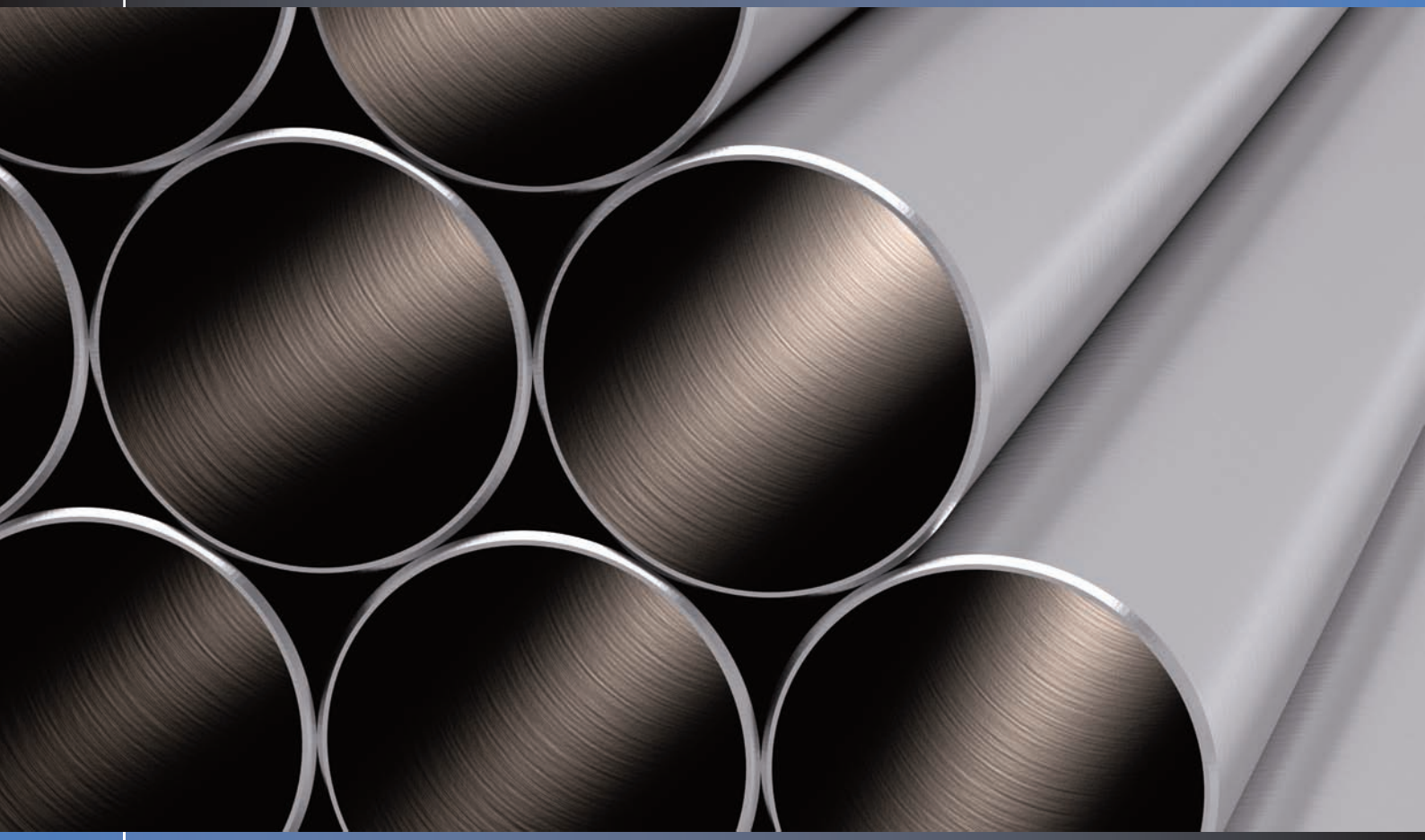
Product information guide

NON FERROUS HEAT EXCHANGER & CONDENSER TUBES



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SalemTube INTERNATIONAL LTD

Your Global Partner for Heat Exchanger and Boiler Tubes

Aluminium Brass | ALLOY 687

STANDARD GRADE	BS 2871/PART 3 CZ 110	ASTM B 111 C 68700	DIN 17660/1785 CuZn20Al2	NFA 51102 CuZn20Al2	JIS H3300 C 6870
Cu	76,0 - 78,0	76,0 - 79,0	76,0 - 79,0	76,0 - 79,0	76,0 - 79,0
Al	1,8 - 2,3	1,8 - 2,5	1,8 - 2,3	1,8 - 2,5	1,8 - 2,5
Pb	0,07 max.	0,07 max	0,07 max.	0,07 max.	0,07 max.
Ni			0,1 max.		
Fe	0,06 max.	0,06 max.	0,07 max.	0,06 max.	0,06 max.
Zn	Rem.	Rem.	Rem.	Rem.	Rem.
As	0,02 - 0,06	0,02 - 0,10	0,02 - 0,035	0,02 - 0,06	0,02 - 0,06
P			0,01 max.		
Mg			0,005 max.		
Mn			0,1 max.		
Total Impurities	0,3 max.		Others Total	0,03 max.	
			0,1 max.		
CONDITION	M	061	F39	Annealed (X690)	O
	TA		F34	—	—
	O			—	—
Yield Strength	—	125 min.	150 - 230	—	—
N/mm2	—	—	120 - 180	—	—
	—	—		—	—
Tensile Strength	—	345 min.	390 min.	—	373 min.
N/mm2	—	—	340 min.	—	—
	—	—	—	—	—
Elongation (%)	—	—	45 min.	—	40 min.
	—	—	55 min.	—	—
	—	—		—	—
Hardness Hv5	150 min.	—	—	80 - 130	—
	85 - 110	—	—	—	—
	75 max.	—	—	—	—
Grain Size (mm)	0,050 max.	0,010 - 0,045	0,010 - 0,050	0,010 - 0,045	0,010 - 0,045
	(Condition TA)				

Typical use: Most used copper alloy for heat exchanger tubes application.
Represents the best option for any heat exchanger which is involved with saline water. The addition of arsenic has solved the problem of dezincfication.

Melting Point: 935° C
Density (20° C): 8,33 g/cm3

- Hot Working Properties: OK
- Cold Working Properties: Very Good

Weight formula:
Average wall: (OD-WT) x WT x 0,0265 = Kg/m (all sizes in mm)
Minimum wall: (OD-WT) x WT x 0,0275 = Kg/m (all sizes in mm)

Admiralty Brass | ALLOY 433

STANDARD GRADE	BS 2871/PART 3 CZ 111	ASTM B 111 C 44300	DIN 17660/1785 CuZn28Sn1	NFA 51102 CuZn29Sn1	JIS H3300 C 4430
Cu	70,0 - 73,0	70,0 - 73,0	70,0 - 72,5	70,0 - 73,0	70,0 - 73,0
Sn	1,0 - 1,5	0,9 - 1,2	0,9 - 1,3	0,9 - 1,2	0,9 - 1,2
Pb	0,07 max.	0,07 max	0,07 max.	0,07 max.	0,07 max.
Ni			0,1 max.		
Fe	0,06 max.	0,06 max.	0,07 max.	0,06 max.	0,06 max.
Zn	Rem.	Rem.	Rem.	Rem.	Rem.
As	0,02 - 0,06	0,02 - 0,06	0,02 - 0,035	0,02 - 0,06	0,02 - 0,06
P			0,01 max.		
Mn			0,1 max.		
Total Impurities	0,3 max.		Others Total	0,03 max.	
			0,1 max.		
CONDITION	M	061	F36	Annealed (X690)	O
	TA		F32	—	—
	O			—	—
Yield Strength	—	105 min.	140 - 220	—	—
N/mm2	—	—	100 - 170	—	—
	—	—		—	—
Tensile Strength	—	310 min.	360 min.	—	314 min.
N/mm2	—	—	320 min.	—	—
	—	—	—	—	—
Elongation (%)	—	—	45 min.	—	30 min.
	—	—	55 min.	—	—
	—	—		—	—
Hardness Hv5	150 min.	—	—	80 - 120	—
	85 - 105	—	—	—	—
	75 max.	—	—	—	—
Grain Size (mm)	0,050 max.	0,010 - 0,045	0,010 - 0,050	0,010 - 0,045	0,010 - 0,045
	(Condition TA)				

Typical use: The specific copper alloy for application fresh water.
Often used for heat exchangers which are involved with operations in petroleum refineries and petrochemical plants.

Melting Point: 935 ° C
Density (20° C): 8,53 g/cm3

- Hot Working Properties: OK
- Cold Working Properties: Very Good

Weight formula:
Average wall: (OD-WT) x WT x 0,0270 = Kg/m (all sizes in mm)
Minimum wall: (OD-WT) x WT x 0,0281 = Kg/m (all sizes in mm)

Copper Nickel 90/10 | ALLOY 706

STANDARD GRADE	BS 2871/PART 3 CN 102	ASTM B 111 C 70600	DIN 17664/1785 CuNi10Fe1Mn	NFA 51102 CuNi10Fe1Mn	JIS H3300 C 7060
Cu	Rem.	Rem.	Rem.	Rem.	Rem.
Pb	0,01 max.	0,05 max.	0,03 max.	0,05 Sn+Pb max.	0,05 max.
Ni	10,0 - 11,0	9,0 - 11,0	9,0 - 11,0	9,0 - 11,0	9,0 - 11,0
Fe	1,0 - 2,0	1,0 - 1,8	1,0 - 1,8	1,0 - 2,0	1,0 - 1,8
Mn	0,5 - 1,0	1,0 max.	0,5 - 1,0	0,3 - 1,0	0,2 - 1,0
Zn		1,0 max.	0,5 max.	0,5 max.	0,5 max.
S	0,05 max.		0,05 max.	0,02 max.	
C	0,05 max.		0,05 max.	0,05 max.	
Cu+Ni+Fe+Mn					99,5 min.
Total Impurities	0,3 max.		Others Total		
			0,1 max.		
CONDITION	M	061	F29	Annealed (X690)	O
	O	H55		—	—
Yield Strength	—	105 min.	90 - 180	—	—
N/mm2	—	240 min.	—	—	—
Tensile Strength	—	275 min.	290 min.	—	275 min.
N/mm2	—	310 min.		—	—
Elongation (%)	—	—	30 min.	—	30 min.
	—	—	—	—	—
Hardness Hv5	150 min.	—	—	70 - 100	—
	80 - 110	—	—	—	—
Grain Size (mm)	0,050 max.	0,010 - 0,045	0,010 - 0,050	0,010 - 0,045	0,010 - 0,045
	(Condition O)				

Typical use: Used for the working in sea water, mainly for shipbuilding and sea water pipelines, stations, desalinati- on, because of its very good corrosive resistance.

Melting Point: 1150° C
Density (20° C): 8,94 g/cm3

- Hot Working Properties: Good
- Cold Working Properties: Good

Weight formula:
Average wall: (OD-WT) x WT x 0,0284 = Kg/m (all sizes in mm)
Minimum wall: (OD-WT) x WT x 0,0295 = Kg/m (all sizes in mm)

Copper Nickel 70/30 | ALLOY 715

STANDARD GRADE	BS 2871/PART 3 CN 107	ASTM B 111 C 71500	DIN 17664/1785 CuNi30Mn1Fe	NFA 51102 CuNi30Mn1Fe	JIS H3300 C 7150
Cu	Rem.	Rem.	Rem.	Rem.	Rem.
Pb	0,01 max.	0,05 max.	0,03 max.	0,05 Sn+Pb max.	0,05 max.
Ni	30,0 - 32,0	29,0 - 33,0	30,0 - 32,0	29,0 - 32,0	29,0 - 33,0
Fe	0,4 - 1,0	0,4 - 1,0	0,4 - 1,0	0,4 - 0,7	0,4 - 0,7
Mn	0,5 - 1,5	1,0 max.	0,5 - 1,5	0,5 - 1,5	0,2 - 1,0
Zn		1,0 max.	0,5 max.	0,5 max.	0,5 max.
S	0,08 max.		0,06 max.	0,02 max.	
C	0,06 max.		0,06 max.	0,06 max.	
Cu+Ni+Fe+Mn					99,5 min.
Total Impurities	0,3 max.		Others Total	0,1 max.	
			0,1 max.		
CONDITION	M	061	F37	Annealed (X690)	O
	O	HR50	—	—	—
Yield Strength	—	125 min.	120 - 220	—	—
N/mm2	—	345 min.	—	—	—
Tensile Strength	—	360 min.	370 min.	—	363 min.
N/mm2	—	495 min.	—	—	—
Elongation (%)	—	—	35 min.	—	30 min.
	—	12 min. (WT 1,21 mm)	—	—	—
		15 min. (WT>1,21 mm)			
Hardness Hv5	150 min.	—	—	90 - 130	—
	90 - 120	—	—	—	—
Grain Size (mm)	0,050 max.	0,010 - 0,045	0,010 - 0,050	0,010 - 0,045	0,010 - 0,045
	(Condition O)				

Typical use: This alloy has all the characteristics of CuNi 90/10, but also offers excellent corrosion resistance in high velocity sea water. Also the operating temperature is much higher than of CuNi 90/10. Can assure a long service life and reliability.

Melting Point: 1240° C
Density (20° C): 8,94 g/cm3

- Hot Working Properties: Good
- Cold Working Properties: Good

Weight formula:
Average wall: (OD-WT) x WT x 0,0284 = Kg/m (all sizes in mm)
Minimum wall: (OD-WT) x WT x 0,0295 = Kg/m (all sizes in mm)

Copper Nickel Iron Manganese 66/30/2/2 | ALLOY 71640

STANDARD GRADE	BS 2871/PART 3 CN 108	ASTM B 111 C 71640	DIN 17664/1785 CuNi30Fe2Mn2	NFA 51102 CuNi30Fe2Mn2	JIS H3300 C 7164
Cu	Rem.	Rem.	Rem.	Rem.	Rem.
Pb		0,05 max.	0,02 max.	0,05 Sn+Pb max.	0,05 max.
Ni	29,0 - 32,0	29,0 - 32,0	29,0 - 32,0	29,0 - 32,0	29,0 - 32,0
Fe	1,7 - 2,3	1,7 - 2,3	1,5 - 2,5	1,5 - 2,0	1,7 - 2,3
Mn	1,5 - 2,5	1,5 - 2,5	1,5 - 2,5	1,5 - 2,0	1,5 - 2,5
Zn		1,0 max.	0,5 max.	0,5 max.	0,5 max.
S			0,06 max.	0,02 max.	
C			0,05 max.	0,06 max.	
Cu+Ni+Fe+Mn					min. 99,5
Total Impurities	0,3 max.		0,3 max.	0,1 max.	
CONDITION	M	061	F42	Annealed (X690)	O
	O	HR50	—		—
Yield Strength	—	170 min.	150 - 260	—	—
N/mm2	—	400 min.	—	—	—
Tensile Strength	—	435 min.	420 min.	—	430 min.
N/mm2	—	560 min.	—	—	—
Elongation (%)	—	—	30 min.	—	30 min.
	—	—	—	—	—
Hardness Hv5	150 min.	—	—	90 - 130	—
	90 - 120	—	—	—	—
Grain Size (mm)	0,050 max.	0,010 - 0,045	0,010 - 0,050	0,010 - 0,045	0,010 - 0,045
	(Condition O)				

Typical use: Has the most resistance against impingement attack and corrosion by suspended solids of all copper based alloys which are used for heat exchanger tube applications. This alloy is preferred for desalination plants.

Melting Point: 1240°C
Density (20°C): 8,94 g/cm3

- Hot Working Properties: Good
- Cold Working Properties: Good

Weight formula:
Average wall: (OD-WT) x WT x 0,0284 = Kg/m (all sizes in mm)
Minium wall: (OD-WT) x WT x 0,0295 = Kg/m (all sizes in mm)

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