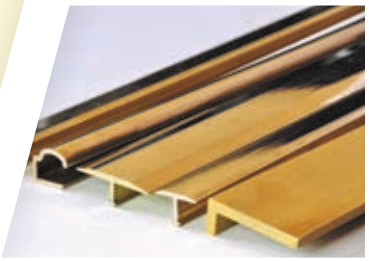
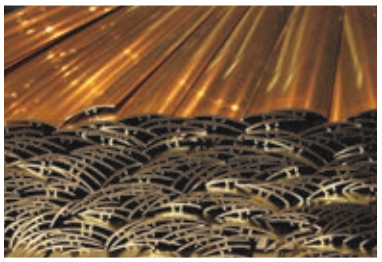
Walcownia Metali "DZIEDZICE" S.A.


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

CERTIFICATE SCHEDULE

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

Head office

ul. Kaniowska 3
43-502 Czechowice-Dziedzice

Activities

Manufacture of rods, tubes, sections of copper alloys and sections of aluminium and aluminium alloys.

Locations

ul. Kochanowskiego 5
43-502 Czechowice -Dziedzice

Activities

Production of strips and coinage blanks.

Approval Certificate No: GDK0003516/Q

Original Approval: 2nd May 1996
Current Certificate: 1st May 2014
Certificate Expiry: 30th April 2017

Page 1 of 1

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 1996
Current Certificate: 1st May 2014
Certificate Expiry: 30th April 2017

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

PREZES
URZĘDU DOZORU TECHNICZNEGO

DECYZJA Nr 30-09-5/2-12
z dnia 30 listopada 2012r.

wydaje się uprawnienie

Walcownia Metali „DZIEDZICE" S.A.
ul. Kaniowska 3
43-502 Czechowice-Dziedzice

do wytwarzania

rur miedzianych

przeznaczonych do budowy i naprawy urządzeń technicznych podlegających dozorowi technicznemu,

UZASADNIENIE

PREZES
URZĘDU DOZORU TECHNICZNEGO

POUCZENIE: Od niniejszej decyzji przysługuje [illegible] do wniesienia odwołania do Ministra Gospodarki, Pl. Trzech Krzyży 3/5, 00-507 w Warszawie, w terminie 14 dni od dnia doręczenia decyzji, za pośrednictwem Prezesa Urzędu Dozoru Technicznego w Warszawie ul. Szczęśliwicka 34.

Załączniki:
Nr 1. Warunki uprawnienia
Nr 2. Zakres uprawnienia

TÜV NORD

CERTIFICATE

Certification Body
of TÜV NORD Systems GmbH & Co. KG

certifies, that the company

Walcownia Metali „Dziedzice" S.A.
Ul. Kaniowska 3
PL 43-502 Czechowice-Dziedzice

has been verified and recognized as material manufacturer according to

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-0998/13.

The company fulfils the following essential requirements:
Facilities permitting appropriate manufacturing and inspection corresponding to the present technical standards, quality assurance, which guarantees that manufacturing and inspection of products stated in our scope of approval are carried out in accordance with technical regulations, competent supervising and inspecting personnel.

This certificate is valid until

10.2016

Katowice, 31.10.2013

M Tarszyński
Certification Body
of TÜV NORD Systems GmbH & Co. KG

TÜV NORD

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 Ul. 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. 4.2

Audit report no.: 9120 P-0998/13

Scope 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 Ul. 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

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

M Tarszyński

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

hutmen®

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

Rod Production Division, Extrusion run out table

DZIEDZICE®

BRASS RODS

DRAWN AND HOT EXTRUDED LEADED - 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 cross-sections. Other shapes of cross-sections require additional arrangements.

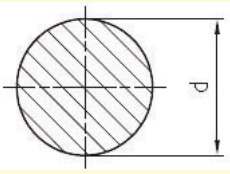
Leaded brass rods are destined for automatic machining or hot and cold forging.

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.

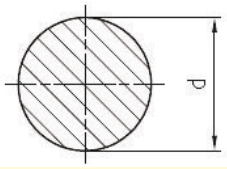
Certain rods are manufactured as special multi-component alloys with the possibility of usage as elements working in chemical and saltwater environments .

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

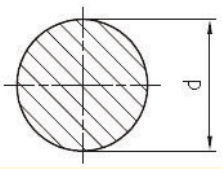


Drawn round rods acc to EN12164

Grade		Temper	Dimension d (mm)	Mechanical properties		Tolerances (mm)	Straightness	Length (mm)	Ends	Packing
Symbol	Number			Tensile Strength Rm N/mm2 (MPa) min	Yield Strength Rp02 N/mm2 (MPa) min					
CuZn39Pb3; CuZn40Pb2	**CW614N □ CW617N**	M	2,0 - 3,0	Without specified mechanical properties		-0,025	1 mm/m	3000 +/-50	broken	cases 500 kg
			3,1 - 6,0			-0,030			chamfered /cut off	
			6,1 - 10,0			-0,036			chamfered /sharpened	
			10,1 - 18,0			-0,043	0,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,052				
			30,1 - 50,0			-0,16	1 mm/m			
			50,1 - 65,0			-0,19			cut off	
		R360	6,0 - 10,0	360	320*	-0,036	1 mm/m		chamfered /sharpened	cases 500 kg
			10,1 - 18,0			-0,043	0,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,052				
			30,1 - 50,0			-0,16	1 mm/m			
			50,1 - 65,0			-0,19			cut off	
		R430	2,0 - 3,0	430	220	-0,025	1 mm/m		broken	cases 500 kg
			3,1 - 6,0			-0,030			chamfered /cut off	
			6,1 - 10,0			-0,036			chamfered /sharpened	
			10,1 - 18,0			-0,043	0,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,052				
			30,1 - 40,0			-0,16	1 mm/m			
		R500	2,0 - 3,0	500	350	-0,025	1 mm/m		broken	cases 500 kg
			3,1 - 6,0			-0,030			chamfered /cut off	
			6,1 - 10,0			-0,036			chamfered /sharpened	
			10,1 - 14,0			-0,043	0,5 mm/m			bundles 500 kg
CuZn39Pb3; CuZn40Pb2	CW614N; CW617N	H090	6,0 - 10,0	90	120	-0,036	1 mm/m	3000 +/-50	chamfered /sharpened	cases 500 kg
			10,1 - 18,0			-0,043	0,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,052				
			30,1 - 50,0			-0,16	1 mm/m			
			50,1 - 65,0			-0,19			cut off	
		H110	2,0 - 3,0	110	160	-0,025	1 mm/m		broken	cases 500 kg
			3,1 - 6,0			-0,030			chamfered /cut off	
			6,1 - 10,0			-0,036			chamfered /sharpened	
			10,1 - 18,0			-0,043	0,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,052				
			30,1 - 40,0			-0,16				
		H135	2,0 - 3,0	135		-0,025	1 mm/m		broken	cases 500 kg
			3,1 - 6,0			-0,030			chamfered /cut off	
			6,1 - 10,0			-0,036			chamfered /sharpened	
			10,1 - 14,0			-0,043	0,5 mm/m			bundles 500 kg
CuZn35Pb1; CuZn35Pb2; CuZn36Pb3; CuZn37Pb2	CW600N; CW601N; CW603N; CW606N	M	2,0 - 3,0	Without specified mechanical properties		-0,025	1 mm/m	3000 +/-50	broken	cases 500 kg
			3,1 - 6,0			-0,030			chamfered /cut off	
			6,1 - 10,0			-0,036			chamfered /sharpened	
			10,1 - 18,0			-0,043	0,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,052				
			30,1 - 50,0			-0,16	1 mm/m			
			50,1 - 65,0			-0,19			cut off	
		R370	2,0 - 3,0	370	250	-0,025	1 mm/m		broken	cases 500 kg
			3,1 - 6,0			-0,030			chamfered /cut off	
			6,1 - 10,0			-0,036			chamfered /sharpened	
			10,1 - 14,0							
			14,1 - 18,0		180	-0,043	0,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,052				
			30,1 - 40,0			-0,16	1 mm/m			
		R440	2,0 - 3,0	440	340	-0,025	1 mm/m		broken	cases 500 kg
			3,1 - 6,0			-0,030			chamfered /cut off	
			6,1 - 10,0			-0,036			chamfered /sharpened	
			10,1 - 14,0			-0,043	0,5 mm/m			bundles 500 kg

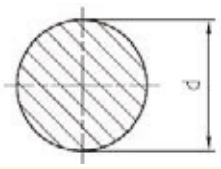


Grade		Temper	Dimension d (mm)	Mechanical properties		Tolerances d (mm)	Straightness	Length (mm)	Ends	Packing
Symbol	Number			Tensile Strength Rm N/mm2 (MPa) min	Yield Strength Rp02 N/mm2 (MPa) min					
CuZn38Pb1; CuZn38Pb2; CuZn39Pb0,5; CuZn39Pb1; CuZn39Pb2	CW607N; CW608N; CW610N; CW611N; CW612N	M	2,0 - 3,0	Without specified mechanical properties		-0,025	1 mm/m	3000 +/-50	broken	cases 500 kg
			3,1 - 6,0			-0,030			chamfered /cut off	
			6,1 - 10,0			-0,036			chamfered /sharpened	bundles 500 kg
			10,1 - 18,0			-0,043	0,5 mm/m			
			18,1 - 30,0			-0,052				
			30,1 - 50,0			-0,16	1 mm/m			
			50,1 - 65,0			-0,19			cut off	
		R360	6,0 - 10,0	360	300*	-0,036	1 mm/m		chamfered /sharpened	cases 500 kg
			10,1 - 18,0			-0,043	0,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,052				
			30,1 - 50,0			-0,16	1 mm/m			
			50,1 - 65,0			-0,19			cut off	
		R410	2,0 - 3,0	410	230	-0,025	1 mm/m		broken	cases 500 kg
			3,1 - 6,0			-0,030			chamfered /cut off	
			6,1 - 10,0			-0,036			chamfered /sharpened	bundles 500 kg
			10,1 - 18,0			-0,043	0,5 mm/m			
			18,1 - 30,0			-0,052				
			30,1 - 40,0			-0,16	1 mm/m			
		R500	2,0 - 3,0	500	350	-0,025	1 mm/m		broken	cases 500 kg
			3,1 - 6,0			-0,030			chamfered /cut off	
			6,1 - 10,0			-0,036			chamfered /sharpened	
			10,1 - 14,0			-0,043	1 mm/m			bundles 500 kg
CuZn38Pb1; CuZn38Pb2; CuZn39Pb0,5; CuZn39Pb1; CuZn39Pb2	CW607N; CW608N; CW610N; CW611N; CW612N	H070	6,1 - 10,0	70	100	-0,036	1 mm/m	3000 +/-50	chamfered /sharpened	cases 500 kg
			10,0 - 18,0			-0,043	0,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,052				
			30,1 - 50,0			-0,16	1 mm/m			
			50,1 - 65,0			-0,19			cut off	
		H100	2,0 - 3,0	100	145	-0,025	1 mm/m		broken	cases 500 kg
			3,1 - 6,0			-0,030			chamfered /cut off	
			6,1 - 10,0			-0,036			chamfered /sharpened	
			10,01 - 18,0			-0,043	0,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,052				
			30,1 - 40,0			-0,16	1 mm/m			
		H120	2,0 - 3,0	120		-0,025	1 mm/m		broken	cases 500 kg
			3,1 - 6,0			-0,030			chamfered /cut off	
			6,1 - 10,0			-0,036			chamfered /sharpened	
			10,1 - 14,0			-0,043	0,5 mm/m			bundles 500 kg
CuZn37Mn3Al2PbSi	CW713R	M	5,0 - 6,0	Without specified mechanical properties		-0,030	2 mm/m	3000 +/-50	chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,036			chamfered /sharpened	
			10,1 - 18,0			-0,043	1 mm/m			bundles 500 kg
			18,1 - 30,0			-0,052				
			30,1 - 50,0			-0,16	2 mm/m			
			50,1 - 65,0			-0,19			cut off	
		R590	5,0 - 6,0	590	370	-0,030	2 mm/m		chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,036			chamfered /sharpened	
			10,1 - 18,0			-0,043	1 mm/m			bundles 500 kg
			18,1 - 30,0			-0,052				
			30,1 - 50,0			-0,16	2 mm/m			
CuZn37Mn3Al2PbSi	CW713R	H150	5,0 - 6,0	150	220	-0,030	2 mm/m	3000 +/-50	chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,036			chamfered /sharpened	
			10,1 - 18,0			-0,043	1 mm/m			bundles 500 kg
			18,1 - 30,0			-0,052				
			30,1 - 50,0			-0,16	2 mm/m			



Grade		Temper	Dimension d (mm)	Mechanical properties		Tolerances d (mm)	Straightness	Length (mm)	Ends	Packing
Symbol	Number			Tensile Strength Rm N/mm2 (MPa) min	Yield Strength Rp02 N/mm2 (MPa) min					
CuZn40Mn1Pb	CW720R	M	5,0- 6,0	Without specified mechanical properties		-0,030	2 mm/m	3000 +/-50	chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,036			chamfered /sharpened	bundles 500 kg
			10,1 - 18,0			-0,043	1 mm/m			
			18,1 - 30,0			-0,052				
			30,1 - 50,0			-0,16	2 mm/m			
			50,1 - 65,0			-0,19			cut off	
		R440	40, - 50,0	440	180	-0,16	2 mm/m		chamfered /sharpened	bundles 500 kg
			50,1 - 65,0			-0,19			cut off	
		R500	5,0 - 6,0	500	270	-0,030	2 mm/m		chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,036			chamfered /sharpened	bundles 500 kg
			10,1 - 18,0			-0,043	1 mm/m			
			18,1 - 30,0			-0,052				
			30,1 - 40,0			-0,16				
CuZn40Mn1Pb	CW720R	H100	40, - 50,0	100	140	-0,16	2 mm/m	3000 +/-50	chamfered /sharpened	bundles 500 kg
			50,1 - 65,0			-0,19			cut off	
		H130	5,0 - 6,0	130		-0,030	2 mm/m		chamfered /sharpened	cases 500 kg
			6,1 - 10,0			-0,036				bundles 500 kg
			10,1 - 18,0			-0,043	1 mm/m			
			18,1 - 30,0			-0,052				
			30,1 - 40,0			-0,16				
CuZn40	CW509L	M	5,0 - 6,0	Without specified mechanical properties		-0,030	2 mm/m	3000 +/-50	broken	cases 500 kg
			6,1 - 10,0			-0,036				bundles 500 kg
			10,1 - 18,0			-0,043	1 mm/m			
			18,1 - 30,0			-0,052				
			30,1 - 50,0			-0,16	2 mm/m		cut off	
			50,1 - 65,0			-0,19				
		R360	5,0 - 6,0	360	300*	-0,030	2 mm/m		broken	cases 500 kg
			6,1 - 10,0			-0,036				bundles 500 kg
			10,1 - 18,0			-0,043	1 mm/m			
			18,1 - 30,0			-0,052				
			30,1 - 50,0			-0,16			cut off	
			50,1 - 65,0			-0,19	2 mm/m			
CuZn36Pb2AS; CuZn35Pb1,5AlAs; CuZn33Pb1,5AlAs	CW602N; CW625N; CW626N;	M	2,0 - 3,0	Without specified mechanical properties		-0,025	1 mm/m	3000 +/-50	broken	cases 500 kg
			3,1 - 6,0			-0,030			chamfered /cut off	
			6,1 - 10,0			-0,036			chamfered /sharpened	bundles 500 kg
			10,1 - 18,0			-0,043	0,5 mm/m			
			18,1 - 30,0			-0,052				
			30,1 - 50,0			-0,16	1 mm/m			
			50,1 - 65,0			-0,19			cut off	
		R280	6,0 - 10,0	280	200*	-0,036	1 mm/m		chamfered /sharpened	cases 500 kg
			10,1 - 18,0			-0,043	0,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,052				
			30,1 - 50,0			-0,16	1 mm/m			
			50,1 - 65,0			-0,19			cut off	
		R320	6,0 - 10,0	320	200	-0,036	1 mm/m		chamfered /sharpened	cases 500 kg
			10,1 - 18,0			-0,043	0,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,052				
			30,1 - 50,0			-0,16	1 mm/m			
			50,1 - 60,0			-0,19			cut off	
CuZn42	CW510L	M	5,0 - 6,0	Without specified mechanical properties		-0,030	2 mm/m	3000 +/-50	broken	cases 500 kg
			6,1 - 10,0			-0,036				bundles 500 kg
			10,1 - 18,0			-0,043	1 mm/m			
			18,1 - 30,0			-0,052				
			30,1 - 50,0			-0,16	2 mm/m		cut off	
			50,1 - 65,0			-0,19				
		R360	5,0 - 6,0	360	320* 20	-0,030	2 mm/m		broken	cases 500 kg
			6,1 - 10,0			-0,036				bundles 500 kg
			10,1 - 18,0			-0,043	1 mm/m			
			18,1 - 30,0			-0,052				
			30,1 - 50,0			-0,16			cut off	
			50,1 - 65,0			-0,19	2 mm/m			

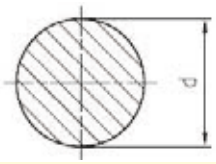
* max value



Grade		Temper	Dimension d (mm)	Mechanical properties		Tolerances d (mm)	Straightness	Length	Ends	Packing
Symbol	Number			Tensile Strength Rm N/mm2 (MPa) min	Yield Strength Rp02 N/mm2 (MPa) min					
CuZn37	CW508L **	M	2,0 - 3,0	Without specified mechanical properties		+/- 0,05	2 mm/m	3000 +/-50	broken	cases 500 kg
			3,1 - 6,0			+/- 0,08				
			6,1 - 10,0			+/- 0,11				
			10,1 - 18,0			+/- 0,14	1 mm/m			bundles 500 kg
			18,1 - 30,0			+/- 0,17				
			30,1 - 50,0			+/- 0,20			cut off	
			50,1 - 65,0			+/- 0,37	2 mm/m			
		R290	2,0 - 3,0	290	230*	+/- 0,05	2 mm/m		broken	cases 500 kg
			3,1 - 6,0			+/- 0,08				
			6,1 - 10,0			+/- 0,11				
			10,1 - 18,0			+/- 0,14	1 mm/m			bundles 500 kg
			18,1 - 30,0			+/- 0,17				
			30,1 - 50,0			+/- 0,20			cut off	
			50,1 - 65,0			+/- 0,37	2 mm/m			
		R370	2,0 - 3,0	370	240	+/- 0,05	2 mm/m		broken	cases 500 kg
			3,1 - 6,0			+/- 0,08				
			6,1 - 10,0			+/- 0,11				
			10,1 - 18,0			+/- 0,14	1 mm/m			bundles 500 kg
			18,1 - 30,0			+/- 0,17				
			30,1 - 40,0			+/- 0,20			cut off	

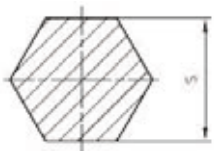
* max value

** alloy offered acc to EN12163



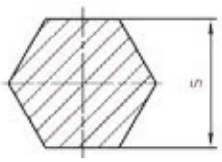
Drawn round rods in Imperial Measurements

WMD MS 13 - CuZn36Pb3 (C36000) acc to ASTM B 16										
							Properties			Packing
Dimension d		Tolerances d		Straightness	Length	Ends	Temper	Rm min	A min	
[cal]	[mm]	[cal]	[mm]		[mm]			[Mpa]	[%]	
3/32	2,38	+/-0,0013	+/-0,035	1 mm/m (0,04"/39")	3660 +/-25 (12ft +/-1")	broken	H02	395	7	Cases 500 kg (1000 lbs)
7/64	2,77									
1/8	3,17									
9/64	3,56					chamfered /cut off				
5/32	3,97	+/-0,0015	+/-0,04							
3/16	4,76									
13/64	5,16									
7/32	5,56									
15/64	5,95									
1/4	6,35									
17/64	6,75									
9/32	7,14									
19/64	7,54									
5/16	7,94									
21/64	8,33									
11/32	8,73									
23/64	9,13									
3/8	9,52									
13/32	10,32			0,5 mm/m (0,02"/39")						Bundles 500 kg (1000 lbs)
7/16	11,11									
29/64	11,51									
15/32	11,91									
1/2	12,70									
17/32	13,49	+/-0,002	+/-0,05			chamfered /sharpened		380	10	
9/16	14,29									
5/8	15,87									
21/32	16,67									
11/16	17,46									
23/32	18,26									
3/4	19,05									
13/16	20,64									
7/8	22,23									
15/16	23,81									
1	25,40									
1 - 1/16	26,99	+/-0,0025	+/-0,06	1 mm/m (0,04"/39")				345	15	
1 - 1/8	28,58									
1 - 3/16	30,16									
1 - 1/4	31,75									
1 - 5/16	33,34									
1 - 3/8	34,93									
1 - 7/16	36,51									
1 - 1/2	38,10									
1 - 9/16	39,69									
1 - 5/8	41,28									
1 - 11/16	42,86									
1 - 3/4	44,45									
1 - 13/16	46,04									
1 - 7/8	47,63									
2	50,80			2 mm/m (0,08"/39")						
2 - 1/4	57,15									
2 - 3/8	60,33									
2 - 1/2	63,50									

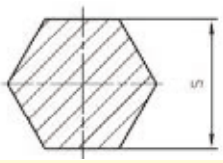


Drawn hexagonal rods acc to EN12164

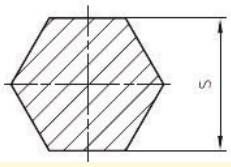
Grade		Temper	Dimensions (mm)	Mechanical properties		Tolerances (mm)	Straightness	Length (mm)	Ends	Packing
Symbol	Number			Tensile Strength Rm N/mm2 (MPa) min	Yield Strength Rp02 N/mm2 (MPa) min					
CuZn39P3; CuZn40Pb2	CW614N; CW617N	M	3,0 - 6,0	Without specified mechanical properties		-0,06	2 mm/m	3000 +/-50	chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	bundles 500 kg
			10,1 - 18,0			-0,11	1,5 mm/m			
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16				
			50,1 - 63,5			-0,19	2 mm/m		cut off	
		R360	6,0 - 10,0	360	320*	-0,09	2 mm/m		chamfered /sharpened	cases 500 kg
			10,1 - 18,0			-0,11	1,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16				
			50,1 - 63,5			-0,19	2 mm/m		cut off	
		R430	3,0 - 6,0	430	220	-0,06	2 mm/m		chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	bundles 500 kg
			10,1 - 18,0			-0,11	1,5 mm/m			
			18,1 - 30,0			-0,13				
			30,1 - 35,0			-0,16				
		R500	3,0 - 6,0	500	350	-0,06	2 mm/m		chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	
CuZn35Pb1; CuZn35Pb2; CuZn36Pb3; CuZn37Pb2	CW600N; CW601N; CW603N; CW606N	M	3,0 - 6,0	Without specified mechanical properties		-0,080	2 mm/m	3000 +/-50	chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,090			chamfered /sharpened	bundles 500 kg
			10,1 - 18,0			-0,110	1,5 mm/m			
			18,1 - 30,0			-0,130				
			30,1 - 50,0			-0,16	2 mm/m			
		R370	3,0 - 6,0	370	250	-0,08	2 mm/m		chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	
			10,1 - 14,0		180	-0,11	1,5 mm/m			bundles 500 kg
			14,1 - 18,0							
			18,1 - 30,0			-0,13				
			30,1 - 35,0			-0,16	2 mm/m			
		R440	2,0 - 3,0	440	340	-0,06	2 mm/m		broken	cases 500 kg
			3,1 - 6,0			-0,08			chamfered /cut off	
			6,1 - 10,0			-0,09			chamfered /sharpened	
CuZn38Pb1; CuZn38Pb2; CuZn39Pb0,5; CuZn39Pb1; CuZn39Pb2	CW607N; CW608N; CW610N; CW611N; CW612N	M	3,0 - 6,0	Without specified mechanical properties		-0,06	2 mm/m	3000 +/-50	chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	bundles 500 kg
			10,1 - 18,0			-0,11	1,5 mm/m			
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16				
			50,1 - 63,5			-0,19	2 mm/m		cut off	
			6,0 - 10,0			-0,09	2 mm/m		chamfered /sharpened	cases 500 kg
			10,1 - 18,0			-0,11	1,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16				
			50,1 - 60,0			-0,19	2 mm/m		cut off	
		R410	3,0 - 6,0	410	230	-0,06	2 mm/m		chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	bundles 500 kg
			10,1 - 18,0			-0,11	1,5 mm/m			
			18,1 - 30,0			-0,13				
			30,1 - 35,0			-0,16				
		R500	3,0 - 6,0	500	350	-0,06	2 mm/m		chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	



Grade		Temper	Dimensions (mm)	Mechanical properties		Tolerances (mm)	Straightness	Length (mm)	Ends	Packing
Symbol	Number			Tensile Strength Rm N/mm2 (MPa) min	Yield Strength Rp02 N/mm2 (MPa) min					
CuZn37Mn3Al2PbSi	CW713R	M	5,0 - 6,0	Without specified mechanical properties		-0,06	3 mm/m	3000 +/-50	chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	
			10,1 - 18,0			-0,11	2 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16				
			50,1 - 63,5			-0,19	3 mm/m		cut off	
		590	5,0 - 6,0	590	370	-0,06	3 mm/m		chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	bundles 500 kg
			10,1 - 18,0			-0,11	2 mm/m			
			18,1 - 30,0			-0,13				
			30,1 - 40,0			-0,16				
CuZn40Mn1Pb	CW720R	M	5,0 - 6,0	Without specified mechanical properties		-0,06	3 mm/m	3000 +/-50	chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	
			101 - 18,0			-0,11	2 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16				
			50,1 - 63,5			-0,19	3 mm/m		cut off	
		R440	40, - 50,0	440	180	-0,160	3 mm/m		chamfered /sharpened	bundles 500 kg
			50,1 - 60,0			-0,190			cut off	
		R500	5,0 - 6,0	500	270	-0,06	3 mm/m		chamfered /cut off	bundles 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	
			10,1 - 18,0			-0,11	2 mm/m			
			18,1 - 30,0			-0,13				
			30,1 - 40,0			-0,16				cases 500 kg
CuZn40	CW509L	M	5,0 - 6,0	Without specified mechanical properties		-0,06	2 mm/m	3000 +/-50	broken	cases 500 kg
			6,1 - 10,0			-0,09				
			10,1 - 18,0			-0,11	1,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16	2 mm/m		cut off	
			50,1 - 63,5			-0,19				
		R360	5,0 - 6,0	360	300*	-0,06	2 mm/m		broken	cases 500 kg
			6,1 - 10,0			-0,09				
			10,1 - 18,0			-0,11	1,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16			cut off	
			50,1 - 60,0			-0,19	2 mm/m			
CuZn36Pb2As	CW511L	M	3,0 - 6,0	Without specified mechanical properties		-0,06	2 mm/m	3000 +/-50	chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	
			10,0 - 18,0			-0,11	1,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16	2 mm/m			
			50,1 - 63,5			-0,19			cut off	
		R280	5,0 - 6,0	280	200* 30	-0,06	2 mm/m		chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	
			10,1 - 18,0			-0,11	1,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16	2 mm/m			
			50,1 - 60,0			-0,19			cut off	
		R320	5,0 - 6,0	320	200 30	-0,06	2 mm/m		chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	
			10,1 - 18,0			-0,11	1,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16	2 mm/m			

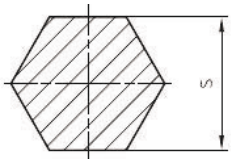


Grade		Temper	Dimensions (mm)	Mechanical properties		Tolerances (mm)	Straightness	Length (mm)	Ends	Packing
Symbol	Number			Tensile Strength Rm N/mm2 (MPa) min	Yield Strength Rp02 N/mm2 (MPa) min					
CuZn36Pb2As	CW602N; CW625N; CW626N; CW602N CW625N; CW626N	M	3,1 - 6,0	Without specified mechanical properties		-0,06	2 mm/m	3000 +/-50	chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	bundles 500 kg
			10,1 - 18,0			-0,11	1,5 mm/m			
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16	2 mm/m			
			50,1 - 63,5			-0,19			cut off	
		R280	5,0 - 6,0	280	200*	-0,06	2 mm/m		chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	bundles 500 kg
			10,1 - 18,0			-0,11	1,5 mm/m			
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16	2 mm/m			
			50,1 - 60,0			-0,19			cut off	
		R320	5,0 - 6,0	320	200	-0,06	2 mm/m		chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	bundles 500 kg
			10,1 - 18,0			-0,11	1,5 mm/m			
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16	2 mm/m			



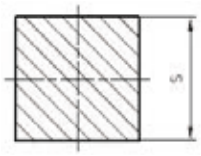
Grade		Temper	Dimensions (mm)	Mechanical properties		Tolerances (mm)	Straightness	Length (mm)	Ends	Packing
Symbol	Number			Tensile Strength Rm N/mm2 (MPa) min	Yield Strength Rp02 N/mm2 (MPa) min					
CuZn37	CW508L	M	3,1 - 6,0	Without specified mechanical properties		+/- 0,08	2 mm/m	3000 +/-50	broken	cases 500 kg
			6,1 - 10,0			+/- 0,11				
			10,1 - 18,0			+/- 0,14	1 mm/m			bundles 500 kg
			18,1 - 30,0			+/- 0,17				
			30,1 - 50,0			+/- 0,20			cut off	
			50,1 - 63,5			+/- 0,37	2 mm/m			
		R290	3,1 - 6,0	290	230*	+/- 0,08	2 mm/m		broken	cases 500 kg
			6,1 - 10,0			+/- 0,11				
			10,1 - 18,0			+/- 0,14	1 mm/m			bundles 500 kg
			18,1 - 30,0			+/- 0,17				
			30,1 - 50,0			+/- 0,20			cut off	
			50,1 - 63,5			+/- 0,37	2 mm/m			
		R370	3,1 - 6,0	370	240	+/- 0,08	2 mm/m		broken	cases 500 kg
			6,1 - 10,0			+/- 0,11				
			10,1 - 18,0			+/- 0,14	1 mm/m			bundles 500 kg
			18,1 - 30,0			+/- 0,17				
			30,1 - 40,0			+/- 0,20			cut off	

* max value



Drawn hexagonal rods in Imperial Measurements

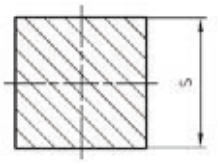
WMD MS 13 - CuZn36Pb3 (C36000) acc to ASTM B 16										
							Properties			Packing
Dimensions		Tolerances		Straightness	Length	Ends	Temper	Rm min	A min	
[cal]	[mm]	[cal]	[mm]		[mm]			[Mpa]	[%]	
5/32	3,97	+/-0,003	+/-0,08	2 mm/m (0,08"/39")	3660 +/-25 (12ft +/-1")	chamfered / cut off	H02	395	7	Cases 500 kg (1000 lbs)
3/16	4,76									
7/32	5,56									
1/4	6,35					chamfered / sharpened				
9/32	7,14									
5/16	7,94									
11/32	8,73									
3/8	9,52									
7/16	11,11			1,5 mm/m (0,06"/39")						Bundles 500 kg (1000 lbs)
1/2	12,70									
9/16	14,29	+/-0,004	+/-0,10					380	10	
5/8	15,87									
11/16	17,46									
3/4	19,05									
7/8	22,23									
15/16	23,81									
1	25,40									
1 - 1/16	26,99	+/-0,005	+/-0,13					345	15	
1 - 1/8	28,58									
1 - 3/16	30,16									
1 - 1/4	31,75									
1 - 5/16	33,34									
1 - 3/8	34,93									
1 - 7/16	36,51									
1 - 1/2	38,10									
1 - 5/8	41,28									
1 - 3/4	44,45									
1 - 7/8	47,63									
2	50,80									



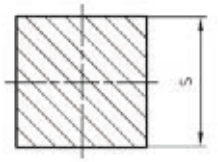
Drawn square rods acc to EN12164

Grade		Temper	Dimensions (mm)	Mechanical properties		Tolerances (mm)	Straightness	Length (mm)	Ends	Packing
Symbol	Number			Tensile Strength Rm N/mm2 (MPa) min	Yield Strength Rp02 N/ mm2 (MPa) min					
CuZn39P3; CuZn40Pb2	CW614N; CW617N	M	3,0 - 6,0	Without specified mechanical properties		-0,06	2 mm/m	3000 +/-50	chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	
			10,1 - 18,0			-0,11	1,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16				
		R360	6,0 - 10,0	360	320*	-0,09	2 mm/m		chamfered /sharpened	cases 500 kg
			10,1- 18,0			-0,11	1,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16				
		R430	3,0 - 6,0	430	220	-0,06	2 mm/m		chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	bundles 500 kg
			10,1 - 18,0			-0,11	1,5 mm/m			
			18,1 - 30,0			-0,13				
			30,1 - 35,0			-0,16				
		R500	3,0 - 6,0	500	350	-0,06	2 mm/m		chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	
CuZn38Pb1; CuZn38Pb2; CuZn39Pb0,5 CuZn39Pb1; CuZn39Pb2	CW607N; CW608N; CW610N CW611N; CW612N	M	3,0 - 6,0	Without specified mechanical properties		-0,06	2 mm/m	3000 +/-50	chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	
			10,1 - 18,0			-0,11	1,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16				
			6,0 - 10,0			-0,09	2 mm/m		chamfered /sharpened	cases 500 kg
			10,1 - 18,0			-0,11	1,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16				
		R410	3,0 - 6,0	410	230	-0,06	2 mm/m		chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	bundles 500 kg
			10,1 - 18,0			-0,11	1,5 mm/m			
			18,1 - 30,0			-0,13				
			30,1 - 35,0			-0,16				
		R500	3,0 - 6,0	500	350	-0,06	2 mm/m		chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	

* max value



Grade		Temper	Dimensions (mm)	Mechanical properties		Tolerances s (mm)	Straightness	Length	Ends	Packing
Symbol	Number			Tensile Strength Rm N/mm2 (MPa) min	Yield Strength Rp02 N/mm2 (MPa) min					
CuZn35Pb1; CuZn35Pb2 CuZn36Pb3; CuZn37Pb2	CW600N; CW601N CW603N; CW606N	M	3,0 - 6,0	Without specified mechanical properties		-0,080	2 mm/m	3000 +/-50	chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,090			chamfered /sharpened	bundles 500 kg
			10,1 - 18,0			-0,110	1,5 mm/m			
			18,1 - 30,0			-0,130				
			30,1 - 50,0			-0,16	2 mm/m			
		R370	3,0 - 6,0	370	250	-0,08	2 mm/m		chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	
			10,1 - 14,0		180	-0,11	1,5 mm/m			bundles 500 kg
			14,1 - 18,0							
			18,1 - 30,0			-0,13				
			30,1 - 35,0			-0,16	2 mm/m			
		R440	3,0 - 6,0	440	340	-0,08	2 mm/m		chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	
CuZn37Mn3Al2PbSi	CW713R	M	5,0 - 6,0	Without specified mechanical properties		-0,06	3 mm/m	3000 +/-50	chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	bundles 500 kg
			10,1 - 18,0			-0,11	2 mm/m			
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16				
		590	5,0 - 6,0	590	370	-0,06	3 mm/m		chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	bundles 500 kg
			10,1 - 18,0			-0,11	2 mm/m			
			18,1 - 30,0			-0,13				
			30,1 - 40,0			-0,16				
CuZn40Mn1Pb	CW720R	M	5,0 - 6,0	Without specified mechanical properties		-0,06	3 mm/m	3000 +/-50	chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	
			10,1 - 18,0			-0,11	2 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16				
		R440	40, - 50,0	440	180	-0,160	3 mm/m		chamfered /sharpened	bundles 500 kg
		R500	5,0 - 6,0	500	270	-0,06	3 mm/m		chamfered /cut off	bundles 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	
			10,1- 18,0			-0,11	2 mm/m			
			18,1 - 30,0			-0,13				
			30,1 - 40,0			-0,16				cases 500 kg

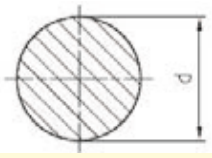


Grade		Temper	Dimension s (mm)	Mechanical properties		Tolerances s (mm)	Straightness	Length (mm)	Ends	Packing
Symbol	Number			Tensile Strength Rm N/mm2 (MPa) min	Yield Strength Rp02 N/mm2 (MPa) min					
CuZn40	CW509L	M	5,0 - 6,0	Without specified mechanical properties		-0,06	2 mm/m	3000 +/-50	broken	cases 500 kg
			6,1 - 10,0			-0,09				
			10,1- 18,0			-0,11	1,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16	2 mm/m		cut off	
		R360	5,0 - 6,0	360	300*	-0,06	2 mm/m		broken	cases 500 kg
			6,1 - 10,0			-0,09				
			10,1 - 18,0			-0,11	1,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16			cut off	
CuZn36Pb2As; CuZn35Pb1,5AlAs CuZn33Pb1,5AlAs	CW602N; CW625N CW626N	M	3,0 - 6,0	Without specified mechanical properties		-0,06	2 mm/m	3000 +/-50	chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	
			10,0 - 18,0			-0,11	1,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16	2 mm/m			
		R280	5,0 - 6,0	280	200*	-0,06	2 mm/m		chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	
			10,1 - 18,0			-0,11	1,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16	2 mm/m			
		R320	5,0 - 6,0	320	200	-0,06	2 mm/m		chamfered /cut off	cases 500 kg
			6,1 - 10,0			-0,09			chamfered /sharpened	
			10,1 - 18,0			-0,11	1,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16	2 mm/m			
CuZn37	CW508L	M	3,0 - 6,0	Without specified mechanical properties		+/- 0,08	2 mm/m	3000 +/-50	broken	cases 500 kg
			6,1 - 10,0			+/- 0,11				
			10,1 - 18,0			+/- 0,14	1 mm/m			bundles 500 kg
			18,1 - 30,0			+/- 0,17				
			30,1 - 50,0			+/- 0,20			cut off	
		R290	4,0 - 6,0	290	230*	+/- 0,08	2 mm/m		broken	cases 500 kg
			6,1 - 10,0			+/- 0,11				
			10,1 - 18,0			+/- 0,14	1 mm/m			bundles 500 kg
			18,1 - 30,0			+/- 0,17				
			30,1 - 50,0			+/- 0,20			cut off	
		R370	4,0 - 6,0	370	240	+/- 0,08	2 mm/m		broken	cases 500 kg
			6,1 - 10,0			+/- 0,11				
			10,1 - 18,0			+/- 0,14	1 mm/m			bundles 500 kg
			18,1 - 30,0			+/- 0,17				
			30,1 - 35,0			+/- 0,20			cut off	
CuZn38As	CW511L	M	3,0 - 6,0	Without specified mechanical properties		-0,06	2 mm/m	3000 +/-50	cut off/ chamfered	cases 500 kg
			6,1 - 10,0			-0,09			chamfered/ sharpened	
			10,1 - 18,0			-0,11	1,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16	2 mm/m			
			50,1 - 63,5			-0,19			cut off	
		R280	5,0 - 6,0	280	200* 30	-0,06	2 mm/m		cut off/ chamfered	cases 500 kg
			6,1 - 10,0			-0,09			chamfered/ sharpened	
			10,0 - 18,0			-0,11	1,5 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16	2 mm/m			
			50,1 - 60,0			-0,19			cut off	
		R320	5,0 - 6,0	320	200 20	-0,06	2 mm/m		cut off/ chamfered	cases 500 kg
			6,1 - 10,0			-0,09			chamfered/ sharpened	
			10,0 - 18,0			-0,11	1 mm/m			bundles 500 kg
			18,1 - 30,0			-0,13				
			30,1 - 50,0			-0,16	1,5 mm/m			

* max value

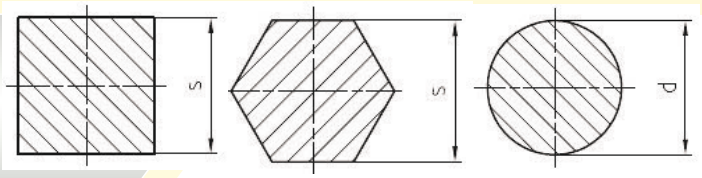
Drawn square rods in Imperial Measurements

WMD MS 13 - CuZn36Pb3 (C36000) acc to ASTM B 16										
							Properties			Packing
Dimensions		Tolerances		Straightness	Length	Ends	Temper	Rm min	A min	
[cal]	[mm]	[cal]	[mm]		[mm]			[Mpa]	[%]	
5/32	3,97	+/-0,003	+/-0,08	2 mm/m (0,08"/39")	3660 +/-25 (12ft +/-1")	chamfered / cut off	H02	395	7	Cases 500 kg (1000 lbs)
3/16	4,76									
7/32	5,56									
1/4	6,35					chamfered /sharpened				
9/32	7,14									
5/16	7,94									
23/64	9,13									
3/8	9,52									
1/2	12,70									Bundles 500 kg (1000 lbs)
5/8	15,87	+/-0,004	+/-0,10	1,5 mm/m (0,06"/39")				380	10	
3/4	19,05									
7/8	22,23									
1	25,40									
1 - 1/8	28,58	+/-0,005	+/-0,13					345	15	
1 - 1/4	31,75									
1 - 1/2	38,10									
1 - 5/8	41,28									
1 - 3/4	44,45									



Extruded round rods acc to EN12165

Grade		Temper	Dimension d (mm)	Mechanical properties			Tolerances d (mm)	Straightness	Length	Ends	Packing
Symbol	Number			Hardness HB	Tensile Strength Rm N/mm2 (MPa) min	Yield Strength Rp02 N/mm2 (MPa) min					
CuZn38Pb2;CuZn39Pb0,5 CuZn39Pb1; CuZn39Pb2 CuZn39Pb3; CuZn40Pb2	CW608N; CW610N CW611N; CW612N CW614N; CW617N	M	16,0-18,0	Without specified mechanical properties			+/- 0,25	3 mm/m	3000 +/-50	cut off	bundles 500 kg
			18,1-30,0				+/- 0,30				
			30,1-50,0				+/- 0,60				
			50,1-80,0				+/- 0,70				
		H080	16,0-18,0	80	(350)	(140)	+/- 0,25				
			18,1-30,0				+/- 0,30				
			30,1-50,0				+/- 0,60				
			50,1-80,0				+/- 0,70				
CuZn36Pb2As CuZn35Pb1,5AlAs CuZn33Pb1,5AlAs CuZn38AlAs	CW602N; CW625N CW626N;CW511L	M	16,0-18,0	Without specified mechanical properties			+/- 0,25	3 mm/m	3000 +/-50	cut off	bundles 500 kg
			18,1-30,0				+/- 0,30				
			30,1-50,0				+/- 0,60				
			50,1-80,0				+/- 0,70				
		H070	16,0-18,0	70	(280)	(120)	+/- 0,25				
			18,1-30,0				+/- 0,30				
			30,1-50,0				+/- 0,60				
			50,1-80,0				+/- 0,70				
CuZn37 CuZn40	CW508L CW509L	M	16,0-18,0	Without specified mechanical properties			+/- 0,25	3 mm/m	3000 +/-50	cut off	bundles 500 kg
			18,1-30,0				+/- 0,30				
			30,1-50,0				+/- 0,60				
			50,1-80,0				+/- 0,70				
		H070	16,0-18,0	70	(300)	(100)	+/- 0,25				
			18,1-30,0				+/- 0,30				
			30,1-50,0				+/- 0,60				
			50,1-80,0				+/- 0,70				
CuZn42	CW510L	M	16,0-18,0	Without specified mechanical properties			+/- 0,25	3 mm/m	3000 +/-50	cut off	bundles 500 kg
			18,1-30,0				+/- 0,30				
			30,1-50,0				+/- 0,60				
			50,1-80,0				+/- 0,70				
		H090	16,0-18,0	90			+/- 0,25				
			18,1-30,0				+/- 0,30				
			30,1-50,0				+/- 0,60				
			50,1-80,0				+/- 0,70				
CuZn37Mn3Al2PbSi	CW713R	M	16,0-18,0	Without specified mechanical properties			+/- 0,25	3 mm/m	3000 +/-50	cut off	bundles 500 kg
			18,1-30,0				+/- 0,30				
			30,1-50,0				+/- 0,60				
			50,1-80,0				+/- 0,70				
		H130	16,0-18,0	130	(550)	(200)	+/- 0,25				
			18,1-30,0				+/- 0,30				
			30,1-50,0				+/- 0,60				
			50,1-80,0				+/- 0,70				
CuZn35Ni3Mn2AlPb	CW710R	M	16,0-18,0	Without specified mechanical properties			+/- 0,25	3 mm/m	3000 +/-50	cut off	bundles 500 kg
			18,1-30,0				+/- 0,30				
			30,1-50,0				+/- 0,60				
			50,1-80,0				+/- 0,70				
		H100	16,0-18,0	100	(440)	(180)	+/- 0,25				
			18,1-30,0				+/- 0,30				
			30,1-50,0				+/- 0,60				
			50,1-80,0				+/- 0,70				
CuZn40Mn1Pb1 CuZn40Mn2Fe1	CW720R CW723R	M	16,0-18,0	Without specified mechanical properties			+/- 0,25	3 mm/m	3000 +/-100	cut off	bundles 500 kg
			18,1-30,0				+/- 0,30				
			30,1-50,0				+/- 0,60				
			50,1-80,0				+/- 0,70		3000 +/-200		
		H80	16,0-18,0	80	(350)	(160)	+/- 0,25		3000 +/-100		
			18,1-30,0				+/- 0,30				
			30,1-50,0				+/- 0,60				
			50,1-80,0				+/- 0,70		3000 +/-200		



Extruded round rods acc to specification below

Grade		Temper	Dimensions (mm)	Mechanical properties (acc to confirmation)	Tolerances (mm) (acc to confirmation)	Straightness (acc to confirmation)	Length (acc to confirmation)	Ends	Packing
Symbol	Number								
CuZn38Pb2 CuZn39Pb0,5 CuZn39Pb1 CuZn39Pb2 CuZn39Pb3 CuZn40Pb2 CuZn36Pb2As CuZn37 CuZn40 CuZn37Mn3Al2PbSi CuZn35Ni3Mn2AlPb CuZn40Mn1Pb1 CuZn40Mn2Fe1 CuZn35Pb CuZn33Pb CuZn38lAs	CW608N CW610N CW611N CW612N CW614N CW617N CW602N CW508L CW509L CW713R CW710R CW720R CW723R CW625N CW626N CW511L	M	80,1-100	Without specified mechanical properties	+/- 1,2	3mm/m	3000 +/-200	cut off	bundles 500 kg
			100,1-110			5mm/m	1500-3000		
			110,1-140		+/- 1,6		1000-2000		
			140,1-180,0				500-1500		

Extruded square and hexagonal rods acc to specification below

Grade		Temper	Dimensions (mm)	Mechanical properties (acc to confirmation)	Tolerances (mm) (acc to confirmation)	Straightness (acc to confirmation)	Length (acc to confirmation)	Ends	Packing
Symbol	Number								
CuZn38Pb2 CuZn39Pb0,5 CuZn39Pb1 CuZn39Pb2 CuZn39Pb3 CuZn40Pb2 CuZn36Pb2As CuZn37 CuZn40 CuZn37Mn3Al2PbSi CuZn35Ni3Mn2AlPb CuZn40Mn1Pb1 CuZn40Mn2Fe1 CuZn35Pb CuZn33Pb CuZn38lAs	CW608N CW610N CW611N CW612N CW614N CW617N CW602N CW508L CW509L CW713R CW710R CW720R CW723R CW625N CW626N CW511L	M	20,0-30,0	Without specified mechanical properties	+/- 0,5	3 mm/m	3000 +/-100	cut off	bundles 500 kg
			30,1-50,0		+/- 0,8		3000 +/-200		
			50,1-80,0		+/- 1,0	5 mm/m			
			80,1-100,0		+/- 1,6	7 mm/m	1500-3000		
			100,1-130,0		+/- 2,2		500-1500		

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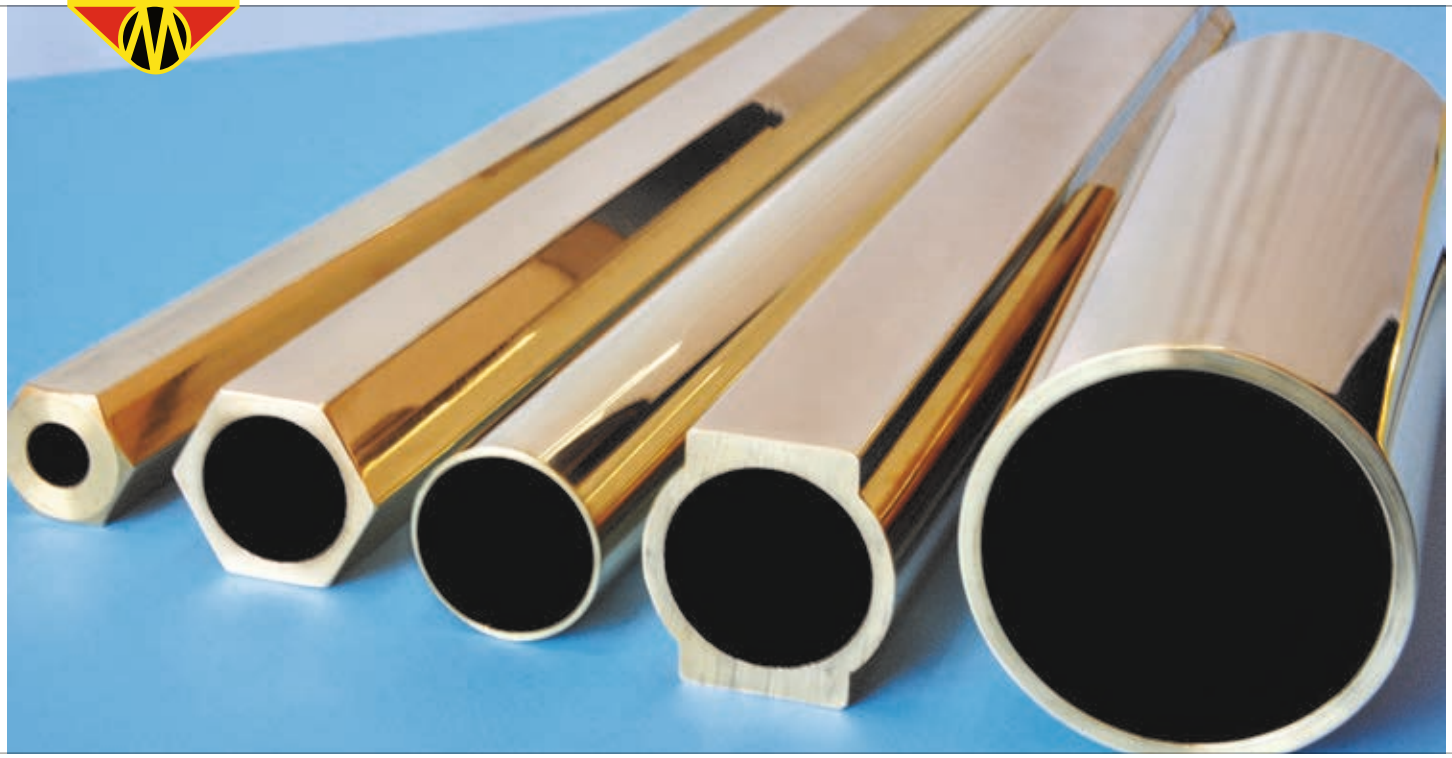


BRASS TUBES

DRAWN AND EXTRUDED BRASS TUBES

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

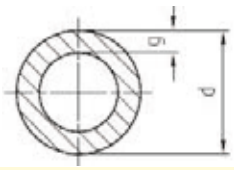
Offered tubes are produced in several copper alloys with zinc and other additives, which provide them with a wide range of use, mainly in the fittings industry, as part of the heating and plumbing installations.

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 .

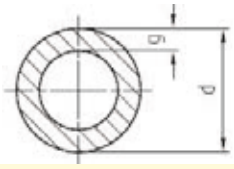
Dimensional charts shown further correspond to the EN standards.
Brass rods are also produced according to other norms.



Drawn round tubes

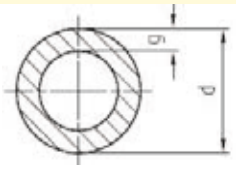
Grades		Dimensional range			Temper	Mechanical properties	Tolerances [mm]			
Symbol	Number	External dimension d [mm]	Wall thickness [g mm]	Length [mm]			External dimension d	Wall thickness g	Straightness	Length
CuZn35Pb2 CuZn36Pb2As CuZn36Pb3 CuZn37Pb1 CuZn37Pb2 CuZn38Pb1 CuZn38Pb2 CuZn39Pb1 CuZn39Pb2 CuZn39Pb3 CuZn40Pb2 CuZn37Mn3Al2PbSi CuZn40Mn1Pb1 CuZn35Pb1,5AlAs CuZn33Pb1,5AlAs CuZn38lAs	CW601N CW602N CW603N CW605N CW606N CW607N CW608N CW611N CW612N CW614N CW617N CW713R CW720R CW625N CW626N CW511L	16,0 - 18,0	2,0 - 3,0	2000 - 4000	M	Without Specified mechanical properties	- 0,11	+/- 12%	1,5 mm/1000mm	+/- 50
			3,1 - 4,0					+/- 10%		
		18,1 - 30,0	2,0 - 3,0				- 0,13	+/- 12%		
			3,1 - 6,0					+/- 10%		
			6,1 - 8,0					+/- 9%		
		30,1 - 50,0	3,1 - 6,0				- 0,16	+/- 10%		+/- 100
			6,1 - 8,0					+/- 9%		
			8,1 - 10,0							
		50,1 - 65,0	3,1 - 6,0				- 0,30	+/- 10%		
			6,1 - 8,0					+/- 9%		
			8,1 - 10,0							
			> 10,1					+/- 8%		
Ratio d/g max 18										
Minimum internal diameter10,0mm										

Grades		Dimensional range			Temper	Mechanical properties		Tolerances [mm]			
Symbol	Number	External dimension d [mm]	Wall thickness g [mm]	Length [mm]		Hardness HB	Hardness HV	External dimension d	Wall thickness g	Straightness	Length
CuZn36Pb3 CuZn37Pb1 CuZn37Pb2 CuZn38Pb1 CuZn38Pb2 CuZn39Pb1 CuZn39Pb2 CuZn39Pb3 CuZn40Pb2	CW603N CW605N CW606N CW607N CW608N CW611N CW612N CW614N CW617N	16,0 - 18,0	2,0 - 3,0	2000 - 4000	H 110 max wall thickness 10,0mm	110 - 160	120 - 170	- 0,11	+/- 12%	1,5 mm/1000mm	+/- 50
			3,1 - 4,0						+/- 10%		
		18,1 - 30,0	2,0 - 3,0					- 0,13	+/- 12%		
			3,1 - 6,0						+/- 10%		
			6,1 - 8,0						+/- 9%		
		30,1 - 50,0	3,1 - 6,0					- 0,16	+/- 10%		+/- 100
			6,1 - 8,0						+/- 9%		
			8,1 - 10,0								
		50,1 - 65,0	3,1 - 6,0					- 0,30	+/- 10%		
			6,1 - 8,0						+/- 9%		
			8,1 - 10,0								
			> 10,1		H 090 min wall thickness 10,1mm	90 - 140	100 - 150		+/- 8%		
Ratio d/g max 18											
Minimum internal diameter10,0mm											

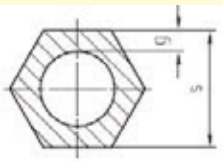


Grades		Dimensional range			Temper	Mechanical properties		Tolerances [mm]			
Symbol	Number	External dimension d [mm]	Wall thickness g [mm]	Length [mm]		Hardness HB	Hardness HV	External dimension D	Wall thickness g	Straightness	Length
CuZn36Pb2As CuZn35Pb1,5AlAs CuZn33Pb1,5AlAs CuZn38lAs	CW602N CW625N CW626N CW511L	16,0 - 18,0	2,0 - 3,0	2000 - 4000	H070	70-110	80-120	- 0,11	+/- 12%	1,5 mm/1000mm	+/- 50
			3,1 - 4,0						+/- 10%		
		18,1 - 30,0	2,0 - 3,0					- 0,13	+/- 12%		
			3,1 - 6,0						+/- 10%		
			6,1 - 8,0						+/- 9%		
		30,1 - 50,0	3,1 - 6,0					- 0,16	+/- 10%		+/- 100
			6,1 - 8,0						+/- 9%		
			8,1 - 10,0								
		50,1 - 65,0	3,1 - 6,0					- 0,30	+/- 10%		
			6,1 - 8,0						+/- 9%		
			8,1 - 10,0								
			> 10,1						+/- 8%		
Ratio d/g max 18											
Minimum internal diameter10,0mm											

Grades		Dimensional range			Temper	Mechanical properties		Tolerances [mm]			
Symbol	Number	External dimension d [mm]	Wall thickness g [mm]	Length [mm]		Hardness HB	Hardness HV	External dimension d	Wall thickness g	Straightness	Length
CuZn37Mn3Al2PbSi	CW713R	16,0 - 18,0	2,0 - 3,0	2000 - 4000	H 110 max wall thickness 10,0mm	110 - 160	120 - 170	- 0,11	+/- 12%	3,0 mm/1000mm	+/- 50
			3,1 - 4,0						+/- 10%		
		18,1 - 30,0	2,0 - 3,0					- 0,13	+/- 12%		
			3,1 - 6,0						+/- 10%		
			6,1 - 8,0						+/- 9%		
		30,1 - 50,0	3,1 - 6,0					- 0,16	+/- 10%		+/- 100
			6,1 - 8,0						+/- 9%		
			8,1 - 10,0								
		50,1 - 65,0	3,1 - 6,0					- 0,30	+/- 10%		
			6,1 - 8,0						+/- 9%		
			8,1 - 10,0								
			> 10,1		H 090 min wall thickness 10,1mm	90 - 140	100 - 150		+/- 8%		
Ratio d/g max 18											
Minimum internal diameter10,0mm											



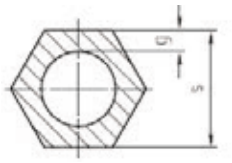
Grades		Dimensional range			Temper	Mechanical properties		Tolerances [mm]			
Symbol	Number	External dimension d [mm]	Wall thickness g [mm]	Length [mm]		Hardness HB	Hardness HV	External dimension d	Wall thickness g	Straightness	Length
CuZn40Mn1Pb1	CW720R	16,0 - 18,0	2,0 - 3,0	2000 - 4000	H 110 max wall thickness 10,0mm	110 - 160	120 - 170	- 0,11	+/- 12%	3,0 mm/1000mm	+/- 50
			3,1 - 4,0						+/- 10%		
		18,1 - 30,0	2,0 - 3,0					- 0,13	+/- 12%		
			3,1 - 6,0						+/- 10%		
			6,1 - 8,0						+/- 9%		
		30,1 - 50,0	3,1 - 6,0					- 0,16	+/- 10%		+/- 100
			6,1 - 8,0						+/- 9%		
			8,1 - 10,0								
		50,1 - 65,0	3,1 - 6,0					- 0,30	+/- 10%		
			6,1 - 8,0						+/- 9%		
			8,1 - 10,0								
			> 10,1		H 090 min wall thickness 10,1mm	90 - 140	100 - 150		+/- 8%		
Ratio d/g max 18											
Minimum internal diameter10,0mm											



Drawn hexagonal tubes

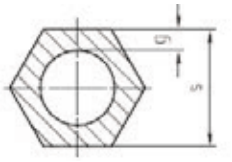
Grades		Dimensional range			Corners radius	Temper	Mechanical properties	Tolerances [mm]			
Symbol	Number	External dimensions [mm]	Wall thickness g [mm]	Length [mm]				External dimensions	Wall thickness g	Straightness	Length
CuZn35Pb2 CuZn36Pb2As CuZn36Pb3 CuZn37Pb1 CuZn37Pb2 CuZn38Pb1 CuZn38Pb2 CuZn39Pb1 CuZn39Pb2 CuZn39Pb3 CuZn40Pb2 CuZn37Mn3Al2PbSi CuZn40Mn1Pb1 CuZn35Pb1,5AlAs CuZn33Pb1,5AlAs CuZn38lAs	CW601N CW602N CW603N CW605N CW606N CW607N CW608N CW611N CW612N CW614N CW617N CW713R CW720R CW625N CW626N CW511L	16,0 - 18,0	2,0 - 3,0	2000 - 4000	0,5 - 1,2	M	Without specified mechanical properties	- 0,11	+/- 12%	2,0 mm/1000mm	+/- 50
			3,1 - 4,0						+/- 10%		
		18,1 - 30,0	2,0 - 3,0		0,6 - 1,8			- 0,13	+/- 12%		
			3,1 - 6,0						+/- 10%		
			6,1 - 8,0						+/- 9%		
		30,1 - 50,0	3,1 - 6,0		0,7 - 2,8			- 0,16	+/- 10%		+/- 100
			6,1 - 8,0						+/- 9%		
			8,1 - 10,0								
		50,1 - 63,5	3,1 - 6,0		0,8 - 4,0			- 0,30	+/- 10%		
			6,1 - 8,0						+/- 9%		
			8,1 - 10,0								
			> 10,1						+/- 8%		
Ratio s/g max 18											
Minimum internal diameter10,0mm											

Grades		Dimensional range			Corners radius	Temper	Mechanical properties		Tolerances [mm]			
Symbol	Number	External dimensions [mm]	Wall thickness g [mm]	Length [mm]			Hardness HB	Hardness HV	External dimensions	Wall thickness g	Straightness	Length
CuZn36Pb3 CuZn37Pb1 CuZn37Pb2 CuZn38Pb1 CuZn38Pb2 CuZn39Pb1 CuZn39Pb2 CuZn39Pb3 CuZn40Pb2	CW603N CW605N CW606N CW607N CW608N CW611N CW612N CW614N CW617N	16,0 - 18,0	2,0 - 3,0	2000 - 4000	0,5 - 1,2	H 110 max wall thickness 10,0mm	110 - 160	120 - 170	- 0,11	+/- 12%	2,0 mm/1000mm	+/- 50
			3,1 - 4,0							+/- 10%		
		18,1 - 30,0	2,0 - 3,0		0,6 - 1,8				- 0,13	+/- 12%		
			3,1 - 6,0							+/- 10%		
			6,1 - 8,0							+/- 9%		
		30,1 - 50,0	3,1 - 6,0		0,7 - 2,8				- 0,16	+/- 10%		+/- 100
			6,1 - 8,0							+/- 9%		
			8,1 - 10,0									
		50,1 - 63,5	3,1 - 6,0		0,8 - 4,0				- 0,30	+/- 10%		
			6,1 - 8,0							+/- 9%		
			8,1 - 10,0									
			> 10,1			H 090 min wall thickness 10,1mm	90 - 140	100 - 150		+/- 8%		
Ratio s/g max 18												
Minimum internal diameter10,0mm												

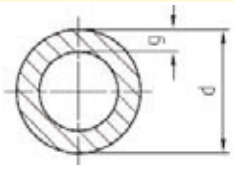


Grades		Dimensional range			Corners radius	Temper	Mechanical properties		Tolerances [mm]			
Symbol	Number	External dimensions [mm]	Wall thickness g [mm]	Length [mm]			Hardness HB	Hardness HV	External dimensions	Wall thickness g	Straightness	Length
CuZn36Pb2As CuZn35Pb1,5AlAs CuZn33Pb1,5AlAs CuZn38lAs	CW602N CW625N CW626N CW511L	16,0 - 18,0	2,0 - 3,0	2000 - 4000	0,5 - 1,2	H070	70-110	80-120	- 0,11	+/- 12%	2,0 mm/1000mm	+/- 50
			3,1 - 4,0							+/- 10%		
		18,1 - 30,0	2,0 - 3,0		0,6 - 1,8				- 0,13	+/- 12%		
			3,1 - 6,0							+/- 10%		
			6,1 - 8,0							+/- 9%		
		30,1 - 50,0	3,1 - 6,0		0,7 - 2,8				- 0,16	+/- 10%		+/- 100
			6,1 - 8,0							+/- 9%		
			8,1 - 10,0									
		50,1 - 63,5	3,1 - 6,0		0,8 - 4,0				- 0,30	+/- 10%		
			6,1 - 8,0							+/- 9%		
			8,1 - 10,0									
			> 10,1							+/- 8%		
Ratio s/g max 18												
Minimum internal diameter10,0mm												

Grades		Dimensional range			Corners radius	Temper	Mechanical properties		Tolerances [mm]			
Symbol	Number	External dimensions [mm]	Wall thickness g [mm]	Length [mm]			Hardness HB	Hardness HV	External dimensions	Wall thickness g	Straightness	Length
CuZn37Mn3Al2PbSi	CW713R	16,0 - 18,0	2,0 - 3,0	2000 - 4000	0,5 - 1,2	H 110 max wall thickness 10,0mm	110 - 160	120 - 170	- 0,11	+/- 12%	4,0 mm/1000mm	+/- 50
			3,1 - 4,0							+/- 10%		
		18,1 - 30,0	2,0 - 3,0		0,6 - 1,8				- 0,13	+/- 12%		
			3,1 - 6,0							+/- 10%		
			6,1 - 8,0							+/- 9%		
		30,1 - 50,0	3,1 - 6,0		0,7 - 2,8				- 0,16	+/- 10%		+/- 100
			6,1 - 8,0							+/- 9%		
			8,1 - 10,0									
		50,1 - 63,5	3,1 - 6,0		0,8 - 4,0				- 0,30	+/- 10%		
			6,1 - 8,0							+/- 9%		
			8,1 - 10,0									
			> 10,1			H 090 min wall thickness 10,1mm	90 - 140	100 - 150		+/- 8%		
Ratio s/g max 18												
Minimum internal diameter10,0mm												

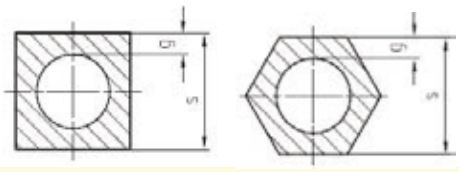


Grades		Dimensional range			Corners radius	Temper	Mechanical properties		Tolerances [mm]			
Symbol	Number	External dimensions [mm]	Wall thickness g [mm]	Length [mm]			Hardness HB	Hardness HV	External dimensions	Wall thickness g	Straightness	Length
CuZn40Mn1Pb1	CW720R	16,0 - 18,0	2,0 - 3,0	2000 - 4000	0,5 - 1,2	H 110 max wall thickness 10,0mm	110 - 160	120 - 170	- 0,11	+/- 12%	4,0 mm/1000mm	+/- 50
			3,1 - 4,0							+/- 10%		
		18,1 - 30,0	2,0 - 3,0		0,6 - 1,8				- 0,13	+/- 12%		
			3,1 - 6,0							+/- 10%		
			6,1 - 8,0							+/- 9%		
		30,1 - 50,0	3,1 - 6,0		0,7 - 2,8				- 0,16	+/- 10%		+/- 100
			6,1 - 8,0							+/- 9%		
			8,1 - 10,0									
		50,1 - 63,5	3,1 - 6,0		0,8 - 4,0				- 0,30	+/- 10%		
			6,1 - 8,0							+/- 9%		
			8,1 - 10,0									
			> 10,1			H 090 min wall thickness 10,1mm	90 - 140	100 - 150		+/- 8%		
Ratio s/g max 18												
Minimum internal diameter10,0mm												



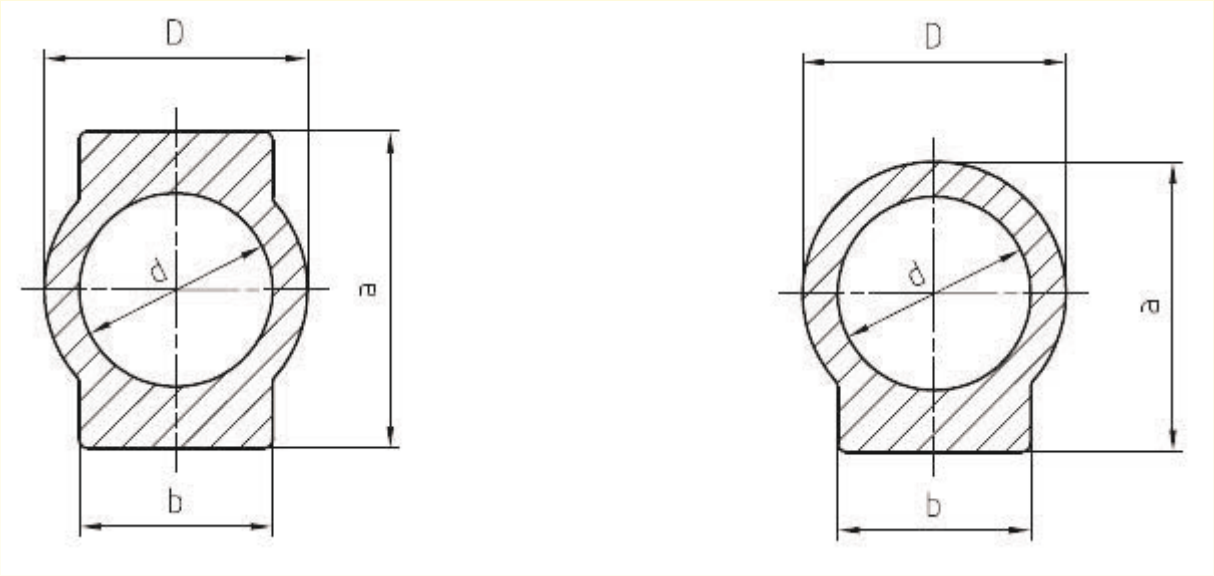
Extruded round tubes

Grades		Dimensional range			Temper	Mechanical properties	Tolerances [mm]				
Symbol	Number	External dimension d [mm]	Wall thickness g [mm]	Length [mm]			External dimension d	Outer diameter ovality	Wall thickness g	Straightness	Length
CuZn35Pb2 CuZn36Pb2As CuZn36Pb3 CuZn37Pb1 CuZn37Pb2 CuZn38Pb1 CuZn38Pb2 CuZn39Pb1 CuZn39Pb2 CuZn39Pb3 CuZn40Pb2 CuZn37Mn3Al2PbSi CuZn40Mn1Pb1 CuZn35Pb1,5AlAs CuZn33Pb1,5AlAs CuZn38lAs	CW601N CW602N CW603N CW605N CW606N CW607N CW608N CW611N CW612N CW614N CW617N CW713R CW720R CW625N CW626N CW511L	18,0 - 30,0	2,5 - 3,0	2000 - 4000	M	Without specified mechanical properties	+/- 0,31	Half of the permissible tolerance	+/- 12%	1,5 mm/1000mm	+/- 50
			3,1 - 6,0						+/- 10%		
			6,1 - 8,0						+/- 9%		
		30,1 - 50,0	2,5 - 3,0						+/- 12%		
			3,1 - 6,0						+/- 10%		
			6,1 - 8,0						+/- 9%		
			8,1 - 10,0								
		50,1 - 80,0	3,0 - 6,0				+/- 0,60		+/- 10%		+/- 100
			6,1 - 8,0						+/- 9%		
			8,1 - 10,0								
			> 10,1						+/- 8%		
		80,1 - 90,0	6,0	2000 - 4000			+/- 1,2	+/- 2,4	+/- 0,5	5 mm/1000mm	+/- 200
			7,0						+/- 0,6		
			8,0						+/- 0,7		
			10,0						+/- 0,9		
			12,0						+/- 1,1		
			15,0						+/- 1,3		
			17,0						+/- 1,4		
			20,0						+/- 1,6		
			22,0						+/- 1,8		
		90,1 - 120,0	8,0	1500 - 3000			+/- 1,6	+/- 2,9	+/- 0,7		Without exact length
			10,0						+/- 0,9		
			12,0						+/- 1,1		
			15,0						+/- 1,3		
			17,0						+/- 1,4		
			20,0						+/- 1,6		
			22,0						+/- 1,8		
			25,0						+/- 2,0		
			27,0						+/- 2,2		
			30,0						+/- 2,4		
		120,1 - 150,0	12,0	1000 - 2000			+/- 1,9	+/- 3,2	+/- 1,1		
			15,0						+/- 1,3		
			17,0						+/- 1,4		
			20,0						+/- 1,6		
			22,0						+/- 1,8		
			25,0						+/- 2,0		
			27,0						+/- 2,2		
			30,0						+/- 2,4		
			35,0						+/- 2,5		
			40,0						+/- 2,8		
		150,1 - 180,0	20,0	500 - 1500			+/- 2,2	+/- 3,5	+/- 1,6		
			22,0						+/- 1,8		
			25,0						+/- 2,0		
			27,0						+/- 2,2		
			30,0						+/- 2,4		
			35,0						+/- 2,5		
			40,0						+/- 2,8		
			45,0						+/- 3,1		
			50,0						+/- 3,5		
outer diameter ø 65,0mm ratio d/g max 18, outer diameter from ø 65,1mm to 120,0mm ratio d/g max 14, outer diameter over ø 120,1mm ratio d/g. max 10											
Minimum internal diameter12,0mm											



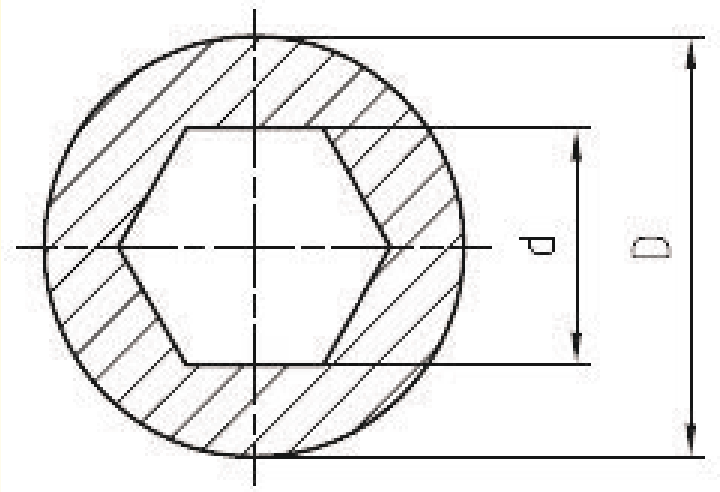
Extruded square and hexagonal tubes

Grades		Dimensional range			Temper	Mechanical properties	Tolerances [mm]				
Symbol	Number	External dimensions [mm]	Wall thickness g [mm]	Length [mm]			External dimensions	Outer diameter ovality	Wall thickness g	Straightness	Length
CuZn35Pb2 CuZn36Pb2As CuZn36Pb3 CuZn37Pb1 CuZn37Pb2 CuZn38Pb1 CuZn38Pb2 CuZn39Pb1 CuZn39Pb2 CuZn39Pb3 CuZn40Pb2 CuZn37Mn3Al2PbSi CuZn40Mn1Pb1 CuZn35Pb1,5AlAs CuZn33Pb1,5AlAs CuZn38lAs	CW601N CW602N CW603N CW605N CW606N CW607N CW608N CW611N CW612N CW614N CW617N CW713R CW720R CW625N CW626N CW511L	18,0 - 30,0	2,5 - 3,0	2000 - 4000	M	Without specified mechanical properties	+/- 0,31	Half of the permissible tolerance	+/- 12%	1,5 mm/1000mm	+/- 50
			3,1 - 6,0						+/- 10%		
			6,1 - 8,0						+/- 9%		
		30,1 - 50,0	2,5 - 3,0						+/- 12%		
			3,1 - 6,0						+/- 10%		
			6,1 - 8,0						+/- 9%		
			8,1 - 10,0								
		50,1 - 80,0	3,0 - 6,0				+/- 0,60		+/- 10%		+/- 100
			6,1 - 8,0						+/- 9%		
			8,1 - 10,0								
			> 10,1						+/- 8%		
		80,1 - 90,0	6,0	1500 - 3000			+/- 1,2	+/- 2,4	+/- 0,5	7 mm/1000mm	Without exact length
			7,0						+/- 0,6		
			8,0						+/- 0,7		
			10,0						+/- 0,9		
			12,0						+/- 1,1		
			15,0						+/- 1,3		
			17,0						+/- 1,4		
			20,0						+/- 1,6		
			22,0						+/- 1,8		
		90,1 - 120,0	8,0				+/- 1,6	+/- 2,9	+/- 0,7		
			10,0						+/- 0,9		
			12,0						+/- 1,1		
			15,0						+/- 1,3		
			17,0						+/- 1,4		
			20,0						+/- 1,6		
			22,0						+/- 1,8		
			25,0						+/- 2,0		
			27,0						+/- 2,2		
			30,0						+/- 2,4		
outer diameter of 65,0mm ratio s/g max 18, outer diameter from 65,1mm to 120,0mm ratio s/g max 14											
Minimum internal diameter12,0mm											

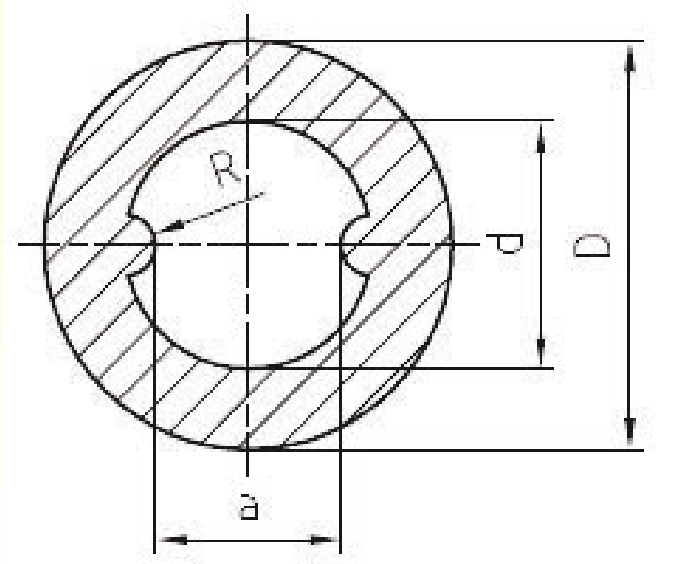


Drawn and extruded hollow profiles

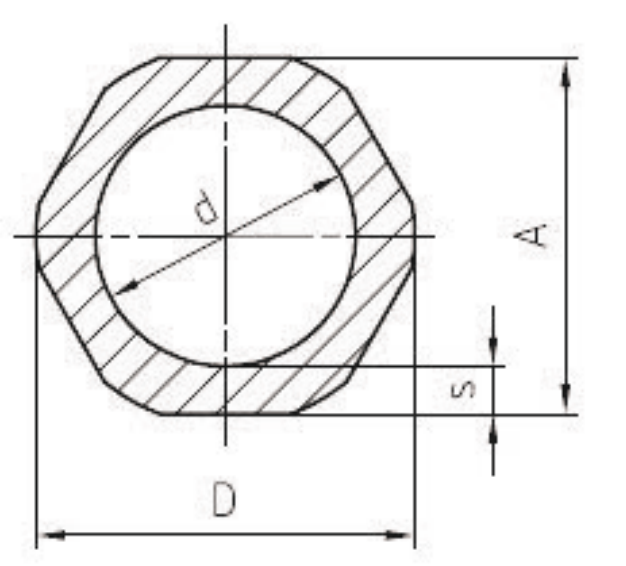
Type of profile	Diameter	Tolerances	Diameter	Tolerances	Dimension	Tolerances	Dimension	Tolerances
	D		d		a		b	
	[mm]							
C1	46	± 0,5	36	± 0,5	51	± 0,5	26	± 0,5
C2	39		30,5		50		26	
C3	39		30,5		42		26	
C4	31		23		34,5		26	
C5	38		30		40		26	
C6	38		30,3		42		25	
C6,5	37,5	+/- 0,1	30	+ 0,3	41	- 0,2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



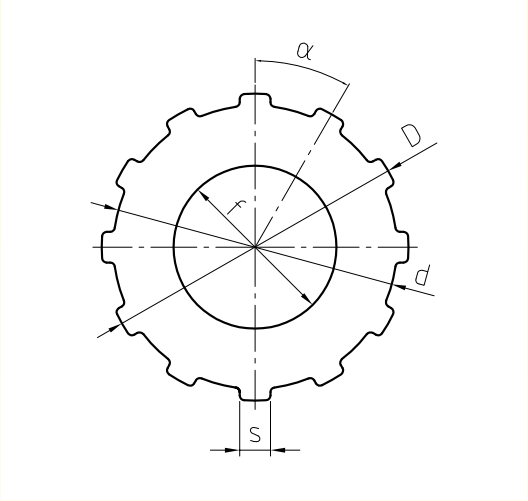
Type of profile	Diameter	Tolerances	Dimension	Tolerances
	D		d	
	[mm]			
A1	24	+/- 0,5	14	+/- 0,5
A2	30	+/- 0,6	19	+/- 0,5
A3	30	+/- 0,6	14	+/- 0,5
A4	38	+/- 0,8	19	+/- 0,5
A5	30	+/- 0,6	17	+/- 0,5
A6	34	+/- 0,6	14	+/- 0,5
A7	25	+/- 0,5	14	+/- 0,5
A8	31	+/- 0,6	17	+/- 0,5
A9	24	+/- 0,6	13	+/- 0,5
A10	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 profile	Diameter	Tolerances	Dimension	Tolerances	Dimension	Tolerances	Corners
	D		d		a		R
	[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						

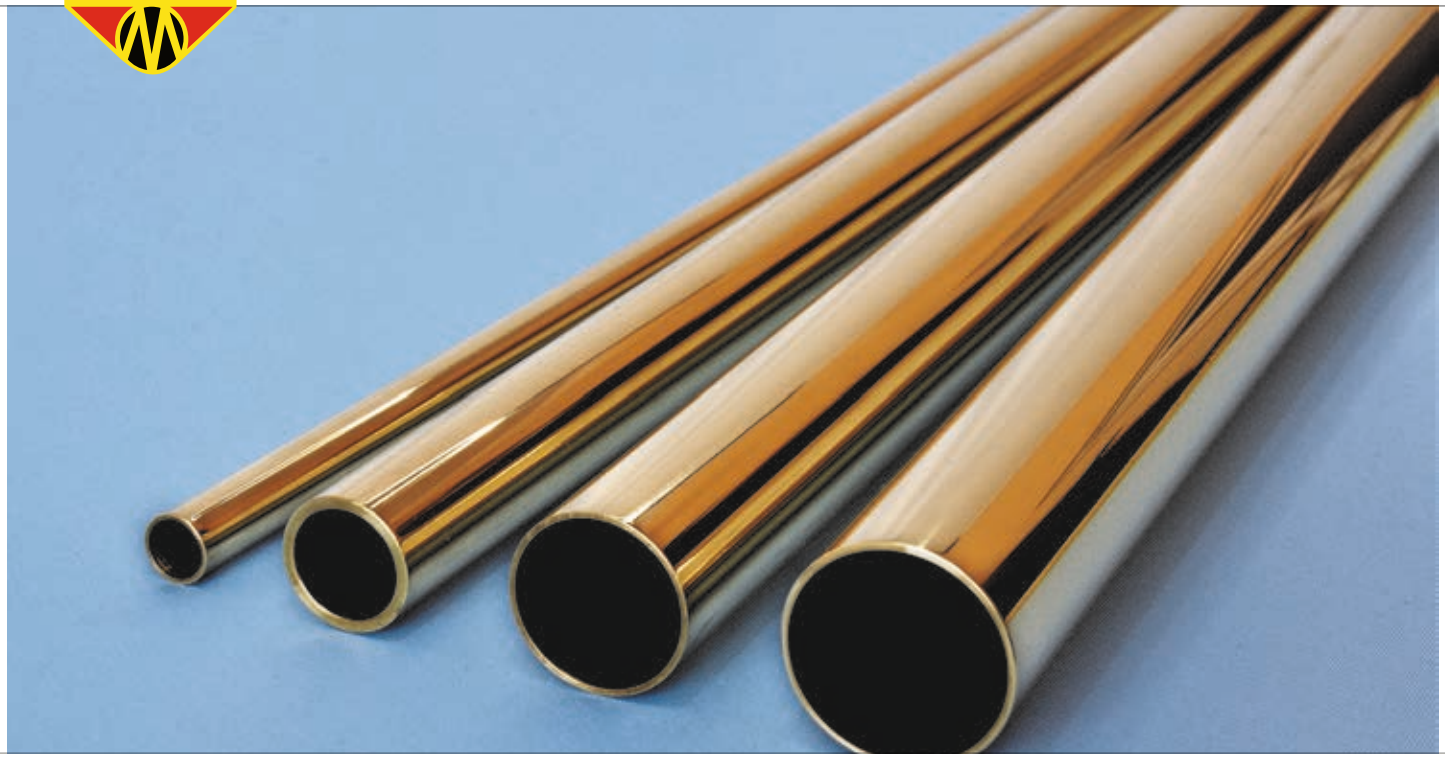


Lp.	Dimension of the tube [mm]				Weigh of 1 m [kg]
	A	s	d	D	
1	22	5,5	11	24	2,8
2	24	3	18	26,4	2,1
3	24	5,5	13	26,4	3,1
4	24	5	14	27	2,9
5	27	5	17	29,5	3,4
6	30	4	22	33,2	3,4
7	30	5	20	33,5	4
8	32	7	18	35	5,4
9	40	5,5	29	43,5	6,2
10	40	6,5	27	43,5	6,9
11	40	6	28	43,5	6,5
12	41	3	35	45,5	4,2
13	42,06	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; CuZn37Pb2; CuZn36Pb3; CuZn36Pb2As; CuZn36Pb1,5; CuZn35Pb2; CuZn35Pb1; CuZn38Pb1, CuZn39Pb0,5, CuZn37Mn3Al2PbSi, CuZn40Mn1Pb1; CuZn40Mn1Fe1;				
Other dimensions to be agreed					

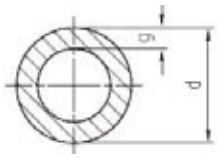


Type	Diameter	Tolerances	Dimension	Tolerances	Diameter	Tolerances	α	Dimension	Tolerances	cross-section
	D	D	d	d	f	f	[*]	S	S	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[mm]	[mm]	mm^2
E0	26	+/- 0,4	24	+/- 0,25	13,8	+/- 0,35	30	2,6	+/- 0,2	334
E1	30	+/- 0,4	27,8	+/- 0,25	17	- 0,6	45	2,6	+/- 0,2	402,8
E2	28	+/- 0,4	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
DECENTRISITY max 10% **Radius corners R=0,5mm**										
Gatunki	CuZn40Pb2; CuZn39Pb3; CuZn39Pb2; CuZn38Pb2; CuZn39Pb1,5; CuZn39Pb1; CuZn37Pb2; CuZn36Pb3; CuZn36Pb2As; CuZn36Pb1,5; CuZn35Pb2; CuZn35Pb1									

DZIEDZICE®



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 ⩽ 8.0 mm wall thickness 0.6 ⩽ 0.8 mm after prior arrangement

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

Extruded tubes:

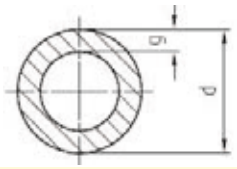
- outer diameter of rd 80 mm or less, length 2000-4000 mm with tolerance of ± 100 mm
- outer diameter bigger than rd 80 mm to 120 mm, inclusive length of 1500-3000 mm without specifying a close length
- outer diameter bigger than rd 120 mm to 180 mm, inclusive length of 1000-2000 mm without specifying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

Packing:

- wooden cases
- bundles of 500 kg

Application:

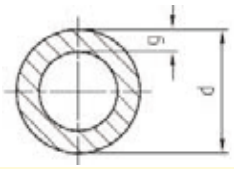
- elements of heating and cooling systems in the automotive industry
- elements of the lamps in the lighting industry
- decorative elements in buildings
- parts of sanitary fittings covered with decorative coatings



Drawn round unleaded brass tubes

Grades		Dimensional range			Temper	Mechanical properties			Tolerances [mm]			
Symbol	Number	External diameter d [mm]	Wall thickness g [mm]	Length [mm]		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
CuZn37	CW508L	8,0 - 10,0	0,75 - 0,99	4000-8000	R300	300	220*	45	+/- 0,06	+/- 15%	3,0 mm/1000mm	+ 10
			1,0 - 1,49							+/- 13%		
		10,1 - 20,0	0,75 - 0,99	4000-12000					+/- 0,08	+/- 15%		+ 20
			1,0 - 1,49							+/- 13%		
			1,50-2,0									
			2,51-3,0									
		20,1 - 30,0	1,0 - 1,49	4000-12000					+/- 0,12	+/- 13%		+ 10
			1,50-2,0									
			2,51-3,0									
		30,1 - 50,0	1,0 - 1,49	4000-8000					+/- 0,15	+/- 13%		+ 10
			1,50-2,0									
			2,51-3,0									
CuZn37	CW508L	8,0 - 10,0	0,75 - 0,99	4000-8000	R370	370	200	25	+/- 0,06	+/- 15%	3,0 mm/1000mm	+ 10
			1,0 - 1,49							+/- 13%		
		10,1 - 20,0	0,75 - 0,99	4000-12000					+/- 0,08	+/- 15%		+ 20
			1,0 - 1,49							+/- 13%		
			1,50-2,0									
			2,51-3,0									
		20,1 - 30,0	1,0 - 1,49	4000-12000					+/- 0,12	+/- 13%		+ 20
			1,50-2,0									
			2,51-3,0									
		30,1 - 50,0	1,0 - 1,49	4000-8000					+/- 0,15	+/- 13%		+ 10
			1,50-2,0									
			2,51-3,0									
CuZn37	CW508L	8,0 - 10,0	0,75 - 0,99	4000-8000	R440	440	320	10	+/- 0,06	+/- 15%	3,0 mm/1000mm	+ 10
			1,0 - 1,49							+/- 13%		
		10,1 - 20,0	0,75 - 0,99	4000-12000					+/- 0,08	+/- 15%		+ 20
			1,0 - 1,49							+/- 13%		
			1,50-2,0									
			2,51-3,0									
		20,1 - 30,0	1,0 - 1,49	4000-12000					+/- 0,12	+/- 13%		+ 20
			1,50-2,0									
			2,51-3,0									
		30,1 - 50,0	1,0 - 1,49	4000-8000					+/- 0,15	+/- 13%		+ 10
			1,50-2,0									
			2,51-3,0									

*max value

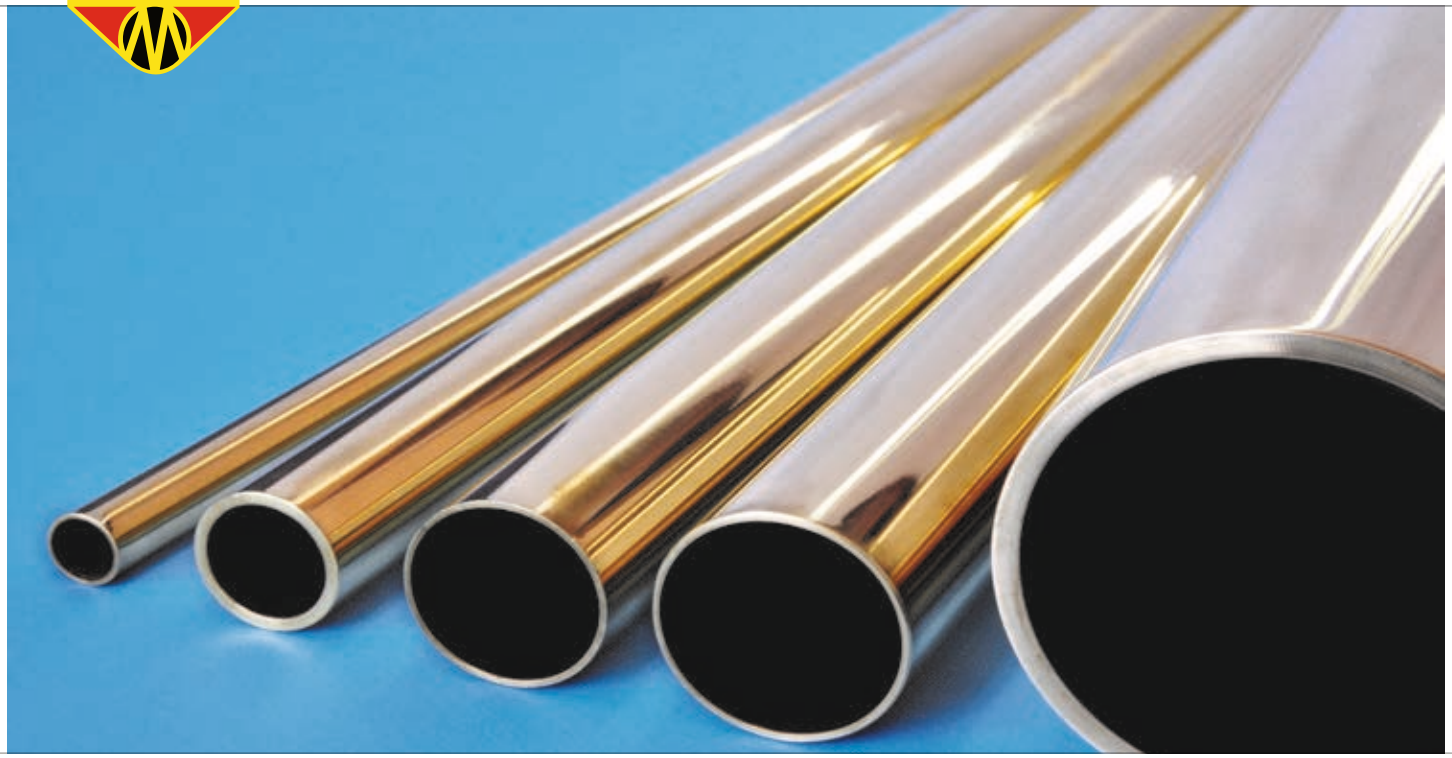


Grades		Dimensional range			Temper	Mechanical properties			Tolerances [mm]			
Symbol	Number	External diameter d [mm]	Wall thickness g [mm]	Length [mm]		Tensile Strength Rm N/mm2 (MPa) min	Yield Strength Rp02 N/mm2 (MPa) min	Elongation A100 mm % min	External diameter d	Wall Thickness g	Straightness	Length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

*max value

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

DZIEDZICE®



CONDENSER TUBES

CONDENSER TUBES

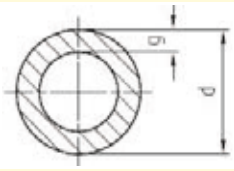
Due to the specific application of the heat exchanger tubes, including tubes for steam condensers in power plants, the choice of alloying elements requires special care. Elimination of metallic and non-metallic impurities allows to achieve a product that corresponds to all the standards and norms.

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

Grades		Dimensional rang			Temper	Mechanical properties			Tolerances [mm]			
Symbol	Number	External diameter [mm]	Wall thickness [mm]	Length [mm]		Tensile strength Rm N/mm2 (MPa) min	Yield strength Rp02 N/mm2 (MPa) min	Elongation A100 mm % min	External diameter [mm]	Wall thickness	Straightness	Length [mm]
CuZn20Al2As, C68700	CW702R	8,0 - 14,0	0,75 - 0,99	2000-8000	R340	340	120	55	-0,12	+/- 10%	3,0mm/1000mm	+ 5
			1,0 - 1,49									
		14,1 - 26,0	0,75 - 0,99	2000-14000					- 0,20			
			1,0 - 1,49									
			1,50-2,0									
			2,51-2,5									
		26,1 - 35,0	1,0 - 1,49	2000-14000					- 0,30			
			1,50-2,0									
			2,51-3,0									
CuZn20Al2As , C68700	CW702R	8,0 - 14,0	0,75 - 0,99	2000-8000	R390	390	150	45	-0,12	+/- 10%	3,0mm/1000mm	+ 5
			1,0 - 1,49									
		14,1 - 26,0	0,75 - 0,99	2000-14000					- 0,20			
			1,0 - 1,49									
			1,50-2,0									
			2,51-3,0									
		26,1 - 35,0	1,0 - 1,49	2000-14000					- 0,30			
			1,50-2,0									
			2,51-3,0									
CuZn28Sn1As , C44300	CW706R	8,0 - 14,0	0,75 - 0,99	2000-8000	R340	340	120	55	-0,12	+/- 10%	3,0mm/1000mm	+ 5
			1,0 - 1,49									
		14,1 - 26,0	0,75 - 0,99	2000-14000					- 0,20			
			1,0 - 1,49									
			1,50-2,0									
			2,51-2,5									
		26,1 - 35,0	1,0 - 1,49	2000-14000					- 0,30			
			1,50-2,0									
			2,51-3,0									
CuZn28Sn1As , C44300	CW706R	8,0 - 14,0	0,75 - 0,99	2000-8000	R390	390	150	45	-0,12	+/- 10%	3,0mm/1000mm	+ 5
			1,0 - 1,49									
		14,1 - 26,0	0,75 - 0,99	2000-14000					- 0,20			
			1,0 - 1,49									
			1,50-2,0									
			2,51-3,0									
		26,1 - 35,0	1,0 - 1,49	2000-14000					- 0,30			
			1,50-2,0									
			2,51-3,0									
CuZn30As	CW707R	8,0 - 14,0	0,75 - 0,99	2000-8000	R340	340	130	45	-0,12	+/- 10%	3,0mm/1000mm	+ 5
			1,0 - 1,49									
		14,1 - 26,0	0,75 - 0,99	2000-14000					- 0,20			
			1,0 - 1,49									
			1,50-2,0									
			2,51-3,0									
		26,1 - 35,0	1,0 - 1,49	2000-14000					- 0,30			
			1,50-2,0									
			2,51-3,0									

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 Ul. 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. 4.2**
Audit report no.:	**9120 P-0998/13**
Scope 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 Ul. 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

notified body TÜV NORD 0045 TÜV NORD Systems

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

M.Tarczyński
Notified body, registration no. 0045

Remark of validity:
Valid until 10.2016

TÜV NORD Systems GmbH & Co. KG
Zertifizierungsstelle für Druckgeräte
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D-22525 Hamburg/Germany

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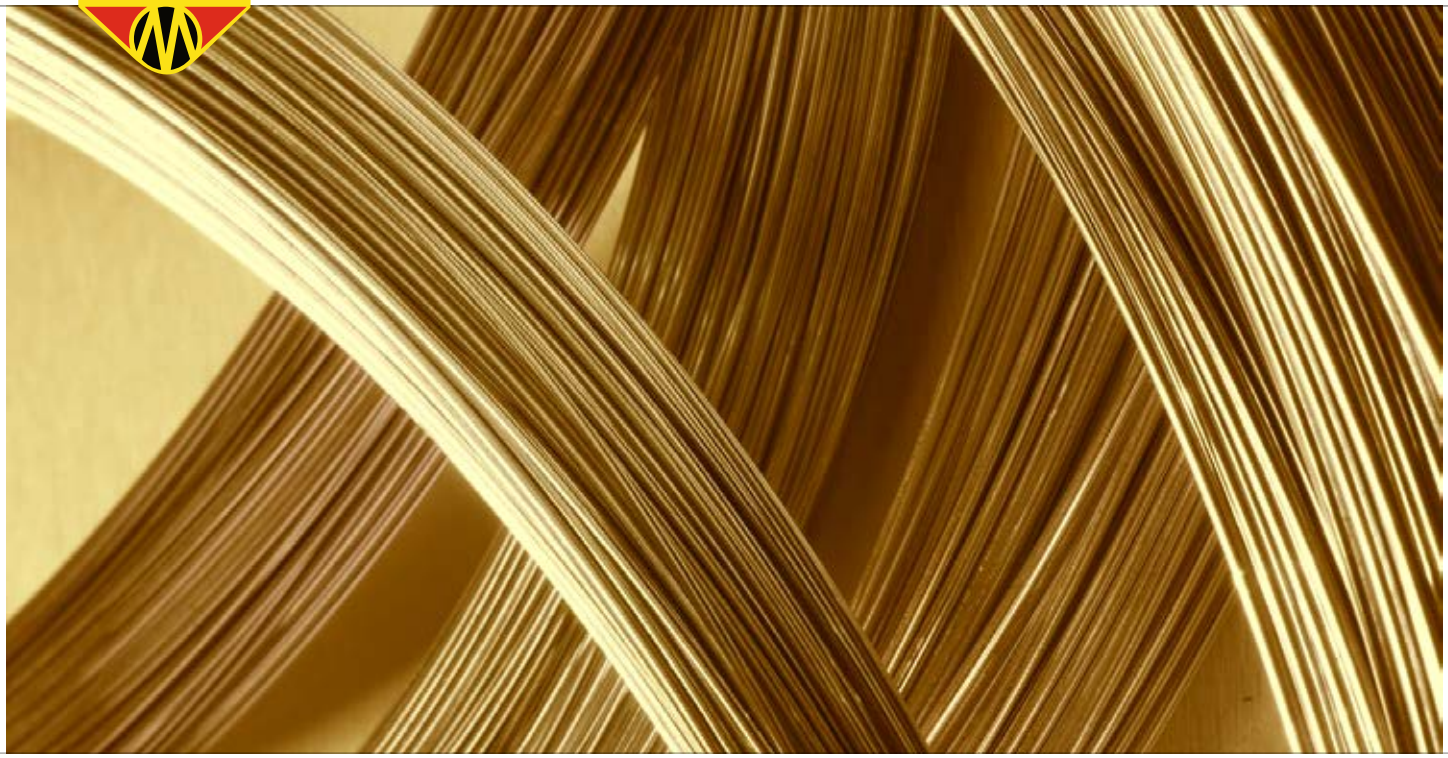
Fax +48 32 786 46 05
e-mail m.tarczynski@tuv-nord.pl

Tube Production Division, Extrusion press run out table



BRASS WIRE

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 :

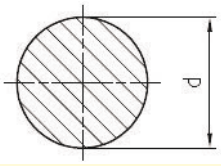
- size range 3,0 mm - 10, 0 mm
- coil weight max 1200 kg
- inner coil diameter 700 mm
- coil height 430 mm
- outside coil diameter depends on the weight of the coil

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

Packing: coils on pallets or in bulk

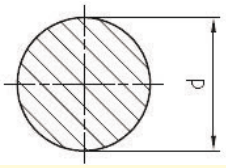
Application :

- 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)

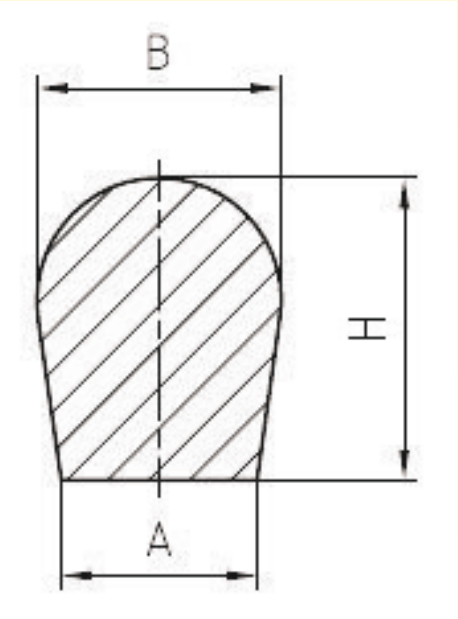


Round drawn wires acc to EN12166

WMD MS 20 (CuZn39Pb3) acc to EN 12166										
			Properties							Packing
External dimension d	Tolerances d		Temper	Rm min	Rm max	R 0,2 approx	A100 min	A11,3 min	A min	
[mm]		[mm]		[Mpa]	[Mpa]	[Mpa]			[%]	
2,0	class E	+0 / -0,04	R510	510		(400)	(4)			coils 50 - 70 kg (irregular coil structure)
2,2										
2,3										
2,5										
2,8										
3,0										
3,5										
4,0										
4,5		+0 / -0,05	R500	500		(390)		6		
4,8										
5,0										
5,1										
5,5										
6,0										
6,2		+0 / -0,06								
6,5										
7,0										
7,5										
8,0										
8,3			R490	490					8	
9,0										
4,8	class E	+0 / -0,05	R500	500		(390)		6		spools ok. 1000 kg
5,0										
5,1										
5,5										
6,0										
6,2		+0 / -0,06								
6,5										
7,0										
7,5										
8,0										
8,3			R490	490					8	
9,0										



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



Drawn profiles in circles

CW614N CuZn39Pb3 acc to EN 12166										
Symbol	Dimensions and tolerances						Properties			Form
	A	tol. A	**B**	tol. B	**H**	tol. H	Temper	Rm min	A11,3%	
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]		[Mpa]		
K-001	**3,8**	0,2	**4,8**	0,2	**6**	0,2	R420	420	8	coils 50 - 70 kg (irregular coil structure)
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				
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				
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				
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				
K-028	**5,08**	+/-0,05	**7,92**	+/-0,05	**9,04**	+/-0,05				
Other alloys possible after previous agreements.										

LEADED BRASS PROFILES

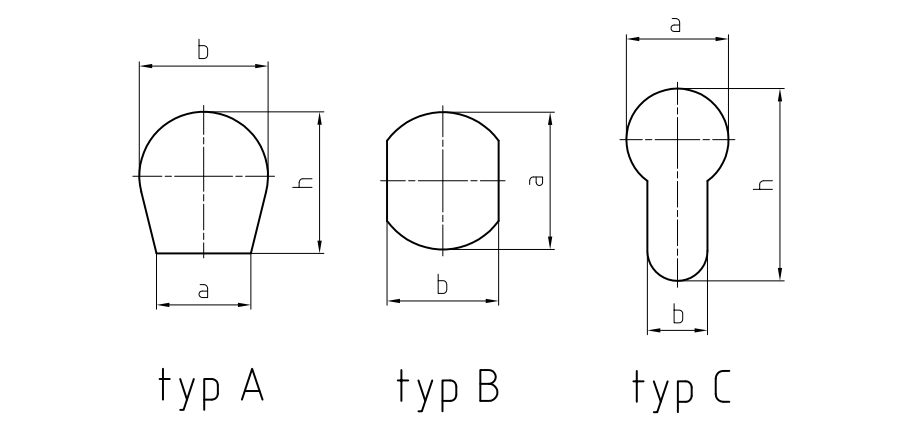
Profiles are produced according to costumer requirements in a wide range of dimensions, according to drawings. Profiles are utilized in many industries like key manufacturing, electronic industry and others.

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

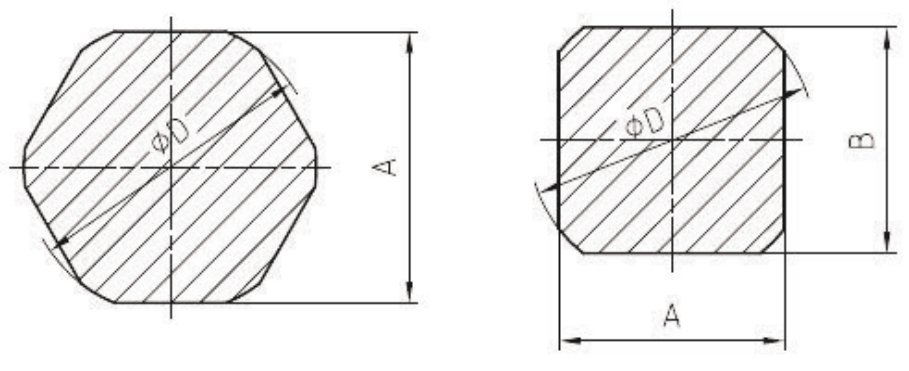
- M - no specific mechanical properties
- R430 - according to EN 12164, EN 12167 for the alloys CW614N, CW617N.

Surface: defined by manufacturing process .

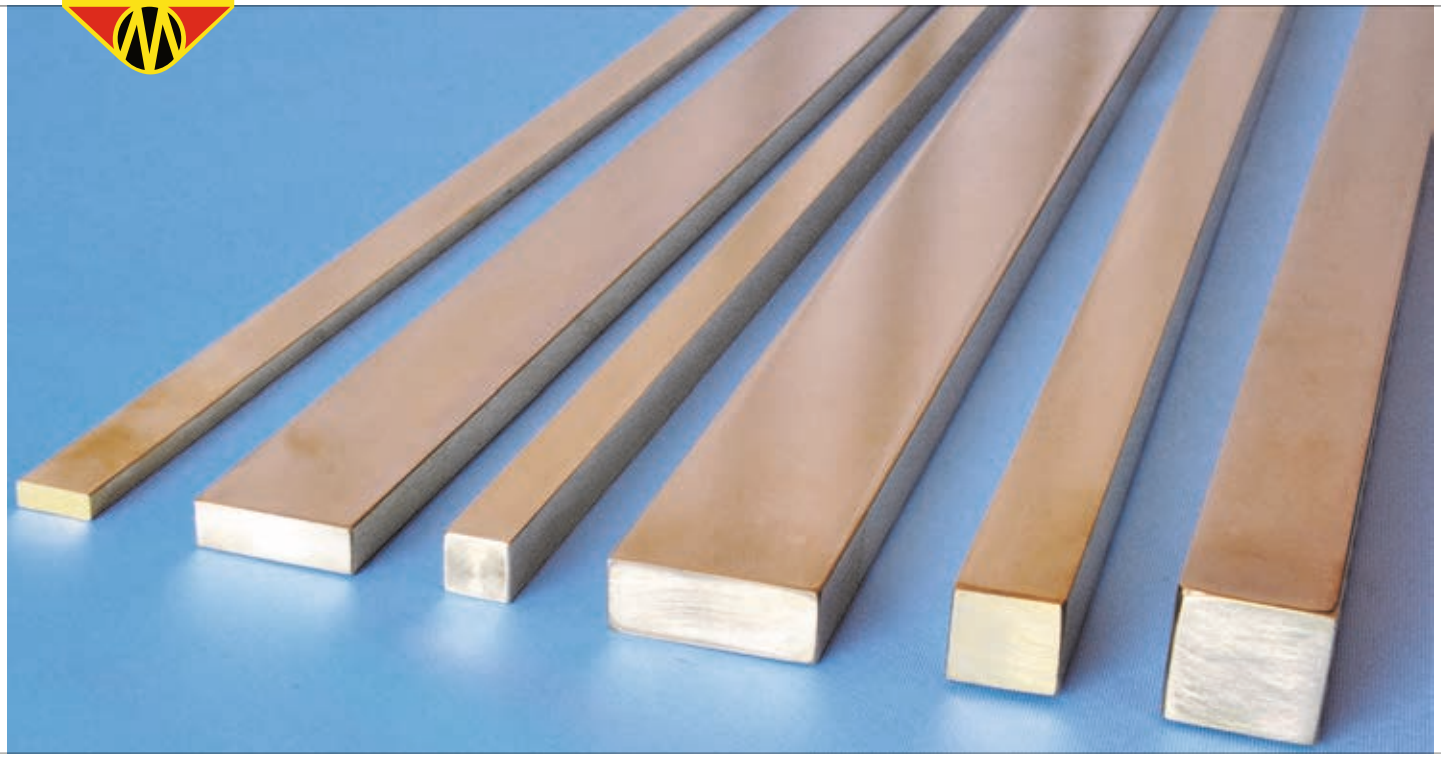
Dimensional charts shown further correspond to the EN standards.
Brass rods are also produced according to other norms.



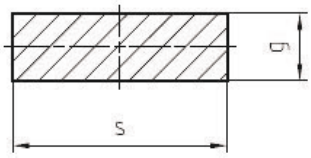
Grades		Symbol	Typ	Profile dimensions [mm]					
				a	tol. a	b	tol. b	h	tol. h
CuZn36Pb2As CuZn39Pb2 CuZn39Pb3 CuZn40Pb2	CW602N CW612N CW614N CW617N	K-021	B	f 6,0	+/- 0,05	5,0	+/-0,05	-	-
		K-022	C	17,0	+/-0,1	10,0	-0,1	33,0	-0,1
		K-024	B	f 7,8	+/-0,05	3,5	-0,2	-	-
		K-029	A	4,4	-0,15	4,4	-0,15	5,1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



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



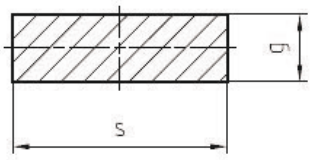
BRASS FLAT BARS



Drawn flat bars in straight lengths according to EN12167

Grade		Temper	Dimensional range		Mechanical properties				Tolerances (mm)		Corners radius	Straightness	Torsion	Length (mm)	Ends
Symbol	Number		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]					
CuZn39P3; CuZn40Pb2	CW614N; CW617N	M	6,0-18,0	3,0 - 6,0	Without specified mechanical properties				+/- 0,10	+/- 0,07	0,3-0,5	2 mm/m	1 mm/m	3000 +/-50	broken
				6,1-10,0						+/- 0,09	0,4-0,8				
				10,1 - 18,0						+/- 0,10	0,5-1,2				
			18,1-30,0	4,0 - 6,0					+/- 0,15	+/- 0,07	0,3-0,5		1,5 mm/m		cut off
				6,1-10,0						+/- 0,09	0,4-0,8				
				10,1 - 18,0						+/- 0,10	0,5-1,2				
				18,1 - 30,0						+/- 0,15	0,6-1,8				
			30,1-50,0	5,0 - 6,0					+/- 0,20	+/- 0,09	0,3-0,5		2 mm/m		
				6,1-10,0						+/- 0,10	0,4-0,8				
				10,1 - 18,0						+/- 0,12	0,5-1,2				
				18,1 - 30,0						+/- 0,15	0,6-1,8				
				30,1 - 40,0						+/- 0,20	0,7-2,8				
				40,1- 45,0							0,8-4,0				
			50,1-60,0	5,0 - 6,0					+/- 0,25	+/- 0,11	0,3-0,5		3 mm/m		
				6,1-10,0						+/- 0,12	0,4-0,8				
				10,1 - 18,0						+/- 0,15	0,5-1,2				
				18,1 - 30,0						+/- 0,20	0,6-1,8				
				30,1 - 40,0						+/- 0,25	0,7-2,8				
				40,1 - 45,0							0,8-4,0				
		R480 H130*	6,0-18,0	3,0 - 6,0	480	(330)	(5)	130*	+/- 0,10	+/- 0,07	0,3-0,5	2 mm/m	1 mm/m		broken
			18,1-30,0	4,0 - 6,0					+/- 0,15	+/- 0,07	0,3-0,5		1,5 mm/m		cut off
			30,1-50,0	5,0 - 6,0					+/- 0,20	+/- 0,09	0,3-0,5		2 mm/m		
			50,1-60,0	5,0 - 6,0					+/- 0,25	+/- 0,11	0,3-0,5		3 mm/m		
		R430 H110*	6,0-18,0	6,0-10,0	430	(200)	(15)	110*		+/- 0,09	0,4-0,8	2 mm/m	1mm/m		broken
				10,1 - 18,0						+/- 0,10	0,5-1,2				
			18,1-30,0	6,0-10,0						+/- 0,09	0,4-0,8		1,5 mm/m		cut off
				10,1 - 18,0						+/- 0,10	0,5-1,2				
				18,1 - 30,0						+/- 0,15	0,6-1,8				
			30,1-50,0	6,0-10,0						+/- 0,10	0,4-0,8		2 mm/m		
				10,1 - 18,0						+/- 0,12	0,5-1,2				
				18,1 - 30,0						+/- 0,15	0,6-1,8				
				30,1 - 40,0						+/- 0,20	0,7-2,8				
				40,1- 45,0							0,8-4,0				
			50,1-60,0	6,0-10,0						+/- 0,12	0,4-0,8		3 mm/m		
				10,1 - 18,0						+/- 0,15	0,5-1,2				
				18,1 - 30,0						+/- 0,20	0,6-1,8				
				30,1 - 40,0						+/- 0,25	0,7-2,8				
				40,1 - 45,0							0,8-4,0				

Applies only to temper of H *



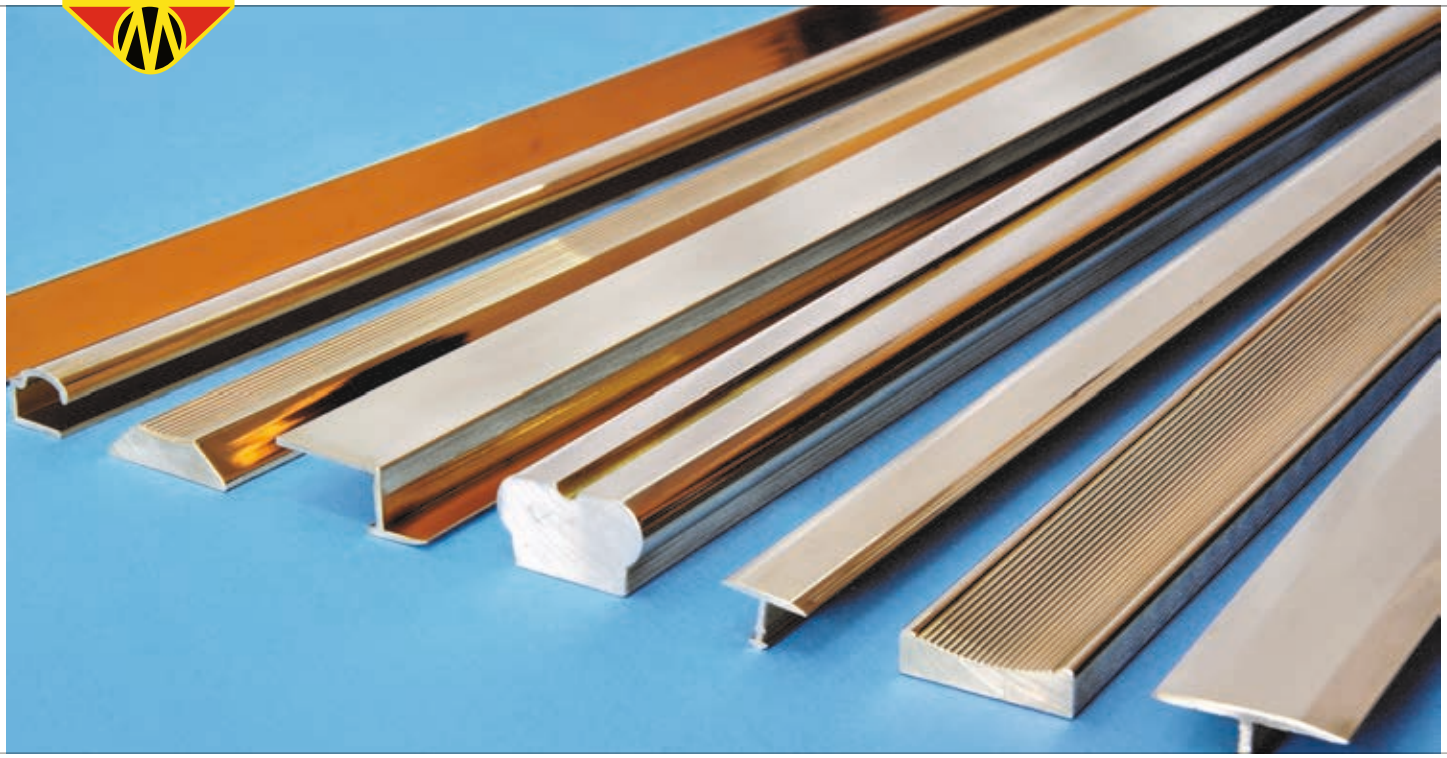
Extruded flat bars in straight lengths according to EN12167

Grade		Temper	Dimensional range		Mechanical properties	Tolerances (mm)		Corners radius	Straightness	Torsion	Length (mm)	Ends
Symbol	Number		Width s [mm]	Thickness g [mm]		Width s [mm]	Thickness g [mm]					
CuZn37 CuZn40 CuZn35Pb1 CuZn35Pb2 CuZn36Pb3 CuZn37Pb2 CuZn36Pb2As CuZn38Pb1 CuZn38Pb2 CuZn39Pb0,5 CuZn39Pb1 CuZn39Pb2 CuZn39P3 CuZn40Pb2 CuZn35Ni3Mn2AlPb CuZn37Mn3Al2PbSi CuZn40Mn1Pb1 CuZn40Mn2Fe1	CW508L CW509L CW600N CW601N CW603N CW606N CW602N CW607N CW608N CW610N CW611N CW612N CW614N CW617N CW710R CW713R CW720R CW723R	M	20,0-30,0	18,0 - 30,0	Without specified mechanical properties	+/- 0,33	+/- 0,33	0,3-0,5	6m m/m	3 mm/m	3000 +/-100	cut off
			30,1-50,0	6,0 - 10,0		+/- 0,62	+/- 0,27	0,4-0,8		4 mm/m		
				10,1 - 18,0			+/- 0,33	0,5-1,2				
				18,1 - 30,0			+/- 0,45	0,6-1,8				
				30,1 - 40,0			+/- 0,62	0,7-2,8				
				40,1 - 50,0				0,8-4,0				
			50,1-80,0	5,0 - 6,0		+/- 1,2	+/- 0,27	0,3-0,5		6 mm/m	3000 +/-200	
				6,1-10,0			+/- 0,33	0,4-0,8				
				10,1 - 18,0			+/- 0,45	0,5-1,2				
				18,1 - 30,0			+/- 0,52	0,6-1,8				
				30,1 - 40,0			+/- 0,74	0,7-2,8				
				40,1- 50,0				0,8-4,0				
				50,1 - 80,0			+/- 1,0					
			80,1-130	5,0 - 6,0		+/- 2,20	+/- 0,33	0,3-0,5		9 mm/m		
				6,1-10,0			+/- 0,45	0,4-0,8				
				10,1 - 18,0			+/- 0,52	0,5-1,2				
				18,1 - 30,0			+/- 0,74	0,6-1,8				
				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				1000-2000	

DZIEDZICE®

Copper Processing Plant, Production Hall

DZIEDZICE®



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

ALUMINIUM ALLOYS PROFILES

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:

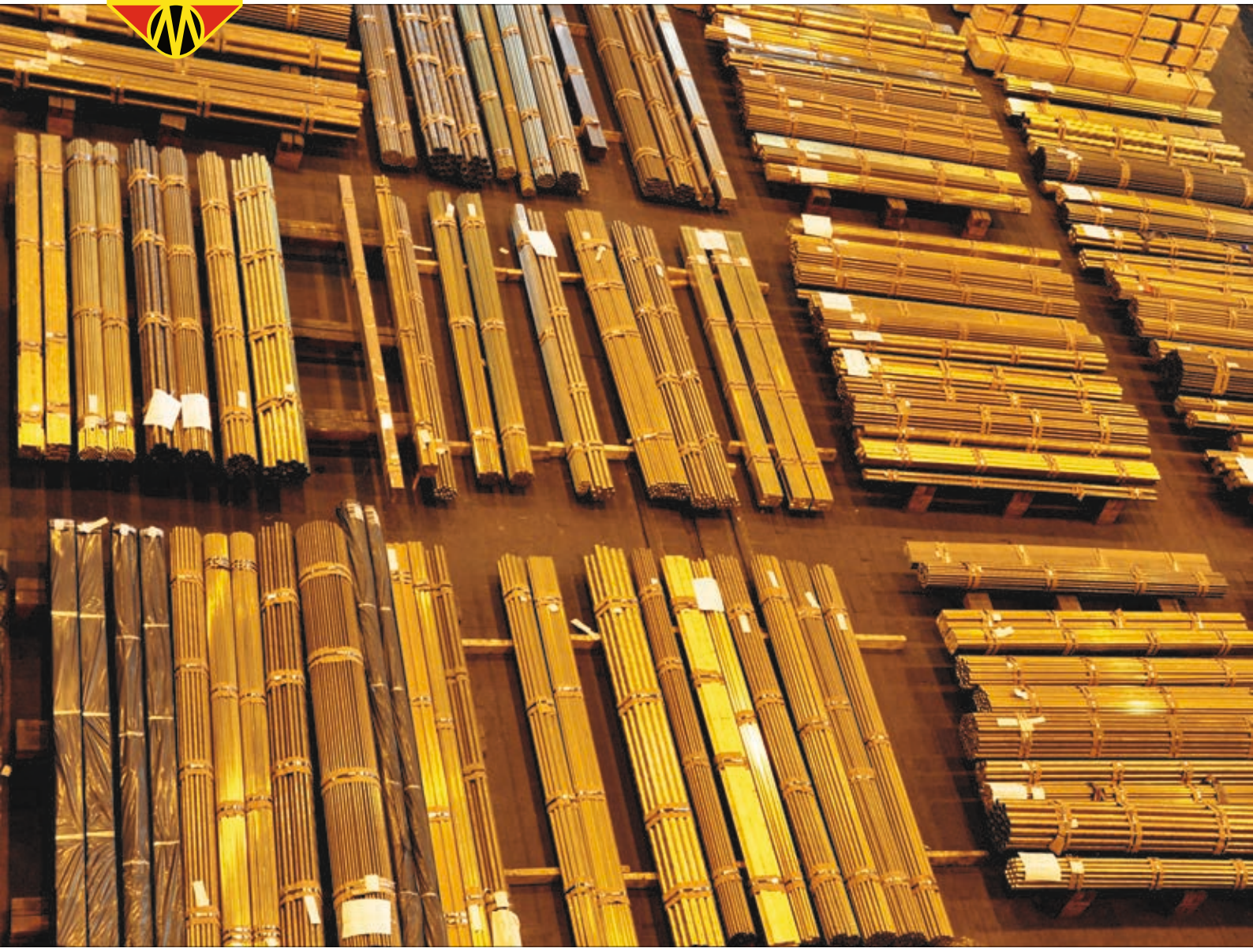
- full
- half-closed

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

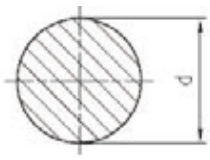
STOCK

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.

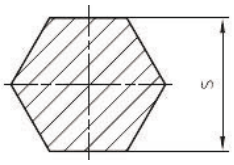
Stock composition is constantly replenished, allowing us to offer a wide range of dimensions .

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



Standard products manufactured in WMD

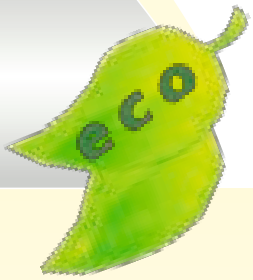
WMD MS 20 (CuZn39Pb3) acc to EN 12164										
						Properties				Packing
Dimensional range d	Tolerances d		Straightness	Length	Ends	Temper	Rm min	R 0,2 approx	A min	
[mm]		[mm]		[mm]			[Mpa]	[Mpa]	[%]	
2,0	h9	+0/-0,025	1 mm/m	3000 +/-50	broken	R500	500	(390)	8	Cases 500 kg
2,3										
2,5						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



WMD MS 20 (CuZn39Pb3) acc to EN 12164									
					Properties				Packing
Dimensional range s	Tolerancess		Straightness	Length	Ends	Temper	Rm min	R 0,2 approx	A min	
[mm]		[mm]		[mm]			[Mpa]	[Mpa]	[%]	
3,5	h11	+0/-0,08	2 mm/m	3000 +/-50	chamfered/ cut off	R500	500	(390)	8	Cases 500 kg
4,0										
4,5										
4,8										
5,0										
5,5										
6,0										
6,5		+0/-0,09			chamfered / sharpened					
7,0										
7,5										
8,0										
8,5										
9,0										
9,5										
10,0			1,5 mm/m							
10,5		+0/-0,11				R430	430	(250)	10	Bundles 500 kg
11,0										
11,5										
12,0										
13,0										
14,0										
15,0										
16,0										
17,0										
18,0										
19,0		+0/-0,13								
20,0										
21,0										
22,0										
23,0										
24,0										
25,0										
26,0										
27,0										
28,0										
29,0										
30,0										
31,0		+0/-0,16				M	Without specified mechanical properties			
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										
47,0										
48,0										
49,0										
50,0										
51,0-63,0		+0/-0,19	2 mm/m							

WMD MS 20 (CuZn39Pb3) acc to EN 12164										
						Properties				Packing
Dimensional range s	Tolerancess		Straightness	Length	Ends	Temper	Rm min	R 0,2 approx	A min	
[mm]		[mm]		[mm]			[Mpa]	[Mpa]	[%]	
3,5	h11	+0/-0,08	2 mm/m	3000 +/-50	chamfered / cut off	R500	500	(390)	8	Cases 500 kg
4,0										
4,5										
5,0										
5,5										
6,0										
7,0		+0/-0,09			chamfered / sharpened					
8,0										
8,5										
9,0										
10,0			1,5 mm/m							
11,0		+0/-0,11				R430	430	(250)	10	Bundles 500 kg
12,0										
13,0										
13,5										
14,0										
15,0										
16,0										
17,0										
18,0										
19,0		+0/-0,13								
20,0										
22,0										
24,0										
25,0										
26,0										
27,0										
28,0										
29,0										
30,0										
30,5		+0/-0,16								
32,0										
35,0-50,0						M	Without specified mechanical properties			

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%:

- CW509L (CuZn40) - C28500acc to ASTM
  - 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
- CW510L (CuZn42) - C28000 acc to ASTM
  - 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%

- CW602N (CuZn36Pb2As)
- CW617N (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

DZIEDZICE®

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
CuZn35Ni3Mn2AlPb	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.
6. 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

Lloyd's Register
LRQA

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 1996
Current Certificate:	1st May 2014
Certificate Expiry:	30th April 2017

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

UKAS
MANAGEMENT
SYSTEMS
001

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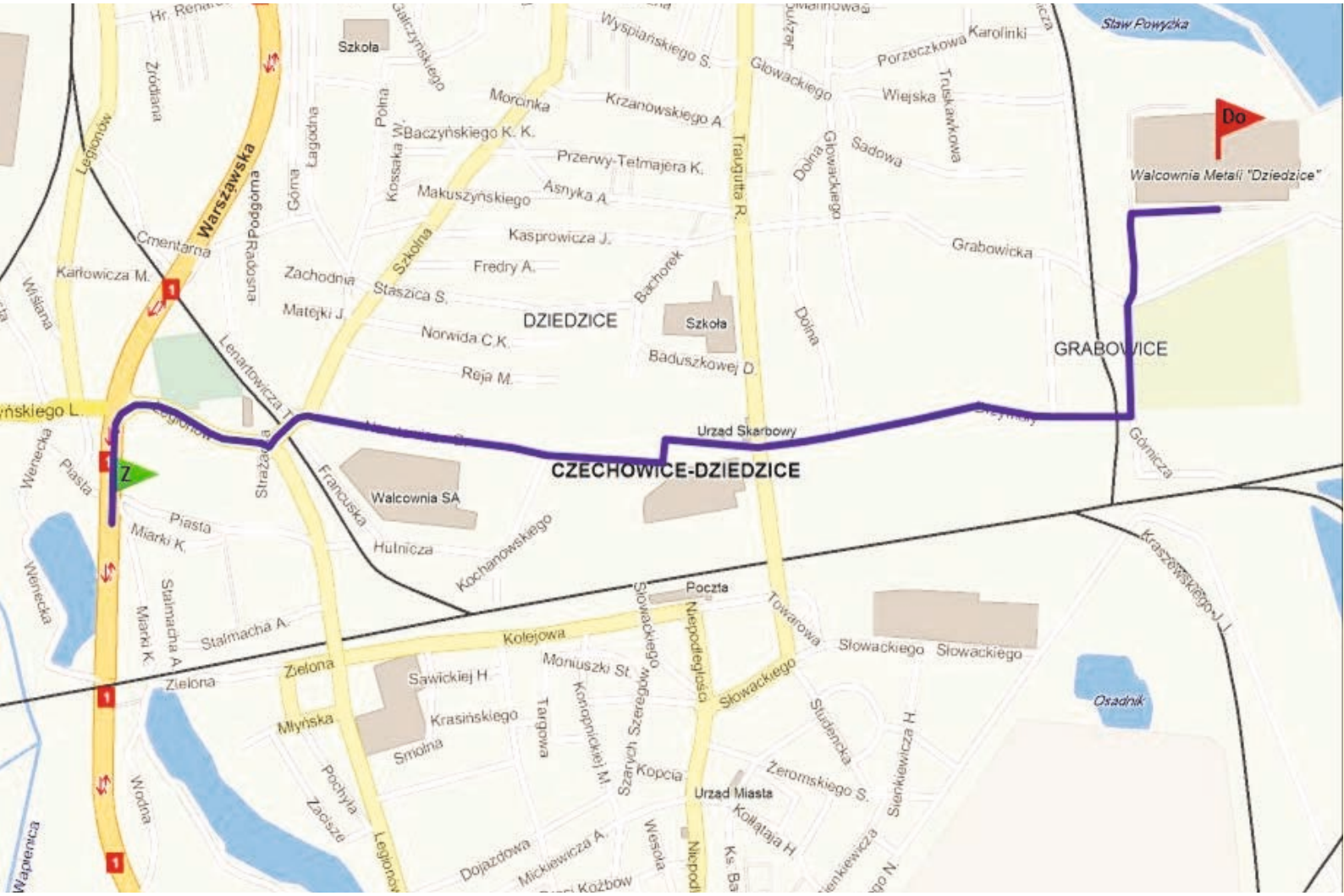
MEASURE CONVERSION TABLE

	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

CONTACTS



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