

Diehl 430 PbF

High tensile, lead-free, free-machining brass
with unique properties



Diehl 430 PbF

Tensile Strength

— like steel

Machinability

— like free-machining brass

Resistance to Corrosion

— without additional cost

Lead-free

— in compliance with legal requirements



Diehl 430 PbF is a state-of-the-art special brass with unique mechanical characteristics which formerly were out of reach for traditional free-machining brass. Its high tensile strength combined with high elongation was until now only known from a few steel grades. However, the proven advantages of free-machining brass are still applicable:

- excellent machining properties
- good cold and hot forming properties



Diehl 430 PbF shows improved resistance to corrosion compared to conventional free-machining brass. It is insensitive to stress corrosion cracking and shows a dezincification resistance hardly achieved by any other brass.

All these characteristics make **Diehl 430 PbF** an ideal material for numerous applications in the automotive, electronic, sanitary and heating industries.

Environmental protection is an inherent part of our company policy which we observe from the first steps of product development onwards.

Diehl 430 PbF is a lead-free alloy suitable for free-machining applications. It meets already today the EU regulations for electrical and electronic equipment and therefore contributes to the positive ecobalance of brass.

Chemical Composition

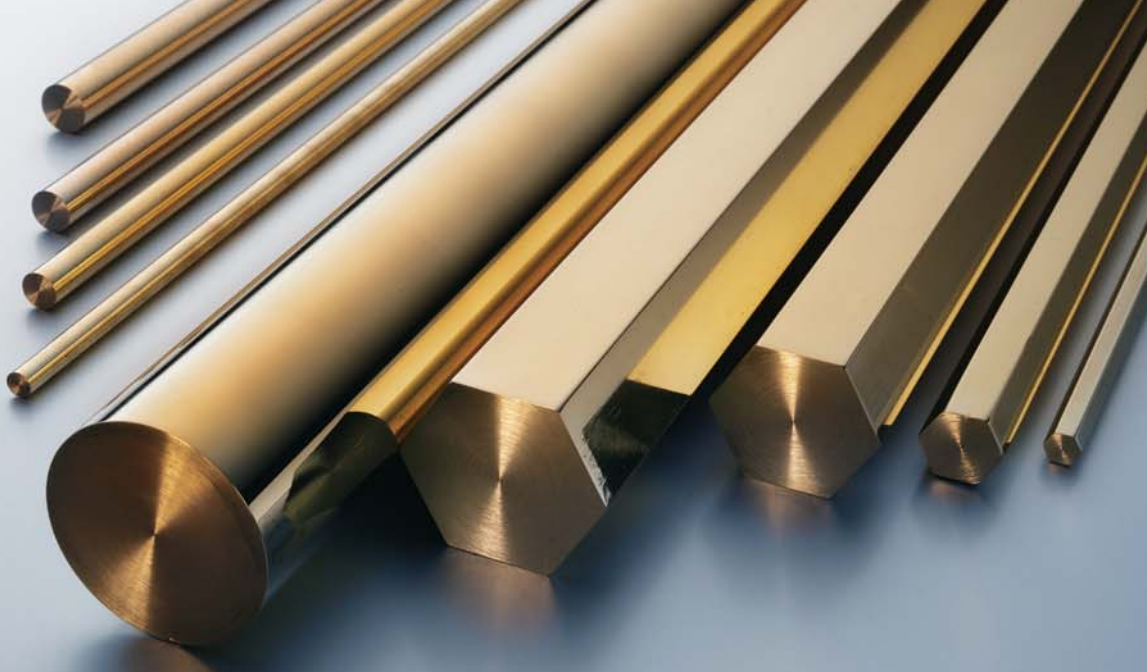
(Reference values in % by weight)

| | |
|----|--------|
| Cu | 76 % |
| Si | 3 % |
| P | 0,05 % |
| Zn | rem. |

Physical Properties

| | |
|----------------------|------------------------|
| Density | 8,3 g/cm ³ |
| Electr. Conductivity | 5,3 m/ mm ² |
| Therm. Conductivity | ca. 40 W/mK |
| Mod. of elast. | 106 kN/mm ² |





Mechanical Properties

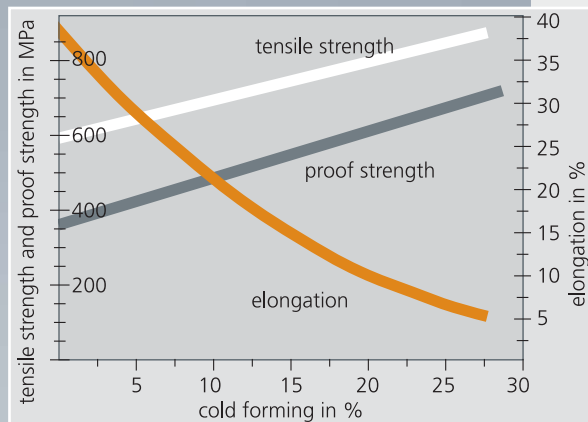
Diehl 430 PbF provides a substantial potential for applications where high strength properties are required. Therefore, new ground can be broken in re-engineering of existing or in developing new components.

| | | |
|---|-----|-------------------|
| Rm tensile strength | 700 | N/mm ² |
| Rp 0,2 %-proof strength | 480 | N/mm ² |
| A5 elongation | 23 | % |
| HB hardness | 180 | Brinell |
| Notch impact acc. to EN 10045 (U-notch) | 14 | J |

(Reference values for rods of approx. 20 mm diameter / .787" diameter)

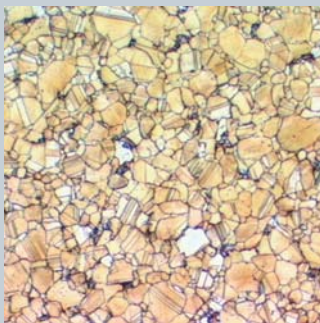
Corrosion Resistance

The additive P (phosphorus) provides dezincification resistance in compliance with ISO 6509 standard requirements. Furthermore, **Diehl 430 PbF** meets the DIN 50916 — part 1 test for stress corrosion cracking with excellent results.



Microstructure

Diehl 430 PbF shows a novel microstructure which consists of α -, κ - and γ -phase. The high-silica κ - and γ -phases produce short-breaking chips which guarantee excellent machinability.



Diehl 430 PbF micro structure

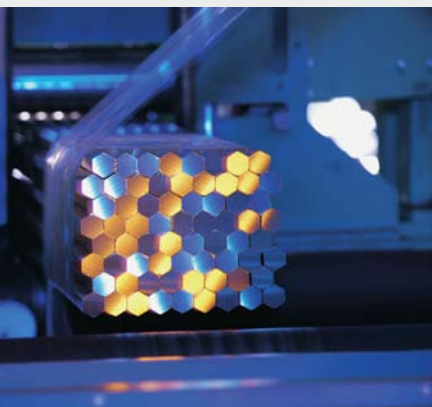
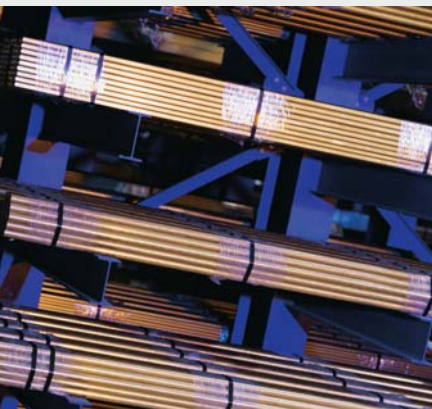


Diehl 430 PbF



Diehl 002 (CuZn39Pb3)

Diehl 430 PbF



Machining Properties

| | | |
|-------------------|---|-----------------------------|
| Machining | short breaking chips, slightly higher tool wear compared to CuZn39Pb3 | |
| Forging | temperature range forging load | narrower slightly higher |
| Cold forming | | good |
| Hot forming | | very good |
| Surface treatment | polishing | good |
| | electroplating | good |
| Joining process | resistance welding | good |
| | gas shielded arc welding | good |
| | brazing | very good |
| | soft soldering | very good |
| Heat treatment | stress relief annealing | 200-400° C |
| | soft annealing | 550-700° C |

Manufacturing Programme

Diehl 430 PbF is available as solid rod, profile and hollow rod.

| | | |
|--|----------------------|--------------------------------|
| Rods round | 6 - 70 mm | .236" - 2.756" |
| Rods hexagonal (AVF) | 6 - 70 mm | .236" - 2.756" |
| Sections (diameter of circumscribing circle) | 6 - 70 mm | .236" - 2.756" |
| Tubes (OD x wall thickness) | 20 - 120 x 2 - 12 mm | .787" - 4.724" x .078" - 4.72" |

Other dimensions upon request.

Diehl 430 PbF can be supplied in Europe in conversion and full price.

For your swarf separation we will supply boxes together with the semis.

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