



Trading as JBS Fabrication Ltd.

**Using the best available
technology to deliver
innovative engineering
solutions globally**

Blast Containment



www.jbsgroupglobal.com

01.

Overview

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BlastTac Solutions

JBS provide BlastTac solutions which utilise next-generation fabrics to create the **worlds safest solutions to blast containment** which are **internationally recognised** and utilised across many industries. Extensive protection capabilities in one blanket which covers explosive and pressure test blasts, ballistic, frag, fire, arc flash and noise reduction.

BlastTac solutions are **flexible, lightweight and have been independently verified** by third parties such as Lloyds Register, UL, DNV GL and ASTM International Test Standards.

All solutions are tested internally and certified by Chesapeake Testing Labs.



Blast Curtains – Explosive and pressure test blast protection in addition to impact and blast protection from both sides of the barrier.

Combined Solutions – We can combine elements in our blast curtains to provide protection from multiple threats in one solution.

Retractable Roof – Patented pressure test bay roof containment system using blast curtains.

Ballistic Protection – A special range of blast protection effective against ballistics, gunfire and explosions.

Portable Pressure Test Bay – A flexible solution allowing clients to test equipment in a safe environment.

Firemax Protection – Fire and heat protection utilizing a truly non-flammable material.

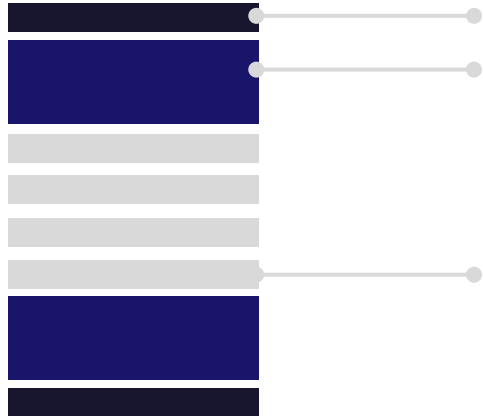
Arc Flash – Light weight blankets providing protection barriers against arc flash.

Noise Reduction – Stand alone solution or combined with other blast solution to provide noise protection.

Bespoke Solutions – JBS can also provide tailored blast containment solutions specific to client requirements across all industries.

BlastTac Material Construction

Consisting of three layers, BlastTac provides unrivalled strength and protection against blast, frag, fire, ballistics and arc flash.



Outer Layer

The world's best Military Grade ballistic nylon, offering extreme durability and waterproof protection.

Middle Layer

Patented 9853 core matrix technology which offers protection against high speed frag and threats. Its monolithic structure can stop threats from both sides.

Inner Layer

ArmourCore patented technology provides superior ballistic protection and when used in conjunction with 9853, provides UL certified level 2 protection.

Value Creation



Saves Lives

Over time BlastTac has saved the lives of 37 NYPD police officers from direct ballistic hits.



Increases Efficiency

One operator saved \$4.8m in 18 months during choke & kill manifold testing on an offshore rig in the UK North Sea.



Asset + Personnel Protection

Provides the best available protection during a variety of industrial testing.

01.

Overview



Oil & Gas



Industrial



Defence



Aerospace



**Power
Generation**



Mining

Applications

JBS BlastTac and FireMax solutions use best available next-generation technology to provide certified protection against blast, frag, fire, arc flash and ballistics, which can be used across multiple industries.

02.

Our

Solutions

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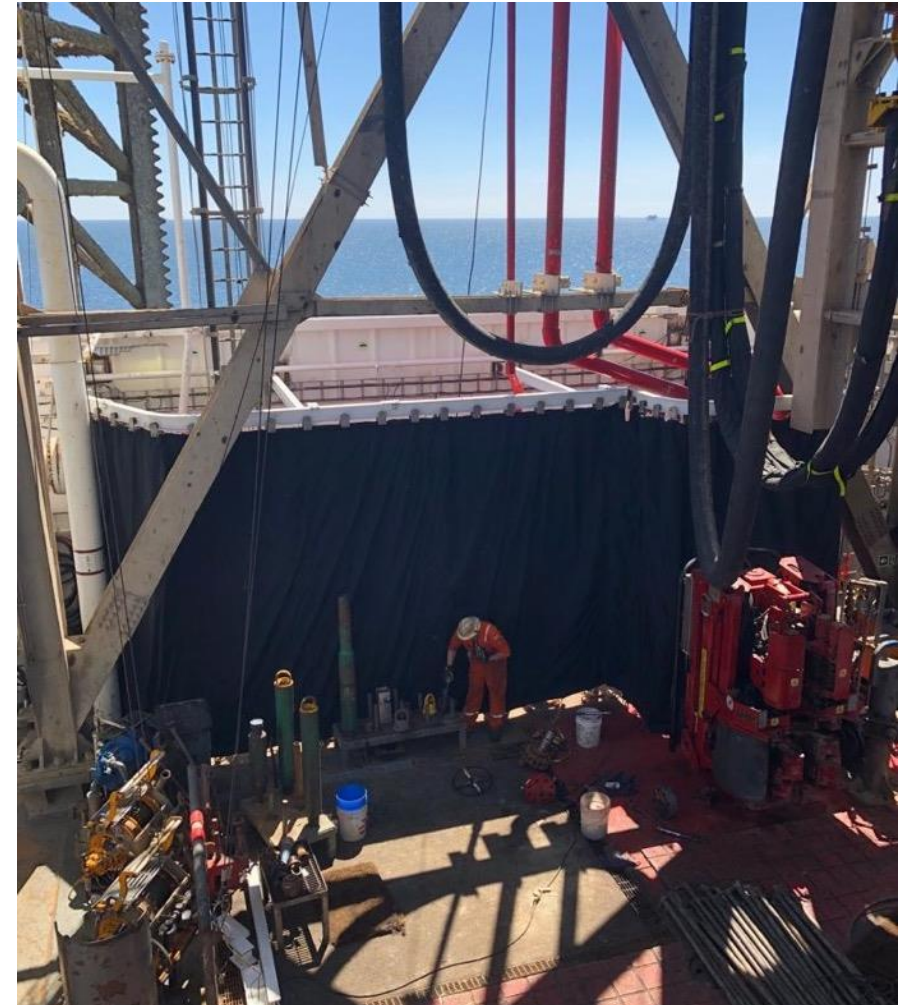
02.

Our Solutions

Blast + Firemax Curtains

- BlastTac curtains are incredibly lightweight and when combined with Firemax are completely non-flammable, providing more effective protection than steel.
- We have solutions **engineered specifically for high-pressure testing** for blast protection on oil and gas rigs.
- BlastTac is the only non-flammable fabric available which has been **approved by the oil & gas industry** for hazardous area installation.
- Versatile solution providing fire and blast protection, acoustic protection and can perform as an arc flash barrier.
- Firemax is a woven fabric which **will not melt, burn or ignite**. It will also repel molten metal, certain chemicals and flammable liquids.

JBS BlastTac advanced fabric solutions are internationally recognized and utilized in many industries providing cost effective blast protection for personnel and equipment.



02.

Our Solutions

Portable Pressure Test Bay (PPTB)

- JBS portable pressure test bay with ballistic glass viewing panel allows clients to test equipment in a flexible and safe environment.
- Due to the flexible design of PPTB, we can **easily incorporate specific dimensions, logistics, handling and testing requirements.**
- PPTB provides a **turnkey pressure test solution**, designed around the equipment to be tested.
- The solution is **easy to assemble**, disassemble and store.
- They can be combined with FireMax solutions to make the enclosure truly **non-flammable**.
- The test bays can accommodate cabling, vents, extractors, cameras and any additional client specifications.

Retractable Roof Systems

- Patented roof containment system for pressure test bays.
- **Provides a certified retrofit roof containment system using BlastTac fabrics.**
- Manual and automated systems are available with options for CCTV, lighting and interlocks.
- Finite Element Analysis (FEA) is used to determine the threat level and to design a system to provide maximum test cell utilization.
- JBS provide **a turnkey solution** from site survey, to design, installation and commissioning.



02.

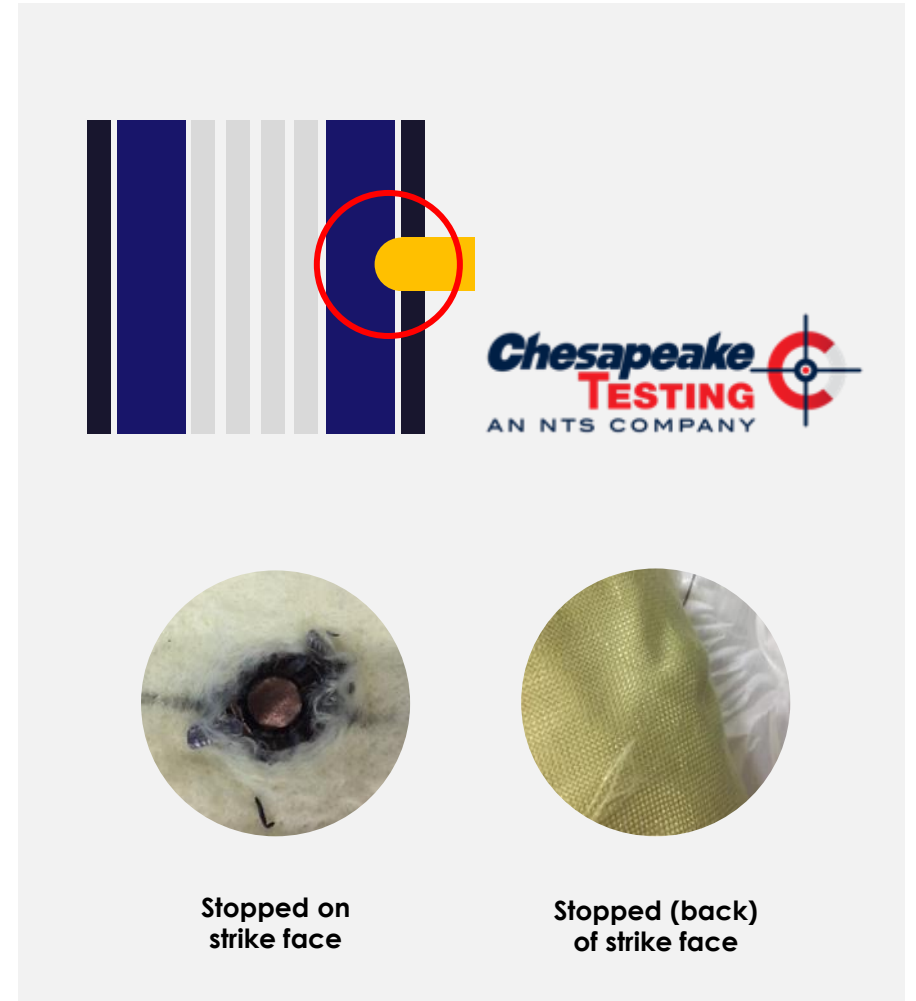
Our Solutions

Ballistic Protection

- JBS ballistic capabilities are breaking records for protection, **exceeding any product on the market today.**
- Can withstand shots in clear, hard armor and flexible solutions.
- Military grade solution designed to **withstand gunfire and explosions.**
- Can also be deployed to protect vehicles, planes, patrol boats, and helicopters.

Ballistic Testing

- JBS ballistic protection underwent **US Military Grade** testing using application Standard MIL-STD-662F.
- The projectile was stopped on BlastTac strike face, **successfully passing third party testing,** at velocity of 1374 ft/sec.
- A secondary test was carried out on a soft armor panel, which was struck 32 times in an area of 1sq. ft, where there was no penetration of the material and the projectile was stopped on strike face.



Stopped on strike face

Stopped (back) of strike face

Bespoke Solutions

- JBS are proud to also provide bespoke blast containment solutions which can be specifically tailored to our clients' requirements.
- **We offer our blast containment solutions globally to a number of sectors including defence, oil & gas, space, military and law enforcement.**



Step One

A site survey is conducted to determine the best solution for individual requirements.



Step Two

JBS provide a 3D design proposal of the bespoke solution to the client.



Step Three

Once the 3D design is approved, JBS will work to manufacture the solution.



Step Four

JBS installation team of accredited engineers will build the solution on-site.

02.

Our Solutions



03.

Case

Studies

03.

Case Studies

Ballistic, Blast and Fire Protection (USA)

The Project

- JBS were contacted by the largest state public power company in the US who operate 16 generating facilities and >1400 miles of transmission lines.
- The client required a bespoke blast curtain which was ballistic resistant, non-ricochet material, blast protection and fire resistant.

The Challenge

- The solution must not interfere with operational or recovery requirements and must provide a physical and visual barrier for any ballistic event.
- The protective materials must not restrict airflow below safe operational levels required for individual transformer units (GSU).
- Must protect staff members from any potential blast when walking on a walkway in front of the transformer.
- The system must be fully automated and cover the main GSU opening dimensions of 76ft wide x 35ft high.

The Solution

- The blast curtain series used for this project combined the characteristics of BlastTac to provide threat protection for ballistic, blast and fire into one blast curtain.
- The system delivered and installed by JBS provided an automated containment solution to cover the entire main transformer opening.
- Automation was achieved using a JBS controlled track runner system which was bolted to the concrete roof structure and allowed full access to the transformer for maintenance.



03.

Case Studies

Explosive Blast Containment (USA)

The Project

- JBS were contacted by a major aerospace company in the US.
- The client required an explosive blast containment solution for use during equipment testing.

The Challenge

- JBS were given the task of providing a protection system to contain potential explosive blast and fragmentation threats during equipment test procedures.
- Blast energy was calculated to be 289,608(J) with a TNT equivalent of 0.06(KG) or 0.132(Lb).

The Solution

- Having completed analysis of the explosive energy characteristics, JBS installed BlastTac technology to provide protection from blast and high speed frag.
- A patented vent system was included to limit the overpressure and mitigate the damage to equipment.
- The solution exceeded client expectations for quality and delivery schedule, helping them to keep on track to complete the first orbital test flight in 2023.
- The system provides explosive blast and frag protection during engine testing for next generation space craft.



03.

Case Studies

Firemax Blast Protection (Australia)

The Project

- JBS were contacted by a global energy company who operate an FLNG.
- They required a bespoke blast curtain to protect personnel from potential direct flame.
- Heat radiation and wind pressure factors were to be considered.

The Challenge

- The blast curtain must be able to withstand direct flame for a period of 12 minutes – heat radiation levels were 55kW/m² on the threat side reducing to 4.73kW/m² on the inside.
- The project required specific test parameters to be confirmed by an international test facility.
- The objective was to reduce the maximum radiated heat from 55kw to 4.73kw for a minimum of 3 minutes.

The Solution

- JBS provided the client with test samples of FireMax curtains.
- During testing the solution was calculated to reduce heat exposure to be less than 1kW/m² behind the curtain.
- The system was delivered and installed by JBS and exceeded the client's expectations for protection against direct flame, heat radiation and its operational efficiency given the environmental constraints.



03.

Case Studies

Arc Flash Protection (UK)

The Project

- JBS were contacted by a large conglomerate, who's innovations have shaped the trajectory of the aerospace industry.
- The client required a JBS portable arc flash chamber to act as a boundary to a destructive testing zone, within which high voltage arc faults will be introduced for testing purposes.

The Challenge

- The enclosure must ensure operator safety from the high voltage, high power (HVHP) equipment contained in the destructive zone.
- It must also protect surrounding test equipment from damage inflicted due to the effects of the arc fault.
- It must be non-flammable, provide operator access, allow for mounting three cameras inside the enclosure, have three apertures in the walls for cables and have the provisions to mount ventilation systems to remove hazardous substances created during the arc fault.

The Solution

- JBS analysed the client's energy characteristics, and produced an enclosure designed to repeatedly withstand effects of arc faults.
- Comprising of JBS BlastTac series, the system exceeded the clients' expectations, assisting them to meet the mandates of increasing the electrification of the aircraft they manufacture.



03.

Case Studies

Retrofit Roof for Pressure Testing Bay (South America)

The Project

- JBS were contacted by a major international O&G company who required assistance to upgrade their internal and external pressure test bays to include a roof protection system.
- The requirement was to ensure the safety of personnel during pressure test operations.

The Challenge

- JBS were given the task of installing a retrofit kit to cover the pressure test bay roof during pressure test operations.
- The roof system had to open and close using an electric motor driven gear mechanism and allow full access from either side of the test bay with uninterrupted access for the overhead crane.
- The client specified various ballistic ratings for the project with the largest threat level deemed to be a 6 ton steel mass, travelling at 75 mph with an impact diameter of 26 inches.

The Solution

- JBS completed a site survey and then designed the **automated and patented pressure test roof containment system** for installation.
- Having analysed the ballistic rating for the roof protection system, JBS recommended a BlastTac solution highly efficient in all types of blast containment designed to provide the operator complete protection delivered and installed on a turnkey basis.



03.

Case Studies

Waste Recycling Facilities (MRF) (UK)

The Project

- MRF sites across the UK segregate waste from local authorities and/or commercial/industrial customers.
- The MRF site uses a combination of advanced mechanical sorting techniques and manual quality control to separate materials for processing and re-purposing.

The Challenge

- Despite many warnings, waste such as gas cannisters can find their way into wheelie bins or containers at household waste level.
- These are deemed high risk and often explode when crushed during the waste recycling process.

The Solution

- To reduce the associated risks and to protect personnel, JBS worked with the client to design, manufacture and install a blast containment curtain system.
- The blast curtain will absorb the blast and retain any frag thereby protecting staff from these high-risk events.



03.

Case Studies

Off-shore Blast Curtains (West Africa)

The Project

- JBS were contacted by a large international O&G company to design a solution which would enable personnel to continue working on drilling operations during pressure testing of rig manifolds.

The Challenge

- High pressure rig manifolds need to be pressure tested every 14 to 21 days to verify the well control barrier is in order.
- When conducting these operations, the rig floor is required to be cleared of personnel causing operational delays until testing is complete.

The Solution

- JBS installed certified non-flammable blast and frag safety curtains to protect personnel from any potential manifold failure.
- The crew were able to continue working during pressure testing therefore improving performance and reducing crew exposure.
- The solution helped to identify a potential **cost saving of over \$4.8M** in just 18 months.
- Lloyds Register approval and certification of the complete blast containment system has been completed – refer Exxon Mobil & Aker Solutions Canada, Hebron and Hibernia offshore production platforms.



03.

Case Studies

Testing Validation (Texas, USA)

The Project

- A global group of energy and petrochemical companies validated test data by performing an independent test at the Southwest Research Institute in Texas, USA.

The Scope

- A total of three blast tests were conducted to simulate conditions that may result from a pressure vessel rupture.
- During the test, pressure, strain and high-speed video data were collected for post-test analysis.
- Images were taken of the pre and post test condition of the fabric panels.

The Results

- The tests showed that the fabric panels were able to reduce blast overpressure in the vicinity directly behind the panel compared with equal distant pressure sensors located in the free-field.
- The panels also showed the ability to capture fragments during the tests.
- 12lbs of C4 were used at approximately 13ft from the blast curtain, which created a 40psi blast wave.
- The blast curtain reduced the 40psi blast wave to 3.0psi approximately 3ft behind the curtain.



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Our
Clients

www.jbsgroupglobal.com





UK : +44 (0) 1779 479742
US : +1 312 371 9999
www.jbsgroupglobal.com

SAP Ariba  FPAL  SEQual

 CYBER ESSENTIALS

 Achilles

