

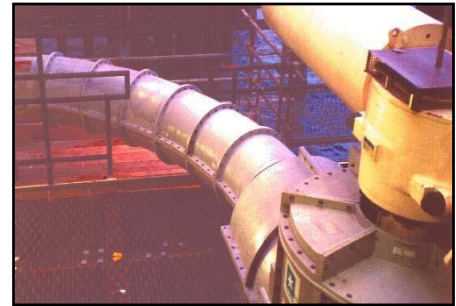
1.1. Introduction

Darco Solutions provide a range of specialist services and technology to all industry sectors on a worldwide basis. By tailoring solutions and services to suit the project and location specific requirements, Darco are able to offer the best available technology with the maximum level of local input and resources.

From our experience in different regions around the world and our product knowledge we are able to identify and deliver the most cost effective solution for the ultimate client.

1.2. Darco Solutions' Experience

Darco Solutions are in the unique position of being experienced in all the key areas of fire protection throughout its life cycle performance. As an EPIC contractor, Darco Solutions are involved in many projects from the earliest design & engineering stage through specification definition, material selection, procurement and installation. Our engineers have also experience in the management of maintenance contracts, allowing the evaluation of materials performance in the field, facilitating a closed loop design process.



Darco Solutions' knowledge of the choice, strengths & weaknesses of the whole range of available systems is second to none. We are regularly involved in the design, manufacture, & testing of new systems on behalf of the raw material manufacturers & clients. Darco Solutions have unrivalled experience on how the systems will perform throughout their life from our experience on long term/ever green maintenance contracts, where we provided fire protection expertise

and services for over 50 installations in the North Sea as well as key onshore petrochemical sites. Our experience is not limited to the UK continental shelf, with projects taking place in such diverse regions & climates as Canada, South America, and the Middle East and throughout Asia.

1.3. Inspection & Verification

A principal activity that Darco Solutions have experience in is the requirement to inspect and verify the suitability of fire protection systems to meet potential hazards throughout the life of the Installation. This involves Darco Solutions studying the Installation or facilities safety case, QRA, and carrying out detailed surveys on the protection systems installed. Darco Solutions is then able to identify any potential deterioration in the systems performance and then put in place a programme of planned maintenance or replacement as necessary.

This activity also provides a grounding for the design of new fire protection systems as it allows us to select and design fire protection systems that are proven to have a longer life and improved integrity.

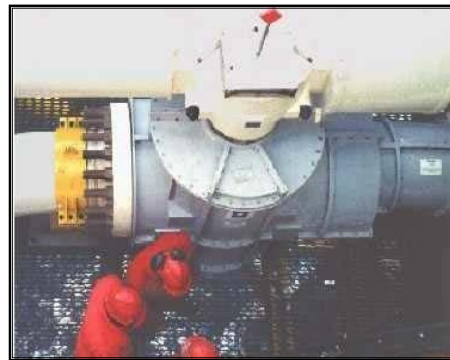
1.4. Design Expertise

Darcos' engineers have a long, proven record in the design of fire and blast protection systems. We are able to carry out detailed surveys and have made extensive investment in CAD/CAM techniques. Utilising some of the latest CAD software Darco Solutions has the capability to carry out 3D solid modelling of process and protection systems. Using industry standard electronic information exchange formats we are able to integrate with clients and suppliers CAD systems to speed the design of protection systems.

This ability allows us to design systems that minimise potential clashes and fouls, and overcome such problems at the design stage – speeding up the installation and reducing manufacturing lead times.

1.5. Solution Engineering

One of Darco Solutions' key strengths is in the area of solution engineering, where known problems are taken & bespoke fire & blast protection systems designed incorporating key operational/in service requirements within radical new concepts in fire protection. This often results in Darco Solutions being involved in the fire testing & type approval of new systems. This experience, on how different materials behave under different configuration & testing conditions, allows Darco Solutions to assess the true suitability of a material for a particular application.



1.6. Technical management

In addition we also manage or assist in the project verification & approval of the fire protection systems & installation design.

This involvement with testing and certification bodies allows Darco Solutions to design systems that are proven to meet international standards and ensures that the integrity of the asset is assured to recognised legislation and standards.

The advantage of this approach is that Darco Solutions delivers the following:

- Optimum PFP design
 - Faster design process
 - Single source of solutions
 - Instant access to the widest range of technical expertise
 - Lowest life cycle cost with a true CAPEX/OPEX balance
- Consistent managed approach throughout the project



PROCON 2000

The Flexible Solution for Fire Protection of Critical Equipment

The PROCON 2000 system is recognised as being a true 2nd generation passive fire protection jacket system, offering real advantages over other systems in terms of robustness, reduced bulk, long term integrity and significantly greater ease and speed of installation, removal and refitting.

The patented outer fabric has exceptional tensile strength and puncture resistance, it has proven resistant to water, chemicals and UV light.



Felted insulation material and Tufting buttons ensuring the insulation remains in place throughout the design life of the jacket.



*The
Solution
Provider*



The "Procon 2000" fire protection jacket system provides proven strength against the high-temperatures and erosive forces encountered in a Hydrocarbon Jet Fire.



The single layer construction with, Velcro flaps at joints, greatly speeds installation and allows the majority of jackets to be fitted by one operative

Tested to Meet the Latest Jet Fire and Blast Standards

Blast over pressure testing was carried out at the Building Research Establishment's fire and blast testing facility housed within the massive airship hangers at Cardington, England.



All seams are sewn with high-strength kevlar and stainless steel thread and are sealed against water ingress.



A series of explosions, witnessed by Lloyd's, were carried out on a single test specimen jacket. This resulted in overpressures of 0.8, 1.25 & 1.46 bar, demonstrating the jacket's ability to withstand repeated exposure to blast and drag forces.

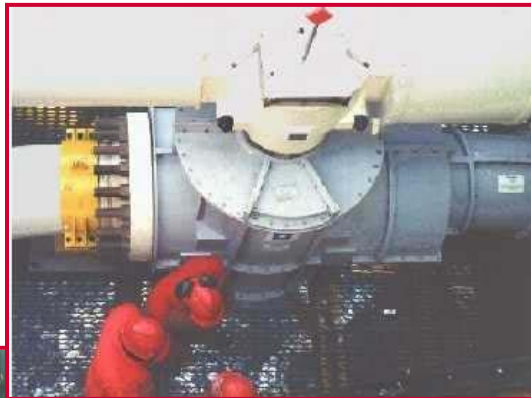


Designed to meet environmental conditions ranging from the extreme cold and wet of the UK and Norwegian sectors of the North Sea to the extreme heat and sunlight of Central America and the Middle East.



Removable Epoxy Intumescent Fire Protection System

**Pre-cast Epoxy
Fire Protection
System**



**Jet Fire and
Blast Tested
Protection**



*The
Solution
Provider*



Quick access, achieved with the minimum of operator skill & ensuring integrity upon completion, allows for routine periodic inspections of the valves, actuators, welds or wall thickness.



Cast epoxy systems have been tested in both the large scale jet fires at Spadeadem and to the new OTI 634 95 standard, is proven to resist the erosive forces and high - temperatures encountered in a Hydrocarbon Jet Fire



The cast epoxy systems are manufactured using a moulding technique base on information taken from CAD models or site survey. The pre-formed components are then simply bolted in place on the risers, valves or



Industrial Insulation & Safety Materials

actuators, sealing all joints against water ingress

Passive Fire Protection
Design and Supply Services

Tested to Meet the Latest Fire and Blast Standards

Blast over pressure testing was carried out at the Building Research Establishment's fire and blast testing facility housed within the massive airship hangers at Cardington, England.



A series of explosions, witnessed by Lloyds, were carried out on a single set of test specimens mounted with the test rig openings.



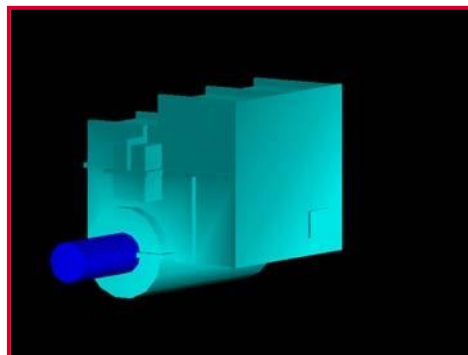
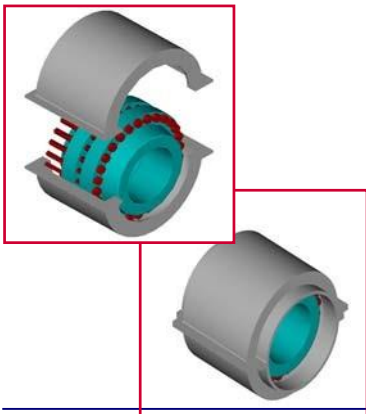
These explosions

produced overpressures of 0.8, 1.25 & 1.46 bar, demonstrating the system's ability to withstand repeated exposure to blast and drag forces.



Using the latest 3D solid modeling software allow us to fully design and visualize the installation ensuring accuracy and ease of fitting.

Utilising the proven technology of Epoxy resins the system is designed and proven to meet the harshest environmental conditions.



Pre-cast insulation to sub-sea pipework - ready for installation by divers in



Epoxy Insulation Systems - for Process & Under PFP Insulation

The development of Epoxy Insulation resins opened up a whole new range of opportunities in epoxy fire protection for use on hot surfaces that previously exceeded the capabilities of the intumescent materials. The first priority was to ensure that the composite system performed in the most arduous fire hazards.



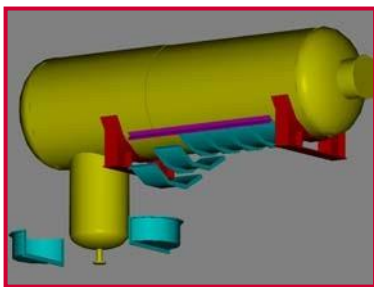
Preparing the
Insulant and
Intumescent
test piece.



Jet Fire Test
to the latest
OTI 95 634
standard



Once the material performance had been proven it was possible to start using the system to provide fire protection to hot operating process vessels, risers and ESD valves.



CAD design for a
removable PFP system
on a process vessel



Castings manufactured
onshore using the
latest CAD/CAM
technology



Three years on & the
installed PFP system is
performing well offshore