
sarbak

sarbak

The fortress of honor with its production and of trust with its quality

www.sarbak.com.tr

Sarbak Metal

Our company will continue to exist as an internationally leading company with activities carried out in the field of non-ferrous metal brass production by extending to many sectors from automotive to industry.

We are renewing our experience and accumulation in this day and age when the world continues to grow fast and the needs renew themselves every day.

The satisfaction of you, our valuable customers, is a must for us while serving with our innovative approaches in the brass industry with our experienced technical team and engineering staff who are fully equipped and renew themselves every day.

Even in the smallest project of our company, every precaution has been taken for the health and safety of our employees.

In carrying out all these activities, with the understanding that every source may end someday, it is our primary duty to adopt and disseminate sustainable environmental consciousness.

With an understanding of quality, customer-focused approach and ensuring our employees' health and safety, we are happy to say that we are doing needs to be done in our activity field and we are always ready to take more responsibility in order to provide a livable future for our children.

Andon ARAKELYAN

Since 1976 Sarbak Metal;

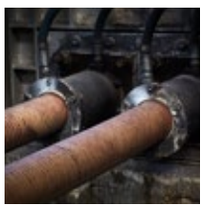
Sarbak Metal, which was established in a shop of 5 m2 in Perşembe Pazarı in Istanbul Karaköy and which plays an important role in the development of Turkish industry, has become one of the biggest companies in the sector with its new factory established in 2002 in Çerkezköy Organize Sanayi Bölgesi on 21 thousand m2 area.

In its first years, Sarbak Metal started rod production by applying cold drawing to the ingots, which were obtained by smelting the metal in crucible furnaces and pouring to permanent molds, that were heated in fuel oil heaters and extrusion ed in manually controlled extrusion press with 750 ton leverage and limited functions, in the chain type drawing machine.

Sarbak Metal, which adopts sustainable development and customer satisfaction as principle and keeps up with the developing technology, has started production with induction melting and continuous casting, induction annealing, extrusion in presses with 2.250 and 2.200 tons of pressure, and cold drawing in combined automatic machines In the new plant which started its activity in 2002 in Çerkezköy, it has doubled its production with the latest technology and reached 5000 tons / month capacity. With the new investments it made on the factory in 2014, it increased its production capacity to 8.000 tons / month.

In 1976, Mr. Andon Arakelyan, our esteemed founder and Chairman of the Board of Directors, started off with a dream. SARBAK METAL is actually a complete success story. We can not deny the dedication of our founder who loves his work and produces brass material as if each time he is bringing a new life to the World. At this point of SARBAK METAL, not only his self-sacrificing work but also his entrepreneurial and innovative spirit played an important role. He saw the risks, assessed them, continued on his path by taking risks. Instead of giving up in difficult times, he overcome the risks by showing each colleague how to become one. The desire to produce better with the tendencies of having the best machines and providing the most equipped personnel employment have brought SARBAK METAL to the present.

As Henry Ford says, "If you need a machine and you do not buy it, you have already paid for it."



Sarbak and Innovation

Our goal is to make people's lives easier, better, healthier and more beautiful with our technology. As Sarbak Metal A.Ş, we have established our innovation strategy to meet the needs of our customers with the increasingly qualified brass materials with the developing technology by using our knowledge and experience from past to present.

The driving factors of innovation at Sarbak Metal are both internal and external sources. Ideas and opinions of employees at every level within the company are transformed into product innovation, process innovation and customer focused innovation applications by evaluating them. Sarbak Metal also uses the results of research and development activities carried out with universities for innovation applications, the information acquired from various consulting services and the technology transfers that are acquired through commercial agreements..

Our Innovation Mission

We place innovation culture in Sarbak Metal and have it adopted by all of our staff. We determine the current and future needs of our customers and to produce such products it brings the necessary technology and talents to Sarbak Metal.

Our Innovation Goals

- In order to minimize the problems encountered during our customers' manufactures, customer specific alloys and technologies are being developed.
- To create a new market for Sarbak Metal by introducing lead-free brass alloys, superior properties of the product and its being environment friendly.
- To replace the efficiency of our production technology with the new generation machine park to provide 10% energy in order to reduce production costs and environmental impacts.

Export

Our company, which has started export in 1994, is in the first place of its product class in Turkey's exports and this success is crowned with the stars of exports awards that are presented by İMMİB (Istanbul Mine and Metals Exporters Association) every year. It exports 40% of its production to countries in many different geographies, mainly European Union countries.

Both our company and our country are actively represented by our foreign trade department on international platforms, at meetings, in associations. Our factory welcomed the members of the International Wrought Copper Council (IWCC) and the Organization of European Copper Alloy Ingot Makers (OECAM). It contributes to the development of our industry, the introduction and solution of problems, and most importantly the recognition of Turkey's copper alloys sector by the World by taking responsibilities at various levels of IWCC and OECAM organizations. Our company has been working in Istanbul Chamber of Industry and Istanbul Copper and Brass Industries Association Board of Directors for many years and takes part in all necessary work for solution by monitoring the sectoral problems day by day. For the purpose of improving the exports of our industry, we are working on the URGE project which is formed jointly with IDDMİB in the activities of the Association.

We follow developments in the world one by one, we participate in many international symposiums, conferences and meetings and we are inform our sector about the gain we receive there by posting it on our web site or by sharing it with our colleagues in NGOs that we work.

While living the rightful pride of being one of the few producers in the world in the production of new generation lead-free brass, the secret of increase in the exports of these alloys every year compared to the previous year is that making the right presentation of our products at the fairs and meetings we attended as well as our active role in the development of these alloys and our knowledge.

We are always pleased to assist our colleagues as much as we can in all aspects of our business, both in terms of foreign trade and sectoral issues.

Integrated Management System

Our policy as Sarbak Metal, is to determine the current and future product needs and requirements of our customers and to bring these technologies and talents to Sarbak Metal to produce such products by using the resources we have in the most efficient way through an efficient IMS (Integrated Management System) supported by ERP, with the participation of all our employees and an innovation-oriented value system.

All the QMS (Quality Management System) - EMS (Environmental Management System) - OHSAS (Occupational Health and Safety) - ISMS (Information Security Management System) legislation, to keep up to date with the new developments of the Integrated Management System (IMS) which we have established in order to observe the benefit of all the elements we affect, especially our employees, to establish a good and effective communication channel with the authorities, suppliers, subcontractors, non-governmental organizations, local residents, the whole community and other stakeholders and to carry out the necessary activities to increase the competence in our employees' QMS, IMS, OHSAS and ISMS, we will keep all our wastes under control and reduce harmful wastes as much as possible and eliminate the ones that are not recovered and we will be able to use energy, raw materials and natural resources efficiently and keep the IMS open to public inspection, we want to ensure operational safety in all the factors stemming from our activity, protect our employees against all kinds of oppression, comply with all the ethical rules we interact with, In the scope of ISMS (Information Security Management System), we will ensure the security of the institutions and organizations we serve and ensure the security of the information assets we use for the services we provide, With in the scope of the QMS, we ensure that customer needs and expectations are met at the lowest cost and with in the desired delivery period with the surplus and reliability continuity. In order to achieve these objectives, we are committed to being in harmony with all of our employees and organizations we work with. We respect for everything. We declare and undertake to develop our systems established in line with the objectives we have determined together with the IMS, continuously and in a timely manner, by adding our technology and our ability.

Quality Management System

Quality is our guide in our products and services. Our policy is to ensure that our products comply with all relevant standards with quality, performance and reliability. There is a well-defined quality target to achieve this goal, which is known to all units and the necessary work is fulfilled. Each Sarbak Metal A.Ş. employee tries to do his/her job in a timely, correct manner that does not need to be corrected later. Quality is the duty of everyone in this sense. Our aim is to meet customer needs and expectations with the lowest cost and within the required delivery time and to provide continuity in quality and reliability.

Occupational Health and Safety Management

Our company which produces brass in nonferrous metals sector, continues to exist by accepting the awareness of environmental protection and Occupational Health and Worker Safety issues as the first step of its works in every stage of its activity.

"Sustainable environment", "safe working environment", "keeping people in the forefront" are mottos that determine our road map under the changing needs, evolving technologies, challenging competition conditions.

With all legal requirements in mind, we carry out our production activities, in connection with non-written policies of our facility and our culture but most importantly with the purpose of leaving a livable world for our children, who are the guarantee of our future.

PRODUCTS

Extrusion and Cold Drawing

Extruded Rods

Cold Drawn Rods

Profiles and Bars

Hollow Rods

Cold Drawn Coils

Continuous Casting

Ingots

Billets

Extrusion and Cold Drawing

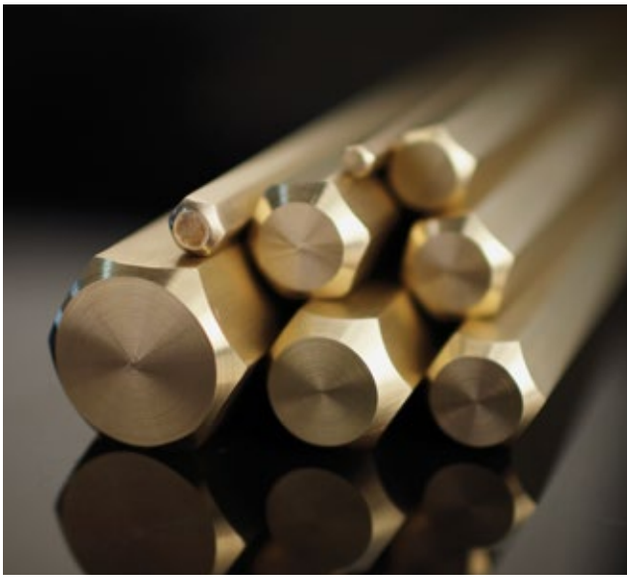
In our extrusion and cold drawing department, cold drawn rods for efficient machining, extruded rods for hot forging, profiles and bars, hollow bars and cold drawn coils are produced.

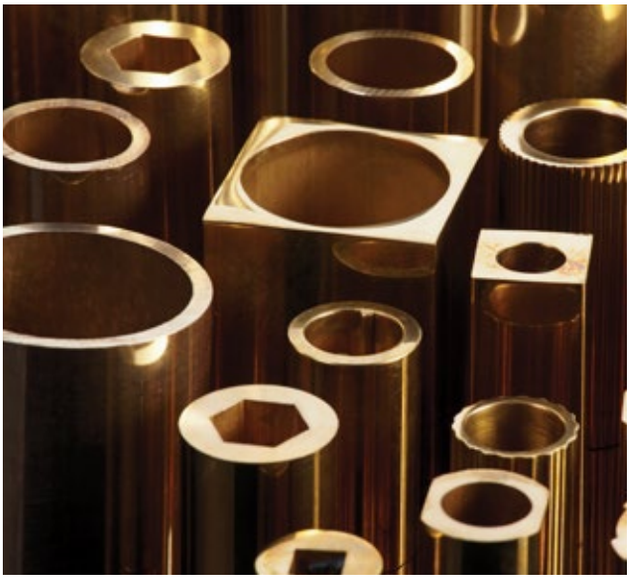
Major sectors and areas of use; Construction, automotive, gas, food, health, aviation, electrical, electronics, plumbing, drinking water products, accessories, fasteners. Our products comply with ROHS II and REACH Directives. Our production is carried out within the framework of quality, environment and work safety rules.

We also have compatible production for drinking water applications according to UBA hygienic list and 4MS

Our production is realized in compliance with European Norm (EN) and American Norm (ASTM) as standard

Different norm and alloy demands that come from our customers are examined and produced by the units.





Extruded Rods

Extruded rods are products that manufactured according to EN 12165 European Standard for hot forging processes.

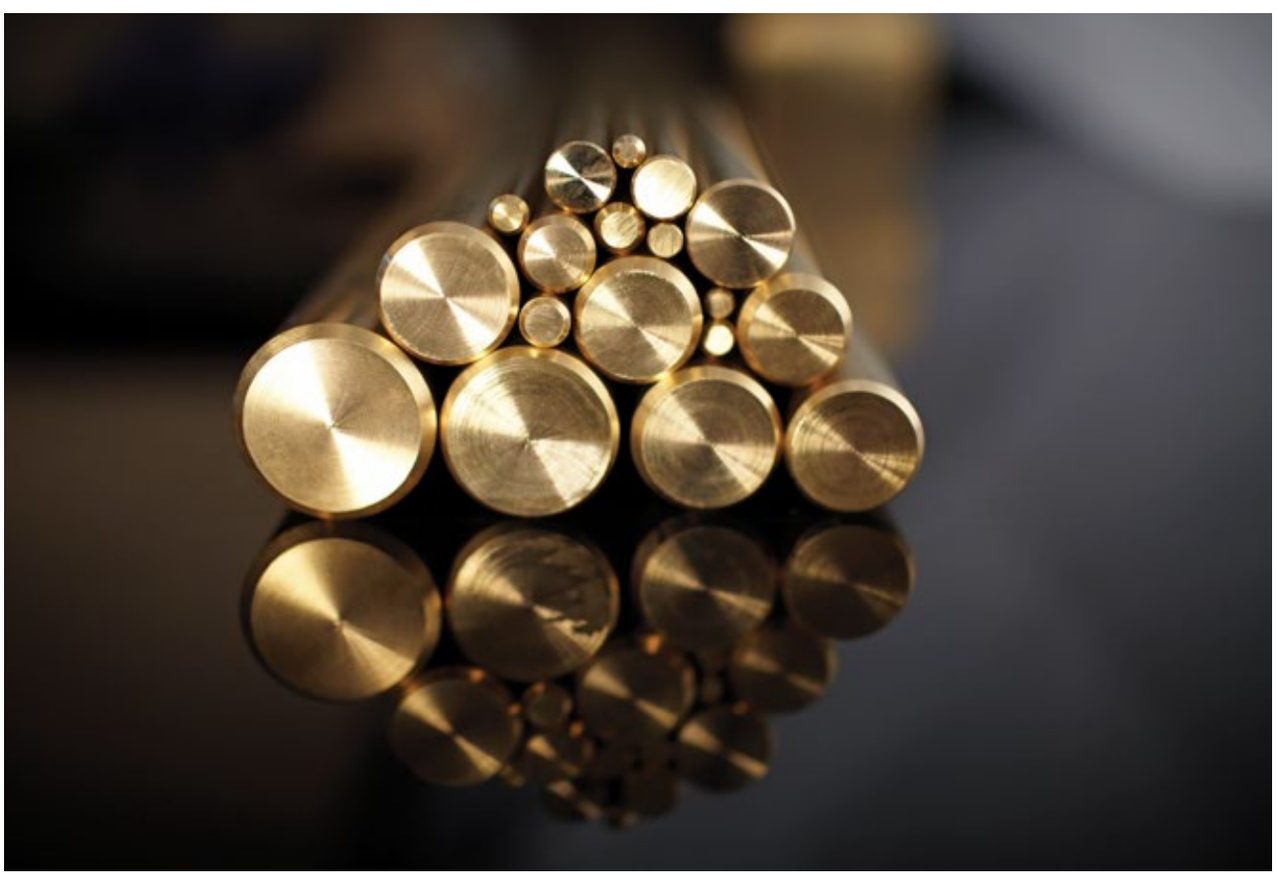
ALLOYS			
Product Code	**EN Sembol**	**EN No**	**ASTM**
Ecobrass	CuZn21Si3P	CW724R	C69300
S509-S509DW	CuZn40	CW509L	C27450
S510-S510DW	CuZn42	CW510L	C28500
S511-S511DW	CuZn38As	DW511L	C27453
S614-S614DW	CuZn39Pb3	CW614N	C38500
S617-S617DW	CuZn40Pb2	CW617N	C38000
S602	CuZn36Pb2As	CW602N	C35330
S625	CuZn35Pb1,5AlAs	CW625N	-
S626	CuZn33Pb1,5AlAs	CW626N	-
S608	CuZn38Pb2	CW608N	-
S612-S612DW	CuZn39Pb2	CW612N	C37700
S709	CuZn32Pb2AsFeSi	CW709R	-
S713	CuZn37Mn3Al2PbSi	CW713R	C67420

TOLERANCES			
Standard		**EN 12165**	
Nominal Diameter		**Tolerances**	
Over	**Up to and including**	**Class A**	**Class B**
5	6	-	-
6	10	±0,25	±0,14
10	13	±0,25	±0,14
13	18	±0,25	±0,14
18	20	±0,30	±0,17
20	23	±0,30	±0,17
23	26	±0,30	±0,17
26	30	±0,30	±0,17
30	50	±0,60	±0,20
50	55	±0,70	±0,37
55	65	±0,70	±0,37
65	80	±0,70	±0,37
80	120	±2	-
120	140	±2,5	-

PRODUCTION RANGES

Designation				Cold Drawn		Extruded	Cold Drawn Polygons		Extruded Polygons
Standards				Diameter (mm)			Width Across-flats (mm)		
Product Code	EN Symbol	EN No	ASTM	Min	Max	Max	Min	Max	Max
S614	CuZn39Pb3	CW614N	C38500	6	80	140	6	55	100
S617	CuZn40Pb2	CW617N	C38000	6	80	140	6	55	100
S602	CuZn36Pb2As	CW602N	C35330	10	80	140	10	55	100
S608	CuZn38Pb2	CW608N	-	6	80	140	6	55	100
S612	CuZn39Pb2	CW612N	C37700	8	80	140	8	55	100
S603	CuZn36Pb3	CW603N	C36000	10	80	140	10	55	100
Ecobrass	CuZn21Si3P	CW724R	C69300	10	80	140	10	55	100
S509	CuZn40	CW509L	C27450	6	80	140	6	55	100
S510	CuZn42	CW510L	C28500	6	80	140	6	55	100
S511	CuZn38As	CW511L	C27453	10	80	140	10	55	100
S625	CuZn35Pb1,5AlAs	CW625N	-	10	80	140	10	55	100
S626	CuZn33Pb1,5AlAs	CW626N	-	10	80	140	10	55	100
S709	CuZn32Pb2AsFeSi	CW709R	-	8	80	140	8	55	100
S713	CuZn37Mn3Al2PbSi	CW713R	C67420	8	80	140	8	55	100

Over than 55 mm polygons and over than 80 mm round rods are produced without straightness process.



Cold Drawn Rods

Cold drawn rods are produced according to EN 12164 European Standard. They are high precision products suitable for efficient chip removal in free machining process.

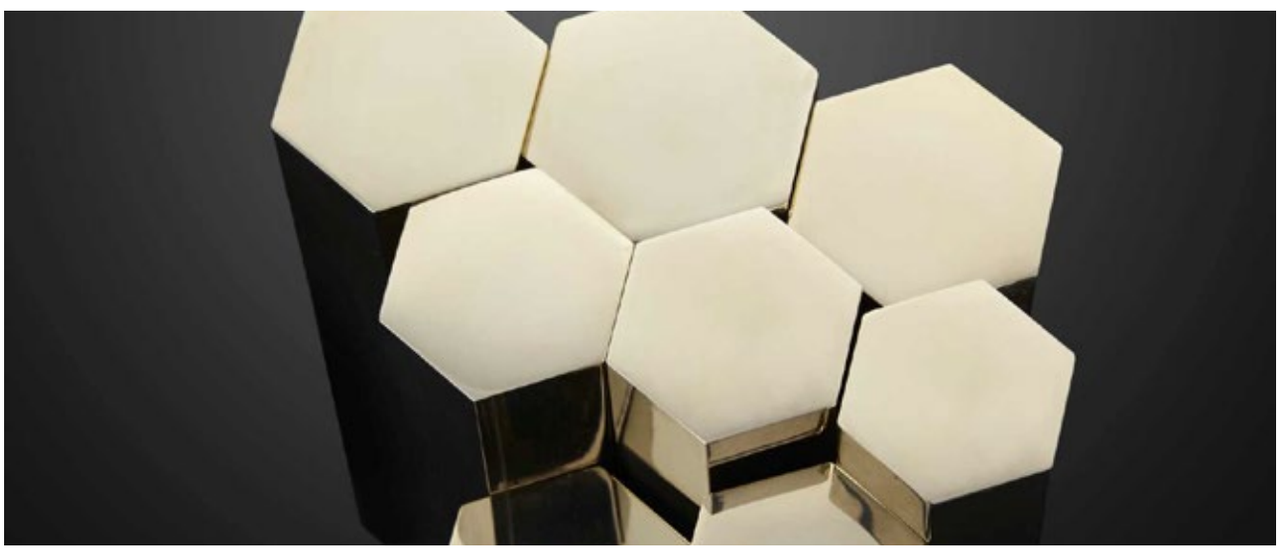
ALLOYS			
Product Code	**EN Symbol**	**EN No**	**ASTM**
Ecobrass	CuZn21Si3P	CW724R	C69300
S509-S509DW	CuZn40	CW509L	C27450
S510-S510DW	CuZn42	CW510L	C28500
S511-S511DW	CuZn38As	DW511L	C27453
S603-S603DW	CuZn36Pb3	CW603N	C36000
S614-S614DW	CuZn39Pb3	CW614N	C38500
S617-S617DW	CuZn40Pb2	CW617N	C38000
S602	CuZn36Pb2As	CW602N	C35330
S625	CuZn35Pb1,5AlAs	CW625N	-
S626	CuZn33Pb1,5AlAs	CW626N	-
S608	CuZn38Pb2	CW608N	-
S612-S612DW	CuZn39Pb2	CW612N	C37700
S709	CuZn32Pb2AsFeSi	CW709R	-
S713	CuZn37Mn3Al2PbSi	CW713R	C67420

PRODUCTION RANGES									
Designation				**Cold Drawn**		**Extruded**	**Cold Drawn Polygons**		**Extruded Polygons**
Standards				**Diameter** (mm)			**Width Across-flats** (mm)		
Product Code	**EN Symbol**	**EN No**	**ASTM**	**Min**	**Max**	**Max**	**Min**	**Max**	**Max**
S614	CuZn39Pb3	CW614N	C38500	6	80	140	6	55	100
S617	CuZn40Pb2	CW617N	C38000	6	80	140	6	55	100
S602	CuZn36Pb2As	CW602N	C35330	10	80	140	10	55	100
S608	CuZn38Pb2	CW608N	-	6	80	140	6	55	100
S612	CuZn39Pb2	CW612N	C37700	8	80	140	8	55	100
S603	CuZn36Pb3	CW603N	C36000	10	80	140	10	55	100
Ecobrass	CuZn21Si3P	CW724R	C69300	10	80	140	10	55	100
S509	CuZn40	CW509L	C27450	6	80	140	6	55	100
S510	CuZn42	CW510L	C28500	6	80	140	6	55	100
S511	CuZn38As	CW511L	C27453	10	80	140	10	55	100
S625	CuZn35Pb1,5AlAs	CW625N	-	10	80	140	10	55	100
S626	CuZn33Pb1,5AlAs	CW626N	-	10	80	140	10	55	100
S709	CuZn32Pb2AsFeSi	CW709R	-	8	80	140	8	55	100
S713	CuZn37Mn3Al2PbSi	CW713R	C67420	8	80	140	8	55	100

Over than 55 mm polygons and over than 80 mm round rods are produced without straightness process.

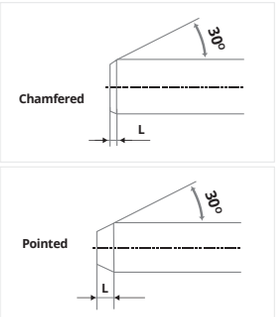
TOLERANCES

Standard		EN 12164		
Nominal Diameter and Width Across- flats		Round Rod		Hexagonal, Square Rods
Over	Up to and including	Class A	Class B	Rod
5	6	0 -0,05	0 -0,03	0 -0,08
6	10	0 -0,06	0 -0,036	0 -0,09
10	13	0 -0,07	0 -0,043	0 -0,11
13	18	0 -0,07	0 -0,043	0 -0,11
18	20	0 -0,08	0 -0,52	0 -0,013
20	23	0 -0,08	0 -0,52	0 -0,013
23	26	0 -0,08	0 -0,52	0 -0,013
26	30	0 -0,08	0 -0,52	0 -0,013
30	50	0 -0,16	-	0 -0,016
50	55	0 -0,019	-	0 -0,019
55	65	0 -0,19	-	-
65	80	0 -0,19	-	-



INDICATIVE SHAPED ENDS DIMENSIONS

Nominal Diameter or Width Across-flats		Type A-Chamfer Length (L)		Type B-Point Lenght (L)	
Over	Up to and including	Min	Max	Min	Max
5	10	0,2	1,5	2	7
10	20	0,2	2	3	10
20	30	0,2	3	4	12



Unless otherwise specified by the buyer, the shape of the ends of products larger than 30 mm is up to the supplier.
Over than 55 mm polygons and over than 65 mm round rods are produced without shaped ends.
**Dimensions are in millimeters (mm).*

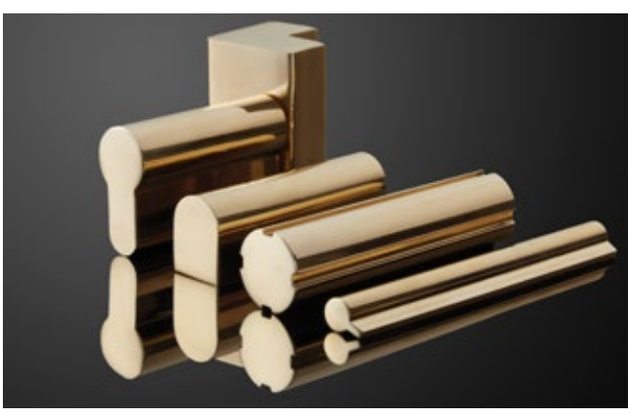
Profiles and Bars

Profiles and Bars are produced according to customer requirements in special sizes and forms with many years of production experience according to EN 12167 European standard.

Production for profiles and bars is divided into two parts as extruded or cold drawn according to the required dimensional tolerances and mechanical properties.

ALLOYS			
Product Code	**EN Symbol**	**EN No**	**ASTM**
Ecobrass	CuZn21Si3P	CW724R	C69300
S509-S509DW	CuZn40	CW509L	C27450
S510-S510DW	CuZn42	CW510L	C28500
S511-S511DW	CuZn38As	DW511L	C27453
S603-S603DW	CuZn36Pb3	CW603N	C36000
S614-S614DW	CuZn39Pb3	CW614N	C38500
S617-S617DW	CuZn40Pb2	CW617N	C38000
S602	CuZn36Pb2As	CW602N	C35330
S625	CuZn35Pb1,5AlAs	CW625N	-
S626	CuZn33Pb1,5AlAs	CW626N	-
S608	CuZn38Pb2	CW608N	-
S612-S612DW	CuZn39Pb2	CW612N	C37700
S709	CuZn32Pb2AsFeSi	CW709R	-
S713	CuZn37Mn3Al2PbSi	CW713R	C67420

EN 12167 - TOLERANCES ON WIDTH AND THICKNESS OF BAR							
Nominal Width		**Tolerance on Width**	**Tolerance on Thickness for Range of Thickness**				
Over	Up to and inc.		Over **5** up to and **including 6**	Over **6** up to and **including 10**	Over **10** up to and **including 18**	Over **18** up to and **including 30**	Over **30** up to and **including 50**
6 Inc.	18	±0,10	±0,07	±0,09	±0,10	-	-
18	30	±0,15	±0,07	±0,09	±0,10	±0,15	-
30	50	±0,20	±0,09	±0,10	±0,12	±0,15	±0,20
50	70	±0,25	±0,11	±0,12	±0,15	±0,20	±0,25



AVAILABLE RECTANGULAR MEASURES

Size (mm)	Weight (kg/m)	Size (mm)	Weight (kg/m)	Size (mm)	Weight (kg/m)	Size (mm)	Weight (kg/m)
8 x 6	0,403	23 x 8	1,546	32 x 12	3,226	45 x 20	7,560
9 x 6,5	0,491	23 x 10	1,932	32 x 18	4,838	45 x 25	9,450
9,28 x 7,6	0,592	25 x 6	1,260	33 x 9	2,495	46 x 16	6,182
10 x 6	0,504	25 x 8	1,680	33,5 x 10	2,814	46 x 26	10,046
10 x 8	0,672	25 x 10	2,100	35 x 8	2,352	50 x 8	3,360
10,8 x 9,8	0,889	25 x 12	2,520	35 x 10	2,940	50 x 10	4,200
12 x 6,5	0,655	25 x 15	3,150	35 x 12	3,528	50 x 12	5,040
12 x 8	0,806	25 x 20	4,200	35R1 x 18R1	5,292	50 x 15	6,300
12 x 10	1,008	25,4 x 9,53	2,033	35 x 15	4,410	50 x 20	8,400
12,7 x 9,53	1,017	25,4 x 12,7	2,710	35 x 20	5,880	50 x 25	10,500
14 x 10	1,176	25,4 x 15,88	3,388	35 x 25	7,350	50 x 30	12,600
14 x 12,5	1,470	25,4 x 19,05	4,065	37 x 20	6,216	50 x 35	14,700
14,6 x 5,8	0,711	26 x 22	4,805	38 x 15,86	5,063	50 x 40	16,800
15 x 8	1,008	28 x 6	1,411	38,1 x 19,05	6,097	50,8 x 19,05	8,129
15 x 10	1,260	28.6 x 12,68	3,046	40 x 8	2,688	50,8 x 22,23	9,486
15 x 12	1,512	30 x 8	2,016	40 x 10	3,360	50,8 x 25,4	10,839
17 x 12	1,714	30 x 10	2,520	40 x 12	4,032	60 x 8	4,032
17,8 x 12,6	1,884	30 x 12	3,024	40 x 15	5,040	60 x 9	4,536
19 x 16	2,554	30 x 15	3,780	40 x 20	6,720	60 x 10	5,040
19,05 x 9,53	1,525	30 x 20	5,040	40 x 25	8,400	60 x 12	6,048
19,05 x 12,7	2,032	30 x 20,2	5,090	40 x 30	10,080	60 x 15	7,560
19,7 x 9,7	1,605	30 x 25	6,300	44,45 x 19,05	7,113	60 x 20	10,080
20 x 8	1,344	30 x 28	7,056	45 x 8	3,024	60 x 25	12,600
20 x 10	1,680	31,75 x 15,88	4,235	45 x 10	3,780	60 x 30	15,120
20 x 12	2,016	32 x 8	2,150	45 x 12	4,536	60 x 40	20,160
20 x 15	2,520	32 x 8,32	2,236	45 x 15	5,670	70 x 20	11,760

Hollow Rods

Hollow Rods are produced according to EN 12168 European Standard.

It is enable to less tool wear, less material consumption and metal loss by decreasing drilling and processing costs to the lowest.

Stress relieving process is an indispensable part of hollow rod production. After the hollow rod production stress relieving process is applied as a standard process.

ALLOYS			
Product Code	**EN Symbol**	**EN No**	**ASTM**
Ecobrass	CuZn21Si3P	CW724R	C69300
S509-S509DW	CuZn40	CW509L	C27450
S510-S510DW	CuZn42	CW510L	C28500
S511-S511DW	CuZn38As	DW511L	C27453
S603-S603DW	CuZn36Pb3	CW603N	C36000
S614-S614DW	CuZn39Pb3	CW614N	C38500
S617-S617DW	CuZn40Pb2	CW617N	C38000
S602	CuZn36Pb2As	CW602N	C35330
S625	CuZn35Pb1,5AlAs	CW625N	-

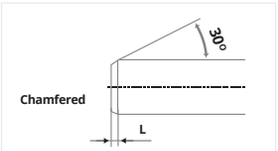
PRODUCTION RANGES													
Designation				**Cold Drawn**		**Extruded**	**Cold Drawn Polygons**		**Extruded Polygons**	**Round and Polygons**			
Standards				**External Diameter** (mm)			**Width Across-flats** (mm)			**Internal Diameter** (mm)		**Wall Thickness** (mm)	
Product Code	**EN Symbol**	**EN No**	**ASTM**	**Min**	**Max**	**Max**	**Min**	**Max**	**Max**	**Min**	**Max**	**Min**	**Max**
S614	CuZn39Pb3	CW614N	C38500	23	80	80	22	74	77	13	59	3	25
S617	CuZn40Pb2	CW617N	C38000	23	80	80	22	74	77	13	59	3	25
S602	CuZn36Pb2As	CW602N	C35330	23	80	80	22	74	77	13	59	4	25
S608	CuZn38Pb2	CW608N	-	23	80	80	22	74	77	13	59	4	25
S612	CuZn39Pb2	CW612N	C37700	23	80	80	22	74	77	13	59	4	25
S603	CuZn36Pb3	CW603N	C36000	23	80	80	22	74	77	13	59	4	25
Ecobrass	CuZn21Si3P	CW724R	C69300	23	80	80	22	74	77	13	59	4	25
S509	CuZn40	CW509L	C27450	23	80	80	22	74	77	13	59	3	25
S510	CuZn42	CW510L	C28500	23	80	80	22	74	77	13	59	3	25
S511	CuZn38As	CW511L	C27453	23	80	80	22	74	77	13	59	4	25
S625	CuZn35Pb1,5AlAs	CW625N	-	23	80	80	22	74	77	13	59	4	25
S626	CuZn33Pb1,5AlAs	CW626N	-	23	80	80	22	74	77	13	59	4	25

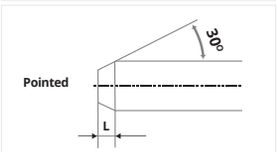
Over than 55 mm polygons and over than 80 mm round rods are produced without straightness process.

STANDARD		EN 12168					
Nominal External Diameter or Width Across-flats		**Tolerances on Diameter or Width Across-flats**			**Tolerance on Hole Round**		**Tolerance on Hole Hexagon**
Over	Up to and inc.	**Class A**	**Class B**	**Class C**	**Class A**	**Class B**	-
5	6	-	-	-	-	-	-
6	10	-	-	-	-	-	-
10	13	-	-	-	-	-	-
13	18	-	-	-	±0,35	-	+0,70 -0
18	20	-	-	-	±0,42	-	+0,84 -0
20	23	-	-	-	±0,42	±0,17	+0,84 -0
23	26	-	0 -0,21	-	±0,42	±0,17	+0,84 -0
26	30	-	0 -0,21	0 -0,13	±0,42	±0,17	+0,84 -0
30	50	-	0 -0,25	0 -0,16	±0,80	±0,20	+1,6 -0
50	55	-	0 -0,46	0 -0,30	±0,95	±0,37	-
55	65	±0,60	0 -0,46	0 -0,30	±0,95	-	-
65	80	±0,60	0 -0,46	0 -0,30	±0,95	-	-

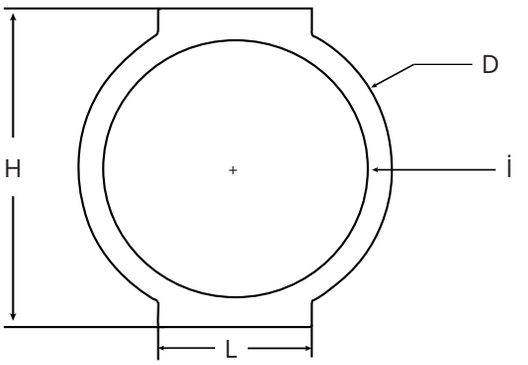
INDICATIVE SHAPED ENDS DIMENSIONS

Nominal Diameter or Width Across-flats		**Type A-Chamfer Length** (L)		**Type B-Point Lenght** (L)	
Over	Up to and including	**Min**	**Max**	**Min**	**Max**
5	10	0,2	1,5	2	7
10	20	0,2	2	3	10
20	30	0,2	3	4	12





Unless otherwise specified by the buyer, the shape of the ends of products larger than 30 mm is up to the supplier.
Over than 55 mm polygons and over than 65 mm round rods are produced without shaped ends.
**Dimensions are in millimeters (mm).*



SARBAK METAL MANIFOLD PROFILE DIMENSIONS AND TOLERANCES

Form Size	3/4" Normal Manifold	3/4" Light Manifold	3/4" Ic Disli Manifold	35X27 Manifold
Alloy	**CW614N**	**CW614N**	**CW614N**	**CW614N**
Top (L1)	24 +0,05 / -0,20	18 +0,05 / -0,20	16 +0,05 / -0,20	27 +0,20 / -0
Bottom (L2)	24 +0,05 / -0,20	18 +0,05 / -0,20	24 +0,05 / -0,20	27 +0,20 / -0
Height (H)	35 +0,10 / -0,35	32 +0,10 / -0,35	35 +0,10 / -0,35	35 +0,10 / -0,35
Outer Dia (D)	31 ±0,20	30 ±0,20	31 ±0,20	32 ±0,20
Inner Dia (I)	24,4 ±0,20	24 ±0,20	24 ±0,20	23 ±0,20
Weight(Kg / m)	**3,92**	**2,73**	**3,66**	**4,94**
Eccentricity (Max)	10%	10%	13%	10%

Form Size	1" Normal Manifold	1" B Manifold	1" Light Manifold	1" Ic Disli Manifold
Alloy	**CW614N**	**CW614N**	**CW603N**	**CW614N**
Top (L1)	24 +0,05 / -0,20	24 +0,05 / -0,20	18 +0,10 / -0,20	18 +0,05 / -0,20
Bottom (L2)	24 +0,05 / -0,20	24 +0,05 / -0,20	18 +0,10 / -0,20	21 +0,05 / -0,20
Height (H)	41 +0,10 / -0,35	41 +0,10 / -0,35	38 +0,10 / -0,35	40,1 +0,10
Outer Dia (D)	37,5 ±0,20	36,5 ±0,20	37 ±0,20	37,15 ±0,20
Inner Dia (I)	30,5 ±0,20	30,5 ±0,20	30,5 ±0,20	30 ±0,20
Weight(Kg / m)	**4,40**	**4,13**	**3,31**	**3,95**
Eccentricity (Max)	10%	10%	10%	13%

Form Size	1"KL6 Manifold	1" Dıs Disli Manifold	1" Disi Manifold	1" Ic Disli Manifold
Alloy	**CW614N**	**CW614N**	**CW614N**	**CW614N**
Top (L1)	16 +0,05 / -0,20	16 +0,05 / -0,20	16 +0,05 / -0,20	16 +0,05 / -0,20
Bottom (L2)	24 +0,05 / -0,20	24 +0,05 / -0,20	24 +0,05 / -0,20	24 +0,05 / -0,20
Height (H)	39 +0,10 / -0,35	37 +0,10 / -0,35	40,5 +0,10 / -0,35	40 +0,10 / -0,35
Outer Dia (D)	37 ±0,20	34 ±0,20	37,5 ±0,20	36,5 ±0,20
Inner Dia (I)	30,5 ±0,20	27 ±0,20	30 ±0,20	30 ±0,20
Weight(Kg / m)	**3,59**	**3,72**	**4,20**	**3,81**
Eccentricity (Max)	13%	13%	13%	13%

SARBAK METAL MANIFOLD PROFILE DIMENSIONS AND TOLERANCES

Form Size	1" Elight Manifold	1 1/4" Normal Manifold	1 1/4" Light Manifold
Alloy	**CW614N**	**CW614N**	**CW614N**
Top (L1)	25,3 +0 / -0,30	24 +0,05 / -0,20	18 +0,05 / -0,20
Bottom (L2)	25,3 +0 / -0,30	24 +0,05 / -0,20	18 +0,05 / -0,20
Height (H)	39 +0,20	51 +0,10 / -0,35	48 +0,10 / -0,35
Outer Dia (D)	37 ±0,20	47 ±0,20	46 ±0,20
Inner Dia (I)	30,6 ±0,20	39 ±0,20	39,5 ±0,20
Weight(Kg / m)	**3,94**	**5,77**	**4,15**
Eccentricity (Max)	10%	10%	10%

Form Size	1 1/4" Icten Disli Manifold	1 1/2" Manifold	1" 20x20 Manifold
Alloy	**CW614N**	**CW614N**	**CW603N**
Top (L1)	18 +0,05 / -0,20	25 +0,05 / -0,20	20 +0,05 / -0,20
Bottom (L2)	21 +0,05 / -0,20	25 +0,05 / -0,20	20 +0,05 / -0,20
Height (H)	50 +0,10 / -0,35	57 +0,10 / -0,35	38 +0,10 / -0,35
Outer Dia (D)	46 ±0,20	53,2 ±0,20	37 ±0,20
Inner Dia (I)	39 ±0,20	44,8 +0/-0,4	30,8 ±0,20
Weight(Kg / m)	**4,82**	**6,65**	**3,30**
Eccentricity (Max)	10%	10%	10%

Form Size	S19 Manifold	S20 Manifold	S21 Manifold
Alloy	**CW603N**	**CW603N**	**CW603N**
Top (L1)	24 +0,10 / -0,20	2 +0,10 / -0,20	24 +0,10 / -0,20
Bottom (L2)	24 +0,10 / -0,20	24 +0,10 / -0,20	24 +0,10 / -0,20
Height (H)	3 +0,10 / -0,35	30,5 +0,10 / -0,35	46,5 +0,10 / -0,35
Outer Dia (D	37 ±0,20	30 ±0,20	46 ±0,20
Inner Dia (I)	30,8 ±0,20	24,4 ±0,20	39,5 ±0,20
Weight(Kg / m)	**3,24**	**2,87**	**4,26**
Eccentricity (Max)	10%	10%	10%

Cold Drawn Coils

Cold drawn coils are produced according to EN 12166 European Standard. They are coil shaped high precision products suitable for efficient chip removal in free machining process.

They increase production speed and productivity by reducing the loading times of machines.

ALLOYS			
Product Code	**EN Symbol**	**EN No**	**ASTM**
S511-S511DW	CuZn38As	DW511L	C27453
S603-S603DW	CuZn36Pb3	CW603N	C36000
S614-S614DW	CuZn39Pb3	CW614N	C38500
S617-S617DW	CuZn40Pb2	CW617N	C38000
S602	CuZn36Pb2As	CW602N	C35330
S625	CuZn35Pb1,5AlAs	CW625N	-
S626	CuZn33Pb1,5AlAs	CW626N	-
S608	CuZn38Pb2	CW608N	-
S612-S612DW	CuZn39Pb2	CW612N	C37700

PRODUCTION RANGES

Type	Production Range
Round	5-14 (mm)
Hexagon, Square	5-12 (mm)
Rectangle	Thickness : 5-10 (mm) Width : 5-20 (mm)

EN 12166 - Tolerances on Diameter of Round Coils						
Nominal Diameter		**Tolerances**				
Over	Up to and including	**Class A**	**Class B**	**Class C**	**Class D**	**Class E**
4,8[Inc.]	6,0	±0,04	0 -0,12	0 -0,08	0 -0,05	0 -0,030
6,0	10,0	±0,06	0 -0,15	0 -0,09	0 -0,06	0 -0,036
10,0	14,0	±0 08	0 -0,18	0 -0,11	0 -0,07	0 -0,043

EN 12166 - Tolerances on Width Across-Flats of Square or Regular Polygonal Coils				
Nominal Width Across-flats		**Tolerances**		
Over	Up to and including	**Class A**	**Class B**	**Class C**
5,0[Inc.]	6,0	±0,06	0 -0,12	0 -0,08
6,0	10,0	±0,08	0 -0,15	0 -0,09
10,0	12,0	±0,10	0 -0,18	0 -0,11

EN 12166 - Tolerances on Width and Thickness of Rectangular Wire Coils					
Nominal Width Across-flats		**Tolerance on Width**	**Tolerances**		
Over	Up to and inc.		over 5,0 up to and İncluding 6,0	**over 6,0 up to and İncluding 10,0**	over 10,0 up to and İncluding 12,0
5,0[Inc.]	6,0	±0,06	±0,06	-	-
6,0	10,0	±0,08	±0,07	±0,08	-
10,0	12,0	±0,10	±0,07	±0,09	±0,10

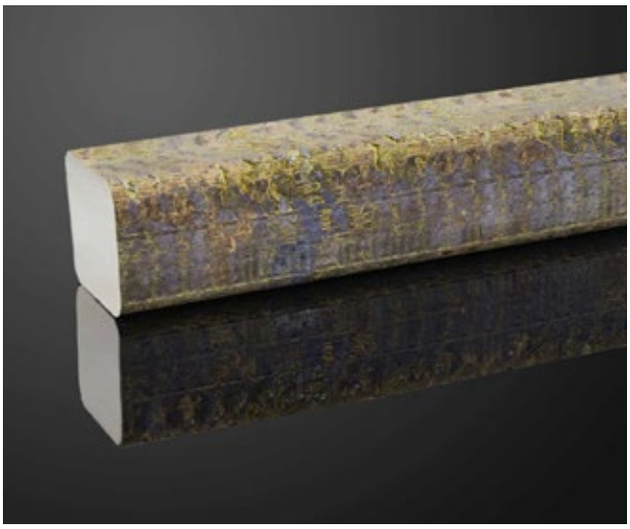
Continuous Casting

Our continuous casting production is composed of casting of billets and ingots.

Major sectors and areas of use; construction, automotive, gas, food, health, aviation, electrical, electronics, plumbing, drinking water products, accessories, fasteners.

Our products comply with ROHS II and REACH Directives. Our manufacturing is realized within the framework of quality, environment and work safety rules.

We also have 4MS and UBA compatible production for drinking water implementations. As a standard our production is carried out according to European Norm (EN) and American Standard (ASTM). Different norm and alloy demands that come from our customers are examined and produced by the relevant units.

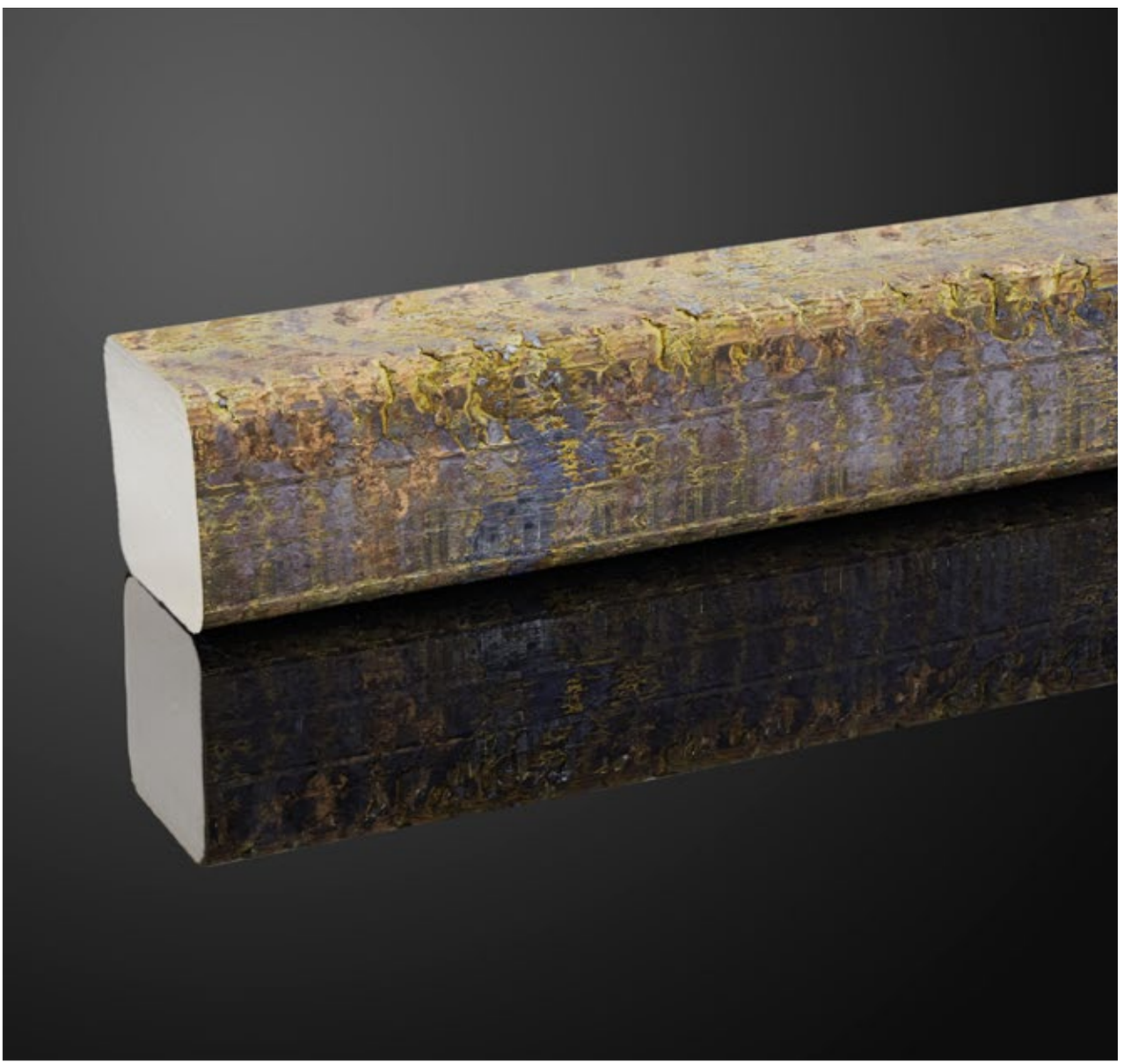


Ingots

In our ingot production process, production is carried out by horizontal continuous casting system. Our company is a member of OECAM (The Organization of European Copper Alloy Ingot Makers).

ALLOYS			
Product Code	**EN Symbol**	**EN No**	**ASTM**
Low Pressure Continuous Casting Ingots	CuZn39Pb1Al-C	CC757S	C85700
Ecocast Unleaded Continuous Casting Ingots	CuZn21Si3P-C	CC768S	C87850
Dezincification - Resistant (DZR) Continuous Casting Ingots	CuZn36Pb-C	CC770S	-
Unleaded Continuous Casting Ingots	CuZn42Al-C	CC773S	-
Federalloy IV-B2	-	-	C89540

STANDARD DIMENSIONS - WEIGHT	
Standard Dimensions (mm)	**Standard Weight (kg)**
64x64x380	Average 12



Billets

The homogeneous, uniformly shaped billets produced in 7 horizontal continuous casting lines with a capacity of 300 tons / day can be produced in desired sizes up to 140 mm from to 240 mm diameter.

ALLOYS			
Product Code	**EN Symbol**	**EN No**	**ASTM**
Ecobrass	CuZn21Si3P	CW724R	C69300
S509-S509DW	CuZn40	CW509L	C27450
S510-S510DW	CuZn42	CW510L	C28500
S511-S511DW	CuZn38As	DW511L	C27453
S603-S603DW	CuZn36Pb3	CW603N	C36000
S614-S614DW	CuZn39Pb3	CW614N	C38500
S617-S617DW	CuZn40Pb2	CW617N	C38000
S602	CuZn36Pb2As	CW602N	C35330
S625	CuZn35Pb1,5AlAs	CW625N	-
S626	CuZn33Pb1,5AlAs	CW626N	-
S608	CuZn38Pb2	CW608N	-
S612-S612DW	CuZn39Pb2	CW612N	C37700
S709	CuZn32Pb2AsFeSi	CW709R	-
S713	CuZn37Mn3Al2PbSi	CW713R	C67420

ALLOYS

ROD	HOLLOW RODS	COILS	INGOTS
S612	S625	S602	LOW PRESSURE CONTINUOUS CASTING INGOTS
S614	S608	S511	DEZINCIFICATION - RESISTANT (DZR) CONTINUOUS CASTING INGOTS
S617	S603	S510	UNLEADED CONTINUOUS CASTING INGOTS
ECOBRASS	S626	S509	ECOBRASS - ECOCAST CONTINUOUS CASTING (PATENTED)
			FEDERALLOY IV - B2 - UNLEADED CONTINUOUS CASTING INGOTS (PATENTED)

S612 - S612DW

RODS / HOLLOW RODS

CW612N - CuZn39Pb2

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CW612N - CuZn39Pb2

Product Code	EN Symbol	EN No	ASTM		Cu	Zn	Pb	Sn	Fe	Ni	Al	Si	Others Total
S612	CuZn39Pb2	CW612N	C37700	Min (%)	59,0	Rem.	1,6	-	-	-	-	-	-
				Max (%)	60,0	Rem.	2,5	0,3	0,3	0,3	0,05	-	0,2
(*) S612DW	CuZn39Pb2-DW	CW612N-DW	C37700	Min (%)	59,0	Rem.	1,6	-	-	-	-	-	-
				Max (%)	60,0	Rem.	2,2	0,3	0,3	0,1	0,05	0,03	0,2

(*) Each of the other elements< 0,02 %

Features And Applications

It is an alloy with excellent hot forging features due to high copper content, and very good machinability with lead content. It has good ductility Also this alloy compliance with RoHS II and REACH directives. CW612N-DW alloy be used suitable for 4MS vs UBA list for drinking water applications.

4MS and UBA Hygienic list group for CW612N-DW alloy: B, C, D

Area of Usage

Automotive, electrical components, screws, clamps .

TECHNICAL SPECIFICATIONS

Structure	α+β
Machinability	% 90
Density	8,44 g/cm³
Electrical Conductivity	13,9 MS/m, 24 %IACS
Thermal Conductivity	109 W/(m·K)
Elasticity Module	102 GPa
Coeff. of Thermal Expansion	21,1 10^{-6}/K
Melting Point	880-895 °C

Hot Forming	650-800 °C
Soft Annealing	450-600 °C
Soft Annealing Time	1-3 hours
Stress Relieving	200-300 °C
Stress Relieving Time	1-3 hours

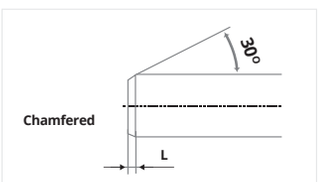
Range of Products

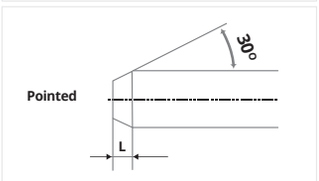
S612 and S612-DW alloys can be produced in our extrusion and cold drawing unit as rods, hollows and profiles suitable for both forging and machining. Please contact us for other technical informations.

INDICATIVE SHAPED ENDS DIMENSIONS

Nominal Diameter or Width		Type A – Chamfer Lenght (L)		Type B – Point Lenght (L)	
Across-flats (mm)		Min (mm)	Max (mm)	Min (mm)	Max (mm)
Over	Up to and including				
5	10	0,2	1,5	2	7
10	20	0,2	2	3	10
20	30	0,2	3	4	12

Unless otherwise specified by the buyer, the shape of the ends of products larger than 30 mm is up to the supplier.





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CW612N - CuZn39Pb2

Nominal Diameter or Width Across-flats (mm)		Preferred (available) Lengths (mm)	Tolerance on Length (mm)
Over	Up to and including		
8 Inc.	30	3.000 - 4.000	±50
30	80	3.000 - 4.000	±100

Stress Relieving The polygonal rods and hollow rods are subjected to stress relieving treatment

Packaging 500 or 1000 kg bundle – 3/5 metal straps different bundle packagings, up to 10 mm dimension products are packed with wooden case

EN 12164 - Rods for Free Machining

Material Condition	Nominal Diameter (mm)		Width Across-flats (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation			Hardness (HBW)	
	Over	Up to and inc.	Over	Up to and inc.	Min	Min	Max	A_{100mm} (%) Min	$A_{11,3}$ (%) Min	A (%) Min	Min	Max
M	All		All		As manufactured							
R360	8	80	8	55	360	-	300	-	15	20	-	-
H070	8	80	8	55	-	-	-	-	-	-	70	100
R410	8	40	8	35	410	230	-	8	10	12	-	-
H100	8	40	8	35	-	-	-	-	-	-	100	145
R500	8	14	8	10	500	350	-	3	5	8	-	-
H120	8	14	8	10	-	-	-	-	-	-	120	-

EN 12168 - Hollow Rods for Free Machining

Material Condition	Wall Thickness (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation A (%)	Hardness (HBW)		Hardness (HV)	
	Over	Up to and inc.	Min	Min	Max	Min	Min	Max	Min	Max
M	All		As manufactured							
R360	4	20	360	-	300	20	-	-	-	-
H070	4	20	-	-	-	-	70	100	80	110
R410	4	10	410	250	-	12	-	-	-	-
H100	4	10	-	-	-	-	100	145	110	155
R500	4	7	500	350	-	8	-	-	-	-
H120	4	7	-	-	-	-	120	-	130	-

EN 12165 - Wrought and Unwrought Forging Stocks

Material Condition	Nominal Diameter (mm)		Hardness (HBW)	
	Over	Up to and including	Min	Max
M	All		As manufactured	
H070	8	80	70	100

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CW612N - CuZn39Pb2

STANDARD		EN 12164			EN 12165		EN 12168					
Dimension Range		Round Rod		Hexagonal, Square	Round Rod		Round and Hexagonal Hollow Rod, Outer Dim. Tol.			Hole Tolerance Round		Hole Tol. Hexagonal
Over	Up to & inc.	Class A	Class B	Rod	Class A	Class B	Class A	Class B	Class C	Class A	Class B	-
7	10	0 -0,06	0 -0,036	0 -0,09	±0,25	±0,14	-	-	-	-	-	-
10	13	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	-	-	-	-
13	18	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	-	±0,35	-	+0,70 -0
18	20	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	-	±0,42	-	+0,84 -0
20	23	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	-	±0,42	±0,17	+0,84 -0
23	26	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	-	±0,42	±0,17	+0,84 -0
26	30	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	0 -0,13	±0,42	±0,17	+0,84 -0
30	50	0 -0,16	-	0 -0,16	±0,60	±0,20	-	0 -0,25	0 -0,16	±0,80	±0,20	+1,6 -0
50	55	0 -0,19	-	0 -0,19	±0,70	±0,37	-	0 -0,46	0 -0,30	±0,95	±0,37	-
55	65	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	0 -0,30	±0,95	-	-
65	80	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	0 -0,30	±0,95	-	-
80	120	-	-	-	±2	-	-	-	-	-	-	-
120	140	-	-	-	±2,5	-	-	-	-	-	-	-

For Hollow Rods
Minimum wall thickness is 4 mm. Eccentricity : %10 (max.)

Outer Cold Drawn - Internal Extruded
Outer Class B - Hole Class A tolerance

Inner-Outer Cold Drawn
Outer Class C - Hole Class B tolerance

Inner-Outer Extruded
Outer Class A - Hole Class A tolerance

S614 - S614DW

RODS / HOLLOW RODS

CW614N - CuZn39Pb3

CW614N - CuZn39Pb3

Product Code	EN Symbol	EN No	ASTM		Cu	Zn	Pb	Sn	Fe	Ni	Al	Si	Others Total
S614	CuZn39Pb3	CW614N	C38500	Min (%)	57,0	Rem.	2,5	-	-	-	-	-	-
				Max (%)	59,0	Rem.	3,5	0,3	0,3	0,3	0,05	-	0,2
(*) S614DW	CuZn39Pb3-DW	CW614N-DW	C38500	Min (%)	57,0	Rem.	2,5	-	-	-	-	-	-
				Max (%)	59,0	Rem.	3,5	0,3	0,3	0,2	0,05	0,03	0,2

(*) Each of the other elements< 0,02 %

Features And Applications

CW614N called MS58 in the market, is the most widely used standard free machining material with a 100% machinability index. It has got limited hot forming and poor cold forming capability. Also this alloy compliance with RoHS II and REACH directives. CW614N-DW alloy be used suitable for 4MS vs UBA list for drinking water applications.

4MS and UBA Hygienic list group for CW614N-DW alloy: C and D

Area of Usage

General parts produced by machining.

TECHNICAL SPECIFICATIONS

Structure	α+β	Hot Forming	650-800 °C
Machinability	% 100	Soft Annealing	450-600 °C
Density	8,46 g/cm³	Soft Annealing Time	1-3 hours
Electrical Conductivity	14,6 MS/m, 25 %IACS	Stress Relieving	200-300 °C
Thermal Conductivity	113 W/(m·K)	Stress Relieving Time	1-3 hours
Elasticity Module	96 GPa		
Coeff. of Thermal Expansion	21,4 10^{-6}/K		
Melting Point	880-895 °C		

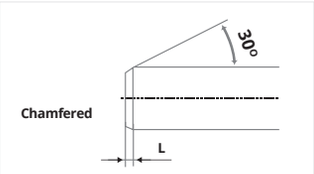
Range of Products

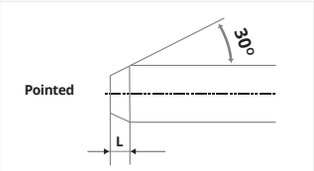
S614 and S614-DW alloys can be produced in our extrusion and cold drawing unit as rods, hollows and profiles suitable for both forging and machining. Please contact us for other technical informations.

INDICATIVE SHAPED ENDS DIMENSIONS

Nominal Diameter or Width		Type A – Chamfer Lenght (L)		Type B – Point Lenght (L)	
Across-flats (mm)		Min (mm)	Max (mm)	Min (mm)	Max (mm)
Over	Up to and including				
5	10	0,2	1,5	2	7
10	20	0,2	2	3	10
20	30	0,2	3	4	12

Unless otherwise specified by the buyer, the shape of the ends of products larger than 30 mm is up to the supplier.





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CW614N - CuZn39Pb3

Nominal Diameter or Width Across-flats (mm)		Preferred (available) Lengths (mm)	Tolerance on Length (mm)
Over	Up to and including		
5	30	3.000 - 4.000	±50
30	80	3.000 - 4.000	±100

Stress Relieving The polygonal rods and hollow rods are subjected to stress relieving treatment

Packaging 500 or 1000 kg bundle – 3/5 metal straps different bundle packagings, up to 10 mm dimension products are packed with wooden case

EN 12164 - Rods for Free Machining

Material Condition	Nominal Diameter (mm)		Width Across-flats (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation			Hardness (HBW)	
	Over	Up to and inc.	Over	Up to and inc.	Min	Min	Max	A_{100mm} (%) Min	$A_{11,3}$ (%) Min	A (%) Min	Min	Max
M	All		All		As manufactured							
R360	6	80	5	55	360	-	350	-	15	20	-	-
H090	6	80	5	55	-	-	-	-	-	-	90	125
R430	5	60	5	40	430	220	-	6	8	10	-	-
H110	5	60	5	40	-	-	-	-	-	-	110	160
R500	5	14	5	10	500	350	-	-	3	5	-	-
H135	5	14	5	10	-	-	-	-	-	-	135	-

EN 12168 - Hollow Rods for Free Machining

Material Condition	Wall Thickness (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation A (%)	Hardness (HBW)		Hardness (HV)	
	Over	Up to and inc.	Min	Min	Max	Min	Min	Max	Min	Max
M	All		As manufactured							
R360	3	40	360	-	320	20	-	-	-	-
H090	3	40	-	-	-	-	90	125	100	135
R430	3	15	430	220	-	10	-	-	-	-
H110	3	15	-	-	-	-	110	160	120	170
R500	3	7	500	350	-	8	-	-	-	-
H135	3	7	-	-	-	-	135	-	145	-

EN 12165 - Wrought and Unwrought Forging Stocks

Material Condition	Nominal Diameter (mm)		Hardness (HBW)	
	Over	Up to and including	Min	Max
M	All		As manufactured	
H080	8	80	80	125

sarbak

CW614N - CuZn39Pb3

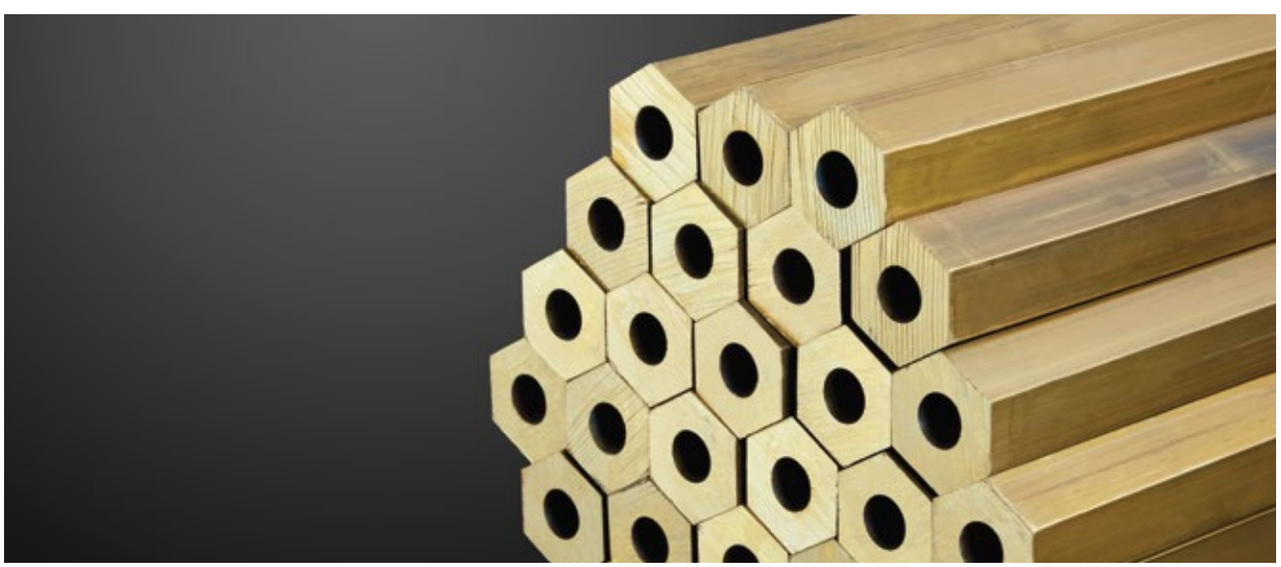
STANDARD		EN 12164			EN 12165		EN 12168					
Dimension Range		Round Rod		Hexagonal, Square	Round Rod		Round and Hexagonal Hollow Rod, Outer Dim. Tol.			Hole Tolerance Round		Hole Tol. Hexagonal
	Up to & inc.	Class A	Class B	Rod	Class A	Class B	Class A	Class B	Class C	Class A	Class B	-
5	6	0 -0,05	0 -0,03	0 -0,08	-	-	-	-	-	-	-	-
6	10	0 -0,06	0 -0,036	0 -0,09	±0,25	±0,14	-	-	-	-	-	-
10	13	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	-	-	-	-
13	18	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	-	±0,35	-	+0,70 -0
18	20	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	-	±0,42	-	+0,84 -0
20	23	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	-	±0,42	±0,17	+0,84 -0
23	26	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	-	±0,42	±0,17	+0,84 -0
26	30	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	0 -0,13	±0,42	±0,17	+0,84 -0
30	50	0 -0,16	-	0 -0,16	±0,60	±0,20	-	0 -0,25	0 -0,16	±0,80	±0,20	+1,6 -0
50	55	0 -0,19	-	0 -0,19	±0,70	±0,37	-	0 -0,46	0 -0,30	±0,95	±0,37	-
55	65	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	0 -0,30	±0,95	-	-
65	80	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	0 -0,30	±0,95	-	-
80	120	-	-	-	±2	-	-	-	-	-	-	-
120	140	-	-	-	±2,5	-	-	-	-	-	-	-

For Hollow Rods
Minimum wall thickness is 3 mm. Eccentricity : %10 (max.)

Outer Cold Drawn - Internal Extruded
Outer Class B - Hole Class A tolerance

Inner-Outer Cold Drawn
Outer Class C - Hole Class B tolerance

Inner-Outer Extruded
Outer Class A - Hole Class A tolerance



S617 - S617DW

RODS / HOLLOW RODS

CW617N - CuZn40Pb2

sarbak

CW617N - CuZn40Pb2

Product Code	EN Symbol	EN No	ASTM		Cu	Zn	Pb	Sn	Fe	Ni	Al	Si	Others Total
S617	CuZn40Pb2	CW617N	C38000	Min (%)	57,0	Rem.	1,6	-	-	-	-	-	-
				Max (%)	59,0	Rem.	2,5	0,3	0,3	0,3	0,05	-	0,2
(*) S617DW	CuZn40Pb2-DW	CW617N-DW	C38000	Min (%)	57,0	Rem.	1,6	-	-	-	-	-	-
				Max (%)	59,0	Rem.	2,2	0,3	0,3	0,1	0,05	0,03	0,2

(*) Each of the other elements< 0,02 %

Features And Applications

CW617N is mainly used standard hot forging material. It has a good machinability capability due to lead content. Also this alloy compliance with RoHS II and REACH directives. CW617N-DW alloy be used suitable for 4MS vs UBA list for drinking water applications.

4MS and UBA Hygienic list group for CW617N-DW alloy: B, C, D

Area of Usage

Hot forging parts.

TECHNICAL SPECIFICATIONS

Structure	α+β	Hot Forming	650-800 °C
Machinability	% 95	Soft Annealing	450-600 °C
Density	8,43g/cm³	Soft Annealing Time	1-3 hours
Electrical Conductivity	14,9 MS/m, 25 %IACS	Stress Relieving	200-300 °C
Thermal Conductivity	113 W/(m·K)	Stress Relieving Time	1-3 hours
Elasticity Module	96 GPa		
Coeff. of Thermal Expansion	21,1 10^{-6}/K		
Melting Point	880-895 °C		

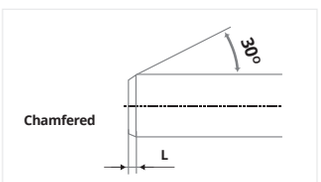
Range of Products

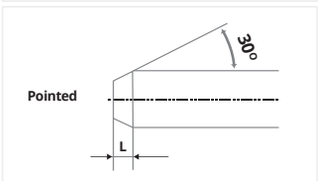
S617 and S617-DW alloys can be produced in our extrusion and cold drawing unit as rods, hollows and profiles suitable for both forging and machining. Please contact us for other technical informations.

INDICATIVE SHAPED ENDS DIMENSIONS

Nominal Diameter or Width		Type A – Chamfer Lenght (L)		Type B – Point Lenght (L)	
Across-flats (mm)		Min (mm)	Max (mm)	Min (mm)	Max (mm)
Over	Up to and including				
5	10	0,2	1,5	2	7
10	20	0,2	2	3	10
20	30	0,2	3	4	12

Unless otherwise specified by the buyer, the shape of the ends of products larger than 30 mm is up to the supplier.





sarbak

CW617N - CuZn40Pb2

Nominal Diameter or Width Across-flats (mm)		Preferred (available) Lengths (mm)	Tolerance on Length (mm)
Over	Up to and including		
5	30	3.000 - 4.000	±50
30	80	3.000 - 4.000	±100

Stress Relieving The polygonal rods and hollow rods are subjected to stress relieving treatment

Packaging 500 or 1000 kg bundle – 3/5 metal straps different bundle packagings, up to 10 mm dimension products are packed with wooden case

EN 12164 - Rods for Free Machining

Material Condition	Nominal Diameter (mm)		Width Across-flats (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation			Hardness (HBW)	
	Over	Up to and inc.	Over	Up to and inc.	Min	Min	Max	A_{100mm} (%) Min	$A_{11,3}$ (%) Min	A (%) Min	Min	Max
M	All		All		As manufactured							
R360	6	80	5	55	360	-	350	-	15	20	-	-
H090	6	80	5	55	-	-	-	-	-	-	90	125
R430	5	60	5	40	430	220	-	6	8	10	-	-
H110	5	60	5	40	-	-	-	-	-	-	110	160
R500	5	14	5	10	500	350	-	-	3	5	-	-
H135	5	14	5	10	-	-	-	-	-	-	135	-

EN 12168 - Hollow Rods for Free Machining

Material Condition	Wall Thickness (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation A (%)	Hardness (HBW)		Hardness (HV)	
	Over	Up to and inc.	Min	Min	Max	Min	Min	Max	Min	Max
M	All			As manufactured						
R360	3	40	360	-	320	20	-	-	-	-
H090	3	40	-	-	-	-	90	125	100	135
R430	3	15	430	220	-	10	-	-	-	-
H110	3	15	-	-	-	-	110	160	120	170
R500	3	7	500	350	-	8	-	-	-	-
H135	3	7	-	-	-	-	135	-	145	-

EN 12165 - Wrought and Unwrought Forging Stocks

Material Condition	Nominal Diameter (mm)		Hardness (HBW)	
	Over	Up to and including	Min	Max
M	All		As manufactured	
H080	8	80	80	125

sarbak

CW617N - CuZn40Pb2

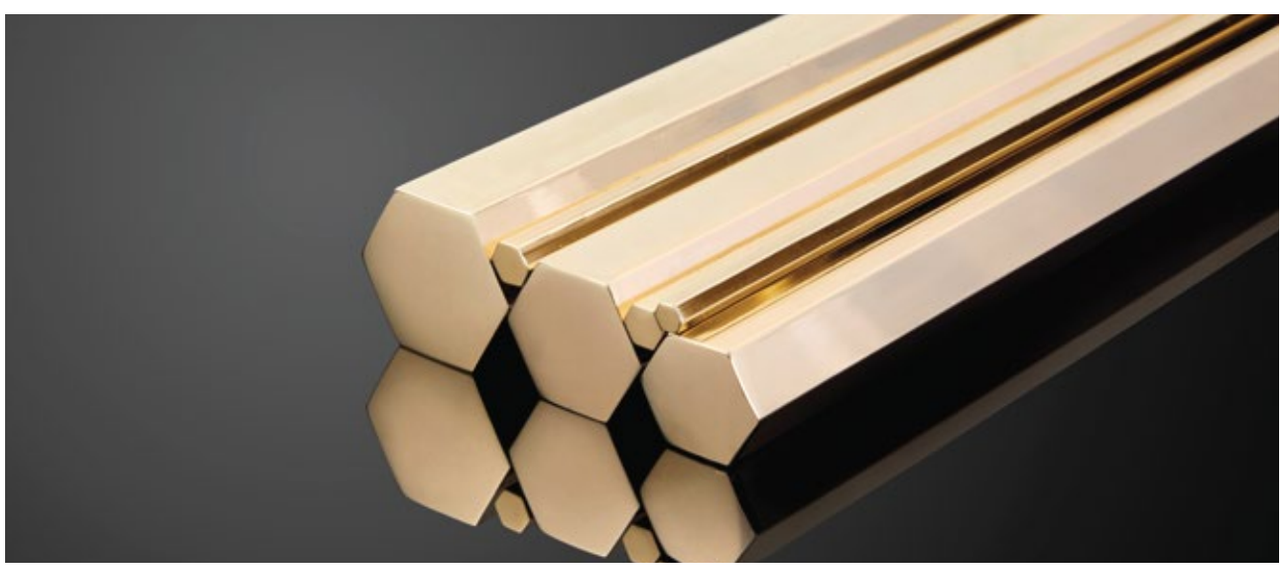
STANDARD		EN 12164			EN 12165		EN 12168					
Dimension Range		Round Rod		Hexagonal, Square	Round Rod		Round and Hexagonal Hollow Rod, Outer Dim. Tol.			Hole Tolerance Round		Hole Tol. Hexagonal
Over	Up to & inc.	Class A	Class B	Rod	Class A	Class B	Class A	Class B	Class C	Class A	Class B	-
5	6	0 -0,05	0 -0,03	0 -0,08	-	-	-	-	-	-	-	-
6	10	0 -0,06	0 -0,036	0 -0,09	±0,25	±0,14	-	-	-	-	-	-
10	13	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	-	-	-	-
13	18	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	-	±0,35	-	+0,70 -0
18	20	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	-	±0,42	-	+0,84 -0
20	23	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	-	±0,42	±0,17	+0,84 -0
23	26	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	-	±0,42	±0,17	+0,84 -0
26	30	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	0 -0,13	±0,42	±0,17	+0,84 -0
30	50	0 -0,16	-	0 -0,16	±0,60	±0,20	-	0 -0,25	0 -0,16	±0,80	±0,20	+1,6 -0
50	55	0 -0,19	-	0 -0,19	±0,70	±0,37	-	0 -0,46	0 -0,30	±0,95	±0,37	-
55	65	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	0 -0,30	±0,95	-	-
65	80	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	0 -0,30	±0,95	-	-
80	120	-	-	-	±2	-	-	-	-	-	-	-
120	140	-	-	-	±2,5	-	-	-	-	-	-	-

For Hollow Rods
Minimum wall thickness is 3 mm. Eccentricity : %10 (max.)

Outer Cold Drawn - Internal Extruded
Outer Class B - Hole Class A tolerance

Inner-Outer Cold Drawn
Outer Class C - Hole Class B tolerance

Inner-Outer Extruded
Outer Class A - Hole Class A tolerance



ECOBRASS

(PATENTED)

RODS / HOLLOW RODS

CW724R - CuZn21Si3P

CW724R - CuZn21Si3P

Product Code	EN Symbol	EN No	ASTM		Cu	Zn	Pb	Sn	Fe	Ni	Al	Mn	P	Si	Others Total
ECOBRASS	CuZn21Si3P	CW724R	C69300	Min (%)	75,0	Rem.	-	-	-	-	-	-	0,02	2,7	-
				Max (%)	77,0	Rem.	0,09	0,3	0,3	0,2	0,05	0,05	0,10	3,5	0,2

(*) Each of the other elements< 0,02 %

Features And Applications

This lead free alloy is patented. Chips and parts should not be mixed with other alloys. It has many features such as good machinability, high durability, recyclability, perfect corrosion resistance, good forgeability. Ecobrass can be produced as rods, hollows, profiles suitably for both forging and machining. Ecobrass meets ISO 6509 requirements regarding the dezincification resistance. Also this alloy compliance with UBA Hygienic list, 4MS, ELV, RoHS II and REACH directives.

4MS and UBA Hygienic list group for CW724R alloy: B, C, D

Area of Usage

Automotive industry, naval industry , plumbing and drinking water applications. Also this alloy suitable for drinking water application in USA and Canada Markets.

TECHNICAL SPECIFICATIONS

Structure	kappa+gama	**Hot Forming**	530-650 °C
Machinability	% 80	**Soft Annealing**	1-3 hours
Density	8,25 g/cm³	**Soft Annealing Time**	200-300 °C
Electrical Conductivity	4,5 MS/m, 7,8 %IACS	**Stress Relieving Time**	1-3 hours
Thermal Conductivity	35 W/(m·K)	**Max. Depth of Dezincification**	<100 µm
Elasticity Module	ca.100 GPa		
Coeff. of Thermal Expansion	860-925 °C		
Melting Point	680-750 °C		

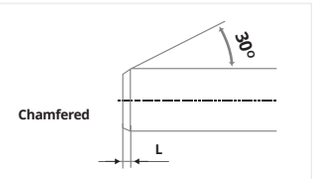
Range of Products

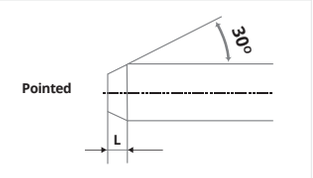
CW724R can be produced in our extrusion and cold drawing unit as rods, hollows and profiles suitable for both forging and machining. Please contact us for other technical informations.

INDICATIVE SHAPED ENDS DIMENSIONS

Nominal Diameter or Width		**Type A – Chamfer Lenght** (L)		**Type B – Point Lenght** (L)	
Across-flats (mm)		**Min** (mm)	**Max** (mm)	**Min** (mm)	**Max** (mm)
Over	Up to and including				
-	10	0,2	1,5	2	7
10	20	0,2	2	3	10
20	30	0,2	3	4	12

Unless otherwise specified by the buyer, the shape of the ends of products larger than 30 mm is up to the supplier.





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CW724R - CuZn21Si3P

Nominal Diameter or Width Across-flats (mm)		Preferred (available) Lengths (mm)	Tolerance on Length (mm)
Over	Up to and including		
10 Inc.	30	3.000 - 4.000	±50
30	80	3.000 - 4.000	±100

Stress Relieving The polygonal rods and hollow rods are subjected to stress relieving treatment

Packaging 500 or 1000 kg bundle – 3/5 metal straps different bundle packagings, up to 10 mm dimension products are packed with wooden case

EN 12164 - Rods for Free Machining

Material Condition	Nominal Diameter (mm)		Width Across-flats (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation			Hardness (HBW)	
	Over	Up to and inc.	Over	Up to and inc.	Min	Min	Max	A_{100mm} (%) Min	$A_{11,3}$ (%) Min	A (%) Min	Min	Max
M	All		All		As manufactured							
R500	10	80	35	55	500	-	450	-	-	15	-	-
H130	10	80	35	55	-	-	-	-	-	-	130	180
R600	10	40	15	40	600	300	-	-	-	12	-	-
H150	10	40	15	40	-	-	-	-	-	-	150	220
R670	10	20	10	15	670	400	-	8	9	10	-	-
H170	10	20	10	15	-	-	-	-	-	-	170	-

EN 12168 - Hollow Rods for Free Machining

Material Condition	Wall Thickness (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation A (%)	Hardness (HBW)		Hardness (HV)	
	Over	Up to and inc.	Min	Min	Max	Min	Min	Max	Min	Max
M	All			As manufactured						
R500	4	20	500	-	450	15	-	-	-	-
H130	4	20	-	-	-	-	130	180	140	190
R600	4	20	600	350	-	12	-	-	-	-
H150	4	20	-	-	-	-	150	220	160	230
R650	4	7	650	400	-	10	-	-	-	-
H170	4	7	-	-	-	-	170	-	180	-

EN 12165 - Wrought and Unwrought Forging Stocks

Material Condition	Nominal Diameter (mm)		Hardness (HBW)	
	Over	Up to and including	Min	Max
M	All		As manufactured	
H130	8	80	130	220

sarbak

CW724R - CuZn21Si3P

STANDARD		EN 12164			EN 12165		EN 12168				
Dimension Range		Round Rod		Hexagonal, Square	Round Rod		Round and Hexagonal Hollow Rod, Outer Dim. Tol.		Hole Tolerance Round		Hole Tol. Hexagonal
Over	Up to & inc.	Class A	Class B	Rod	Class A	Class B	Class A	Class B	Class A	Class B	-
-	10	0 -0,06	0 -0,036	0 -0,09	±0,25	±0,14	-	-	-	-	-
10	13	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	-	-	-
13	18	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	±0,35	-	+0,70 -0
18	20	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	±0,42	-	+0,84 -0
20	23	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	±0,42	±0,17	+0,84 -0
23	26	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	±0,42	±0,17	+0,84 -0
26	30	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	±0,42	±0,17	+0,84 -0
30	50	0 -0,16	-	0 -0,16	±0,60	±0,20	-	0 -0,25	±0,80	±0,20	+1,6 -0
50	55	0 -0,19	-	0 -0,19	±0,70	±0,37	-	0 -0,46	±0,95	±0,37	-
55	65	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	±0,95	-	-
65	80	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	±0,95	-	-
80	120	-	-	-	±2	-	-	-	-	-	-
120	140	-	-	-	±2,5	-	-	-	-	-	-

For Hollow Rods
Minimum wall thickness is 4 mm. Eccentricity : %10 (max.)

Outer Cold Drawn - Internal Extruded
Outer Class B - Hole Class A tolerance

Inner-Outer Extruded
Outer Class A - Hole Class A tolerance

S625

RODS / HOLLOW RODS

CW625N - CuZn35Pb1,5AlAs

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CW625N - CuZn35Pb1,5AlAs

Product Code	EN Symbol	EN No	ASTM		Cu	Zn	Pb	Sn	Fe	As	Ni	Al	Mn	Others Total
S625	CuZn35Pb1,5AlAs	CW625N	-	Min (%)	62,0	Rem.	1,2	-	-	0,02	-	0,5	-	-
				Max (%)	64,0	Rem.	1,6	0,3	0,3	0,15	0,2	0,7	0,1	0,2

(*) Each of the other elements< 0,02 %

Features And Applications

CW625N is an alloy as a substitute for the alloy CW602N. CW625N meets ISO 6509 requirements regarding the dezincification resistance. Approximately 2 hours annealing at around 500 °C is recommended for EN ISO 6509 standard compliance after hot forging process. Depending on the process conditions, temperature and time can also change. Also this alloy compliance with UBA Hygienic list, 4MS, RoHS II and REACH directives.

4MS and UBA Hygienic list group for CW625N alloy: B, C, D

Area of Usage

Fitting parts used in aggressive (corrosive) water.

TECHNICAL SPECIFICATIONS

Structure	α	Hot Forming	700-800 °C
Machinability	% 80	Soft Annealing	500-550 °C
Density	8,4 g/cm³	Soft Annealing Time	2 hours
Electrical Conductivity	19 %IACS	Stress Relieving	200-250 °C
Thermal Conductivity	93 W/(m·K)	Stress Relieving Time	2 hours
Elasticity Module	100 kN/mm²	Max. Depth of Dezincification	<200 µm
Coeff. of Thermal Expansion	21,3 10^{-6}/K		
Melting Point	875-900 °C		

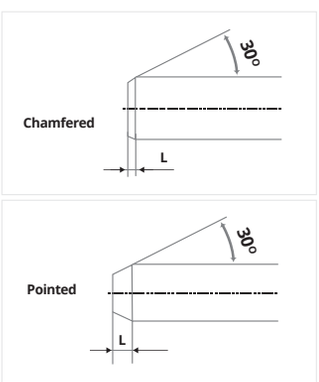
Range of Products

S625 alloy can be produced in our extrusion and cold drawing unit as rods, hollows and profiles suitable for both forging and machining. Please contact us for other technical informations.

INDICATIVE SHAPED ENDS DIMENSIONS

Nominal Diameter or Width		Type A – Chamfer Lenght (L)		Type B – Point Lenght (L)	
Across-flats (mm)		Min (mm)	Max (mm)	Min (mm)	Max (mm)
Over	Up to and including				
-	10	0,2	1,5	2	7
10	20	0,2	2	3	10
20	30	0,2	3	4	12

Unless otherwise specified by the buyer, the shape of the ends of products larger than 30 mm is up to the supplier.



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CW625N - CuZn35Pb1,5AlAs

Nominal Diameter or Width Across-flats (mm)		Preferred (available) Lengths (mm)	Tolerance on Length (mm)
Over	Up to and including		
10 Inc.	30	3.000 - 4.000	±50
30	80	3.000 - 4.000	±100

Stress Relieving The polygonal rods and hollow rods are subjected to stress relieving treatment

Packaging 500 or 1000 kg bundle – 3/5 metal straps different bundle packagings, up to 10 mm dimension products are packed with wooden case

EN 12164 - Rods for Free Machining

Material Condition	Nominal Diameter (mm)		Width Across-flats (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation			Hardness (HBW)	
	Over	Up to and inc.	Over	Up to and inc.	Min	Min	Max	A_{100mm} (%) Min	$A_{11,3}$ (%) Min	A (%) Min	Min	Max
M	All		All		As manufactured							
R280	10	80	10	55	280	-	200	-	25	30	-	-
H070	10	80	10	55	-	-	-	-	-	-	70	110
R320	10	60	10	50	320	200	-	-	15	20	-	-
H090	10	60	10	50	-	-	-	-	-	-	90	135
R400	10	15	10	13	400	250	-	-	5	8	-	-
H105	10	15	10	13	-	-	-	-	-	-	105	-

EN 12168 - Hollow Rods for Free Machining

Material Condition	Wall Thickness (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation A (%)	Hardness (HBW)		Hardness (HV)	
	Over	Up to and inc.	Min	Min	Max	Min	Min	Max	Min	Max
M	All		As manufactured							
R280	4	All	280	-	200	30	-	-	-	-
H070	4	All	-	-	-	-	70	110	80	120
R320	4	20	320	200	-	20	-	-	-	-
H090	4	20	-	-	-	-	90	135	100	145
R400	4	8	400	250	-	8	-	-	-	-
H105	4	8	-	-	-	-	105	-	115	-

EN 12165 - Wrought and Unwrought Forging Stocks

Material Condition	Nominal Diameter (mm)		Hardness (HBW)	
	Over	Up to and including	Min	Max
M	All		As manufactured	
H070	8	80	70	110

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CW625N - CuZn35Pb1,5AlAs

STANDARD		EN 12164			EN 12165		EN 12168					
Dimension Range		Round Rod		Hexagonal, Square	Round Rod		Round and Hexagonal Hollow Rod, Outer Dim. Tol.			Hole Tolerance Round		Hole Tol. Hexagonal
Over	Up to & inc.	Class A	Class B	Rod	Class A	Class B	Class A	Class B	Class C	Class A	Class B	-
-	10	0 -0,06	0 -0,036	0 -0,09	±0,25	±0,14	-	-	-	-	-	-
10	13	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	-	-	-	-
13	18	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	-	±0,35	-	+0,70 -0
18	20	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	-	±0,42	-	+0,84 -0
20	23	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	-	±0,42	±0,17	+0,84 -0
23	26	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	-	±0,42	±0,17	+0,84 -0
26	30	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	0 -0,13	±0,42	±0,17	+0,84 -0
30	50	0 -0,16	-	0 -0,16	±0,60	±0,20	-	0 -0,25	0 -0,16	±0,80	±0,20	+1,6 -0
50	55	0 -0,19	-	0 -0,19	±0,70	±0,37	-	0 -0,46	0 -0,30	±0,95	±0,37	-
55	65	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	0 -0,30	±0,95	-	-
65	80	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	0 -0,30	±0,95	-	-
80	120	-	-	-	±2	-	-	-	-	-	-	-
120	140	-	-	-	±2,5	-	-	-	-	-	-	-

For Hollow Rods
Minimum wall thickness is 4 mm. Eccentricity : %10 (max.)

Outer Cold Drawn - Internal Extruded
Outer Class B - Hole Class A tolerance

Inner-Outer Cold Drawn
Outer Class C - Hole Class B tolerance

Inner-Outer Extruded
Outer Class A - Hole Class A tolerance

S608

RODS / HOLLOW RODS

CW608N - CuZn38Pb2

CW608N - CuZn38Pb2

Product Code	EN Symbol	EN No	ASTM		Cu	Zn	Pb	Sn	Fe	Ni	Al	Others Total
S608	CuZn38Pb2	-	-	Min (%)	60,0	Rem.	1,6	-	-	-	-	-
				Max (%)	61,0	Rem.	2,5	0,2	0,2	0,3	0,05	0,2

Features And Applications

In addition to good machinability is an alloy that exhibits good cold working properties. Also this alloy compliance with RoHS II and REACH directives.

CW603N alloy is not suitable for 4MS vs UBA list for drinking water applications.

Area of Usage

Parts manufactured by cold forming.

TECHNICAL SPECIFICATIONS

Structure	α+β	Hot Forming	650-750 °C
Machinability	% 90	Soft Annealing	450-650 °C
Density	8,44 g/cm³	Soft Annealing Time	1-3 hours
Electrical Conductivity	14 MS/m, 24 %IACS	Stress Relieving	200-300 °C
Thermal Conductivity	109 W/(m·K)	Stress Relieving Time	1-3 hours
Elasticity Module	102 GPa		
Coeff. of Thermal Expansion	20,4 10^{-6}/K		
Melting Point	895-900 °C		

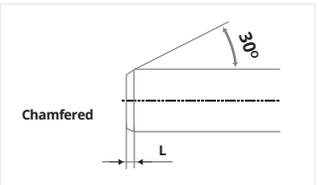
Range of Products

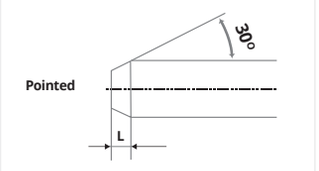
S608 alloy can be produced in our extrusion and cold drawing unit as rods, hollows and profiles suitable for both forging and machining. Please contact us for other technical informations.

INDICATIVE SHAPED ENDS DIMENSIONS

Nominal Diameter or Width		Type A – Chamfer Lenght (L)		Type B – Point Lenght (L)	
Across-flats (mm)		Min (mm)	Max (mm)	Min (mm)	Max (mm)
Over	Up to and including				
6 Inc.	10	0,2	1,5	2	7
10	20	0,2	2	3	10
20	30	0,2	3	4	12

Unless otherwise specified by the buyer, the shape of the ends of products larger than 30 mm is up to the supplier.





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CW608N - CuZn38Pb2

Nominal Diameter or Width Across-flats (mm)		Preferred (available) Lengths (mm)	Tolerance on Length (mm)
Over	Up to and including		
6 Inc.	30	3.000 - 4.000	±50
30	80	3.000 - 4.000	±100

Stress Relieving The polygonal rods and hollow rods are subjected to stress relieving treatment

Packaging 500 or 1000 kg bundle – 3/5 metal straps different bundle packagings, up to 10 mm dimension products are packed with wooden case

EN 12164 - Rods for Free Machining

Material Condition	Nominal Diameter (mm)		Width Across-flats (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation			Hardness (HBW)	
	Over	Up to and inc.	Over	Up to and inc.	Min	Min	Max	A_{100mm} (%) Min	$A_{11,3}$ (%) Min	A (%) Min	Min	Max
M	All		All		As manufactured							
R360	6	80	6	55	360	-	300	-	15	20	-	-
H070	6	80	6	55	-	-	-	-	-	-	70	100
R410	6	40	6	35	410	230	-	8	10	12	-	-
H100	6	40	6	35	-	-	-	-	-	-	100	145
R500	6	14	6	10	500	350	-	3	5	8	-	-
H120	6	14	6	10	-	-	-	-	-	-	120	-

EN 12168 - Hollow Rods for Free Machining

Material Condition	Wall Thickness (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation A (%)	Hardness (HBW)		Hardness (HV)	
	Over	Up to and inc.	Min	Min	Max	Min	Min	Max	Min	Max
M	All		As manufactured							
R360	4	20	360	-	300	20	-	-	-	-
H070	4	20	-	-	-	-	70	100	80	110
R410	4	10	410	250	-	12	-	-	-	-
H100	4	10	-	-	-	-	100	145	110	155
R500	4	7	500	350	-	8	-	-	-	-
H120	4	7	-	-	-	-	120	-	130	-

EN 12165 - Wrought and Unwrought Forging Stocks

Material Condition	Nominal Diameter (mm)		Hardness (HBW)	
	Over	Up to and including	Min	Max
M	All		As manufactured	
H070	8	80	70	100

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CW608N - CuZn38Pb2

STANDARD		EN 12164			EN 12165		EN 12168					
Dimension Range		Round Rod		Hexagonal, Square	Round Rod		Round and Hexagonal Hollow Rod, Outer Dim. Tol.			Hole Tolerance Round		Hole Tol. Hexagonal
Over	Up to & inc.	Class A	Class B	Rod	Class A	Class B	Class A	Class B	Class C	Class A	Class B	-
-	6	0 -0,05	0 -0,03	0 -0,08	-	-	-	-	-	-	-	-
6	10	0 -0,06	0 -0,36	0 -0,09	±0,25	±0,14	-	-	-	-	-	-
10	13	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	-	-	-	-
13	18	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	-	±0,35	-	+0,70 -0
18	20	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	-	±0,42	-	+0,84 -0
20	23	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	-	±0,42	±0,17	+0,84 -0
23	26	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	-	±0,42	±0,17	+0,84 -0
26	30	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	0 -0,13	±0,42	±0,17	+0,84 -0
30	50	0 -0,16	-	0 -0,16	±0,60	±0,20	-	0 -0,25	0 -0,16	±0,80	±0,20	+1,6 -0
50	55	0 -0,19	-	0 -0,19	±0,70	±0,37	-	0 -0,46	0 -0,30	±0,95	±0,37	-
55	65	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	0 -0,30	±0,95	-	-
65	80	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	0 -0,30	±0,95	-	-
80	120	-	-	-	±2	-	-	-	-	-	-	-
120	140	-	-	-	±2,5	-	-	-	-	-	-	-

For Hollow Rods
Minimum wall thickness is 4 mm. Eccentricity : %10 (max.)

Outer Cold Drawn - Internal Extruded
Outer Class B - Hole Class A tolerance

Inner-Outer Cold Drawn
Outer Class C - Hole Class B tolerance

Inner-Outer Extruded
Outer Class A - Hole Class A tolerance

S603 -S603DW

RODS / HOLLOW RODS

CW603N - CuZn36Pb3

CW603N - CuZn36Pb3

Product Code	EN Symbol	EN No	ASTM		Cu	Zn	Pb	Sn	Fe	Ni	Al	Si	Others Total
S603	CuZn36Pb3	CW603N	C36000	Min (%)	60,0	Rem.	2,5	-	-	-	-	-	-
				Max (%)	62,0	Rem.	3,5	0,2	0,3	0,3	0,05	-	0,2
(*) S603DW	CuZn36Pb3-DW	CW603N-DW	C36000	Min (%)	60,0	Rem.	2,5	-	-	-	-	-	-
				Max (%)	62,0	Rem.	3,5	0,2	0,3	0,2	0,05	0,02	0,2

(*) Each of the other elements< 0,02 %

Features And Applications

CW603N is standard free machining alloy in USA market and named C36000. Also this alloy compliance with RoHS II and REACH directives. CW603N-DW alloy be used suitable for 4MS vs UBA list for drinking water applications.

4MS and UBA Hygienic list group for CW603N-DW alloy: C and D

Area of Usage

High speed machining parts, screws and nuts.

TECHNICAL SPECIFICATIONS

Structure	α+β	Hot Forming	700-800 °C
Machinability	% 90	Soft Annealing	450-600 °C
Density	8,5 g/cm³	Soft Annealing Time	1-3 hours
Electrical Conductivity	13 MS/m, 22 %IACS	Stress Relieving	200-300 °C
Thermal Conductivity	100 W/(m·K)	Max. Depth of Dezincification	1-3 hours
Elasticity Module	102 GPa		
Coeff. of Thermal Expansion	20,6 10^{-6}/K		
Melting Point	885-900 °C		

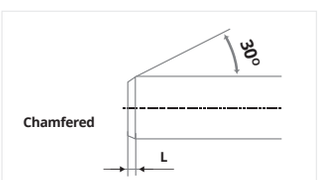
Range of Products

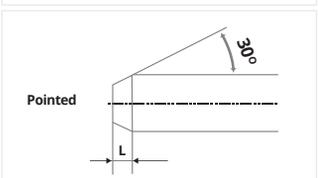
S603 and S603-DW alloys can be produced in our extrusion and cold drawing unit as rods, hollows and profiles suitable for both forging and machining. Please contact us for other technical informations.

INDICATIVE SHAPED ENDS DIMENSIONS

Nominal Diameter or Width		Type A – Chamfer Lenght (L)		Type B – Point Lenght (L)	
Across-flats (mm)		Min (mm)	Max (mm)	Min (mm)	Max (mm)
Over	Up to and including				
-	10	0,2	1,5	2	7
10	20	0,2	2	3	10
20	30	0,2	3	4	12

Unless otherwise specified by the buyer, the shape of the ends of products larger than 30 mm is up to the supplier.





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CW603N - CuZn36Pb3

Nominal Diameter or Width Across-flats (mm)		Preferred (available) Lengths (mm)	Tolerance on Length (mm)
Over	Up to and including		
10 Inc.	30	3.000 - 4.000	±50
30	80	3.000 - 4.000	±100

Stress Relieving The polygonal rods and hollow rods are subjected to stress relieving treatment

Packaging 500 or 1000 kg bundle – 3/5 metal straps different bundle packagings, up to 10 mm dimension products are packed with wooden case

EN 12164 - Rods for Free Machining

Material Condition	Nominal Diameter (mm)		Width Across-flats (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation			Hardness (HBW)	
	Over	Up to and inc.	Over	Up to and inc.	Min	Min	Max	A_{100mm} (%) Min	$A_{11,3}$ (%) Min	A (%) Min	Min	Max
M	All		All		As manufactured							
R340	10	80	10	55	340	-	280	-	-	20	-	-
H070	10	80	10	55	-	-	-	-	-	-	70	120
R400	10	25	10	20	400	200	-	4	8	12	-	-
H100	10	25	10	20	-	-	-	-	-	-	100	140
R480	10	14	10	10	480	350	-	3	5	8	-	-
H125	10	14	10	10	-	-	-	-	-	-	125	-

EN 12168 - Hollow Rods for Free Machining

Material Condition	Wall Thickness (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation A (%)	Hardness (HBW)		Hardness (HV)	
	Over	Up to and inc.	Min	Min	Max	Min	Min	Max	Min	Max
M	All		As manufactured							
R340	4	20	340	-	280	20	-	-	-	-
H070	4	20	-	-	-	-	70	120	80	130
R400	4	10	400	200	-	12	-	-	-	-
H100	4	10	-	-	-	-	100	140	110	150
R480	4	7	480	350	-	8	-	-	-	-
H125	4	7	-	-	-	-	125	-	135	-

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CW603N - CuZn36Pb3

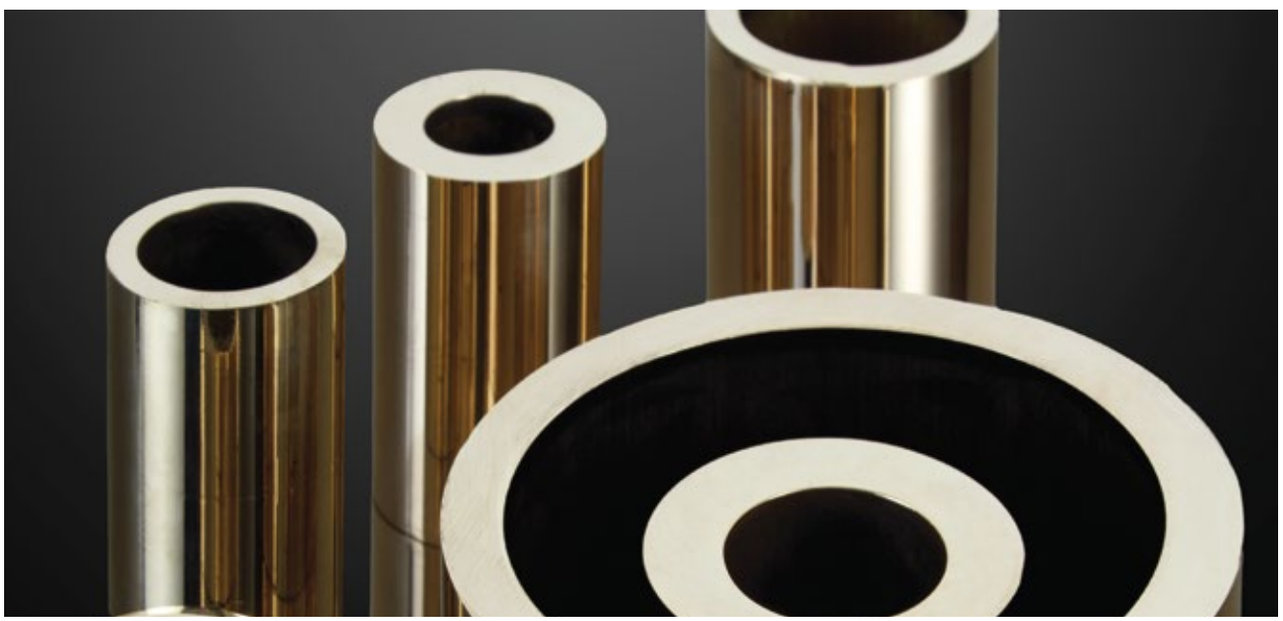
STANDARD		EN 12164			EN 12165		EN 12168					
Dimension Range		Round Rod		Hexagonal, Square	Round Rod		Round and Hexagonal Hollow Rod, Outer Dim. Tol.			Hole Tolerance Round		Hole Tol. Hexagonal
Over	Up to & inc.	Class A	Class B	Rod	Class A	Class B	Class A	Class B	Class C	Class A	Class B	-
-	10	0 -0,06	0 -0,036	0 -0,09	-	-	-	-	-	-	-	-
10	13	0 -0,07	0 -0,043	0 -0,11	-	-	-	-	-	-	-	-
13	18	0 -0,07	0 -0,043	0 -0,11	-	-	-	-	-	±0,35	-	+0,70 -0
18	20	0 -0,08	0 -0,052	0 -0,13	-	-	-	-	-	±0,42	-	+0,84 -0
20	23	0 -0,08	0 -0,052	0 -0,13	-	-	-	-	-	±0,42	±0,17	+0,84 -0
23	26	0 -0,08	0 -0,052	0 -0,13	-	-	-	0 -0,21	-	±0,42	±0,17	+0,84 -0
26	30	0 -0,08	0 -0,052	0 -0,13	-	-	-	0 -0,21	0 -0,13	±0,42	±0,17	+0,84 -0
30	50	0 -0,16	-	0 -0,16	-	-	-	0 -0,25	0 -0,16	±0,80	±0,20	+1,6 -0
50	55	0 -0,19	-	0 -0,19	-	-	-	0 -0,46	0 -0,30	±0,95	±0,37	-
55	65	0 -0,19	-	-	-	-	±0,60	0 -0,46	0 -0,30	±0,95	-	-
65	80	0 -0,19	-	-	-	-	±0,60	0 -0,46	0 -0,30	±0,95	-	-
80	120	-	-	-	-	-	-	-	-	-	-	-
120	140	-	-	-	-	-	-	-	-	-	-	-

For Hollow Rods
Minimum wall thickness is 4 mm. Eccentricity : %10 (max.)

Outer Cold Drawn - Internal Extruded
Outer Class B - Hole Class A tolerance

Inner-Outer Cold Drawn
Outer Class C - Hole Class B tolerance

Inner-Outer Extruded
Outer Class A - Hole Class A tolerance



S626

RODS / HOLLOW RODS

CW626N - CuZn33Pb1,5AlAs

CW626N - CuZn33Pb1,5AlAs

Product Code	EN Symbol	EN No	ASTM		Cu	Zn	Pb	Sn	Fe	As	Ni	Al	Mn	Others Total
S626	CuZn33Pb1,5AlAs	CW626N	-	Min (%)	64,0	Rem.	1,2	-	-	0,02	-	0,8	-	-
				Max (%)	66,0	Rem.	1,7	0,3	0,3	0,15	0,2	1	0,1	0,2

(*) Each of the other elements< 0,02 %

Features And Applications

CW626N is an alloy as a substitute for the alloy CW602N. CW626N meets ISO 6509 requirements regarding the dezincification resistance. Approximately 2 hours annealing at around 500 °C is recommended for EN ISO 6509 standard compliance after hot forging process. Depending on the process conditions, temperature and time can also change. Also this alloy compliance with UBA Hygienic list, 4MS, RoHS II and REACH directives.

4MS and UBA Hygienic list group for CW626N alloy: B, C, D

Area of Usage

Fitting parts used in aggressive (corrosive) water.

TECHNICAL SPECIFICATIONS

Structure	α	Hot Forming	700-800 °C
Machinability	% 70	Soft Annealing	500-550 °C
Density	8,4 g/cm³	Soft Annealing Time	2 hours
Electrical Conductivity	20 %IACS	Stress Relieving	200-250 °C
Thermal Conductivity	95 W/(m·K)	Stress Relieving Time	2 hours
Elasticity Module	96 kN/mm²	Max. Depth of Dezincification	<200 µm
Coeff. of Thermal Expansion	21,5 10^{-6}/K		
Melting Point	875-900 °C		

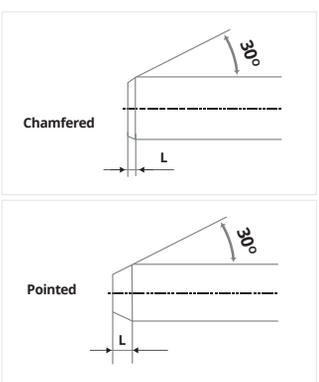
Range of Products

S626 alloy can be produced in our extrusion and cold drawing unit as rods, hollows and profiles suitable for both forging and machining. Please contact us for other technical informations.

INDICATIVE SHAPED ENDS DIMENSIONS

Nominal Diameter or Width		Type A – Chamfer Lenght (L)		Type B – Point Lenght (L)	
Across-flats (mm)		Min (mm)	Max (mm)	Min (mm)	Max (mm)
Over	Up to and including				
-	10	0,2	1,5	2	7
10	20	0,2	2	3	10
20	30	0,2	3	4	12

Unless otherwise specified by the buyer, the shape of the ends of products larger than 30 mm is up to the supplier.



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CW626N - CuZn33Pb1,5AlAs

Nominal Diameter or Width Across-flats (mm)		Preferred (available) Lengths (mm)	Tolerance on Length (mm)
Over	Up to and including		
10 Inc.	30	3.000 - 4.000	±50
30	80	3.000 - 4.000	±100

Stress Relieving The polygonal rods and hollow rods are subjected to stress relieving treatment

Packaging 500 or 1000 kg bundle – 3/5 metal straps different bundle packagings, up to 10 mm dimension products are packed with wooden case

EN 12164 - Rods for Free Machining

Material Condition	Nominal Diameter (mm)		Width Across-flats (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation			Hardness (HBW)	
	Over	Up to and inc.	Over	Up to and inc.	Min	Min	Max	A_{100mm} (%) Min	$A_{11,3}$ (%) Min	A (%) Min	Min	Max
M	All		All		As manufactured							
R280	10	80	10	55	280	-	200	-	25	30	-	-
H070	10	80	10	55	-	-	-	-	-	-	70	110
R320	10	60	10	50	320	200	-	-	15	20	-	-
H090	10	60	10	50	-	-	-	-	-	-	90	135
R400	10	15	10	13	400	250	-	-	5	8	-	-
H105	10	15	10	13	-	-	-	-	-	-	105	-

EN 12168 - Hollow Rods for Free Machining

Material Condition	Wall Thickness (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation A (%)	Hardness (HBW)		Hardness (HV)	
	Over	Up to and inc.	Min	Min	Max	Min	Min	Max	Min	Max
M	All		As manufactured							
R280	4	All	280	-	200	30	-	-	-	-
H070	4	All	-	-	-	-	70	110	80	120
R320	4	20	320	200	-	20	-	-	-	-
H090	4	20	-	-	-	-	90	135	100	145
R400	4	8	400	250	-	8	-	-	-	-
H105	4	8	-	-	-	-	105	-	115	-

EN 12165 - Wrought and Unwrought Forging Stocks

Material Condition	Nominal Diameter (mm)		Hardness (HBW)	
	Over	Up to and including	Min	Max
M	All		As manufactured	
H070	8	80	70	110

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CW626N - CuZn33Pb1,5AlAs

Dimension Range		Round Rod		Hexagonal, Square	Round Rod		Round and Hexagonal Hollow Rod, Outer Dim. Tol.			Hole Tolerance Round		Hole Tol. Hexagonal
Over	Up to & inc.	Class A	Class B	Rod	Class A	Class B	Class A	Class B	Class C	Class A	Class B	-
-	10	0 -0,06	0 -0,036	0 -0,09	±0,25	±0,14	-	-	-	-	-	-
10	13	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	-	-	-	-
13	18	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	-	±0,35	-	+0,70 -0
18	20	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	-	±0,42	-	+0,84 -0
20	23	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	-	±0,42	±0,17	+0,84 -0
23	26	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	-	±0,42	±0,17	+0,84 -0
26	30	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	0 -0,13	±0,42	±0,17	+0,84 -0
30	50	0 -0,16	-	0 -0,16	±0,60	±0,20	-	0 -0,25	0 -0,16	±0,80	±0,20	+1,6 -0
50	55	0 -0,19	-	0 -0,19	±0,70	±0,37	-	0 -0,46	0 -0,30	±0,95	±0,37	-
55	65	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	0 -0,30	±0,95	-	-
65	80	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	0 -0,30	±0,95	-	-
80	120	-	-	-	±2	-	-	-	-	-	-	-
120	140	-	-	-	±2,5	-	-	-	-	-	-	-

For Hollow Rods
Minimum wall thickness is 4 mm. Eccentricity : %10 (max.)

Outer Cold Drawn - Internal Extruded
Outer Class B - Hole Class A tolerance

Inner-Outer Cold Drawn
Outer Class C - Hole Class B tolerance

Inner-Outer Extruded
Outer Class A - Hole Class A tolerance

S602

RODS / HOLLOW RODS

CW602N - CuZn36Pb2As

CW602N - CuZn36Pb2As

Product Code	EN Symbol	EN No	ASTM		Cu	Zn	Pb	Sn	Fe	As	Ni	Al	Mn	Others Total
S602	CuZn36Pb2As	CW602N	C35330	Min (%)	61,0	Rem.	1,7	-	-	0,02	-	-	-	-
				Max (%)	63,0	Rem.	2,2	0,1	0,1	0,15	0,3	0,05	0,1	0,2

Features And Applications

CW602N alloy is standard dezincification resistant brass . CW602N meets ISO 6509 requirements regarding the dezincification resistance. Approximately 2 hours annealing at around 500° C is recommended for EN ISO 6509 standard compliance after hot forging process. Depending on the process conditions, temperature and time can also change. Also this alloy compliance with RoHS II and REACH directives.

CW602N alloy is not suitable for 4MS.

Area of Usage

Fitting parts used in aggressive (corrosive) water.

TECHNICAL SPECIFICATIONS

Structure	α
Machinability	% 80
Density	8,46 g/cm³
Electrical Conductivity	14,7 MS/m, 25 %IACS
Thermal Conductivity	114 W/(m·K)
Elasticity Module	105 GPa
Coeff. of Thermal Expansion	20,3 10^{-6}/K
Melting Point	885-910 °C

Hot Forming	720-830 °C
Soft Annealing	450-550 °C
Soft Annealing Time	1-3 hours
Stress Relieving	250-350 °C
Stress Relieving Time	1-3 hours
Max. Depth of Dezincification	<100 µm

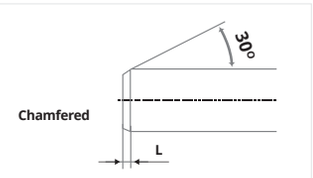
Range of Products

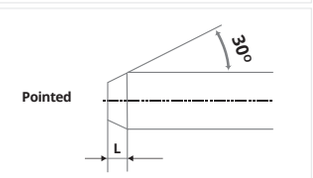
S602 alloy can be produced in our extrusion and cold drawing unit as rods, hollows and profiles suitable for both forging and machining. Please contact us for other technical informations.

INDICATIVE SHAPED ENDS DIMENSIONS

Nominal Diameter or Width		Type A – Chamfer Lenght (L)		Type B – Point Lenght (L)	
Across-flats (mm)		Min (mm)	Max (mm)	Min (mm)	Max (mm)
Over	Up to and including				
-	10	0,2	1,5	2	7
10	20	0,2	2	3	10
20	30	0,2	3	4	12

Unless otherwise specified by the buyer, the shape of the ends of products larger than 30 mm is up to the supplier.





CW602N - CuZn36Pb2As

Nominal Diameter or Width Across-flats (mm)		Preferred (available) Lengths (mm)	Tolerance on Length (mm)
Over	Up to and including		
10 Inc.	30	3.000 - 4.000	±50
30	80	3.000 - 4.000	±100

Stress Relieving The polygonal rods and hollow rods are subjected to stress relieving treatment

Packaging 500 or 1000 kg bundle – 3/5 metal straps different bundle packagings, up to 10 mm dimension products are packed with wooden case

EN 12164 - Rods for Free Machining

Material Condition	Nominal Diameter (mm)		Width Across-flats (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation			Hardness (HBW)	
	Over	Up to and inc.	Over	Up to and inc.	Min	Min	Max	A_{100mm} (%) Min	$A_{11,3}$ (%) Min	A (%) Min	Min	Max
M	All		All		As manufactured							
R280	10	80	10	55	280	-	200	-	25	30	-	-
H070	10	80	10	55	-	-	-	-	-	-	70	110
R320	10	60	10	50	320	200	-	-	15	20	-	-
H090	10	60	10	50	-	-	-	-	-	-	90	135
R400	10	15	10	13	400	250	-	-	5	8	-	-
H105	10	15	10	13	-	-	-	-	-	-	105	-

EN 12168 - Hollow Rods for Free Machining

Material Condition	Wall Thickness (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation A (%)	Hardness (HBW)		Hardness (HV)	
	Over	Up to and inc.	Min	Min	Max	Min	Min	Max	Min	Max
M	All		As manufactured							
R280	4	All	280	-	200	30	-	-	-	-
H070	4	All	-	-	-	-	70	110	80	120
R320	4	20	320	200	-	20	-	-	-	-
H090	4	20	-	-	-	-	90	135	100	145
R400	4	8	400	250	-	8	-	-	-	-
H105	4	8	-	-	-	-	105	-	115	-

EN 12165 - Wrought and Unwrought Forging Stocks

Material Condition	Nominal Diameter (mm)		Hardness (HBW)	
	Over	Up to and including	Min	Max
M	All		As manufactured	
H070	8	80	70	110

sarbak

CW602N - CuZn36Pb2As

STANDARD		EN 12164			EN 12165		EN 12168					
Dimension Range		Round Rod		Hexagonal, Square	Round Rod		Round and Hexagonal Hollow Rod, Outer Dim. Tol.			Hole Tolerance Round		Hole Tol. Hexagonal
Over	Up to & inc.	Class A	Class B	Rod	Class A	Class B	Class A	Class B	Class C	Class A	Class B	-
-	10	0 -0,06	0 -0,036	0 -0,09	±0,25	±0,14	-	-	-	-	-	-
10	13	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	-	-	-	-
13	18	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	-	±0,35	-	+0,70 -0
18	20	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	-	±0,42	-	+0,84 -0
20	23	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	-	±0,42	±0,17	+0,84 -0
23	26	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	-	±0,42	±0,17	+0,84 -0
26	30	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	0 -0,13	±0,42	±0,17	+0,84 -0
30	50	0 -0,16	-	0 -0,16	±0,60	±0,20	-	0 -0,25	0 -0,16	±0,80	±0,20	+1,6 -0
50	55	0 -0,19	-	0 -0,19	±0,70	±0,37	-	0 -0,46	0 -0,30	±0,95	±0,37	-
55	65	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	0 -0,30	±0,95	-	-
65	80	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	0 -0,30	±0,95	-	-
80	120	-	-	-	±2	-	-	-	-	-	-	-
120	140	-	-	-	±2,5	-	-	-	-	-	-	-

For Hollow Rods
Minimum wall thickness is 4 mm. Eccentricity : %10 (max.)

Outer Cold Drawn - Internal Extruded
Outer Class B - Hole Class A tolerance

Inner-Outer Cold Drawn
Outer Class C - Hole Class B tolerance

Inner-Outer Extruded
Outer Class A - Hole Class A tolerance

S511 - S511DW

RODS / HOLLOW RODS

CW511L - CuZn38As

CW511L - CuZn38As

Product Code	EN Symbol	EN No	ASTM		Cu	Zn	Pb	Sn	Fe	Ni	Al	As	Others Total
S511	CuZn38As	CW511L	C27453	Min (%)	61,5	Rem.	-	-	-	-	-	0,02	-
				Max (%)	63,5	Rem.	0,2	0,1	0,1	0,3	0,05	0,15	0,2
(*) S511DW	CuZn38As-DW	CW511L-DW	C27453	Min (%)	61,5	Rem.	-	-	-	-	-	0,02	-
				Max (%)	63,5	Rem.	0,2	0,1	0,1	0,3	0,05	0,15	0,2

(*) Each of the other elements< 0,02 %

Features And Applications

CW511L alloy is standard dezincification resistant brass with low lead content. Chips and parts can be mixed with CW602N alloy. CW511L meets ISO 6509 requirements regarding the dezincification resistance. Approximately 2 hours annealing at around 500 °C is recommended for EN ISO 6509 standard compliance after hot forging process. Depending on the process conditions, temperature and time can also change.
Also these alloy compliance with RoHS II and REACH directives. CW511L-DW alloy be used suitable for 4MS vs UBA list for drinking water applications.

4MS and UBA Hygienic list group for CW511L-DW alloy: B, C, D

Area of Usage

This alloy suitable for drinking water application in USA and Canada Markets because of the lead content below 0.2%. Thanks to a good dezincification resistance properties, it is suitable for the manufacture of parts used in aggressive (corrosive) water.

TECHNICAL SPECIFICATIONS

Structure	α	Melting Point	850-900 °C
Machinability	% 40	Hot Forming	600-800 °C
Density	8,41 g/cm³	Soft Annealing	450-550 °C
Electrical Conductivity	14,7 MS/m, 25,4 %IACS	Soft Annealing Time	1-3 hours
Thermal Conductivity	114 W/(m·K)	Stress Relieving	200-250 °C
Elasticity Module	100 kN/mm²	Stress Relieving Time	1-3 hours
Coeff. of Thermal Expansion	21,7 10^{-6}/K	Max. Depth of Dezincification	<100 µm

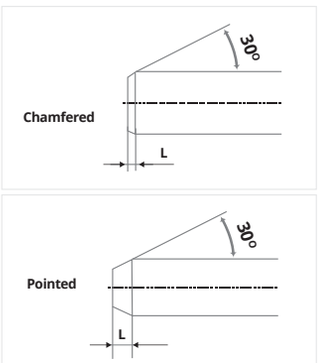
Range of Products

S511L and S511L-DW alloys can be produced in our extrusion and cold drawing unit as rods, hollows and profiles suitable for both forging and machining. Please contact us for other technical informations.

INDICATIVE SHAPED ENDS DIMENSIONS

Nominal Diameter or Width		Type A – Chamfer Lenght (L)		Type B – Point Lenght (L)	
Across-flats (mm)		Min (mm)	Max (mm)	Min (mm)	Max (mm)
Over	Up to and including				
-	10	0,2	1,5	2	7
10	20	0,2	2	3	10
20	30	0,2	3	4	12

Unless otherwise specified by the buyer, the shape of the ends of products larger than 30 mm is up to the supplier.



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CW511L - CuZn38As

Nominal Diameter or Width Across-flats (mm)		Preferred (available) Lengths (mm)	Tolerance on Length (mm)
Over	Up to and including		
10 Inc.	30	3.000 - 4.000	±50
30	80	3.000 - 4.000	±100

Stress Relieving The polygonal rods and hollow rods are subjected to stress relieving treatment

Packaging 500 or 1000 kg bundle – 3/5 metal straps different bundle packagings, up to 10 mm dimension products are packed with wooden case

EN 12164 - Rods for Free Machining

Material Condition	Nominal Diameter (mm)		Width Across-flats (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation			Hardness (HBW)	
	Over	Up to and inc.	Over	Up to and inc.	Min	Min	Max	A_{100mm} (%) Min	$A_{11,3}$ (%) Min	A (%) Min	Min	Max
M	All		All		As manufactured							
R280	10	80	10	55	280	-	200	-	25	30	-	-
H070	10	80	10	55	-	-	-	-	-	-	70	110
R320	10	60	10	50	320	200	-	-	15	20	-	-
H090	10	60	10	50	-	-	-	-	-	-	90	135
R400	10	15	10	13	400	250	-	-	5	8	-	-
H105	10	15	10	13	-	-	-	-	-	-	105	-

EN 12168 - Hollow Rods for Free Machining

Material Condition	Wall Thickness (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation A (%)	Hardness (HBW)		Hardness (HV)	
	Over	Up to and inc.	Min	Min	Max	Min	Min	Max	Min	Max
M	All		As manufactured							
R280	4	All	280	-	200	30	-	-	-	-
H070	4	All	-	-	-	-	70	110	80	120
R320	4	20	320	200	-	20	-	-	-	-
H090	4	20	-	-	-	-	90	135	100	145
R400	4	8	400	250	-	8	-	-	-	-
H105	4	8	-	-	-	-	105	-	115	-

EN 12165 - Wrought and Unwrought Forging Stocks

Material Condition	Nominal Diameter (mm)		Hardness (HBW)	
	Over	Up to and including	Min	Max
M	All		As manufactured	
H070	8	80	70	110

sarbak

CW511L - CuZn38As

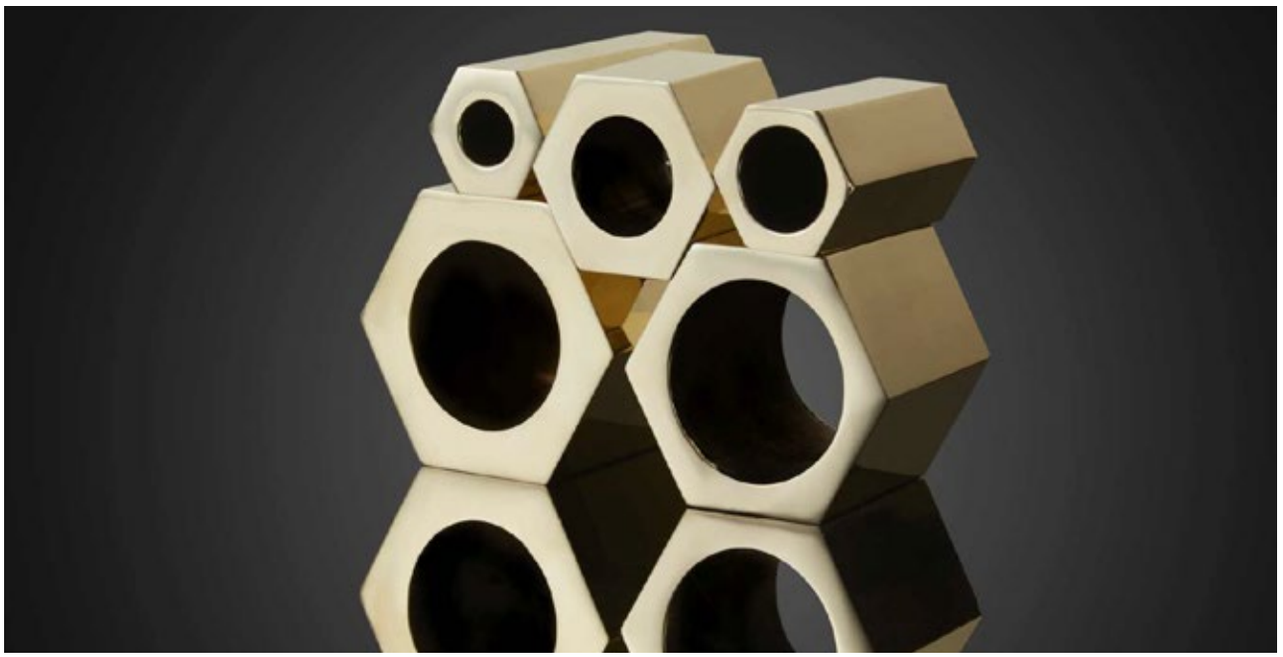
STANDARD		EN 12164			EN 12165		EN 12168					
Dimension Range		Round Rod		Hexagonal, Square	Round Rod		Round and Hexagonal Hollow Rod, Outer Dim. Tol.			Hole Tolerance Round		Hole Tol. Hexagonal
Over	Up to & inc.	Class A	Class B	Rod	Class A	Class B	Class A	Class B	Class C	Class A	Class B	-
-	10	0 -0,06	0 -0,036	0 -0,09	±0,25	±0,14	-	-	-	-	-	-
10	13	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	-	-	-	-
13	18	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	-	±0,35	-	+0,70 -0
18	20	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	-	±0,42	-	+0,84 -0
20	23	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	-	±0,42	±0,17	+0,84 -0
23	26	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	0 -0,13	±0,42	±0,17	+0,84 -0
26	30	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	0 -0,16	±0,42	±0,17	+0,84 -0
30	50	0 -0,16	-	0 -0,16	±0,60	±0,20	-	0 -0,25	0 -0,30	±0,80	±0,20	+1,6 -0
50	55	0 -0,19	-	0 -0,19	±0,70	±0,37	-	0 -0,46	0 -0,30	±0,95	±0,37	-
55	65	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	0 -0,30	±0,95	-	-
65	80	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46		±0,95	-	-
80	120	-	-	-	±2	-	-	-	-	-	-	-
120	140	-	-	-	±2,5	-	-	-	-	-	-	-

For Hollow Rods
Minimum wall thickness is 4 mm. Eccentricity : %10 (max.)

Outer Cold Drawn - Internal Extruded
Outer Class B - Hole Class A tolerance

Inner-Outer Cold Drawn
Outer Class C - Hole Class B tolerance

Inner-Outer Extruded
Outer Class A - Hole Class A tolerance



S510 - S510DW

RODS / HOLLOW RODS

CW510L - CuZn42

CW510L - CuZn42

Product Code	EN Symbol	EN No	ASTM		Cu	Zn	Pb	Sn	Fe	Ni	Al	Si	Others Total
S510	CuZn42	CW510L	C28500	Min (%)	57,0	Rem.	-	-	-	-	-	-	-
				Max (%)	59,0	Rem.	0,2	0,3	0,3	0,3	0,05	-	0,2
(*) S510DW	CuZn42-DW	CW510L-DW	C28500	Min (%)	57,0	Rem.	-	-	-	-	-	-	-
				Max (%)	59,0	Rem.	0,2	0,3	0,3	0,2	0,05	0,02	0,2

(*) Each of the other elements< 0,02 %

Features And Applications

Chips and parts can be mixed with MS58 group alloys. Also this alloy compliance with RoHS II and REACH directives. CW510L-DW alloy be used suitable for 4MS vs UBA list for drinking water applications.

4MS and UBA Hygienic list group for CW510L-DW alloy: B, C, D

Area of Usage

Construction, automotive, gas, food, health, aviation, electrical, electronics, plumbing, drinking water products, accessories and fittings. Also this alloy suitable for drinking water application in USA and Canada Markets because of the lead content below 0.2%.

TECHNICAL SPECIFICATIONS

Structure	α+β
Machinability	% 70
Density	8,37 g/cm³
Electrical Conductivity	18 MS/m, 31 %IACS
Thermal Conductivity	139 W/(m·K)
Elasticity Module	85 kN/mm²
Coeff. of Thermal Expansion	21,7 10^{-6}/K
Melting Point	870-900 °C

Hot Forming	650-750 °C
Soft Annealing	450-550 °C
Soft Annealing Time	1-3 hours
Stress Relieving	250-350 °C
Stress Relieving Time	1-3 hours

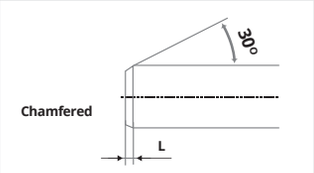
Range of Products

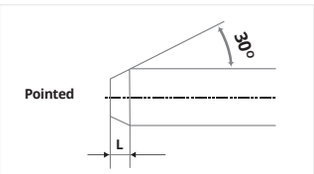
S510L and S510L-DW alloys can be produced in our extrusion and cold drawing unit as rods, hollows and profiles suitable for both forging and machining. Please contact us for other technical informations.

INDICATIVE SHAPED ENDS DIMENSIONS

Nominal Diameter or Width		Type A – Chamfer Lenght (L)		Type B – Point Lenght (L)	
Across-flats (mm)		Min (mm)	Max (mm)	Min (mm)	Max (mm)
Over	Up to and including				
5	10	0,2	1,5	2	7
10	20	0,2	2	3	10
20	30	0,2	3	4	12

Unless otherwise specified by the buyer, the shape of the ends of products larger than 30 mm is up to the supplier.





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CW510L - CuZn42

Nominal Diameter or Width Across-flats (mm)		Preferred (available) Lengths (mm)	Tolerance on Length (mm)
Over	Up to and including		
6 Inc.	30	3.000 - 4.000	±50
30	80	3.000 - 4.000	±100

Stress Relieving The polygonal rods and hollow rods are subjected to stress relieving treatment

Packaging 500 or 1000 kg bundle – 3/5 metal straps different bundle packagings, up to 10 mm dimension products are packed with wooden case

EN 12164 - Rods for Free Machining

Material Condition	Nominal Diameter (mm)		Width Across-flats (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation			Hardness (HBW)	
	Over	Up to and inc.	Over	Up to and inc.	Min	Min	Max	A_{100mm} (%) Min	$A_{11,3}$ (%) Min	A (%) Min	Min	Max
M	All		All		As manufactured							
R360	6	80	6	55	360	-	320	-	15	20	-	-
H090	6	80	6	55	-	-	-	-	-	-	90	125
R430	6	40	6	35	430	220	-	6	8	10	-	-
H110	6	40	6	35	-	-	-	-	-	-	110	160
R500	6	14	6	10	500	350	-	-	3	5	-	-
H135	6	14	6	10	-	-	-	-	-	-	135	-

EN 12168 - Hollow Rods for Free Machining

Material Condition	Wall Thickness (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation A (%)	Hardness (HBW)		Hardness (HV)	
	Over	Up to and inc.	Min	Min	Max	Min	Min	Max	Min	Max
M	All		As manufactured							
R360	3	40	360	-	320	20	-	-	-	-
H090	3	40	-	-	-	-	90	125	100	135
R430	3	15	430	220	-	10	-	-	-	-
H110	3	15	-	-	-	-	110	160	120	170
R500	3	7	500	350	-	8	-	-	-	-
H135	3	7	-	-	-	-	135	-	145	-

EN 12165 - Wrought and Unwrought Forging Stocks

Material Condition	Nominal Diameter (mm)		Hardness (HBW)	
	Over	Up to and including	Min	Max
M	All		As manufactured	
H090	8	80	90	125

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CW510L - CuZn42

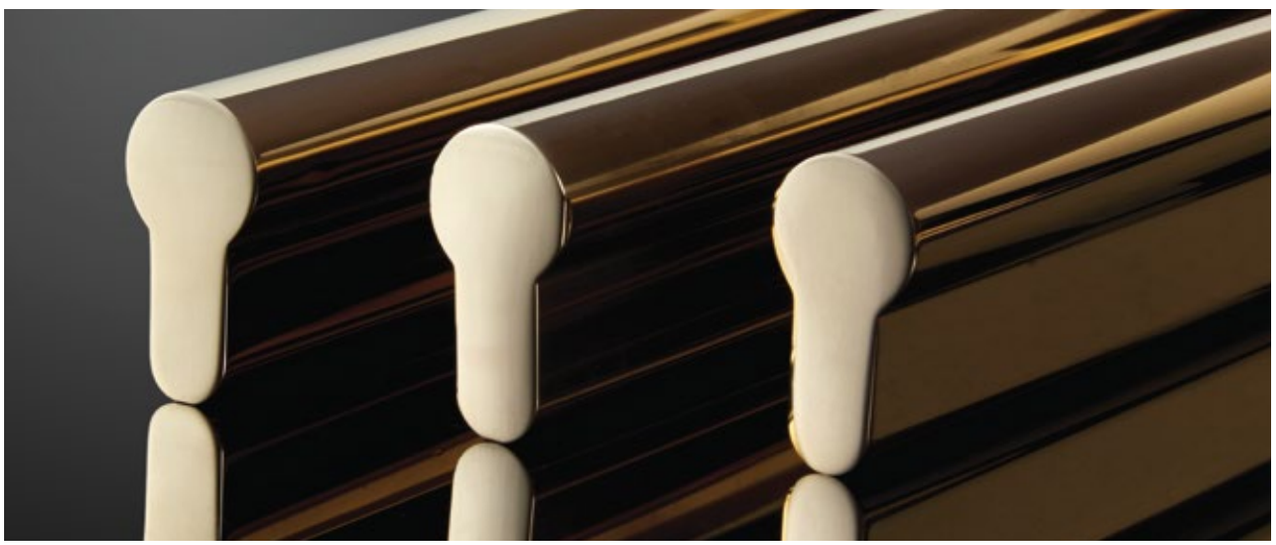
STANDARD		EN 12164			EN 12165		EN 12168					
Dimension Range		Round Rod		Hexagonal, Square	Round Rod		Round and Hexagonal Hollow Rod, Outer Dim. Tol.			Hole Tolerance Round		Hole Tol. Hexagonal
Over	Up to & inc.	Class A	Class B	Rod	Class A	Class B	Class A	Class B	Class C	Class A	Class B	-
5	6	0 -0,05	0 -0,03	0 -0,08	-	-	-	-	-	-	-	-
6	10	0 -0,06	0 -0,036	0 -0,09	±0,25	±0,14	-	-	-	-	-	-
10	13	0 -0,07	0 -0,43	0 -0,11	±0,25	±0,14	-	-	-	-	-	-
13	18	0 -0,07	0 -0,43	0 -0,11	±0,25	±0,14	-	-	-	±0,35	-	+0,70 -0
	20	0 -0,08	0 -0,52	0 -0,13	±0,30	±0,17	-	-	-	±0,42	-	+0,84 -0
20	23	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	-	±0,42	±0,17	+0,84 -0
23	26	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	-	±0,42	±0,17	+0,84 -0
26	30	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	0 -0,13	±0,42	±0,17	+0,84 -0
30	50	0 -0,16	-	0 -0,16	±0,60	±0,20	-	0 -0,25	0 -0,16	±0,80	±0,20	+1,6 -0
50	55	0 -0,19	-	0 -0,19	±0,70	±0,37	-	0 -0,46	0 -0,30	±0,95	±0,37	-
55	65	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	0 -0,30	±0,95	-	-
65	80	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	0 -0,30	±0,95	-	-
80	120	-	-	-	±2	-	-	-	-	-	-	-
120	140	-	-	-	±2,5	-	-	-	-	-	-	-

For Hollow Rods
Minimum wall thickness is 3 mm. Eccentricity : %10 (max.)

Outer Cold Drawn - Internal Extruded
Outer Class B - Hole Class A tolerance

Inner-Outer Cold Drawn
Outer Class C - Hole Class B tolerance

Inner-Outer Extruded
Outer Class A - Hole Class A tolerance



S509 - S509DW

RODS / HOLLOW RODS

CW509L - CuZn40

CW509L - CuZn40

Product Code	EN Symbol	EN No	ASTM		Cu	Zn	Pb	Sn	Fe	Ni	Al	Si	Others Total
S509	CuZn40	CW509L	C27450	Min (%)	59,0	Rem.	-	-	-	-	-	-	-
				Max (%)	61,5	Rem.	0,2	0,2	0,2	0,3	0,05	-	0,2
(*) S509DW	CuZn40-DW	CW509L-DW	C27450	Min (%)	59,5	Rem.	-	-	-	-	-	-	-
				Max (%)	61,5	Rem.	0,2	0,2	0,2	0,2	0,05	0,02	0,2

(*) Each of the other elements< 0,02 %

Features And Applications

Chips and parts can be mixed with MS58 group alloys. Also this alloy compliance with RoHS II and REACH directives. CW509L-DW alloy be used suitable for 4MS vs UBA list for drinking water applications.

4MS and UBA Hygienic list group for CW509L-DW alloy: B, C, D

Area of Usage

Construction, automotive, gas, food, health, aviation, electrical, electronics, plumbing, drinking water products, accessories and fittings. Also this alloy suitable for drinking water application in USA and Canada Markets because of the lead content below 0.2%.

TECHNICAL SPECIFICATIONS

Structure	α+β	Hot Forming	650-750 °C
Machinability	% 50	Soft Annealing	450-550 °C
Density	8,4 g/cm³	Soft Annealing Time	1-3 hours
Electrical Conductivity	28 %IACS	Stress Relieving	200-250 °C
Thermal Conductivity	122 W/(m·K)	Stress Relieving Time	1-3 hours
Elasticity Module	105 GPa		
Coeff. of Thermal Expansion	20,8 10^{-6}/K		
Melting Point	880-910 °C		

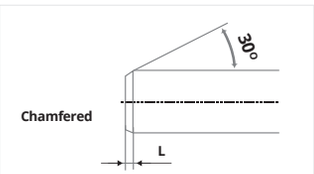
Range of Products

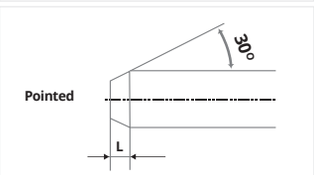
S509L and S509L-DW alloys can be produced in our extrusion and cold drawing unit as rods, hollows and profiles suitable for both forging and machining. Please contact us for other technical informations.

INDICATIVE SHAPED ENDS DIMENSIONS

Nominal Diameter or Width		Type A – Chamfer Lenght (L)		Type B – Point Lenght (L)	
Across-flats (mm)		Min (mm)	Max (mm)	Min (mm)	Max (mm)
Over	Up to and including				
-	10	0,2	1,5	2	7
10	20	0,2	2	3	10
20	30	0,2	3	4	12

Unless otherwise specified by the buyer, the shape of the ends of products larger than 30 mm is up to the supplier.





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CW509L - CuZn40

Nominal Diameter or Width Across-flats (mm)		Preferred (available) Lengths (mm)	Tolerance on Length (mm)
Over	Up to and including		
10 Inc.	30	3.000 - 4.000	±50
30	80	3.000 - 4.000	±100

Stress Relieving The polygonal rods and hollow rods are subjected to stress relieving treatment

Packaging 500 or 1000 kg bundle – 3/5 metal straps different bundle packagings, up to 10 mm dimension products are packed with wooden case

EN 12164 - Rods for Free Machining

Material Condition	Nominal Diameter (mm)		Width Across-flats (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation			Hardness (HBW)	
	Over	Up to and inc.	Over	Up to and inc.	Min	Min	Max	A_{100mm} (%) Min	$A_{11,3}$ (%) Min	A (%) Min	Min	Max
M	All		All		As manufactured							
R360	10	80	10	55	360	-	300	-	15	20	-	-
H070	10	80	10	55	-	-	-	-	-	-	70	100
R410	10	40	10	35	410	230	-	8	10	12	-	-
H100	10	40	10	35	-	-	-	-	-	-	100	145
R500	10	14	10	10	500	350	-	3	5	8	-	-
H120	10	14	10	10	-	-	-	-	-	-	120	-

EN 12168 - Hollow Rods for Free Machining

Material Condition	Wall Thickness (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation A (%)	Hardness (HBW)		Hardness (HV)	
	Over	Up to and inc.	Min	Min	Max	Min	Min	Max	Min	Max
M	All		As manufactured							
R360	4	20	360	-	300	20	-	-	-	-
H070	4	20	-	-	-	-	70	100	80	110
R410	4	10	410	250	-	12	-	-	-	-
H100	4	10	-	-	-	-	100	145	110	155
R500	4	7	500	350	-	8	-	-	-	-
H120	4	7	-	-	-	-	120	-	130	-

EN 12165 - Wrought and Unwrought Forging Stocks

Material Condition	Nominal Diameter (mm)		Hardness (HBW)	
	Over	Up to and including	Min	Max
M	All		As manufactured	
H070	8	80	70	100

sarbak

CW509L - CuZn40

STANDARD		EN 12164			EN 12165		EN 12168					
Dimension Range		Round Rod		Hexagonal, Square	Round Rod		Round and Hexagonal Hollow Rod, Outer Dim. Tol.			Hole Tolerance Round		Hole Tol. Hexagonal
Over	Up to & inc.	Class A	Class B	Rod	Class A	Class B	Class A	Class B	Class C	Class A	Class B	-
-	10	0 -0,06	0 -0,036	0 -0,09	±0,25	±0,14	-	-	-	-	-	-
10	13	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	-	-	-	-
13	18	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	-	±0,35	-	+0,70 -0
18	20	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	-	±0,42	-	+0,84 -0
20	23	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	-	±0,42	±0,17	+0,84 -0
23	26	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	-	±0,42	±0,17	+0,84 -0
26	30	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	0 -0,13	±0,42	±0,17	+0,84 -0
30	50	0 -0,16	-	0 -0,16	±0,60	±0,20	-	0 -0,25	0 -0,16	±0,80	±0,20	+1,6 -0
50	55	0 -0,19	-	0 -0,019	±0,70	±0,37	-	0 -0,46	0 -0,30	±0,95	±0,37	-
55	65	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	0 -0,30	±0,95	-	-
65	80	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	0 -0,30	±0,95	-	-
80	120	-	-	-	±2	-	-	-	-	-	-	-
120	140	-	-	-	±2,5	-	-	-	-	-	-	-

For Hollow Rods
Minimum wall thickness is 3-4 mm. Eccentricity : %10 (max.)

Outer Cold Drawn - Internal Extruded
Outer Class B - Hole Class A tolerance

Inner-Outer Cold Drawn
Outer Class C - Hole Class B tolerance

Inner-Outer Extruded
Outer Class A - Hole Class A tolerance

S709

RODS / HOLLOW RODS

CW709R - CuZn32Pb2AsFeSi

CW709R - CuZn32Pb2AsFeSi

Product Code	EN Symbol	EN No	ASTM		Cu	Zn	Pb	Sn	Fe	Ni	Al	Si	As	Others Total
S709	CuZn32Pb2AsFeSi	CW709R	-	Min (%)	64,0	Rem.	1,5	-	0,1	-	-	0,45	0,03	-
				Max (%)	66,5	Rem.	2,2	0,3	0,2	0,3	0,05	0,8	0,08	0,2

Features And Applications

Due to its good resistance to dezincification, it is preferred in the manufacture of parts which come in contact with water. Also this alloy compliance with RoHS II and REACH directives.

Area of Usage

Fitting parts used in aggressive (corrosive) water.

TECHNICAL SPECIFICATIONS

Structure	α+β
Machinability	% 85
Density	8,48 g/cm³
Electrical Conductivity	13,4 %IACS
Thermal Conductivity	65 W/(m·K)
Elasticity Module	109 GPa
Coeff. of Thermal Expansion	21 10^{-6}/K
Melting Point	910-940 °C

Hot Forming	700-830 °C
Soft Annealing	500-600 °C
Soft Annealing Time	1-3 hours
Stress Relieving	300-400 °C
Stress Relieving Time	1-3 hours
Max. Depth of Dezincification	<100 µm

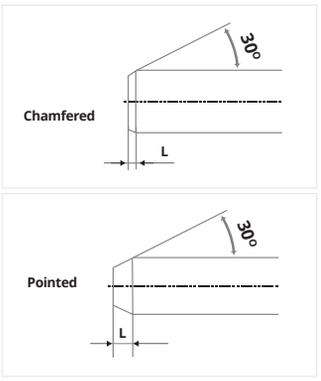
Range of Products

S709 alloy can be produced in our extrusion and cold drawing unit as rods, hollows and profiles suitable for both forging and machining. Please contact us for other technical informations.

INDICATIVE SHAPED ENDS DIMENSIONS

Nominal Diameter or Width		Type A – Chamfer Lenght (L)		Type B – Point Lenght (L)	
Across-flats (mm)		Min (mm)	Max (mm)	Min (mm)	Max (mm)
Over	Up to and including				
8 Inc.	10	0,2	1,5	2	7
10	20	0,2	2	3	10
20	30	0,2	3	4	12

Unless otherwise specified by the buyer, the shape of the ends of products larger than 30 mm is up to the supplier.



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CW709R - CuZn32Pb2AsFeSi

Nominal Diameter or Width Across-flats (mm)		Preferred (available) Lengths (mm)	Tolerance on Length (mm)
Over	Up to and including		
8 Inc.	30	3.000 - 4.000	±50
30	80	3.000 - 4.000	±100

Stress Relieving The polygonal rods and hollow rods are subjected to stress relieving treatment

Packaging 500 or 1000 kg bundle – 3/5 metal straps different bundle packagings, up to 10 mm dimension products are packed with wooden case

EN 12164 - Rods for Free Machining

Material Condition	Nominal Diameter (mm)		Width Across-flats (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation			Hardness (HBW)	
	Over	Up to and inc.	Over	Up to and inc.	Min	Min	Max	A_{100mm} (%) Min	$A_{11,3}$ (%) Min	A (%) Min	Min	Max
M	All		All		As manufactured							
R380	8	40	8	40	380	220	-	-	15	20	110	160
R430	8	40	8	40	430	280	-	-	12	15	120	170

EN 12168 - Hollow Rods for Free Machining

Material Condition	Wall Thickness (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation A (%)	Hardness (HBW)		Hardness (HV)	
	Over	Up to and inc.	Min	Min	Max	Min	Min	Max	Min	Max
M	All			As manufactured						
R380	4	15	380	220	-	20	-	-	-	-
H110	4	15	-	-	-	-	110	150	120	160
R430	4	10	430	260	-	15	-	-	-	-
H120	4	10	-	-	-	-	120	170	130	180

EN 12165 - Wrought and Unwrought Forging Stocks

Material Condition	Nominal Diameter (mm)		Hardness (HBW)	
	Over	Up to and including	Min	Max
M	All		As manufactured	
H090	8	80	90	170

sarbak

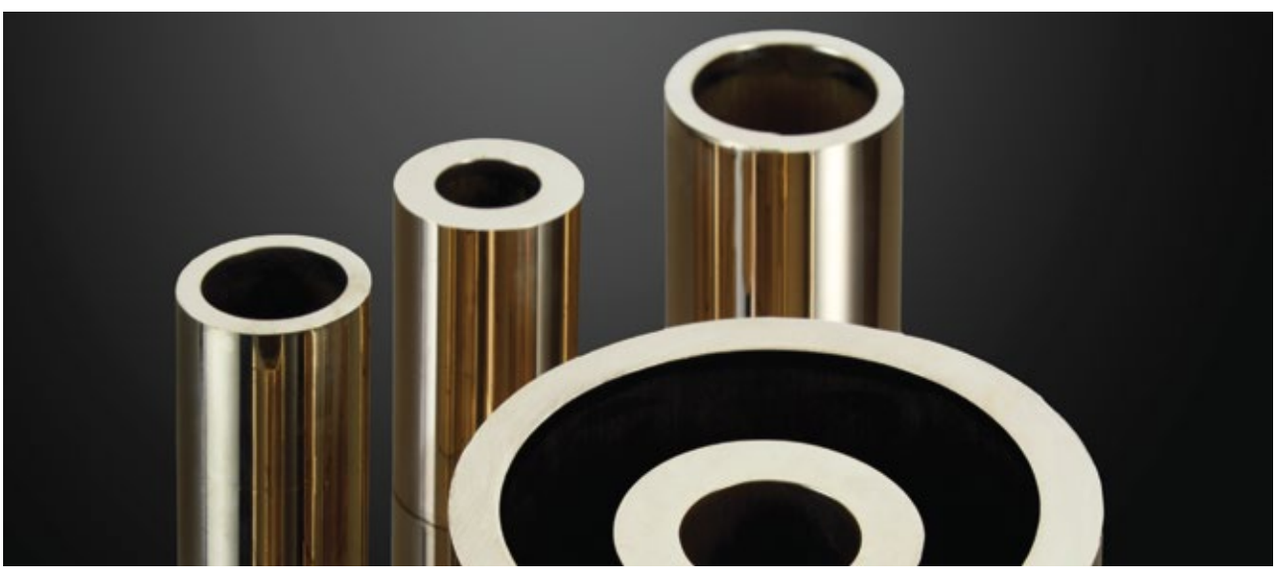
CW709R - CuZn32Pb2AsFeSi

STANDARD		EN 12164			EN 12165		EN 12168			
Dimension Range		Round Rod		Hexagonal, Square	Round Rod		Round and Hexagonal Hollow Rod, Outer Dim. Tol.		Hole Tolerance Round	Hole Tol. Hexagonal
Over	Up to & inc.	Class A	Class B	Rod	Class A	Class B	Class A	Class B	Class A	-
8	10	0 -0,06	0 -0,036	0 -0,09	±0,25	±0,14	-	-	-	-
10	13	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	-	-
13	18	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	±0,35	+0,70 -0
18	20	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	±0,42	+0,84 -0
20	23	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	±0,42	+0,84 -0
23	26	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	±0,42	+0,84 -0
26	30	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	±0,42	+0,84 -0
30	50	0 -0,16	-	0 -0,16	±0,60	±0,20	-	0 -0,25	±0,80	+1,6 -0
50	55	0 -0,19	-	0 -0,19	±0,70	±0,37	-	0 -0,46	±0,95	-
55	65	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	±0,95	-
65	80	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	±0,95	-
80	120	-	-	-	±2	-	-	-	-	-
120	140	-	-	-	±2,5	-	-	-	-	-

For Hollow Rods
Minimum wall thickness is 4 mm. Eccentricity : %10 (max.)

Outer Cold Drawn - Internal Extruded
Outer Class B - Hole Class A tolerance

Inner-Outer Extruded
Outer Class A - Hole Class A tolerance



S713

RODS / HOLLOW RODS

CW713R - CuZn37Mn3Al2PbSi

CW713R - CuZn37Mn3Al2PbSi

Product Code	EN Symbol	EN No	ASTM		Cu	Zn	Pb	Sn	Fe	Ni	Al	Si	Mn	Others Total
S713	CuZn37Mn3Al2PbSi	CW713R	C67420	Min (%)	57,0	Rem.	0,2	-	-	-	1,3	0,3	1,5	-
				Max (%)	59,0	Rem.	0,8	0,3	1,0	1,0	2,3	1,3	3,0	0,3

Features And Applications

CW713R alloy has high mechanical properties, good resistance to wear under heavy loads stable, resistant to atmospheric agents. Also this alloy compliance with RoHS II and REACH directives.

Area of Usage

Bearings for high loads, sliding parts, valves, pistons and guides.

TECHNICAL SPECIFICATIONS

Structure	β
Machinability	% 50
Density	8,12 g/cm³
Electrical Conductivity	7,8 MS/m, 13,4 %IACS
Thermal Conductivity	63 W/(m·K)
Elasticity Module	93 GPa
Coeff. of Thermal Expansion	20,3 10^{-6}/K
Melting Point	875-910 °C

Hot Forming	600-700 °C
Soft Annealing	500-650 °C
Soft Annealing Time	1-3 hours
Stress Relieving	250-400 °C
Stress Relieving Time	1-3 hours

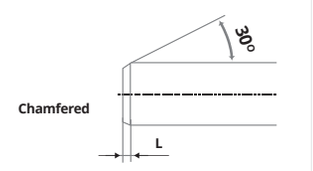
Range of Products

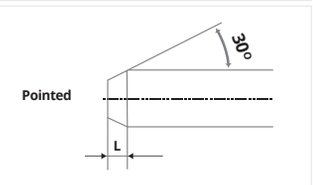
S713 alloy can be produced in our extrusion and cold drawing unit as rods, hollows and profiles suitable for both forging and machining. Please contact us for other technical informations.

INDICATIVE SHAPED ENDS DIMENSIONS

Nominal Diameter or Width		**Type A – Chamfer Lenght** (L)		**Type B – Point Lenght** (L)	
Across-flats (mm)		**Min** (mm)	**Max** (mm)	**Min** (mm)	**Max** (mm)
Over	Up to and including				
8 Inc.	10	0,2	1,5	2	7
10	20	0,2	2	3	10
20	30	0,2	3	4	12

Unless otherwise specified by the buyer, the shape of the ends of products larger than 30 mm is up to the supplier.





sarbak

CW713R - CuZn37Mn3Al2PbSi

Nominal Diameter or Width Across-flats (mm)		Preferred (available) Lengths (mm)	Tolerance on Length (mm)
Over	Up to and including		
8 Inc.	30	3.000 - 4.000	±50
30	80	3.000 - 4.000	±100

Stress Relieving The polygonal rods and hollow rods are subjected to stress relieving treatment

Packaging 500 or 1000 kg bundle – 3/5 metal straps different bundle packagings, up to 10 mm dimension products are packed with wooden case

EN 12164 - Rods for Free Machining

Material Condition	Nominal Diameter (mm)		Width Across-flats (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation			Hardness (HBW)	
	Over	Up to and inc.	Over	Up to and inc.	Min	Min	Max	A_{100mm} (%) Min	$A_{11,3}$ (%) Min	A (%) Min	Min	Max
M	All		All		As manufactured							
R540	8	80	8	55	540	280	-	-	12	15	-	-
H130	8	80	8	55	-	-	-	-	-	-	130	170
R590	8	50	8	40	590	370	-	-	8	10	-	-
H150	8	50	8	40	-	-	-	-	-	-	150	220

EN 12168 - Hollow Rods for Free Machining

Material Condition	Wall Thickness (mm)		Tensile Strength Rm N/mm² (MPa)	0,2 % Proof Strength N/mm² (MPa)		Elongation A (%)	Hardness (HBW)		Hardness (HV)	
	Over	Up to and inc.	Min	Min	Max	Min	Min	Max	Min	Max
M	All			As manufactured						
R540	10	30	540	280	-	15	-	-	-	-
H130	10	30	-	-	-	-	130	170	140	180
R590	5	10	590	320	-	10	-	-	-	-
H150	5	10	-	-	-	-	150	190	160	200

EN 12165 - Wrought and Unwrought Forging Stocks

Material Condition	Nominal Diameter (mm)		Hardness (HBW)	
	Over	Up to and including	Min	Max
M	All		As manufactured	
H130	8	80	130	170

sarbak

CW713R - CuZn37Mn3Al2PbSi

STANDARD		EN 12164			EN 12165		EN 12168			
Dimension Range		Round Rod		Hexagonal, Square	Round Rod		Round and Hexagonal Hollow Rod, Outer Dim. Tol.		Hole Tolerance Round	Hole Tol. Hexagonal
Over	Up to & inc.	Class A	Class B	Rod	Class A	Class B	Class A	Class B	Class A	-
8	10	0 -0,06	0 -0,036	0 -0,09	±0,25	±0,14	-	-	-	-
10	13	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	-	-
13	18	0 -0,07	0 -0,043	0 -0,11	±0,25	±0,14	-	-	±0,35	+0,70 -0
18	20	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	±0,42	+0,84 -0
20	23	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	-	±0,42	+0,84 -0
23	26	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	±0,42	+0,84 -0
26	30	0 -0,08	0 -0,052	0 -0,13	±0,30	±0,17	-	0 -0,21	±0,42	+0,84 -0
30	50	0 -0,16	-	0 -0,16	±0,60	±0,20	-	0 -0,25	±0,80	+1,6 -0
50	55	0 -0,19	-	0 -0,19	±0,70	±0,37	±0,60	0 -0,46	±0,95	-
55	65	0 -0,19	-	-	±0,70	±0,37	±0,60	0 -0,46	±0,95	-
65	80	0 -0,19	-	-	±0,70	±0,37	-	0 -0,46	±0,95	-
80	120	-	-	-	±2	-	-	-	-	-
120	140	-	-	-	±2,5	-	-	-	-	-

For Hollow Rods
Minimum wall thickness is 4 mm. Eccentricity : %10 (max.)

Outer Cold Drawn - Internal Extruded
Outer Class B - Hole Class A tolerance

Inner-Outer Extruded
Outer Class A - Hole Class A tolerance

LOW PRESSURE CONTINUOUS CASTING INGOTS

CC757S - CuZn39Pb1Al-C

CC757S - CuZn39Pb2Al-C												
Product Code	**EN Symbol**	**ASTM**		**Cu**	**Zn**	**Pb**	**Sn**	**Fe**	**Ni**	**Al**	**Mn**	**Si**
Low Pressure Ingots CC757S	CuZn39Pb2Al-C	C85700	Min %	58,0	Rem.	0,2	-	-	-	0,3	-	-
			Max %	63,0	Rem.	1,4	0,5	0,3	0,2	0,9	0,05	0,05

Each of the other elements < 0,02 %

Material Properties and Typical Applications

The Low Pressure Ingots, completely manufactured from raw material, has excellent microstructure and polishability.
The ingots are shipped in euro pallets between 1 and 2 tons.
ROHS II complies with the REACH directives. 4MS and UBA material restriction group: B, C, D

Different norm and alloy demands that come from our customers are examined and produced by the relevant units.

Areas of Usage

* Low Pressure ingots is used in the production of tap water depending on the metallurgical properties.

APPLICABLE STANDARDS	
EN-1982	Standard for brass and copper alloys, ingots and casts.
DIN 50930-6	Standard for brass materials used areas contacting drinking water.
UBA List	The list for brass materials used in drinking water published by German Federal Environment Agency.
4MS	Committee regulating the national approvals for materials and products contacting drinking water that France, Germany, the Netherlands and United Kingdom are members of.

Casting Process and Designation	**Tensile Strength** Rm N/mm² (MPa) **Min**	**0,2 % Proof Strength** N/mm² (MPa) **Min**	**Elongation** A (%) **Min**	**Hardness** (HBW) **Min**
Permanent Mould - GM	400	140	15	90
Pressure Die Cast - GP	310	270	1	120
Sand - GS	300	100	15	70

Note: These mechanical properties are valid for casting parts.

STANDARD MEASURES – WEIGHT	
Standard Meter (mm)	**Standard Weight** (kg)
64x64x380	Average 12

DEZINCIFICATION-RESISTANT (DZR) CONTINUOUS CASTING INGOTS

CC770S - CuZn36Pb-C

sarbak

CC770S - CuZn36Pb-C

CC770S - CuZn36Pb-C												
Product Code	**EN Symbol**	**ASTM**		**Cu**	**Zn**	**Pb**	**Sn**	**Fe**	**As**	**Ni**	**Al**	**Mn**
Dzr Continuous Casting Ingots CC770S	CuZn36Pb-C	-	Min %	62,0	Rem.	0,2	-	-	0,04	-	0,5	-
			Max %	64,0	Rem.	1,6	0,3	0,3	0,14	0,2	0,7	0,1

Each of the other elements < 0,02 %

Material Properties and Typical Applications

It is used in the manufacture of water faucets due to dezincification sills, metallographed structures and corrosion resistance.
DZR ingots, produced entirely from original raw material, has excellent polishability.
The ingots are shipped in euro pallets between 1 and 2 tons.
ROHS II complies with the REACH directives. 4MS and UBA material restriction group: B, C, D

Different norm and alloy demands that come from our customers are examined and produced by the relevant units.

Areas of Usage

It is usually used in the manufacture of water watches and water faucet.

APPLICABLE STANDARDS	
EN-1982	Standard for brass and copper alloys, ingots and casts.
DIN 50930-6	Standard for brass materials used areas contacting drinking water.
UBA List	The list for brass materials used in drinking water published by German Federal Environment Agency.
4MS	Committee regulating the national approvals for materials and products contacting drinking water that France, Germany, the Netherlands and United Kingdom are members of.

Casting Process and Designation	**Tensile Strength** Rm N/mm² (MPa) **Min**	**0,2 % Proof Strength** N/mm² (MPa) **Min**	**Elongation** A (%) **Min**	**Hardness** (HBW) **Min**
Permanent Mould - GM	280	110	10	70
Pressure Die Cast - GP	310	270	1	120

Note: These mechanical properties are valid for casting parts.

STANDARD MEASURES – WEIGHT	
Standard Meter (mm)	**Standard Weight** (kg)
64x64x380	Average 12

UNLEADED CONTINUOUS CASTING INGOTS

CC773S - CuZn42Al-C

sarbak

CC773S - CuZn42Al-C

CC773S - CuZn42Al-C												
Product Code	**EN Symbol**		**Cu**	**Zn**	**Pb**	**Sn**	**Fe**	**Ni**	**Al**	**Mn**	**P**	**Si**
Unleaded Ingots CC773S	CuZn42Al-C	Min %	57,0	Rem.	-	-	-	-	0,1	-	-	-
		Max %	59,0	Rem.	0,2	0,3	0,3	0,02	0,3	0,02	0,02	0,02

Each of the other elements < 0,02 %

Material Properties and Typical Applications

Unleaded ingots produced as continuous casting, from the unlead element in traditional drinking armature culverts. They ingots are by unlead the laws of water application. This is why drinking water is used. It is by suitable for use in places. Unleaded ingots produced entirely from raw material. Unleaded ingots, made entirely from original raw material, has excellent polishability.
The ingots are shipped in euro pallets between 1 and 2 tons.
ROHS II complies with the REACH directives. 4MS and UBA material restriction group: B, C, D

Different norm and alloy demands that come from our customers are examined and produced by the relevant units.

Areas of Usage

* It is usually used in the manufacture of water watches and water faucet.

APPLICABLE STANDARDS	
EN-1982	Standard for brass and copper alloys, ingots and casts.
DIN 50930-6	Standard for brass materials used areas contacting drinking water.
UBA List	The list for brass materials used in drinking water published by German Federal Environment Agency.
4MS	Committee regulating the national approvals for materials and products contacting drinking water that France, Germany, the Netherlands and United Kingdom are members of.

Casting Process and Designation	**Tensile Strength** Rm N/mm² (MPa) **Min**	**0,2 % Proof Strength** N/mm² (MPa) **Min**	**Elongation** A (%) **Min**	**Hardness** (HBW) **Min**
Permanent Mould - GM	300	120	15	80

Note: These mechanical properties are valid for casting parts.

STANDARD MEASURES – WEIGHT	
Standard Meter (mm)	**Standard Weight** (kg)
64x64x380	Average 12

ECOBRASS – ECOCAST CONTINUOUS CASTING (PATENTED)

CC768S - CuZn21Si3P-C

CC768S - CuZn21Si3P-C													
Product Code	**EN Symbol**	**ASTM**		**Cu**	**Zn**	**Pb**	**Sn**	**Fe**	**Ni**	**Al**	**Mn**	**P**	**Si**
Ecocast Unleaded Ingots CC768S	CuZn21Si3P-C	C87850	Min %	75,0	Rem.	-	-	-	-	-	-	0,02	2,7
			Max %	77,0	Rem.	0,1	0,3	0,3	0,2	0,05	0,05	0,10	3,5

Each of the other elements < 0,02 %

Material Properties and Typical Applications

The ecocast ingots, which are produced as continuous castings, are unleaded ingots which is free from the damage of the lead element in traditional armature ingots. The EcoCast alloy, which is produced entirely from raw materials, has excellent pourable properties.
The ingots are shipped in euro pallets between 1 and 2 tons.
ROHS II complies with the REACH directives. 4MS and UBA material restriction group: B, C, D

Different norm and alloy demands that come from our customers are examined and produced by the relevant units.

Areas of Usage

* It is usually used in the manufacture of water watches and water faucet.

APPLICABLE STANDARDS	
EN-1982	Standard for brass and copper alloys, ingots and casts.
DIN 50930-6	Standard for brass materials used areas contacting drinking water.
UBA List	The list for brass materials used in drinking water published by German Federal Environment Agency.
4MS	Committee regulating the national approvals for materials and products contacting drinking water that France, Germany, the Netherlands and United Kingdom are members of.

Casting Process and Designation	**Tensile Strength** Rm N/mm² (MPa) **Min**	**0,2 % Proof Strength** N/mm² (MPa) **Min**	**Elongation** A (%) **Min**	**Hardness** (HBW) **Min**
Permanent Mould - GM	460	180	20	100
Sand - GS	420	140	20	80
Continuous - GC	420	140	20	80

Note: These mechanical properties are valid for casting parts.

STANDARD MEASURES – WEIGHT	
Standard Meter (mm)	**Standard Weight** (kg)
64x64x380	Average 12

FEDERALLOY IV - B2 – UNLEADED CONTINUOUS CASTING INGOTS (PATENTED)

C89540

FEDERALLOY IV - B2											
Product Code	**ASTM**		**Cu**	**Zn**	**Pb**	**Sn**	**Fe**	**Ni**	**Al**	**Bi**	**Se**
Unleaded Ingots FEDERALLOY IV - B2	C89540	Min %	58,0	Rem.	-	-	-	-	0,10	0,6	-
		Max %	64,0	Rem.	0,10	1,2	0,50	1,0	0,60	1,2	0,1

Each of the other elements < 0,02 %

Material Properties and Typical Applications

Federalloy ingots, produced as continuous casting, is unleaded ashes which are free from the damage of the lead element in traditional armature ingots. Bismuth is used instead of lead. Fedaralloy ingots, which is produced entirely from raw material, has good crystal structure and excellent polishability. Like leaded equivalents, elongation and inclination guarantee quality testing. Better casting capability at low temperatures provides low cost to the end user.

The ingots are shipped in euro pallets between 1 and 2 tons.

Different norm and alloy demands that come from our customers are examined and produced by the relevant units.

Areas of Usage

* Generally used in the manufacture of water watches and water faucets
* USA and Canada are suitable alloys for use in drinking water lines for the market.

APPLICABLE STANDARDS	
ASTM	(International American Society of Testing and Materials) A community that develops and publishes technical standards for a wide variety of materials, products and systems.

Casting Process and Designation	**Tensile Strength** Rm N/mm² (MPa) **Min**	**0,2 % Proof Strength** N/mm² (MPa) **Min**	**Elongation** A (%) **Min**	**Hardness** (HBW) **Min**
Permanent Mould - GM	350	200	5	-

Note: These mechanical properties are valid for casting parts.

STANDARD MEASURES – WEIGHT	
Standard Meter (mm)	**Standard Weight** (kg)
64x64x380	Average 12

Headquarter
Eğitim Mah. Adım Sok. Orjin İş Merkezi No: 10 -18 Kat: 3 Daire No: 39 - 49 34722
Hasanpaşa / Kadıköy / İstanbul / Turkey
T: +90 216 414 45 35 pbx | **F:** +90 216 414 45 40

Factory
Çerkezköy Organize Sanayi Bölgesi Gazi Osman Paşa Mah. 8.Cad. No: 3 59500
Çerkezköy / Tekirdağ / Turkey
T: +90 282 725 19 60 pbx | **F:** +90 282 725 19 70

www.sarbak.com.tr | www.ekosari.com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