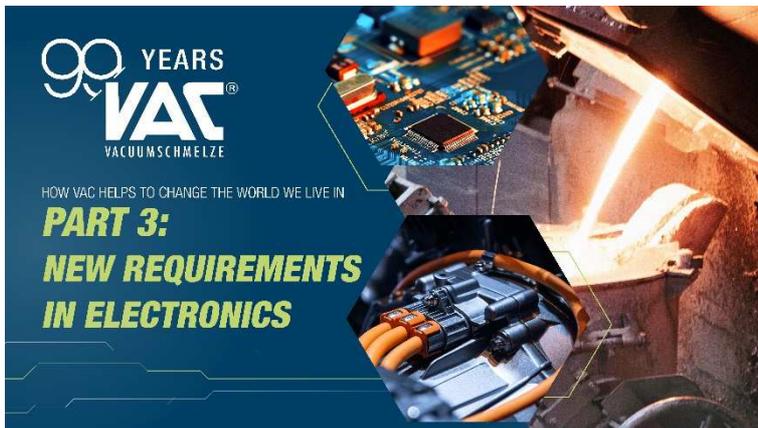


The world is changing – How VAC helps to change the world we live in.

Hanau – Humanity has always wanted to become faster, better, safer or more efficient. For this reason, many technologies that were invented at a certain time are no longer in use today, or can just be found very occasionally. They were replaced by newer technologies that can do the job more efficiently. For almost 100 years now, VAC has been involved in the development of advanced technologies that influence all our lives, make them easier or offer us completely new possibilities. Even if VAC's contribution is not directly visible in most cases, we work every day to ensure that even the technologies that are already considered efficient and state-of-the-art today can be replaced by new, better technologies.



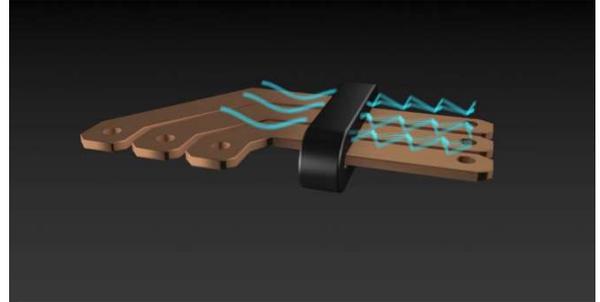
The world is changing and VAC is an essential part of this change. We would like to show you how VAC has been influencing our daily lives over the last century and will continue to do so in the future.

Part 3: Evolution of magnetic materials to support today's electronic requirements – From ferrite to VAC nanocrystalline technology

More electrification and advances in technology does not come without its challenges. Those of us of certain generations might recall the strange sound you could hear from your car radio in the 90s just before your cellphone would ring. This sound was a symptom of electromagnetic interference (EMI). EMI occurs because of the relationship between electricity and magnetism. Whether manmade or a natural occurrence such as storms, EMI is the result of an external electromagnetic source disrupting electronics of another device or circuit.

How do we manage EMI to ensure different devices or circuits do not interfere with each other?

To ensure that electrical circuits do not influence each other, one option would be to move them farther apart. However, today's devices are becoming smaller, at the same time their electrical complexity is increasing. Therefore, spatial separation is typically not an option. When many different circuits and components have to perform different functions in a confined space, it is essential that they are either grounded, shielded, or filtered to limit the stray magnetic fields.



VITROPERM core solution for electric vehicle busbar

A common EMI solution is filtering with components such as common-mode-chokes (CMCs). Traditionally, these CMCs were made of ferrite materials. However, ferrites have limitations related to the amount of electrical current they can manage, and their ability to filter at the higher frequencies used in today's devices. As a result we see a paradigm shift in many applications migrating to nanocrystalline based solutions to address EMI, such as VAC's VITROPERM® material, and respective inductive components and cores.

VITROPERM based CMC's offer the highest attenuation in compact designs due to high permeability and saturation magnetization. This allows for a significant reduction in component size while achieving the same or better performance as a large ferrite CMC. Further, VITROPERM cores also generate much lower temperatures versus ferrite solutions, which is both a safety and performance concern.

Whether it be consumer electronics such as smartphones, electric vehicles, or medical devices to name a few, electronic solutions are driving our tomorrow. Effective EMI suppression is critical to ensure devices can be small, lightweight, efficient, and safe.

To learn more about VAC's solutions to address EMI please visit

<https://www.vacuumschmelze.com/Nanocrystalline-Material>

<https://www.vacuumschmelze.com/Inductive-Components-and-Cores>

VACUUMSCHMELZE (VAC) is among the world's most highly innovative developers of magnetic materials, inductive components and other related products. With a global network of Sales and Field Application Engineers, VAC designs and manufactures tailor-made solutions for a wide variety of industries, comprising renewable energies, automotive, industrial automation installation technology, and aviation.

VACUUMSCHMELZE GmbH & Co. KG. | Grüner Weg 37 | 63450 Hanau | Germany
Phone: +49 6181 / 38 – 0 | Mail: info@vacuumschmelze.com | www.vacuumschmelze.com

