

Exhaust Insulation System

Thermal Insulation of wide bore diesel exhausts

Why fit Exhaust Insulation?:

World-wide, legislators are setting clear targets for the reduction of pollutant gases and particulate matter from diesel engine exhaust emissions. Despite significant advances in engine design, developments in catalytic converter and particulate filter systems appear to provide the most promising solution in meeting the tighter requirements.

Currently, most of the available systems are temperature dependant and research shows that heat loss from wide bore exhaust pipes can reduce the efficiency of the equipment used in exhaust gas conversion and particulate removal. Insulation is already used around converters and filter traps to enhance performance though the exhaust pipe from the engine manifold to the catalyst can be largely ignored. The new regulations also apply to existing vehicles and will necessitate a programme of retrofits, where the diversity of vehicle operating conditions will have to be taken into account, often when the vehicle is situated on another continent.

Retrofits will require an easy to fit, insulation kit. Variable engine load and frequent stops and starts, typically found on city buses, adversely effect the gas temperature cycles hence the catalyst equipment can become inefficient. Choosing a proven insulation system will reduce heat loss and optimise performance. In retrofit applications exhaust pipe configurations vary from vehicle to vehicle and it is unlikely that drawings will always be available, therefore on these occasions, bespoke insulation jacketing will not be an option.

The "fit all" **Thermolastic® System** provides a solution.



Advantages:

- ✔ Can often be installed on the vehicle without removing exhaust
- ✔ Efficient, high density insulation acts as heat store, reduces temperature fluctuation and heat loss
- ✔ Fits any bore size
- ✔ Long life, cost effective
- ✔ Will not slip, bonds together on initial heating
- ✔ Oil and water resistant coating
- ✔ Each layer individually protected from water ingress
- ✔ No special tools required
- ✔ Insulation thickness can easily be varied along the pipe
- ✔ Stays permanently flexible, can accommodate expansion joints.
- ✔ Tough outer layer resists frost, stone chips etc.
- ✔ Outer layer can be easily repaired or replaced in the event of physical damage
- ✔ Clean to work with using only non toxic materials

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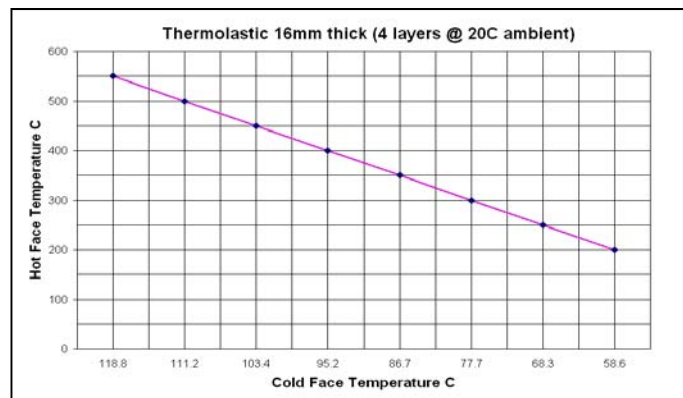
Although Thermolastic was originally designed to maintain gas temperatures in exhausts where emission control equipment is used, it is also widely used for thermal insulation. Typical applications are to reduce temperatures in engine compartments and where the exhaust is in close proximity to services such as hoses and cables.

Other applications include agricultural equipment, i.e. Harvesters where the product is used to reduce the risk of crop fires, and in confined spaces such as Power Generator sets, Locomotive and Marine engine bays.



No special tools are required to install Thermolastic, just a knife, good scissors and a measuring tape. Fully illustrated fitting instructions are supplied with each delivery and we have video clips available on our website showing various examples of installations.

We can send out video files on CD/DVD on request



Thermolastic® has now been adopted by a number of the major European vehicle manufacturers. For OEM's or fleet operators we can offer pre-shaped cuffs and bend segments to save time on installation where the customer has larger numbers of similar pipes to insulate.

Tests have been conducted on a 100 mm bore exhaust system to establish outside skin temperatures using three insulation layers. The exhaust included right angle bends known to create hot spots and was conducted at 450C average gas temperature (at peaks 512C). Max temperature on the surface of the Thermolastic protective layer was 157C on the hotspot at steady state. Average temperature 125C

Full test data is available on request.

The higher temperature style protective layer should be considered where the exhaust is in close proximity to radiant heat from turbochargers etc.

Availability

| Style | Pack Size | Width | Length Required* | Weight per metre | Thickness |
|---------|-----------------------|--------|------------------|------------------|-----------|
| TILP-01 | Rolls of 5 m | 100 mm | 11.5 m | 240g approx | 5 mm |
| TILP-02 | Rolls of 5 m | 50 mm | 19 m | 115g approx | 5 mm |
| TILR-01 | Rolls of approx 5.5 m | 100 mm | 11.5 m | 240g approx | 5 mm |
| TILR-02 | Rolls of approx 5.5 m | 50 mm | 19 m | 115g approx | 5 mm |
| TILR-06 | Rolls of approx 5.5 m | 50 mm | 2 m | 115g approx | 5 mm |
| TPLG-01 | Rolls of 5.0 m | 75 mm | 7 m | 117g | 1 mm |
| TPLR-01 | Rolls of 5.0 m | 75 mm | 7 m | 117g | 1 mm |
| TPLB-01 | Rolls of 5.0 m | 75 mm | 7 m | 117g | 1 mm |

*Typical length/usage of Thermolastic components based on a 3 insulation layer configuration covering a 1m length of 100 mm diameter exhaust



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The **Thermolastic® System** comprises of two main components, an insulating layer tape and an outer protective layer tape. The inner layer consists of high temperature insulation material bonded to a reflective film, in a unique format that allows the tape to stretch, thereby accommodating bends and avoiding slippage when wrapped.

The outer layer consists of a self bonding, high temperature resistant elastomer that provides extra protection to the insulation layers. The elastomer is also flame retardant to UL 94 V-0 and remains flexible in service.

See table below for product selection

Thermolastic® Insulation wrap is applied in layers according to the temperatures involved in the application, normally three layers. Fully illustrated fitting instructions available with each pack.

For higher temperatures it is recommended that at least one plain insulation layer is applied against the hot face with the reflective layers applied later.

See fitting instructions supplied

The outer protective layer is applied over the insulation layers with an overlap of approx 20mm, the outer layer bonds to itself to provide a sealed cover.

Tape Styles and Properties:

| Style | Product | Description | Duty |
|----------------------------------------------------------------------|---------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------------------------|
| TILP | Thermolastic Insulation Tape: | Plain Insulation layer (without reflective foil) | Suitable for continuous operating temperatures of -25C to +550C excursions to 600C |
| TILR | Thermolastic Insulation Tape: | Reflective Insulation layer | Suitable for continuous operating temperatures of -25C to +550C excursions to 600C |
| TPLG | Thermolastic Protective Tape: | Protective Outer Layer Grey | Suitable for continuous operating temperatures of -25C to +200C excursions to 250C |
| TPLB | Thermolastic Protective Tape: | Protective Outer Layer Black | Suitable for continuous operating temperatures of -25C to +200C excursions to 250C |
| TPLR | Thermolastic Protective Tape: | Protective Outer Layer Red | Suitable for continuous operating temperatures of -25C to +260C excursions to 300C |
| TAGT | Thermolastic Self Adhesive Glass Tape | High Temperature Adhesive Tape for fixing etc. | Suitable for continuous operating temperatures of -25C to +200C |
| TRTV-01 | Thermolastic HT Adhesive | High Temperature Adhesive for use with Grey Outer layer | Suitable for continuous operating temperatures of -25C to +200C excursions to 250C |
| TRTV-02 | Thermolastic HT Adhesive | High Temperature Adhesive for use with Red Outer layer | Suitable for continuous operating temperatures of -25C to +260C excursions to 300C |
| Higher temperature Insulation layers can be manufactured as specials | | <i>See fitting instructions sheet for application guidelines</i> | |

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