

DEF STAN 02-879 (Annex C, Grade 1)

Smiths Advanced Metals

Rev: SAM/datasheets/copper-nickel-alloys/def-stan-02-879-annex-c-grade-1/aug-2023

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Hydrogen embrittlement resistance

Our product is a copper-nickel alloy released to the British Defence Standard and a direct equivalent of copper-nickel 90/10.

In this case, the standard defines the UK Ministry of Defence (MOD) requirement for using engineering raw materials in applications, including for the Royal Navy. Releases of DEF STAN material are usually to the most stringent standards.

DEF STAN 02-879 (Annex C) Grade 1 is a direct equivalent to 90/10 copper-nickel alloy, replacing DEF STAN 02-779 and NES 779. As the name suggests, the alloy represents a mix of 90% copper and 10% nickel with trace additions of other elements to improve strength and corrosion resistance.

The material offers a combination of high toughness and ductility, which is highly suitable for use in the marine sector. The alloy provides excellent resistance to saltwater corrosion and high hydrogen embrittlement resistance. DEF STAN 02-879 also operates well in biological fouling environments and retains its mechanic properties at cryogenic temperatures. Both welding and fabricability are excellent.

Benefits

- Resists hydrogen embrittlement
- High toughness and ductility
- Anti-microbial characteristics



Key Applications

- Pressure vessels
- Heat exchangers
- Valve and pump components

*Chemical Composition (weight %)

	Cu	Ni	Mn	Fe	C	Al	S	B	P	Pb	Si	Bi	Others
min.	Bal	10.00	0.50	1.00									
max.	Bal	11.00	1.50	2.00	0.05	0.03	0.05	0.02	0.01	0.01	0.05	0.002	0.30

* As per DEF STAN 02-879 Annex C

*Physical & Mechanical Properties

Density	8.94g/cm ³
Tensile Strength (MPa, min)	280
Elongation (%)	30
Hardness (HV, max)	90

* As per DEF STAN 02-879 Annex C

Use in Commercial Engineering

The alloy is highly suitable for seawater applications above and below the water line.

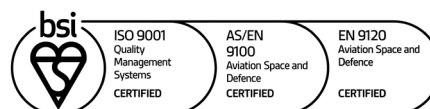
An additional benefit is the alloy's anti-microbial characteristics, as it destroys most pathogens within a few hours of exposure. The copper-nickel grade has become increasingly popular in hygienic environments such as clean rooms.

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