

Exhaust Insulation Blanket

Technical Overview & Engineering Reference

This document provides engineering-oriented reference data and selection guidance for removable exhaust insulation blankets used on high-temperature exhaust components.

Quick Engineering Summary

- Thermal performance depends on insulation core material, thickness, exhaust geometry, and outer cover.
- Specify continuous operating temperature, target surface temperature, and available installation space.
- Select insulation core material first, then adjust thickness to meet thermal requirements.

1. Typical Operating Conditions

Parameter	Typical Range / Notes
Continuous Exhaust Temperature	500°C – 1000°C
Peak Temperature	Up to 1200°C
Thermal Cycling	Frequent
Vibration Level	Medium to High
Maintenance Access	Often required

2. Insulation Core Materials

Material	Continuous Temp	Notes
Fiberglass	≤ 550°C	Cost-effective for moderate temperature exhaust systems.
Basalt Fiber	≤ 750°C	Higher temperature capability and abrasion resistance.
Silica Fiber (High SiO ₂)	≤ 1000°C	Flexible; suitable for high vibration environments.
Ceramic Fiber	≤ 1260°C	Excellent thermal stability for turbo and industrial exhaust.
High-Silica Aerogel Composite	≤ 650–800°C	Low thermal conductivity; space-limited designs.

3. Surface Temperature Reduction Reference

Reference basis: typical uninsulated exhaust surface temperature of 600°C under steady-state operation. Values below are engineering reference ranges for comparison. Actual results depend on pipe OD, airflow, clearance, fastening tightness, and duty cycle. Options with a 0.1 mm embossed aluminum heat shield liner typically reduce outer surface temperature further by improving radiant heat reflection at the hot face.

Material	Thickness	Uninsulated Surface	Surface With Blanket
Fiberglass	6 mm	600°C	260-320°C
Fiberglass	10 mm	600°C	220-280°C
Fiberglass	20 mm	600°C	160-220°C
Basalt Fiber	6 mm	600°C	240-300°C
Basalt Fiber	10 mm	600°C	200-260°C
Basalt Fiber	20 mm	600°C	140-200°C
Silica Fiber (High SiO ₂)	6 mm	600°C	220-290°C
Silica Fiber (High SiO ₂)	10 mm	600°C	180-240°C
Silica Fiber (High SiO ₂)	20 mm	600°C	120-180°C
Ceramic Fiber	6 mm	600°C	210-280°C
Ceramic Fiber	10 mm	600°C	170-230°C
Ceramic Fiber	20 mm	600°C	110-170°C
High-Silica Aerogel Composite	6 mm	600°C	190-260°C
High-Silica Aerogel Composite	10 mm	600°C	140-200°C
High-Silica Aerogel Composite	20 mm	600°C	90-150°C
Ceramic Fiber + 0.1 mm Embossed Aluminum Heat Shield (liner)	10 mm	600°C	150-210°C
High-Silica Aerogel Composite + 0.1 mm Embossed Aluminum Heat Shield (liner)	10 mm	600°C	120-180°C
High-Silica Aerogel Composite + 0.1 mm Embossed Aluminum Heat Shield (liner)	20 mm	600°C	80-130°C

4. Engineering Selection Notes

- Select insulation material based on continuous temperature rather than peak temperature.
- Increase thickness to achieve lower target surface temperature.
- Ceramic or high-silica insulation is recommended for turbochargers.
- Choose outer cover based on abrasion, oil, and environmental exposure.

Reference Product Page

https://www.bstbraidedsleeve.com/custom-removable-exhaust-insulation-blanket_p172.html

Note: Surface temperature ranges shown are typical engineering references. For project specification or compliance, verify by testing under your operating conditions.