

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, 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 approved IT system.

3 Sites:

- Ashcott, Cheddar, and Holman Test Mine



Event Horizon

Company founded in 1998 and operate three sites in the South West of UKs



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
- New 25m indoor range commissioned
- Innovation space in design



Holman Test Mine

Operated from 2018

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



FACILITIES – Ashcott site

General:

- Main Offices
- Conference Rooms
- Secure meeting room

Licensed areas:

- HSE licensed explosives lab
- Explosives and Pyro stores
- Armoury

Auxiliary:

- Design capability
- Electronic prototyping
- Software development
- Manufacturing capability
- Chemical analysis capability
- Laboratories and blast room
- Indoor Ballistic Test Range
- Workshops CNC & fabrication

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Event Horizon, Ashcott Facility

Document Number: EH17022R008
Issue: 1
Date: 18/03/2018
Page: 1



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
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Event Horizon Ashcott Research, and Impact Range Facility

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Issue: 1
Date: 10/02/2021
Page: 1

Event Horizon own and maintains the Ashcott Research and Impact Range Facility, located in Somerset.

- The range is 25m x 9m and has an adjoining networked control and secure meeting room.
- Cat 6 network and integral instrumentation network.
- Event Horizon operate a pair of **iX Cameras i-SPEED 3** monochrome cameras.
- Dewesoft SIRIUS-HS 8xSTG high speed data acquisition modules (Sample at speeds of up to 1 MHz over 8 channels on each module at 16-bit resolution) and a wide range of transducers.

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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
 - Remote processing
 - White Phosphorous removal rig



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Event Horizon, Cheddar Facility

Document Number	EH17022R006
Issue	1
Date	18/03/2018
Page	1



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

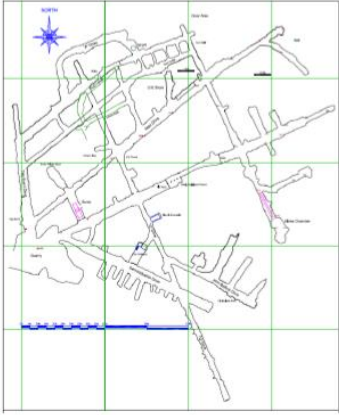

Auxiliary:

- Environmental Test facility
- S3 test facility
- Networked Underground Test Ranges and Chambers
- Outdoor test areas
- Manufacturing and assembly workshops

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**Event Horizon Holman Test Mine**

Document Number	EH17022R007
Issue	2
Date	16/04/2018
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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 mine excavations are predominantly level with two large access drives.

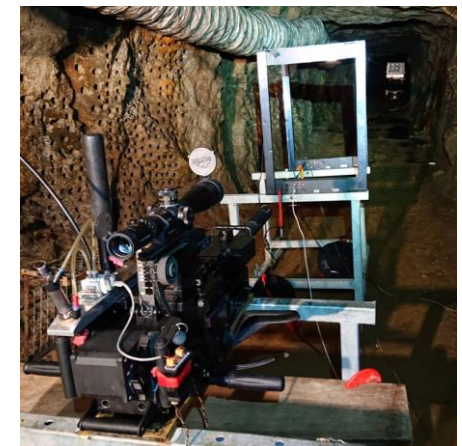


The geology of the mine is an igneous intrusion principally of granite with some minor mineral veins.

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TEST CAPABILITY - Overview

Laboratory

- Gas Chromatography / Mass Spectrometry – Agilent 8890 GC & 5977 MS
- Unity XR Thermal Desorption (Markes International)
- Differential Scanning Calorimetry (DSC) - Mettler Toledo
- Oxford Instruments NMR spectrometer
- Scanning Electron Microscope with Electron Dispersive Spectrometer
- Digital X-Ray
- Karl Fischer Titration



Range

- Provision of Ballistic Test (range of calibres, and velocities)
- UN/EMTAP/STANNAG small scale characterisation tests

Field trials

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



Environmental Test Capability to support Safe, Suitable, for Service (S3) programmes

Capabilities for design and commission of specialist test facilities to suit customer requirements.



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.

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.

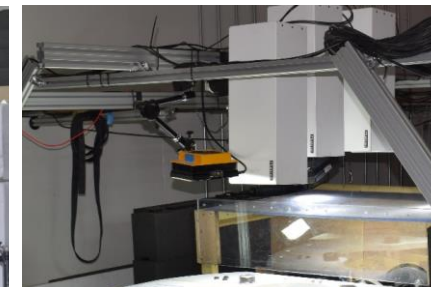
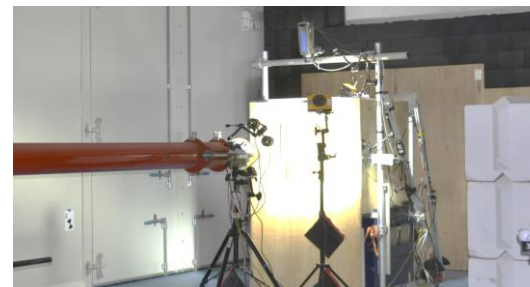


TEST CAPABILITY - Ballistic Test

Low Speed

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

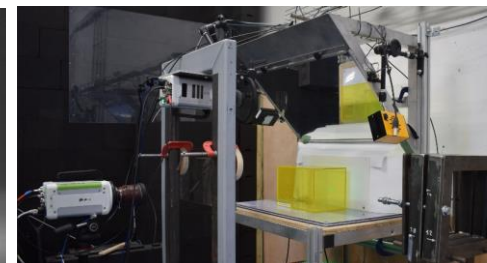
Capability to condition the Unit on Test to elevated and reduced temperatures (-55°C to +1100°C). Current barrel diameters from ¼" to 11" with current demonstrated speeds up-to 350m/s.



Medium Speed

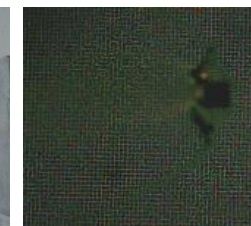
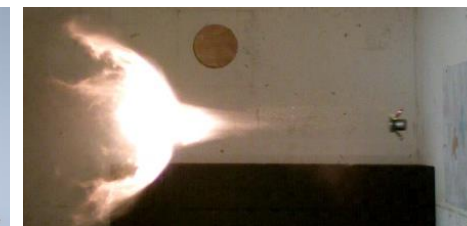
Remotely actuated propellant systems - including service weapons and bespoke sabot rounds up-to speeds to 1450m/s.

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



High Speed - Two-stage resevoir 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 30gram / 20mm diameter projectile 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 - Environmental Test

Environmental test suite capabilities:

- 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.
- 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)

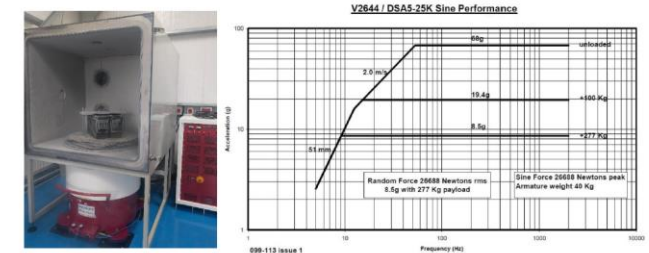
Chamber Performance

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

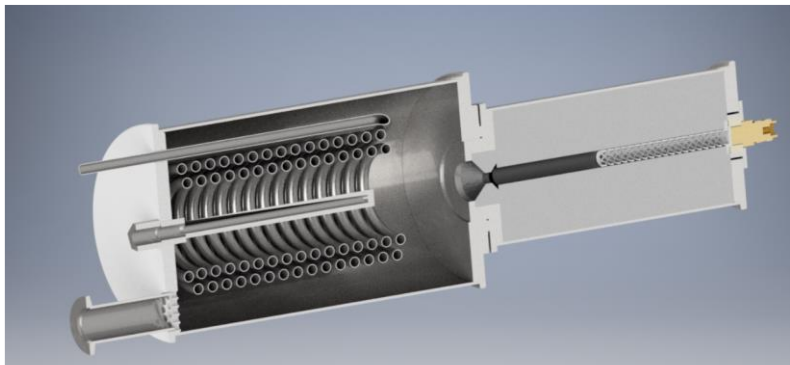
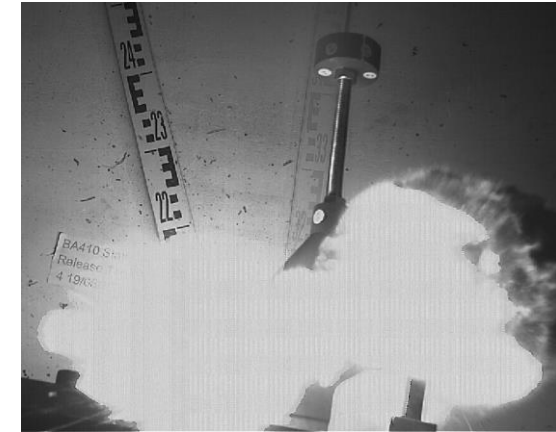
Unloaded 68g performance can be achieved operating the Shaker table outside of the Environmental Chamber by removing the Head Expander.



PRODUCTS - Product Design and Development

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

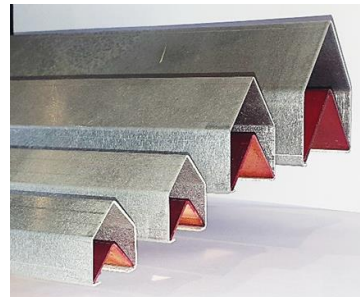
- Bespoke Linear Cutting Charges;
- Bespoke Conical Shaped Charges;
- Pneumatic and hydraulic systems;
- Rig fixtures;
- Ballistic Systems;
- Small scale rockets;
- Control Systems (hardware and software);
- Packaging Solutions.



PRODUCTS - Overview

Event Horizon product range - further details available on request:

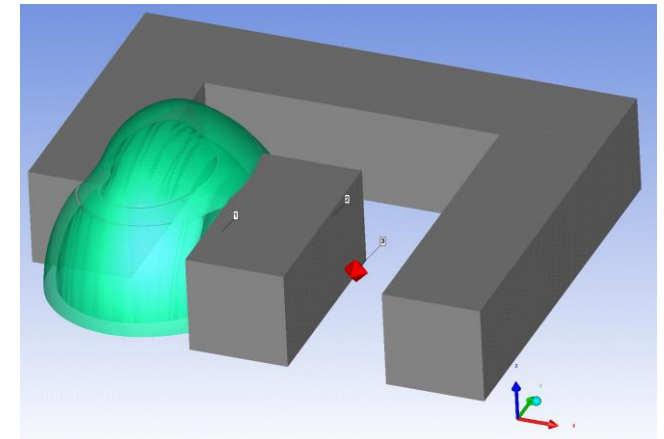
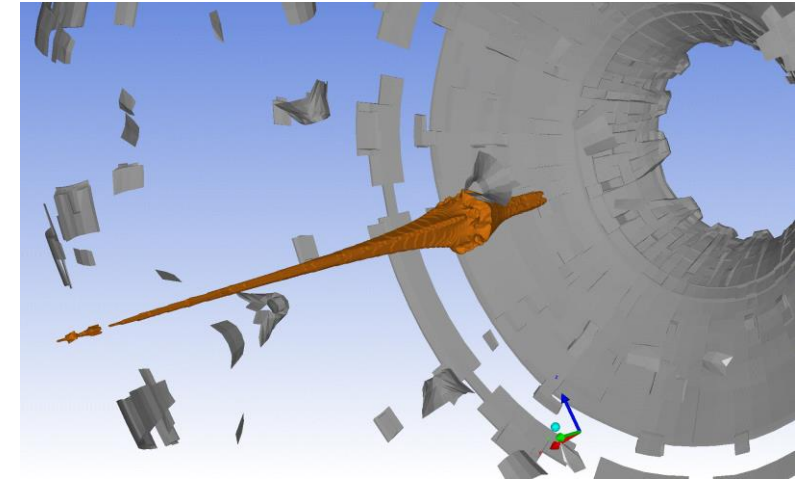
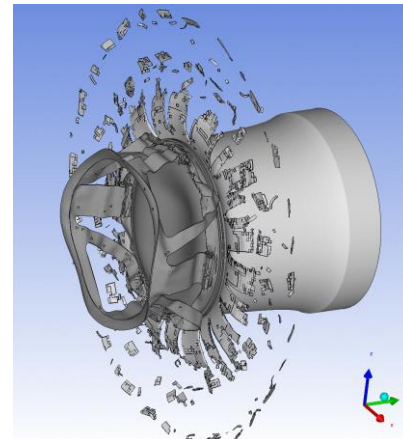
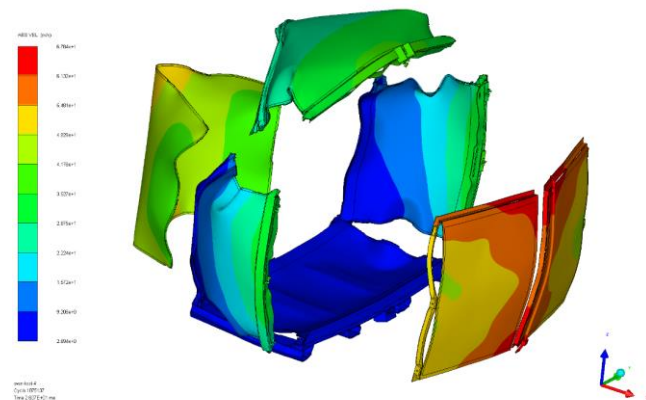
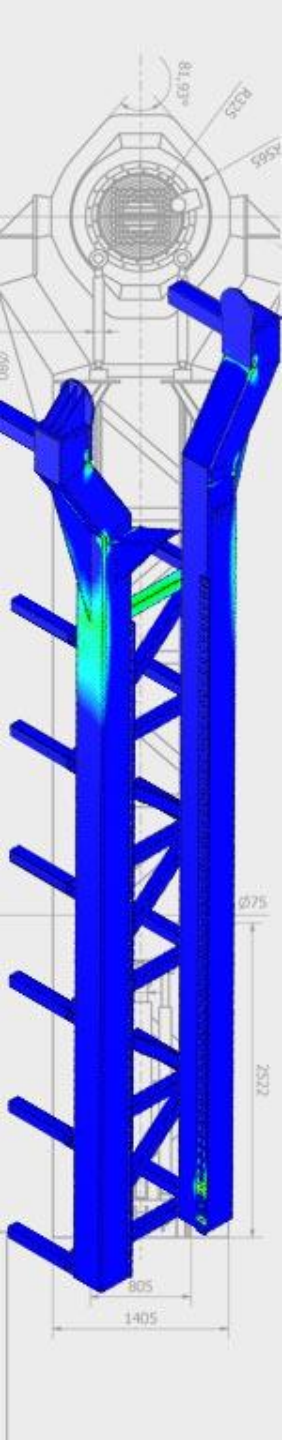
- CE marked 'Machete 30/40/80' Linear Cutting Charge range
- 'Bombardier' 0.44 and 0.50 cal disruptors
- Self-fill EOD tools – 'Paw', 'Fist', 'Barracuda'
- Special Effects Pneumatic Systems
- Small Arms Ammunition Disposal Oven
- Field deployable Chemical incinerator
- Specialist explosive compositions



SIMULATION - Capabilities overview

In-house Simulation capabilities, i.e.:

- 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.



Company Background – Special Effects

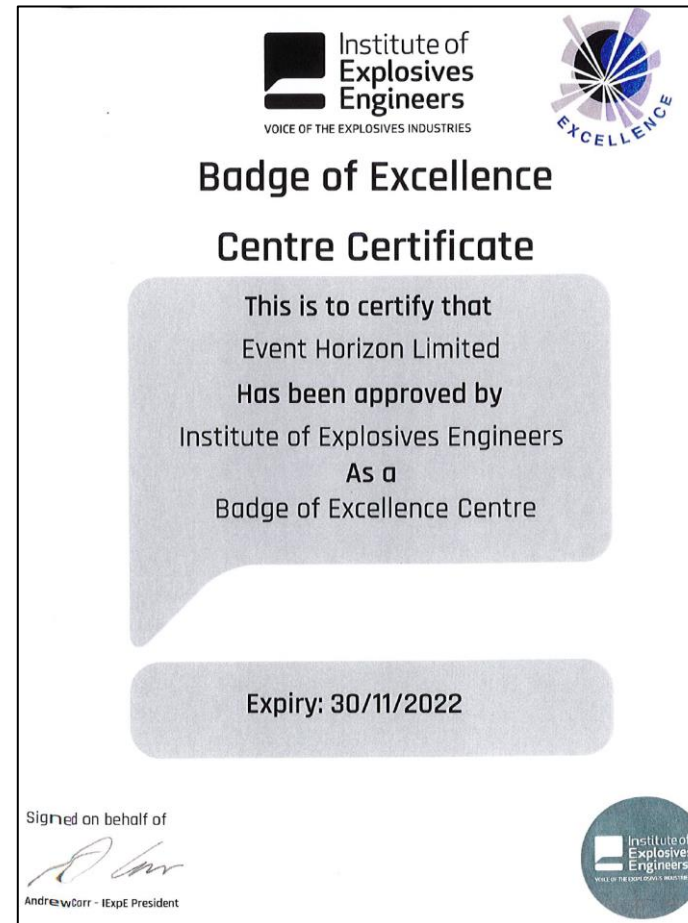
Event Horizon provides a range of stunning special effects for film, TV and public events. We are fully licensed to use all explosive materials and types and all our staff are trained in their safe use. We can create anything from massive explosions on the battlefield, to intimate bullet hits on actors 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.....



TRAINING

Institute of Explosive Engineers accredited training.



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APPENDIX

TEST CAPABILITY - Explosive Characterisation

In-house capability to undertake a range of undertake testing including:

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 - Electric Spark 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:

- Bullet Attack,
- Fragment Attack,
- Slow Heating.

