
DIEHL
Brass Solutions
THE NEW STANDARD
.ecological
.zero lead
.easy to machine
.economical

THE NEW STANDARD

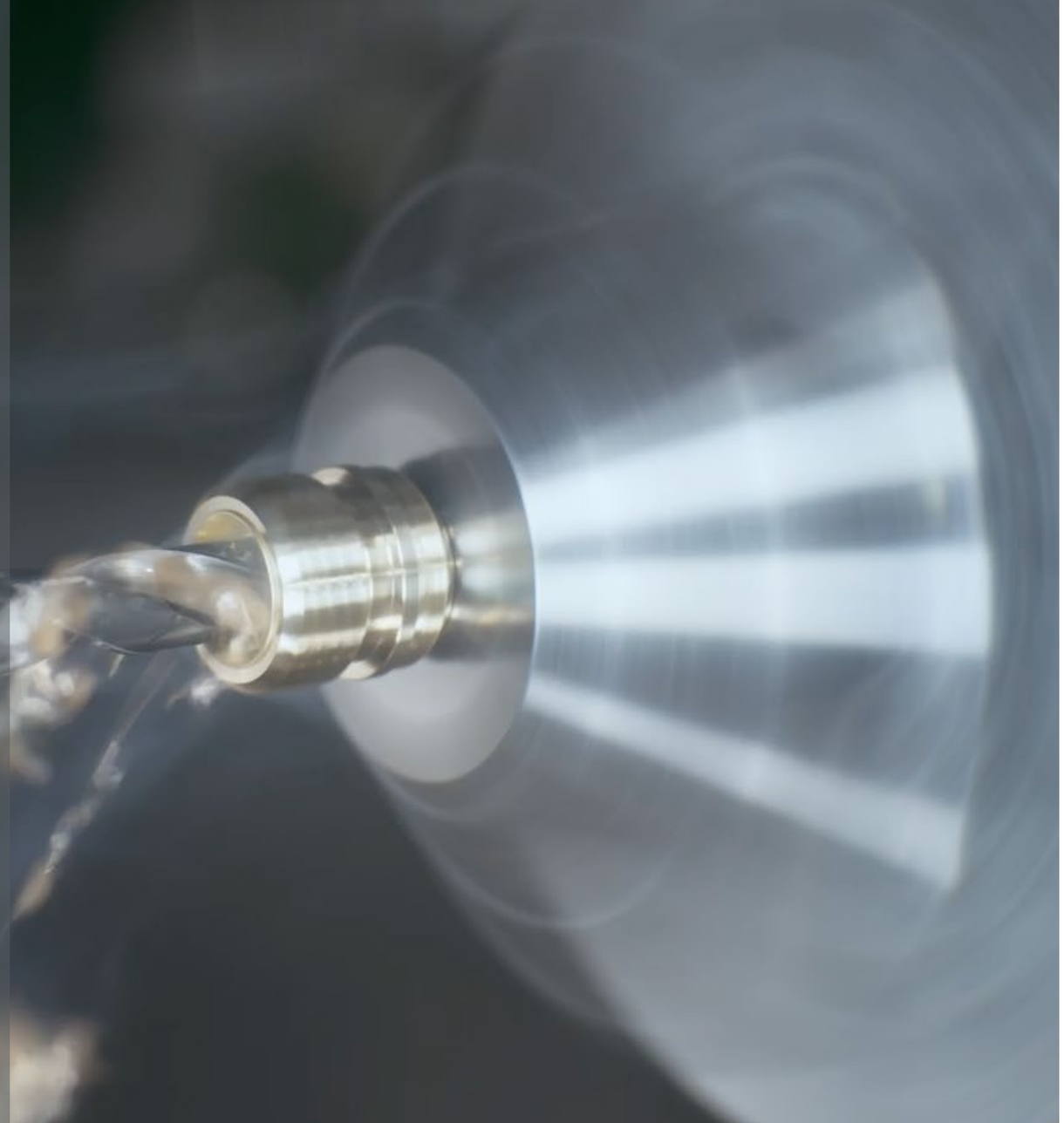
eZeebrass – the innovative lead-free standard brass sets new standards and meets tomorrow's regulatory requirements today!

Thanks to its optimized composition, **eZeebrass** meets the most stringent demands in terms of machinability and processing, even with its low copper content. And it's lead-free, too.

It's eZee!

A newly developed chip-breaking mechanism means that **eZeebrass** produces short chips that can be handled in an automated manner in machining and processing operations. As a result, **eZeebrass** delivers top quality results, not only ecologically but also economically.

eZeebrass – THE NEW STANDARD.
On the way to a lead-free future!



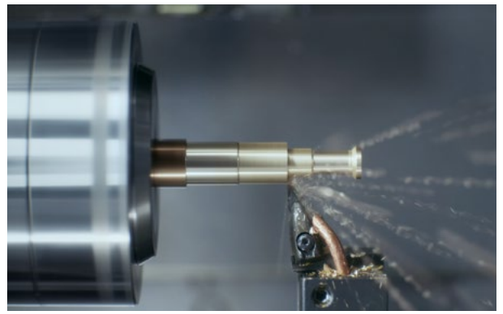
ZERO LEAD
eZee brass

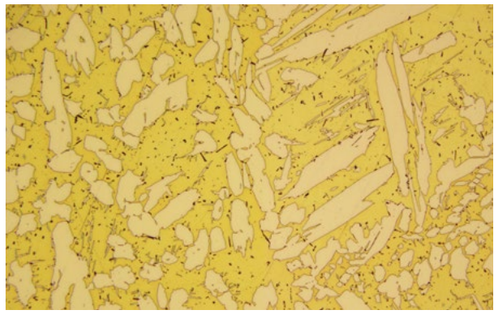
MATERIAL AND PROPERTIES

When developing the new material, the key premise was to transfer the proven properties of the existing brass alloys (e.g., CW614N and CW617N) to the lead-free world – both in terms of application-oriented material parameters as well as production-related processing properties. The result of these efforts is **eZeebrass**, the new standard for lead-free brass alloys. The alloy consists of around 58% copper, 41% zinc, and approx. 0.4% magnesium.

What's NEW with **eZeebrass**? The innovation here is the addition of **magnesium**, which although small in amount nevertheless has a great metallurgical impact, achieving the chip-breaking effect previously performed by lead in standard brasses. This combination of magnesium and copper produces a short-breaking chip even at the highest cutting speeds.

With a microstructure that corresponds to known (lead-containing) standard brasses, **eZeebrass** therefore represents **the new standard** for all common, fully automated machining processes.





Typical microstructure of alpha and beta solid solution and homogeneously distributed Cu_2Mg precipitates

Chemical Properties

Composition (mass percentage, reference values)				
	Cu	Mg	Pb	Zn
CW614N	58	-	3.0	Remainder
eZeebrass	58	0.4	<0.1	Remainder

NEW MATERIAL – KNOWN PROPERTY PROFILE

As is customary for standard brass materials, the mechanical properties of eZeebrass are adjusted by the cold forming process of drawing. Compared to the CW614N / CW617N material group, **eZeebrass** demonstrates slightly higher strength and hardness.

However, both parameters can be adjusted to the specific application by adapting the degree of cold forming during the production of the semi-finished product and by means of suitable heat treatment within the range of the usual standard specifications.

The physical properties can be found in the table on the right. With its property profile, **eZeebrass** can cover the common application spectrum of the CW614N / CW617 N material group.

Magnesium is a very light element. In addition, eZeebrass also requires no lead. This results in the density advantage of **eZeebrass** over CW614N. This density advantage means that components with the same geometry weigh less when produced from **eZeebrass**. In addition, more components can be produced per ton of semi-finished product, resulting in greater material efficiency.

Also in terms of corrosion properties, **eZeebrass** is comparable to the CW614N / CW617N material group. **eZeebrass** is non-dezincification resistant according to ISO 6509; the stress corrosion cracking test according to ISO 6957 is passed if the material hardness is set accordingly.

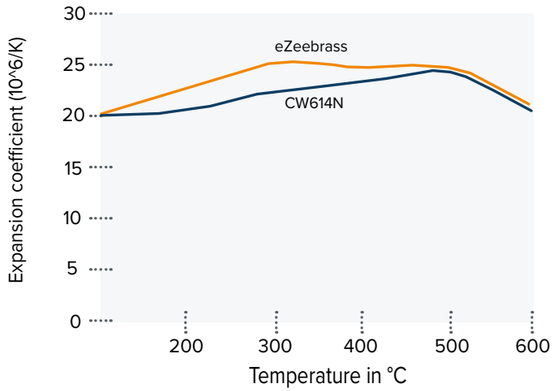
Mechanical Properties

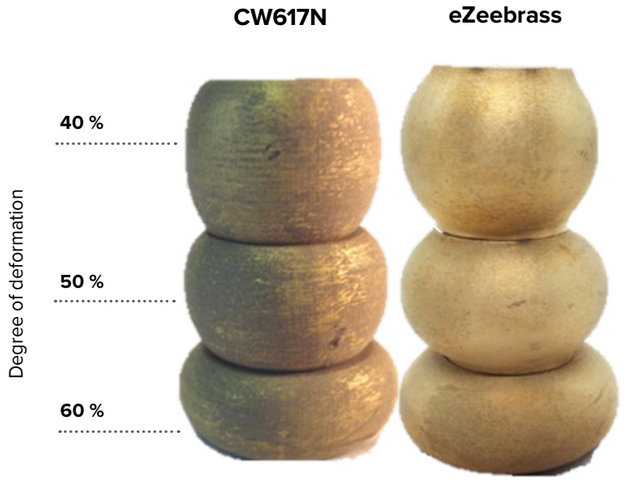
Mechanical Properties: (reference values for rods of approx. 20 mm in diameter)	
Tensile strength R_m	600
Yield strength $R_{p0.2}$	450
Elongation A5	12
Brinell hardness	160

Physical Properties

Physical Properties (reference values)		
	CW614N	eZeebrass
Density [g/cm³]	8.5	8.2
Electrical conductivity [MS/m]	15.70	14.60
Specific electrical resistance [Ω mm²]	0.064	0.068
Thermal conductivity* [W/mK]	113.0	104.6

*Calculated via the Wiedemann-Franz law





HOT FORMING

Another advantage of **eZeebrass**, in addition to its excellent machinability, is its very good hot formability. This means that **eZeebrass** can also be used in forging applications as a lead-free substitute for the established material CW617N.

The decisive factors here are the beta-phase content in the microstructure, the very good die-filling properties, and the crack-free forming of flash at moderate forming forces. Depending on the component size and geometric complexity, suitable forging temperatures lie in the range of 700°C - 750°C.

If the forging billets produced are reworked by means of machining, component manufacturers benefit directly from the excellent machinability of **eZeebrass**.

The thermal expansion coefficient of **eZeebrass** is similar to that of CW614N in the application-relevant temperature range. Taking the thermal elongation of a component into account will only lead to minor adjustments in the component geometry.

ECOLOGICAL ASPECTS

As a typical copper material, eZeebrass conserves our scarce resources. In addition, **eZeebrass** can be fully recycled, as an excellent recycling system already exists. Not only does recycling conserve raw materials, but it also helps to save energy. This is because recycling copper eliminates the energy input associated with ore mining, preparation, and transportation to the processing sites. For example, the energy required to melt down the scrap material is only a fraction of that required to extract the metal from ore.

As a result, eZeebrass has a favorable energy balance for copper materials.

Support us!

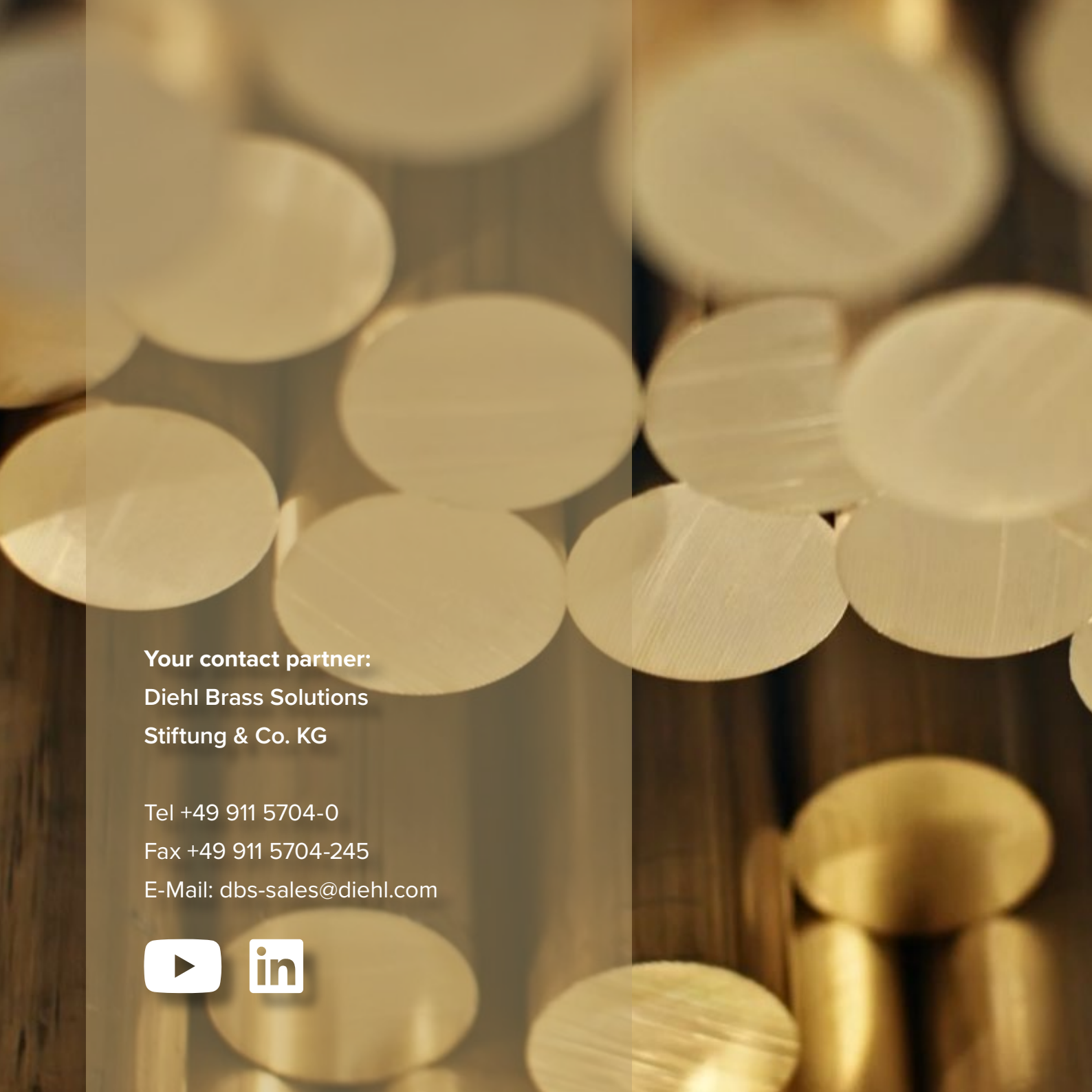
Contribute to the positive energy balance of eZeebrass. Keep this material unmixed and separated at every stage of the recycling system (from extraction to raw material recovery).

For the sake of the environment!

OUR EXPERTS ARE THERE FOR YOU

You can download all specifications for the desired application from our website. In our material data sheets, you will find a list of the physical, thermal, mechanical, and resistance properties.

If you have any questions about the materials and the processing thereof, please call our experts or send us your inquiry directly.



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