



# High Temperature Flexible Thermal Protection for Launchers

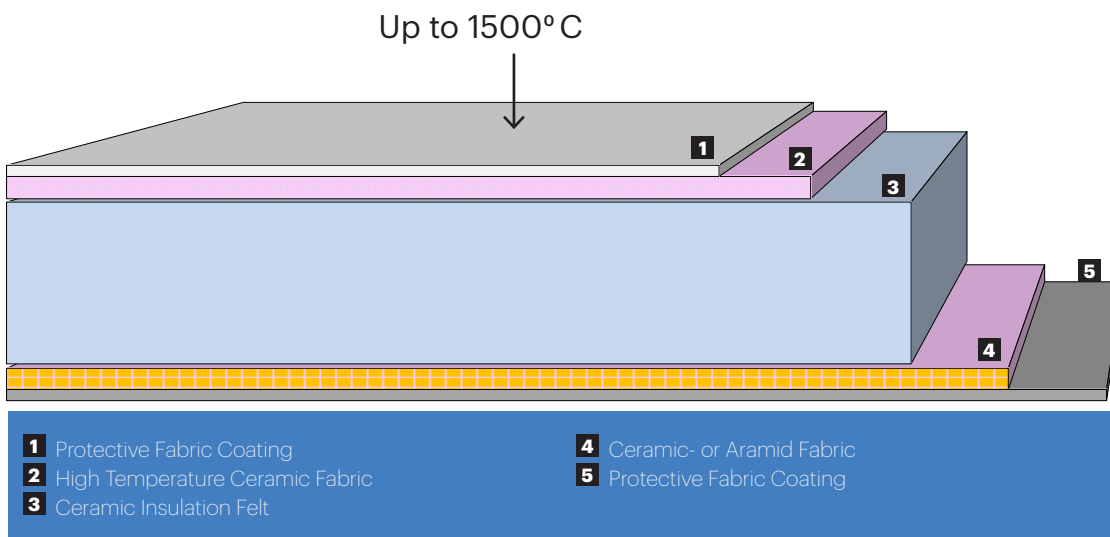
This insulation is the ideal choice for applications that need maximum mechanical flexibility in combination with a high thermal resistance.

- Thermally and mechanically tested up to 1500°C
- Extensive experience in manufacturing of thermal insulation including processes such as sewing or attaching metal parts and a variety of interfaces
- High flexibility in shape and performance leads to numerous possible applications in different environments
- Typical application in areas of high dynamic loads or dynamic relative movements between interfaces

## Key Features

- The core element of this insulation is a ceramic felt with adjustable performance through different thicknesses and densities.
- The felt surface is covered by a high temperature ceramic fabric with an application temperature 1500°C and above.
- The fabric can be covered with coatings which have protecting function (environmental, mechanical, ESD) during storage and integration of the insulation.
- Inner fabric layers are selected based on temperature and performance requirements from our stock of high performance Aramid-, glass- or ceramic fabrics.
- The product can literally be tailored to the respective application. This not only includes the geometry but also the thermal and mechanical performance is fully adjustable by combining different materials and thicknesses.

### Structure of High Temperature Flexible Thermal Insulation



## Specifications

- Excellent thermal insulation properties up to 1500°C
- Considerable mechanical performance even at highest temperatures
- Weight/density
  - Ceramic Felt for 1500°C = 100 – 130 kg/m<sup>3</sup>; e.g. for 13mm thickness = 1270 – 1650 g/m<sup>2</sup>
  - Ceramic Fabric for 1500°C = 510 g/m<sup>2</sup>
  - Aramid Fabric = 280 g/m<sup>2</sup>
  - Protective Coating (depending on type) = 30 – 120 g/m<sup>2</sup>
- Protective fabric coating, available with emphasis on
  - High flexibility (Polyurethane or Silicone)
  - Electrical conductivity/ESD (Aluminum coated PET foil)

Ceramic Insulation		Thermal Conductivity [W/(mK)] at		
Material	Thickness [mm]	25°C	750°C	1500°C
Felt	13	0,04	0,18	0,33
Felt-Fabric compound	14	0,04	0,16	0,33