DIEHL
Metall

THE NEW STANDARD

THE NEW GENERATION OF LEAD-FREE & FUTURE-PROOF* BRASS ALLOYS

DIEHL
Brass Solutions

THE EZEE MATERIAL FAMILY

The eZee material family represents a new generation of modern, lead-free brass alloys. It combines high performance with forward-looking innovation and the proven sustainability of brass materials, already meeting numerous regulatory requirements of tomorrow.

Each alloy within the eZee range is specifically designed for use in demanding industrial applications—without sacrificing the economic advantages traditionally associated with conventional brass alloys.

Through the targeted addition of magnesium, short and easily manageable chips are produced, contributing to excellent machinability across all relevant manufacturing processes.

The entire family is fully recyclable and integrated into an efficient copper recycling system. This significantly improves the energy balance compared to other metals and polymers, thereby making a positive contribution to overall sustainability.

eZee stands for a modern, safe, and sustainable brass family—paving the way toward a lead-free future.

THE NEW STANDARD

eZeebrass

The lead-free standard brass meets current regulatory requirements and sets benchmarks in machinability and processability compared to other lead-free standard brass materials. Its optimized composition produces short, easily handled chips suitable for automated handling, enabling economically efficient manufacturing processes.

eZeebrass – THE NEW STANDARD.
Moving toward a lead-free future!

Composition:
(mass as %, reference values)

	Cu	Mg	Pb	Zn
CW614N	58	-	3.0	remainder
eZeebrass	58	0.4	≤0.1	remainder

Material and Properties

eZeebrass transfers the specific advantages of classic brasses such as CW614N and CW617N into a lead-free alloy world. The added magnesium forms brittle Cu_2Mg phases, providing a reliable chip-breaking effect, while the overall microstructure remains consistent with standard brass. This makes eZeebrass ideal for fully automated machining processes, with the potential for further performance optimization through adjustments to machine parameters and tooling depending on the production setup.

New Material – Familiar Property Profile

Although eZeebrass is a newly developed lead-free alloy, its property profile remains familiar: strength and hardness are slightly higher than CW614N/CW617N, yet can be tailored to specific applications through cold working and heat treatment. At the same time, its lower density enhances material efficiency and reduces component weight—without compromising performance.

Hot Forming

eZeebrass exhibits excellent hot formability and is a reliable lead-free substitute for CW617N. The presence of β-phases in the microstructure ensures very good die fill and burr-free shaping under moderate forming forces. Optimal forging temperatures range between 700 and 750 °C, and even after hot forming, the material maintains excellent machinability for subsequent processing.

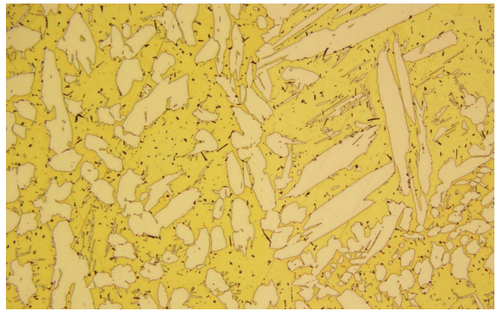


Figure 1: Typical microstructure consisting of α- and β-mixed crystals with homogeneously distributed Cu_2Mg precipitates

Mechanical Properties

Mechanical Properties: (Reference values based on STD 20 Z)	
Tensile Strength R_m [MPa]	600
Yield Strength $R_{p0.2}$ [MPa]	450
Elongation at Break A5 [in %]	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
Electrical Resistivity [Ω mm²]	0.064	0.068
Thermal Conductivity* [W/mK]	113.0	104.6

*calculated using the Wiedemann–Franz law

NEXT-GENERATION LEAD-FREE DEZINCIFICATION-RESISTANT BRASS

eZeedzr

The alloy combines outstanding dezincification resistance with excellent machinability and optimal forging properties. Like eZeebrass, magnesium is used as an alloying element, forming fine precipitates that act as effective chip breakers.

To achieve superior dezincification resistance, the copper content has been raised to the level of proven leaded, dezincification-resistant alloys such as CW602N. In addition, established inhibitors—phosphorus and arsenic—provide extra corrosion protection in accordance with ISO 6509.

Corrosion Resistance

eZeedzr passes the standardized dezincification test ISO 6509 when the microstructure is properly controlled. Component testing for stress corrosion cracking in accordance with ISO 6957 is also satisfied with appropriate heat treatment.

Forging Behavior

eZeedzr exhibits excellent forging properties from 700 °C. The optimal microstructure is achieved between 720 °C and 760 °C. To ensure dezincification resistance after hot forming, a heat treatment is required.

Composition:
(mass as %, reference values)

	Cu	Mg	P	As	Pb	Zn
CW602N	62.5	-	-	0.1	2.0	remainder
eZeedzr	63.5	0.2	0.25	0.1	≤0.1	remainder

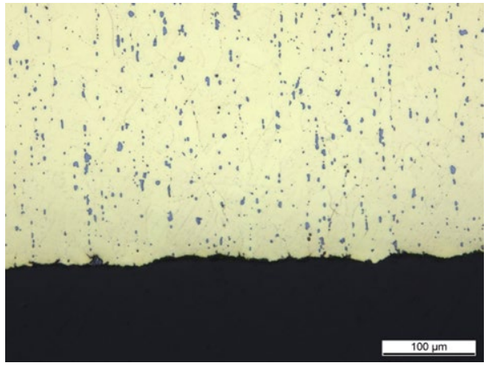


Figure 2: Cross-section of a successful dezincification test according to ISO 6509

Mechanical Properties

Mechanical Properties: (Reference values based on STD 24 Z)	
Tensile Strength R_m [MPa]	370
Yield Strength $R_{p0.2}$ [MPa]	295
Elongation at Break A5 [%]	25
Brinell Hardness	115

Physical Properties

Physical Properties: (Reference Values)	
Density [g/cm³]	8.4
Electrical Conductivity [at RT in MS/m]	14.2
Thermal Conductivity [at RT in W/mK]	102

LEAD-FREE. CONDUCTIVE. EXCELLENT FORMABILITY.

eZeecrimp

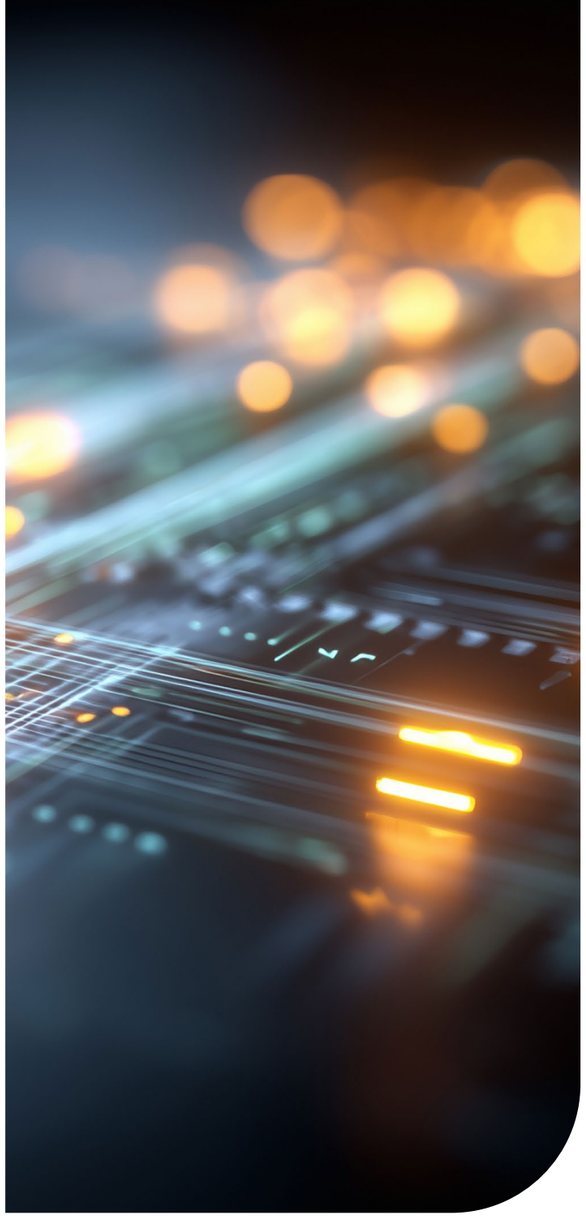
The alloy combines lead-free composition, good electrical conductivity, and excellent cold formability. The higher copper content compared to eZeebrass ensures superior formability, while magnesium enhances machinability without compromising electrical conductivity.

Proven Performance

eZeecrimp offers electrical conductivity comparable to common standard brasses and exceeds the de facto standard value of 22 % IACS for electronics and connectors. For electrical and electronic applications, eZeecrimp therefore outperforms silicon-alloyed brasses. Heavily crimped components made from eZeecrimp show no detectable cracking.

Composition:
(mass as %, reference values)

	Cu	Mg	Pb	Zn
CW601N	63.0	-	2.0	remainder
eZeecrimp	62.5	0.3	≤0.1	remainder



Mechanical Properties

Mechanical Properties: (Reference values based on STD 24 Z)	
Zugfestigkeit R_m [in MPa]	400
Dehngrenze $R_{p0.2}$ [in MPa]	310
Bruchdehnung A5 [in %]	28
Brinell-Härte	115

Physical Properties

Physical Properties: (Reference Values)	
Density [g/cm³]	8.2
Electrical Conductivity [at RT in MS/m]	14.1
Electrical Conductivity [at RT in %IACS]	24.3
Thermal Conductivity [bei RT in W/mK]	101

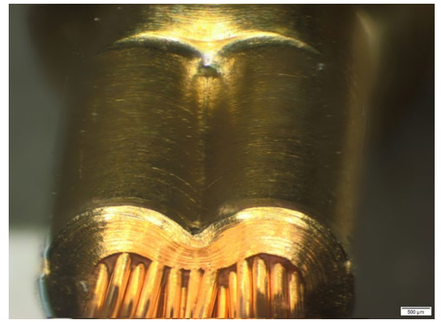


Figure 3: Heavily crimped component made of eZeecrimp without any visible cracking

Electrical Conductivity

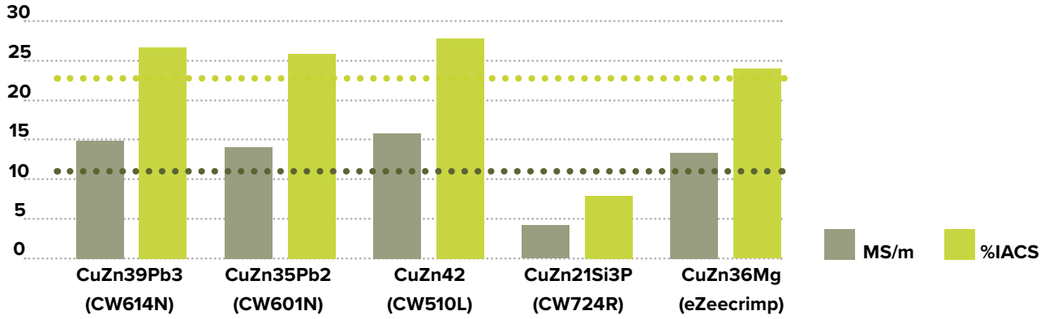


Figure 4: Comparison of electrical conductivity with other brass alloys

ECOLOGICAL ASPECTS

As modern copper alloys, the eZee material family helps conserve our scarce resources, being fully recyclable and integrated into the established copper recycling system.

Recycling not only preserves valuable raw materials but also saves significant amounts of energy. When copper is reused, the energy-intensive steps of ore mining, processing, and global transportation are avoided. Melting down scrap material requires only a fraction of the energy needed to produce metal from ores. Compared to other metals and polymers, the eZee material family offers a significantly better energy balance and overall sustainability.

Support the Effort!

Contribute to a positive environmental footprint by keeping materials separately sorted at all stages of recycling—from dismantling to reprocessing.

For the sake of the environment!

OUR EXPERTS ARE READY TO HELP

For each eZee alloy, detailed material datasheets are available on our website — including physical, mechanical, and thermal properties, as well as corrosion resistance. If you have any questions regarding the selection, processing, or application of our eZee materials, our experts are always available by phone or email.

Want to learn more?
Simply scan the QR code
and visit our website.

Risk Disclosure

The tests took place under the test conditions mentioned here. In these tests, selected properties of the alloy can be investigated. The test results are based on the test setup shown, which has specific laboratory conditions. Deviating conditions in the field may have significant effects. Aspects which play a decisive role include, in particular, but not exhaustively, the design of the components, the further processing of the alloy, the processing of the finished parts made with the alloy, transport and storage, the manner and location of use, the installation and the installation situation.

When it comes to properties, the corrosion resistance of the material is a key factor. The DIN standard DIN EN ISO 8044 (formerly DIN 50900) defines corrosion as a reaction of a metallic material with its environment that causes a measurable change in the material and can impair the function of a metal component or an entire system. From a technical point of view, corrosion is a reaction of a material with its environment that causes a measurable change in the material. Corrosion can impair the function of a component or system. Corrosion, as a complex system of interactions, depends on a large number of factors which, in their multiformity, cannot be fully reproduced under test conditions. The type of corrosion known as dezincification, which occurs with zinc-containing copper alloys that are in contact with drinking water, is familiar to the broad expert public.

The purchaser of the alloy is responsible for determining and testing the design, further processing, application areas of products made from the alloy, and any other relevant factors. This is also applicable when determining the dezincification depth that is considered reasonable for the selected area of application. Diehl cannot accept any liability for this, but solely for the information contained in the enclosed product data sheet.

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WE GET METAL INTO SHAPE

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**entsprechend der bekannten Regularien zum Stand 02/2026*