

Walcownia Metali "DZIEDZICE" S.A.



MANUFACTURER OF COPPER ALLOYS PRODUCTS

Edition 2015



Walcownia Metali "DZIEDZICE" S.A.



Walcownia Metali "Dziedzice" S.A. is a world recognized producer of non-ferrous semi-finished products and in particular:

- brass rods
- brass tubes
- brass flat bars
- condenser tubes

All products are manufactured to our customers requirements in order to meet their expectations and provide the highest standards.

Trademark "Dziedzice" is a combination of tradition and modernity. A hundred-year tradition, experienced and highly competent personnel together with modern engineering and up-to-date technologies guarantee products of the highest quality.

In our company, we focus on modernity, innovation and professionalism. Our clients' trust is proof that it is worthwhile to work with us. A wide selection of products that we sell on the domestic market and export to many countries mean that customers all over the world appreciate our commitment and knowledge.

QUALITY POLICY WM DZIEDZICE S.A.



With the main objective of the wider customer satisfaction and meeting the expectations of the public, employees, owners and suppliers of Walcownia Metali "Dziedzice" SA, we would like first of all to deliver to the market products of high and stable quality which comply with the requirements and meet the needs of our Customers.

At the same time we are taking action to prevent any kind of job security threats, including potential accidents and accidents and occupational diseases, as well as to minimize the negative impact of manufacturing processes on the environment and promote economical use of its resources.

To this end, we set the following criteria and principles which will be followed our business activities:

- achieving the highest quality, technical and organizational standards in order to cooperate with the innovative and highly developed industries
- development and continuous improvement of the solutions and the effectiveness of the quality management system, overseeing the planning of all processes, including the product manufacturing processes and activities related to environmental protection and health and safety at work
- systematic introduction to the company's offer of new, profitable and technologically more advanced products that will increase the market share of recipients of non-ferrous metal products
- provision of adequate resources and means to implement the quality policy
- engaging all of the staff in the design, implementation and maintenance of all elements of the quality management system
- the use of processes and technologies that minimize impact on the environment, generation of waste and ensure their safe disposal
- creating and fostering a safe and friendly working environment and continuous improvement of health and safety
- upgrading skills and taking into account the role of employees and their commitment towards quality, health and safety and the environment

This policy is implemented within the quality management system in accordance with the requirements of ISO 9001, as required by law and our Customers.

All employees of the Company are familiar with the content and are responsible for the implementation of policy objectives.

CERTIFICATES





GA System acc. to AD3000-Markblutt W0 and EN 764-5, sec. 4.2

Details of the scope are meritioned in the armax of the certificate A22000-Mandsatt WIII.

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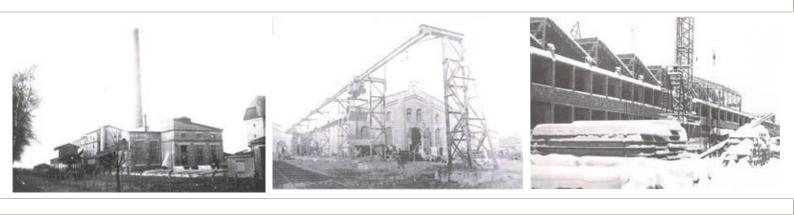
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AD 2000-Merkblatt W0 Certificate-No.: 07-203-9120-WP-0998/13 The scope of approval is available in the annex "scope of approval", file no.: 9120 P-0998113. Pacificas partitions accurate scientianth, quality assures to our woope of agen A quarter larred a

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HISTORY





In 1896 "Zinkwalzwerke Dziedzice" was established, employing 64 workers and producing only zinc rolled products.

In 1906, there was a thorough reconstruction and reorganization of production plant to aluminum products, with the possibility of extension of the production in later stages to products made of copper and its alloys.

From 1921 the plant was one of the joint stock company in Moravian Ostrava, which brings together zinc mills from Provoz in the Czech Republic, Dziedzice and Oswiecim in Poland and Vaczu in Hungary.

In August 1925 plants in Dziedzice and Oswiecim were districted from the Orava Joint Stock Company. Polish company was founded under the name "Walcownia Metali SA" based in Dziedzice.

With good management and a number of significant investments in the first half of 1939 the highest production rate of that time was achieved, with 458 tones/month of aluminum, copper and brass alloys and new silver and zinc.

After World War II Rolling Mills in Dziedzice were launched on June 16, 1945 as a state -owned enterprise.

In the years 1968 - 1976 a Copper Processing Plant was built, which started producing rods and tubes of copper and its alloys.

In 1996, Company's quality system has been certified according to ISO-9001.

In 1996 the ownership status was changed and the state enterprise was transformed into a joint stock company with a major shareholder – Impexmetal.

Continuous development and modernization led to a significant expansion of the range of products, achieving high quality and enabled Walcownia Metali "Dziedzice" SA entry with its products to foreign markets.

WE ARE A PART OF THE GROUP



QUALITY AND ENVIRONMENT



Walcownia Metali "Dziedzice" SA provides conducting and development of economic activities in compliance with national and supranational legal and ethical standards, focusing on selected issues that are seen as critical to ensure the proper conduct of its activities and maintained business relationships.

"Dziedzice" SA requires its employees and representatives to ensure that all actions taken by them are in accordance with:

- a) detailed rules laid down by Walcownia Metali "Dziedzice" SA, contained in the Code of Ethics and other regulations and internal procedures,
- b) national and international law in force in the country in which the company's operations are carried out, including:

- Undertakes to respect and promote the fundamental rights enshrined in the Universal Declaration of Human Rights, dignity and worth of the individual, the right to privacy of employees and equality between women and men. In particular, Walcownia Metali "Dziedzice" SA ensures compliance with the principles set out in the UN Global Compact on child and young persons labor, the employment of people with disabilities, discrimination, sexual harassment and mental health, health and safety at work,

- In accordance with the Dodd-Frank "Conflict Minerals" Act, Walcownia Metali "Dziedzice" S.A. monitors the origin of minerals used, so that they do not come from countries where their production is associated with the escalation of armed conflict and human rights violations,

- Environmental protection and actions in favor of its permanent increase the are one of the priorities of of Walcownia Metali "Dziedzice" SA. The main objectives pursued by our Company in the range of care for the environment, is:

- limiting the size of noise emission,
- limitation of pollutant emissions into the atmosphere,
- rational management of water, materials, waste and energy.

Walcownia Metali "Dziedzice" SA has for many years undertaken pro-ecological actions aimed at reducing the adverse impact on the natural environment. It has a regulated formal-legal situation for all elements of environmental protection, in accordance with decisions of integrated permits and a water permit. The Company realizes imposed obligations of environmental monitoring in the range of noise emission to the environment, the emission of pollutants into the air as well as monitoring the quality of discharged sewage in the manner provided the applicable Council on an ongoing basis.

- Walcownia Metali "Dziedzice" SA is a participant of REACH system in which is defined as a "downstream user". All alloying elements of manufactured products are pre-registered under REACH and are free of substances classified as CMR, PBT or vPvB and the substances classified as SVHC. As part of fulfilling their obligations under the REACH Regulation, our Company made a pre-registration and proper registration of following substances in marketed products: copper, zinc, lead, nickel, manganese, aluminum, tin, phosphorus, magnesium, silicon, iron and arsenic.

- In accordance with the RoHS II Directive No. 2011/65 / EC no product manufactured by Walcownia Metali "Dziedzice" S.A. contains: mercury (Hg), polybrominated biphenyl (PBB) and polybrominated biphenyl ether as (PBDE).

The content of other substances mentioned in the Directive and found in our products is as follows:

Pb - up to 4%, as an alloying element of copper alloy (in lead-brass rods) and homogeneous materials:

- Pb-0.1% Cd-0.01%
- Cr-0.1%

| WMD PRODUCTION |
|----------------|
| RANGE |



| BRASS RODS | 11 |
|---------------------------------|----|
| BRASS TUBES | 30 |
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Rod Production Division, Extrusion run out table



BRASS RODS



The offer for rods is very wide, both in respect to dimension, as well as alloy variety.

Drawn rods are manufactured in sizes ranging 2-65 mm, while the hot extruded rods in 15-180 mm size range. We offer both, drawn and extruded rods, depending on the size, in length up to 5000mm, packed in bundles of 500 kg or 1000 kg.

Rods are produced with round, hexagonal, octagonal and square crosssections. Other shapes of cross-sections require additional arrangements.

Leaded brass rods are destined for automatic machining or hot and cold forging.

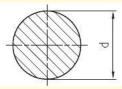
The usage of rods is very wide, mainly in the fittings industry as hardware components of water and gas installations.

They are also widely used in the automotive industry, electrotechnics and pieces of equipment for construction industry.

Certain rods are manufactured as special multi-component alloys with the possibility of usage as elements working in chemical and saltwater environments.

Dimensional charts shown further correspond to the EN standards. Brass rods are also produced according to other norms.





Drawn round rods acc to EN12164

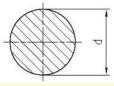
| Gra | ade | | | Mechanica | l properties | | | | | | |
|--|--------------------------------|--------|-----------------------------------|--|---|--------------------|--------------|--------------------|------------------------------|-----------------|--|
| Symbol | Number | Temper | Dimension d (mm) | Tensile Strength Rm N/mm2 (MPa) min | Yield Strength Rp02 N/mm2 (MPa) min | Tolerances (mm) | Straightness | Length (mm) | Ends | Packing | |
| | | | 2,0 - 3,0 | | | -0,025 | | | broken | | |
| | | | 3,1 - 6,0 | | | -0,030 | 1 mm/m | | chamfered /cut off | cases 500 kg | |
| | | Z | 6,1 - 10,0 10,1 - 18,0 | Without specifi | | -0,036 -0,043 | | | | | |
| | | | 18,1 - 30,0 | prope | erties | -0,052 | 0,5 mm/m | | chamfered /sharpened | hundloo 500 kg | |
| | | | 30,1 - 50,0 | | | -0,16 | 1 mm/m | | | bundles 500 kg | |
| ß | | | 50,1 - 65,0 6,0 - 10,0 | | | -0,19 -0,036 | 1 mm/m | | cut off | cases 500 kg | |
| CuZn39Pb3; CuZn40Pb2 | CW | ਸ | 10,1 - 18,0 | | | -0,043 | 0,5 mm/m | | chamfered /sharpened | oucco coo kg | |
| 9Pb | CW614N□ CW617N | R360 | 18,1 - 30,0 | 360 | 320* | -0,052 | 0,5 mm/m | 300 | chamered /sharpened | bundles 500 kg | |
| ů; C | | | 30,1 - 50,0 50,1 - 65,0 | | | -0,16 -0,19 | 1 mm/m | 3000 +/-50 | cut off | U U | |
| μZr | CW | | 2,0 - 3,0 | | | -0,025 | | -50 | broken | | |
| 140F | 6171 | - | 3,1 - 6,0 | | | -0,030 | 1 mm/m | chamfered /cut off | | cases 500 kg | |
| b2 | ~ | R430 | 6,1 - 10,0 10,1 - 18,0 | 430 | 220 | -0,036 -0,043 | | | | | |
| | | 0 | 18,1 - 30,0 | | | -0,052 | 0,5 mm/m | | chamfered /sharpened | bundles 500 kg | |
| | | | 30,1 - 40,0 | | | -0,16 | 1 mm/m | | | | |
| | | ਸ | 2,0 - 3,0 3,1 - 6,0 | | | -0,025 -0,030 | 1 mm/m | | broken chamfered /cut off | cases 500 kg | |
| | | R500 | 6,1 - 10,0 | 500 | 350 | -0,036 | | | | eaces are ng | |
| | | | 10,1 - 14,0 | | | -0,043 | 0,5 mm/m | | chamfered /sharpened | bundles 500 kg | |
| | | | 6,0 - 10,0 | - | | -0,036 -0,043 | 1 mm/m | | | cases 500 kg | |
| | | 060H | 10,1 - 18,0 18,1 - 30,0 | 90 | 120 | -0,043 | 0,5 mm/m | | chamfered /sharpened | | |
| S | CW | 00 | 30,1 - 50,0 | | | -0,16 | 1 mm/m | | | bundles 500 kg | |
| IZn3 | | | 50,1 - 65,0 | | | -0,19 -0,025 | | 3000 +/-50 | cut off broken | | |
| CuZn39Pb3; CuZn40Pb2 | CW614N; CW617N | | 2,0 - 3,0 3,1 - 6,0 | 110 16 | | -0,025 | 1 mm/m | | chamfered /cut off | cases 500 kg | |
| 3; 0 | N; C | H110 | 6,1 - 10,0 | | 160 | -0,036 | | | | | |
|) uZr | 2W6 | 10 | 10,1 - 18,0 | | 100 | -0,043 -0,052 | 0,5 mm/m | | chamfered /sharpened | bundles 500 kg | |
| 140F | 17N | | 18,1 - 30,0 30,1 - 40,0 | | - | -0,052 | | | | | |
| b2 | | | 2,0 - 3,0 | | | -0,025 | | | broken | | |
| | | H135 | 3,1 - 6,0 6,1 - 10,0 | 135 | | -0,030 -0,036 | 1 mm/m | | chamfered /cut off | cases 500 kg | |
| | | Οī | 10,1 - 14,0 | | | -0,030 | 0,5 mm/m | | chamfered /sharpened | bundles 500 kg | |
| Q | | | 2,0 - 3,0 | | | -0,025 | , | | broken | | |
| JZn | _ | | 3,1 - 6,0 | | | -0,030 | 1 mm/m | | chamfered /cut off | cases 500 kg | |
| 35Pt | CW | M | 6,1 - 10,0 10,1 - 18,0 | | ed mechanical | -0,036 -0,043 | | | | | |
| o1; (| 1005 | | 18,1 - 30,0 | prope | erties | -0,052 | 0,5 mm/m | | chamfered /sharpened | bundles 500 kg | |
| CuZi | 4; C | | 30,1 - 50,0 | | | -0,16 | 1 mm/m | | aut aff | buildles 500 kg | |
| 135F | W60 | | 50,1 - 65,0 2,0 - 3,0 | | | -0,19 -0,025 | | ω | cut off broken | | |
| ob2; |)1N; | | 3,1 - 6,0 | | 250 | -0,030 | 1 mm/m | 000 | chamfered /cut off | cases 500 kg | |
| Cu | СŴ | R370 | 6,1 - 10,0 | 270 | 200 | -0,036 | | 3000 +/-50 | | | |
| Zn3(| /603 | 70 | <u>10,1 - 14,0</u> 14,1 - 18,0 | 370 | | -0,043 | 0,5 mm/m | Ö | chamfered /sharpened | | |
| SPb | Ņ; | | 18,1 - 30,0 | | 180 | -0,052 | | | | bundles 500 kg | |
| 3; C | SM6 | | 30,1 - 40,0 | | | -0,16 | 1 mm/m | | brokon | | |
| uZn; | CW600N; CW601N; CW603N; CW606N | Ŗ | 2,0 - 3,0 3,1 - 6,0 | | | -0,025 -0,030 | 1 mm/m | | broken chamfered /cut off | cases 500 kg | |
| CuZn35Pb1; CuZn35Pb2; CuZn36Pb3; CuZn37Pb2 | | R440 | 6,1 - 10,0 | 440 | 340 | -0,036 | | | chamfered /sharpened | | |
| 62 | | | 10,1 - 14,0 | | | -0,043 | 0,5 mm/m | | shannereu /sharpeneu | bundles 500 kg | |



| A | \mathcal{O} | t |
|-----|---------------------------|---|
| A | | P |
| ()) | $\langle \rangle \rangle$ | |
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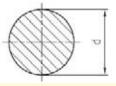
| Gra | de | | | Mechanical | properties | | | | | |
|---|---|--------|--------------------------------------|--|--|----------------------------|--------------|----------------|-------------------------------|----------------|
| Symbol | Number | Temper | Dimension d (mm) | Tensile Strength Rm N/mm2 (MPa) min | Yield Strength Rp02 N/mm2 (MPa) min | Tolerances d (mm) | Straightness | Length (mm) | Ends | Packing |
| CuZn38 | | | 2,0 - 3,0 3,1 - 6,0 6,1 - 10,0 | - | | -0,025 -0,030 -0,036 | 1 mm/m | | broken chamfered /cut off | cases 500 kg |
| CuZn38Pb1; CuZn38Pb2; CuZn39Pb0,5; CuZn39Pb1; CuZn39Pb2 | CW607N; CW608N; CW610N; CW611N; CW612N | Μ | 10,1 - 18,0 18,1 - 30,0 | Without specifie prope | | -0,043 -0,052 | 0,5 mm/m | | chamfered /sharpened | bundles 500 kg |
| JZn3 | N; C | | 30,1 - 50,0 50,1 - 65,0 | - | | -0,16 -0,19 | 1 mm/m | | cut off | |
| 8Pb | W6 | | 6,0 - 10,0 | | | -0,036 | 1 mm/m | | | cases 500 kg |
| į, O | 08N | R360 | 10,1 - 18,0 18,1 - 30,0 | 360 | 300* | -0,043 -0,052 | 0,5 mm/m | | chamfered /sharpened | |
| ;uZn | CW6 | 60 | 30,1 - 50,0 | 000 | 000 | -0,16 | 1 mm/m | 3000 +/-50 | | bundles 500 kg |
| 39P | /610 | | 50,1 - 65,0 | | | -0,19 | 1 11111/111 | 0 +/ | cut off | |
| ,0d |)N; | | 2,0 - 3,0 3,1 - 6,0 | | | -0,025 -0,030 | 1 mm/m | -50 | broken chamfered /cut off | cases 500 kg |
| ູ; ດ | CW6 | R | 6,1 - 10,0 | 410 | 230 | -0,036 | | | onamered reat on | cubec coo ng |
| uZni | 511N | R410 | 10,1 - 18,0 | 410 | | -0,043 | 0,5 mm/m | | chamfered /sharpened | |
| 39P | 4; C | | 18,1 - 30,0 30,1 - 40,0 | - | | -0,052 -0,16 | , 1 mm/m | | | bundles 500 kg |
| b1; (| W6, | | 2,0 - 3,0 | - 500 | | -0,025 | 1 11111/111 | | broken | |
| CuZ | 12N | R | 3,1 - 6,0 | | 350 | -0,020 | 1 mm/m | | chamfered /cut off | cases 500 kg |
| n39 | | R500 | 6,1 - 10,0 | 500 | | -0,036 | | | | g |
| Pb2 | | | 10,1 - 14,0 | - | | -0,043 | 1 mm/m | | chamfered /sharpened | bundles 500 kg |
| | Q | | 6,1 - 10,0 | | | -0,036 | 1 mm/m | | | cases 500 kg |
| CuZn38Pb1; CuZn38Pb2; CuZn39Pb0,5 CuZn39Pb1; CuZn39Pb2 | CW607N; CW608N; CW610N; CW611N; CW612N | Н | 10,0 - 18,0 | | 100 | -0,043 | 0,5 mm/m | | chamfered /sharpened | |
| 138F | | H070 | 18,1 - 30,0 30,1 - 50,0 | 70 | | -0,052 -0,16 | , | | · | bundles 500 kg |
| bb1; | | | 50,1 - 65,0 | | | -0,19 | 1 mm/m | | cut off | |
| n39F | 09N | CW60 | 2,0 - 3,0 | | 145 | -0,025 | | 3000 +/-50 | broken | |
| ⊃b1; |)8N; CW(| т | 3,1 - 6,0 6,1 - 10,0 | | | -0,030 -0,036 | 1 mm/m | | chamfered /cut off | cases 500 kg |
| iPb1; CuZn38Pb2; CuZn3 CuZn39Pb1; CuZn39Pb2 | 08N; CW6 CW612N | H100 | 10,01 - 18,0 | 100 | | -0,038 | | + | | |
| 2; C Zn3 | /610 V | 0 | 18,1 - 30,0 | + | | -0,052 | 0,5 mm/m | 80 | chamfered /sharpened | bundles 500 kg |
| 9Pb |)N; | | 30,1 - 40,0 | | | -0,16 | 1 mm/m | | | |
| 139F | CWG | Н | 2,0 - 3,0 3,1 - 6,0 | | | -0,025 -0,030 | 1 mm/m | | broken chamfered /cut off | cases 500 kg |
| ър0, | 611I | 120 | 6,1 - 10,0 | 120 | | -0,036 | | | | cubbe coo kg |
| ָ <u></u> ָיִ | , | | 10,1 - 14,0 | | | -0,043 | 0,5 mm/m | | chamfered /sharpened | bundles 500 kg |
| | | | 5,0 - 6,0 6,1 - 10,0 | + | | -0,030 | 2 mm/m | | chamfered /cut off | cases 500 kg |
| Q | | | 10,1 - 10,0 | Without specifie | ed mechanical | -0,036 -0,043 | | | | |
| uZni | | Ν | 18,1 - 30,0 | prope | | -0,052 | 1 mm/m | ω | chamfered /sharpened | bundles 500 kg |
| CuZn37Mn3Al2PbSi | CW713R | | 30,1 - 50,0 | - | | -0,16 | 2 mm/m | 3000 +/-50 | | bundles 500 kg |
| In3A | 713 | | 50,1 - 65,0 5,0 - 6,0 | | | -0,19 -0,030 | | + | cut off chamfered /cut off | |
| vi2P | ת | т | 6,1 - 10,0 | | | -0,036 | 2 mm/m | 50 | chamered /edt on | cases 500 kg |
| bS: | | R590 | 10,1 - 18,0 | 590 | 370 | -0,043 | 1 mm/m | | chamfered /sharpened | |
| | | 0 | 18,1 - 30,0 | | | -0,052 | | | | bundles 500 kg |
| Q | | | <u>30,1 - 50,0</u> 5,0 - 6,0 | | | -0,16 -0,030 | 2 mm/m | | chamfered /cut off | |
| uZn: | | | 6,1 - 10,0 | | | -0,036 | 2 mm/m | ω | | cases 500 kg |
| 37M | CW | Ţ | 10,1 - 18,0 | | | -0,043 | | 3000 | | |
| CuZn37Mn3Al2PbSi | CW713R | H150 | 18,1 - 30,0 | 150 | 220 | -0,043 | 1 mm/m |) +/-: | Chamfered /sharpened | ed |
| N2P | ת | | | | | | | 50 | | bundles 500 kg |
| bSi | | | 30,1 - 50,0 | | | -0,16 | 2 mm/m | | | |





| Gra | ade | | | Mechanica | al properties | | | | | |
|---|------------------------|---|--|--|---|-------------------------------------|--------------------|----------------|--|----------------|
| Symbol | Number | Temper | Dimension d (mm) | Tensile Strength Rm N/mm2 (MPa) min | Yield Strength Rp02 N/mm2 (MPa) min | Tolerances d (mm) | Straightness | Length (mm) | Ends | Packing |
| | | | 5,0- 6,0 6,1 - 10,0 | | | -0,030 -0,036 | 2 mm/m | | chamfered /cut off | cases 500 kg |
| C | | Ζ | 10,1 - 10,0 10,1 - 18,0 18,1 - 30,0 30,1 - 50,0 | | ied mechanical erties | -0,030 -0,043 -0,052 -0,16 | 1 mm/m | | chamfered /sharpened | bundles 500 kg |
| CuZn40Mn1Pb | CW720R | R440 | 50,1 - 65,0 40, - 50,0 50,1 - 65,0 | 440 | 180 | -0,19 -0,16 -0,19 | 2 mm/m 2 mm/m | 3000 +/-50 | cut off chamfered /sharpened cut off | bundles 500 kg |
| Pb | ,- | | 5,0 - 6,0 6,1 - 10,0 | _ | | -0,030 -0,036 | 2 mm/m | 0 | chamfered /cut off | cases 500 kg |
| | | R500 | 10,1 - 18,0 18,1 - 30,0 30,1 - 40,0 | 500 | 270 | -0,043 -0,052 -0,16 | 1 mm/m | | chamfered /sharpened | bundles 500 kg |
| CuZ | 0 | H100 | 40, - 50,0 50,1 - 65,0 | 100 | 140 | -0,16 -0,19 | 2 mm/m | 3(| chamfered /sharpened cut off | bundles 500 kg |
| CuZn40Mn1Pb | CW720R | т | 5,0 - 6,0 6,1 - 10,0 | | | -0,030 -0,036 | 2 mm/m | 3000 +/-50 | | cases 500 kg |
| In1Pb | 0R | H130 | 10,1 - 18,0 18,1 - 30,0 30,1 - 40,0 | 130 | | -0,043 -0,052 -0,16 | 1 mm/m | -50 | chamfered /sharpened | bundles 500 kg |
| | | | 5,0 - 6,0 6,1 - 10,0 | | | -0,030 -0,036 | 2 mm/m | | broken | cases 500 kg |
| | CW509L | Ζ | 10,1 - 18,0 18,1 - 30,0 | | ied mechanical erties | -0,043 -0,052 | 1 mm/m | 3 | broken | bundles 500 kg |
| CuZn40 | | 50,1 - 65 5,0 - 6,0 6,1 - 10, 10,1 - 18 8 18,1 - 30 | 30,1 - 50,0 50,1 - 65,0 5,0 - 6,0 | 5,0 0 | -0,16 -0,19 -0,030 | 2 mm/m 2 mm/m | 3000 +/-50 | cut off | cases 500 kg | |
| 0 | | | 6,1 - 10,0 10,1 - 18,0 18 1 - 30 0 | | 300* | -0,036 -0,043 -0,052 | 1 mm/m | 50 | broken | |
| | | 0 | 30,1 - 50,0 50,1 - 65,0 | - | | -0,16 -0,19 | 2 mm/m | | cut off | bundles 500 kg |
| CuZn36Pb | | | 2,0 - 3,0 3,1 - 6,0 6,1 - 10,0 | | | -0,025 -0,030 -0,036 | 1 mm/m | | broken chamfered /cut off | cases 500 kg |
| 3Pb2AS; | CW602 | Ζ | 10,1 - 18,0 18,1 - 30,0 30,1 - 50,0 | Without specified mechanical properties | | -0,043 -0,052 -0,16 | 0,5 mm/m | - | chamfered /sharpened | bundles 500 kg |
| CuZn | 2N; C/ | | 50,1 - 65,0 6,0 - 10,0 | - | | -0,19 -0,036 | 1 mm/m 1 mm/m | 30 | cut off | cases 500 kg |
| in35Pb1, 5AIAs | W602N; CW625N; CW626N; | R280 | 10,1 - 18,0 18,1 - 30,0 | 280 | 200* | -0,043 -0,052 | 0,5 mm/m | 3000 +/-50 | chamfered /sharpened | bundles 500 kg |
| 5AIAs | CW6 | 0 | 30,1 - 50,0 50,1 - 65,0 | | | -0,16 -0,19 | 1 mm/m | 0 | cut off | |
| 2AS; CuZn35Pb1,5AlAs; CuZn33Pb1, 5AlAs | 26N; | R320 | 6,0 - 10,0 10,1 - 18,0 18,1 - 30,0 | 320 | 200 | -0,036 -0,043 -0,052 | 1 mm/m 0,5 mm/m | | chamfered /sharpened | cases 500 kg |
| 3Pb1, | | ö | 30,1 - 50,0 50,1 - 60,0 | | | -0,16 -0,19 | 1 mm/m | | cut off | bundles 500 kg |
| | | | 5,0 - 6,0 6,1 - 10,0 10,1 - 18,0 | | 1 | -0,030 -0,036 -0,043 | 2 mm/m | <u> </u> | broken | cases 500 kg |
| CuZn42 | CW510L | Μ | 18,1 - 30,0 30,1 - 50,0 | | ied mechanical erties | -0,052 -0,16 | 1 mm/m 2 mm/m | 300 | cut off | bundles 500 kg |
| n42 | 510L | | 50,1 - 65,0 5,0 - 6,0 6,1 - 10,0 | | | -0,19 -0,030 -0,036 | 2 mm/m | 3000 +/-50 | | cases 500 kg |
| | | R360 | 10,1 - 18,0 18,1 - 30,0 30,1 - 50,0 | 360 3 | 320* 20 | -0,043 -0,052 -0,16 | 1 mm/m | | | bundles 500 kg |
| | | | 50,1 - 65,0 | | | -0,19 | 2 mm/m | | cut off | |



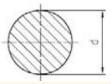


| Gr | ade | | | Mechanica | l properties | | | | | |
|--------|----------|--------|---------------------|--|---|----------------------|------------------|------------|---------|----------------|
| Symbol | Number | Temper | Dimension d (mm) | Tensile Strength Rm N/ mm2 (MPa) min | Yield Strength Rp02 N/mm2 (MPa) min | Tolerances d (mm) | Straightness | Length | Ends | Packing |
| | | | 2,0 - 3,0 | | | +/- 0,05 | | | | |
| | | | 3,1 - 6,0 | | | +/- 0,08 | 2 mm/m | | | cases 500 kg |
| | | | 6,1 - 10,0 | | | +/- 0,11 | | | broken | |
| | | Σ | 10,1 - 18,0 | Without specifi | | | | | | |
| | | | 18,1 - 30,0 | | | +/- 0,17 | 1 mm/m | | | bundles 500 kg |
| | | | 30,1 - 50,0 | | | +/- 0,20 | | | cut off | bundles 500 kg |
| | C | | 50,1 - 65,0 | | | +/- 0,37 | 2 mm/m 2 mm/m | | cuton | |
| | | | 2,0 - 3,0 | _ | - | +/- 0,05 | | | broken | |
| | | | 3,1 - 6,0 | | | +/- 0,08 | | 3000 +/-50 | | cases 500 kg |
| CuZn37 | W5(| T | 6,1 - 10,0 | | | +/- 0,11 | | | | |
| n37 | CW508L** | R290 | 10,1 - 18,0 | 290 | 230* | +/- 0,14 | | +/-5 | | |
| | * | 0 | 18,1 - 30,0 | | | +/- 0,17 | 1 mm/m | 0 | | bundles 500 kg |
| | | | 30,1 - 50,0 | | | +/- 0,20 | | | cut off | bundles 500 kg |
| | | | 50,1 - 65,0 | | | +/- 0,37 | 2 mm/m | | cuton | |
| | | | 2,0 - 3,0 | _ | | +/- 0,05 | | | | |
| | | | 3,1 - 6,0 | | | +/- 0,08 | 2 mm/m | | | cases 500 kg |
| | | R370 | 6,1 - 10,0 | 370 | 240 | +/- 0,11 | | | broken | |
| | | 70 | 10,1 - 18,0 | | 270 | +/- 0,14 | 4 | | | |
| | | | 18,1 - 30,0 | | | +/- 0,17 | 1 mm/m | | | bundles 500 kg |
| | | | 30,1 - 40,0 | | | +/- 0,20 | | | cut off | |

* max value

** alloy offered acc to EN12163

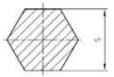




| | | | | | - | | ASTM B 16 | | | |
|--------------|----------------|-----------|----------|--------------|----------------|--------------------|-----------|----------|-------|-------------------------|
| | | | 515 - (| | 5 (0360 | 00) acc 10 | | operties | | |
| | | | | S | | | Pro | perties | | _ |
| Dime | nsion d | Tolera | | Straightness | Length | Ends | Temper | Rm min | A min | Packing |
| [cal] | [mm] | [cal] | [mm] | SS | [mm] | | | [Mpa] | [%] | |
| 3/32 | 2,38 | | | _ | | | | | | |
| 7/64 | 2,77 | +/-0,0013 | +/-0 035 | | | broken | | | | |
| 1/8 | 3,17 | 17-0,0013 | 17-0,000 | | | | _ | | | |
| 9/64 | 3,56 | | | | | cha | | | | |
| 5/32 | 3,97 | | | | | chamfered /cut off | | | | 0 |
| 3/16 | 4,76 | | | | | fere | | | | Cases 500 kg (1000 lbs) |
| 13/64 | 5,16 | | | | | o/ pé | | | | es (|
| 7/32 | 5,56 | | | 1 mm/m | | out | | | | 500 |
| 15/64 | 5,95 | | | | | off | | | | kg |
| 1/4 | 6,35 | | | (0,04"/39") | | | | | | Ĵ |
| 17/64 | 6,75 | | | · · / | | | | 395 | 7 | 100 |
| 9/32 | 7,14 | _ | | | | | | 395 | 1 | 9I 0 |
| 19/64 | 7,54 | +/-0,0015 | +/-0,04 | | | | | | | (si |
| 5/16 | 7,94 | +/-0,0015 | +/-0,04 | | | | | | | |
| 21/64 | 8,33 | _ | | | | | | | | |
| 11/32 | 8,73 | - | | | | | | | | |
| 23/64 | 9,13 | - | | | | | | | | |
| 3/8 13/32 | 9,52 10,32 | - | | | - | | | | - | |
| 7/16 | 11,11 | | | | | | | | | |
| 29/64 | 11,51 | - | | | | | | | | |
| 15/32 | 11,91 | | | | | | | | | |
| 1/2 | 12,70 | | | | 36 | | | | | |
| 17/32 | 13,49 | | | | 3660 +/-25 | | | | | |
| 9/16 | 14,29 | | | 0,5 mm/m | +/-2 | | | | | |
| 5/8 | 15,87 | | | 0,5 1111/11 | G | | H02 | | | |
| 21/32 | 16,67 | _ | | (0,02"/39") | Ĺ. | | HU2 | | 10 | |
| 11/16 | 17,46 | _ | | (0,02739) | (12ft +/-1") | chamfered /s | | | | |
| 23/32 | 18,26 | +/-0,002 | +/-0,05 | | + | amf | | 380 | | |
| 3/4 | 19,05 | _ | | | 1") | ere | | | | |
| 13/16 | 20,64 | - | | | | d /s | | | | B |
| 7/8 | 22,23 | - | | | | sha | | | | pur |
| 15/16 | 23,81 | | | | | rpe | | | | les |
| 1 - 1/16 | 25,40 26,99 | | | | | harpened | | | | Bundles 500 kg |
| 1 - 1/8 | 28,99 | - | | | | - | | | | D Kc |
| 1 - 3/16 | 30,16 | - | | | | | | | | |
| 1 - 1/4 | 31,75 | | | | | | | | | (10 |
| 1 - 5/16 | 33,34 | | | | | | | | | (1000 lbs) |
| 1 - 3/8 | 34,93 | | | | | | | | | lbs |
| 1 - 7/16 | 36,51 | | | 1 mm/m | | | | | | ÷ |
| 1 - 1/2 | 38,10 | 1 | | | | | | | | |
| 1 - 9/16 | 39,69 | | | (0,04"/39") | | | | | | |
| 1 - 5/8 | 41,28 | +/-0,0025 | +/-0,06 | | | | | 345 | 15 | |
| 1 - 11/16 | 42,86 | 1 | | | | | | | | |
| 1 - 3/4 | 44,45 | 1 | | | | | | | | |
| 1 - 13/16 | 46,04 | 1 | | | | | | | | |
| 1 - 7/8 | 47,63 | 1 | | | | | | | | |
| 2 | 50,80 | 1 | | | | | | | | |
| 2 - 1/4 | 57,15 | 1 | | 2 mm/m | | | | | | |
| 2 - 3/8 | 60,33 | 1 | | (0.000 | | | | | | |
| | | 1 | | (0,08"/39") | | | | | | |
| 2 - 1/2 | 63,50 | 1 | | (0,08"/39") | | | | | | |

Drawn round rods in Imperial Measurements

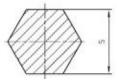




Drawn hexagonal rods acc to EN12164

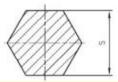
| Gra | de | | | Mechanica | I properties | | | | | |
|--|--------------------------------|--------|----------------------------|--|---|----------------------|--------------|----------------|--|------------------|
| Symbol | Number | Temper | Dimension s (mm) | Tensile Strength Rm N/mm2 (MPa) min | Yield Strength Rp02 N/mm2 (MPa) min | Tolerances s (mm) | Straightness | Length (mm) | Ends | Packing |
| | | | 3,0 - 6,0 | | | -0,06 | 2 mm/m | | chamfered /cut off | cases 500 kg |
| | | | 6,1 - 10,0 | | | -0,09 | 2 11111/111 | | | Cases 500 kg |
| | | \leq | 10,1 - 18,0 18,1 - 30,0 | | ied mechanical erties | -0,11 -0,13 | 1,5 mm/m | | chamfered /sharpened | |
| | | | 30,1 - 50,0 | | | -0,16 | ., | | | bundles 500 kg |
| Cuz | 0 | | 50,1 - 63,5 | | | -0,19 | 2 mm/m | | cut off | |
| CuZn39P3; CuZn40Pb2 | W6 | | 6,0 - 10,0 | | | -0,09 -0,11 | 2 mm/m | ۵ | | cases 500 kg |
|)P3; | 14N | R360 | 10,1 - 18,0 18,1 - 30,0 | 360 | 320* | -0,11 | 1,5 mm/m | 3000 | chamfered /sharpened | |
| ß | CW614N; CW617N | 00 | 30,1 - 50,0 | | 020 | -0,16 | 1,0 1111 |) +/-50 | | bundles 500 kg |
| Zn4 | N61 | | 50,1 - 63,5 | | | -0,19 | 2 mm/m | 50 | cut off | |
| OPt | 7N | | 3,0 - 6,0 | | | -0,06 | 2 mm/m | | chamfered /cut off | cases 500 kg |
| Ň | | R430 | 6,1 - 10,0 10,1 - 18,0 | 430 | 220 | -0,09 -0,11 | | | | |
| | | 30 | 18,1 - 30,0 | 100 | 220 | -0,13 | 1,5 mm/m | | chamfered /sharpened | bundles 500 kg |
| | | | 30,1 - 35,0 | | | -0,16 | | | | |
| | | R500 | 3,0 - 6,0 | 500 | 350 | -0,06 | 2 mm/m | | chamfered /cut off | cases 500 kg |
| - | 0 | õ | 6,1 - 10,0 3,0 - 6,0 | | | -0,09 -0,080 | | | chamfered /sharpened chamfered /cut off | |
| Cuz | W6 | | 6,1 - 10,0 | | | -0,090 | 2 mm/m | | chamered /cdt on | cases 500 kg |
| n35 | CW600N; CW601N; CW603N; CW606N | Σ | 10,1 - 18,0 | | ied mechanical erties | -0,110 | 1,5 mm/m | | chamfered /sharpened | |
| βPb | | | 18,1 - 30,0 | prop | erties | -0,130 | | | chamered /sharpened | bundles 500 kg |
| 0 0 1; | | | 30,1 - 50,0 3,0 - 6,0 | | | -0,16 -0,08 | 2 mm/m | ω | chamfered /cut off | |
| uZn | | - | 6,1 - 10,0 | - | 250 | -0,08 | 2 mm/m | 3000 +/-50 | | cases 500 kg |
| CuZn35Pb1; CuZn35Pb2; CuZn36Pb3; CuZn37Pb2 | ; 0 | R370 | 10,1 - 14,0 | 370 | 180 | -0,11 | | | chamfered /sharpened | bundles 500 kg |
| b2; b2 | V60 | 70 | 14,1 - 18,0 | 370 | | | 1,5 mm/m | | | |
| Cuz | 3N; | | 18,1 - 30,0 30,1 - 35,0 | | | -0,13 -0,16 | 2 mm/m | | | 0 |
| Zn3(| СМ | - | 2,0 - 3,0 | | | -0,06 | 2 1111/111 | | broken | |
| SPb | /606 | R440 | 3,1 - 6,0 | 440 | 340 | -0,08 | 2 mm/m | | chamfered /cut off | cases 500 kg |
| ų | ŰŽ | 0 | 6,1 - 10,0 | | | -0,09 | | | chamfered /sharpened | |
| | СV | | 3,0 - 6,0 6,1 - 10,0 | | | -0,06 -0,09 | 2 mm/m | | chamfered /cut off | cases 500 kg |
| 0 | CW607N; | | 10,1 - 18,0 | Without specif | ied mechanical | -0,09 | | | | |
| CuZn | 7N; | \leq | 18,1 - 30,0 | | erties | -0,13 | 1,5 mm/m | | chamfered /sharpened | hundlog 500 kg |
| 0 0 0 | CW | | 30,1 - 50,0 | | | -0,16 | | | | bundles 500 kg |
| ůZr | 809, | | 50,1 - 63,5 | | | -0,19 | 2 mm/m | | cut off | |
| Cu: | ŝN; | | 6,0 - 10,0 10,1 - 18,0 | | | -0,09 -0,11 | 2 mm/m | ω | | cases 500 kg |
| ⊃b1 | CW | | 18,1 - 30,0 | | | -0,13 | 1,5 mm/m | 000 | chamfered /sharpened | |
| CL 8Pb | 310 | | 30,1 - 50,0 | | | -0,16 | | 3000 +/-50 | | bundles 500 kg |
| 38Pb1; CuZn38Pb2; CuZn39Pb0,5; CuZn39Pb1; CuZn39Pb2 | CW608N; CW610N; CW611N; CW612N | | 50,1 - 60,0 | | | -0,19 | 2 mm/m | 50 | cut off | 5001 |
| SuZ1 | :W6 | | 3,0 - 6,0 6,1 - 10,0 | | | -0,06 -0,09 | 2 mm/m | | chamfered /cut off | cases 500 kg |
| n39 02 | 51 1 N | R410 | 10,1 - 18,0 | 410 | 230 | -0,03 | | | | |
| Pb0 | 4; C | 10 | 18,1 - 30,0 | | | -0,13 | 1,5 mm/m | | chamfered /sharpened | d bundles 500 kg |
|),5; | W6 | _ | 30,1 - 35,0 | | | -0,16 | | | | |
| | 12N | R500 | 3,0 - 6,0 | 500 | 350 | -0,06 | 2 mm/m | | chamfered /cut off | cases 500 kg |
| | - | õ | 6,1 - 10,0 | | | -0,09 | | | chamfered /sharpened | ~ |





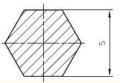
| Gra | de | | | Mecha | anical | properties | | | | | | | | | | | | |
|------------------|--------|--------|--|---------------------------------------|---------|--|----------------------|-------------------|--------------------|----------------------|----------------|--|--|--|---------------------------|----------------|----------|--|
| Symbol | Number | Temper | Dimension s (mm) | Tensil Strength N/mm (MPa) r | Rm 2 | Yield Strength Rp02 N/mm2 (MPa) min | Tolerances s (mm) | Straightness | Length (mm) | Ends | Packing | | | | | | | |
| | | | 5,0 - 6,0 | | | | -0,06 | 3 mm/m | | chamfered /cut off | cases 500 kg | | | | | | | |
| 0 | | | 6,1 - 10,0 | 14/11 | | | -0,09 | | - | | g | | | | | | | |
| μŽ | | \leq | 10,1 - 18,0 18,1 - 30,0 | | | pecified properties | -0,11 -0,13 | 2 mm/m | | chamfered /sharpened | | | | | | | | |
| 137 | CV | | 30,1 - 50,0 | | | F F | -0,16 | | 3000 +/-50 | | bundles 500 kg | | | | | | | |
| Mna | CW713R | | 50,1 - 63,5 | | | | -0,19 | 3 mm/m | Õ + | cut off | | | | | | | | |
| CuZn37Mn3Al2PbSi | 3R | | 5,0 - 6,0 | | | | -0,06 | 3 mm/m | /-50 | chamfered /cut off | cases 500 kg | | | | | | | |
| Pb | | 590 | 6,1 - 10,0 | 500 | | 270 | -0,09 | | - | | | | | | | | | |
| <u>נס</u> | | 00 | 10,1 - 18,0 18,1 - 30,0 | 590 | | 370 | -0,11 -0,13 | 2 mm/m | | chamfered /sharpened | bundles 500 kg | | | | | | | |
| | | | 30,1 - 40,0 | | | | -0,16 | 2 | | | | | | | | | | |
| | | | 5,0 - 6,0 | | | | -0,06 | 3 mm/m | | chamfered /cut off | cases 500 kg | | | | | | | |
| | | | 6,1 - 10,0 | | | | -0,09 | 5 1111/111 | - | | Cases 500 kg | | | | | | | |
| | | \leq | 101 - 18,0 | | | pecified | -0,11 | 0 | | chamfered /sharpened | | | | | | | | |
| 0 | | | 18,1 - 30,0 30,1 - 50,0 | mecna | anicai | properties | -0,13 -0,16 | 2 mm/m | | onamerea /enarpenea | bundles 500 kg | | | | | | | |
| CuZn40Mn1Pb | 2 | | 50,1 - 63,5 | | | | -0,19 | 3 mm/m | 300 | cut off | | | | | | | | |
| 401 | CW720R | R440 | 40, - 50,0 | 440 | | 180 | -0,160 | | 00 + | chamfered /sharpened | hundles EOO ka | | | | | | | |
| /In1 | OR | 40 | 50,1 - 60,0 | 440 | | 160 | -0,190 | 3 mm/m | 3000 +/-50 | cut off | bundles 500 kg | | | | | | | |
| Pb | | | 5,0 - 6,0 | | | | -0,06 | 3 mm/m | 0 | chamfered /cut off | | | | | | | | |
| | | R500 | 6,1 - 10,0 | 500 | | 270 | -0,09 | | | | bundles 500 kg | | | | | | | |
| | | 00 | 10,1 - 18,0 18,1 - 30,0 | 500 | | 270 | -0,11 -0,13 | 2 mm/m | | chamfered /sharpened | | | | | | | | |
| | | | 30,1 - 40,0 | | | | -0,16 | 2 | | | cases 500 kg | | | | | | | |
| | | | 5,0 - 6,0 | | | | -0,06 | 2 mm/m | _ | | cases 500 kg | | | | | | | |
| | 2 | | 6,1 - 10,0 ≤ 10,1 - 18,0 18,1 - 20,0 | Without | | | -0,09 | 2 | | broken | cases ooo kg | | | | | | | |
| | | | | Σ | Σ | Σ | Σ | Σ | Z | Σ | | | | | specified I properties | -0,11 -0,13 | 1,5 mm/m | |
| | | | 30,1 - 50,0 | mecha | anicai | properties | -0,13 | | ω | | bundles 500 kg | | | | | | | |
| Cuz | CW | | 50,1 - 63,5 | | | | -0,19 | 2 mm/m | 000 | cut off | | | | | | | | |
| CuZn40 | CW509L | | 5,0 - 6,0 | | | | -0,06 | 2 mm/m | 3000 +/-50 | | cases 500 kg | | | | | | | |
| 0 | | - | 6,1 - 10,0 | | | | -0,09 | 2 1111/111 | 50 | broken | Cases 500 kg | | | | | | | |
| | | R360 | 10,1 - 18,0 18,1 - 30,0 | 360 | | 300* | -0,11 -0,13 | 1,5 mm/m | | | | | | | | | | |
| | | 0 | 30,1 - 50,0 | | | | -0,13 | 1,5 mm/m | | | bundles 500 kg | | | | | | | |
| | | | 50,1 - 60,0 | | | | -0,19 | 2 mm/m | - | cut off | | | | | | | | |
| | | | 3,0 - 6,0 | | · | | -0,06 | 2 mm/m | | chamfered /cut off | cases 500 kg | | | | | | | |
| | | | 6,1 - 10,0 | | | | -0,09 | 2 | - | | oucco coo kg | | | | | | | |
| | | \leq | 10,0 - 18,0 18,1 - 30,0 | | | pecified properties | -0,11 -0,13 | 1,5 mm/m | | chamfered /sharpened | | | | | | | | |
| | | | 30,1 - 50,0 | meene | annoar | properties | -0,15 | | - | | bundles 500 kg | | | | | | | |
| | | | 50,1 - 63,5 | | | | -0,19 | 2 mm/m | | cut off | | | | | | | | |
| Cu | | | 5,0 - 6,0 | | | | -0,06 | 2 mm/m | ω | chamfered /cut off | cases 500 kg | | | | | | | |
| Zn3 | 2 | Ŧ | 6,1 - 10,0 | | | | -0,09 | <u>د ۱۱۱۱/۱۱۱</u> | 3000 +/-50 | | 54555 500 Kg | | | | | | | |
| 6Pt | CW511L | R280 | 10,1 - 18,0 18,1 - 30,0 | 280 | 200 | 0* 30 | -0,11 -0,13 | 1,5 mm/m | + | chamfered /sharpened | | | | | | | | |
| CuZn36Pb2As | 11L | 0 | 30,1 - 50,0 | | | | -0,13 | | 50 | | bundles 500 kg | | | | | | | |
| s | | | 50,1 - 60,0 | | | | -0,19 | 2 mm/m | | cut off | | | | | | | | |
| | | | 5,0 - 6,0 | | | | -0,06 | 2 mm/m | chamfered /cut off | | cases 500 kg | | | | | | | |
| | | ק | 6,1 - 10,0 | | | | -0,09 | £ | - | | | | | | | | | |
| | | R320 | 10,1 - 18,0 | 320 | 20 | 200 30 | -0,11 | 1,5 mm/m | | chamfered /sharpened | hundlos 500 kg | | | | | | | |
| | | 20 | 18,1 - 30,0 30,1 - 50,0 | | | | -0,13 -0,16 | 2 mm/m | - | | bundles 500 kg | | | | | | | |
| L | L | | 30,1 - 30,0 | | | | 0,10 | ~ | I | l | L | | | | | | | |





| Gra | ade | | | Mechanica | l properties | | | | | | |
|-------------|---------------------------------------|---------------------------|----------------------------|--|--|----------------------|------------------------|----------------|----------------------|----------------|--|
| Symbol | Number | Temper | Dimension s (mm) | Tensile Strength Rm N/mm2 (MPa) min | Yield Strength Rp02 N/mm2 (MPa) min | Tolerances s (mm) | Straightness | Length (mm) | Ends | Packing | |
| | | | 3,1 - 6,0 | | 1 | -0,06 | 2 mm/m | | chamfered /cut off | cases 500 kg | |
| | 0 | | 6,1 - 10,0 | | | -0,09 | | | | | |
| | W6 | M R28 CW602N; CW625N; | 10,1 - 18,0 18,1 - 30,0 | Without : mechanica | | -0,11 -0,13 | 1,5 mm/m | | chamfered /sharpened | | |
| | 02 | | 30,1 - 50,0 | meenamea | i properties | -0,15 | | | | bundles 500 kg | |
| | , , , | | 50,1 - 63,5 | | | -0,19 | 2 mm/m | | cut off | | |
| S | NC N | | 5,0 - 6,0 | | - | -0,06 | 0 | 3000 | chamfered /cut off | F00 km | |
| CuZn36Pb2As | 620 | | 6,1 - 10,0 | | | -0,09 | 2 mm/m | | | cases 500 kg | |
| 36F | , , , , , , , , , , , , , , , , , , , | R280 | 10,1 - 18,0 | 280 | 200* | -0,11 | 1,5 mm/m | 0.+ | chamfered /sharpened | | |
| ъ 2 | 22 | 80 | 18,1 - 30,0 | 200 | 200 | -0,13 | 1,0 1111/11 | +/-50 | chamered /sharpened | bundles 500 kg | |
| As | V62 | | 30,1 - 50,0 | | | -0,16 | 2 mm/m | 0 | | sandlee eee ng | |
| | CW626N; CW626N 9b2As | | 50,1 - 60,0 | | | -0,19 | | | cut off | | |
| | - <u>-</u> - | | 5,0 - 6,0 | | | -0,06 | 2 mm/m | | chamfered /cut off | cases 500 kg | |
| CW602N | R320 | 6,1 - 10,0 10,1 - 18,0 | 320 | 200 | -0,09 -0,11 | | | | | | |
| | 20 | 18,1 - 30,0 | 520 | 200 | -0,13 | 1,5 mm/m | n chamfered /sharpened | | bundles 500 kg | | |
| | 2N | | 30,1 - 50,0 | | | -0,16 | 2 mm/m | | | bundles 500 kg | |

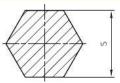




| Gra | ade | | | Mechanica | l properties | | | | | | |
|--------|--------|--------|---------------------|--|---|----------------------|--------------|----------------|---------|-----------------|--|
| Symbol | Number | Temper | Dimension s (mm) | Tensile Strength Rm N/mm2 (MPa) min | Yield Strength Rp02 N/mm2 (MPa) min | Tolerances s (mm) | Straightness | Length (mm) | Ends | Packing | |
| | | | 3,1 - 6,0 | | | +/- 0,08 | 2 mm/m | | | cases 500 kg | |
| | | | 6,1 - 10,0 | | | +/- 0,11 | 2 11111/111 | | broken | cases 500 kg | |
| | | Z | 10,1 - 18,0 | Without specifi | ied mechanical | +/- 0,14 | | | DIOKEII | | |
| | | 4 | 18,1 - 30,0 | prop | erties | +/- 0,17 | 1 mm/m | | | bundles 500 kg | |
| | | | 30,1 - 50,0 | | | +/- 0,20 | | | cut off | bunules 500 kg | |
| | | | 50,1 - 63,5 | | 1 | +/- 0,37 | 2 mm/m | | cuton | | |
| | | - | 3,1 - 6,0 | _ | 230* | +/- 0,08 | 2 mm/m | | | cases 500 kg | |
| ç | CV | | 6,1 - 10,0 | | | +/- 0,11 | 2 | 3000 +/-50 | broken | | |
| CuZn37 | CW508L | R290 | 10,1 - 18,0 | 290 | | +/- 0,14 | | | bronon | | |
| 7 | 135 | 06 | 18,1 - 30,0 | 200 | 200 | +/- 0,17 | 1 mm/m | | | bundles 500 kg | |
| | | | 30,1 - 50,0 | | | +/- 0,20 | | | cut off | barraice eee kg | |
| | | | 50,1 - 63,5 | | | +/- 0,37 | 2 mm/m | | outon | | |
| | | | 3,1 - 6,0 | | | +/- 0,08 | 2 mm/m | | | cases 500 kg | |
| | | ਸ | 6,1 - 10,0 | | | +/- 0,11 | 2 | | broken | | |
| | | R370 | 10,1 - 18,0 | 370 | 240 | +/- 0,14 | 17 1 mm/m | | | | |
| | | _ | 18,1 - 30,0 | | | +/- 0,17 | | | | bundles 500 kg | |
| | | | 30,1 - 40,0 | | | +/- 0,20 | | | cut off | | |

* max value





Drawn hexagonal rods in Imperial Measurements

| | | WMD | MS 13 | - CuZn36F | 2 b3 (C | 36000) acc to | ASTM | B 16 | | |
|-----------|------------|----------|------------------|--------------|----------------|------------------------|--------|-----------|-------|-------------------------|
| | | | | | | | | Propertie | S | |
| Dime s | nsion S | Tolera | | Straightness | Length | Ends | Temper | Rm min | A min | Packing |
| [cal] | [mm] | [cal] | [mm] | SS | [mm] | | | [Mpa] | [%] | |
| 5/32 | 3,97 | | | | | | | | | 0 0 |
| 3/16 | 4,76 | _ | | | | chamfered / cut off | | | | ase |
| 7/32 | 5,56 | | | | | outon | | | | s 50 |
| 1/4 | 6,35 | | | 2 mm/m | | | | | | 00 K |
| 9/32 | 7,14 | +/-0,003 | +/-0,08 | (0,08"/39") | | | | 395 | 7 | g (|
| 5/16 | 7,94 | +/-0,003 | +/ - 0,00 | (0,00,000) | | | | 395 | 7 | 100 |
| 11/32 | 8,73 | | | | | | | | | Cases 500 kg (1000 lbs) |
| 3/8 | 9,52 | | | | | | | | | (s |
| 7/16 | 11,11 | | | | | | | | | |
| 1/2 | 12,70 | | | | | | | | | |
| 9/16 | 14,29 | | | | | | | | | |
| 5/8 | 15,87 | | | | 366 | | | | | |
| 11/16 | 17,46 | | | | 3660 +/-25 | | | | | |
| 3/4 | 19,05 | +/-0,004 | +/-0,10 | | /-25 | char | | 380 | 10 | |
| 7/8 | 22,23 | | | | | nfei | H02 | | | ω |
| 15/16 | 23,81 | | | | (12ft +/-1") | red | | | | und |
| 1 | 25,40 | | | | t +/- | / sh | | | | lles |
| 1 - 1/16 | 26,99 | | | 1,5 mm/m | .1") | chamfered / sharpened | | | | Bundles 500 kg |
| 1 - 1/8 | 28,58 | | | | | enec | | | | kg |
| 1 - 3/16 | 30,16 | | | (0,06"/39") | | | | | | |
| 1 - 1/4 | 31,75 | | | | | | | | | (1000 lbs) |
| 1 - 5/16 | 33,34 | | | | | | | | | 0 Ib |
| 1 - 3/8 | 34,93 | | 1/0.12 | | | | | 245 | 15 | s) |
| 1 - 7/16 | 36,51 | +/-0,005 | +/-0,13 | | | | | 345 | 15 | |
| 1 - 1/2 | 38,10 | | | | | | | | | |
| 1 - 5/8 | 41,28 | | | | | | | | | |
| 1 - 3/4 | 44,45 | | | | | | | | | |
| 1 - 7/8 | 47,63 | | | | | | | | | |
| 2 | 50,80 | | | | | | | | | |



Drawn square rods acc to EN12164

| Grad | de | | | Mechanical | properties | | | | | |
|---|--|--------|----------------------------|--|--|----------------------|--------------|----------------|------------------------|----------------|
| Symbol | Number | Temper | Dimension s (mm) | Tensile Strength Rm N/mm2 (MPa) min | Yield Strength Rp02 N/ mm2 (MPa) min | Tolerances s (mm) | Straightness | Length (mm) | Ends | Packing |
| | | | 3,0 - 6,0 | | | -0,06 | 0 | | chamfered /cut off | 500 lun |
| | | | 6,1 - 10,0 | | | -0,09 | 2 mm/m | | | cases 500 kg |
| | | \leq | 10,1 - 18,0 | Without s mechanical | | -0,11 | | | abovefeved (above even | |
| | | | 18,1 - 30,0 | meenamear | properties | -0,13 | 1,5 mm/m | | chamfered /sharpened | bundles 500 kg |
| 0 | | | 30,1 - 50,0 | | | -0,16 | | | | |
| CuZn39P3; CuZn40Pb2 | Ŝ | | 6,0 - 10,0 | _ | | -0,09 | 2 mm/m | | | cases 500 kg |
| 139F | V61- | R360 | 10,1- 18,0 | 360 | 320* | -0,11 | | зc | chamfered /sharpened | |
| ů, | CW614N; CW617N | 60 | 18,1 - 30,0 | 500 | 520 | -0,13 | 1,5 mm/m | 3000 +/-50 | chamered /sharpened | bundles 500 kg |
| Cuz | Ŝ | | 30,1 - 50,0 | | | -0,16 | | +/-5 | | |
| In40 | 617 | | 3,0 - 6,0 | 4 | | -0,06 | 2 mm/m | õ | chamfered /cut off | cases 500 kg |
|)Pb | ž | R | 6,1 - 10,0 | 4 | | -0,09 | 2 | | | |
| | | R430 | 10,1 - 18,0 | 430 | 220 | -0,11 | | | chamfered /sharpened | bundles 500 ka |
| | | 0 | 18,1 - 30,0 | - | | -0,13 | 1,5 mm/m | | enamerea venarpenea | Sanalee eee kg |
| | - | | 30,1 - 35,0 | | | -0,16 | | | | |
| | | R500 | 3,0 - 6,0 | 500 | 350 | -0,06 | 2 mm/m | | chamfered /cut off | cases 500 kg |
| | | õ | 6,1 - 10,0 | | | -0,09 | | | chamfered /sharpened | |
| | | | 3,0 - 6,0 | - | | -0,06 | 2 mm/m | | chamfered /cut off | cases 500 kg |
| | | _ | 6,1 - 10,0 | Without s | pecified | -0,09 | | | | |
| C L | | Ζ | 10,1 - 18,0 | mechanical | | -0,11 | 1 5 mana/ma | | chamfered /sharpened | hundles EOO ka |
| Zn3 | 0 | | 18,1 - 30,0 | - | | -0,13 | 1,5 mm/m | | | bundles 500 kg |
| င္ နာ | W6 | | 30,1 - 50,0 | | | -0,16 | 0 | | | 500 lun |
| 1; C Zn3 | 07N | | 6,0 - 10,0 | - | | -0,09 | 2 mm/m | | | cases 500 kg |
| 9Pt | CW607N; CW608N; CW610N CW611N; CW612N | | 10,1 - 18,0 | - | | -0,11 | 1 5 100 100 | 300 | chamfered /sharpened | hundles 500 km |
| n38 01; (| N90 N; 0 | | 18,1 - 30,0 30,1 - 50,0 | - | | -0,13 | 1,5 mm/m | 3000 +/-50 | | bundles 500 kg |
| Pb2 | 08N | | 30,1 - 50,0 | | | -0,16 -0,06 | | /-50 | chamfered /cut off | cases 500 kg |
| n39 | 612I | | 6,1 - 10,0 | - | | -0.09 | 2 mm/m | - | Shannorda / dat on | cubbe coo kg |
| Pb2 | V61 | R410 | 10,1 - 18,0 | 410 | 230 | -0,11 | | | | |
| .º 39P | Ñ | 10 | 18,1 - 30,0 | | 200 | -0,13 | 1,5 mm/m | | chamfered /sharpened | bundles 500 kg |
| CuZn38Pb1; CuZn38Pb2; CuZn39Pb0,5 CuZn39Pb1; CuZn39Pb2 | | | 30,1 - 35,0 | | | -0,16 | | | | |
| | - | ת | 3,0 - 6,0 | | | -0,06 | | | chamfered /cut off | |
| | | R500 | 6,1 - 10,0 | 500 | 350 | -0,09 | 2 mm/m | | chamfered /sharpened | cases 500 kg |

* max value





| Gra | ade | | | Mechanica | l properties | | | | | |
|--|----------------------------------|--------|----------------------------|--|--|----------------------|-------------------|------------|--|----------------|
| Symbol | Number | Temper | Dimension s (mm) | Tensile Strength Rm N/mm2 (MPa) min | Yield Strength Rp02 N/mm2 (MPa) min | Tolerances s (mm) | Straightness | Length | Ends | Packing |
| | | | 3,0 - 6,0 | | | -0,080 | 2 mm/m | | chamfered /cut off | cases 500 kg |
| | | Σ | 6,1 - 10,0 | Without | | -0,090 | | | | |
| Cuz | 00 | | 10,1 - 18,0 | mechanica | l properties | -0,110 | 1,5 mm/m | | chamfered /sharpened | |
| In3(| W C | | 18,1 - 30,0 30,1 - 50,0 | | | -0,130 -0,16 | 2 mm/m | | | bundles 500 kg |
| SPb | 300 303 | | 3,0 - 6,0 | | | -0,18 | 2 mm/m | 3000 +/-50 | chamfered /cut off | |
| ο 3; 3; | ZZ | | 6,1 - 10,0 | - | 250 | -0,09 | 2 mm/m | 00 | chamered /out on | cases 500 kg |
| | С Х Х | т | 10,1 - 14,0 | - | | 0,00 | | +/-5 | | |
| CuZn35Pb1; CuZn35Pb2 CuZn36Pb3; CuZn37Pb2 | CW600N; CW601N CW603N; CW606N | R370 | 14,1 - 18,0 | 370 | 180 | -0,11 | 1,5 mm/m | 0 | chamfered /sharpened | hundles 500 kg |
| Pb2 | ~ ~ | | 18,1 - 30,0 | | 160 | -0,13 | | | | bundles 500 kg |
| 10 10 | | | 30,1 - 35,0 | | | -0,16 | 2 mm/m | | | |
| | | R440 | 3,0 - 6,0 6,1 - 10,0 | 440 | 340 | -0,08 -0,09 | 2 mm/m | | chamfered /cut off chamfered /sharpened | cases 500 kg |
| | | | 5,0 - 6,0 | | | -0,06 | 2 | | chamfered /cut off | ECO Ire |
| 0 | | | 6,1 - 10,0 | | | -0,09 | 3 mm/m | | | cases 500 kg |
| μ | | \leq | 10,1 - 18,0 | Without : mechanica | | -0,11 | | | abovefeved (above eved | |
| n37 | Q | | 18,1 - 30,0 | mechanica | rproperties | -0,13 | 2 mm/m | 30 | chamfered /sharpened | bundles 500 kg |
| Mr | N7 | | 30,1 - 50,0 | | | -0,16 | | 00. | | |
| CuZn37Mn3Al2PbS | CW713R | | 5,0 - 6,0 | | | -0,06 | 3 mm/m | 3000 +/-50 | chamfered /cut off | cases 500 kg |
| I2P | ~ | сī | 6,1 - 10,0 | | | -0,09 | 3 1111/11 | õ | | |
| bSi | | 590 | 10,1 - 18,0 | 590 | 370 | -0,11 | a <i>i</i> | | chamfered /sharpened | bundles 500 ka |
| | | | 18,1 - 30,0 30,1 - 40,0 | - | | -0,13 -0,16 | 2 mm/m | | | 5 |
| | | | 5,0 - 6,0 | | | -0,16 | | | chamfered /cut off | |
| | | | 6,1 - 10,0 | | | -0,09 | 3 mm/m | | | cases 500 kg |
| | | Z | 10,1 - 18,0 | Without | | -0,11 | | | | |
| Cu | | | 18,1 - 30,0 | mecnanica | l properties | -0,13 | 2 mm/m | (1) | chamfered /sharpened | bundles 500 kg |
| Znć | СМ | | 30,1 - 50,0 | | | -0,16 | | 3000 +/-50 | | |
| MOI | CW720R | R440 | 40, - 50,0 | 440 | 180 | -0,160 | 3 mm/m |) + C | chamfered /sharpened | bundles 500 ka |
| CuZn40Mn1Pb | R | | 5,0 - 6,0 | | | -0,06 | | -50 | chamfered /cut off | |
| ď | | - | 6,1 - 10,0 | | | -0,09 | 3 mm/m | | | hundlog 500 km |
| | | R500 | 10,1- 18,0 | 500 | 270 | -0,11 | | | abamforod /abamanad | bundles 500 kg |
| | | ō | 18,1 - 30,0 | | | -0,13 | 2 mm/m | | chamfered /sharpened | |
| | | | 30,1 - 40,0 | | | -0,16 | | | | cases 500 kg |

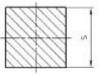


| 11 | 111 | |
|---------------------|---------------------------|------|
| 71 | 114 | - 10 |
| $\langle \rangle$ | $\langle \rangle \rangle$ | |
| 111 | 111 | |

| Gra | de | | | Mechanio | cal properties | | | | | |
|---|--------------------------|--------|-----------------------------------|--|---|----------------------|--------------|----------------|-------------------------------|----------------|
| Symbol | Number | Temper | Dimension s (mm) | Tensile Strength Rm N/mm2 (MPa) min | Yield Strength Rp02 N/mm2 (MPa) min | Tolerances s (mm) | Straightness | Length (mm) | Ends | Packing |
| | | | 5,0 - 6,0 6,1 - 10,0 | _ | | -0,06 -0,09 | 2 mm/m | | | cases 500 kg |
| | 0 | Ζ | 10,1- 18,0 18,1 - 30,0 | | ified mechanical perties | -0,11 | 1,5 mm/m | 30 | broken | bundles 500 kg |
| CuZ | W5 | | 30,1 - 50,0 | | | -0,16 | 2 mm/m | 00 | cut off | |
| CuZn40 | CW509L | | 5,0 - 6,0 | - | | -0,06 | 2 mm/m | 3000 +/-50 | | cases 500 kg |
| | | R360 | 6,1 - 10,0 10,1 - 18,0 | 360 | 300* | -0,09 -0,11 | | 0 | broken | |
| | | ő | 18,1 - 30,0 | | | -0,13 | 1,5 mm/m | | | bundles 500 kg |
| | | | 30,1 - 50,0 | | | -0,16 -0,06 | | | cut off | |
| | | | 3,0 - 6,0 6,1 - 10,0 | - | -(| | 2 mm/m | | chamfered /cut off | cases 500 kg |
| Cu | | \leq | 10,0 - 18,0 | | ified mechanical | -0,09 -0,11 | 4 E | | ale and fame of the annual of | |
| CuZn36Pb2As; CuZn35Pb1,5AlAs CuZn33Pb1,5AlAs | | | 18,1 - 30,0 | più | perties | -0,13 | 1,5 mm/m | | chamfered /sharpened | bundles 500 kg |
| SPb Cu | CW602N; CW625N CW626N | | 30,1 - 50,0 | | | -0,16 | 2 mm/m | | chamfered /cut off | |
| 2As Zn3 | 602 C/ | _ | 5,0 - 6,0 6,1 - 10,0 | - | | -0,06 -0,09 | 2 mm/m | 300 | chamiered /cut on | cases 500 kg |
| Pb2As; CuZn35Pb CuZn33Pb1,5AlAs | N; C | R280 | 10,1 - 18,0 | 280 | 200* | -0,11 | 1,5 mm/m | 3000 +/-50 | abamfarad (abarpanad | |
| 1,5, | 6N (| 0 | 18,1 - 30,0 | - | | -0,13 | | /-50 | chamfered /sharpened | bundles 500 kg |
| AIAs |)25N | | 30,1 - 50,0 5,0 - 6,0 | | | -0,16 -0,06 | 2 mm/m | | chamfered /cut off | |
| ў <u>01</u> 5 | ~ | - | 6,1 - 10,0 | - | | -0,00 | 2 mm/m | | channered /cut on | cases 500 kg |
| AIA | | R320 | 10,1 - 18,0 | 320 | 200 | -0,11 | 1,5 mm/m | | chamfered /sharpened | |
| 0 | | 0 | 18,1 - 30,0 | - | | -0,13 | | | chamered /sharpened | bundles 500 kg |
| | | | 30,1 - 50,0 3,0 - 6,0 | | | -0,16 +/- 0,08 | 2 mm/m | | | |
| | | | 6,1 - 10,0 | | | +/- 0,11 | 2 mm/m | | la una la sura | cases 500 kg |
| | | \leq | 10,1 - 18,0 | | ified mechanical perties | +/- 0,14 | | | broken | |
| | | | 18,1 - 30,0 | - | | +/- 0,17 | 1 mm/m | | cut off | bundles 500 kg |
| | - | | 30,1 - 50,0 4,0 - 6,0 | | | +/- 0,20 +/- 0,08 | | | cut on | |
| ß | СМ | R | 6,1 - 10,0 | | | +/- 0,11 | 2 mm/m | 3000 +/-50 | broken | cases 500 kg |
| CuZn37 | CW508L | R290 | 10,1 - 18,0 | 290 | 230* | +/- 0,14 | | 0 +/ | DIOKEIT | |
| 7 | ٣ | - | 18,1 - 30,0 30,1 - 50,0 | - | | +/- 0,17 +/- 0,20 | 1 mm/m | -50 | cut off | bundles 500 kg |
| | ŧ | | 4,0 - 6,0 | | | +/- 0,08 | 0 | | outon | 500 km |
| | | Ŗ | 6,1 - 10,0 | - | | +/- 0,11 | 2 mm/m | | broken | cases 500 kg |
| | | R370 | <u>10,1 - 18,0</u> 18,1 - 30,0 | 370 | 240 | +/- 0,14 +/- 0,17 | 1 mm/m | | | bundles 500 kg |
| | | | 30,1 - 35,0 | - | | +/- 0,17 | 1 11111/111 | | cut off | bundles 500 kg |
| | | | 3,0 - 6,0 | | ľ | -0,06 | 2 mm/m | | cut off/ chamfered | cases 500 kg |
| | | | 6,1 - 10,0 | Without spec | ified mechanical | -0,09 | 2 11111/111 | | | cases 500 kg |
| | | \leq | 10,1 - 18,0 18,1 - 30,0 | | perties | -0,11 -0,13 | 1,5 mm/m | | chamfered/ sharpened | |
| | | | 30,1 - 50,0 | - | | -0,16 | 0 | | | bundles 500 kg |
| | | | 50,1 - 63,5 | | | -0,19 | 2 mm/m | | cut off | |
| Q | 0 | | 5,0 - 6,0 | | | -0,06 | 2 mm/m | 30 | cut off/ chamfered | cases 500 kg |
| CuZn38As | CW511L | ק | 6,1 - 10,0 10,0 - 18,0 | 280 2 | 200* 30 | -0,09 -0,11 | | 3000 +/-50 | chamfered/ | |
| 38A | 1 1 1 | R280 | 18,1 - 30,0 | 200 / | | -0,13 | 1,5 mm/m | +/-5(| sharpened | bundles 500 kg |
| S | | | 30,1 - 50,0 | | | -0,16 | 2 mm/m | 0 | | |
| | | | 50,1 - 60,0 5,0 - 6,0 | | | -0,19 -0,06 | | | cut off cut off/ chamfered | |
| | | | 6,1 - 10,0 | | | -0,00 | 2 mm/m | | | cases 500 kg |
| | | R320 | 10,0 - 18,0 | 320 | 200 20 | -0,11 | 1 mm/m | | chamfered/ | |
| | | Ő | 18,1 - 30,0 30,1 - 50,0 | | | -0,13 | 1,5 mm/m | | sharpened | bundles 500 kg |
| | | | 50,1 - 50,0 | I I | | -0,16 | 1,0 1111/111 | | | |

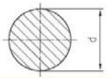
* max value





| | | Drawn | square | e rods in l | mperia | l Measurer | nents | ; | | |
|---------|-------------|---------------------|----------------|-------------|----------------|------------------------|--------|-----------|-------|----------------|
| | V | /MD MS [·] | 13 <i>-</i> Cu | uZn36Pb3 (| (C36000 | D) acc to AS | STM E | 8 16 | | |
| | | - | | | | | I | Properti | es | |
| Dime | ension S | Tolera s | | Length Im | | Ends | Temper | Rm min | A min | Packing |
| [cal] | [mm] | [cal] | [mm] | SS | [mm] | | | [Mpa] | [%] | |
| 5/32 | 3,97 | | | | | | | | | 0 |
| 3/16 | 4,76 | - | | | | chamfered / cut off | | | | ase |
| 7/32 | 5,56 | - | | | | outon | | | | Cases 500 kg |
| 1/4 | 6,35 | | | 2 mm/m | | | | | | 0 kg |
| 9/32 | 7,14 | +/-0,003 | +/-0,08 | (0,08"/39") | (1) | | | 395 | 7 | |
| 5/16 | 7,94 | | | (0,00739) | 3660 +/-25 | | | | | (1000 lbs) |
| 23/64 | 9,13 | | | |) +/ | | | | |) Ibs |
| 3/8 | 9,52 | | | | -25 | cha | | | | Ű |
| 1/2 | 12,70 | | | | | mfe | H02 | | | п |
| 5/8 | 15,87 | | | | (12ft +/-1") | erec | | | | Suna |
| 3/4 | 19,05 | +/-0,004 | +/-0,10 | | t +/- | l /st | | 380 | 10 | dles |
| 7/8 | 22,23 | +/-0,004 | +/-0,10 | | | narr | | 300 | 10 | 50 |
| 1 | 25,40 | | | 1,5 mm/m | • | chamfered /sharpened | | | | Bundles 500 kg |
| 1 - 1/8 | 28,58 | | | | | ed | | | | D |
| 1 - 1/4 | 31,75 | | | (0,06"/39") | | | | | | (1 |
| 1 - 1/2 | 38,10 | +/-0,005 | +/-0,13 | | | | | 345 | 15 | 000 |
| 1 - 5/8 | 41,28 | | | | | | | | | (1000 lbs) |
| 1 - 3/4 | 44,45 | | | | | | | | | ÿ |

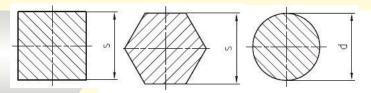




Extruded round rods acc to EN12165

| Gra | de | | | ion Mechanical properties Tensile Yield Strength T | | | | Stra | | | |
|---|--|--------|------------------------|---|--|--|----------------------|--------------|-------------|---------|----------------|
| Symbol | Number | Temper | Dimension d (mm) | Hardness HB | Tensile Strength Rm N/mm2 (MPa) min | Yield Strength Rp02 N/mm2 (MPa) min | Tolerances d (mm) | Straightness | Length | Ends | Packing |
| ဝဝဝ | | | 16,0-18,0 | | | | +/- 0,25 | | | | |
| | ଟଟ୍ଟ | _ | 18,1-30,0 | | | | +/- 0,30 | | | | |
| 39F | CW608N; CW611N; CW614N; | \leq | 30,1-50,0 | without sp | ecified mechani | cal properties | +/- 0,60 | | | | |
| ³ b2; | 44 N N N N N N N N N N N N N N N N N N | | 50,1-80,0 | | | | +/- 0,70 | 3 m | 2000 1/ 50 | | hundles 500 km |
| | <u> </u> | | 16,0-18,0 | | | | +/- 0,25 | mm/m | 3000 +/-50 | cut off | bundles 500 kg |
| IZn3 | V61 V61 | Н | 18,1-30,0 | 00 | (250) | (1.10) | +/- 0,30 | | | | |
| CuZn38Pb2;CuZn39Pb0,5 CuZn39Pb1; CuZn39Pb2 CuZn39Pb3; CuZn40Pb2 | ; CW610N ; CW612N ; CW617N | H080 | 30,1-50,0 | 80 | (350) | (140) | +/- 0,60 | | | | |
| 62 52 52 | | | 50,1-80,0 | | | | +/- 0,70 | | | | |
| | 0 | | 16,0-18,0 | | | | +/- 0,25 | | | | |
| CuZn36Pb2As CuZn35Pb1,5AlAs CuZn33Pb1,5AlAs CuZn38lAs | CW602N; CW625N CW626N;CW511L | Z | 18,1-30,0 | Without sr | ecified mechani | cal properties | +/- 0,30 | | | | |
| CuZn36Pb2As JZn35Pb1,5Al/ JZn33Pb1,5Al/ CuZn38lAs | 302 /62 | _ | 30,1-50,0 | , in all out op | | | +/- 0,60 | ω | | | |
| 3Pb Zn3 | SN NG | | 50,1-80,0 16,0-18,0 | | | | +/- 0,70 +/- 0,25 | mm/m | 3000 +/-50 | cut off | bundles 500 kg |
| 8 A A B A 5 5 2 | | т | 18,1-30,0 | | | | +/- 0,25 | /m | | | |
| S AIA | 625 1511 | H070 | 30,1-50,0 | 70 | (280) | (120) | +/- 0,60 | | | | |
| N N | ΓŻ | U | 50,1-80,0 | | | | +/- 0,70 | | | | |
| | | | 16,0-18,0 | | | | +/- 0,25 | | | | |
| | | \leq | 18,1-30,0 | Without sr | ecified mechani | cal properties | +/- 0,30 | | | | |
| 00 | 22 | | 30,1-50,0 | without op | | cal properties | +/- 0,60 | ω | | | |
| CuZn37 CuZn40 | N5(| | 50,1-80,0 | | | | +/- 0,70 | mm/m | 3000 +/-50 | cut off | bundles 500 kg |
| 137 140 | CW508L CW509L | т | 16,0-18,0 18,1-30,0 | | | | +/- 0,25 +/- 0,30 | ı/m | | | _ |
| | | H070 | 30,1-50,0 | 70 | (300) | (100) | +/- 0,30 | | | | |
| | | 0 | 50,1-80,0 | | | | +/- 0,70 | | | | |
| | | | 16,0-18,0 | | I | I | +/- 0,25 | | | | |
| | | \leq | 18,1-30,0 | Without sr | ecified mechani | cal properties | +/- 0,30 | | | | |
| 0 | 2 | _ | 30,1-50,0 | without op | | | +/- 0,60 | ω | | | |
| CuZn42 | CW510L | | 50,1-80,0 | | | | +/- 0,70 | mm/m | 3000 +/-50 | cut off | bundles 500 kg |
| 142 | 10L | т | 16,0-18,0 18,1-30,0 | | | | +/- 0,25 +/- 0,30 | /m | | | |
| | | 060H | 30,1-50,0 | 90 | | | +/- 0,60 | | | | |
| | | 0 | 50,1-80,0 | | | | +/- 0,70 | | | | |
| 0 | | | 16,0-18,0 | | I | I | +/- 0,25 | | | | |
| μZ | | Σ | 18,1-30,0 | Without en | ecified mechani | cal properties | +/- 0,30 | | | | |
| n37 | 2 | 7 | 30,1-50,0 | without sp | | cal properties | +/- 0,60 | ω | | | |
| Mn | W713R | | 50,1-80,0 | | | | +/- 0,70 | mm/m | 3000 +/-50 | cut off | bundles 500 kg |
| 3AU | 13R | т | 16,0-18,0 18,1-30,0 | | | | +/- 0,25 +/- 0,30 | ı/m | | | |
| CuZn37Mn3Al2PbSi | | H130 | 30,1-50,0 | 130 | (550) | (200) | +/- 0,30 | | | | |
| <u>N</u> | | 0 | 50,1-80,0 | | | | +/- 0,70 | | | | |
| 0 | | | 16,0-18,0 | | | | +/- 0,25 | | | | |
| CuZn35Ni3Mn2AIPb | | Z | 18,1-30,0 | Without sr | ecified mechani | cal properties | +/- 0,30 | | | | |
| 135 | 5 | _ | 30,1-50,0 | | | | +/- 0,60 | ω | | | |
| Ni3 | CW710R | | 50,1-80,0 | | | | +/- 0,70 | mm/m | 3000 +/-50 | cut off | bundles 500 kg |
| Mní | ନ | т | 16,0-18,0 18,1-30,0 | | | | +/- 0,25 +/- 0,30 | /m | | | |
| 2AIF | | H100 | 30,1-50,0 | 100 | (440) | (180) | +/- 0,30 | | | | |
| Ъ | | 0 | 50,1-80,0 | | | | +/- 0,70 | | | | |
| | | | 16,0-18,0 | | | | +/- 0,25 | | | | |
| <u> </u> | | Σ | 18,1-30,0 | Without sr | ecified mechani | cal properties | +/- 0,30 | | 3000 +/-100 | | |
| JZn J | 22 | _ | 30,1-50,0 | | | | +/- 0,60 | ω | 0000 / 005 | | |
| 40N | N7: | | 50,1-80,0 | | | | +/- 0,70 | mm/m | 3000 +/-200 | cut off | bundles 500 kg |
| /In1 /In2 | CW720R CW723R | | 16,0-18,0 18,1-30,0 | | | | +/- 0,25 +/- 0,30 | ۱/m | 3000 +/-100 | | 9 |
| CuZn40Mn1Pb1 CuZn40Mn2Fe1 | | H80 | 30,1-50,0 | 80 | (350) | (160) | +/- 0,60 | | 0000 1/-100 | | |
| | | 0 | 50,1-80,0 | | | | +/- 0,70 | | 3000 +/-200 | | |
| <u> </u> | I | | 00,100,0 | I | | | ., 0,70 | | 5555 7 200 | | |



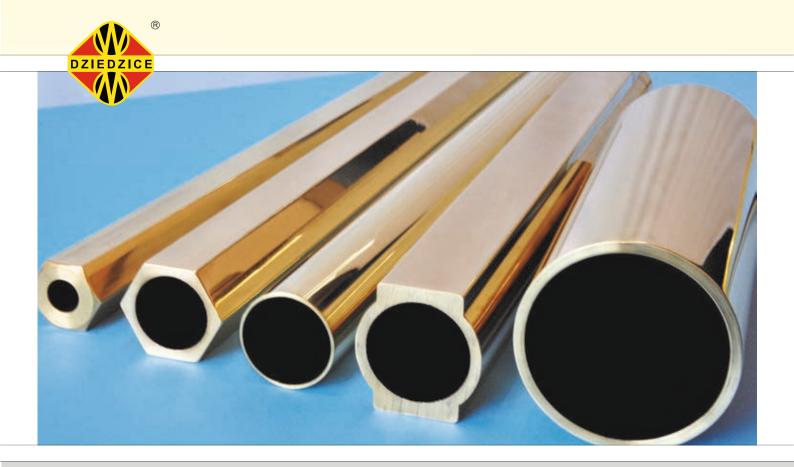


Extruded round rods acc to specification below

| Grade | | | | Mechanical | Tolerances | Str (acc to | | | |
|---|--|--------|---------------------|---|------------------------------------|----------------------------------|------------------------------------|---------|-----------|
| Symbol | Number | Temper | Dimension s (mm) | properties (acc to confirmation) | s (mm) (acc to confirmation) | Straightness to confirmation) | Length (acc to confirmation) | Ends | Packing |
| CuZn38Pb2 CuZn39Pb0,5 CuZn39Pb1 CuZn39Pb2 CuZn39Pb3 | CW608N CW610N CW611N CW612N CW614N | | 80,1-100 | Withou | +/- 1,2 | 3mm/m | 3000 +/-200 | | |
| CuZn40Pb2 CuZn36Pb2As CuZn37 | CW617N CW602N CW508L | М | 100,1-110 | t specified m | | | 1500-3000 | cut off | bundles 5 |
| CuZn40 CuZn37Mn3Al2PbSi CuZn35Ni3Mn2AlPb CuZn40Mn1Pb1 | CW509L CW713R CW710R CW720R | | 110,1-140 | Without specified mechanical properties | +/- 1,6 | 5mm/m | 1000-2000 | ff | 500 kg |
| CuZn40Mn2Fe1 CuZn35Pb CuZn33Pb CuZn38IAs | CW723R CW625N CW626N CW511L | | 140,1-180,0 | | ., 1,0 | | 500-1500 | | |

Extruded square and hexagonal rods acc to specification below

| Grade | | | | | | (acc | | | |
|--|--|--------|---------------------|--|--|-------------------------------------|------------------------------------|---------|----------------|
| Symbol | Number | Temper | Dimension s (mm) | Mechanical properties (acc to confirmation) | Tolerances s (mm) (acc to confirmation) | Straightness cc to confirmation) | Length (acc to confirmation) | Ends | Packing |
| | | | 20,0-30,0 | With | +/- 0,5 | 3 m | 3000 +/-100 | | |
| CuZn38Pb2 CuZn39Pb0,5 CuZn39Pb1 CuZn39Pb2 | CW608N CW610N CW611N CW612N CW614N | | 30,1-50,0 | nout specifi | +/- 0,8 | mm/m | 3000 +/-200 | | þ |
| CuZn39Pb3 CuZn40Pb2 CuZn36Pb2As CuZn37 | CW614N CW617N CW602N CW508L CW509L | М | 50,1-80,0 | Without specified mechanical properties | +/- 1,0 | 5 mm/m | 3000 11-200 | cut off | bundles 500 kg |
| CuZn40 CuZn37Mn3Al2PbSi CuZn35Ni3Mn2AlPb CuZn40Mn1Pb1 | CW713R CW710R CW720R CW723R | | 80,1-100,0 | iical proper | +/- 1,6 | 7 mm/m | 1500-3000 | | ĝ |
| CuZn40Mn2Fe1 CuZn35Pb CuZn33Pb CuZn38IAs | CW625N CW626N CW511L | | 100,1- 130,0 | ties | +/- 2,2 | n/m | 500-1500 | | |



BRASS TUBES



Drawn tubes are manufactured in sizes ranging 16-65 mm, while hot extruded tubes are in 16-180 mm size range.

Offered tubes are produced in several copper alloys with zinc and other additives, which provide them with a wide range of use, mainly in the fittings industry, as part of the heating and plumbing installations.

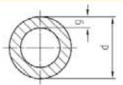
Corrosion resistance, which is characteristic for the products of these alloys, allows to produce installation elements and devices working in environment of water, chemical and gas.

Lead-brass tubes are mainly used in housing construction, industrial and transmission applications. Depending on the needs of the customer, such tubes are produced and sold extruded or drawn.

Within this group of products we manufacture tube from multi-component alloys, resistant to the major pressure, abrasion, also in sea water environments.

Dimensional charts shown further correspond to the EN standards. Brass rods are also produced according to other norms.





Drawn round tubes

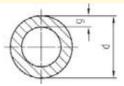
| Grades | | Dime | ensional ran | ge | | | | Tolerances [mm] | | |
|---------------------------------|-------------------|---------------------------------|-----------------------------|----------------|-------------|--------------------------|----------------------------|------------------------|--------------|--------|
| Symbol | Number | External dimension d [mm] | Wall thickness [g mm] | Length [mm] | Temper | Mechanical properties | External dimension d | Wall thickness g | Straightness | Length |
| CuZn35Pb2 | CW601N | 16,0 - 18,0 | 2,0 - 3,0 | | | | - 0,11 | +/- 12% | | |
| CuZn36Pb2As | CW602N | 10,0 - 10,0 | 3,1 - 4,0 | | | | - 0, 11 | +/- 10% | | + |
| CuZn36Pb3 CuZn37Pb1 | CW603N CW605N | | 2,0 - 3,0 | | | | | +/- 12% | | +/- 50 |
| CuZn37Pb2 | CW606N | 18,1 - 30,0 | 3,1 - 6,0 | | | | - 0,13 | +/- 10% | | 0 |
| CuZn38Pb1 CuZn38Pb2 | CW607N CW608N | | 6,1 - 8,0 | 2000 | | Without | | +/- 9% | , л С | |
| CuZn39Pb1 | CW6000N CW611N | | 3,1 - 6,0 | 1 | М | Specified | | +/- 10% | 1/mr | |
| CuZn39Pb2 CuZn39Pb3 | CW612N CW614N | 30,1 - 50,0 | 6,1 - 8,0 | 4000 | | mechanical properties | - 0,16 | +/- 9% | mm/1000mm | |
| CuZn39Pb3 CuZn40Pb2 | CW614N CW617N | | 8,1 - 10,0 | 00 | | properties | | 17- 378 | Jmn | +_ |
| CuZn37Mn3Al2PbSi | CW713R | | 3,1 - 6,0 | | | | | +/- 10% | | - 100 |
| CuZn40Mn1Pb1 CuZn35Pb1,5AlAs | CW720R CW625N | 50,1 - 65,0 | 6,1 - 8,0 | | | | - 0,30 | +/- 9% | | 0 |
| CuZn33Pb1,5AlAs CuZn38lAs | CW626N CW511L | 00,1 00,0 | 8,1 - 10,0 | | | | 0,00 | 17- 378 | | |
| CUZII38IAS | CWSIIL | | > 10,1 | | | | | +/- 8% | | |
| | | | I | Ratio d/g m | nax 18 | | | | | |
| | | | Minimum | internal dia | ameter10,0n | าm | | | | |

| Grad | es | Dime | nsional rang | je | | | anical erties | | Tolerances [mm] | 3 | |
|------------------------|------------------|---------------------------------|-----------------------------|----------------|---------------------------------------|----------------|------------------|----------------------------|------------------------|--------------|--------|
| Symbol | Number | External dimension d [mm] | Wall thickness g [mm] | Length [mm] | Temper | Hardness HB | Hardness HV | External dimension d | Wall thickness g | Straightness | Length |
| | | 16,0 - 18,0 | 2,0 - 3,0 | | | | | - 0,11 | +/- 12% | | |
| | | 10,0 10,0 | 3,1 - 4,0 | | | | | 0,11 | +/- 10% | | + |
| | | | 2,0 - 3,0 | | | | | | +/- 12% | | +/- 50 |
| | | 18,1 - 30,0 | 3,1 - 6,0 | | | | | - 0,13 | +/- 10% | | 0 |
| CuZn36Pb3 | CW603N | | 6,1 - 8,0 | | H 110 max | | | | +/- 9% | <u> </u> | |
| CuZn37Pb1 CuZn37Pb2 | CW605N CW606N | | 3,1 - 6,0 | 2000 | wall thickness | 110 - 160 | 120 - 170 | | +/- 10% | 1,5 m | |
| CuZn38Pb1 CuZn38Pb2 | CW607N CW608N | 30,1 - 50,0 | 6,1 - 8,0 8,1 - 10,0 | | 10,0mm | | | - 0,16 | +/- 9% | mm/1000mm | |
| CuZn39Pb1 CuZn39Pb2 | CW611N CW612N | | 3,1 - 6,0 | 4000 | | | | | +/- 10% |)0mr | + |
| CuZn39Pb3 | CW614N | | 6,1 - 8,0 | | | | | | | н | /- 100 |
| CuZn40Pb2 | CW617N | 50,1 - 65,0 | 8,1 - 10,0 | | | | | - 0,30 | +/- 9% | | õ |
| | | | > 10,1 | | H 090 min wall thickness 10,1mm | 90 - 140 | 100 - 150 | 0,00 | +/- 8% | | |
| | | | | R | atio d/g max 18 | 3 | | | · I | | |
| | | | Ν | linimum iı | nternal diamete | er10,0mm | | | | | |



| Grades | 6 | Dime | ensional ran | ige | | Mech | | | Tolerances [mm] | ; | |
|------------------------------|------------------|---------------------------------|-----------------------------|----------------|--------------|----------------|----------------|----------------------------|------------------------|--------------|--------|
| Symbol | Number | External dimension d [mm] | Wall thickness g [mm] | Length [mm] | Temper | Hardness HB | Hardness HV | External dimension D | Wall thickness g | Straightness | Length |
| | | 16,0 - 18,0 | 2,0 - 3,0 | | | | | - 0,11 | +/- 12% | | |
| | | 10,0 - 10,0 | 3,1 - 4,0 | | | | | -0,11 | +/- 10% | | + |
| | | | 2,0 - 3,0 | | | | | | +/- 12% | | +/- 50 |
| | | 18,1 - 30,0 | 3,1 - 6,0 | | | | | - 0,13 | +/- 10% | | |
| | | | 6,1 - 8,0 | 20 | | | | | +/- 9% | 1,51 | |
| CuZn36Pb2As | CW602N | | 3,1 - 6,0 | 2000 - | H070 | 70-110 | 00.400 | | +/- 10% | /mm | |
| CuZn35Pb1,5AlAs | CW625N | 30,1 - 50,0 | 6,1 - 8,0 | 4000 | HU70 | 70-110 | 80-120 | - 0,16 | +/- 9% | mm/1000mm | |
| CuZn33Pb1,5AlAs CuZn38lAs | CW626N CW511L | | 8,1 - 10,0 | 8 | | | | | 17- 370 |)mm | +/- |
| | | | 3,1 - 6,0 | | | | | | +/- 10% | | - 100 |
| | | 50,1 - 65,0 | 6,1 - 8,0 | | | | | - 0,30 | +/- 9% | | ō |
| | | 50,1-05,0 | 8,1 - 10,0 | | | | | - 0,30 | 1/- 970 | | |
| | | | > 10,1 | | | | | | +/- 8% | | |
| | | | | R | atio d/g max | (18 | | | | | |
| | | | Ν | Minimum i | nternal diam | eter10,0mm | ı | | | | |

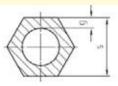
| Grades | | Dimensional range | | | | Mecha prope | | Tolerances [mm] | | | | |
|--------------------|--------|---------------------------------|-----------------------------|----------------|--|----------------|----------------|----------------------------|------------------------|--------------|---------|--|
| Symbol | Number | External dimension d [mm] | Wall thickness g [mm] | Length [mm] | Temper | Hardness HB | Hardness HV | External dimension d | Wall thickness g | Straightness | Length | |
| | | 16,0 - 18,0 | 2,0 - 3,0 3,1 - 4,0 | | H 110 max wall thickness 10,0mm | | | - 0,11 | +/- 12% +/- 10% | | | |
| | | | 2,0 - 3,0 | | | | 120 - 170 | - 0,13 | +/- 12% | | +/- 50 | |
| | | 18,1 - 30,0 | 3,1 - 6,0 | 2000 - 4000 | | | | | +/- 10% | | õ | |
| | | | 6,1 - 8,0 | | | 110 - 160 | | | +/- 9% | | | |
| | | | 3,1 - 6,0 | | | | | - 0,16 | +/- 10% | 3,0 n | | |
| CuZn37Mn3Al2PbSi | CW713R | 30,1 - 50,0 | 6,1 - 8,0 | | | | | | +/- 9% | nm/ | | |
| Cuzh371WIN3AI2PDSI | CWIISK | | 8,1 - 10,0 | | | | | | ., ., | 100 | | |
| | | | 3,1 - 6,0 | 00 | | | | | +/- 10% | mm/1000mm | t | |
| | | | 6,1 - 8,0 | | | | | | +/- 9% | | +/- 100 | |
| | | 50,1 - 65,0 | 8,1 - 10,0 | | | | | - 0,30 | | | Ō | |
| | | 50,1 - 03,0 | > 10,1 | | H 090 min wall thickness 10,1mm | 90 - 140 | 100 - 150 | 3,00 | +/- 8% | | | |
| | | · | · | Ratio d | /g max 18 | · | | | | | | |
| | | | Minimu | um interna | al diameter1 | 0,0mm | | | | | | |





| Grades | | Dim | ensional rang | je | | | anical erties | Т | olerances [mm] | | |
|--------------|--------|---------------------------------|-----------------------------|----------------|--|----------------|------------------|----------------------------|------------------------|---------------|--------|
| Symbol | Number | External dimension d [mm] | Wall thickness g [mm] | Length [mm] | Temper | Hardness HB | Hardness HV | External dimension d | Wall thickness g | Straightness | Length |
| | | 16,0 - 18,0 | 2,0 - 3,0 | - | | | | - 0,11 | +/- 12% | | |
| | | 10,0 10,0 | 3,1 - 4,0 | | | | | 0,11 | +/- 10% | | + |
| | | | 2,0 - 3,0 | | | | | | +/- 12% | | +/- 50 |
| | | 18,1 - 30,0 | 3,1 - 6,0 | | H 110 max wall thickness 10,0mm | | | - 0,13 | +/- 10% | | |
| | | | 6,1 - 8,0 | | | | | | +/- 9% | | |
| | | | 3,1 - 6,0 | 2000 - 4000 | | 110 - 160 | 120 - 170 | | +/- 10% | ,0 n | |
| | | 30,1 - 50,0 | 6,1 - 8,0 | | | | | - 0,16 | +/- 9% | nm/ | |
| CuZn40Mn1Pb1 | CW720R | | 8,1 - 10,0 | | | | | | 17- 370 | 3,0 mm/1000mm | |
| | | | 3,1 - 6,0 | 00 | | | | | +/- 10% | | +/- |
| | | | 6,1 - 8,0 | | | | | | +/- 9% | | - 100 |
| | | 50,1 - 65,0 | 8,1 - 10,0 | | | | | - 0,30 | +/- 3 /0 | | õ |
| | | 50,1-05,0 | > 10,1 | | H 090 min wall thickness 10,1mm | 90 - 140 | 100 - 150 | - 0,30 | +/- 8% | | |
| | | | | Ratio | d/g max 18 | | | | | | |
| | | | Mir | nimum inter | nal diameter1 | 0,0mm | | | | | |

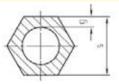




Drawn hexagonal tubes

| Grades | | Dime | ensional ran | ge | | | | | Tolerance [mm] | S | | | | | |
|--|------------------|--|--|--------------------------------------|-------------------|-------------|-------------------------------------|----------------------------|-----------------------------|-------------------|-------------------------------|--------|------------------------------|-------|-------|
| Symbol | Number | External dimension s [mm] | Wall thickness g [mm] | Length [mm] | Corners radius | Temper | Mechanical properties | External dimension s | Wall thickness g | Straightness | Length | | | | |
| CuZn35Pb2 CuZn36Pb2As | CW601N CW602N | 16,0 - 18,0 - | 2,0 - 3,0 3,1 - 4,0 | | 0,5 - 1,2 | | × | - 0,11 | +/- 12% +/- 10% | | +/- | | | | |
| CuZn36Pb3 CuZn37Pb1 CuZn37Pb2 CuZn38Pb1 | CW720R | CW605N CW606N CW607N CW608N CW611N CW612N | CW605N CW606N | CW605N CW606N | CW605N CW606N | 18,1 - 30,0 | 2,0 - 3,0 3,1 - 6,0 6,1 - 8,0 | 2000 | 0,6 - 1,8 | | Without specified properti | - 0,13 | +/- 12% +/- 10% +/- 9% | 2,0 m | /- 50 |
| CuZn38Pb2 CuZn39Pb1 CuZn39Pb2 CuZn39Pb3 | | | 30,1 - 50,0 | 3,1 - 6,0 6,1 - 8,0 8,1 - 10,0 | 00 - 4000 | 0,7 - 2,8 | Μ | pecified me properties | - 0,16 | +/- 10% +/- 9% | mm/1000mm | +/- | | | |
| CuZn40Pb2 CuZn37Mn3Al2PbSi CuZn40Mn1Pb1 CuZn35Pb1,5AlAs | | 7N 3R 0R 50,1 - 63,5 | 3,1 - 6,0 6,1 - 8,0 8,1 - 10,0 > 10,1 | | 0,8 - 4,0 | | mechanical es | - 0,30 | +/- 10% +/- 9% +/- 8% | m | - 100 | | | | |
| CuZn33Pb1,5AlAs CuZn38lAs | CW626N CW511L | | .0,1 | Ratio | o s/g max 1 | 8 | | | , 0,0 | | | | | | |
| | | | Mini | | rnal diamet | | | | | | | | | | |

| Grade | es | Dime | nsional ranç | ge | | | Mecha prope | | | Tolerances [mm] | | | |
|------------------------|------------------|---------------------------------|-----------------------------|----------------|-------------------|--|----------------|----------------|----------------------------|------------------------|--------------|--------|---|
| Symbol | Number | External dimension s [mm] | Wall thickness g [mm] | Length [mm] | Corners radius | Temper | Hardness HB | Hardness HV | External dimension s | Wall thickness g | Straightness | Length | |
| | | 16,0 - 18,0 | 2,0 - 3,0 3,1 - 4,0 | | 0,5 - 1,2 | | | | - 0,11 | +/- 12% +/- 10% | _ | | |
| | | 2,0 - 3,0 | | | | | | | +/- 12% | | +/- 50 | | |
| | | | 18,1 - 30,0 | 3,1 - 6,0 | | 0,6 - 1,8 | | | | - 0,13 | +/- 10% | | 0 |
| | CW603N CW605N | | 6,1 - 8,0 | | | H 110 max wall | 110 - | 120 - | | +/- 9% | 2,0 | | |
| CuZn37Pb1 CuZn37Pb2 | CW605N | | 3,1 - 6,0 | 2000 | | thickness |) - 160 | - 170 | | +/- 10% | | | |
| CuZn38Pb1 CuZn38Pb2 | CW607N CW608N | 30,1 - 50,0 | 6,1 - 8,0 | - ! | 0,7 - 2,8 | 2,8 10,0mm | 00 | 0 | - 0,16 | +/- 9% | n/10 | | |
| CuZn39Pb1 | CW611N | | 8,1 - 10,0 | | | | | | | (100(| mm/1000mm | | |
| CuZn39Pb2 CuZn39Pb3 | CW612N CW614N | | 3,1 - 6,0 | | | | | | | +/- 10% | mm | + - | |
| CuZn40Pb2 | CW617N | | 6,1 - 8,0 | | | | | | | +/- 9% | | 100 | |
| | | 50,1 - 63,5 | 8,1 - 10,0 | | 0,8 - 4,0 | 11.000 min | | | - 0,30 | | | | |
| | | | > 10,1 | | | H 090 min wall thickness 10,1mm | 90 - 140 | 100 - 150 | | +/- 8% | | | |
| | | | | • | Ratio s/ | g max 18 | | | | | | | |
| | | | | Minim | um interna | l diameter10, | ,0mm | | | | | | |





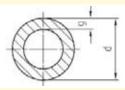
| Grades | S | Dime | nsional rang | je | | | Mecha | | Т | olerances [mm] | | |
|------------------------------|------------------|---------------------------------|-----------------------------|----------------|-------------------|------------|----------------|----------------|----------------------------|------------------------|--------------|--------|
| Symbol | Number | External dimension s [mm] | Wall thickness g [mm] | Length [mm] | Corners radius | Temper | Hardness HB | Hardness HV | External dimension s | Wall thickness g | Straightness | Length |
| | | 16,0 - 18,0 | 2,0 - 3,0 | | 0,5 - 1,2 | | | 80-120 | - 0,11 | +/- 12% | | |
| | | 10,0 - 10,0 | 3,1 - 4,0 | | 0,5 - 1,2 | | | | | +/- 10% | | - |
| | | | 2,0 - 3,0 | | | | | | - 0,13 | +/- 12% | | +/- 50 |
| | | 18,1 - 30,0 | 3,1 - 6,0 | | 0,6 - 1,8 | | | | | +/- 10% | | 0 |
| | | | 6,1 - 8,0 | 2 | | | | | | +/- 9% | 2,0 | |
| CuZn36Pb2As | CW602N | | 3,1 - 6,0 | 2000 - 4000 | | H070 | 70-110 | | | +/- 10% | mm/1000mm | |
| CuZn35Pb1,5AlAs | CW625N | 30,1 - 50,0 | 6,1 - 8,0 | | 0,7 - 2,8 | | | | - 0,16 | +/- 9% | | |
| CuZn33Pb1,5AlAs CuZn38lAs | CW626N CW511L | | 8,1 - 10,0 | | | | | | | +/- 9 /0 | mm | +/- |
| | | | 3,1 - 6,0 | | | | | | | +/- 10% | | /- 100 |
| | | 50,1 - 63,5 | 6,1 - 8,0 | | 0,8 - 4,0 | | | | - 0,30 | +/- 9% | | 0 |
| | | 50,1-05,5 | 8,1 - 10,0 | | 0,0 - 4,0 | | | | | +/- 9 /0 | | |
| | | | > 10,1 | | | | | | | +/- 8% | | |
| | | | | | Ratio s/g m | nax 18 | | | | | | |
| | | | I | Minimum | internal dia | ameter10,0 | mm | | | | | |

| Grades | | Dimensional range | | | | | Mechanical properties | | Tolerances [mm] | | | |
|------------------|--------|---------------------------------|-----------------------------|----------------|-------------------|--|--------------------------|----------------|----------------------------|------------------------|--------------|--------|
| Symbol | Number | External dimension s [mm] | Wall thickness g [mm] | Length [mm] | Corners radius | Temper | Hardness HB | Hardness HV | External dimension s | Wall thickness g | Straightness | Length |
| | | 16,0 - 18,0 | 2,0 - 3,0 | | 0,5 - 1,2 | | | | - 0,11 | +/- 12% | | |
| | | | 3,1 - 4,0 | | | H 110 max wall thickness 10,0mm | | 120 - 170 | | +/- 10% | | +/- |
| | | | 2,0 - 3,0 | | | | | | 0.40 | +/- 12% | | - 50 |
| | | 30,1 - 50,0 | | | 0,6 - 1,8 | | | | - 0,13 | +/- 10% | | |
| | | | 6,1 - 8,0 | | | | | | | +/- 9% | 4,0 | |
| | CW713R | | 3,1 - 6,0 | 2000 - 4000 | | | | | - 0,16 | +/- 10% | mm/1000 | |
| CuZn37Mn3Al2PbSi | | | | | | | | | | +/- 9% | | |
| | | | 8,1 - 10,0 | 400 | | | | | | | | |
| | | | 3,1 - 6,0 | 0 | | | | | | +/- 10% | mm | +- |
| | | | 6,1 - 8,0 | | | | | | | +/- 9% | | 100 |
| | | 50,1 - 63,5 | 8,1 - 10,0 | | 0,8 - 4,0 | | | | - 0,30 | | | 0 |
| | | 00,1 00,0 | > 10,1 | | 0,0-4,0 | H 090 min wall thickness 10,1mm | 90 - 140 | 100 - 150 | 0,00 | +/- 8% | | |
| | | | • | Rat | io s/g max | (18 | • | • | | | | |
| | | | Min | imum int | ernal diam | eter10,0mm | ı | | | | | |



| Grades | | Dimer | isional ran | ge | | | Mechanical properties | | Tolerances [mm] | | | |
|--------------|--------|---------------------------------|-----------------------------|----------------|-------------------------|--|-----------------------|----------------|----------------------------|------------------------|--------------|---------|
| Symbol | Number | External dimension s [mm] | Wall thickness g [mm] | Length [mm] | Corners radius | Temper | Hardness HB | Hardness HV | External dimension s | Wall thickness g | Straightness | Length |
| | | 16,0 - 18,0 | 2,0 - 3,0 3,1 - 4,0 | | 0,5 - 1,2 | | | | - 0,11 | +/- 12% +/- 10% | | |
| | CW720R | 18,1 - 30,0 | 2,0 - 3,0 3,1 - 6,0 | | 0,6 - 1,8 | | | | - 0,13 | +/- 12% +/- 10% | | +/- 50 |
| | | | 6,1 - 8,0 3,1 - 6,0 | 2 | | H 110 max wall | 110 - 160 | 120 - 170 | | +/- 9% +/- 10% | 4,0 | |
| CuZn40Mn1Pb1 | | 30,1 - 50,0 | 6,1 - 8,0 8,1 - 10,0 | 00 | 0,7 - 2,8 | thickness 10,0mm | | | - 0,16 | +/- 9% | mm/1000mm | |
| | | | 3,1 - 6,0 6,1 - 8,0 | | | | | | | +/- 10% | 0mm | +/- 100 |
| | | 50,1 - 63,5 | | | 0,8 - 4,0 | 11.000 | | | - 0,30 | +/- 9% | | 00 |
| | | | > 10,1 | | | H 090 min wall thickness 10,1mm | 90 - 140 | 100 - 150 | | +/- 8% | | |
| | | | | Minimu | Ratio s/g m internal | max 18 diameter10, | Omm | | | | | |

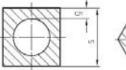




| Extruded round tube |
|---------------------|
|---------------------|

| Grades | Di | mensional rar | | | | Tolerances [mm] | | | | | |
|--|--|---|----------------|--------------|---|----------------------------|---|--|---------------|----------------------|--|
| Symbol Nun | nber dimens d [mn | ion thickness | Length [mm] | Temper | Mechanical properties | External dimension d | Outer diameter ovality | Wall thickness g | Straightness | Length | |
| | 18,0 - 3 30,1 - 5 | 6,1 - 8,0 2,5 - 3,0 | 2000 - 4000 | | | +/- 0,31 | Half of the permissible tolerance | +/- 12% +/- 10% +/- 9% +/- 12% +/- 10% +/- 9% | 1,5 mm/1000mm | +/- 50 | |
| | 50,1 - 8 | 0,0 3,0 - 6,0 6,1 - 8,0 8,1 - 10,0 > 10,1 | | | | +/- 0,60 | | +/- 10% +/- 9% +/- 8% | Omm | +/- 100 | |
| | 80,1 - 9 501N 502N | 15,0 17,0 20,0 22,0 | 2000 - 4000 | | Withou | +/- 1,2 | +/- 2,4 | +/- 0,5 +/- 0,6 +/- 0,7 +/- 0,9 +/- 1,1 +/- 1,3 +/- 1,4 +/- 1,6 +/- 1,8 | | +/- 200 | |
| CuZn36Pb3 CW6 CuZn37Pb1 CW6 CuZn37Pb2 CW6 CuZn38Pb1 CW6 CuZn38Pb1 CW6 CuZn39Pb1 CW6 CuZn39Pb1 CW6 CuZn39Pb1 CW6 CuZn39Pb2 CW6 CuZn39Pb3 CW6 CuZn40Pb2 CW6 CuZn37Mn3Al2PbSi CW7 | 503N 505N 506N 507N 508N 511N 512N 512N 514N 517N | 8,0 10,0 12,0 15,0 20,0 22,0 25,0 27,0 30,0 | 1500 - 3000 | Σ | Without specified mechanical properties | +/- 1,6 | +/- 2,9 | +/- 0,7 +/- 0,9 +/- 1,1 +/- 1,3 +/- 1,4 +/- 1,6 +/- 1,8 +/- 2,0 +/- 2,2 +/- 2,4 | 5 mm/1000mm | | |
| CuZn35Pb1,5AlAs CW6 CuZn33Pb1,5AlAs CW6 | 525N 526N 511L 120,1 150,0 | | 1000 - 2000 | | ß | +/- 1,9 | +/- 3,2 | +/- 1,4 +/- 1,6 +/- 1,8 +/- 2,0 +/- 2,2 +/- 2,4 +/- 2,5 +/- 2,8 | | Without exact length | |
| | 150,1 180,0 | | 500 - 1500 | | | +/- 2,2 | +/- 3,5 | +/- 1,6 +/- 1,8 +/- 2,0 +/- 2,2 +/- 2,4 +/- 2,5 +/- 2,8 +/- 3,1 +/- 3,5 | | | |
| | | outer dian diameter froi outer diameter | n ø 65,1r | | nm ratio | o d/g max 14, | | | | | |
| | | | | rnal diamete | | | | | | | |

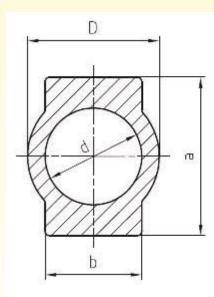


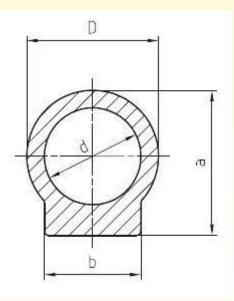


| Grades | | | nsional ran | | | agonarta | | Tolera | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|-------------|---|--|---|---|---------|
| Grades | | Diffe | | 90 | | | | [mr | n] | S | | | | | | | | | |
| Symbol | Number | External dimension s [mm] | Wall thickness g [mm] | Length [mm] | Temper | Mechanical properties | External dimension s | Outer diameter ovality | Wall thickness g | Straightness | Length | | | | | | | | |
| | CW601N CW602N CW603N CW605N CW606N CW607N CW608N CW611N CW612N | 18,0 - 30,0 | 2,5 - 3,0 3,1 - 6,0 6,1 - 8,0 2,5 - 3,0 3,1 - 6,0 | 2000 | | | +/- 0,31 | Half of the | +/- 12% +/- 10% +/- 9% +/- 12% +/- 10% | 1,5 mn | +/- 50 | | | | | | | | |
| | | 30,1 - 50,0 | 6,1 - 8,0 8,1 - 10,0 3,0 - 6,0 | 2000 - 4000 | | | | permissible tolerance | +/- 9% +/- 10% | mm/1000mm | + | | | | | | | | |
| CuZn35Pb2 CuZn36Pb2As | | CW602N CW603N CW605N CW606N CW607N CW608N CW611N CW612N | CW602N CW603N CW605N CW606N CW607N CW608N CW611N CW612N | CW602N CW603N CW605N CW606N CW607N CW608N CW611N | 50,1 - 80,0 | 6,1 - 8,0 8,1 - 10,0 > 10,1 | | | Without | +/- 0,60 | | +/- 9% +/- 8% | | +/- 100 | | | | | |
| CuZn36Pb3 CuZn37Pb1 CuZn37Pb2 CuZn38Pb1 CuZn38Pb2 CuZn39Pb1 CuZn39Pb2 CuZn39Pb3 | | | | | CW603N CW605N CW606N CW607N CW608N CW611N CW612N CW614N | CW603N CW605N CW606N CW607N CW608N CW611N CW612N CW614N | CW603N CW605N CW606N CW607N CW608N CW611N CW612N CW614N | CW603N CW605N CW606N CW607N CW608N CW611N CW612N CW614N | CW605N CW606N CW607N CW608N CW611N CW612N CW614N | CW605N CW606N CW607N CW608N CW611N CW612N CW614N | CW605N CW606N CW607N CW608N CW611N CW612N | CW605N CW606N CW607N CW608N CW611N CW612N CW614N | CW605N CW606N CW607N CW608N CW611N CW612N CW614N CW617N | 80,1 - 90,0 | 6,0 7,0 8,0 10,0 12,0 15,0 | | Σ | Without specified mechanical properties | +/- 1,2 |
| CuZn40Pb2 CuZn37Mn3Al2PbSi CuZn40Mn1Pb1 CuZn35Pb1,5AlAs CuZn33Pb1,5AlAs | CW617N CW713R CW720R CW625N CW626N | | 17,0 20,0 22,0 8,0 10,0 | 1500 - 3000 | | al properties | | | +/- 1,4 +/- 1,6 +/- 1,8 +/- 0,7 +/- 0,9 | 7 mm/1000mm | Without exact length | | | | | | | | |
| CuZn33Pb1,5AlAs CuZn38lAs | CW626N CW511L | CW626N | CW626N | 90,1 - 120,0 | 12,0 15,0 17,0 20,0 22,0 25,0 27,0 30,0 | Ō | | | +/- 1,6 | +/- 2,9 | +/- 1,1 +/- 1,3 +/- 1,4 +/- 1,6 +/- 1,8 +/- 2,0 +/- 2,2 +/- 2,4 | nm | ength | | | | | | |
| outer diameter of 65,0mm ratio s/g max 18, outer diameter from 65,1mm to 120,0mm ratio s/g max 14 | | | | | | | | | | | | | | | | | | | |
| | | | Minim | um interr | nal diamete | r12,0mm | | | | | | | | | | | | | |

Extruded square and hexagonal tubes



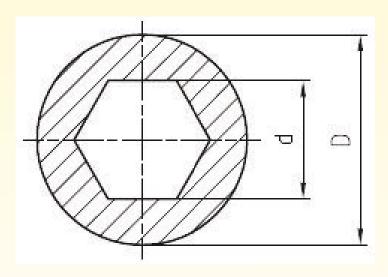




| Type of | Diameter | Tolerances | Diameter | Tolerances | Dimension | Tolerances | Dimension | Tolerances | | | |
|---------|---|------------|------------|------------|--------------|------------|-----------|------------|--|--|--|
| profile | | D | | d | | а | | b | | | |
| | | | | [m | im] | | | | | | |
| C1 | 46 | | 36 | | 51 | | 26 | | | | |
| C2 | 39 | | 30,5 | ± 0,5 | 50 | ± 0,5 | 26 | ± 0,5 | | | |
| C3 | 39 | ± 0,5 | 30,5 | _ 0,0 | 42 | _ 0,0 | 26 | _ 0,0 | | | |
| C4 | 31 | ± 0,5 | 23 | | 34,5 | | 26 | | | | |
| C5 | 38 | | 30 | | 40 | | 26 | | | | |
| C6 | 38 | | 30,3 | | 42 | | 25 | | | | |
| C6,5 | 37,5 | +/- 0,1 | 30 | + 0,3 | 41 | - 0,2 | 25 | -0,15 | | | |
| C7 | 37 | +/- 0,2 | 30,6 | +/- 0,2 | 39 | +/- 0,2 | 25,3 | -0,3 | | | |
| C11 | 38 | +/- 0,3 | 30 | + 0,5 | 42 | +/- 0,3 | 27 | +/- 0,25 | | | |
| C13 | 38 | -1 | 31,3 | +/-0,5 | 42 | +/- 0,5 | 25 | +/- 0,5 | | | |
| | | DECENT | RISITY max | 10% C1-C5 | C6,5, C7; ma | x 12% C-6 | | | | | |
| | | | | Grades | | | | | | | |
| | CuZn40Pb2; CuZn39Pb3; CuZn39Pb2; CuZn38Pb2; CuZn39Pb1,5; CuZn39Pb1; CuZn37Pb2; CuZn36Pb3; CuZn36Pb2As; CuZn36Pb1,5; CuZn35Pb2; CuZn35Pb1 | | | | | | | | | | |
| | Other dimensions to be agreed | | | | | | | | | | |

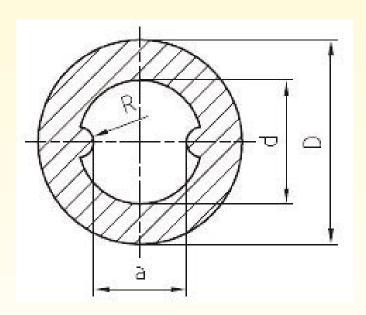
Drawn and extruded hollow profiles





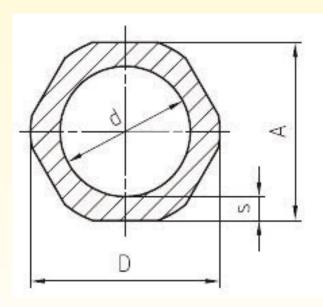
| | | Diameter | Tolerances | Dimension | Tolerances | | | | | |
|--------|--|----------|------------|-----------|------------|--|--|--|--|--|
| Туре | of profile | | | | d | | | | | |
| | | | [n | nm] | | | | | | |
| | A1 | 24 | +/- 0,5 | 14 | +/- 0,5 | | | | | |
| | A2 | 30 | +/- 0,6 | 19 | +/- 0,5 | | | | | |
| | A3 | 30 | +/- 0,6 | 14 | +/- 0,5 | | | | | |
| | A4 | 38 | +/- 0,8 | 19 | +/- 0,5 | | | | | |
| | A5 | 30 | +/- 0,6 | 17 | +/- 0,5 | | | | | |
| | A6 | 34 | +/- 0,6 | 14 | +/- 0,5 | | | | | |
| | A7 | 25 | +/- 0,5 | 14 | +/- 0,5 | | | | | |
| | A8 | 31 | +/- 0,6 | 17 | +/- 0,5 | | | | | |
| | A9 | 24 | +/- 0,6 | 13 | +/- 0,5 | | | | | |
| | A10 | 30 | +/- 0,6 | 12 | +/- 0,5 | | | | | |
| | A11 | 32 | +/- 0,6 | 12 | +/- 0,5 | | | | | |
| , | A12 | 19 | +/- 0,6 | 10 | +/- 0,5 | | | | | |
| , | A13 | 36 | +/- 0,6 | 17 | +/- 0,5 | | | | | |
| | DECENTRISITY max 10% | | | | | | | | | |
| Grades | CuZn40Pb2; CuZn39Pb3; CuZn39Pb2; CuZn38Pb2; CuZn39Pb1,5; CuZn39Pb1; CuZn37Pb2; CuZn36Pb3; CuZn36Pb2As; CuZn36Pb1,5; CuZn35Pb2; CuZn35Pb1 | | | | | | | | | |





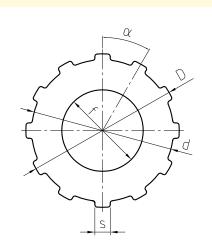
| Type of | Diameter | Tolerances | Dimension | Tolerances | Dimension | Tolerances | Corners | | | | |
|---------|--|------------|-----------|------------|-----------|------------|---------|--|--|--|--|
| profile | | D | (| d | а | | R | | | | |
| | | | 1 | [mm] | | | | | | | |
| B1 | 24 | + 0,6 | 15 | +/- 0,35 | 11 | +/- 0,35 | ~ 2,0 | | | | |
| B2 | 30 | + 0,6 | 19 | +/- 0,45 | 15 | +/- 0,45 | ~ 2,0 | | | | |
| B3 | 38 | + 0,6 | 24 | +/- 0,5 | 18 | +/- 0,5 | ~ 3,0 | | | | |
| B4 | 30 | + 0,6 | 13 | +/- 0,5 | 10 | +/- 0,5 | ~ 1,5 | | | | |
| B5 | 33 | + 0,6 | 19 | +/- 0,45 | 15 | +/- 0,45 | ~ 2,0 | | | | |
| B7 | 38 | + 0,6 | 17 | +/- 0,45 | 13,4 | +/- 0,45 | ~ 2,0 | | | | |
| B9 | 45 | +/- 0,4 | 32,2 | +/- 0,6 | 26 | +/- 0,3 | ~ 3,0 | | | | |
| B10 | 52 | +/- 0,5 | 38,2 | +/- 0,6 | 31 | +/- 0,35 | ~ 3,0 | | | | |
| B11 | 70 | +/- 0,6 | 50 | +/- 0,6 | 45 | +/- 0,50 | ~ 3,1 | | | | |
| B12 | 55 | +/- 0,5 | 38,2 | 0,6 | 31 | +/- 0,35 | ~ 3,0 | | | | |
| B13 | 63 | +/- 0,6 | 49,2 | 0,6 | 42 | +/- 0,4 | ~ 3,0 | | | | |
| B1 pc | 24 | -0,21 | 15 | +0,2/-0,7 | 11 | +0,2/-0,7 | ~ 2,0 | | | | |
| B2 pc | 30 | -0,21 | 19 | +0,2/-0,7 | 15 | +0,2/-0,7 | ~ 2,0 | | | | |
| B6 pc | 20 | +/- 0,3 | 11,5 | +/- 0,3 | 8,7 | +/- 0,3 | ~ 2,0 | | | | |
| | DECENTRISITY max 10% | | | | | | | | | | |
| Grades | CuZn40Pb2; CuZn39Pb3; CuZn39Pb2; CuZn38Pb2; CuZn39Pb1,5; CuZn39Pb1; CuZn37Pb2; CuZn36Pb3; CuZn36Pb2As; CuZn36Pb1,5; CuZn35Pb2; CuZn35Pb1 | | | | | | | | | | |





| Lp. | | | Weigh of 1 m [kg] | | | | | | | |
|--------|---|--------------|-------------------|-------|------|--|--|--|--|--|
| | Α | S | d | D | | | | | | |
| 1 | 22 | 5,5 | 11 | 24 | 2,8 | | | | | |
| 2 | 24 | 3 | 18 | 26,4 | 2,1 | | | | | |
| 3 | 24 | 5,5 | 13 | 26,4 | 3,1 | | | | | |
| 4 | 24 | 5 | 14 | 27 | 2,9 | | | | | |
| 5 | 27 | 5 | 17 | 29,5 | 3,4 | | | | | |
| 6 | 30 | 4 | 22 | 33,2 | 3,4 | | | | | |
| 7 | 30 | 5 | 20 | 33,5 | 4 | | | | | |
| 8 | 32 | 7 | 18 | 35 | 5,4 | | | | | |
| 9 | 40 | 6,2 | | | | | | | | |
| 10 | 40 | 6,5 | 27 | 43,5 | 6,9 | | | | | |
| 11 | 40 | 6 | 28 | 43,5 | 6,5 | | | | | |
| 12 | 41 | 3 | 35 | 45,5 | 4,2 | | | | | |
| 13 | 42,06 | 3,66 | 34,75 | 46,4 | 5 | | | | | |
| 14 | 44,45 | 5,72 | 33,02 | 50 | 7,3 | | | | | |
| 15 | 49,99 | 6,1 | 37,79 | 54,36 | 8,9 | | | | | |
| 16 | 50 | 7 | 36 | 55 | 9,8 | | | | | |
| 17 | 51 | 3 | 45 | 56 | 5,6 | | | | | |
| 18 | 54 | 3 | 48 | 60 | 6,1 | | | | | |
| 19 | 54 | 8,5 | 37 | 60 | 12,3 | | | | | |
| 20 | 55 | 8 | 39 | 59 | 12,1 | | | | | |
| 21 | 55 | 12,5 | 30 | 60 | 16,3 | | | | | |
| 22 | 57 | 4,5 | 48 | 61 | 8,5 | | | | | |
| 23 | 60 | 6 | 48 | 65,5 | 11,1 | | | | | |
| Grades | CuZn40Pb2; CuZn39Pb3; CuZn39Pb2; CuZn38Pb2; CuZn39Pb1,5; CuZn39Pb1; Grades CuZn37Pb2; CuZn36Pb3; CuZn36Pb2As; CuZn36Pb1,5; CuZn35Pb2; CuZn35Pb1; CuZn38Pb1, CuZn39Pb0,5, CuZn37Mn3Al2PbSi, CuZn40Mn1Pb1; CuZn40Mn1Fe1; | | | | | | | | | |
| | 1 | Other dimens | sions to be agre | | | | | | | |



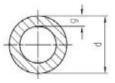


| | Diameter | Tolerances | Dimension | Tolerances | Diameter | Tolerances | α | Dimension | Tolerances | cross- section | | |
|--------|------------------------|--|-----------|------------|-------------------------|------------|--------|-----------|------------|-------------------|--|--|
| Туре | D | D | d | d | f | f | [*] | S | S | | | |
| | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] | [mm] | mm ² | | |
| E0 | 26 | +/- 0,4 | 24 | +/- 0,25 | 13,8 | +/- 0,35 | 30 | 2,6 | +/- 0,2 | 334 | | |
| E1 | 30 | +/- 0,4 | 27,8 | +/- 0,25 | 17 | - 0,6 | 45 | 2,6 | +/- 0,2 | 402,8 | | |
| E2 | 28 | +/- 0,4 | 26 | +/- 0,5 | 17 | - 0,6 | 30 | 2,6 | +/- 0,2 | 325,1 | | |
| E3 | 32 | +/- 0,4 | 29,6 | +/- 0,25 | 18 | +/- 0,42 | 30 | 2,6 | +/- 0,2 | 741 | | |
| E4 | 34 | +/- 0,4 | 34,7 | +/- 0,5 | 22 | - 0,6 | 30 | 2,6 | +/- 0,2 | 601,5 | | |
| E5 | 47,2 | +/- 0,4 | 45 | +/- 0,25 | 27 | +/- 0,42 | 25,714 | 2,8 | +/- 0,2 | 1061,3 | | |
| E6 | 54 | +/- 0,6 | 51,8 | +/- 0,25 | 38 | +/- 0,6 | 25,714 | 2,8 | +/- 0,2 | 1016,4 | | |
| E7 | 30 | +/- 0,4 | 27,8 | +/- 0,25 | 18 | +/- 0,35 | 45 | 2,6 | +/- 0,2 | 375,4 | | |
| E8 | 28 | +/- 0,4 | 26 | +/- 0,5 | 18 | +/- 0,35 | 30 | 2,6 | +/- 0,2 | 297,6 | | |
| E9 | 32 | +/- 0,4 | 29,6 | +/- 0,25 | 19 | +/- 0,42 | 30 | 2,6 | +/- 0,2 | 442 | | |
| E10 | 37 | +/- 0,4 | 35 | +/- 0,5 | 23 | +/- 0,4 | 30 | 2,6 | +/- 0,2 | 577,7 | | |
| E11 | 47,2 | +/- 0,4 | 45 | +/- 0,25 | 29 | +/- 0,42 | 24,714 | 2,8 | +/- 0,2 | 973,4 | | |
| E12 | 47,2 | +/- 0,4 | 45 | +/- 0,25 | 32 | +/- 0,42 | 24,714 | 2,8 | +/- 0,2 | 829,6 | | |
| E13 | 39 | +/- 0,4 | 37 | +/- 0,25 | 25 | +/- 0,4 | 30 | 2,6 | +/- 0,2 | 615,5 | | |
| E14 | 36 | +/- 0,35 | 34 | +/- 0,25 | 19 | +/- 0,35 | 30 | 26 | +/- 0,2 | 650,3 | | |
| | | | | DECENT | RISITY max 1 | 0% | | | | | | |
| | Radius corners R=0,5mm | | | | | | | | | | | |
| Gatunk | ci | | CuZn39P | b1,5; CuZn | 9Pb3; CuZ 39Pb1; CuZ | Zn37Pb2; C | uZn36F | ²b3; | | | | |
| | | CuZn36Pb2As; CuZn36Pb1,5; CuZn35Pb2; CuZn35Pb1 | | | | | | | | | | |



UNLEADED BRASS TUBES





Tubes are produced in straight lengths depending on customer's requirement in following ranges:

Drawn tubes:

- outer diameter 16,0 60,0mm
- Length> 12000 mm by prior arrangement
- Diameters of rd 6.0 mm and \leq 8.0 mm wall thickness 0.6 \leq 0.8 mm after prior arrangement

Annealed condition, annealing in an oxidizing atmosphere, outer and inner surface oxidized.

Extruded tubes:

- outer diameter of rd 80 mm or less, length 2000-4000 mm with tolerance of \pm 100 mm
- outer diameter bigger than rd 80 mm to 120 mm, inclusive length of 1500-3000 mm without specifying a close length
- outer diameter bigger than rd 120 mm to 180 mm, inclusive length of 1000-2000 mm without specifying a close length

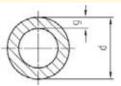
Packing:

- wooden cases
- bundles of 500 kg

Application:

- elements of heating and cooling systems in the automotive industry
- elements of the lamps in the lighting industry
- decorative elements in buildings
- parts of sanitary fittings covered with decorative coatings



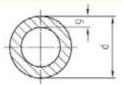


Drawn round unleaded brass tubes

| Gra | ides | Di | mensional ra | nge | | Mecha | nical propert | | | Tolerances [mm] | 6 | |
|--------|---------------|--------------------------------|---|----------------|--------|--|--|--------------------------------|---------------------------|------------------------|---------------|--------|
| Symbol | Number | External diameter d [mm] | Wall thickness g [mm] | Length [mm] | Temper | Tensile Strength Rm N/ mm2 (MPa) min | Yield Strength Rp02 N/ mm2 (MPa) min | Elongation A100 mm % min | External diameter d | Wall Thickness g | Straightness | Length |
| | | 8,0 - 10,0 | 0,75 - 0,99 1,0 - 1,49 | 4000-8000 | | | | | +/- 0,06 | +/- 15% +/- 13% | | + 10 |
| | | 10,1 - 20,0 | 0,75 - 0,99 1,0 - 1,49 1,50-2,0 2,51-3,0 | 4000-12000 | | 300 | 0001 | 45 | +/- 0,08 | +/- 15% +/- 13% | 3,0 mm | + 20 |
| CuZn37 | | 20,1 - 30,0 | 1,0 - 1,49 1,50-2,0 2,51-3,0 | 4000-12000 | R300 | 300 | 220* | | +/- 0,12 | +/- 13% | 3,0 mm/1000mm | + 10 |
| | | 30,1 - 50,0 | 1,0 - 1,49 1,50-2,0 2,51-3,0 | 4000-8000 | | | | | +/- 0,15 | +/- 13% | | + 10 |
| | | 8,0 - 10,0 | 0,75 - 0,99 1,0 - 1,49 | 4000-8000 | | 370 | | | +/- 0,06 | +/- 15% +/- 13% | | + 10 |
| | | 10,1 - 20,0 | 0,75 - 0,99 1,0 - 1,49 1,50-2,0 2,51-3,0 | 4000-12000 | | | | | +/- 0,08 | +/- 15% +/- 13% | 3,0 mm | + 20 |
| CuZn37 | CW508L | 20,1 - 30,0 | 1,0 - 1,49 1,50-2,0 2,51-3,0 | 4000-12000 | R370 | | 200 | 25 | +/- 0,12 | +/- 13% | nm | + 20 |
| | | 30,1 - 50,0 | 1,0 - 1,49 1,50-2,0 2,51-3,0 | 4000-8000 | | | | | +/- 0,15 | +/- 13% | | + 10 |
| | | 8,0 - 10,0 | 0,75 - 0,99 1,0 - 1,49 | 4000-8000 | | | | | +/- 0,06 | +/- 15% +/- 13% | | + 10 |
| | CuZn37 CW508L | 10,1 - 20,0 | 0,75 - 0,99 1,0 - 1,49 1,50-2,0 2,51-3,0 | 4000-12000 | - | | | | +/- 0,08 | +/- 15% +/- 13% | 3,0 mm/ | + 20 |
| CuZn37 | | 20,1 - 30,0 | 1,0 - 1,49 1,50-2,0 2,51-3,0 | 4000-12000 | R440 | 440 | 320 | 10 | +/- 0,12 | +/- 13% | 3,0 mm/1000mm | + 20 |
| | | 30,1 - 50,0 | 1,0 - 1,49 1,50-2,0 2,51-3,0 | 4000-8000 | _ | | | | +/- 0,15 | +/- 13% | | + 10 |

*max value





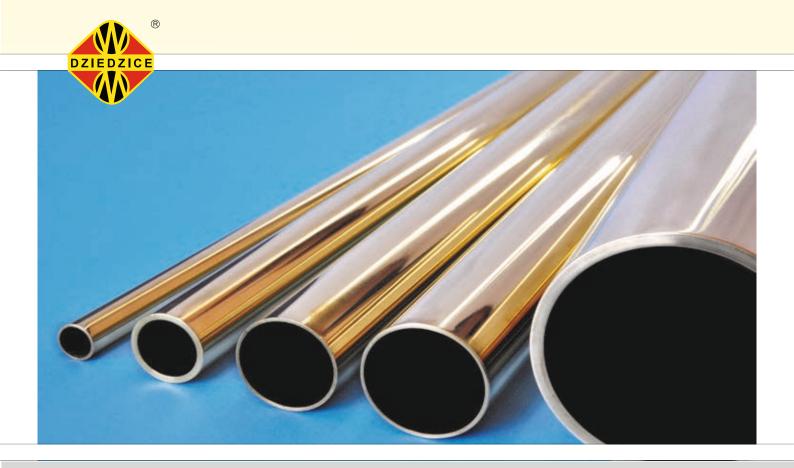
| Gra | des | Din | nensional ra | nge | | Mechar | nical properties | 3 | | Tolerances [mm] | | | |
|--------|---------------|--------------------------------|---|----------------|----------------|--|--|--------------------------------|---------------------------|-------------------------------|---------------|--------|--|
| Symbol | Number | External diameter d [mm] | Wall thickness g [mm] | Length [mm] | Temper | Tensile Strength Rm N/mm2 (MPa) min | Yield Strength Rp02 N/mm2 (MPa) min | Elongation A100 mm % min | External diameter d | Wall Thickness g | Straightness | Length | |
| | | 8,0 - 10,0 | 0,75 - 0,99 1,0 - 1,49 | 4000-8000 | | | | | +/- 0,06 | +/- 15% +/- 13% | | + 10 | |
| | | 10,1 - 20,0 | 0,75 - 0,99 1,0 - 1,49 1,50-2,0 2,51-3,0 | 4000-12000 | 50.40 | 0.10 | 250* | 35 | +/- 0,08 | +/- 15% +/- 13% | 3,0 mm/ | + 20 | |
| CuZn36 | CW507L | 20,1 - 30,0 | 1,0 - 1,49 1,50-2,0 2,51-3,0 | 4000-12000 | R340 | 340 | | | +/- 0,12 | +/- 13% | 3,0 mm/1000mm | + 20 | |
| | | 30,1 - 50,0 | 1,0 - 1,49 1,50-2,0 2,51-3,0 | 4000-8000 | | | | | +/- 0,15 | +/- 13% | | + 10 | |
| | | 8,0 - 10,0 | 0,75 - 0,99 1,0 - 1,49 | 4000-8000 | | | | | +/- 0,06 | +/- 15% +/- 13% | | + 10 | |
| | | 10,1 - 20,0 | 0,75 - 0,99 1,0 - 1,49 1,50-2,0 2,51-3,0 | 4000-12000 | 00 R410 410 | | | +/- 0,08 | +/- 15% +/- 13% | 3,0 mm | + 20 | | |
| CuZn36 | CuZn36 CW507L | 20,1 - 30,0 | 1,0 - 1,49 1,50-2,0 2,51-3,0 | 4000-12000 | R410 | 410 | 250 | 18 | +/- 0,12 | +/- 13% | mm/1000mm | + 20 | |
| | | 30,1 - 50,0 | 1,0 - 1,49 1,50-2,0 2,51-3,0 | 4000-8000 | | | | | +/- 0,15 | +/- 13% | | + 10 | |
| | | 8,0 - 10,0 | 0,75 - 0,99 1,0 - 1,49 | 4000-8000 | | | | | +/- 0,06 | +/- 15% +/- 13% | 3,0 mm/100 | + 10 | |
| | | 10,1 - 20,0 | 0,75 - 0,99 1,0 - 1,49 1,50-2,0 2,51-3,0 | 4000-12000 | | | | | +/- 0,08 | +/- 15% +/- 13% | | + 20 | |
| CuZn30 | CW505L | 20,1 - 30,0 | 1,0 - 1,49 1,50-2,0 2,51-3,0 | 4000-12000 | R280 | 280 | 180* | 50 | +/- 0,12 | +/- 13% | | + 20 | |
| | | 30,1 - 35,0 | 1,0 - 1,49 1,50-2,0 2,51-3,0 | 4000-12000 | | | | | +/- 0,15 | +/- 13% | | + 20 | |
| | | 8,0 - 10,0 | 0,75 - 0,99 1,0 - 1,49 0,75 - 0,99 | 4000-8000 | | | | | +/- 0,06 | +/- 15% +/- 13% +/- 15% | | + 10 | |
| CuZn30 | | 10,1 - 20,0 | 1,0 - 1,49 1,50-2,0 2,51-3,0 | 4000-12000 | R350 | 350 | 200 | 25 | +/- 0,08 | +/- 13% | 3,0 mm/1000mm | + 20 | |
| Guznou | | 20,1 - 30,0 | 1,0 - 1,49 1,50-2,0 2,51-3,0 | 4000-12000 | | 50 350 | 200 | 25 | +/- 0,12 | +/- 13% | 1000mm | + 20 | |
| | | 30,1 - 35,0 | 1,0 - 1,49 1,50-2,0 2,51-3,0 | 4000-12000 | | | | | +/- 0,15 | +/- 13% | | + 20 | |

*max value





Examples of profiles manufactured in Walcownia Metali "Dziedzice " S.A.



CONDENSER TUBES



Due to the specific application of the heat exchanger tubes, including tubes for steam condensers in power plants, the choice of alloying elements requires special care. Elimination of metallic and non-metallic impurities allows to achieve a product that corresponds to all the standards and norms.

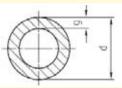
Tubes for heat exchangers are manufactured in two basic alloys, one of them – admiralty brass- with adder of tin, and the second- aluminium brass- with adder of aluminium.

Tubes for heat exchangers are manufactured with main operation on pilger process, providing excellent tube quality after rolling.

They are mainly used in power plants (conventional and nuclear), desalination plants petrochemical and marine industry.

Dimensional charts shown further correspond to the EN standards. Brass rods are also produced according to other norms.





Condenser tubes

| Grad | des | Di | mensional rai | ng | | Mecha | inical prope | erties | Tolerances [mm] | | | |
|----------------------|--------|------------------------------|---|----------------|--------|--|---|--------------------------------|------------------------------|-------------------|------------------|----------------|
| Symbol | Number | External diameter [mm] | Wall thickness [mm] | Length [mm] | Temper | Tensile strength Rm N/mm2 (MPa) min | Yield strength Rp02 N/mm2 (MPa) min | Elongation A100 mm % min | External diameter [mm] | Wall thickness | Straightnes s | Length [mm] |
| CuZ | | 8,0 - 14,0 | 0,75 - 0,99 | 2000-8000 | | | | | -0,12 | | ŝ | |
| CuZn20Al2As, C68700 | CW702R | 14,1 - 26,0 | 0,75 - 0,99 1,0 - 1,49 1,50-2,0 2,51-2,5 | 2000-14000 | R340 | 340 | 120 | 55 | - 0,20 | +/- 10% | 3,0mm/1000mm | + 5 |
| 68700 | | 26,1 - 35,0 | 1,0 - 1,49 1,50-2,0 2,51-3,0 | 2000-14000 | | | | | - 0,30 | | mm | |
| ĉ | | 8,0 - 14,0 | 0,75 - 0,99 1,0 - 1,49 | 2000-8000 | | | | | -0,12 | | | |
| CuZn20Al2As , C68700 | CW702R | 14,1 - 26,0 | 0,75 - 0,99 1,0 - 1,49 1,50-2,0 2,51-3,0 | 2000-14000 | R390 | 390 | 150 | 45 | - 0,20 | +/- 10% | 3,0mm/1000mm | + 5 |
| C68700 | ~ | 26,1 - 35,0 | 1,0 - 1,49 1,50-2,0 2,51-3,0 | 2000-14000 | | | | | - 0,30 | | Imm | |
| Cui | C C | 8,0 - 14,0 | 0,75 - 0,99 1,0 - 1,49 | 2000-8000 | | 340 | | | -0,12 | | 6 | |
| Zn28Sn1As, | | 14,1 - 26,0 | 0,75 - 0,99 1,0 - 1,49 1,50-2,0 2,51-2,5 | 2000-14000 | R340 | | 120 | 55 | - 0,20 | +/- 10% | 3,0mm/1000mm | + 5 |
| C44300 | ~ | 26,1 - 35,0 | 1,0 - 1,49 1,50-2,0 2,51-3,0 | 2000-14000 | | | | | - 0,30 | |)mm | |
| Cui | | 8,0 - 14,0 | 0,75 - 0,99 1,0 - 1,49 | 2000-8000 | | | | | -0,12 | | | |
| CuZn28Sn1As , C44300 | CW706R | 14,1 - 26,0 | 0,75 - 0,99 1,0 - 1,49 1,50-2,0 2,51-3,0 | 2000-14000 | R390 | 390 | 150 | 45 | - 0,20 | +/- 10% | 3,0mm/1000mm | + 5 |
| C44300 | | 26,1 - 35,0 | 1,0 - 1,49 1,50-2,0 2,51-3,0 | 2000-14000 | _ | | | | - 0,30 | | nm | |
| | | 8,0 - 14,0 | 0,75 - 0,99 1,0 - 1,49 | 2000-8000 | | | | | -0,12 | | | |
| CuZn30As | | 14,1 - 26,0 | 0,75 - 0,99 1,0 - 1,49 1,50-2,0 2,51-3,0 | 2000-14000 | _ | 340 | 130 45 | 45 | - 0,20 | +/- 10% | 3,0mm/1000mm | + 5 |
| | | 26,1 - 35,0 | 1,0 - 1,49 1,50-2,0 2,51-3,0 | 2000-14000 | -14000 | | | | | | nm | |



Tubes are produced in straight lengths as below:

- rd 8,0-15,0 mm, length 2000 mm 8000mm
- over rd 15,0 mm length 2000 mm 14000 mm
- length over 14000 mm acc to arrangement

Annealed condition, annealing in an oxidizing atmosphere, outer and inner surface oxidized.

Leakproofness of tubes checked by Eddy Currents Test for 100% of tubes.

The warranty for corrosion resistance tubes:

- 2.5 years for the alloy CuZn28Sn1 agreed by the warranty card for condenser tubing in power industry
- 3 years for the alloy CuZn20Al2 agreed by the warranty card for condenser tubing in power industry

Packing: wooden cases.

Application:

- condenser tubing (capacitors) in the energy industry
- heat exchangers and systems for power plants
- heat exchangers and coolers used in the shipbuilding industry operating in marine environments
- systems for water desalination



CERTIFICATE

Quality Assurance System for Material Manufacturer acc. to Pressure Equipment Directive 97/23/EC

Certificate no.: 07-202-9120 WZ-0998/13

Name and address of manufacturer: Walcownia Metali "Dziedzice" PL 43-502 Czechowice-Dziedzice UI. Kaniowska 3

This is to certify that the manufacturer has implemented and applies a QA System. This QA System has been subjected to a specific assessment for material acc. to Directive 97/23/EC, annex I, sec. 4.3 with regard to the materials mentioned within the scope of approval.

Approved:QA System acc. to AD2000-Merkblatt W0
and EN 764-5, sec. 4.2Audit report no.:9120 P-0998/13Scope of approval:Seamless Copper Alloy Tubes
Details of the scope are mentioned in the annex of the
certificate AD2000-Merkblatt W0.Production site:Walcownia Metali "Dziedzice"
PL 43-502 Czechowice-Dziedzice
UI. Kaniowska 3

The manufacturer disposes of the essential procedures and equipments as well as the required qualified personnel to ensure quality of manufacturing and testing the materials and products mentioned in the scope of approval.

Katowice, 31.10.2013

Remark of validity: Valid until 10.2016

> Tel. +48 (32) 786 46 51 Fax +48 32 786 46 05 e-mail m.tarczynski@tuv-nord.pl

o body

TIN NORD

Certification Body for Pressure Equipment of TÜV NORD Systems GmbH & Co. KG

M.Tarczyński

Notified body, registration no. 0045

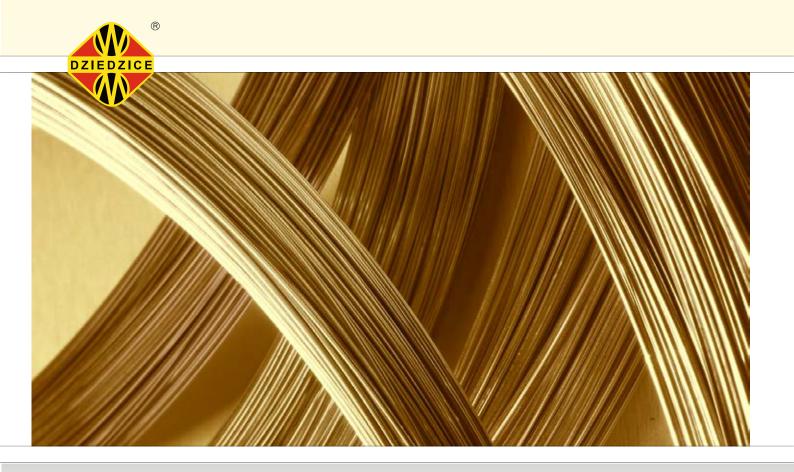
Zertifizierungsstelle für Druckgeräte Benannte Stelle 0045 Große Bahnstraße 31 D-22525 Hamburg/Germany

TÜV NORD Systems GmbH & Co. KG

STW DOR W F8-320 Zerff/kat-DGR-W ENG Rev.04 2013-07



Tube Production Division, Extrusion press run out table



BRASS WIRE



We offer a wide range of brass wire in several grades of alloys. Wires are available:

- In irregular coils, weighing 60 kg 140 kg
- In regular coils, weighing 400 1200 kg

Wires are intended for further machining, hot forging and cold heading.

Used in electrical industry due to good electrical conductivity, in the automotive industry as a spokes nipples, valves an others.



Wire in irregular coil structure



Wire in irregular coil structure



Wire in irregular coil :

- size range: 2,0 10, 0 mm
- inner coil diameter min 500 mm
- outer coil diameter max 800 mm
- coil weight 30-40 kg, 50-70 kg, 120-140 kg
- circles bound in four places

Wire in regular coil :

- size range 3,0 mm 10, 0 mm
- coil weight max 1200 kg
- inner coil diameter 700 mm
- coil height 430 mm
- outside coil diameter depends on the weight of the coil

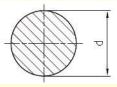
Surface: clean and bright, half-hard temper or for soft temper dull, oxidized.

Packing: coils on pallets or in bulk

Application :

- screw joints resistant to sea-water, manufactured by cold forming
- welding and resistance welding electrodes; brazing solders
- electrodes for electromachining (for further drawing)
- components and accessories in electrical and automotive industry
- metal wool production (CW508L)

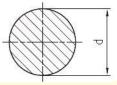




| WMD MS 20 (CuZn39Pb3) acc to EN 12166 Properties | | | | | | | | | | | | |
|--|-------|---------------|--------|-----------|-----------|-----------------|-------------|--------------|-------|-----------------------------|--|--|
| External dimension d | То | lerances d | Temper | Rm min | Rm max | R 0,2 approx | A100 min | A11,3 min | A min | Packing | | |
| [mm] | | [mm] | | [Mpa] | [Mpa] | [Mpa] | | | [%] | | | |
| 2,0 | | | | | | | | | | | | |
| 2,2 | | | | | | | | | | | | |
| 2,3 | | | | | | | | | | | | |
| 2,5 | | +0 / -0,04 | R510 | 510 | | (400) | (4) | | | | | |
| 2,8 | | +07-0,04 | K310 | 510 | | (400) | (4) | | | <u>8</u> | | |
| 3,0 | | | | | | | | | | ls 5 | | |
| 3,5 | | | | | | | | | | Õ I | | |
| 4,0 | | | | | | | | | | coils 50 - 70 kg | | |
| 4,5 | c | | | | | | | | | kg | | |
| 4,8 | class | | | | | | | | | | | |
| 5,0 | Ē | +0 / -0,05 | | | | | | | | irre | | |
| 5,1 | | +07-0,05 | | | | | | | | gula | | |
| 5,5 | | | | | | | | | | aro | | |
| 6,0 | | | R500 | 500 | | (390) | | 6 | | (irregular coil structure) | | |
| 6,2 | | | | | | | | | | stru | | |
| 6,5 | | | | | | | | | | ctur | | |
| 7,0 | | | | | | | | | | .е) | | |
| 7,5 | | +0 / -0,06 | | | | | | | | | | |
| 8,0 | | | | | | | | | | | | |
| 8,3 | | | R490 | 490 | | | | | 8 | | | |
| 9,0 | | | R490 | 490 | | | | | 0 | | | |
| 4,8 | | | | | | | | | | | | |
| 5,0 | | | | | | | | | | | | |
| 5,1 | | +0 / -0,05 | | | | | | | | | | |
| 5,5 | | | | | | | | | | spc | | |
| 6,0 | Cla | | R500 | 500 | | (390) | | 6 | | sloc | | |
| 6,2 | class | | 1300 | 500 | | (080) | | 0 | | 읏 | | |
| 6,5 | Ш | | | | | | | | | spools ok. 1000 kg | | |
| 7,0 | | | | | | | | | |)00 | | |
| 7,5 | | +0 / -0,06 | | | | | | | | kg | | |
| 8,0 | | | | | | | | | | | | |
| 8,3 | | | R490 | 490 | | | | | 8 | | | |
| 9,0 | | | 11700 | +50 | | | | | 5 | | | |

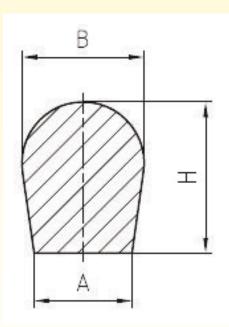
Round drawn wires acc to EN12166





| WMD MD 10 (CuZn37) acc to EN 12166 | | | | | | | | | | | |
|------------------------------------|-----------------|------------|---------|-----------|-----------|-----------------|-------------|--------------|-------|-----------------------------|--|
| | | | | | Pro | perties | | | | | |
| External dimension d | Tolerances d | | Temper | Rm min | Rm max | R 0,2 approx | A100 min | A11,3 min | A min | Packing | |
| [mm] | | [mm] | | [Mpa] | [Mpa] | [Mpa] | | | [%] | | |
| 2,0 | | | | | | | | | | | |
| 2,2 | | | | | 570 | | | | | | |
| 2,3 | | | R470 47 | | | (200) | (5) | | | | |
| 2,5 | | +0 / -0,04 | | 470 | | | | | | | |
| 2,8 | | | K470 | 470 | 570 | (390) | | | | | |
| 3,0 | | | | | | | | | | CO | |
| 3,5 | | | | | | | | | | ils 5(| |
| 4,0 | | | | | | | | | | coils 50 - 70 kg | |
| 4,5 | | +0 / -0,05 | | | | | | | | 0 kg | |
| 4,8 | class | | | | | | | | | | |
| 5,0 | SS E | | | | | | | | | irreg | |
| 5,1 | 111 | | | | | | | | | Jular | |
| 5,5 | | | | | | | | | | coil | |
| 6,0 | | | | | | | | | | (irregular coil structure) | |
| 6,2 | | | R370 | 370 | 470 | (250) | | (20) | (25) | ıctur | |
| 6,5 | | | | | | | | | | e) | |
| 7,0 | | | | | | | | | | | |
| 7,5 | | +0 / -0,06 | | | | | | | | | |
| 8,0 | | | | | | | | | | | |
| 8,3 | | | | | | | | | | | |
| 9,0 | | | | | | | | | | | |





Drawn profiles in circles

| | | | | | | acc to EN | | | | | |
|--------|------|---------|---------|----------|------|-----------|--------|-----------|--------|---|--|
| Symbol | | Dim | ensions | and tole | Pro | | | | | | |
| | Α | tol. A | В | tol. B | н | tol. H | Temper | Rm min | A11,3% | Form | |
| | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [Mp | | | | |
| K-001 | 3,8 | 0,2 | 4,8 | 0,2 | 6 | 0,2 | | | | | |
| K-002 | 4,2 | 0,2 | 5,8 | 0,2 | 7,5 | 0,2 | | | | | |
| K-003 | 4 | 0,2 | 5 | 0,2 | 6,1 | 0,2 | | | | | |
| K-004 | 3,2 | -0,12 | 4 | -0,12 | 4,5 | -0,12 | | | | | |
| K-005 | 4,4 | -0,15 | 4,4 | -0,15 | 5,5 | -0,16 | | | | coils 50 - 70 kg (irregular coil structure) | |
| K-006 | 5,6 | -0,16 | 7,2 | -0,16 | 8,2 | -0,16 | | | | | |
| K-007 | 2,9 | 0,2 | 4,3 | 0,2 | 5,7 | 0,2 | | | | | |
| K-008 | 3,7 | -0,1 | 4,7 | -0,1 | 6,1 | -0,1 | | | | | |
| K-009 | 4,4 | -0,15 | 4,4 | -0,15 | 5,9 | -0,15 | | | | | |
| K-015 | 4 | 0,1 | 5,5 | -0,15 | 7 | -0,15 | R420 | 420 | 8 | | |
| K-016 | 5 | -0,15 | 5 | -0,15 | 7 | -0,1 | | | | | |
| K-017 | 4 | +/-0,10 | 5,6 | +/-0,10 | 6,7 | +/-0,10 | | | | | |
| K-018 | 3,7 | +/-0,10 | 4,5 | +/-0,10 | 5,7 | +/-0,10 | | | | | |
| K-019 | 3,7 | +/-0,10 | 5 | -2 | 5,7 | +/-0,05 | | | | | |
| K-020 | 2,8 | +/-0,10 | 3,8 | +/-0,10 | 4,7 | +/-0,10 | 1 | | | | |
| K-025 | 5 | -0,14 | 5 | -0,14 | 6 | -0,16 | | | | | |
| K-026 | 3,7 | -0,12 | 4 | -0,12 | 4,5 | -0,12 | | | | | |
| K-027 | 3,5 | -0,1 | 4,7 | -0,1 | 6,1 | -0,1 | 1 | | | | |
| K-028 | 5,08 | +/-0,05 | 7,92 | +/-0,05 | 9,04 | +/-0,05 | 1 | | 1 | | |



Profiles are produced according to costumer requirements in a wide range of dimensions, according to drawings. Profiles are utilized in many industries like key manufacturing, electronic industry and others.

Size range: in accordance to following charts or in acc to EN 12164, EN 12167 or acc to approved specifications.

Length of manufactured profiles: 3000-4000mm with length tolerance +/-50mm. **Temper:** Ordered as extruded: the hot extrusion

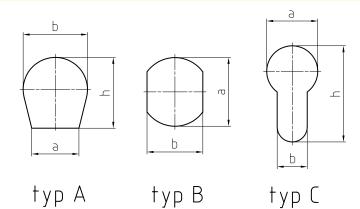
Ordered as drawn

- M no specific mechanical properties
- R430 according to EN 12164, EN 12167 for the alloys CW614N, CW617N.

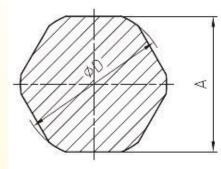
Surface: defined by manufacturing process .

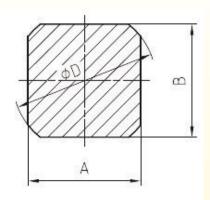
Dimensional charts shown further correspond to the EN standards. Brass rods are also produced according to other norms.





Profile dimensions [mm] Grades **Symbol** Тур tol. a b tol. b h tol. h а +/- 0,05 +/-0,05 K-021 В f 6,0 5,0 --CuZn36Pb2As CW602N K-022 С 17,0 +/-0,1 10,0 -0,1 33,0 -0,1 CuZn39Pb2 CW612N CuZn39Pb3 CW614N K-024 В f 7,8 +/-0,05 3,5 -0,2 --CuZn40Pb2 CW617N А K-029 4,4 -0,15 -0,15 4,4 5,1 -0,16 K-030 С 17,0 +/-0,1 10,0 +/-0,1 32,0 +/-0,1 K-031 С 8,2 -0,15 2,4 -0,12 10,6 -0,2 K-032 С 20,95 -0,15 9,95 -0,1 31,95 -0,20 С K-034 14 +0,05/-0,13 4 +0,05/-0,13 +0,05/-0,15 19 K-035 А 11 +/-0,2 15 10 +0,1/-0,2 K-036 С 17,0 +/-0,1 10,0 32,88 -0,1 -0,1



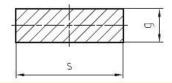


| Grades | | Lp. | Туре | Rod dimensions Ax Bx D [mm] | | | | | |
|--|----------------------------|--------|------|-----------------------------|-----------------------|--|---|---|-----------------------|
| Symbol | Number | 1 | А | 7,93 x 7,93 x 9,42 | | | | | |
| | | 2 | А | 9,14 x 9,14 x 11,15 | | | | | |
| | | 3 | А | 10,03 x 10,03 x 12,4 | | | | | |
| CuZn36Pb2As CuZn39Pb2 CuZn39Pb3 CuZn40Pb2 | CW602N CW612N CW614N | CW612N | 4 | А | 12,98 x 12,98 x 16,33 | | | | |
| | | | | | | | 5 | А | 15,98 x 16,99 x 21,23 |
| | CW617N | 6 | В | 26,99 x — x 30,16 | | | | | |
| | | 7 | В | 25,4 x — x 27,85 | | | | | |



BRASS FLAT BARS



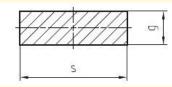


Drawn flat bars in straight lengths according to EN12167

| Gra | ade | | Dimensic | onal range | Mechanical prop | | erties | | | rances nm) | Cor | St | | | | | | | |
|-----------|--|---------------|-------------------------------------|--|--|--|-----------------------------|-----------------------|--|--|---|--------------|------------------------------|----------------|--|--|--|-------------------|--------|
| Symbol | Number | Temper | Width s [mm] | Thickness g mm] | Tensile Strength Rm N/ mm2 (MPa) min | Yield Strength Rp02 N/ mm2 (MPa) min | Elongation A% min | Hardness HB | Width s [mm] | Thickness g [mm] | Corners radius | Straightness | Torsion | Length (mm) | Ends | | | | |
| | | | 6,0-18,0 | 3,0 - 6,0 6,1-10,0 10,1 - 18,0 | | | | | +/- 0,10 | +/- 0,07 +/- 0,09 +/- 0,10 | 0,3-0,5 0,4-0,8 0,5-1,2 | | 1 mm/m | | broken | | | | |
| | M R480 H130* CW614N; CW617N CuZn39P3; CuZn40Pb2 | | 18,1-30,0 | 4,0 - 6,0 6,1-10,0 10,1 - 18,0 18,1 - 30,0 | | | | | +/- 0,15 | +/- 0,07 +/- 0,09 +/- 0,10 +/- 0,15 | 0,3-0,5 0,4-0,8 0,5-1,2 0,6-1,8 | | 1,5 mm/m | | | | | | |
| | | Z | 30,1-50,0 | 5,0 - 6,0 6,1-10,0 10,1 - 18,0 18,1 - 30,0 30,1 - 40,0 | Without | specified m properties | ified mechanical perties | | | +/- 0,09 +/- 0,10 +/- 0,12 +/- 0,15 +/- 0,20 | 0,3-0,5 0,4-0,8 0,5-1,2 0,6-1,8 0,7-2,8 | 2 mm/m | 2 mm/m | | cut off | | | | |
| CuZnt | | | 50,1-60,0 | 40,1-45,0 5,0-6,0 6,1-10,0 10,1-18,0 18,1-30,0 | | | | | +/- 0,25 | +/- 0,11 +/- 0,12 +/- 0,15 +/- 0,20 | 0,8-4,0 0,3-0,5 0,4-0,8 0,5-1,2 0,6-1,8 | | 3 mm/m | | | | | | |
| 39P3; CuZ | | | 6,0-18,0 | 30,1 - 40,0 40,1 - 45,0 3,0 - 6,0 | 480 | (330) (5 | (5) | | +/- 0,10 | +/- 0,25 | 0,7-2,8 0,8-4,0 0,3-0,5 | N | 1 mm/m | 3000 +/-50 | broken | | | | |
| n40Pb2 | | R480 1130* | 18,1-30,0 30,1-50,0 50,1-60,0 | 4,0 - 6,0 5,0 - 6,0 5,0 - 6,0 | | | | 130* | +/- 0,15 +/- 0,20 +/- 0,25 | +/- 0,07 +/- 0,09 +/- 0,11 | 0,3-0,5 0,3-0,5 0,3-0,5 | 2 mm/m | 1,5 mm/m 2 mm/m 3 mm/m | | cut off | | | | |
| | | R430 H110* | R430 H110* | R430 H110* | R430 H110* | - | R430 H110* | 6,0-18,0 18,1-30,0 | 6,0-10,0 10,1 - 18,0 6,0-10,0 10,1 - 18,0 | | | | | | +/- 0,09 +/- 0,10 +/- 0,09 +/- 0,10 | 0,4-0,8 0,5-1,2 0,4-0,8 0,5-1,2 | | 1mm/m 1,5 mm/m | |
| | | | | | | | | R430 H110* | R430 H110* | 30,1-50,0 | 18,1 - 30,0 6,0-10,0 10,1 - 18,0 18,1 - 30,0 30,1 - 40,0 40,1 - 45,0 | 430 (200) | (15) | 110* | | +/- 0,15 +/- 0,10 +/- 0,12 +/- 0,15 +/- 0,20 | 0,6-1,8 0,4-0,8 0,5-1,2 0,6-1,8 0,7-2,8 0,8-4,0 | 2 mm/m | 2 mm/m |
| | | | 50,1-60,0 | 6,0-10,0 10,1 - 18,0 18,1 - 30,0 30,1 - 40,0 40,1 - 45,0 | · - - - | | | | | +/- 0,12 +/- 0,15 +/- 0,20 +/- 0,25 | 0,4-0,8 0,5-1,2 0,6-1,8 0,7-2,8 0,8-4,0 | | 3 mm/m | | | | | | |

Applies only to temper of H *





| Grade | | Temper | Dimensic | onal range | Mechanical properties | | ances m) | Corners | Straightness | Torsion | Length (mm) | Ends | | | | | | |
|-------------------------------|--|--|-----------|-------------|--------------------------|---------------------|------------------|-------------------|---------------------|----------|----------------|-----------|-----------|-------------|----------|---------|---------|---------|
| Symbol | Number | per | Iper | Iper | Width s [mm] | Thickness g [mm] | anical erties | Width s [mm] | Thickness g [mm] | radius | ntness | sion | gth m) | ds | | | | |
| | | | 20,0-30,0 | 18,0 - 30,0 | | +/- 0,33 | +/- 0,33 | 0,3-0,5 | | 3 mm/m | | | | | | | | |
| | | | | 6,0 - 10,0 | İ | | +/- 0,27 | 0,4-0,8 | 1 | | 3000 +/-100 | | | | | | | |
| 0 7 07 | 0.4/50.01 | | | 10,1 - 18,0 | | | +/- 0,33 | 0,5-1,2 | | 4 mm/m | | | | | | | | |
| | CuZn37 CW508L CuZn40 CW509L CuZn35Pb1 CW600N CuZn35Pb2 CW601N CuZn36Pb3 CW603N CuZn37Pb2 CW606N CuZn36Pb2As CW602N | | 30,1-50,0 | 18,1 - 30,0 | _ | +/- 0,62 | +/- 0,45 | 0,6-1,8 | - | | | | | | | | | |
| | | | | | | | 30,1 - 40,0 | Without specified | | +/- 0.62 | 0,7-2,8 | | | 00 | | | | |
| | | | | | | | | 40,1 - 50,0 | out | | ., 0,02 | 0,8-4,0 | | | | | | |
| | | CW606N CW602N CW607N CW608N CW610N CW611N CW612N | | 5,0 - 6,0 | ds | | +/- 0,27 | 0,3-0,5 | | | | | | | | | | |
| | | | | 6,1-10,0 | ecif | | +/- 0,33 | 0,4-0,8 | - | | | | | | | | | |
| CuZn38Pb1 | CW607N | | М | | | | 10,1 - 18,0 | ied | | +/- 0,45 | 0,5-1,2 | g | | | | | | |
| CuZn38Pb2 | CW608N | | | 50,1-80,0 | 18,1 - 30,0 | me | ∃e +/- 1,2 | +/- 0,52 | 0,6-1,8 | 6m m/m | 6 mm/m | ω | cut off | | | | | |
| CuZn39Pb0,5 CuZn39Pb1 | | | | | | | | 30,1 - 40,0 | 5 | chanic | +/- 0.74 | 0,7-2,8 | m/r | | 000 | off | | |
| CuZn39Pb2 | CW612N | | | | | | | 40,1- 50,0 | | | ., 0,,,+ | 0.8-4.0 | | |) +/ | | | |
| CuZn39P3 | CW614N | | | | | | | | | I | I | I | | 50,1 - 80,0 | | | +/- 1,0 | 0,0 1,0 |
| CuZn40Pb2 CuZn35Ni3Mn2AlPb | CW617N | | | | | CW617N CW710R | | | | 1 | | 5,0 - 6,0 | rop | | +/- 0,33 | 0,3-0,5 | - | |
| CuZn37Mn3Al2PbSi | CW710R CW713R | | | 6,1-10,0 | erti | | +/- 0,45 | 0,4-0,8 | - | | | | | | | | | |
| CuZn40Mn1Pb1 | CW720R | | | 10,1 - 18,0 | es | | +/- 0,52 | 0,5-1,2 | - | | | | | | | | | |
| CuZn40Mn2Fe1 | CW723R | | 80,1-130 | 18,1 - 30,0 | | +/- 2,20 | +/- 0,74 | 0,6-1,8 | - | 9 mm/m | | | | | | | | |
| | | | | 30,1 - 40,0 | | | +/- 1,0 | 0,7-2,8 | | | 1500-3000 | | | | | | | |
| | | | | 40,1- 50,0 | | | | 0,8-4,0 | | | | | | | | | | |
| | | | | 50,1 - 80,0 | | | +/- 1,2 | 0,0 4,0 | | | 1000-2000 | | | | | | | |

Extruded flat bars in straight lengths according to EN12167



Copper Processing Plant, Production Hall



BRASS AND ALUMINUM PROFILES

BRASS PROFILES



The offer provides all kinds of shapes according to customer's request.

The main purpose of the brass profiles whose thickness usually does not exceed 3 mm is the construction industry.

Parts made of these profiles are very well polished, improving the presentation of the interior.

Application of profiles are: connection elements in partition walls, ceramic tile flooring and antiskid skirting boards .

Profiles are produce acc to our own **alloy MA 56** with following contents:

- Cu 56.0 59.0%
- Pb 1.0 3.0%
- Al 0.3 1.0%
- Zn rest
- total impurities max 1.8%

Shapes and dimensions :

- profiles with the straight cross-section
- equal and unequal angles
- equal and unequal tee bars
- channel sections

Profiles with a complex cross-section made in accordance with existing drawings or drawings provided by the client (open profiles) length 2000 - 4000 mm length tolerance of + 15

Dimensional tolerances:

According to PN - 75 / H - 08 sheet 93623 Size range of produced profiles:

- cross-section in the circumscribed circle with a diameter of 80 mm
- minimum wall thickness of 1.0 mm

Temper: after hot extrusion with no specified and tested properties

Surface: defined by manufacturing process such as the hot extrusion



Produced and offered in a wide range of assortment according to customer's request.

Component recipe of the main alloy from which the profiles are made, provides very good mechanical properties.

Used primarily in construction, but also in the production of household appliances, automotive and electrical industry and many others.

Alloy: Alloy PA 38, according to PN - 79 / H - 88026

Shapes and :dimensions

- profiles with the straight cross-section
- equal and unequal angles
- equal and unequal tee bars
- channel sections

Profiles with a complex cross-section made in accordance with existing drawings or drawings provided by the client:

- full
- half-closed

Dimensional range of profiles :

- cross-section described in circle with a diameter of 80 mm
- minimum wall thickness of 1.0 mm
- length 2000 4000 mm length tolerance of + 15 mm

Temper: after hot extrusion

Surface: defined by manufacturing process such as the hot extrusion



Standard products stock



ADDITIONAL INFORMATION



In order to meet the demands of the market and provide customers highest quality Walcownia Metali "Dziedzice" SA introduces standardization of products.

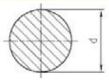
Standardization is based on the standards EN12164 and includes drawn rods in the alloy CW614N. The introduction of new standards led to the creation of a stock, and thus the fast, few-day delivery.

Stock composition is constantly replenished, allowing us to offer a wide range of dimensions .



In order to obtain information about the current status of stock please contact our Sales Department

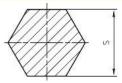




| | WMD MS 20 (CuZn39Pb3) acc to EN 12164 | | | | | | | | | |
|---|---------------------------------------|------------------------|--------------|------------|----------------------|--------|---------|----------------------------|-----------|----------------|
| | | | 1 | 1 | | | Prop | perties | | |
| Dimensional range d | | ances d | Straightness | Length | Ends | Temper | Rm min | R 0,2 approx | A min | Packing |
| [mm] | | [mm] | ess | [mm] | | ř | [Mpa] | [Mpa] | [%] | |
| 2,0 2,3 2,5 3,0 | | +0/-0,025 | | | broken | _ | | | | |
| 3,5 4,0 4,5 4,8 5,0 5,5 6,0 6,5 7,0 7,5 8,0 8,5 9,0 9,5 | | +0/-0,030 +0/-0,036 | 1 mm/m | | chamfered /cut off | R500 | 500 | (390) | 8 | Cases 500 kg |
| 10,0 10,5 11,0 11,5 12,0 13,0 14,0 15,0 | h9 | +0/-0,043 | | | | | | | | |
| 16,0 17,0 18,0 19,0 20,0 21,0 22,0 23,0 24,0 25,0 | | +0/-0,052 | 0,5 mm/m | 3000 +/-50 | chamfered /sharpened | | | | | Bundle |
| 26,0 27,0 28,0 29,0 30,0 | | | | | d. | R430 | 430 | (250) | 10 | Bundles 500 kg |
| 31,0 32,0 33,0 34,0 35,0 36,0 37,0 38,0 39,0 40,0 | h10 | +0/-0,16 | 1 mm/m | | | | | | | |
| 40,0 41,0 - 50,0 51,0- 65,0 | | +0/-0,19 | 2 mm/m | - | | М | Without | specified me properties | echanical | |

Standard products manufactured in WMD





| | | WN | ID MS 20 | (CuZn39 | ⊃b3) a | cc to EN 1216 | 4 Propert | ies | | | | | | | | | | |
|---|--------|----------|---------------|----------|--------------------|---------------|--------------|----------------------------|-----------|--------------|----------|------------|-----------------------|------|---------|-------|----|----------------|
| Dimensional range s | Tolera | ancess | Straightness | Length | Ends | Temper | Rm min | | A min | Packing | | | | | | | | |
| [mm] | | [mm] | less | [mm] | <u>,</u> | | [Mpa] | [Mpa] | [%] | g | | | | | | | | |
| 3,5 4,0 4,5 4,8 5,0 5,5 6,0 | | +0/-0,08 | | | chamfered/ cut off | | | | | Case | | | | | | | | |
| 6,5 7,0 7,5 8,0 8,5 9,0 9,5 | | +0/-0,09 | 2 mm/m | | | R500 | 500 | (390) | 8 | Cases 500 kg | | | | | | | | |
| 10,0 10,5 11,0 11,5 12,0 13,0 14,0 15,0 16,0 17,0 18,0 | | +0/-0,11 | | | | | | | | | | | | | | | | |
| 19,0 20,0 21,0 22,0 23,0 24,0 25,0 26,0 27,0 28,0 29,0 30,0 | h11 | +0/-0,13 | - 1,5 mm/m | 1,5 mm/m | 1,5 mm/m | 1,5 mm/m | 1,5 mm/m | 1,5 mm/m | 1,5 mm/m | 1,5 mm/m | 1,5 mm/m | 3000 +/-50 | chamfered / sharpened | R430 | 430 (24 | (250) | 10 | Bundles 500 kg |
| $\begin{array}{r} 31,0\\ 32,0\\ 33,0\\ 34,0\\ 35,0\\ 36,0\\ 37,0\\ 38,0\\ 39,0\\ 40,0\\ 41,0\\ 42,0\\ 43,0\\ 44,0\\ 45,0\\ 46,0\\ \end{array}$ | | +0/-0,16 | | | | М | Without s | specified me properties | echanical | 500 kg | | | | | | | | |
| 47,0 48,0 50,0 51,0-63,0 | | +0/-0,19 | 2 mm/m | - | | | | | | | | | | | | | | |



| 11 | 111 | 1 |
|----|-----|------|
| 71 | 114 | - 10 |
| 11 | 111 | |
| 11 | 111 | - 1 |

| | WMD MS 20 (CuZn39Pb3) acc to EN 12164 | | | | | | | | | | | | | | | |
|---------------------------|---------------------------------------|-----------|--------------|--|---------------------|--------|---------------|-------------------------|-----------------|--------------|--|--|--|--|--|--|
| | | | | | | | Prope | rties | | | | | | | | |
| Dimensional range s | Tolera | ancess | Straightness | Length | Ends | Temper | Rm min | R 0,2 approx | A min | Packing | | | | | | |
| [mm] | | [mm] | SS | [mm] | | | [Mpa] | [Mpa] | [%] | | | | | | | |
| 3,5 | | | | | с г | | | | | | | | | | | |
| 4,0 | | | | | chamfered / cut off | | | | | | | | | | | |
| 4,5 | | +0/-0,08 | | | ere | | | | | | | | | | | |
| 5,0 | | . 0/-0,00 | | | d/d | | | | | S | | | | | | |
| 5,5 | | | 2 mm/m | | cut | | | | | lses | | | | | | |
| 6,0 | | | | | off | R500 | 500 | (390) | 8 | \$ 50 | | | | | | |
| 7,0 | | | | | | | | | | Cases 500 kg | | | | | | |
| 8,0 | | | | | | | | | | ŋ | | | | | | |
| 8,5 | | +0/-0,09 | | | | | | | | | | | | | | |
| 9,0 | | | | | | | | | | | | | | | | |
| 10,0 | | | | | | | | | | | | | | | | |
| 11,0 | | | | | | | | | | | | | | | | |
| 12,0 | | | | | | | | | | | | | | | | |
| 13,0 | +0/-0,11 | | | | | | | | | | | | | | | |
| 13,5 | | | | | | | | | | | | | | | | |
| 14,0 | | +0/-0,11 | | 30 | | | | | | | | | | | | |
| 15,0 | h11 | | | 00 | <u>ი</u> | | | | | | | | | | | |
| 16,0 | | | | h11 h11 h11 h11 h11 h11 h11 h11 h11 h11 h11 h1,5 mm/m | | | | | | | | | | | | |
| 17,0 | | | | | | ö | nfer | | | | | | | | | |
| 18,0 | | | - | | ed | | | | | | | | | | | |
| 19,0 | | | | | / sh | - | | | | Bu | | | | | | |
| 20,0 | | | 1,5 mm/m | | arp | R430 | 430 | (250) | 10 | Bundles | | | | | | |
| 22,0 | | | 1,3 1111/11 | | ene | | | | | | | | | | | |
| 24,0 | | | | | ď | | | | | 500 kg | | | | | | |
| 25,0 | | +0/-0,13 | | | | | | | | kg | | | | | | |
| 26,0 | | | | | | | | | | | | | | | | |
| 27,0 | | | | | | | | | | | | | | | | |
| 28,0 29,0 | | | | | | | | | | | | | | | | |
| 30,0 | | | | | | | | | | | | | | | | |
| 30,5 | | | | | | | | | | | | | | | | |
| 32,0 | | | | | | | | | | | | | | | | |
| 35,0-50,0 | | +0/-0,16 | | | | М | With mecha | out speci nical prop | fied perties | | | | | | | |

NEW ECO-ALLOYS FOR DRINKING WATER





Accordingly to European and United States regulations, of the lead content of elements used in drinking water systems, Walcownia Metali "Dziedzice" S.A. has undertaken several measures to start the production of low-lead and lead-free alloys, and together with the Institute of Non-Ferrous Metals in Gliwice, is continuing to develop the offer of ecological alloys for use in drinking water systems.

We currently offer products for use in drinking water systems in two groups depend on lead content in alloys. The first of these contains Pb in the form of impurities, while the second group contains lead present as an alloying component:

1. Pb content max 0,20%:

- <u>CW509L (CuZn40) C28500acc to ASTM</u>
 - the maximum content of Pb is 0,2%, ensures compatibility with the upcoming (year 2013/2014) restrictive legal requirements on installation materials used for drinking water in Europe and USA (Directive: UE 98/83/EC; DIN50916-T1; Reduction of Lead in Drinking Water Act),
 - has very good properties for heat operation,
 - has non-sparking properties thus is suitable for gas installations,
 - is suitable for mechanical as well as electromechanical polishing
 fully recyclable
- <u>CW510L (CuZn42) C28000 acc to ASTM</u>
 - the maximum content of Pb is 0,2%, ensures compatibility with the upcoming (year 2013/2014) restrictive legal requirements on installation materials used for drinking water in Europe and USA (Directive: UE 98/83/EC; DIN50916-T1; Reduction of Lead in Drinking Water Act),
 - has very good properties for heat operation,
 - has non-sparking properties thus is suitable for gas installations,
 - is suitable for mechanical as well as electromechanical polishing
 - fully recyclable



- CW511L (CuZn38As) - C27450 acc to ASTM

- arsenic content makes this type resistant to dezincification (just like CW602N),
- characterized by good resistance to stress corrosion,
- the maximum content of Pb is 0,2%, ensures compatibility with restrictive legal requirements on installation materials used for drinking water in Europe and USA (Directive: UE 98/83/EC; DIN50916-T1; Reduction of Lead in Drinking Water Act),
- has very good properties for cold working,
- in case of heat operation (eg. forging), in order to obtain resistance to dezincification, heat treatment is recommended,
- characterized by a lower machinability than CW602N,
- has non-sparking properties thus is suitable for gas installations,
- fully recyclable

2. Pb content between 1,2-2,2%

- <u>CW602N (CuZn36Pb2As</u>)
- <u>CW617N</u> (CuZn40Pb2)
- CW626N (CuZn33Pb1,5AlAs)
 - alternative alloy to CW602N (CuZn36Pb2As)
 - higher dezincification resistant than alloy CW602N,
 - high resistance of stress corrosion cracking,
 - fully accorded with restrictive legal regulations in USA and Europe regarding installation's material used for drinking water (Directive UE 98/83/EC; DIN50916-T1;Reduction of Lead in Drinking Water Act),
 - has very good properties for hot working and forging, limited cold working;
 - high corrosion resistance in sea water;
 - fully recyclable.



Work is currently underway to implement additional lead-free and low-lead alloys



Our products are offered in the following grades

| Standard brass offered by WMD | | | | | | | |
|-------------------------------|--|--|--|--|--|--|--|
| Symbol | Compliance with norms | General characteristics of the alloy | Examples of use | | | | |
| CuZn36Pb1 | EN (CW 600N), CSN (CuZn36Pb1) | perfect for profiling, for cold working, stamping, riveting machining, water-resistance, salt solution resistance and various organic liquids | components made by different methods machining and forming | | | | |
| CuZn36Pb1,5 | EN (CW 601N), DIN (CuZn36Pb1,5), ASTM (C34500), PN (MO62) | easily machined, susceptible for cold and hot working | components made by different methods machining and forming | | | | |
| CuZn37Pb2 | EN (CW 606N), BS (CZ 131), ASTM (C35300) | easily machined, susceptible for cold working (limited bending and riveting) | components made by different methods machining and forming | | | | |
| CuZn36Pb3 | EN (CW 603N), DIN (CuZn36Pb3), ASTM (C36000), JIS (C3601,C3602), BS (CZ 124), PN (MO61) | very easily machined (suitable for processing on automats), with limited susceptibility for cold working | components made by different methods machining, suitable for processing on automatic | | | | |
| CuZn38Pb1.5 | EN (CW 607N), DIN (CuZn38Pb1,5), PN (MO60) | easily machined, susceptible for cold working | components made by different methods machining and hot forming | | | | |
| CuZn38Pb2 | EN (CW 608N) | with good mechanical properties, suitable for machining and hot working. Alloy CuZn38Pb2 has a good fastness to water, alkaline solution of organic salts, it is not fastness of acids and sulphur | components made by different methods machining and hot forming (watches envelopes, optical elements, embossed and engraved parts) | | | | |
| CuZn39Pb0,5 | EN (CW 610N), DIN (CuZn39Pb0,5) | easily machined, susceptible for cold working | alloy typical for cold bending | | | | |
| CuZn39Pb1 | EN (CW 611N) | easily machined, susceptible for cold working | components made by different methods machining and hot forming | | | | |
| CuZn39Pb1 | GOST (Łs 59-1), CSN (CuZn39Pb1) | easily machined, susceptible for cold working | components made by different methods machining and hot forming | | | | |
| CuZn39Pb2 | EN (CW 612N), DIN (CuZn39Pb2), ASTM (C37700), JIS (C3771), PN (MO59) | very susceptible for hot forging and machining , cold working is limited, characterized by high ductility | components made by different methods machining and hot forming | | | | |
| CuZn39Pb3 | EN (CW 614N), DIN (CuZn39Pb3), PN (MO58, MO58A), ASTM (C38500), JIS(C3603, C3604) | easily machined, with limited susceptible for cold working (classical alloy for automatic machining) | components made by different methods machining, especially for processing on automatic | | | | |
| CuZn39Pb3 | EN (CW 614N), DIN (CuZn39Pb3) | perfect for machining, with limited susceptible for cold working (classical alloy for automatic machining) | components made by different methods machining, especially for processing on automatic with the requirements of DIN 50930-6 (drinking water) - sanitary fittings elements | | | | |
| CuZn39Pb3 | EN (CW 614N) | alloy similar to MS 20 with increased susceptibility for machining | components made by different methods machining, especially for processing on automatic | | | | |
| CuZn39Pb3 | EN (CW 614N) | alloy similar to MS 20 with increased susceptibility to plastic strains | components made by different methods machining, especially for processing on automatic where there is an additional requirement for increased plasticity | | | | |
| CuZn39Pb3 | BS (CZ121) | perfect for machining, with limited susceptible for cold working | components made by different methods machining, especially for processing on automatic | | | | |
| CuZn40Pb2 | EN (CW 617N), DIN (CuZn40Pb2), CSN (CuZn40Pb2), PN (MO58B) | easily machined, with limited susceptible for cold working, with high susceptible for hot working | production of forged parts with complex shapes, industrial clamps, parts for pipe fittings, plumbing parts, heating, industrial fittings, etc . | | | | |
| CuZn40Pb2 | EN (CW 617N), DIN (CuZn40Pb2) | easily machined, with limited susceptible for cold working, with high susceptible for hot working | production of forged parts with complex shapes, industrial clamps, parts for pipe fittings, plumbing parts, heating, industrial fittings, with the requirements of DIN 50930-6 (drinking water) | | | | |
| CuZn40Pb2 | BS (CZ122) | easily machined, with limited susceptible for cold working, with high susceptible for hot working | production of forged parts with complex shapes, industrial clamps, parts for pipe fittings, plumbing parts, heating, industrial fittings, etc | | | | |
| CuZn36Pb2As | EN (CW 602N) | easily machined and susceptible for cold working, very high resistance for dezincification | elements which require high resistance to dezincification combined with good machinability | | | | |
| CuZn36Pb2As | EN (CW 602N) | easily machined and susceptible for cold working, very high resistance for dezincification | elements which require high resistance to dezincification combined with good machinability with the requirements of DIN 50930-6 (drinking water) - sanitary fittings elements | | | | |

| Special brass offered by WMD | | | | | | | |
|------------------------------|--|--|---|--|--|--|--|
| Symbol | Compliance with norms | General characteristics of the alloy | Examples of use | | | | |
| CuZn37Pb2Sn1 | ASTM (C48500) | easily machined and susceptible for hot working, high susceptibility for soldering | the marine industry (elements of valves, screws) | | | | |
| CuZn38Sn1 | ASTM (C46400) | corrosion resistance | perforated bottoms of marine equipment capacitors | | | | |
| CuZn31Si1 | EN (CW 708R) | high mechanical properties machinability of 40-50% | bearings and sliding elements | | | | |
| CuZn35Ni3Mn2AIPb | EN (CW 710R), DIN (CuZn35Ni2) | high structural strength, corrosion and abrasion resistance | elements of devices, valves | | | | |
| CuZn40Al2 | EN (CW 713R), DIN (CuZn40Al2) | high mechanical properties machinability of 40-50% | bearings and sliding elements | | | | |
| CuZn40Mn2 | PN (MM58), DIN (CuZn40Mn2) | high atmospheric corrosion resistance | elements of the apparatus, architecture | | | | |
| CuZn40Mn1Pb1 | EN (CW 720R), DIN (CuZn40Mn1Pb) | slightly increased mechanical properties, high atmospheric corrosion resistance | architectural elements (windows frames, railing, curtain rails) | | | | |
| CuZn40Mn2Fe1 | EN (CW 723R) | slightly increased mechanical properties, high atmospheric corrosion resistance | architectural elements (windows frames, railing, curtain rails) | | | | |
| CuZn20Al2 | EN (CW 702R) ASTM (C68700) JIS (C6870) DIN (CuZn20Al2) BS (CZ 110) PN (MA77) TLV (CuZn20Al2As) | high corrosion resistance, especially in sea water environment | condenser tubes (for heat exchangers), tubes for ship borne condenser | | | | |
| CuZn28Sn1 | EN (CW 706R) DIN (CuZn28Sn1) ASTM (C44300) BS (CZ 111) JIS (C4430) PN (MC70) TLV (CuZn28Sn1As) | high corrosion resistance | condenser tubes (for heat exchangers) | | | | |
| CuZn40 | EN CW509L ASTM C28000 BS CZ109 DIN CuZn40 | very susceptible to cold working, can be soldered | elements made with different forming methods | | | | |
| CuZn42 | CW510L EN | high susceptibility to hot working (forging) | production of forged parts, industrial clamps, parts for pipe fittings, plumbing parts, heating parts, industrial valves, etc. | | | | |
| CuZn38As | CW511L EN | relatively good machinability and susceptibility to cold working, high resistance to dezincification, CW602N alloy alternative | elements which require high resistance to dezincification | | | | |
| CuZn33Pb1,5AlAs | CW626N EN | relatively good machinability and susceptibility to cold working, high resistance to dezincification, CW602N alloy alternative | elements which require high resistance to dezincification, product meets the requirements for "drinking water". | | | | |
| CuZn35Pb1,5AlAs | CW625N EN | relatively good machinability and susceptibility to cold working, high resistance to dezincification, CW602N alloy alternative | elements which require high resistance to dezincification, product meets the requirements for "drinking water". | | | | |

| Two-Component Brass Alloys Offered by WMD | | | | | | |
|---|--|--|---|--|--|--|
| Symbol | Compliance with norms | General characteristics of the alloy | Examples of use | | | |
| CuZn37 | EN (CW 508L) DIN (CcZn37) CSN (CuZn37) GOST (Ł63) PN (M63) | well susceptible for cold working, well for soldering (basics two-component brass alloy) | elements made by various method of machining and plastic forming, including by the deep drawing | | | |
| CuZn30 | EN (CW 505L) DIN (CcZn30) CSN (CuZn30) ASTM (C26000) JIS (C2600) PN (M70) | well susceptible for cold working, well for soldering | elements made by various method of machining and plastic forming, including by the deep drawing | | | |

We are committed to continuously developing and expanding our services. Be sure to contact us and ask about new products! !!

GENERAL CONDITIONS OF SALE



- 1. The following General Conditions of Sale shall refer to all sales between the Seller and Buyers and shall override any other conditions of purchase.
- 2. An order containing the data such as the type, hardness, quantity, dimensions and any other additional demands shall be made by the Buyer in writing by letter or e-mail.
- 3. An order confirmation containing the conditions of the order shall be sent to the Buyer by the Seller in writing by letter or e-mail within 7 days from the receipt of the order.
- 4. The conditions of the order can be changed only if both parties agree on the change in writing by letter or e-mail.
- 5. If the Buyer is responsible for the transport, the Buyer shall collect the goods within 5 days from the receipt of the notification of readiness that the Seller shall send in writing by letter or e-mail. After the above-mentioned period, the Seller reserves the right to send the goods to the Buyer with all risks and costs transferred to the Buyer. In case of delay to collect the goods, the Seller is entitled to charge the Buyer with penalty interest of sales value at the statutory rate- the penalty interest shall in no way exclude the Seller's right to claim for damages in line with general principles. The Seller shall pack the goods as it has been requested by the Buyer or in conformity with Seller's practice for the transport
- involved.
 If the Seller is responsible for the transport, the goods shall be sent after the Buyer is notified about the readiness of goods for dispatch (in writing by letter or e-mail) and the Buyer shall collect the goods. The Seller shall pack the goods as it has been requested by the Buyer or in conformity with Seller's practice for the transport involved.
- 7. The Seller reserves the right to invoice the Buyer for the packaging of the goods. If accepted by mutual agreement, the costs of packaging may be included in the price of goods or returnable packaging may be sent. The returnable packaging shall be returned within 60 days unless agreed otherwise. The costs of return are transferred to the Buyer unless both contractual parties have agreed otherwise.
- 8. Payment shall be made by the Buyer at contractually agreed time regardless of a filed complaint.
- 9. In case of delay in payment, the Buyer shall pay penalty interest at the statutory or agreed rate.
- 10.In case of order cancelation in writing by the Buyer that shall be approved by the Seller, the Buyer is obliged to pay to the Seller all costs of production, stock of material and costs of currency unless the loss is higher. The amount, which the Buyer is charged with, shall be agreed on the basis of individual calculation prepared by the Seller.
- 11.In case of order cancelation by the Buyer approved by the Seller before the production of goods, the Buyer shall cover all costs of metal hedging on the LME. The amount, which the Buyer is charged with, shall be agreed on the basis of individual calculation prepared by the Seller.
- 12.Until the payment goods remain the property of the Seller.
- 13.In the case of the Buyer's late payment, the Seller reserves the right to withhold shipment until the due payment and claim interest for late payment.
- 14. Any dispute arising out of or in connection with this contract shall be determined by appropriate provisions of the Polish law.
- 15. Matters in dispute shall be adjudicated by negotiations; in case the agreement cannot be reached, matters in dispute shall be adjudicated by court of general jurisdiction- the court having jurisdiction over the Seller's seat.
- 16.Both parties are excluded from the liability if they cannot fulfil contractual obligations due to force majeure. If force majeure occurs, the party shall immediately notify the other contractual party in writing. However, the occurrence of force majeure shall not affect the Buyer's responsibility to pay for delivered goods.
- 17.If the Seller provides the Buyer with General Conditions of Sale in other languages than Polish, the Polish version shall be applied in case of any divergence

THE RULES OF FILING AND INVESTIGATING COMPLAINTS



1. The Seller guarantees proper quality of the goods in accordance with standards listed in the order confirmation.

2. The rules of filing the complaints:

- 2.1. All the complaints shall be filed immediately after finding a defect regarding the following conditions:
- 2.2. Complaints regarding shipping (quantity, surface conditions, packaging) shall be filed immediately during delivery acceptance otherwise the right to question it is lost.

The precondition of examining the complaint is entering the weight differences in the delivery documentation, signed by representatives of both parties or by people responsible for transport.

In case of deliveries of products ordered by different measurement than by weight, for example by meters or number of items, the base for the evaluation of the delivery as to its quantity is the weight specified in the delivery documentation. The precondition of examining the complaint is entering the mass differences in the delivery documentation, signed by representatives of both parties or by people responsible for transport.

2.3. Complaints concerning quality in case of apparent defects (surface, shape, dimensions) shall be filed according to the rule described in Point 2.1, but not later than 14 days from the delivery date.

2.4. Complaints concerning quality in case of hidden defects, material defects and product's features not in accordance with the standards confirmed in the order (not mentioned above) shall be filed within 6 months after delivering the goods, unless agreed on other period of time.

- 2.5. The Seller is not responsible for the quantity and quality of the surface of products stored in the Buyer's or third parties' warehouses after 14 days since the delivery.
- 3. The complaint shall include:
 - 3.1. Number of the order confirmation.
 - 3.2. Date of delivering the product to the Customer.
 - 3.3. Detailed description of the defective product.
 - 3.4. Quantity of defective products.
 - 3.5. Cause of complaint with evidence: samples, photos or description.
 - 3.6. Possible suggestion of examination of the complaint.
- 4. Rules of investigating the complaints:
 - 4.1. The Seller shall investigate a complain within 35 days from the receipt of the complain if possible. The Seller reserves the right to extend the time to investigate the complain by suitable period of time needed to take certain actions, e.g. to go to the Customer or to return goods to the Seller. All the arrangements shall be made in writing (letter or e-mail.)
 - 4.2. All the arrangements shall be made in writing (letter or e-mail.)
 - 4.3. The Seller reserves the right to examine defective products directly at the Customer's premises.
 - 4.4. The Seller reserves the right to reject a complaint in case of not receiving from the Customer the proper quantity of the product's samples proving that the product has not been manufactured according to the order.
 - 4.5. In case of accepting a claim by the Seller, the Seller is the only party with the right to decide if the defected product is to be scrapped at the Customer's premises or sent to the Seller at the Seller's expense.
 - 4.6. Complaints concerning the defects appeared during transportation will be investigated according to the rules included in INCOTERMS 2000.
 - 4.7. Any dispute arising out of or in connection with the rules shall be determined by appropriate provisions of the Polish law. Matters in dispute shall be adjudicated by negotiations; in case the agreement cannot be reached, matters in dispute shall be adjudicated by court of general jurisdiction- the court having jurisdiction over the Seller's seat



CERTIFICATE OF APPROVAL

This is to certify that the Quality Management System of:

Walcownia Metali "Dziedzice" S. A. ul. Kaniowska 3 43-502 Czechowice-Dziedzice, Poland

has been approved by Lloyd's Register Quality Assurance to the following Quality Management System Standards:

ISO 9001:2008

The Quality Management System is applicable to:

Manufacture of rods, tubes, sections of copper alloys and sections of aluminium and aluminium alloys and manufacture of strips and coinage blanks.

This certificate is valid only in association with the certificate schedule bearing the same number on which the locations applicable to this approval are listed.

Approval Certificate No: GDK0003516/Q Original Approval:2nd May 1996Current Certificate:1st May 2014Certificate Expiry:30th April 2017

Issued by: Lloyd's Register (Polska) sp. z o.o. for and on behalf Lloyd's Register Quality Assurance Limited



Lloyd's Register (Polska) sp. z o.o., Al. Zwycięstwa 13a, 80-219 Gdańsk, KRS 0000117768 for and on behalt of Hiramford, Middlemarch Office Village, Siskin Drive, Coventry, CV3 4FJ, United Kingdom

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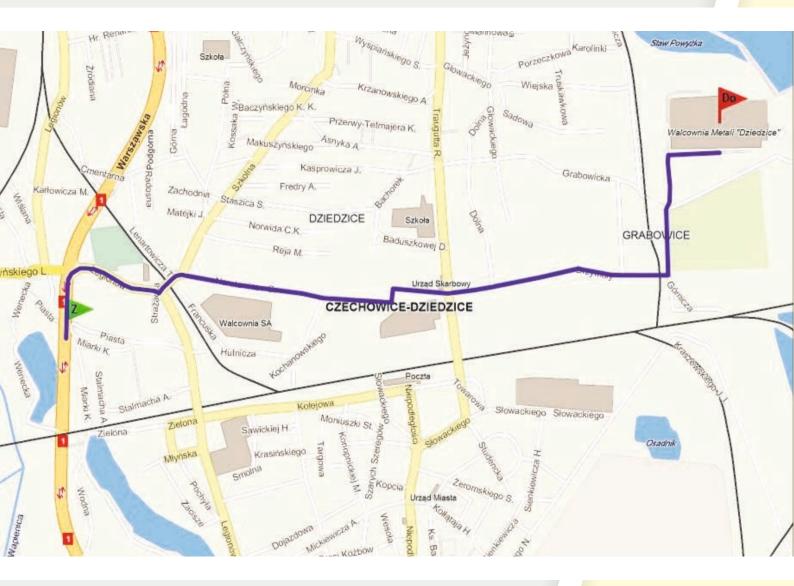
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MEASURE CONVERSION TABLE



| | | | Length | | Weight | | | |
|-----|-------|-------|--------|-------------------|--------|------|-------|-------|
| mm | ~2500 | ~3000 | ~3660 | ~4000 | ~5000 | | | |
| in | 100 | 120 | 144 | 157 | 197 | | | |
| ft | ~8,3 | 10,0 | 12,0 | [~] 13,0 | ~16,5 | | | |
| kg | | | · | | | 250 | 500 | 1000 |
| lbs | | | | | | ~550 | ~1100 | ~2200 |

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