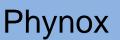
Jacques Allemann SA





advanced solutions in metal

Abbreviation	EN Norm	ASTM / AISI	AFNOR	DIN Abbreviation	ISO	Other
CoCr20Ni15Mo	2.4711	ASTM F1058		2.4711	5832-7	

Phynox Wire

Chemical analysis by European norm in mass percent.

C ≤ 0.15	Si ≤ 0.12	Mn 1.50-2.50	P ≤ 0.015	S ≤ 0.015	Cr 19.0-21.0	Mo 6.5-7.5	Ni 15.0-18.0
Co 39.0-41.0	Be ≤ 0.001	Fe Rest	Other ≤ 1.0				
Diameter		0.02	2 – 4.00 mm				

Application and use

Phynox is categorized as a cobalt alloy and possesses extraordinary characteristics in tensile strength, tenacity, ductility and resistance to corrosion. Additionally it is biocompatible and therefore well established as an implant material. The alloy is made up of: 40% cobalt, 20% chrome, 16% nickel, and 7% molybdenum. This material is used whenever high resistance to corrosion is required and material fatigue not an option. Primary implementation includes but is not limited to: the medicinal and dental sectors, chemical industry, aeronautics, and even the watch industry, where Phynox is a favoured material for spring and axle manufacturing.

Tensile strengths up to 2800N/mm² (depending on the diameter) can be reached with appropriate thermal treatment. A long flex life, the ability to withstand very high temperatures and non-magnetic behaviour are also key characteristics that define Phynox.

Resistance to corrosion

Both organic and mineral acids are completely or almost completely unable to attack Phynox, allowing it to leave even the best stainless steels behind in terms of resistance to corrosion. Together with its inactivity when contacting bodily fluids or tissue, this resistivity makes Phynox an excellent choice for implants.

Thermal treatment

Phynox can be hardened at a temperature of 520°C for three hours in a vacuumed or an argon flooded oven. Exposure to air will cause a green colouring to manifest, which has no impact on the materials' mechanical properties. The level of hardness at delivery should be chosen in an appropriate fashion, as the delivery condition influences the maximum effect of the heat treatment.

Weldability

Phynox can be easily welded as well as soldered; however, only cold-worked material can be hardened. Therefore areas which are welded should not be exposed to excessive mechanical stress.

Surface Finish		
Drawn	Chemically purged	0.020 – 3.499 mm
Surface ground	Chemically purged	3.500 – 4.000 mm



Delivery mode

As a ring On assorted spools Straightened

Axles

Diameter tolerances

Diameter (mm)	Tolerance (%)	Tolerance (µ)
0.020 - 0.249		± 1.0
0.250 – 0.399		± 1.5
0.400 – 1.500		± 2.0
1.500 – 4.000		± 2.5

Mechanical Properties

Condition at delivery (mm) 0.005 - 0.019 0.020 - 0.199 0.200 - 0.499 0.500 - 0.999 1.000 - 1.999 2.000 - 4.000 Tensile strength in cold-twisted condition at delivery $(\ensuremath{N/\text{mm}^2})$

950 - 2250 (higher tensile strengths on request)

Physical Properties

Density		8.30	g/cm ³
Coefficient of thermal expansion	20 °C – 200 °C	12.50	10 ⁻⁶ /K
Specific heat capacity	20 °C	450.00	J/kgK
Thermal conductivity	20 °C	12.50	W/mK
Specific electric resistance	20 °C	0.10	Ω mm ² /m
Young's Modulus	20 °C	215.00	GPa

All data found in the product data sheets of Jacques Allemann SA is based on latest technological standards and to the best of available information, however without any guarantee. For any and all materials, use and application should be discussed with the sales consultant or laboratory at Jacques Allemann SA.