

XPE®-MP Substrate Support Mat

Introduction

XPE®-MP is a multipurpose, third-generation support mat system developed by Unifrax specifically for mechanical support and insulation of ceramic substrates used in diesel and gasoline emission control devices.

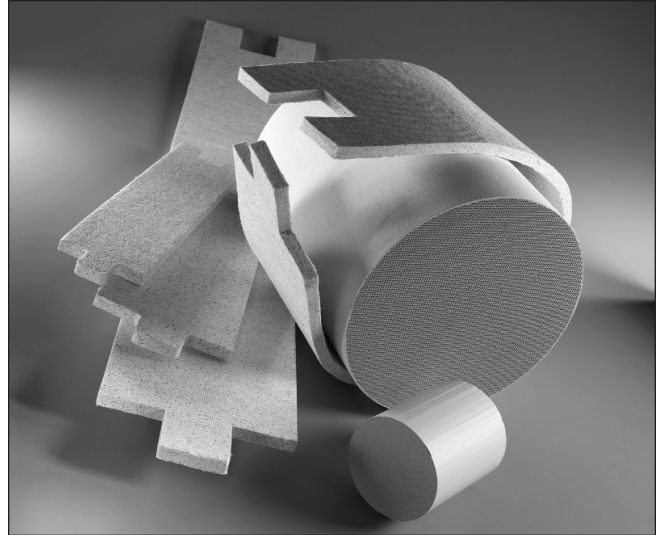
This revolutionary product combines the unique performance characteristics of both non-intumescent and vermiculite-based mats in the same product.

At low operating temperatures (less than 350°C), the product will behave as a non-intumescent mat, relying on its spring-like ceramic fiber matrix to provide the holding force required for the system. At temperatures above 350°C, a second feature of the product is activated. Small amounts of vermiculite particles within the fiber matrix compensate for thermal gap expansion of the shell, thus providing additional holding force to the ceramic substrate.

As a result, XPE-MP is an ideal solution for a wide range of emission control devices, including large diesel oxidation catalysts (DOC), diesel particulate filters (DPF), selective catalyst reduction units (SCR) as well as gasoline oxidation catalysts, including E-85 underbody converters.

Support mat long-term durability is one of the critical issues involved in assuring a robust design for high-efficiency emission control systems. A variety of mechanisms are currently available to improve long-term cold holding performance and erosion resistance, but they may add extra production steps and cost to the system.

XPE-MP has been designed to provide robust performance without the need for wire mesh ring protection (for erosion) or heat treatment for additional holding force at low temperatures.



Product Availability

Basis Weight	Nominal Thickness*	Nominal Installed Gap
(g/m ²)	mm	mm
2400	8.8	4.0
3600	13.2	6.0

*Thickness measured @ 0.725 kPa.

Typical Properties

Thermal Conductivity at 650°C*	0.12 W/mK
Loss on Ignition	6.5% (min)
Tensile Strength	100.0 kPa (min)

*Thermal conductivity measured through resistive thermal exposure testing. Reference SAE Paper 2007-01-0471.

Typical Chemical Composition

Fiberfrax® Fibers	65.0%	±5.0%
Vermiculite	26.0%	±5.0%
Binder Content	7.5%	±2.5%

Canning Performance

XPE-MP is typically installed at a nominal gap bulk density (GBD) of 0.60 g/cm³. The room temperature compression behavior of XPE-MP 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.

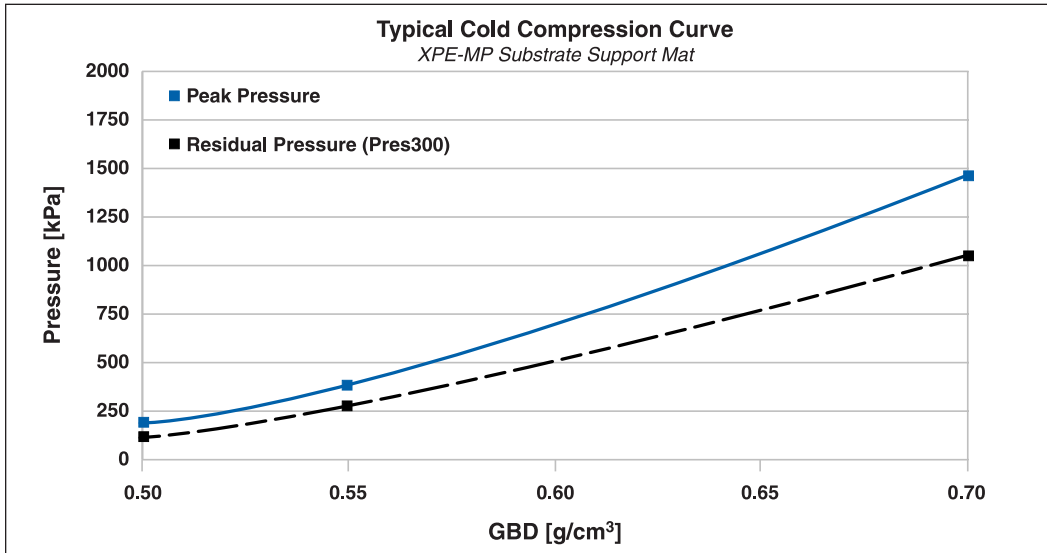


Figure 1: Typical Cold Compression Curve for XPE-MP support mat.

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. XPE-MP has been designed specifically to present a low erosion profile. Figure 3 presents comparative erosion loss for different support mat types as a function of GBD.

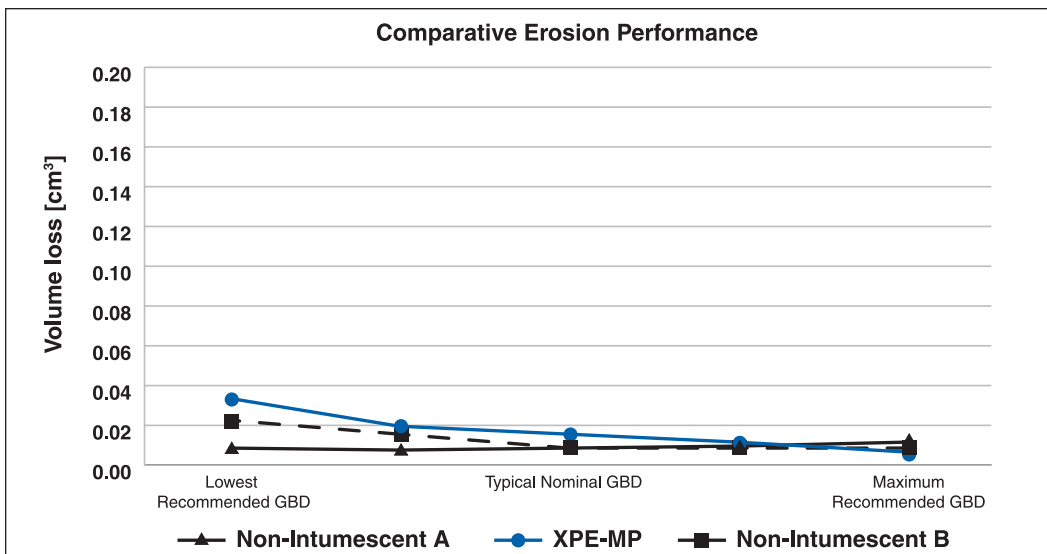


Figure 2: Comparative erosion data for XPE-MP.



Superior Holding Force

XPE-MP combines the performance advantages of both intumescent and non-intumescent mats. The final result is a superior holding force over a broad temperature range. Figures 3 and 4 present the aged mat pressure of XPE-MP when installed at its nominal GBD.

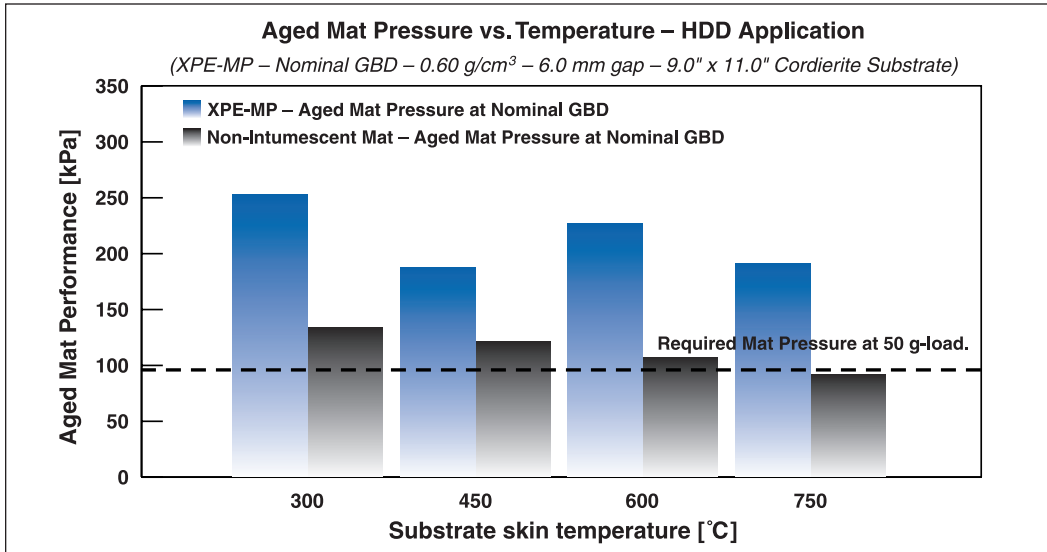


Figure 3.

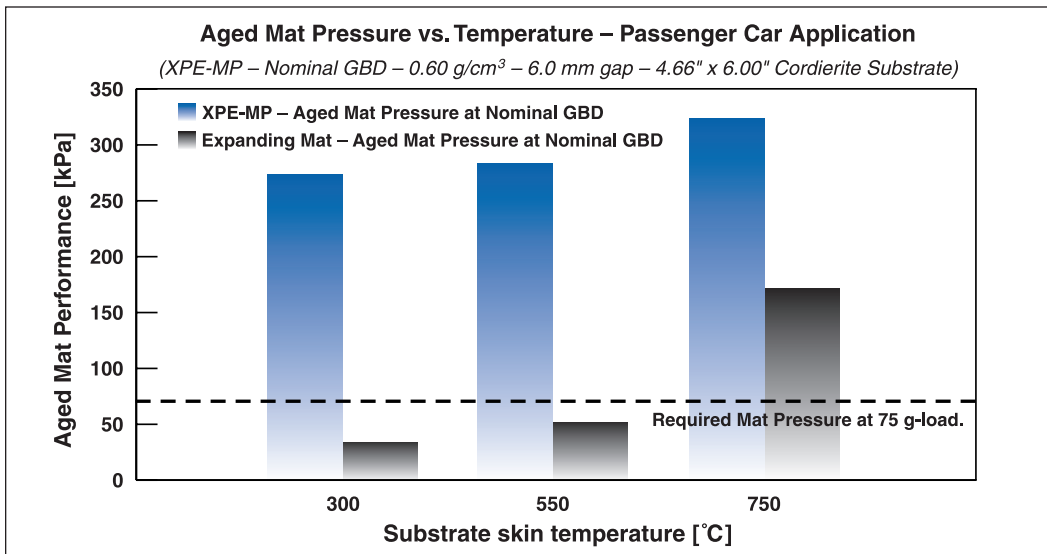


Figure 4.

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 XPE-MP or any of our catalytic support mats, please contact the Unifrax Automotive Application Engineering Department at 716-278-3983.

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

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



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