NoVibeHeat®

Innovative Brake Shim Materials

low noise low heat low emission

Omnia® advanced materials

Superior NVH Performance
with tailor-made features

Omnia
advanced materials

OUR COMPANY

OMNIA Advanced Materials is a privately owned company founded in Italy in the 1950s operating in Alife, Italy, and Beaver Falls, NY.

We custom design and manufacture wet-laid, fiber-based solutions for industrial product applications.

Our materials have a long history of proven results in high-performance and demanding applications across numerous industries.

Our worldwide presence has allowed us to comprehensively understand industrial needs for decades.

LOYALTY IS OUR PROMISE.

If we say it, we do it.

Our culture is built on respect for people, the environment, promises, and achievements. Since starting our business, we have considered our people and partners part of our family. We recognize that our greatest strength has always come from the people who choose to share their time and talents in helping Omnia grow into a larger family.

We will remain focused on the sustainable aspects of our natural resources, social well-being, and awareness among all our people and their families for generations to come.

Certifications

ISO 9001 certification, and **IATF** ongoing certification, assure rigorous testing for consistent quality with each and every production lot.

ESG (Environmentally Sustainable Company Governance)

Our certification **ISO 14001** demonstrates our commitment and attention to environmental protection.

Our investments and know-how are constantly oriented toward lowering Omnia's environmental impact and improving our process solutions.

Our products are in REACH compliance, and we are proud of our achievements in creating products with evolved performance standards, all **without any presence of SVCH substances**.

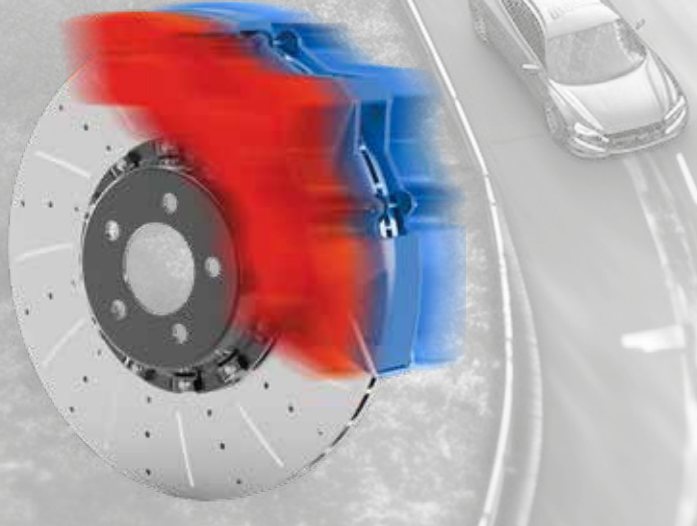
Technology Meets Features and Design

Omnia Advanced Materials™ introduces its innovative multi-patented NoVibeHeat ® technologies.

NoVibeHeat® shim material is an advanced material composite containing NBR latex, optionally laminated on a carrier made of metal or inorganic fibers.

NoVibeHeat® multi patent process technology allows enhanced noise/vibration & Heat absorption (which minimizes the potential for overboiling in brake fluid circuits), compared to traditional shim technology.

NoVibeHeat® shims are differentiated by innovative features such as a green manufacturing process (100% VOC Free) and unlimited complimentary customizable designs – including **Pantone colors, coating, and trademarking**.



Currently, NoVibeHeat® is available in three options:

Good	Better	Best
coreBEAT	coreWEB	coreTECH

Corebeat

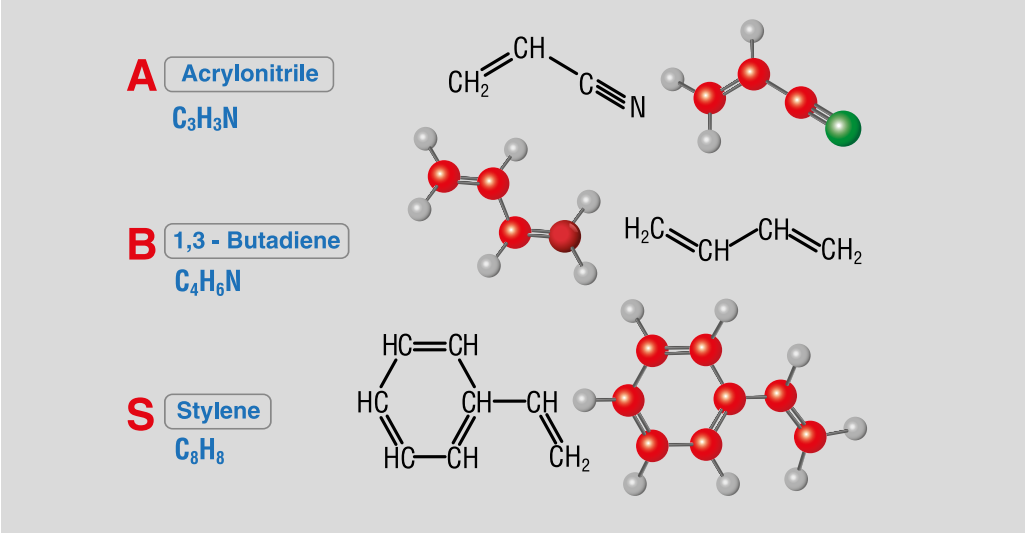
The material is produced from a selection of NBR rubber composite and a flexible fiber carrier with exceptional flexibility within the shim material. It offers excellent damping and resistance to high brake temperatures. CoreBeat also delivers budget-friendly performance results for NOT OVER designed applications. It can be combined with other shims as a stacked application where maximum damping is required.

CoreBeat damping is achieved by the fiber materials' ability to generate inner friction work and rubber deformation. Whereas rubber generally causes damping by only deformation.

Rubber

Various rubber compounds are built out of molecular chains. These molecular chains interlink into a loose mesh, thus allowing the material to easily deform under load and spring back ideally to its original shape when the load is released.

The inner work of the material may express this deformation as a spring-back effect. This inner work converts excitation energy into heat. Therfore, energy conversion generates damping.



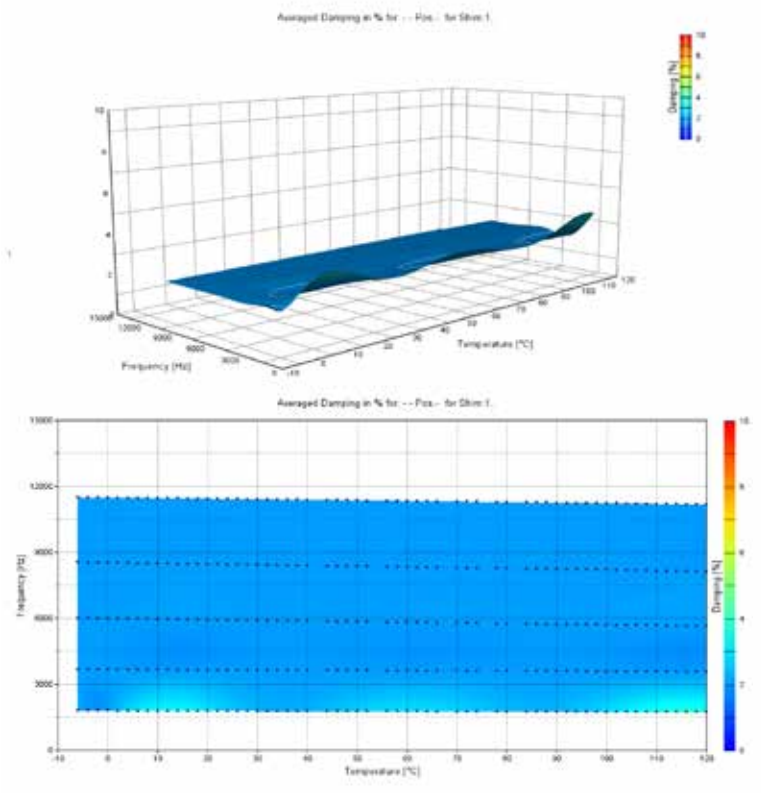
Fibers

Within a bundle of fibers, the majority of inner work can be expressed by the friction between the single fiber strains when deforming the bundle. Again, excitation energy is converted into heat increasing the damping effect.

Since CoreBeat uses both fibers and rubber, the resulting damping is a combination of both effects.

coreBEAT

SAE J3001 / EKB 1101 - Shim Damping



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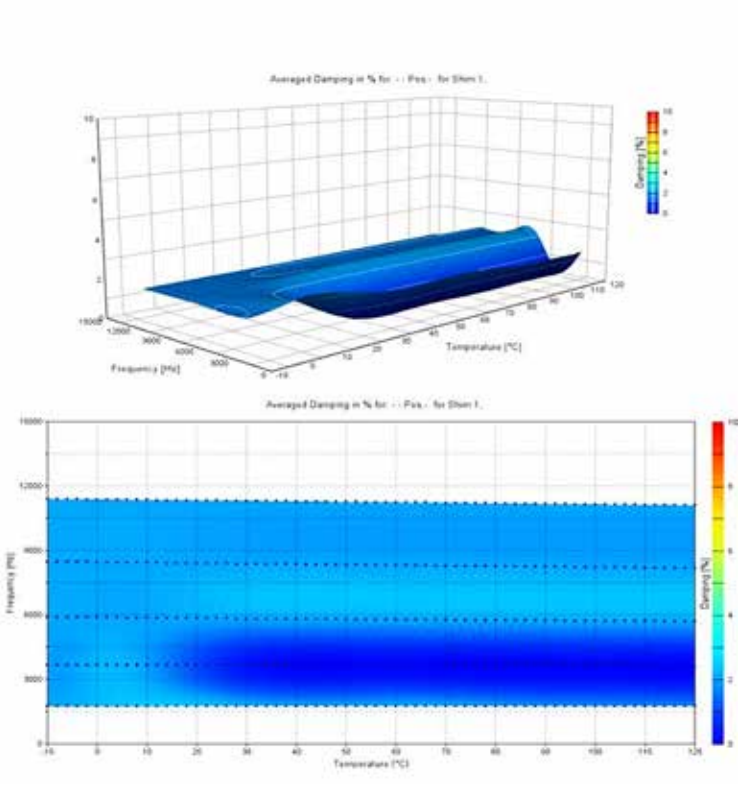
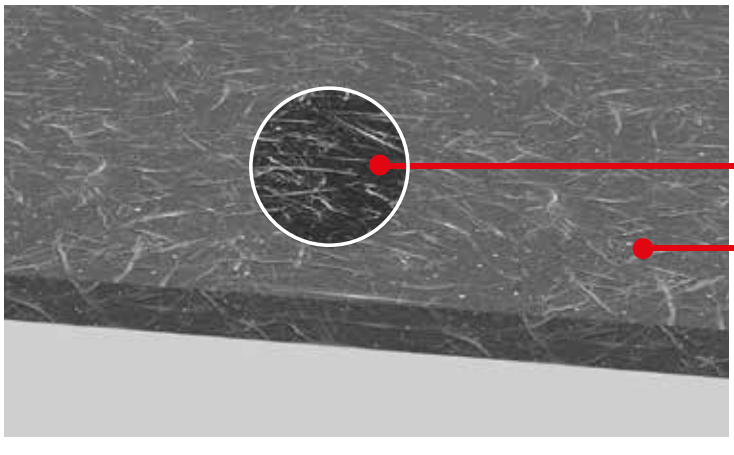
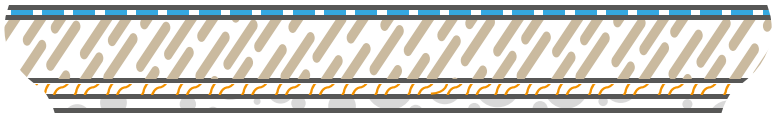


Core Beat



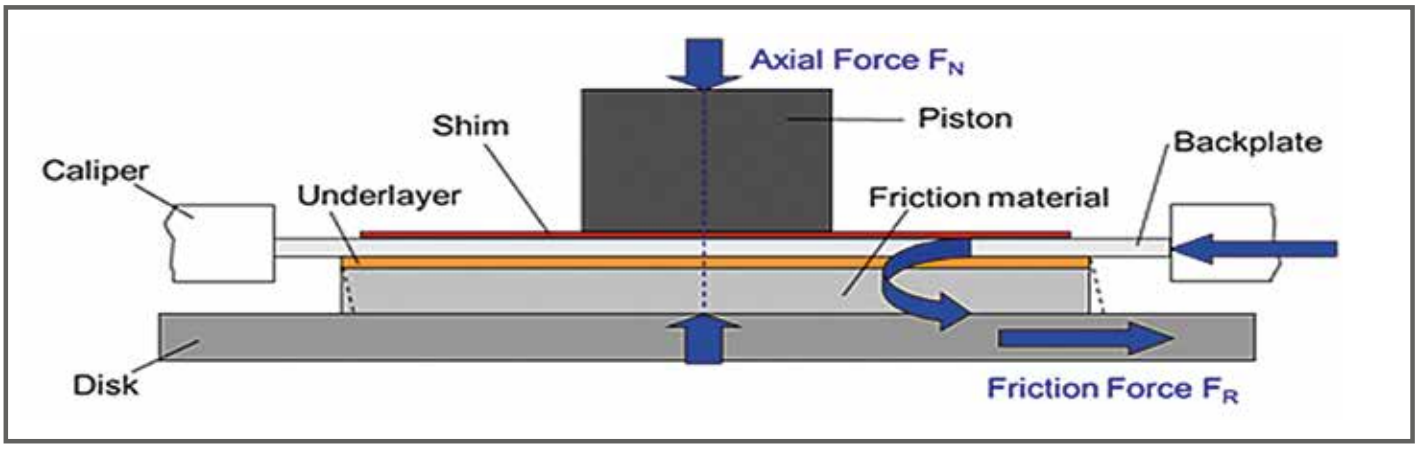


- Coating PTFE
- NBR Composite
- Acrylic Adesive
- Release Paper Protections

coreWEB

Patent pending

Multilayer NBR composite, reinforced with synthetic/metallic woven structure at its core. The steel layer generally used in brake pad shims, typically serves both as a carrier for the rubber (main dampening function) and adds strength to the product.



Where the piston creates a normal force in the Z-direction, the friction force is in the radial (XY) direction. Furthermore, shim steel will have elastic deformation only due to external forces. The different external forces usually applied to a shim are:

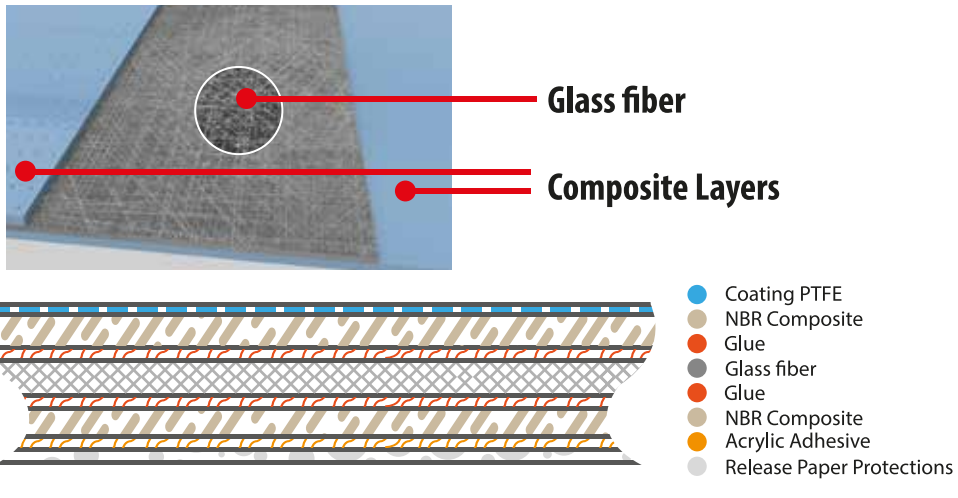
- Piston (Force z, x and y)
- Frictional force related to elongation
- Temperature

The effect of the radial frictional force (XY) and temperature is **100 times higher** than the deformation due to the compression force Fz.

Therefore, any replacement material to this steel carrier needs to provide sufficient stability in the XY-direction and equal or better rubber bonding properties to prevent rubber squeeze out and thus the destruction of the shim.

Furthermore, metal shims are sensitive to temperature and corrosion. Consequently deformation/deterioration could impact the N.V.H. damping functions.

Core Web provides a new patented approach of semi-flexible shim materials that offers the best of both worlds, CoreBeat and Core Tech – High stability, low thermal conductivity, no or low corrosion, and excellent NVH properties.



coreWEB

ISO 9227 / EKB 1102 – Accelerated Corrosion - Salt Spray Test

Pre Corrosion

O. E.

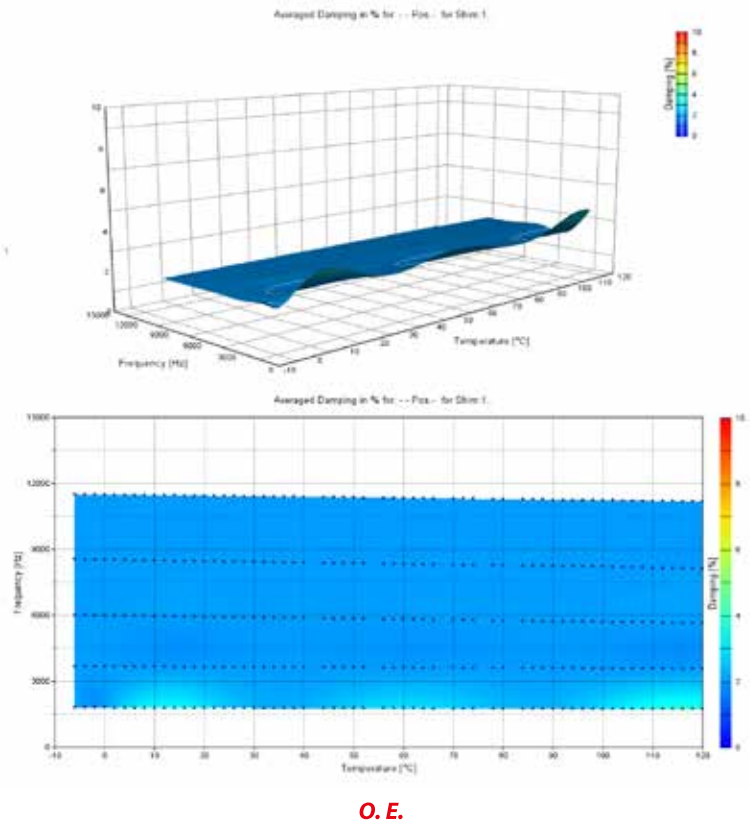
Post Corrosion

Pre Corrosion

Core Web

Post Corrosion

SAE J3001 / EKB 1101 - Shim Damping



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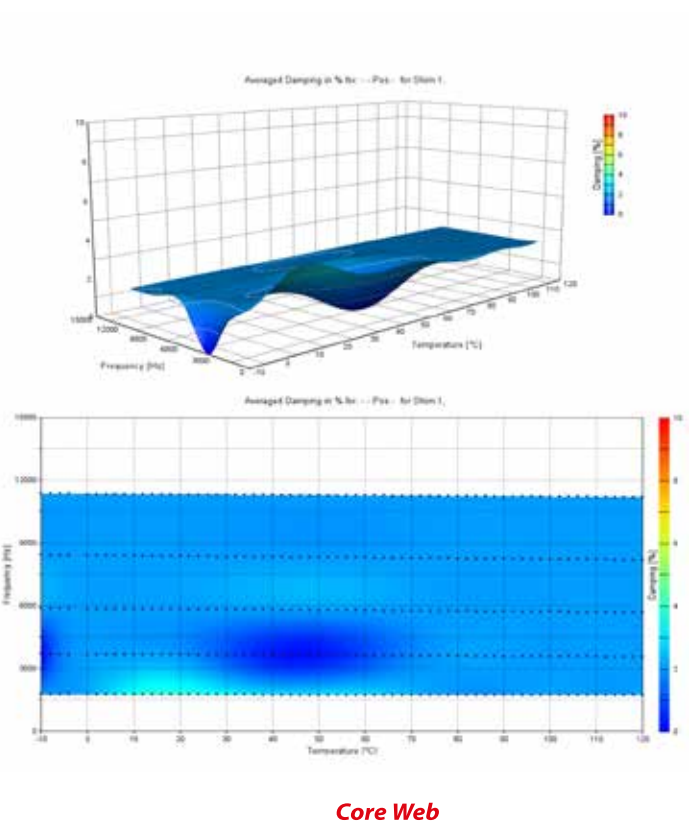


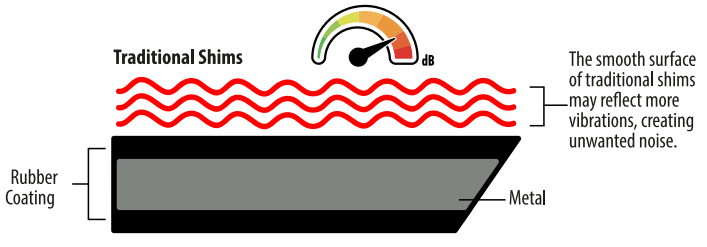
Core Web

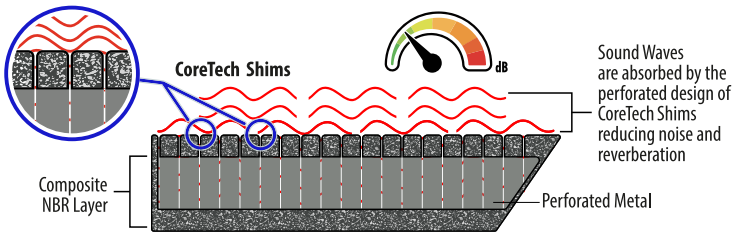
coreTECH

Patent : WO 2021/234533 A1

CoreTech shims stand to disrupt the status quo, offering a quieter, safer, greener alternative with unmatched design flexibility to meet broader performance criteria.

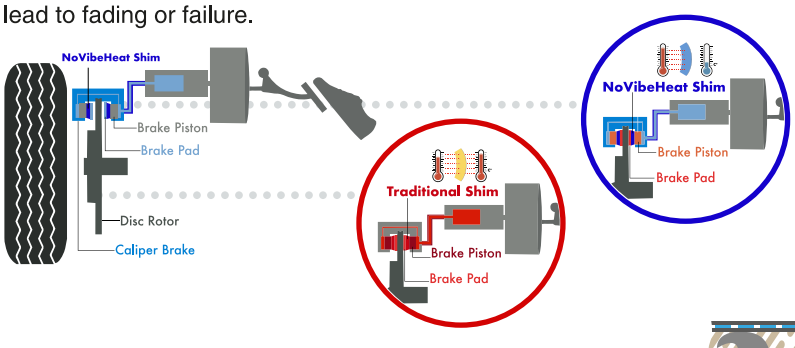
Noise Dampening Perforated Surface





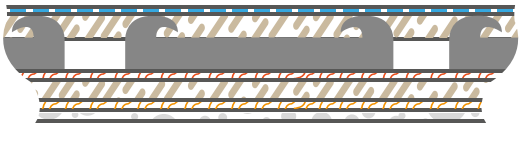
Heat shielding - Thermal Layer Design

Of the approximate six million accidents per year in the USA, brake failure**contributes to roughly 22%** of all mechanical related factors. CoreTech shims deliver a significant technological advantage by providing superior thermal barrier properties that prevent wet point brake fluid boiling that could lead to fading or failure.



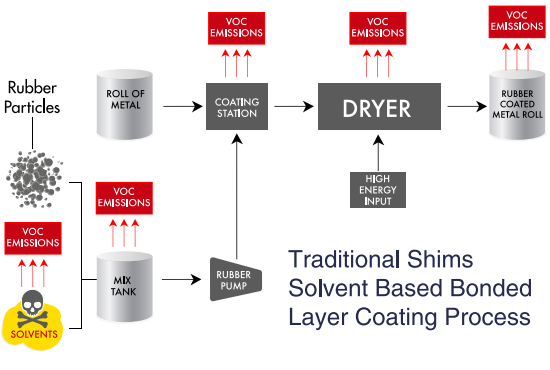
AT A GLANCE - coreTECH

	Traditional Shims	CoreTech
Noise Dampening	Standard	High
Thermal Resistance	Low	Superior
Enviromentally Friendly	Toxic Solvents Requiered	100% Solvent Free
Design Flexibility	Limited	Superior



- Coating PTFE
- NBR Composite
- Perforated Steel
- Glue
- NBR Composite
- Acrylic Adhesive
- Release Paper Protections

Green Manufacturing - 100% VOC Free



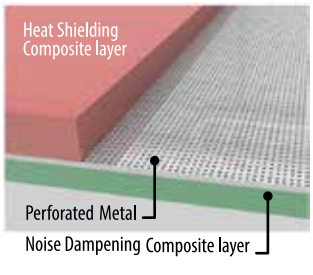
Traditional Shims
Solvent Based Bonded
Layer Coating Process

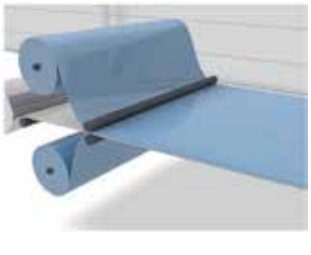
coreTECH **Shims** A 100% VOC Free Manufacturing Process

CoreTech is produced using a patented environmentally friendly process that eliminates 100% of solvents and consumes a fraction of the energy required to produce traditional bonded layers of solvent coated NBR rubber shim materials.

A Multilayer Innovative Design NoVibeHeat®

Composed of two layers of advanced material composite bound with NBR a metal perfored sheet.





coreTECH shims feature an innovative, perforated noise dampening, heat-shielding design, and a green manufacturing process while offering unlimited design flexibility.

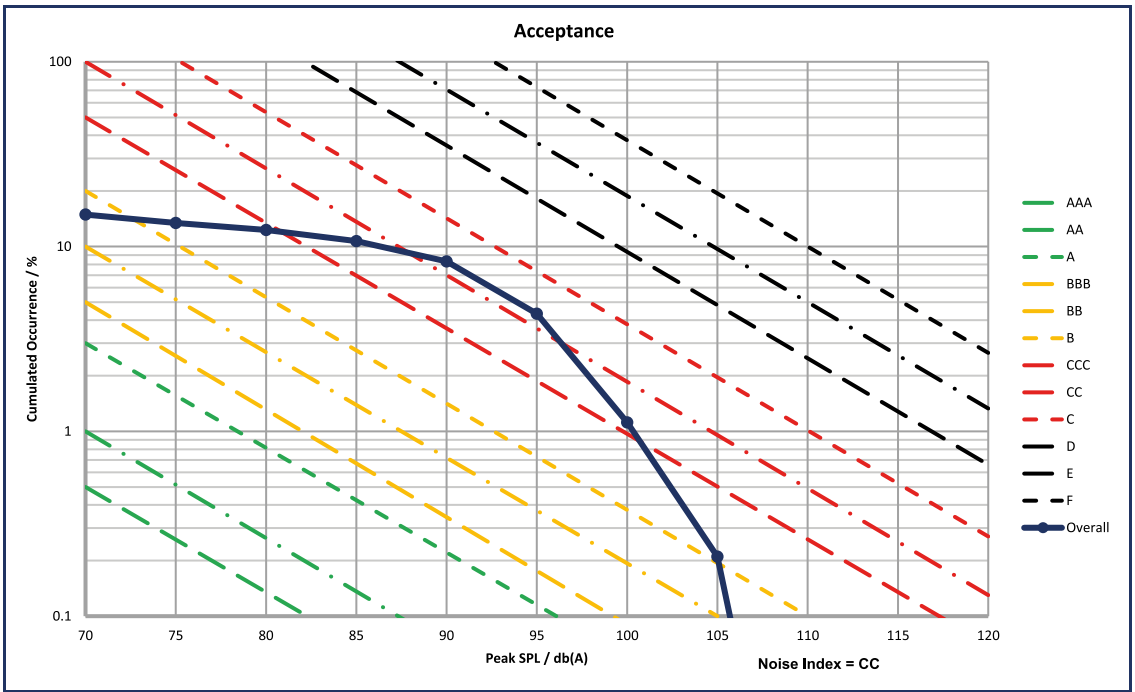
Omnia advanced materials

SAE J2521 – Disc and Drum Brake Dynamometer Squeal Noise Test

Test Request #: 190453-03

LINK

Customer Ref: C-0591



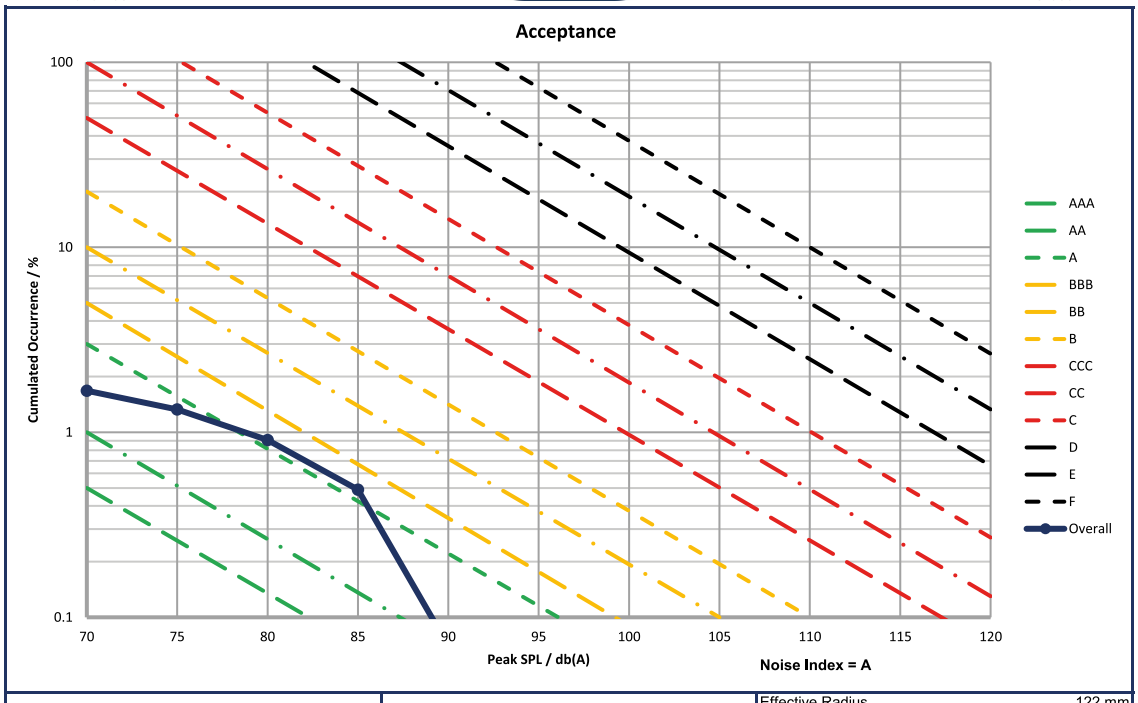
Test Description: D840 SAE J2521 2013 1-18	Rotor	073404	Effective Radius	122 mm
	Primary Lining	073385	Piston Diameter	1 x 57 mm
	Secondary Lining	073386	Actual Inertia	67.76 kg·m²
			Actual Wheel Load	719.4 kg
			Rolling Radius	307 mm

O. E.

Test Request #: 220462-03

LINK

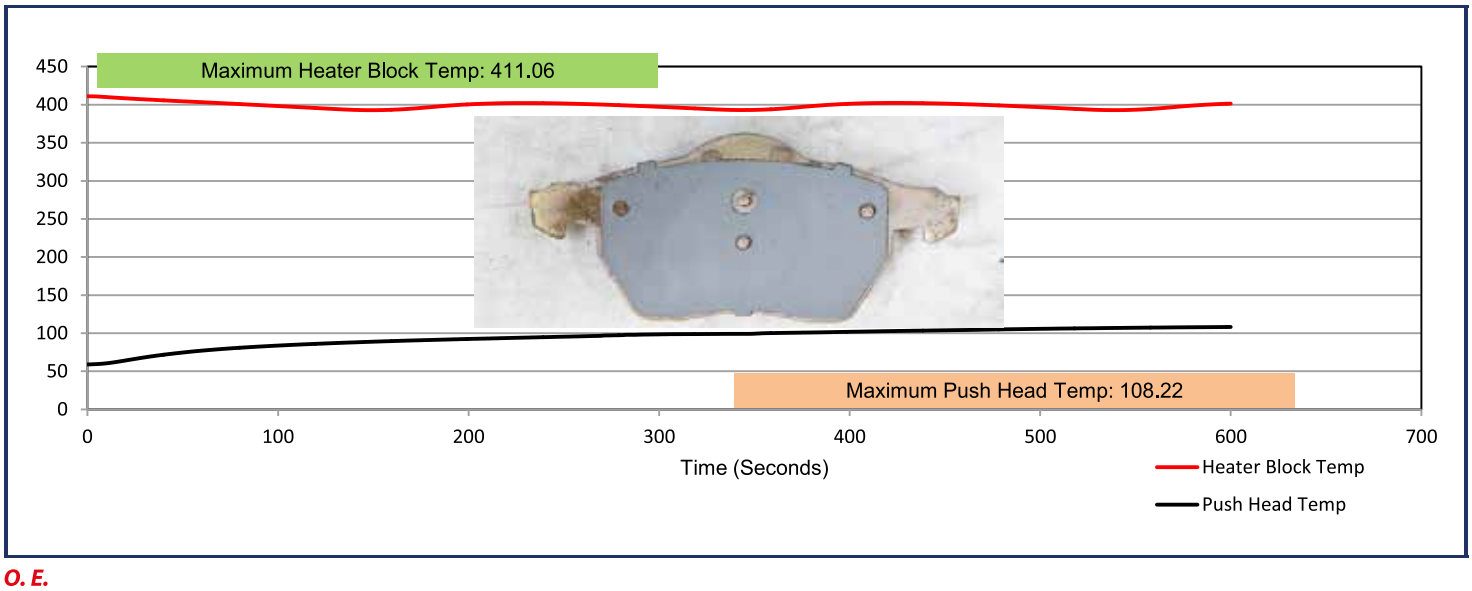
Customer Ref: C-0591



Test Description: D840 SAE J2521 2013 1-18	Rotor	100151	Effective Radius	122 mm
	Primary Lining	100145	Piston Diameter	1 x 57 mm
	Secondary Lining	100146	Actual Inertia	67.756 kg·m²
			Actual Wheel Load	719.4 kg
			Rolling Radius	307 mm

Core Tech

ISO 6310 - Hot Test



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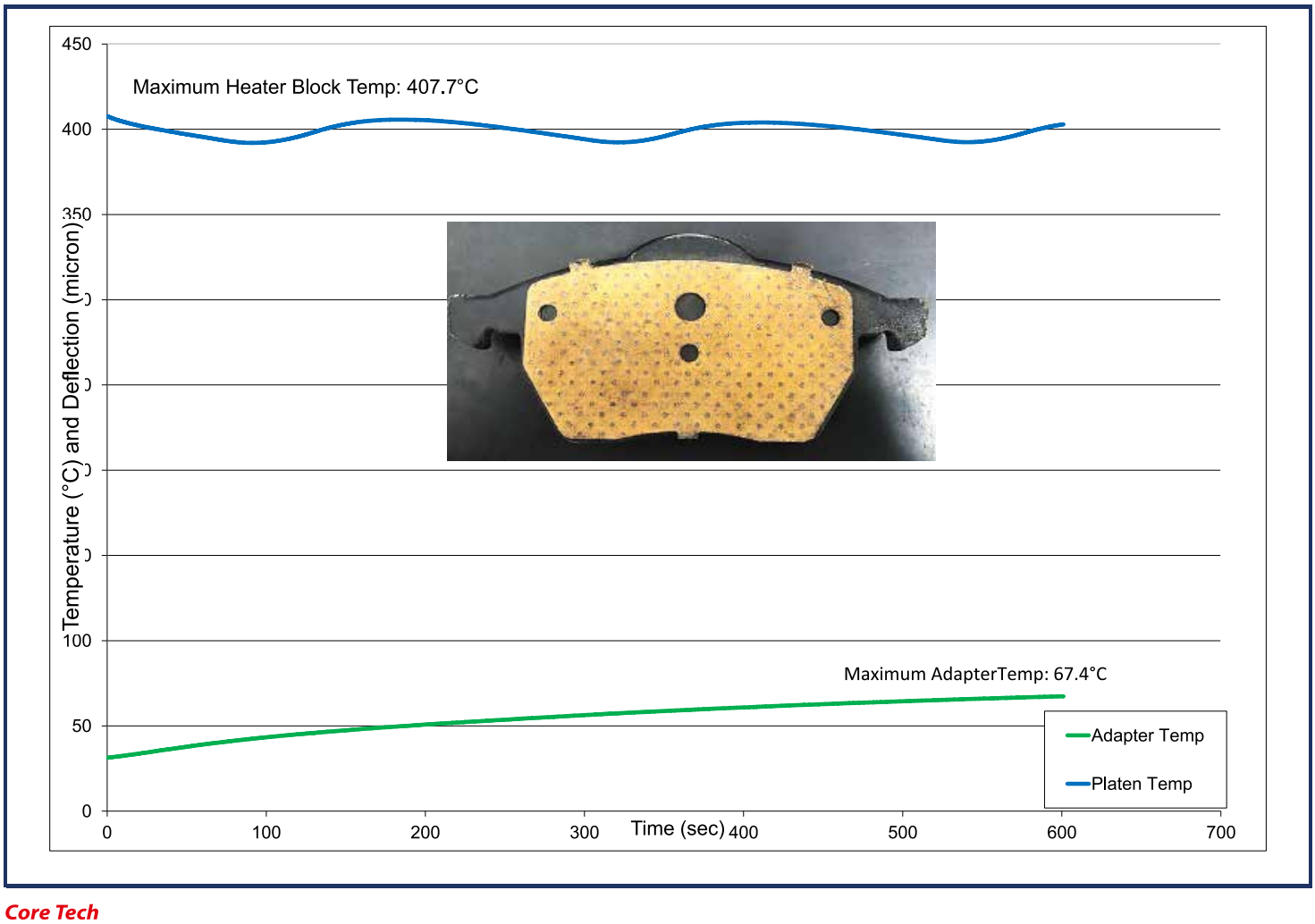
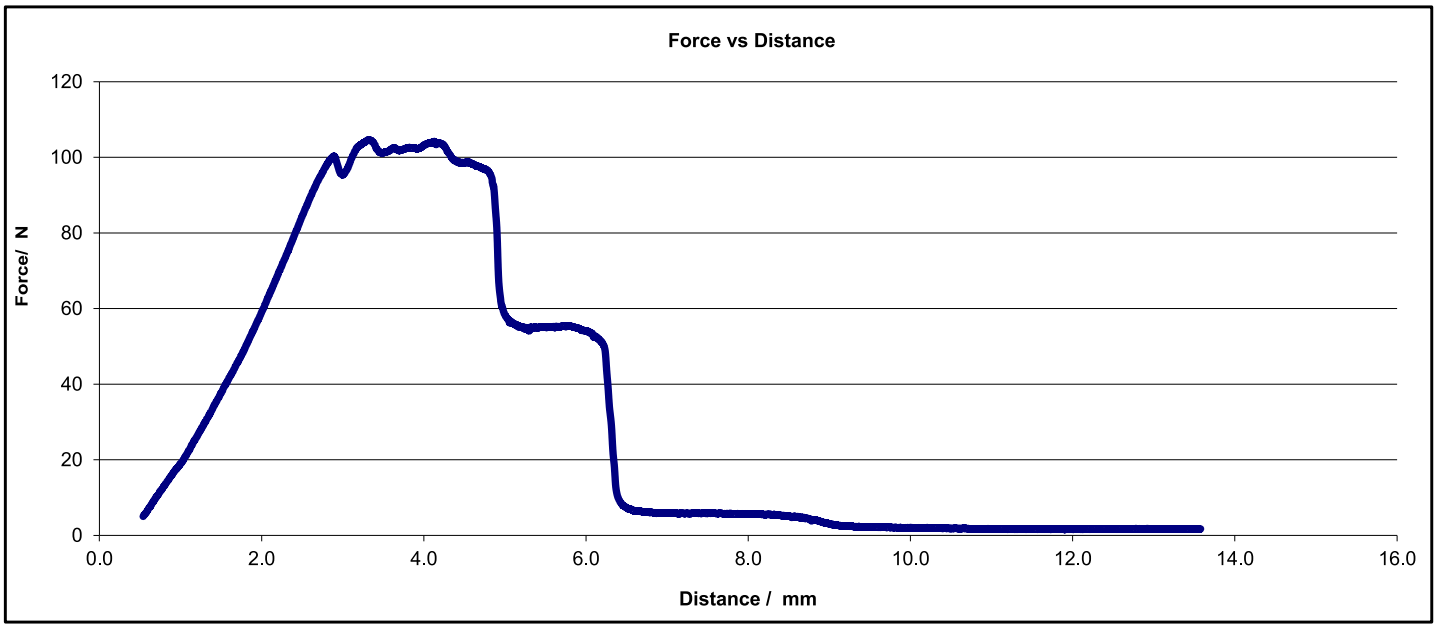


Core Tech

EKB 1107 – Quality Control of Anti-Noise Shims T-Pull Test - Force VS Distance



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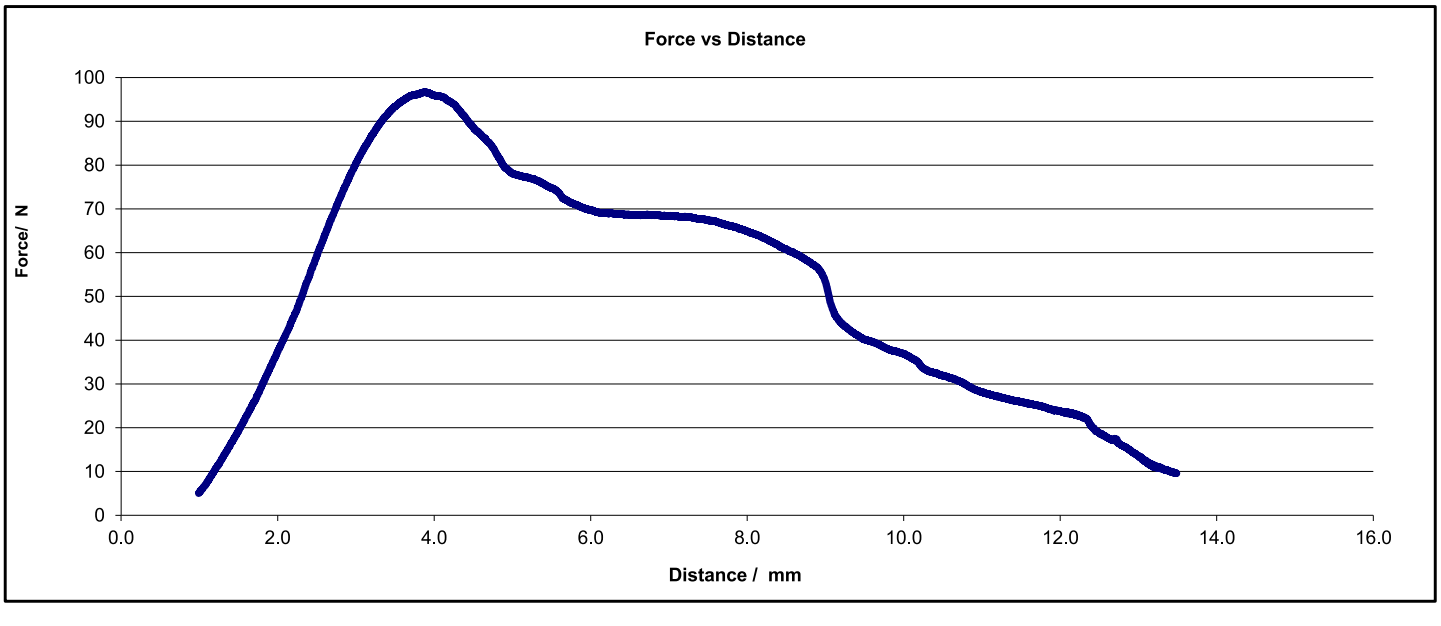

Core Tech

CUSTOMIZING

Build your technology

Customizing has never been more accessible within the Brake Shim Market.

With NoVibeHeat®, multiple aesthetical and functional versions are readily available. For example:

Coloring

Omnia Advanced Materials offers various standard colors, and numerous other custom Pantone colors can be developed provided Minimum Order Quantities (MOQ) are met

Trademarking ™

Custom Trademarking is available subject to MOQ.

Coating

Shim performance can be optimized by applying surface coatings designed to meet individual customer needs. For example, a PFTE coating can be applied to improve the decoupling of the shim surface, or GRAPHITE can be used to improve thermal properties.

Layers composition

Provided that the order meets specific MOQ requirements, NoVibeHeat® has the potential to differentiate formulation layers based on your requirements.

For example, the pad side of the shim may require higher temperature resistance, and the piston side may need improved NVH properties.

NOTE

Omnia
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Sole Member Company Nominal value of the capital subscribed € 3.500.000,00 t.d.;
Business Registration Code in Caserta CCIAA and VAT Number IT03592010619