

HOT FORGED BRASS NUT AND CAP

Hot forged nuts as blanks or as finished product. A hot forged nut can increase fatigue strength more than 50% compared to a machined nut. We supply nuts in a variety of sizes and configurations.

Composition

CW614 N	Cu	Zn	Pb	Al	Fe	Ni	Sn	Other
Limits	57.0-59.0%	Rem	2.5-3.5%	<0.05%	<0.3%	<0.3%	<0.3%	<0.2%

CW617N	Cu	Zn	Pb	Al	Fe	Ni	Sn	Other
Limits	57.0-59.0%	Rem	1,6-2,5%	<0.05%	<0.3%	<0.3%	<0.3%	<0.2%

CW602 N	Cu	Zn	Pb	Al	Fe	Ni	Sn	Mn	As	Other
Limits	61.0-61.8%	Rem	1.7-2.0%	<0.01%	<0.1%	<0.1%	<0.1%	<0.01%	0.06-0.15%	<0.2%

Application example

Nut, cap:

Plumbing and other types of pipe installations.
Valve parts.

Physical properties

Property	Value	Unit
Density	8500	kg/m ³
Melting temperature	875-890	°C
Heat capacity at 20°C	0.38	kJ/(kg°C)
Resistivity at 20°C	62	nΩm
Temperature coefficient for resistance at 20°C, 0-100°C	0.0017	°C
Conductivity at 20°C	16 28%	MS/m IACS ¹
Thermal conductivity at 20°C	120	W/m°C
Thermal linear expansion , 20-300°C	21*10 ⁻⁶	°C
Modulus of elasticity	96	GPa
Modulus of shearing	35	GPa

1) IACS = International Annealed Copper Standard. 100% IACS is equivalent to a resistivity of 17.241 nΩm and a conductivity of 58 MS/m.

Heat treatment

Stress-relief annealing. Temperature <350-400°C. Time 2-4 hours. Stress-relief annealing should be carried out after all cold working which gives high residual tensile stresses in the material. It may also be justified after machining. This eliminates the risk of stress corrosion cracking caused by internal stresses. Performed upon request from customer.

Corrosion resistance

Copper is a relatively noble metal. Copper and its alloys therefore show little tendency to react with the environment. As a result of this, the copper materials generally have good corrosion resistance. However, corrosion may occur under disadvantageous unfavorable conditions. The type of corrosion which may occur depends on both the environment and the composition of the alloy. In applications where the nut or the cap will be in direct contact with water, a dezincification resistant alloy should be used.

The corrosion resistance of CW 614 N, CW 617 N and CW 602 N/V are:

Corrosion types	Corrosion resistance	Comment
Stress Corrosion Cracking, SCC	Satisfactory	This type of corrosion only occurs in the simultaneous presence of high stresses in the material and a corrosive medium containing ammonia and moisture. (See Heat treatment.)
Dezincification, DZR	Poor	This type of corrosion only occurs when the material is exposed to water or a moist atmosphere, preferentially at elevated temperature and at the presence of chlorides.
Erosion corrosion	Quite good	

Surface treatment

Mechanical surface treatment such as blasting is carried out by conventional methods.
Metallization (metallic surface coating) such as nickel and chrome plating is easy to carry out. Polymer coating such as slip coating can also be performed easily.

Mechanical properties

CW614 N, CW617 N and CW602 N from Nordic Brass Gusum meet and exceed the quality demands defined in the standards. To give an idea of the mechanical properties some empirical values, according to the material state "M" in the EN standard, are listed below. These values are to be considered as guideline values for the delivered material.

Property	CW614N	CW617N	CW602N	Unit
Rm, Tensile strength	>410	>400	>350	MPa
Rp02, Yield strength	ca 330	ca 340	ca 260	MPa
A5, Fracture s elongation	>15	>15	>35	%
Brinell hardness after fabrication of nut	~110	~110	~100	HB