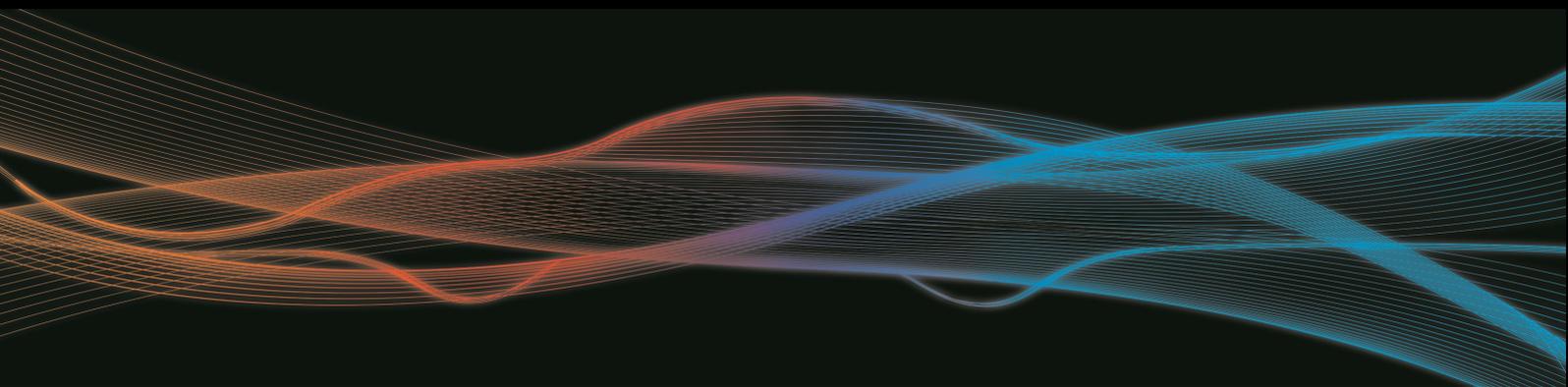


FACTS:

Vitri[®] Flex

Exhaust Insulation System



AUTOMOTIVE

The Vitri[®] Flex System[®]



- **Fits any boresize**
- **Can often be installed on the vehicle without removing exhaust**
- **Long life**
- **kosteneffektiv**
- **Cost effective**
- **No special tools required**
- **Oil and water resistant**
- **Stays permanently flexible**



Thermal Insulation of wide bore diesel exhaust

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 is 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.

The Culimeta Vitri[®]Flex-system was specifically developed to install a highly efficient isolation as simply and quickly.

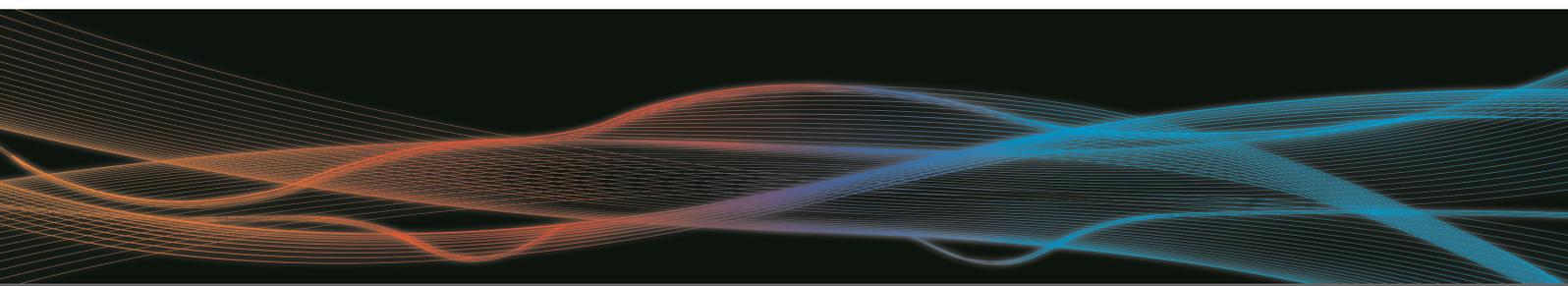
Vitri[®]Flex exhaust system

The Vitri[®]Flex 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 on the next site for product selection.

| Product | Description | Properties |
|---|---|---|
| Vitri[®]Flex insulation | standard without foil | Suitable for continuous operating temperatures of -25°C to +550°C excursions to 600°C |
| Vitri[®]Flex insulation | with heat-reflective foil, stretchy | Suitable for continuous operating temperatures of -25°C to +550°C excursions to 600°C |
| Vitri[®]Flex outer layer GREY / BLACK | protective outer layer | Suitable for continuous operating temperatures of -25°C to +200°C excursions to 250°C |
| Vitri[®]Flex outer layer RED | protective outer layer | Suitable for continuous operating temperatures of -25°C to +200°C excursions to 250°C |
| Vitri[®]Flex adhesive glass tape | high temperature adhesive tape for fixing etc. | Suitable for continuous operating temperatures of -25°C to +200°C |
| Vitri[®]Flex HT glue GREY | for fixing protective outer layer | Suitable for continuous operating temperatures of -25°C to +200°C excursions to 250°C |
| Vitri[®]Flex HT glue RED | for fixing protective outer layer | Suitable for continuous operating temperatures of -25°C to +250°C |
| | See fitting instructions sheet for application guidelines | |



Article overview

The surface temperature of a three layers isolated exhaust pipe has been tested. The isolated pipe had a right angle in its mid, to exacerbate the test-situation intentionally. The initiated exhausts generated a hot-gas-temperature of 450°C (max. 512°C) and the maximum surface temperature of the isolating Vitri®Flex-layers was 157°C.

You can get the complete review of the test if you want to order!

Vitri®Flex-isolations for high-temperature-applications should not be used where the exhaust-system is in close proximity of radiant heat, for example on turbocharger.

| Artikelnr. / Article no. | Beschreibung/ Description | Breite/ Width | Länge/ Length | Einheit/ Unit |
|--------------------------|--|---------------|---------------|---------------|
| FB0111AL | reflektierende Isolationslage reflective insulation layer | 65mm | 5,5m | Rolle / roll |
| HCS003 | Hochtemperaturkleber, rot high temperature glue, red | - | 82ml | Tube / tube |
| HCS035 | refl. Isolationslage, beids. Alu kaschiert refl. Insulation layer, both sides Alu | 50mm | 5,5m | Rolle / roll |
| HCS006 | Hochtemperaturkleber, grau high temperature glue for outer layer | - | 82ml | Tube / tube |
| HCS016 | äußere Schutzlage, rot outer protective layer, red | 75mm | 5m | Rolle / roll |
| HCS032 | äußere Schutzlage, schwarz outer protective layer, black | 75mm | 5m | Rolle / roll |
| HCS005 | äußere Schutzlage, grau outer protective layer, grey | 75mm | 5m | Rolle / roll |
| HBB007 | Hochtemperaturklebeband, schwarz high temperature adhesive tape, black | 25mm | 50m | Rolle / roll |

The Culimea Vitri®Flex system can be used as universal solution.



Vitri®Flex stripes



Easy to use



Self-binding protection management



No special tools required

You only need measuring tape, scissors and ruler, no special tools are required for installation.

benefits:

- direct installation, mostly without expansion of the exhaust system
- efficient insulation with different density, reduces the heat loss
- suitable for all exhaust pipe diameters
- durable and therefore cost-effective
- oil- and water-resistant protecting coating
- each individual layer prevents the ingress of water
- no special tools required
- insulation thickness may be varied along the length of the exhaust pipe
- remains permanent flexible, compensation joints can be involved
- durable outer layer resists frost and rockfall
- simple repair or replacement of the outer layer

Installation instructions



Step 1:

- The pipe should be clean and free from oil and dust.
- At a required end panel the insulation tape (HCS035) is attached to the tape (HBB007)
- Then the tube is wrapped in the required insulation thickness (usually four-layer)
- Finally, the isolation layers are again fixed with tape.

Step 2:

- The isolation position (FB0111AL) is fixed with tape (HBB007) under tension at the pipe.
- The isolation position is now spiralling to wrap around the pipe, taking care to ensure it that the film overlapped each
- The insulating tape should be installed location poking at position

Folie ↑



Step 3:

- Each next position should be wound in the opposite direction
- The tape end (FB0111AL) is again to fix with the heat-resistant tape (HBB007)
- When the pipe was wrapped with 4 layers insulation (FB0111AL), it is fixed with tape (HBB007) on the end panel



Step 4:

- Then the beginning and the end of the elastomer (HCS016) are coated to fixation with Vitri®Flex high temperature silicone (HCS003)
- The Vitri®Flex protection situation (HCS016) is now also spirally and at the same time remove the foil to wrap around the pipe
- The protecting situation (HCS016) should overlap at least 20 mm. The vulcanization starts at normal humidity and temperature.



Vitri[®] Flex - Do's and Don'ts

Do's:

- Do make sure pipes to be wrapped are clean, i.e. free from dust and oil or other contamination before fitting the insulation
- Do make sure any radiated heat on the outer layer, especially in close proximity to turbochargers, is minimised by the use of a heat shield or alternatively terminate the insulation at a suitable distance from the heat source.
- Do allow at least 10 - 15mm between the terminations of the insulation and the pipe flanges or couplings, pipe hangers etc. (to reduce the effect of radiated heat on the outer layer).
- Do minimise the temperature the outer layer is exposed to. Use at least 3 insulation layers for normal temperatures (up to 450C). Where the temperatures are higher than normal i.e. close to manifolds, use more insulation layers.
- Do make sure the polythene interleaving on the rolls of the elastomeric tape is removed before the tape is applied.

Don'ts:

- Do not allow the elastomeric outer layer to come into direct contact with the hot pipe.
- Do not use Vitri[®] Flex insulation over joints, couplings, flanges etc.
- Do not insulate over the elastomeric outer layer. (as this will greatly increase the temperature the material is exposed to).
- Do not expose the elastomeric outer layer to temperatures above 200C for extended periods and never above 300C. Always use sufficient insulation layers to achieve a cold face temperature of 150C in normal conditions.
- Do not use fastening systems on the isolated points of the pipe.
- Do contact customer service at Culimeta if you need any assistance: www.info@culimeta.de