

## Daken Fire Jacket (DFJ) - Flexible Passive Fire Protection Enclosure System

Daken's flexible jacket Passive Fire Protection System is a high-performance solution composed of different layers of alkaline earth silicate (AES) fibre blanket. It has been developed as both an enclosure system for valves, actuators, pipelines, cable trays, and pressure vessels and as a tubular design for pipework and structural steelwork. The system is designed to meet the most demanding requirements to protect equipment against hydrocarbon pool fires and hydrocarbon jet fires. In all cases a bespoke design is considered, offering the optimum design to ensure a compact, easy to install, user friendly, and fully certified system is supplied.



The DAKEN Fire Jacket (DFJ) holds a Lloyd's Type Approval Certificate and is in compliance with the following standards:.

**UL 1709:2017** UL Standard for Safety Rapid Rise Fire Tests of Protection Materials for Structural Steel

**ISO 20088-3:2018** Determination of the Resistance to Cryogenic Spillage of Insulation Materials, Part 3: Jet Release

**ISO 22899-1:2021** Determination of the Resistance of Jet Fires of Passive Fire Protection Materials, Part 1: General requirements

**Engineering:** Each bespoke design is specifically engineered to fit closely around the protected item using 3D modelling software to ensure a good fit-up and allowing for clash detection to avoid any issues during installation. A 2D drawing detailing the PFP design and the thermal requirements are generated and supplied per item type along with an installation procedure.

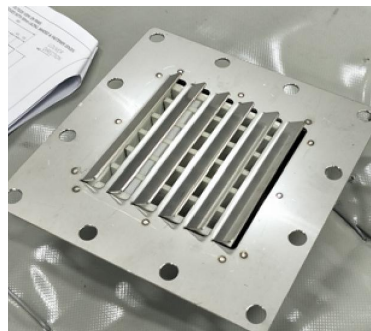
Daken Fire Jacket (**DFJ**) can be designed from GA Drawings, Customer Models, Project Models, or alternatively a site survey, if required. Our skilled engineers can be deployed to complete up-front site surveys and are familiar with onshore and offshore facilities and are fully conversant with Permit to Work and HSE policies.

**Features:** Our standard product features are as follows -

- Professional certified design & manufacture procedure as per test-work.
- The lightest, thinnest, specialized design, and certified fire jacket in the industry.
- Achieving a very low temperature rise for pool fire and jet fire test scenarios.
- Lloyd's tested and approved Access Doors, secured by quick release toggle fastener, providing access to the protected equipment for visual inspection, operation of controls, or maintenance requirements.
- Lloyd's tested and approved Ventilation Grill, Drainage and Cable or Pipe Penetration features.
- Lloyd's tested and approved belt buckle securement, allowing easy installation and removable.
- 316L Stainless Steel materials for Supporting Frame, Ventilation Grille and Nameplate, as standard.
- Blast test performance up to 1.85bar (1bar=100KPa).



Quick Access Door



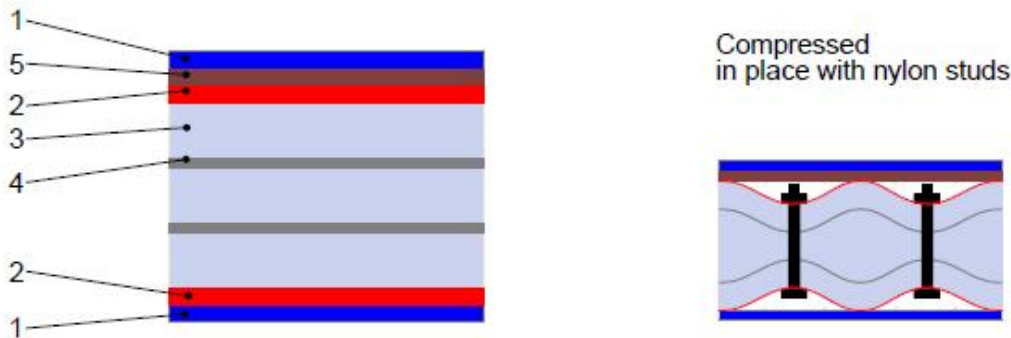
Durable Ventilation



Robust Frame

**Product Structure:** Each panel is constructed of layers of alkaline earth silicate fibre and reflective aluminium foil and is compressed and studded with nylon pins throughout the panel surface. The complete outer surface is covered with a weather resistant silicone coated E-glass cloth that can be tailored to suit project requirements.

The nylon pins hold the Daken fire protection system components together, ensuring that the insulation material remains securely in place and does not migrate to a different location on the panel (a problem that can occur in some poor-quality fire jacket). The compression pin compresses the insulation by approximately 40% of the original thickness to provide a very flexible but compact system. All of this helps ensure that the passive fire protection system is easy to remove and install again.



1. Silicone coated E-glass cloth, as standard, is a weatherproof protective layer, with anti-weathering, anti-chemical corrosion and anti-ultraviolet function.
2. Polyethylene cloth
3. Compressed alkaline earth silicate fibre (AES), the fireproof fibre is Insulfrax® Water Repellent with high temperature stability (up to 1200°C), free of asbestos and credited by Fraunhofer bio persistence test.
4. Heat-insulating & reflective aluminium foil
5. Stainless steel mesh for Jet fire scenarios



**Options:** Daken Fire Jacket (**DFJ**) uses a silicone coated E-glass cloth as standard, which considers a maximum operating temperature of up to 230°C. Other outer cloth material can be selected for high temperature applications, and we have access to materials that can withstand temperatures exceeding 1100°C. The outer material colour is grey however, if required, this can be changed to suite the protected item (green for fail close or red for fail open) or any project requirements such as colours per zone or area.

Typically, access is required to parts of the protected item, and a fully tested and certified quick-release inspection door can be added. This will allow quick release access to controls, drain valves, injection points etc.



If the protected item has a high process temperature or, in some cases, can release gas, then a fully tested and certified ventilation grille can be considered. These can allow hot air to dissipate to prevent over heating or any gas to escape to prevent any build-up inside the enclosure.

The enclosures are generally designed in a water-shedding manner using water repellent materials but, if required, a fully tested and certified drain plug can add to the low point of the system to ensure any water that may cause a CUI risk, is drained away from the equipment.

**Testing & Certification:** The correct test standard must be considered (typically UL1709 & ISO22899-1), and care should be taken to ensure products have been tested correctly considering the correct standard. In addition to the correct test standard, the Hp/A section

factor for the protected item and the test substrate should be comparable.

The testing of PFP must be completed considering the actual design and supply and if an enclosure (cuboidal shape with corner joints & edge features) is required then an enclosure including all features must be tested. It should be noted for jet-fire, this is a planar test configuration rather than a tubular test configuration which is used for pipes, tubes, and steelwork only.

The duration of protection is relative to the thermal requirements and the maximum allowable temperature of the protected item must be considered. This temperature minus ambient or process temperature will derive a temperature rise for the required duration and this should be matched against the test and test certificate.

Daken Fire Jacket (**DFJ**) fire certificate is available upon request and details the required test standard, is to the correct configuration, and considers various Hp/A section factors. All features that are considered in the standard design have been tested and are detailed in the certificate proving that all features are tested and approved by Lloyds Register.

To ensure that the design of any PFP system is in line with the test work completed, Lloyds Register detail that a project specific design appraisal (DAD) is completed and issued. Daken has a good relationship with Lloyds Register and because of multiple tests that include all features, can easily obtain a DAD if required.

**Site Services:** In addition to site surveys, our Service Team can complete the installation of the PFP, supervise local labour, conduct training, complete inspections, and offer after-sales support.