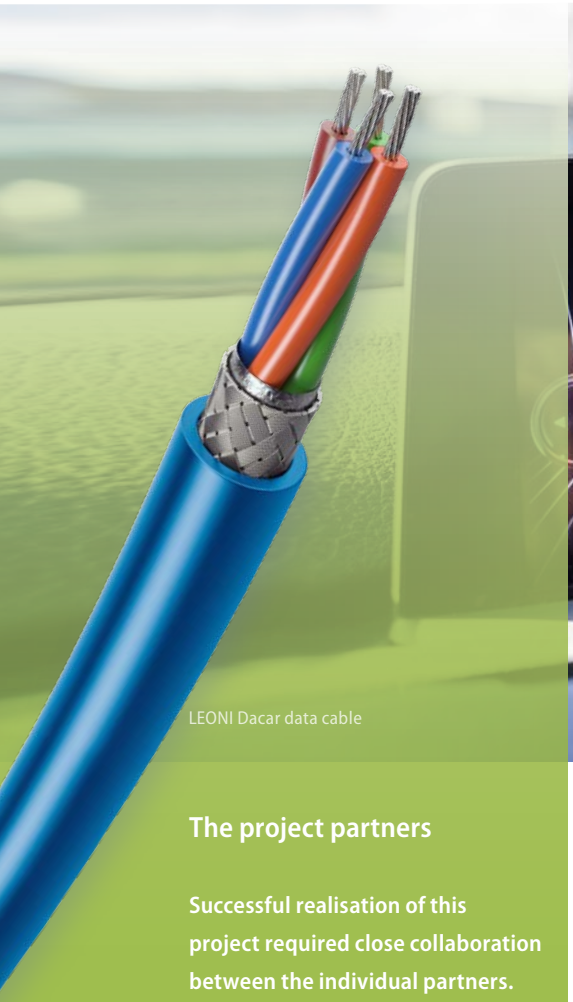
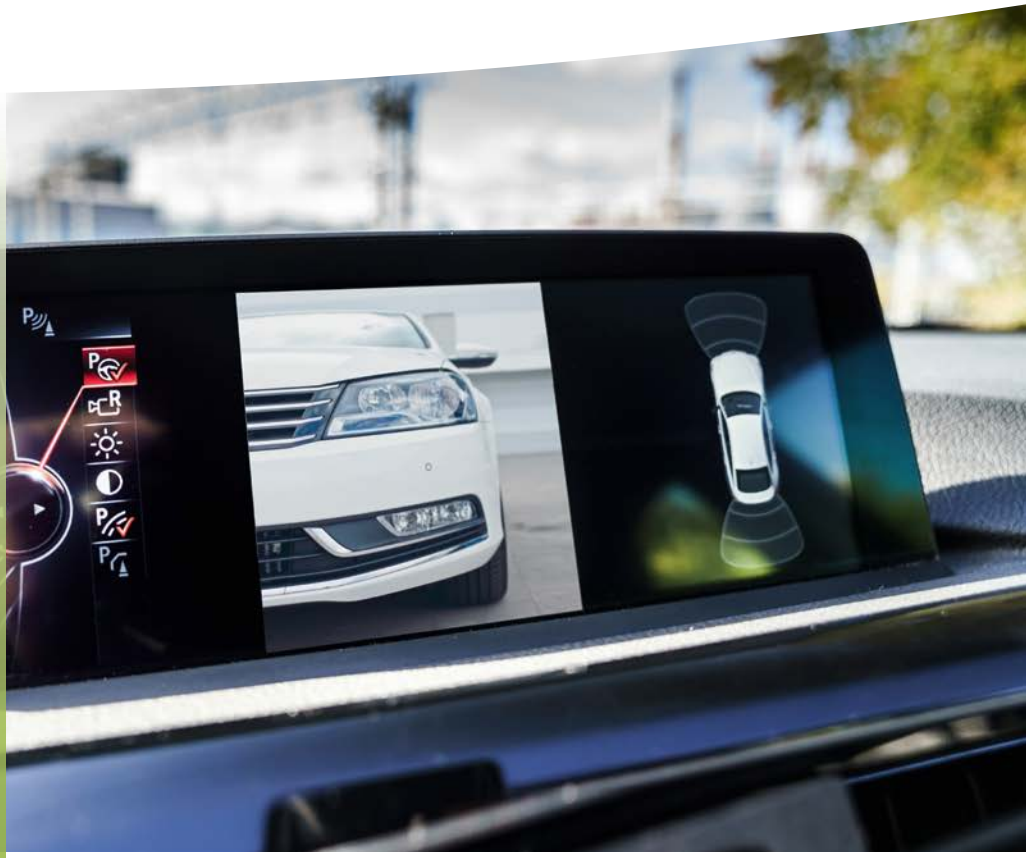
LEONI success story

June 2016



LEONI Dacar data cable



The project partners

Successful realisation of this project required close collaboration between the individual partners.

Alongside LEONI, well-known, global carmakers as well as cable harness assemblers participated in the work. LEONI furthermore cooperated in this project with a chip manufacturer familiar in the automotive sector, which developed a new generation of chip that ensures high-resolution data transfer.

Where others hit their limits – we go further with our LEOMER BN 008 T core compound

What's required of the cable

The challenge lies in developing a cable that has optimum transfer properties for high data rates at frequencies up to 3 GHz. Although the preceding type of cable provided robust and reliable transfer, the dielectric insulation materials available on the market were not ideally suited in terms of quality. Project managers approached LEONI, based on our comprehensive materials know-how, with the request to develop a dedicated core compound for use as a dielectric in multi-core data cables.

The application: transferring high data rates
LEONI Dacar data cables are used in such infotainment and assist systems as communication and camera systems, USB connections, smartphone connectivity and environment recognition. The cables are laid either fixed or dynamically, as for example in wing mirrors or the tailgate.

The development of new generations of data cables also plays a role in realising the vision of autonomous driving. They make it possible to network a large number of such components as car-to-x communication, for example.

The customised solution for optimum transfer
Taking into account the requirements imposed on the polymer material, like optimum dielectric properties, temperature-independent high frequency transfer, temperature stability as well as long-term ageing, we selected a special polypropylene (PP) resin that combines the aforementioned properties. Adding an optimised means of stabilisation for long-term temperature resistance only slightly changed the key dielectric material benchmarks, which are virtually comparable with the unstabilised basic PP.

Various tests were subsequently run during development of the material. Tests with respect to thermal stability combined with the typical jacket materials of TPE-U and PVC in a temperature range of up to +105 °C produced a convincing result after 3,000 hours of exposure. The newly developed compound passed with flying colours the tests prescribed by the standard, such as the cable's insertion loss after ageing, to assess thermal durability as well as the test of cold-temperature flexibility in both unaged and aged condition.

The outcome was the LEOMER BN 008 T core compound with very good suitability for the heavy demands in terms of temperature stability and high frequency transfer. It even trumps all of the insulation materials that have been on the market up to now.

Trials are currently under way on use also for audible frequencies up to 6 GHz because the demands for greater data frequencies combined with faster transfer speeds are rising.

In line with its validation plan, LEOMER BN 008 T has a broad range of market application. We have approval pursuant to LV 112 for cables that contain this LEOMER compound as a dielectric. Validation tests in accordance with LV 213-2 as well as customer-specific standards were carried out and successfully passed at our RF laboratory in Roth.

Derived from LEOMER BN 008 T, there are currently further variants for special areas of application in the development phase or, in some cases, almost ready for production. As part of developing automotive ethernet cables, work is currently under way on a flame retardant derivative as well as on a foamable compound for use in foamed dielectrics.

Convincing benefits

In both new and aged condition, the compound achieves very good dielectric properties because the stabilised polymer has a low dielectric constant and also a small dielectric loss factor. Thanks to the matched stabilisation system, it is even suited, in terms of temperature resistance, for the next higher temperature class of +125 °C.

LEOMER BN 008 T is processed on extrusion lines at LEONI facilities in Roth and in Slovakia. The material is suited for very high extrusion speeds and is easy to produce, as shown by, among other factors, a very stable manufacturing process. This in-house development means that supply bottlenecks and quality problems involving the input materials can be avoided.

LEOMER BN 008 T is LEONI's own formula and has the added advantage that the company can itself apply targeted enhancements to the compound. From devising the formula through to application – every link in the value chain originates from LEONI.

The data transfer cables with LEOMER BN 008 T

LEOMER BN 008 T is used in the production of LEONI Dacar LVDS cables for video transmission systems. The compound can likewise be used in LEONI Dacar ethernet cables.

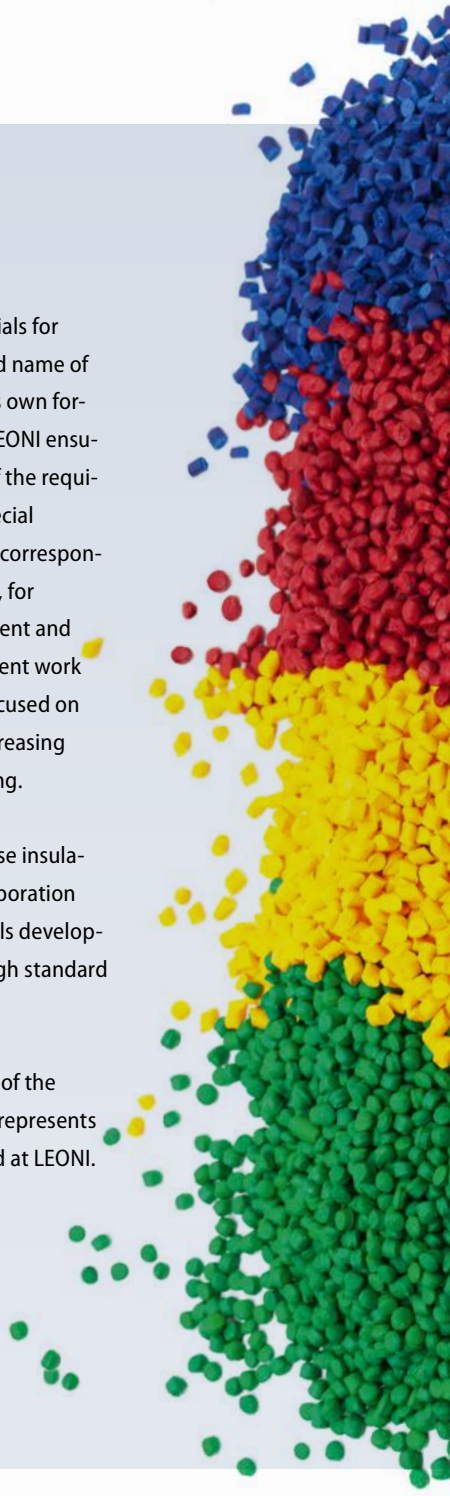
LEOMER BN 008 T – an insulation material for dielectric applications for which there are no upper limits!

LEOMER® – It's all in the mix

LEONI carries its insulation materials for cable production under the brand name of LEOMER. With more than 50 of its own formulations developed in-house, LEONI ensures the best possible fulfilment of the requirements that arise from these special applications. The cables with the corresponding compounds are deployed in, for example, transmission, infotainment and assist systems. LEONI's development work on future formulas is currently focused on the prevailing trends towards increasing data rates and autonomous driving.

The in-house manufacture of these insulation materials and the close collaboration between production and materials development guarantee a consistently high standard of quality.

The 'LEOMER' name is composed of the terms 'LEONI' and 'polymer', and represents the diversity of the materials used at LEONI.



Additional links

More about LEOMER

Our Success Stories online

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