

CC-Max[®] 6 Substrate Support Mat

Maximum Performance

Unifrax Corporation has recently announced the development of CC-Max[®] 6, a revolutionary non-intumescent material specifically developed for mechanical support of ceramic substrates used in catalytic converters. CC-Max 6 catalytic converter support mat has been engineered for superior low-temperature performance and is targeted for applications which challenge the lower temperature limit of vermiculite-based intumescent mat systems. Such applications include diesel and turbo-diesel as well as any application which may result in cold converter conditions.

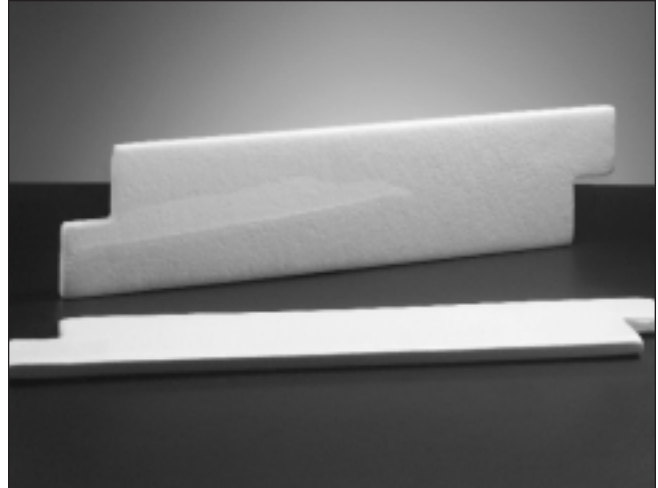
Prior to the development of CC-Max 6 catalytic converter support mat, non-intumescent support mats were manufactured from high-alumina fiber produced via the sol-gel manufacturing process. Sol-gel fibers were believed to be the key to maintaining sufficient substrate holding force for such systems. However, one drawback to these systems is that these fibers are costly to produce and result in premium-priced mat mounting systems.

As a manufacturer of fibers used in a variety of catalytic converter mounting systems, Unifrax has successfully combined fiber-making expertise with a state-of-the-art paper manufacturing process to maximize the performance of CC-Max 6. Utilizing fibers produced with melt fiberization technology, Unifrax has developed a flexible resilient support mat in CC-Max 6. CC-Max 6 catalytic converter support mat is thermally stable to 400°C average mat temperature. The mat is engineered to maintain a constant holding force on a substrate across a wide temperature range from ambient to 650°C (inlet gas temperature). The felt-like mat is installed at approximately one half the GBD of a traditional intumescent support system yet offers superior erosion resistance.

Applications

Diesel Converters

In many low-temperature applications, inlet gas temperature may not be sufficient to activate the vermiculite and provide sufficient holding force for the substrate. Since CC-Max 6 support mat is non-intumescent, its in-service performance is not dependent on vermiculite expansion to maintain constant pressure on the substrate.



Independent Testing

CC-Max 6 support mat has been evaluated by an independent test facility and was proven to be a durable substrate mount system. The product performance test matrix included a 100-hour cool shake at 150°C inlet temperature and 75g converter shake force as well as a 100-hour hot shake test at 700°C inlet temperature and 75g converter shake force.

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. Contact the Unifrax Automotive Application Engineering Department at (716) 278-3800 for more information regarding CC-Max 6 support mat.

Typical Properties

Basis Weight (g/m ²):	1600, 2150, 2565
Density:	0.23g/cm ³
LOI:	less than 6%
Temperature limit:	650°C

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

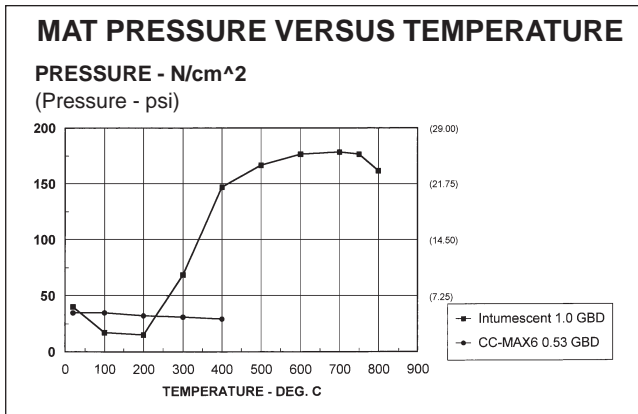


Figure 1. Expansion Pressure versus Temperature.

Thermal Performance

CC-Max 6 support mat exhibits constant pressure over a broad range of temperatures as shown in Figure 1.

XPE® expanding mat is also shown for comparison.

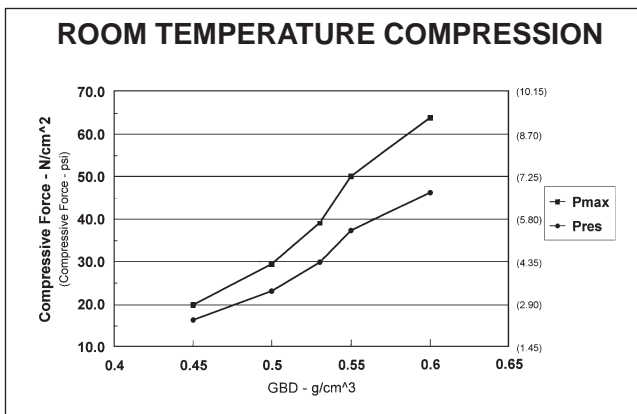


Figure 2. Compression Force versus Installed Density.

Canning Performance

CC-Max 6 support mat is typically installed at a nominal gap bulk density (GBD) of 0.50-0.55 which is approximately one half the typical GBD of an intumescent system. The compressive force exerted by CC-Max 6 support mat is shown in Figure 2. P_{MAX} is the maximum pressure measured during canning of the converter. P_{RES} is the residual pressure measured five minutes after canning.

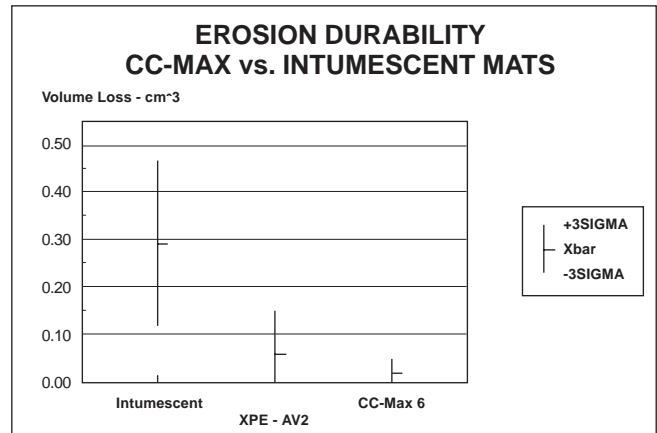


Figure 3. Erosion Durability measured as volume loss.

Erosion Durability

The durability of catalytic converter support materials is of major importance to long-term converter efficiency and integrity. Exhaust gas erosion through the mat will result in exhaust gases bypassing the substrate and a loss in converter efficiency. After a period of time, the mat will no longer be able to support the substrate and a complete mechanical failure of the system will occur. 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.

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