

New base substance for oil-free cooling lubricants



Three test rollers used in lubrication tests for abrasive wear (Reichert): Left, lubricated with water; centre, using a standard cooling lubricant; right, with Novotec CL 800 (five per cent in each). Source: Gelita AG



Looks like water, performs better than oil and enables the manufacture of environmentally friendly cooling lubricants: Novotec CL 800 Source: Gelita AG

With its latest invention, Gelita AG is paving the way for the production of high-performance, oil-free cooling lubricants, which are completely free from allergens and toxic substances.

Instead of conventional oil, functional proteins ensure that metal-processing can be carried out smoothly. A further advantage is that unwanted oily residues are avoided.

In the metal-processing industry, cooling lubricants are indispensable for protecting work pieces and tools against wear and overheating during lathing, drilling, milling or grinding. Conventional cooling lubricants therefore consist of an oil-in-water emulsion – the oil is used for lubrication and the water for cooling.

The disadvantage is that the oil does not dissipate any heat, thus preventing the produced heat from being effectively transported away from the work piece. In addition, during metal-processing, an oil mist that is harmful to health can be produced.

Disposing of the cooling lubricant is expensive and, not least, oil resources are finite so that, due to the increasing scarcity of raw materials, they are subject to constant price increases.

In Europe alone, approximately 320,000 tons of metal-processing lubricating concentrates are consumed each year. Gelita experts have already been researching alternatives for four years.

Together with a well-known automotive part supplier and a local industrial college in Eberbach, Gelita scientists have developed an innovative raw material for a new generation of oil-free cooling lubricants: the liquid protein concentrate Novotec CL 800.

“Metal-processing fluids based on this functional protein look like water, perform better than oil and show significantly better cooling than mineral-oil based products as they are much more stable than an oil emulsion,” explains Dr Matthias Reihmann, Product Manager for photographic and technical gelatines. This was demonstrated in a comparative test with a reference recipe using devices to measure the pressure stability of the lubricating film (Reichert Wear Test). An additional 15-month field test confirmed routine performance and aging stability. While developing the reference recipe, Gelita worked together with two experienced German companies in the area of high-performance additives and preserving agents for cooling lubricants.

Advantage compared with oil-free polymer-based cooling lubricants:

Metal-processing fluids based on Novotec CL 800 also have an advantage compared with oil-free polymer-based cooling lubricants: they leave no unwanted residues on work pieces, tools or shavings. Processed parts can thus be used for

further production, such as bonding, welding, painting or coating, without the need for intensive cleaning. The shavings that are produced can also be directly processed. This reduces costs and increases the efficiency of production. Moreover, Novotec CL 800 is ecologically degradable and free of allergens and pollutants. The Gelita protein concentrate is suitable for the production of environmentally friendly cooling lubricants for all modern production procedures.

In practice

Gelita initially tested the development of the protein-based substance for practicability in its own workshops in Eberbach, Minden and Memmingen. Numerous cooling lubricant producers are currently testing how the protein solution works for use in their own products. In close collaboration with Gelita developers, the components are being integrated into specific recipes. Volker Sigmund, Head of Maintenance in Eberbach, is optimistic: “The key advantages are obvious – Novotec CL 800 is biologically degradable and does not form an annoying oil film on the processed surface, and all that with better cooling lubricant performance. A truly clean solution.”

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