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Thermal Exhaust Jackets - Installation & Maintenance Manual

Contents:

Section 1 - Safety and General Precautions:

All personnel working on the equipment should employ safe practises, Halyard (M&I) Ltd will not be responsible for personal injury or damage to property resulting from careless use of hand tools, lifting equipment, power tools or unaccepted maintenance or working practises.
Due to the possible danger to persons or property from accidents that may occur from the use of machinery, proper installation maintenance and operating procedures must be followed. Halyard (M&I) Ltd will not be responsible for personal injury resulting from careless working practices.
All personnel working on the equipment should inspect as necessary to ensure safe operations under prevailing conditions. The appropriate Personal Protective equipment (PPE) that may be specified in the safety codes should be used. This equipment is neither provided by or the responsibility of Halyard (M&I) Ltd.
Note: This information is to be used in conjunction with any specific site requirements.

NOTE: The exhaust system should be cool prior to carrying out any inspection, installation, removal, or maintenance activities.

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Section 2 - Introduction:

Halyard (M&I) Ltd flexible removable exhaust jackets are bespoke, easy to install and manufactured from high quality materials. They can be supplied for exhaust pipe work, elbows, flanges, compensators, silencers, supports and other equipment where thermal protection is required. When correctly installed the exhaust Jackets significantly reduce surface temperatures and aid noise reduction, whilst providing a safe environment for personnel in the vicinity of the exhaust system.

This manual explains the steps to correctly install a Halyard (M&I) Ltd exhaust jacket system and provides information to ensure the exhaust is effectively insulated and maintained.

Before commencing the installation please read this manual in full. If you have any questions regarding the supply or fitting of these products please contact your Halyard Dealer, Distributor or Halyard directly.

Examples of Typical Jackets:


Bellows


Pipe & 45° Bend


90° Bend


Flange or Overwrap

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Section 3 - Exhaust Jacket Specification (Standard Supply):

Thermal Exhaust Blanket Specification		
Temp Range:		Minus 20° to Plus 600° Centigrade (Continuous)
Thickness:		6mm to 50mm (Typically 25mm)
Outer Layer:		460g M² Grey or Black Silicone coated glass Fabric, 600g M² PU Coated Silica
Insulation:		E Glass Needlematt
Inner Layer:		Type 310 Stainless Steel Knitted Wire, 600g M² PU Coate Silica
Fastening:		Strapping & "D" Ring System, Stainless Steel Spring Fastening, Fire Retardent Hook & Loop, Kevlar Draw Cords

Section 4 - Pre-Installation checks:

1. Upon receipt of the exhaust jacket kit confirm that the kit list supplied with the jackets matches the intended engine and exhaust system.

2. Remove the jackets from the packaging (avoiding contact with wet or contaminated areas) and verify that all the items detailed in the kit list are present. Please notify your Halyard thermal jacket supplier of any issues within 3 days of receipt of product.

3. Check that the exhaust system is complete and correctly installed and is at a safe working temperature.

4. Inspect the surface to which you are installing the jackets which should be clean, dry and free from any flammable or corrosive substances e.g. oils or cleaning fluids

5. Make sure there are no sharp edges or foreign objects that could potentially damage the exhaust jacket.

6. Check area around the exhaust taking note of any equipment that could either be damaged or cause a snagging point during installation e.g. exhaust sensors, flange fasteners etc.
7. Do not pinch or compress jackets with mounting fixtures/equipment during installation. This may cause premature failure or limit thermal insulation performance.

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Section 5 - Installation:

The following should be carried out in conjunction with the specific kit list and installation guide:

1. Position the appropriate thermal blanket with the grey or Black coated face on the outside (Fig 1) around the corresponding exhaust section in the sequence shown in the kit list (supplied with the jacket set)


Fig 1


Fig 2


Fig 3

Feed the strap through both "D" rings (Fig 2), loop the strap back on itself over the second ring and under the first pulling the strap gently towards you to loosely secure the jacket (Fig 3). At this point position the internal silica flap (beige in colour) under the insulation on the opposite edge (Fig 4), this will form a seal on the joint when all straps are tightened. The grey or black flap then overlaps the outer face of the jacket to complete the insulation integrity (Fig 5).


Fig 4


Fig 5

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2. Repeat stage 2 for all straps. The jacket is now loosely installed but can still be manoeuvred into the exact position required. When this has been achieved pull the straps tight so the two edges of the insulation butt-up together (Fig 6). For aesthetic reasons and where possible on straight sections of pipe, flanges, compensators etc, position the jacket joint out of sight with the straps facing away from you (Fig 7).

Fig 6

Fig 7

3. For stainless steel spring fastenings (Fig 8), carefully pull the tension spring which is fastened to one edge of the Jacket over the joint ensuring the internal and external flaps are in position (as above) and hook the "O" ring over the retaining hook (Fig 9).

Fig 8

Fig 9

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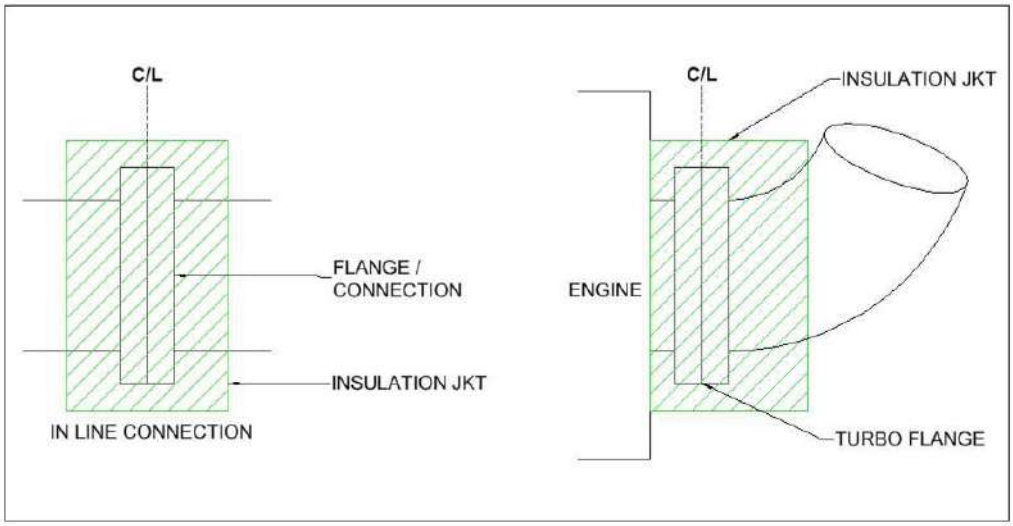
4. Draw cords should be pulled tight and fastened with a bow (Fig 10) (to enable easy removal). For aesthetic reasons push the excess cord out of sight under the edge of the jacket (Fig 11).

Fig 10

Fig 11

5. Flanges, V Clamps and Overwraps - Follow the same procedure as above. The jacket must pull down tightly onto the jacket below with no visible gaps. Wherever possible ensure that the centre of the jacket is in line with the centre of the flange or joint



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6. Continue the above procedure for each section of the exhaust until the entire system from turbocharger to sprayhead. It is essential that there should be no uncovered areas or gaps.

Fig 12

7. Bracket Wraps should be installed last. As with the main exhaust they should fit snugly around the bracket and be fastened securely around the pipe work using the fixings provided.

Section 6 - Post Installation checks:

When all jackets have been installed confirm:

1. There are no gaps between the exhaust jackets where heat can escape
2. All overwrap jackets are secure and correctly positioned and check all straps for tightness
3. Strap ends fed neatly through the loops on the body of the jacket.

Fig 13

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Section 7 - Post Start Up:

Notes:

1. Within the manufacture of the material, there are organic sizing agents used as a lubricant to assist with weaving of the base glass fabric. After installation of the jackets and exposure to elevated temperatures these agents (which are sacrificial) will break down and be emitted into the air. This will cause no detrimental effect to the performance, or physical characteristics of the cover/jacket in any way. This will normally cease after a period of time dependant on the exhaust operating temperature (typically up to 8 hours).
   Please refer to Section 11 - Material Safety Data Sheet
2. After the engine start up the initial vibration may cause a slight loosening of the jacket straps, ensure the system has sufficiently cooled, recheck and adjust as necessary.

Section 8 - Post Sea Trial:

1. Check jacket straps ensuring the system has cooled sufficiently.

Note: There may be some slight discolouration (more evident on grey silicone exhaust jackets) on the edges where the blanket is covered by either a flange blanket or overwrap and next to the turbo. This is merely cosmetic and has no detrimental effect to the jacket's thermal performance.

Section 9 - Maintenance:

Whilst Halyard (M&I) Limited thermal jackets are extremely durable, correct maintenance will ensure the longevity of the products.

1. Keep flammable or corrosive substances off the jacket. Should the jackets need to be cleaned, wipe with warm water with a mild detergent using a soft cloth. Do not use chloride or halide-based cleaners. If a jacket becomes contaminated with oil, or flammable/corrosive substances, safely remove the item and replace with new.
2. Prevent rips and tears by keeping sharp or abrasive objects away from the jacket. Abrasion or friction will breakdown the silicone coating and insulation necessitating the replacement of the jacket.
3. Regular jacket and exhaust system visual inspections are recommended, checking for gaps, loose jackets and straps, gas leakage from the exhaust system, contamination, or significant areas of damage.

NOTE: Over time the exhaust jackets will mould to the shape of the exhaust and when removed will be less malleable than when originally installed. This has no detrimental effect on the performance of the jacket but if the jacket shows signs of contamination, wear or damage it must be replaced with new - Please contact your Halyard Dealer, Distributor or Halyard directly.

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Section 10 - Lifespan:

The jackets should give many years of thermal protection however incorrect fitting, treatment or maintenance will reduce the lifespan of the jackets and may invalidate the warranty.

Section 11 - Material Safety Data Sheet:

Material Safety Data Sheet Style: Codes ending SR1**

1. Identification of substance
Product description: Silicone coated woven E-glass cloth
Style reference: All THS Codes ending SR1**

2. Hazard Identification
In a sustained fire situation, the coating will degrade to give smoke containing carbon monoxide and carbon dioxide. There are no major health hazards associated with the base fabric; however, exposure to glass fibres sometimes causes irritation of the skin and less frequently irritation of the eyes, nose or throat.

3. Composition/Information on ingredients
Chemical characterisation: Fibrous glass (E-type, continuous filament) compositions consisting principally of oxides of silicon, aluminium, calcium, boron and magnesium, fused in an amorphous vitreous state.
Vulcanised silicone
Glass fibre does not meet the classification for a 'dangerous substance' according to 67/548/EEC. Glass Fibre carries no CAS registry number and no EPA code designation number. Glass as a generic substance, the E-glass composition included, has been incorporated in the EINECS under no. 65997-17-3.

4. First Aid Measures
Inhalation: In case of inhalation of glass dust particles or fumes from thermal degradation move into fresh air, if irritation persists seek medical attention.
Skin Contact: If irritation is a problem then rinse the affected areas with cool water, then wash gently with mild soap. If glass fibre becomes embedded in the skin, then seek medical attention.
Eye Contact: Flush eyes with clear water for at least 15 minutes, if irritation persists seek medical attention.

5. Fire Fighting Measures
Glass fibre is inherently non-flammable; however, the coating will burn off during a sustained fire.
Suitable extinguishing media: Water, carbon dioxide, dry powder.
Protective equipment for
Fire fighters: In a sustained fire, self-contained breathing apparatus
And protective clothing should be utilised.

6. Accidental Release Measures
Personal precautions: None
Environmental precautions: None
Methods for cleaning up: Dust pan and wet brush.

7. Handling and Storage
Precautions for handling: No special measures, for personal protection see section 8. Glass fibre has electrical isolation properties and so may give some static.
Precautions for storage: Store below 25 deg C, in a dry, well ventilated place.

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8. Exposure limits and personal protection

Respiratory protection: None required. If airborne glass fibre concentrations exceed the control limit, respiratory protection for nuisance dust should be provided.
Eye protection: Safety glasses with side shields should be worn.
Hand/Skin protection: Protective gloves, overalls buttoned to fit loosely at the neck and wrists and long trousers may reduce irritation in some operations. Barrier cream may provide further protection from irritation.
Hygiene measures: Wash hands before breaks and at the end of the day. Launder items of clothing contaminated with glass fibre dust separately.
Control limits: Airborne glass dust – TLV = 5mg/m3
Possible trace retained toluene = 100ppm

9. Physical and chemical properties

Appearance: White woven fibres, coated both sides with grey / black silicone
Colour: Grey
Odour: None
pH Value: Not applicable
Melting point (softening) 830 deg C
Flash point: Not applicable
Auto ignition temperature: Not applicable
Explosive properties: Not applicable
Specific gravity: 2.6g/cm3
Solubility: Insoluble in water. Glass fibre will disperse, to some extent in organic solvents like styrene, acetone etc.

10. Stability and reactivity

Conditions to avoid: Stable under recommended storage and handling conditions (see section 7).
Material to avoid:
Hazardous decomposition
products: Carbon dioxide, carbon monoxide, silicone dioxide.

11. Toxicology information

Inhalation: The products of thermal decomposition, including carbon dioxide and carbon monoxide may cause dizziness and headache after prolonged low-level exposure.
Pre-existing upper respiratory and lung disease may be aggravated.
Skin contact: No toxicological effect.
Eye contact: No toxicological effect.
Products do not contain glass fibre with diameters that are classified as respirable (fibres with diameters less than 3.0 microns which are capable of travelling into the body to the trachea, bronchi etc.)
All of the fibres products used by, or manufactured by, THS have fibre diameters equal to or greater than 4.5 microns, and are therefore not physically capable of travelling beyond the nose and pharynx.

12. Ecological information

Glass fabrics are not readily biodegradable.
No known harmful effects on the environment.

13. Information concerning disposal

Waste from residues/unused
products: Dispose as solid, non-recyclable waste according to local regulations.
Contaminated packaging: Empty containers should be transported/delivered using a registered waste carrier for local recycling where possible or waste disposal.

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14. Transport information
No special precautions or restriction involving transport are known.

15. Regulatory information
Symbols: None
Risk phrases: None
Safety phrases: None

16. Other information
The data mentioned above refers to questions of safety and is given to the best of our present knowledge. This data must not be regarded as quality features and does not release the user from responsibility for the handling of this material and from observing legal regulations and directives.