

WORLD LEADERS IN THE DEVELOPMENT OF HEAT AND WIND SHIELDS
SINCE 1976



PROJECT: FPSO KIKEH (Turret Cladding)
SUPPLIED TO: SBM
PRODUCT: Ladder Shield



PROJECT: KUPE GAS Burn Pit (Exhaust cover)
SUPPLIED TO: Technic Oceania Pty Ltd
PRODUCT: Ladder Shields



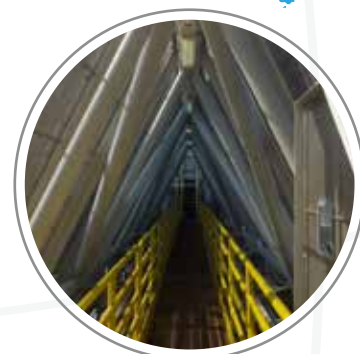
PROJECT: Transocean Galaxy 1 (Derrick Cladding)
SUPPLIED TO: Transocean
PRODUCT: Ladder and Mini ES Shields



PROJECT: Shell Prelude FLNG (Escape routes, stair towers, flare deck, instrument covers)
SUPPLIED TO: SHI, Technip, SMB
PRODUCT: Ladder, Mini ES and Flare Deck Shields



PROJECT: Grangemouth Refinery (Escape Route)
SUPPLIED TO: Ineos
PRODUCT: Mini Shield



PROJECT: Bulhanine PS3 Link Bridge (Walkway)
SUPPLIED TO: Dopet
PRODUCT: Ladder Shield

Locker Radiant Heat Shield cladding panels reduce the levels of radiant heat produced during flaring to protect both personnel and equipment. They are used on a range of projects from offshore FLNG's to onshore refineries. Common installations include Derrick protection, escape routes, stair towers, turret protection and flare structures.

The need for this type of protection was first recognised on the Claymore platform in the Forties field in 1976. Locker was the first company in the World to design and manufacture radiant heat shielding specifically for this application. Continuous product improvements since then provide even higher levels of protection, coupled with reduced weight and increased strength.

The heatshields are designed to be both light in weight and rigidly structured, able to withstand the offshore environment and rough handling.

Locker heatshields are passive in construction, and have no moving parts. Support services such as water, electricity, pipe work and monitoring devices are unnecessary.

The table below shows levels of radiant heat that can be produced from flaring, and their effects on the human body. Locker Heat Shields have been taken through extensive tests and have been found to reduce the levels of radiant heat by 80%.



Thermal Radiation kW/m ² (BTU/hr/ft ²)	Effect	Thermal Radiation 150mm behind rear face of the Heatshield kW/m ² (BTU/hr/ft ²)
1.2 (380)	Received from the sun at noon in summer.	Double Skin: 0.25 (79) Single Skin: 0.36 (114)
2 (634)	Minimum to cause pain after 1 minute.	Double Skin: 0.4 (127) Single Skin: 0.6 (190)
Less than 5 (1585)	Will cause pain in 15-20 seconds and injury after 30 seconds exposure.	Double Skin: 1 (317) Single Skin: 1 (317)
Greater than 6 (1902)	Pain within approximately 10 seconds. Rapid escape only is possible.	Double Skin: 1.2 (380) Single Skin: 1.4 (438)
12.5 (3963)	Significant chance of fatality for medium duration exposure. Thin steel with insulation on the side away from the fire may reach thermal stress level high enough to cause structural failure.	Double Skin: 2.3 (729) Single Skin: 3.75 (1189)
25 (7925)	Likely fatality for extended exposure and significant chance of fatality for instantaneous exposure. Spontaneous ignition of wood after long exposure. Unprotected steel will reach thermal stress temperatures that can cause failure.	Double Skin: 4 (1268) Single Skin: 7.5 (2378)
35 (11095)	Cellulosic material will pilot ignite within one minute's exposure. Significant chance of fatality for people exposed instantaneously.	Double Skin: 6 (1902) Single Skin: 10.5 (3329)

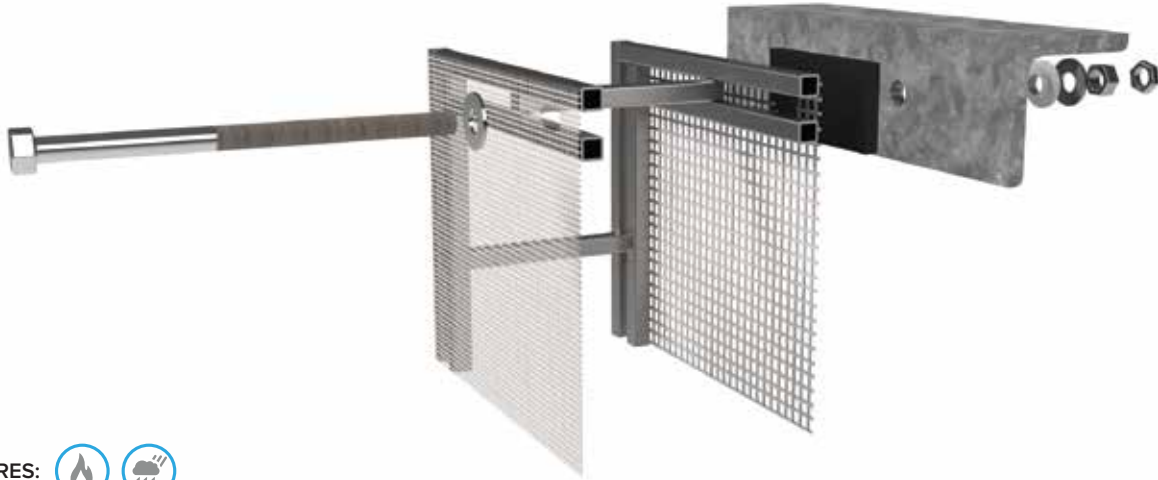
HSE - Methods of approximation and determination of human vulnerability for offshore major accident hazard assessment
Table 14: Thermal radiation exposure effects



PERSONNEL PROTECTION: LADDER SHIELD



The 'Ladder' shield consists of dual skin shielding media attached to both sides of a ladder frame. This provides maximum protection in areas where personnel may come into contact with the shield, such as stair towers and derrick areas. The robust construction of primary radiant shielding incorporates heavy duty woven mesh for maximum heat flux reduction.



KEY FEATURES:

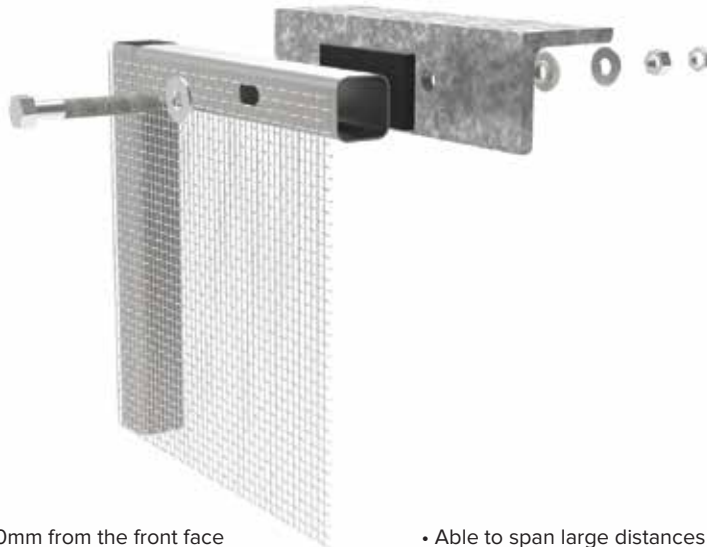


- Heat flux reduction in excess of 80% at 300mm from the front face
- Rolled hollow section framework gives high resistance to wind buffeting
- All stainless steel type 316L construction
- Able to withstand continuous thermal cycling
- Excellent light transmission and ventilation
- Provides protection against wind and snow
- Mesh proven to reduce wind speed by over 70%
- Quick on-site installation and removal
- Supplied complete with all necessary A4 Stainless Steel fasteners
- Able to withstand blast loads up to 24kN/m².



EQUIPMENT PROTECTION: MINI ES SHIELD

The 'Mini ES' shield consists of a single skin shielding media attached to the front face. Shields can be altered to provide a double layer of protection which increases the thermal radiation level reduction. Intended for protection of key equipment and in areas where personnel will not come into direct contact with the radiant shields.



KEY FEATURES:



- Heat flux reduction in excess of 80% at 150mm from the front face
- Rolled hollow section framework gives high resistance to wind buffeting
- Designed primarily for protection of equipment and roofs of Escape Routes and Stair Towers
- All stainless steel type 316L construction
- Able to span large distances between supporting steelwork
- Lower cost and weight
- Excellent light transmission and ventilation
- Provides protection against wind and snow
- Mesh proven to reduce wind speed by over 62%.



FLARE DECK SHIELD

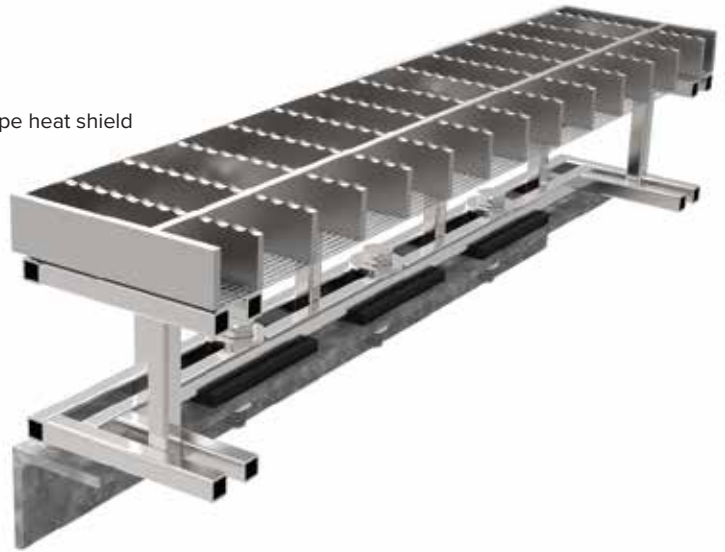


The "Flare Deck" shield consists of a serrated grid floor suspended by a single skin Ladder shield which provides the thermal protection.

KEY FEATURES:



- Open grid serrated floor panel with heavy duty mesh, bolted to ladder type heat shield
- Mesh aids cooling and allows free movement of air and liquids
- Excellent light transmission
- All Stainless Steel type 316L construction
- Designed to withstand evenly distributed load of 5kN/m²
- Tested to front face surface temperature of 700°C
- Penetrations and kick plates incorporated as required
- Grid floor panels removable from top working surface
- No special tools required.



CABLE TRAY SHIELD

The Cable Tray Heatshield is designed to protect power and equipment cables from the effects of elevated levels of radiant heat.



KEY FEATURES:



- Reduces heat flux by up to 80%
- Easily retrofitted and customised to suit any configuration
- Easily removable top cover for access and maintenance with optional grab handles if required
- Supplied complete with all insulation gaskets and fasteners
- Robust all stainless 316L construction
- Performance warranted
- Independently tested
- Indefinite lifespan under normal operating conditions
- Available in standard 1.5m lengths or purpose built per application.



HEAT SHADE

Locker Heat Shades are specifically designed to provide radiant heat and temperature shielding for lighting.



KEY FEATURES:



- Designed to protect lighting from the effects of radiant heat and elevated temperature
- Reduces heat flux by 80%
- Robust design manufactured in 316L grade stainless steel
- Performance warranted and independently tested
- Indefinite lifespan under normal operating conditions.



GALEBREAKER FABRIC HEAT SHIELDS



Galebreaker Heatshields are designed specifically to meet your protection requirements using a single skin Vamac® coated polyester based cloth.

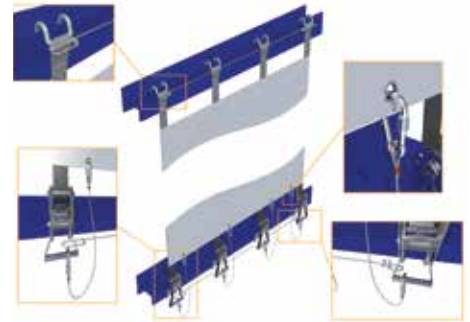
All materials have been independently tested and shields are designed to protect against flares when installed on the derrick or drill floor.

Providing protection against heat flares with a temperature range from -30°C to $+180^{\circ}\text{C}$, the fabric offers insulation and protection against radiant heat for up to 60 minutes.

Galebreaker Heatshields are lightweight and flexible with a range of fixing techniques available. All fixings are stainless steel marine grade (316 standard) or galvanised.

KEY FEATURES:

- Constructed from a silver-grey single skin Vamac® coating on polyester base cloth with built-in tensioning system
- Fasteners supplied in either marine grade (316) or galvanised
- Excellent UV and abrasion resistance
- Temperature range -30°C to $+180^{\circ}\text{C}$
- Maximum temperature exposure 180°C
- Maximum exposure 60 mins
- Able to withstand 10kW/m^2 (3100 BTU/hr/ft^2)
- 2.5kg/m^2 including fixings
- Designed to withstand wind speed from 90mph to a maximum 120mph.




GALEBREAKER FABRIC WIND SHIELDS

Lightweight and strong, Galebreaker Wind Shields offer protection from the elements while maintaining a light and airy working environment. Single skin in construction with patented built-in tensioning technology, the PVC coated charcoal grey polyester provides 75% wind speed reduction up to a standard 90mph and maximum 120mph. Wind Shields provide protection against rain, dirt and dust.

KEY FEATURES:

- Constructed from a charcoal grey single skin Polyester with PVC coating with built-in tensioning system
- Fasteners supplied in either marine grade (316) or galvanised
- Wind, rain and dirt resistant
- Protective wraps and safety wires
- Temperature range -30°C to $+70^{\circ}\text{C}$
- Maximum temperature exposure 70°C
- 1.25kg/m^2 including fixings
- Designed to withstand wind speed from 90mph to a maximum 120mph.



PRODUCT NAME	TYPICAL USES	BENEFITS
 <p>DOUBLE SKIN LADDER HEATSHIELD</p>	 Heat Protection  Wind & Weather Protection	<ul style="list-style-type: none"> • Protect people and equipment • Heat flux reduction in excess of 80% behind the shield • Able to span distances up to 4.5m between supports • Reduce wind speed by up to 70% • Wind load tested up to 80mph
 <p>MINI ES HEATSHIELD</p>	 Heat Protection  Wind & Weather Protection	<ul style="list-style-type: none"> • Protect equipment and areas where personnel do not come in to contact with the shield • Lightweight 15kg/m² • Reduce heat flux by 80% behind the shield • Able to span distances up to 4.5m between supports • Reduces wind speed by up to 70% • Wind load tested up to 101mph
 <p>MINI HEATSHIELD</p>	 Heat Protection  Wind & Weather Protection	<ul style="list-style-type: none"> • Protect equipment and areas where personnel do not come in to contact with the shield • Lightweight - 12kg/m² • Reduce heat flux by 80% behind the shield • Able to span distances up to 2.2m between supports • Mesh proven to reduce wind speed by up to 70%
 <p>FLARE DECK SHIELD</p>	 Heat Protection	<ul style="list-style-type: none"> • Protect Flare Boom structure • Withstand evenly distributed loads of 5kN/m² • Tested to front face surface temperature of 700°C. • Temperature reduction of 86% behind shield • Grid floor panels removable from top working surface • Designed and manufactured to any shape to avoid flare tip pipes and protrusions
 <p>FABRIC HEAT SHIELD</p>	 Heat Protection  Wind & Weather Protection	<ul style="list-style-type: none"> • Protect people and equipment • Constructed from Vamac® coating on polyester base cloth • Lightweight 2.5kg/m² • Able to withstand 10kW/m² • Designed for wind loads up to 120mph • Quick and easy to install
 <p>FABRIC WIND SHIELD</p>	 Wind & Weather Protection	<ul style="list-style-type: none"> • Constructed from Polyester with PVC coating • Able to span between decks and to fit any installation • Lightweight 1.25kg/m² • Reduce wind speed by up to 75% • Designed for wind loads up to 120mph • Quick and easy to install



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