

The logo for LIQFRIC, featuring the brand name in a bold, blue, sans-serif font with a registered trademark symbol.

Liquid intelligence friction compounds



Thermal energy consumption

Up to

85%

++ Rail +++ Industrial +++ Automotive +++ Bike ++

Reduced

The first brake pad from liquid phase

Company

LF GmbH & Co. KG, founded in March 2016, is located in Innovationpark Leverkusen. Our goal is to develop, produce and market innovative friction materials while reducing the thermal energy consumption during manufacturing by up to 85%.

The developmental strategy follows the foundress's idea to create a liquid phase of the friction material before curing.

The already developed liquid organic 2-K systems have been intensively tested, especially for their frictional capabilities, and are ready to be used by our customers. The required production capabilities have been built up and are able to easily meet initial demands.

The freedom of shaping, combined with the simplified mold makeup allows for a radical redesign of clutch geometry, as well as thin-layer materials in the range of 150 - 1000 μm . Their usage in printing- and 3D printing applications is currently being tested.

Manufacturing HP-Brakepad (inorganic):



From the drawing to the tool



Inorganic binder



Raw materials to make LIQFRIC-Compounds

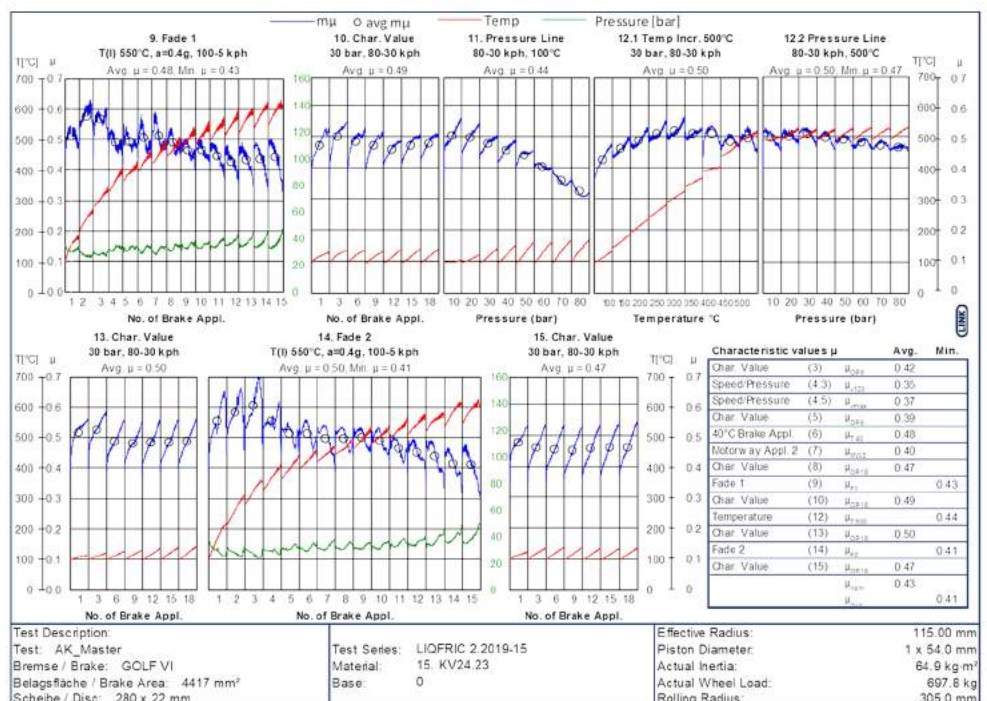
While refining our organic 2-K products for thin-film clutches, our R&D is developing a first generation of water-based inorganic compounds that will allow for usage in applications with higher temperatures of up to 600°C (1112°F).

The launch of our inorganic LIQFRIC[®]HP products is scheduled for June 2019.

First AKM tests show excellent frictional- and wear properties.

Initial applications are brake pads for e-bikes and holding brakes as well as overload-clutches.

Our company can support manufacturing requests for prototypes in small quantities for the interested customer on a cost sharing basis.



AK-Master of water-based inorganic compounds

Field of use

Industrial:

Forklifts, lifting equipment, winches.
I.e. 2K-LIQFRIC® compounds for manufacturing overload-clutches.

Automotive:

Clutch facings, park brake applications, racing applications.
I.e. 2K-LIQFRIC® compounds for manufacturing EPB-linings directly bonded to the brake shoe

Construction:

Cranes, trucks, excavators.
I.e. 2K-LIQFRIC®-compounds for the manufacturing of holding brakes.

Wearables:

Special products for testing.
I.e. 2K-LIQFRIC® compounds for the manufacturing to special grip shoes. 2K-LIQFRIC® for screen printing process.

Prototypes:

Rapid prototyping allowing for fast adaptation of friction materials.
New parts possible within 24h after mold release.
Friction levels $0,3 \geq \mu \leq 0,5$.

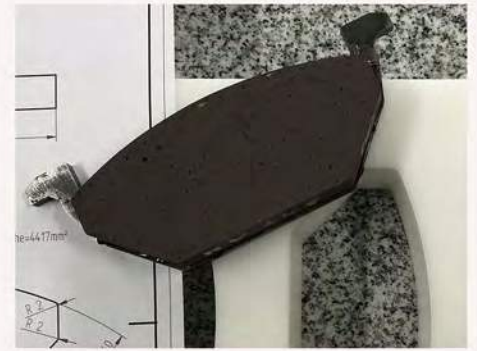
I.e. 2K-LIQFRIC® compounds for the manufacturing of testing prototypes with near net shape geometry and small series production.



Filling of a die-casting mold



Structured surface from die-casting



From the drawing to the finished pad

Products



Compound & Binder

LIQFRIC® 1 A/B

Organic 2K-friction material for application in wet clutch applications; casting process

LIQFRIC® HP 1A/B

Inorganic 2K-friction material for usage in brakes with higher temperature load; casting process

LIQFRIC® 3D 1A/B

For usage in 3D printed thin-film friction applications; screen printing process



YOUR COMPETENT PARTNER FOR LIQFRIC COMPOUNDS

LF GmbH & Co. KG develops custom tailored compounding solutions in the most different areas of the friction industry.

From idea generation over compounding up to commissioning of entire plants - we are your reliable partner. Our core competencies are on the one hand the development of liquid friction compounds, e.g. for clutch facings and break pads.

On the other hand, we have the expertise to optimize products, especially for the manufacturing process.

The intelligent resource utilization enables us to brake fresh ground and expand the bounds of possibility. By combining the new LIQFRIC®-technology with established solutions, we can create long term sustainable and economic solutions for our clients.

Our partnership with a renowned manufacturing equipment supplier in the friction industry means that our technology, process engineering and construction go hand in hand.

This assures maximum innovation, reliability and quality in the development and manufacturing of your products.

We would love to identify together with you, how you can harness the potential of the LIQFRIC®-compounds for your company.

We look forward to your inquiry.

LF GmbH & Co. KG

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