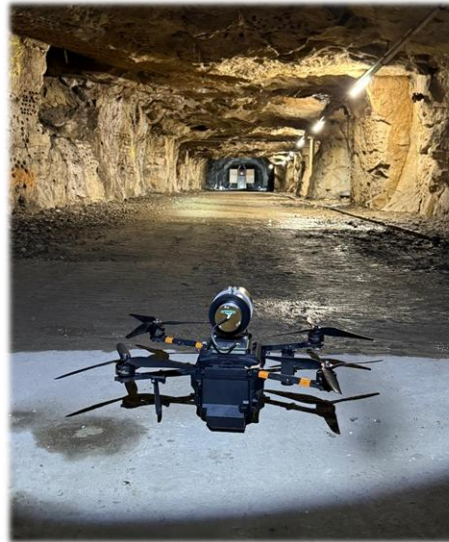
- Main Offices & Conference Rooms

Licensed areas:

- Explosive stores

Auxiliary:

- Environmental test facility
- Comprehensive S3 test facility
- Networked underground test ranges and chambers
- Outdoor test areas
- Manufacturing and assembly workshops



COMMERCIAL IN CONFIDENCE

Event Horizon Holman Test Mine

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Event Horizon own and maintains the Holman Test Mine, located in Cornwall. The site occupies 30 acres with over 2km of underground tunnels for use for research, test and enclosed detonation of munitions. Above ground facilities include:

- S3 trials suite with Environmental Chamber, Vibration Chamber and Firing Range;
- Lecture Rooms and Workshops;
- Open cast quarry;
- Fully alarmed HSE licenced explosive storage.

The geology of the mine is an igneous intrusion principally of granite with some minor mineral veins.

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The mine excavations are predominantly level with two large access drives.

COMMERCIAL IN CONFIDENCE

Laboratory – analytical chemistry and characterisation tools

- Gas Chromatography / Mass Spectrometry – Agilent 8890 GC & 5977 MS.
- Unity XR Thermal Desorption (Markes International).
- Mettler Toledo Differential Scanning Calorimetry (DSC) and TGA 2.
- Oxford Instruments NMR spectrometer.
- Karl Fischer Titration.
- SEM: Zeiss Evo 15 VP. EDS: Oxford Instruments Ultim Max 40Deben Peltier Cold Stage.
- Multiple Digital X-Ray systems from NOVO and VIDISCO
- Bruker Diffractometer | D6 Phaser Benchtop System

Range

- Small-Arms and Gas Gun Ballistic Test.
- Prototypa Ballistic Measuring equipment: LS-06 Light gate, POTSS target, DRS-1 Doppler Radar System. Prototypa STZA 12 M1 Mobile Firing Rest with remote operating accessories.
- UN/EMTAP/STANNAG small scale characterisation tests.
- High-speed rotational rigs (71k rpm) for fuze mechanism actuation.

Field trials

- Fragmentation Trials.
- Blast wave pressure measurement in the near, mid and far field (PCB).
- UN/EMTAP/STANNAG field characterisation tests.
- ScandiFlash X Ray



TEST CAPABILITY - Environmental Test

Environmental test suite capabilities including but not limited to:

- **1m³ Diurnal test chamber** (-65 to +130°C) – capability to couple to Shaker Table for mixed mode.
- **Data Physics Vibration Shaker Table**, capability for profiles within DEF-STAN 00-035 Pt 3, Issue 5, Chap. 2-01.
- **Climatic chambers**, various environmental chambers including smaller diurnal chambers.
- **Salt Mist** chamber, capability for DEF-STAN 00-035 Pt 3, Issue 5, Chap. 4-02, Para. 5.3 Table 2.
- **Bounce Rig**, capability for DEF-STAN 00-035 Pt 3, Issue 5, Chap. 2-11, Test M11.
- **Sand and Dust**, capability for Test CL25, defined by 'DEF-STAN 00-035 Pt 3, Issue 5, Chap. 3-25, Para. 2.3 within 2023.
- **Drop Rigs** with remote release for 1.5, 3, 12m height available.
- **Rapid Decompression** capability for DEF-STAN 00-035 Pt 3, Chap. 3-09.
- **Immersion** (Packaged and Unpackaged)(CL29) – to DEF STAN 00-35 Part 3 Issue 5 Chap 3-29, (CL29).
- Environmental Test Equipment close coupled to **Underground range** for proofing and test purposes.



Environmental Chamber & Shaker Technical Specification

FLOOR STANDING TEMPERATURE CHAMBER WITH VIBRATION INTERFACE - MODEL REFERENCE: FS1452-65V

Dimensions

Internal Size	1200mm Wide, 1100mm High, 1100mm Deep
Capacity	1452 Litres

Temperature Specification

Temperature Range	-65°C to +130°C
Temperature Fluctuation	± 0.5°C at the control sensor when stable.
Temperature Distribution	± 1.0°C
Temperature Measurement	Platinum resistance thermometer PT100 (BS EN 60751:1996)

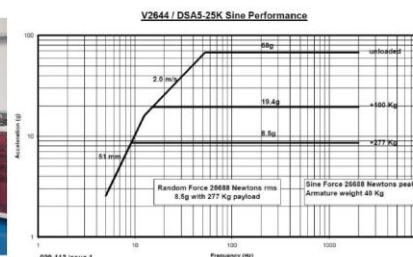
Chamber Performance

Rate of Cooling (Air Temp)	1.5°C to 2°C/min average highest to lowest empty chamber
Rate of Heating (Air Temp)	1.5°C to 2°C/min average lowest to highest empty chamber

VIBRATION SHAKER TABLE

Vibration Shaker Table, Data Physics V2644/DSA5-25K

Unloaded 68g performance can be achieved operating the Shaker table outside of the Environmental Chamber by removing the Head Expander.



TEST CAPABILITY - Explosive Characterisation

In-house capability to undertake a range of undertake testing (current facilities listed – all tests in manual considered):

UN:

- UN Test Series 1 Gap Test (Zero Gap)
- UN Test Series 3 BAM drop hammer, BAM friction and Thermal Stability.
- UN Test Series 4 Thermal Stability Test, 12 Meter Drop Test.
- UN Test Series 5 External Bonfire Test.
- UN Test Series 6 Single Package Test, Stack test, External Fire Test. Unconfined Package Test

EMTAP (current facilities listed – all tests in manual considered):

- 3 - Temperature of Ignition Test,
- 4 - Ease of Ignition (Bickford Fuse) Test,
- 5 - Train Test,
- 6 - Electrostatic Discharge Test
- 7 - Electric Spark Test – Method for sensitive explosives
- 11 - Small Scale Gap Test,
- 36 - Fragment Attack Test,
- 40 - Shaped Charge Attack Test,
- 41 - Tube Test - Fast Heating,
- 42 - Tube Test - Electrically Heated,
- 43 - BAM Impact Test,
- 44 - BAM Friction Test.

STANAG:

- Temp of ignition via Differential Scanning Calorimetry (DSC) – STANAG 4515
- Bullet Attack,
- Fragment Attack,
- Slow Heating.



TEST CAPABILITY - Explosive Characterisation

In-house capability to undertake a range of undertake testing (current facilities listed – all tests in manual considered):

AOP

- Accelerated aging IAW - Explosives, Nitrocellulose-Based Propellants, Stability Test Procedures and Requirements using Stabilizer Depletion - AOP 48
- Density testing - AOP 7 edition 2 UK/102.071.
- Acidity testing – AOP 4023 and AOP-4682. Method 3.1.1
- Vacuum Stability Test - AOP 7
- BAM Impact Test - AOP 7 EMTAP test 43

Others

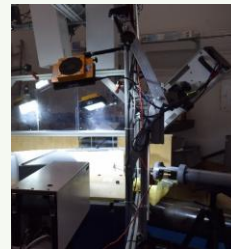
- Thermal stability and long-term elevated temperature ageing trials.
- Compositional analysis of different types of explosives using Nuclear Magnetic Resonance (NMR)
- Shore Hardness Test - A
- Elevated Hot Temperature Crack testing - to Mil -PRF-46676
- Elevated Cold Temperature Crack testing - to Mil -PRF-46676
- Determination of water content - Karl Fischer titration method (using Mettler Toledo C10S Coulometric KF Titrator)
- EN 13763-2 Determination of Thermal Stability Testing Procedure
- EN 13763-6 Lead Wire Low Temperature Testing Procedure
- EN 13763-11 Drop Testing Procedure
- EN 13763-19 Firing Impulse Testing Procedure

TEST CAPABILITY - Ballistic Test

Low Speed

Remotely actuated air systems. Used for various hardbodies, fragments, gelatine and bird strike, tyre impact, and hail impact. Keyed and smooth bore barrels.

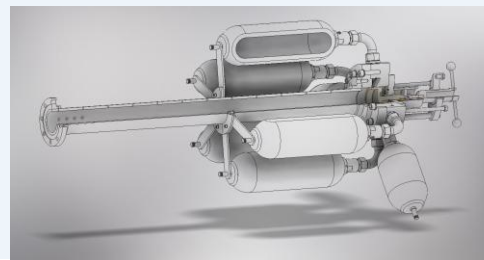
Capability to condition the Unit on Test to elevated and reduced temperatures (-55°C to +1100°C). Current barrel diameters from ¼" to 11" with current demonstrated speeds up-to 350m/s (Nitrogen).



Medium Speed

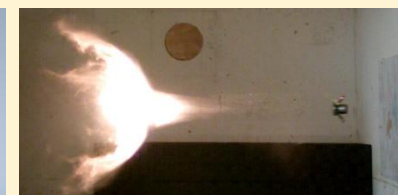
Remotely actuated propellant systems - including service weapons and bespoke sabot rounds up-to speeds to 1450m/s.

Single-stage Helium Gas Guns for medium speed upto 0.5kg projectiles at 600m/s



High Speed - Two-stage reservoir light gas gun

Our two-stage light gas gun is pneumatically driven and incorporates a modular design allowing interchangeable first and second stage barrels for varied configurations. Demonstrated speed of 1400m/s with a bespoke air-strip sabot assembly. Design capability with a hardbody at 30mm bore is 1800m/s, with capacity for hypervelocity speeds at reduced bore sizes.



TEST CAPABILITY – High-speed instrumentation & data acquisition

Data Acquisition

Data acquisition capability, including autonomous operations.

Various National Instruments, Picoscope and Dewesoft SIRIUS High Speed (1MHz) data loggers.

Protypa gun mount, light gates, optical target and doppler radar.

High Speed Cameras

Multiple Phantom T2410 and iX 727 cameras, these cameras can be linked with our data acquisition equipment to perform synchronous data logging.

Sensors

We have an expanding library of sensors for use with our data acquisition systems, including:

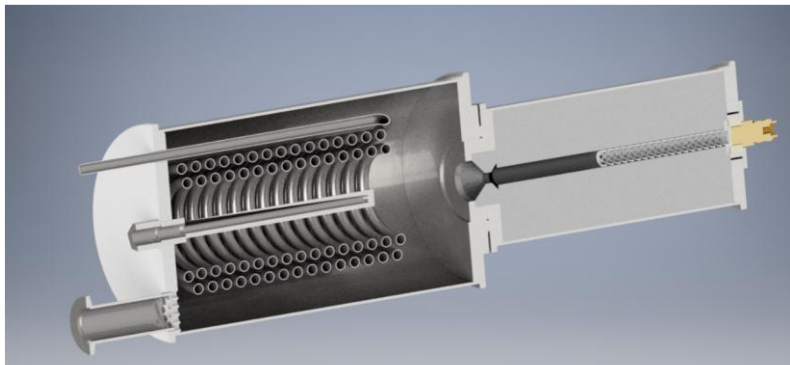
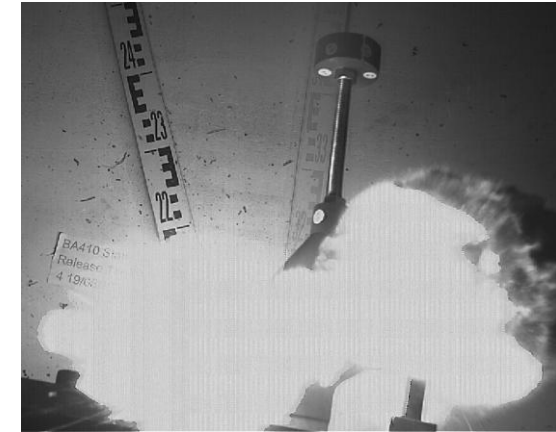
- A range of overpressure meters suitable for measuring blast wave pressure in the near, mid and far field;
- An equally versatile range of hydrophones for use underwater;
- Pressure sensors for measuring vacuum;
- Geophones and accelerometers for measuring vibration;
- Velocity of detonation probes;
- Various accelerometers.



PRODUCTS - Product Design and Development

In-house design, development and manufacture capabilities, i.e.:

- Bespoke linear cutting charges.
- Bespoke conical shaped charges.
- Pneumatic and hydraulic systems.
- Rig fixtures.
- Ballistic and actuator systems.
- Small scale rockets.
- Control Systems (hardware and software).
- Packaging Solutions.



PRODUCTS - Overview

Event Horizon product range - further details available on request:

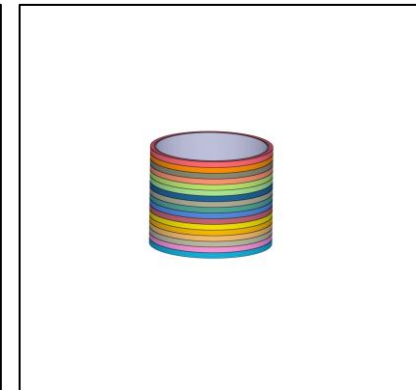
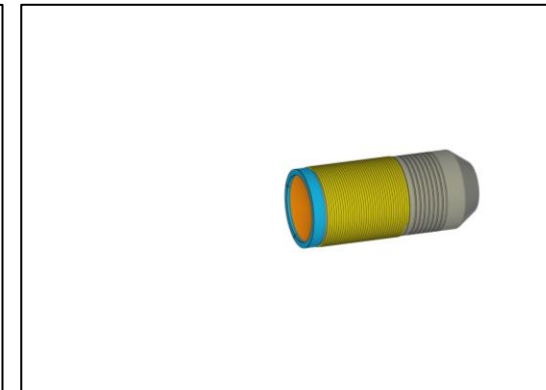
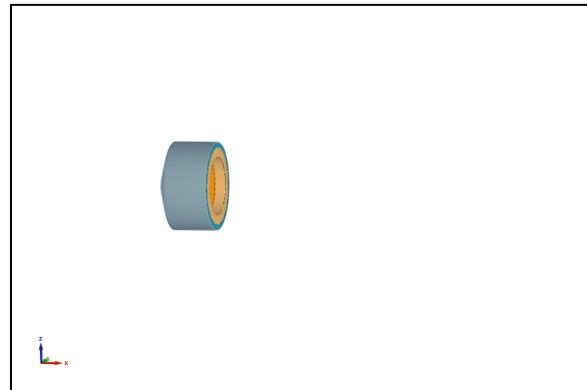
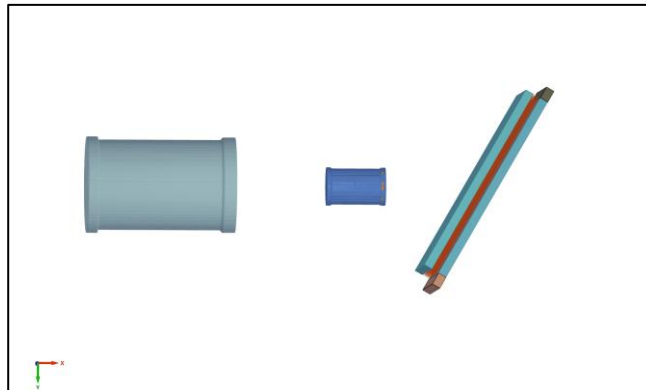
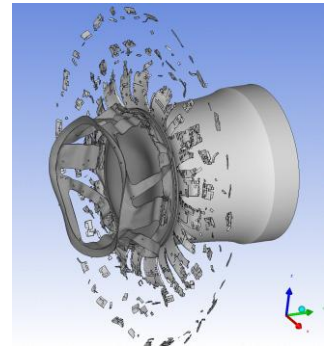
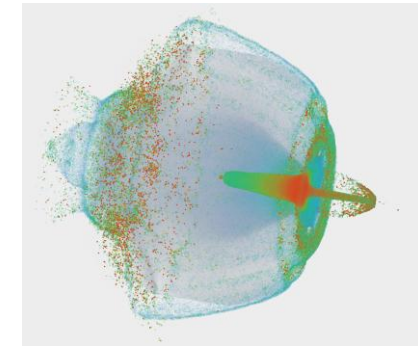
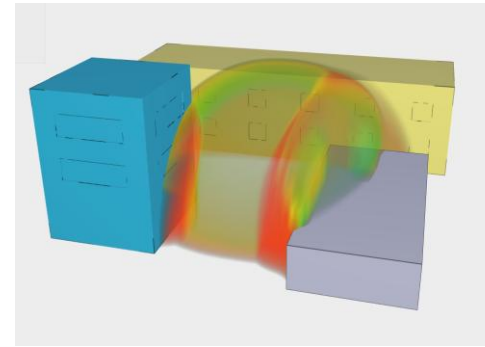
- CE marked 'Machete 30/40/80' Linear Cutting Charge range
- 'Bombardier' 0.44 and 0.50 cal disruptors
- Self-fill EOD tools – 'Paw', 'Fist', 'Barracuda'
- Special Effects Pneumatic Systems
- Small Arms Ammunition Disposal Oven
- Field deployable Chemical incinerator
- Specialist explosive compositions



SIMULATION - Capabilities overview

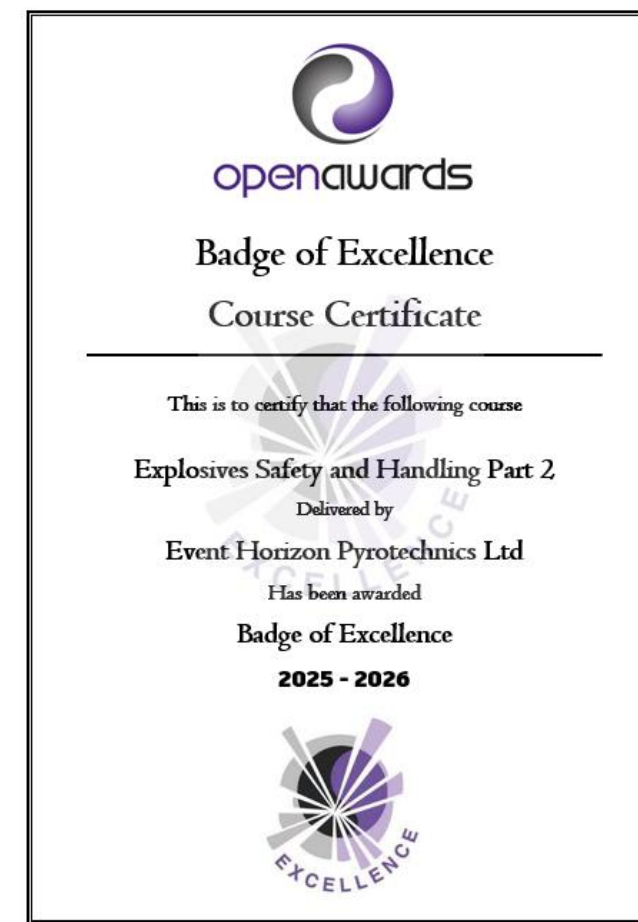
In-house Simulation capabilities, INPETUS and AUTODYN

- Shaped charge jet development and cutting performance;
- Blast analysis;
- Ballistic impact;
- Fragmentation;
- High strain rate component failure modes;
- Gas compression and expansion;
- Computational Fluid Dynamics (CFD);
- Structural Mechanics.



TRAINING

Open Awards accredited training centre.



Company Background – Special Effects

Event Horizon provides a range of stunning special effects for film, TV and public events.

We are fully licensed to use all explosive materials and types, and all our staff are trained in their safe use.

We can create anything from massive explosions on the battlefield, to intimate bullet hits on actors bodies, vehicle pyrotechnics to simulated building demolitions. Whatever your need, we can supply a low cost, high impact solution in total safety.

1408 • 28 Weeks Later • 47 Ronin • Alex rider: Stormbreaker • All You Need is Kill • Batman: The Dark Knight • Batman: The Dark Knight Rises • Body of Lies • Bond: Spectre: Casino Royale • Bond: Quantum of Solace • Bond: Skyfall • Captain America: The first Avenger.....

