

Nordic Gold

Coinage

Alloy Designation

EN	CuAl5Zn5Sn1
DIN CEN/TS 13388	- Not Listed -
JIS	- Not Listed -
BS	- Not Listed -
UNS	- Not Listed -

Chemical Composition

Weight percentage

Cu	Rest	
Al	5	%
Zn	5	%
Sn	1	%
Impurities		%

This alloy is in accordance with RoHS 2002/96/CE for electric & electronic equipments and 2002/53/CE for automotive industry

Coinage



Copper is used for production of coins since ancient times. Today the major part of all currencies is made from copper alloys.

The decision to use copper as the base material for minting coins is due to a series of important advantages deriving from its inherent properties:

- ease of embossing due to the unique deformability of copper which makes it possible to achieve clear pictures and a clean stamp on both sides of the coin;
- corrosion resistance, which allows the coins to maintain a pleasant look over time and above all, to keep the minting process, thickness, shape and weight of the coins the same;
- aesthetic appearance of copper with colours that vary from red to yellow to white silver (thanks to its capacity to fuse into numerous alloys);
- the antibacterial properties of copper can stop the proliferation of harmful bacteria and therefore prevent the transmission of diseases and bacterial infections;
- the electrical conductivity and the magnetic permeability which help distinguish the various sizes of coins in vending machines.

Characteristics

CuAl5Zn5Sn1 is a golden coloured alloy with excellent corrosion and antimicrobial properties. It is used for e.g. 50 cent € coins.

Main Applications

Coinage

Physical Properties

Typical values in annealed temper at 20 °C

Density	*	g/cm ³
Electrical conductivity (IACS)	*	%

* For authorized persons on request

CuAl5Zn5Sn1



KME

Nordic Gold

Coinage

Coin blank properties	Nominal	Tolerance
Rimming diameter	* mm	* mm
Rim edge height	* mm	* mm
Strip thickness	* mm	* mm
Vickers hardness	* HV	* HV
Piece weight	* g	* %
Bulk weight (100 pieces)		* %
Roughness Ra	* μm	
Electrical conductivity	* % IACS	* % IACS

* For authorized persons on request

Mechanical Properties*						
Temper		Tensile Strength	Yield Strength Standard	Elongation Standard Minimum	Hardness	
		Rm	Rp _{0.2}	A _{50mm}	HV	
		MPa	MPa	%	HV	
Nordic Gold	Hard	*	*	*	*	
Nordic Gold	Stamped Strip (Parallel)	*	*	*	*	
Nordic Gold	(Transverse)	*	*	*	*	

* For authorized persons on request

Corrosion Resistance*

Nordic Gold maintains a pleasant look over time. The thickness, shape and weight of the coins remain constant for decades.

* For more details call our technical service



Sanitary and Antimicrobial Properties



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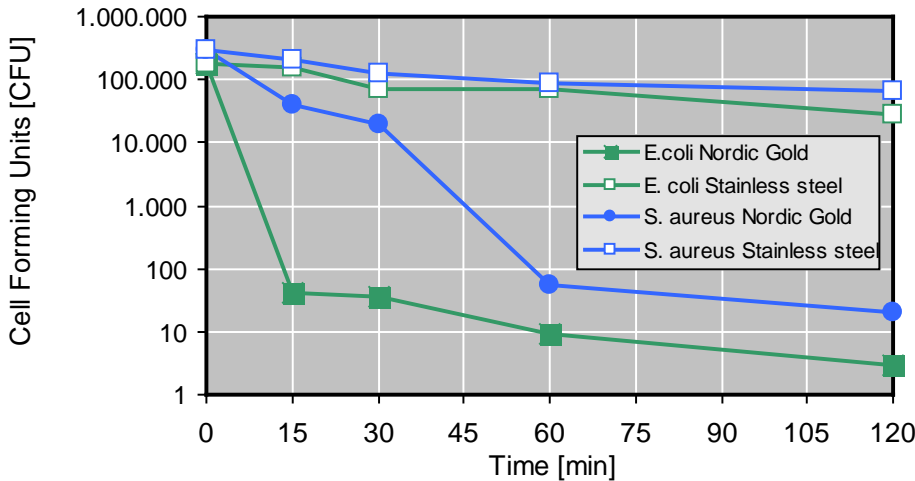
Copper has been recognised as a hygienic material since the dawn of civilisation and, in the last two centuries, the anecdotal evidence has been supported by scientific research showing that Nordic Gold is antimicrobial, i.e. it inhibits the growth of harmful pathogens - bacteria, moulds, algae, fungi and viruses. Due to its high copper content of about 89% Nordic Gold provides the full antimicrobial properties of copper to inhibit the growth of bacteria, viruses and fungi which are in contact for a short period of time on copper containing surfaces.

Copper surfaces have sanitizing properties and self-sanitizing activity that make it attractive for hygienic and sanitary use e.g. in hospitals, nursing homes and other healthcare facilities or public buildings. The effect has been verified in recent scientific studies on a range of disease-causing organisms including MRSA, *Clostridium difficile*, *E.coli*, *Listeria monocytogenes*, *Influenza A (H1N1)* and *Aspergillus niger*.

Picture: Copper coin (Irish penny) on an agar plate with cells of *E. coli* bacteria

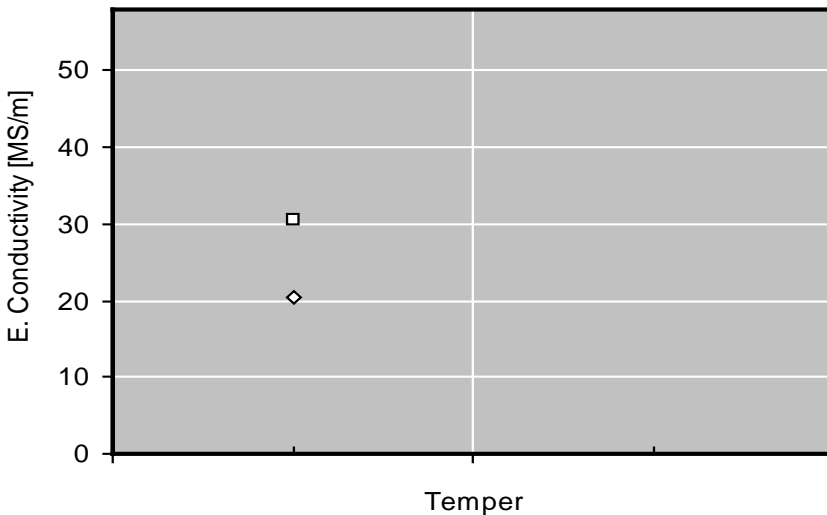
For more details please contact our technical service.

Antimicrobial test results



Measured by BSL BIOSERVICE Scientific Laboratories Germany-Planegg (Munich) according to ISO 22196. Report: Test 093462-A, 093462-B


Electrical Conductivity *



Electrical conductivity is strongly influenced by chemical composition. A high level of cold deformation and small grain size decrease the electrical conductivity moderately. Minimum conductivity level can be specified.

* For authorized persons on request



Formats	Dimension			
	Coin	Strip thickness (other thicknesses on request)	≥ 0.9 .. 4.00	mm
		Strip width	≥ 3 .. 700	mm
		Outside diameter	≤ 1,400	mm
		Weight (Standard)	≤ 9,000	kg
		Weight per mm	≤ 13.5	kg

Surface coatings & Special Treatments	Dimension
	Surface burnished and pickled, shiny and bright

Standards for copper and copper alloys

EN 1652	Plate, sheet, strip and circles for general purposes
EN 1654	Strip for springs and connectors
EN 1758	Strip for lead frames
EN 13148	Hot-dip tinned strip
EN 13599	Copper plate, sheet and strip for electrical purposes
EN 14436	Electrolytically tinned strip

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