

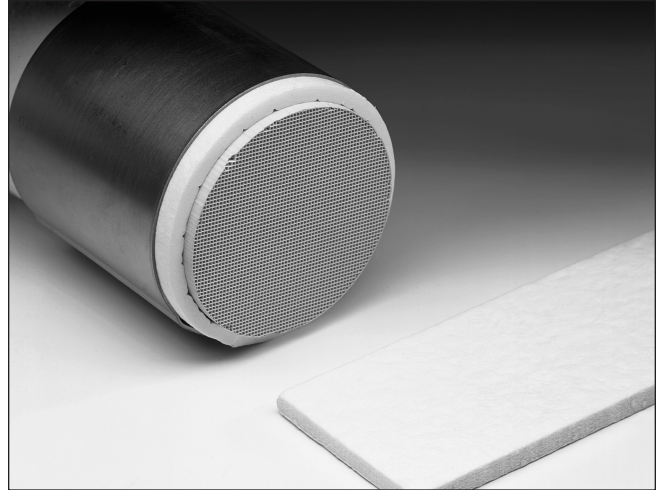
## CC-Max<sup>®</sup> 4 HP Substrate Support Mat

CC-Max<sup>®</sup> 4 HP mat is a revolutionary non-intumescent material specifically developed by Unifrax 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.

Prior to the development of CC-Max 4 HP mat, non-intumescent 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 traditional vermiculite-based mat systems, such as diesel oxidation catalyst and particulate filters. In many applications, exhaust gas temperatures may not be high enough to activate the vermiculite and provide sufficient holding force for the substrate. The spring-like 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.



### Product Availability

Basis Weight	Nominal Thickness*	Nominal Installed Gap
(g/m <sup>2</sup> )	mm	mm
1200	6.8	3.0
1600	9.0	4.0
2400	13.6	6.0

\*Thickness measured @ 0.725 kPa.

### Typical Properties

Thermal Conductivity at 650°C*	0.13 W/mK
Loss on Ignition	5.5% (min)
Tensile Strength	100.0 kPa (min)

\*ASTM C177

### Chemical Composition

Fiberfrax <sup>®</sup> Fibers	94.0%	±2.0%
Binder System	6.5%	+1.5/-2.5%

## Canning Performance

CC-Max 4 HP is typically installed at a nominal gap bulk density (GBD) of 0.40 g/cm<sup>3</sup>. The room temperature compression behavior of CC-Max 4 HP is shown in Figure 1. The GBD range for each specific application will be defined according to the requirements for holding force and substrate strength. Unifrax provides a global network of application engineering services and will provide you with a support mat recommendation for your specific converter design.

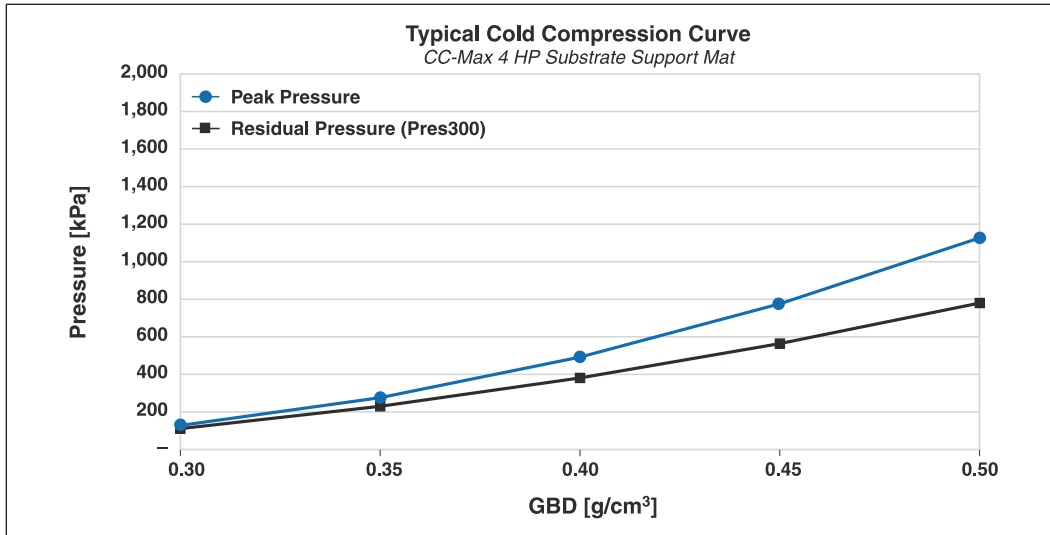


Figure 1: Typical cold compression curve for CC-Max 4 HP support mat.

## Erosion Resistance

Support mat erosion may occur as a result of improper support mat installation or due to lack of holding force of the fiber matrix. Different types of support mat are more susceptible to erosion than others. CC-Max 4 HP can be properly designed in order to present a low erosion profile. Figure 2 presents comparative erosion loss for CC-Max 4 HP and a sol-gel non-intumescent mat as a function of GBD.

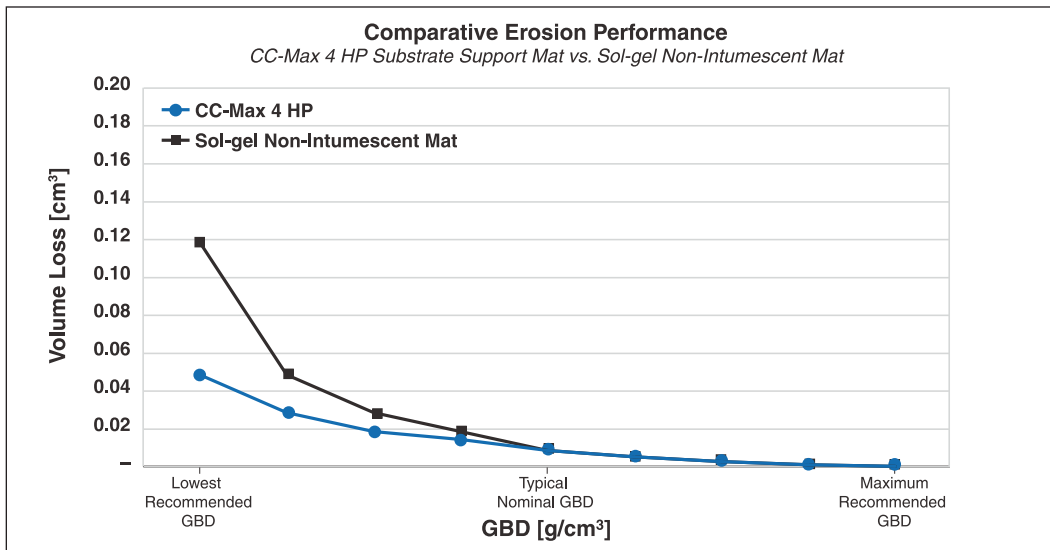


Figure 2: Comparative erosion data for CC-Max 4 HP.

## Support Mat Aging Performance – Typical Curve For CC-Max 4 HP

CC-Max 4 HP is designed to present robust performance at operating temperatures above 1000°C. Figure 3 presents a typical aged mat performance curve for CC-Max 4 HP as a function of temperature. Factors such as design nominal gap and thermal shell expansion also influence support mat performance. Please contact our Application Engineering Department for additional information regarding the performance of CC-Max 4 HP under specific operating conditions.

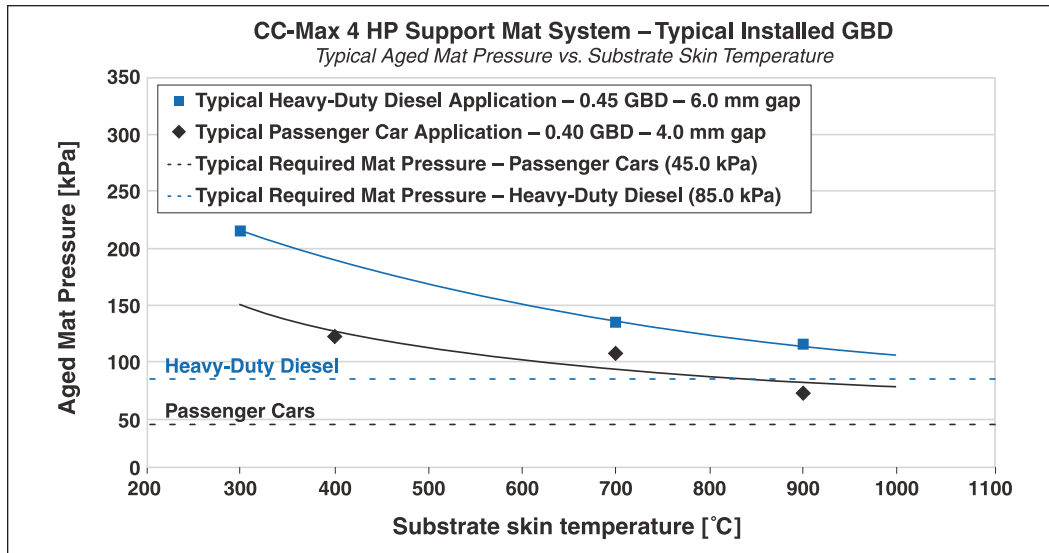


Figure 3: Typical aged mat pressure for CC-Max 4 HP as a function of temperature.

## Worldwide Technical Support

Unifrax is a worldwide sales and service organization with several international locations and representatives. The services that we provide include thermal modeling, system design engineering assistance, and failure analysis as well as technical exchange programs. For additional information regarding CC-Max 4 HP or any of our catalytic support mats, please contact the Unifrax Emission Control Application Engineering Department at 716-768-6461 or [aecoordinator@unifrax.com](mailto:aecoordinator@unifrax.com).

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 Safety Data Sheet (SDS) for recommended work practices and other product safety information.

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Form C-3088-1  
Effective 11/14  
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