STAINLESS

High performance Alloys - Medical - Aerospace - Microtechnics - Motorsport - Industry

Elgiloy®
Phynox®
ASTM F1058
ISO 5832-7

GENERALITIES

*The cobalt-based alloy **Elgiloy® or Phynox®** has excellent corrosion resistance and very high mechanical properties with a maximum strength of up to 2600 MPa and good fatigue strength. The grade has excellent corrosion resistance, is biocompatible and has very good high temperature resistance up to 450°C.*

Stainless has qualified European and American sources in stock, as well as different diameters and thicknesses to suit your application needs. This product can also be made to measure or cut into slugs by our service centres.

Each material is delivered with its producer's certificate of origin in order to guarantee you total transparency and complete traceability.

APPLICATIONS

Due to its recognised biocompatibility in the medical field, the grade is used in the manufacture of implants (prostheses, stents, etc.) obtained by machining. Other fields of application include watchmaking, chemicals, dentistry, oil, industry, springs, etc.

The material is available in the form of bars, wires or strips in annealed, cold worked for small diameters or aged condition.

STANDARDS AND DESIGNATIONS

Numerical designations:
W. Nr 2.4711 - UNS R30003 – UNS R30008

Standards:
ISO 5832-7 - ASTM F 1058 - AMS 5876 - AMS 5833

Brands:
FWM1058®, Conichrome®, Phynox®, Elgiloy®

TYPICAL CHEMICAL ANALYSIS (mass %)

	Carbon	Manganese	Silicium	Phosphorus	Sulfur	Chrome	Nickel	Molybdenum	Cobalt	Iron
MIN	---	1.50	---	---	---	19.0	14.0	6.0	39.0	BALANCE
MAX	0.15	2.50	1.20	0.015	0.015	21.0	16.0	8.0	41.0	

METALLURGY

The melting processes combined with the transformation processes allow a homogeneous microstructure of the face-centred cubic type with a fine grain of at least index 5 to be obtained for medical applications. The grade is generally produced by vacuum melting followed by remelting, which makes it very clean and homogeneous.

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PHYSICAL PROPERTIES AT 20°C

Density.....8.3 g.cm-3.
Coefficient of thermal expansion (between 20 et 200°C).....12.5 x 10^{-6} m/m.°C
Young's modulus.....190 à 220 x 10^{3} MPa (depending on condition)
Thermal conductivity.....12.5 W.m/m^{2}.°C
Relative magnetic permeability..... < 1.01

MECHANICAL PROPERTIES OF THE BARS

The grade is offered as standard in the annealed, hardened or aged condition with the following typical properties for bars (>4.75mm)

Delivery status	Rm (Mpa)	Rp0.2% (MPa)	E5d%
Annealing	> 850	> 450	>65
Hardened	>1400	---	---
Hardened and aged	>1550	>1200	---

PROCESSIES

Forgeability
Machining this grade requires suitable equipment and tools (carbide tools). Moderate cutting speeds are preferred. Welding is also possible on this grade.

Weldability
The high level of inclusionary cleanliness and the homogeneity of the microstructure of this grade allows optimum polishing.

Heat treatments
Ageing on the previously work-hardened condition takes place at around 500°C for approximately 4 hours. The higher the initial work hardening, the higher the hardening.

CORROSION RESISTANCE

The grade is highly resistant to general corrosion and also to pitting due to its high chromium and molybdenum content combined with its low inclusion rate. The grade is also very insensitive to hydrogen embrittlement.

STANDARD SHAPE

- 3m round bars in annealed, hardened or aged condition - Hardened or ground surface
- Wires - Strips

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