

CC-Max® 4 HP Substrate Support Mat

CC-Max® 4 HP mat is a revolutionary non-intumescent material specifically developed by Unifrax Corporation for mechanical support of ceramic substrates used in catalytic converters. As a manufacturer of fibers used in a variety of catalytic converter mounting systems, Unifrax has successfully utilized furnacing expertise and state-of-the-art processing technology to produce a unique non-intumescent mat product with superior performance properties.

Developed to address concerns with mounting fragile ultra-thin wall substrates, CC-Max 4 HP is engineered to provide controlled holding force to eliminate any substrate movement caused by exhaust gas pressure or axial acceleration.

Prior to the development of CC-Max 4 HP mat, nonintumescent support mats were manufactured from high alumina fiber produced via the sol-gel manufacturing process. These sol-gel fibers were believed to be the key to maintaining sufficient substrate holding force for such non-intumescent mat mount systems. Unifrax has successfully developed a high-performance fiber utilizing melt fiberization technology. CC-Max 4 HP mat is produced when the proprietary fiber is converted into a flexible felt-like product.

The material is thermally stable and engineered to maintain a controlled holding force on the substrate across a wide temperature range from ambient to 1250 °C (inlet gas temperature).

CC-Max 4 HP may also be used in applications which challenge the temperature limits of vermiculite-based mat systems. In many applications, exhaust gas temperatures may not be high enough to activate the vermiculite and provide sufficient holding force for the substrate. The springlike fiber matrix of CC-Max 4 HP provides constant pressure on the substrate at temperatures well below the expansion point of vermiculite systems. Similarly, as a result of the product's unique properties, CC-Max 4 HP maintains its resiliency and substrate support at elevated temperatures when intumescent systems begin to lose function.

CC-Max® 4 HP Substrate Support Mat

CC-Max 4 HP mat is typically installed at less than one-half the gap bulk density of a typical intumescent system.

Because CC-Max 4 HP mat is produced without fillers or expansion agents, its fiber composition serves as an excellent thermal insulator. In some applications, CC-Max 4 HP mat can be installed at a smaller gap than intumescent products while continuing to maintain critical holding force and gas-tight seal.

Applications

Ultra-Thin Wall Substrates

To meet Regulatory demands for faster light-off and reduced emissions, substrate technology is being directed toward thinner walls, increased cell density and lower substrate mass. These fragile substrate cores require support systems with carefully controlled expansion.

Preconverters

In Precat or manifold converters, where high temperature and vibration are the norm, CC-Max 4 HP mat mount system maintains its resiliency and holding force while providing superior erosion resistance.

Isothermal Converters

Motorcycle converters or converters requiring heat shielding due to confined space or locality to critical engine components often exhibit high-temperature isothermal conditions. Such designs often result in average mat temperatures beyond the use limits of vermiculite-based mats and will require non-intumescent materials like CC-Max 4 HP for monolith support.

Diesel Converters/Diesel Filters

Diesel converter and filter applications both require holding force at low temperatures. Diesel particulate filters also require mat mount system with excellent thermal stability necessary to provide holding force when the filters are regenerated at higher temperatures. CC-Max 4 HP mat combines low-temperature holding force with hightemperature stability.

Unifrax Corporation provides full engineering services to review your design. This service features thermal and mechanical analysis as well as a final design recommendation for your application. For more information regarding

CC-Max 4 HP mat, contact the Unifrax Automotive Application Engineering Department at (716) 278-3983 or Email us at: aecoordinator@unifrax.com.

Canning Performance

CC-Max 4 HP support mat is typically installed at a nominal gap bulk density (GBD) of 0.4. GBD range is a function of the application but typically falls between 0.30 and 0.70. The compressive force of CC-Max 4 HP versus GBD is shown in Figure 2. Pmax is the maximum pressure measured during canning of the converter. Pres is the residual pressure measured five minutes after canning.

Erosion Durability

The durability of a catalytic converter support material is of major importance to long-term converter efficiency and integrity. Mat erosion is most often the result of low mat pressure caused by the inability of a design to maintain targeted GBD. A design is unable to maintain GBD either due to shell spring deformation or when the temperature of the converter causes shell expansion to be too great for the mat to absorb. Pulsating exhaust gases then attack and erode the unsupported mat, resulting in bypass and a decrease in converter efficiency. The data provided in Figure 3 was generated at Unifrax in a test apparatus

which simulates a 4-cylinder engine running at 6000 rpm. Erosion loss is calculated by measuring the volume loss of support mat material. The lower the measured volume loss, the higher the resistance of the mat to erosion.

Unifrax CC-Max 4 HP has superior erosion resistance when compared with other traditional intumescent mats currently commercially available to the automotive market.

Unifrax is a worldwide sales and service organization with several international locations and representatives. Please take advantage of our application engineering services and technical exchange programs. For additional information regarding CC-Max 4 HP or any of our catalytic support mats, please contact us at our corporate headquarters.

Data are average results of tests conducted under standard procedures and are subject to variation. Results should not be used for specification purposes.

Refer to the product Material Safety Data Sheet (MSDS) for recommended work practices and other safety information.



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