

Pursuing excellence, Redefining trends



Enterprise's Principle

Indigo is committed to provide complete range of Copper & Copper base alloy products to its clients and assist the clients in getting best quality raw materials which is most suitable to their requirements.

The endeavour at Indigo is always to exceed the expectation of the client so as to keep resetting our Quality & Service goals higher and higher implementing the Total Quality Management System.

About Us

Indigo Metal Industries came to being in 2001 in Umbergaon District of Gujarat State. Under the steadfastly impressive vision of Mr Kanakraj N. Mehta who initially forayed into the Copper & Copper Alloy by trading and importing the products, Indigo created a brand name, which was exceedingly synergic. Mr Kanakraj N. Mehta's invaluable prudence further created a group of entrepreneurs and professionals who have acquired sufficient expertise in the discipline of Copper and Copper base Alloy Products manufacturing and sales. The transformed expertise recreated world renowned Tubes, Pipes, Coils, Rods, Profiles, Sections, Wires & Fittings and gave India new methods of producing value-added Copper and Copper Alloy Products.

Indigo has magnificently accomplished enormous projects in the last decade. Government Undertakings to Public Sector Undertakings, MNC's to SSI and other Private Sector Undertakings, the company has established itself in the business and handles major customers across the major Metros and Cities. At Indigo, work excellence and in-time delivery have always been significant in the entre gamut of production and sale. All products manufactured by Indigo are truly committed by National and International Standards, viz., ASTM, DIN, BS, JISH, etc.

Owing to rock-solid performance and achievements in Copper and Copper Alloy Products, Indigo enjoys a strong presence in the discipline of Marketing, Exporting, Importing and supplying of high quality Hot Extruded & Cold Drawn Copper Products such as Copper & Copper Alloys Tubes, Rods, Flats, Sections, Profiles & Fitting, which is in compliance with BS, IS & ASTM Standards.

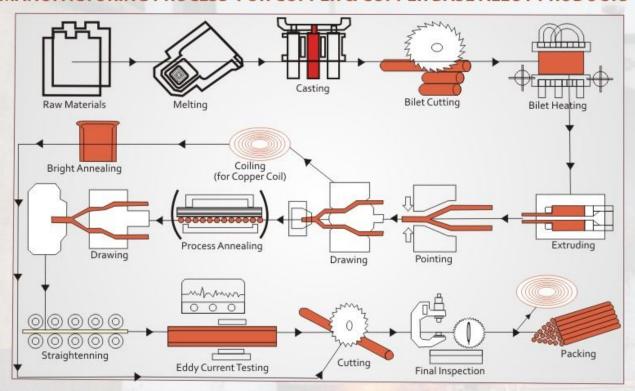
As Indigo products are very well accepted in the domestic and international markets for high quality standard, reliability, and competitive pricing, the company has magnificently accomplished enormous projects in the last decade. In the world of globalization, total customer satisfaction is prime slogan of Indigo.

Thus far, Indio has developed a solid infrastructure and techno-commercial network all over India. The company, at the same time, offers ranges of Copper products and is competent in satisfying the enormous market demand.

Having its headquarters in the business city- Mumbai Indigo is meticulously administered by a team of proficient and motivated professionals. Their enthusiastic approach and consistency in work helps them set and achieve business goals. They are well supported by scrupulous, motivated, principled and vastly skilled workforce. The fully geared Indigo is recognized as one of the forerunners in its entire business realm and endures growth each year. Dominated by young visionaries, the company is vibrant, forceful and self-motivated in its style and approach. At the helm of the business are leaders in their own right, who are constantly renewing themselves with a keen eye on future developments enabling Indigo to remain flexible and compliant with upcoming demands.



MANUFACTURING PROCESS FOR COPPER & COPPER BASE ALLOY PRODUCTS



At Indigo highly advanced technological processes are used to manufacture products which involve Melting in induction furnaces, Extrusion by 1600 metric tonne oil hydraulic extrusion press, Cold drawing by pilger mills, sophisticated drawbenches & modern bull blocks, Intermediate process annealing by gas fired furnaces, Final annealing by bright annealing furnaces, Straightening & coiling process, & final inspection & testing

Incoming Raw Material is tested in laboratory and then issued to melting shop. This material is molten cast in water-cooled molds. The cast logs are cut into billets of suitable length. These billets are pre-heated to proper extrusion temperature and extruded into mother Tube/ Rods/ Section undergo pickling, if required. Then undergo pointing, cold drawing and if required intermediate annealing. The Tubes, Rods, Sections are straightened. Tubes undergo Eddy current testing/ Hydrostatic t testing. The products undergo annealing if customer require them in soft temper or drawn further if required Half hard/ Hard Temper. The finished products undergo visual check, Dimensional check, Flaring, Flattening test, physical properties, and grain size test are also carried out before packing and despatch.

QUALITY TESTING

Product quality has been one of the hallmarks at Indigo. Each product line undergoes a battery of stringent and sophisticated quality control tests to ensure that every batch of product is of the highest quality.

- Chemical Analysis
- Physical Analysis
- Hardness testing
- Hydrostatic testing
- Pneumatic testing
- Stress corrosion testing
- Dimensional inspection
- Destructive testing flattening, Drift test
- Bend test
- NDT Eddy Current Testing









PRODUCT RANGE:

An impressive product range is the first step towards entering a competitive global market.

At Indigo we are committed to providing our client with the best quality raw material most suitable to their requirements. We offer a spectrum of Copper & Copper base alloy products which are manufactured using premium quality raw materials with the best manufacturing techniques following series of stringent quality controlled measures. Our products have varied application in Industries such as Airconditioning & Refrigeration, Plumbing & Waterlines, Medical gas, Instrumentation, Electricals, Defence, Gen. Engineering, Oil & Gas, Dessalination Plants, Architectural & Furniture work. Indigo produces Copper & Copper alloy products as per National & International standard based on customers specification.

Product Range:
MANUFACTURING...

GRADE

COPPER: DHP, DLP, ETP, OFHC, DOW, Tellurium Copper,

BRASS: 63/37Brass, 70/30 Brass, 85/15 Brass, Admiralty Brass,

Aluminium Brass, Naval Brass, Arsenic Brass, Aluminium Bronze,

Leaded Brass, Forging Brass, High Tensile Brass.

CUPRONICKEL: 95/5, 90/10 & 70/30 Alloys.

IMPORT...

Stainless Steel: TP 304, TP 310, TP 316 TP 409, TP 410, TP 430

Nickel Alloy: Inconel, Hastel Alloy, Nickel, Monel,

Titanium, Tungsten, Cobalt.

FORM

Tubes, Pipes, Coils, Flats, Sheets, Rods, Wires, Sections

Profiles, Fittings etc.

SHAPES

Round, Square, Hexagonal, Oval, or any other non standard Type required as per customers

specification.

SIZES

All sizes from 1mm to 250mm dia up to any thickness.



COPPER & COPPER ALLOY TUBES IN STRAIGHT & COIL FORM:



PANCAKE COILS: : 1/8"(3.2mm)OD to 1"(25.4mm)OD Sizes

Length : 50ft/100ft

Thickness: 10 s.w.g(3.2mm) to 27s.w.g(0.4mm)

Temper



L.W.C(Level Wound

Coils):

Sizes Length

: 1/4"(6.34mm)OD to 5/8 (15.8mm)OD : In continues length upto 1000mtrs Thickness: 18 s.w.g (1.21mm) to 31 s.w.g(0.27mm)

: 0 Temper



Inner Grooved L.W.C: Sizes : 7mm OD to 5/8"(15.8mm)OD

Length : In continues length upto 1000mtrs

Thickness: 0.41mm to 0.27mm

: 0 Temper



P. V. C. (Poly Venyl Chloride) Coated Tubes Length

& Coils:

: 1/8"(3.2mm)OD to 1" (25.4mm)OD Sizes : In cut length from 2mtr to 14mtr

In continues length from 15mtr to 1000mtr : O for soft coils H/HH for straight pipes

P.V.C : 0.5mm to 2mm

Thickness

Temper

Straight Pipes & Tubes: Sizes : 2mm OD to 250mm OD

: Up to 10mtr or as required Length Thickness: 0.30mm to 20mm

Temper : O/HH/H



Finned Tubes: (19/26 finns per inch) Sizes Length

: 5/8"(15.8mm)OD & 3/4"(19.044mm)OD : Specific length or up to 10 mtr

Thickness: 1.6mm to 1.2mm

: HH Temper

: Intergroove Integrally Finned Tubes Type

Internally Grooved Tubes, Outer grooved Finned Tubes, Spiral Finned Tubes.

: 6mm OD to 159mm OD Plumbing Tubes: Sizes

Thickness: 0.5mm to 2.5mm as per Table X,

Table Y, Table Z

Length : 10 Feet or as required

: H/HH Temper



Cappillery Tubes:

: 0.030"ID to 0.090" ID Sizes Thickness : 0.7mm to 0.4mm

: 100ft standard or upto 500mtrs Length

Temper :



COPPER & COPPER ALLOY TUBES IN STRAIGHT & COIL FORM:



90/10 & 70/30 CuproNickel Tubes : Sizes: 6mm to 250mm

Length: upto 18 mtrs Thickness: 0.5mm to 10mm

Temper: O.HH



Admiralty & Aluminum Brass Tubes: Sizes: 6mm to 150mm Length: upto 18 mtrs Thickness: 0.5mm to 10mm

> O.HH Temper:



63/37 & 70/30 Brass Tubes : Sizes: 6mm to 150mm Length: upto 10 mtrs Thickness: 0.5mm to 10mm

> Temper: HH,O

Shapes: Round, Oval, Reeded, Square, Rectangular

or any non standard type.

COPPER & COPPER ALLOY PROFILES & SEMIS:



Copper & Copper Alloy Rods: 6mm to 150mm Sizes:

Temper: HH.O

As per customers specification Length:

Grade: Copper: Commercial, EC, ETP, OFHC & Arsenical. Copper Alloys: Admiralty, Aluminum Brass,

70/30,90/10 CuproNickel.

Copper alloy rods in any alloy composition

can be developed.



Copper & Copper alloy Flats & Bus bars : Width upto 250mm Sizes: Thickness upto 25mm

HH.O Temper:

Length: As per customers specification

Grade: Copper: Commercial, EC, ETP, OFHC & Arsenical.

Copper Alloys: Admiralty, Aluminum Brass, 70/30,90/10 CuproNickel.



Elbows, Tees, Couplings, Reducers or any Shapes:

non standard type.

Types: Seamless, Welded, Flarred, Unflarred

Shouldered, Threaded

Grade: Copper, CuproNickel, Brass, Gunmetal etc



Copper & Copper Alloy Sections: Sizes: 3mm to 108mm

Temper: O.HH

Grade:

As per customers specifications. Length: Round, Oval, Rectangular, Square or Shapes:

any non standard type. Copper, Brass, CuproNickel

OTHER COPPER & COPPER BASED ALLOY PRODUCTS:



Brazing Rods

: Brazing Rods for Copper to Copper or Copper to any other metals For Shouldering or Brazing.



Copper & Brass Wires

: Electrolytic, Commercial, Super Enammeled Copper Wires. Brass wire in any alloy composition.



Copper Electric
Accessories

: Cable Terminal Ends (Lugs), Earthing Clamps,
Brass Cable Glands & Control Panel Accessories



Sheets & Plates

: Sheets & Plates as per Customers Specifications, Dimensions & Thickness in any Copper Alloy Combination.



Standard	JIS H3300	ASTM B-68	BS 2871 PART 3	DIN 1785	IS 2501	BS 2871 PART 2	IS 2501
Symbol	C 1220	C 12200	C 106	SfCu 25	DHP IS191 PART VIII	C 101	ETP COPPER
Cu	99.9 Min	99.9 Min	99.85 Min	99.9 Min	99.8 Min	99.90** Min	99.90** Min
Sn	+	-	0.01 Max		0.01	-	+
Pb		-	0.01 Max		0.01	0.005	0.005
Ni	7.	- 5	0.10 Max	0.01 Max	0.10 Max		
Fe			0.03 Max	•	0.03		
As		0.01-Max	0.05 Max	-	0.05	-	-
P	0.15-0.40	0.015040	0.013050	.015040	0.015-0.10		
Total Impurites Max.	-	-	0.06*		0.06	0.03*	0.03*
Condition	O 1/2H H	050 - 060	M1/2H O	F 25	O,1/2H,HD	OM	O,1/2H,HD
Yield Strength N/mm2		-		150-240	-	-	-
Tensile N/mm2	205 Min 245-325 315Max.	*	*	250 Min	205Min 235Min 235Min 280Min	200 - 250 Min. 270 Min.	205Min 235Min 265Min 280Min
Elongation %	40% Min.		-	30% Min.	25%	40% Min.	25% Min
Hardness HV 5		*	105 Min 80-100 60 Max			100 Max 60 Max	40% Min 25% Min
Grain Size Mm (75X)	0.25-0.06-	0.015- 0040 0.040 Min	0.05 Max		-	-	-

Excluding Silver, Arsenic or Copper

TECHNICAL SPECIFICATION COPPER RODS & FLATS

COPPER RODS & SECTION AS PER BS 2874 : 1969
Manufacturing Range : Copper Rod: 6mm to 120mm Copper Flats: Width upto 150mm Thk upto 25mm

	ETP COPPER	ARSENICAL COPPER	PHOS-DE-OX NON ARSANICAL COPPER	CADMIUM COPPER
SYMBOL	C 101	C 107	C 106	C 108
CU (Min)	99.90%	99.2% Incl. Silver	99.85%Incl.Silver	99.50%
Imp.(max)	0.03% Arsenic	0.2%-10.5% Phos	013%-0.5%	Cadmium01.2%
Condition	НН	0	0	НН
Tensile	10-12 MM 26.5 Min	22 Min Annealed	21.5	35
Kg/mm2	12-25 MM 25.5 Min	22 Min	23.5	
min.	> 25 MM 23.5 Min	21 Min	23.5	
Elongation	10-12MM 12% Min	35%Min Annealed	33%	8 % Min
% on	12-25MM 18% Min	35%Min As Manufacture 13%	13%	
5.65A(Min)	> 25 MM 22% Min	40%Min		
Conductivity I.A.C.S.	99.25%			80%
USES:	Electrical Conductors, Switched, Terminals, Gaskets, Nails Rivets, Radiators etc	Locomotive boiler stay bolts & Rivets. Plates for locomotive fire boxes etc.	Household & gen. purpose	Electrical holder for Resistance welding machine Arc-Furnances Electriodes for spot seam welding of a aluminium alloy, commulat-orbas, spring contact swith gear components & for other equipment

CHEMICAL COMPOSITION MECHANICAL PROPERTIES

63/37 BRASS TUBES Product Application Areas: General Engineering, Furniture, Architectural Grill Work,

Standard	ASTMB-135	JIS H3300	JIS H3300	DIN 17671	DIN 17671	IS 407
Symbol	C 27200	*C 2720	*C 2280	CuZn 37		CuZn 37
Cu	62.0-65.0	63.0-67.0	59-63.0	62.0-64.0		62.0-65.0
Sn				0.10		-
Al			5	0.03		(2)
Pb	0.07	0.07Max	0.10	0.10		0.30
Ni				0.30		-
Fe	0.07	0.05Max	0.07	0.10	-	0.1
Zn	Remainder	Remainder	Remainder	Remainder	Remainder	Remainder
As				•		0.06
Total Impurites Max.				0.10		0.06
**	H58	0	0	F 29	F 44	0
Condition	H80	1/2H	1/2H	F 37	F 54	TA
		Н	Н			HD
Yield				180 Max	340 Min	
Strength		-	2	200 Min	470 Min	-
N/mm2						
Tensile	370 Min	294 Min.	314 Min.	290-370	440-540	285 Min
N / mm2	455 Min	373 Min.	373 Min.	370-440	540 Min	320 Min
		450 Min	451 Min.			400 Min
Elongation					45 Min.	40 Min
%			-		45 Min.	35 Min
100					20 Min.	
Hardness HV 5	150 Min			75 Max		80 Max
	85-110		80-105	80-110		80-105
	75 Min			135 Min	*	95-130
						150 Min
Grain Size	0.05 Max	-	010-045	-	025-060	065 Max
14(79.03.6)		-			00011	00515
Mm (75X)		7			035 Min	035 Min

C2700=65/37 *C2800=60/40

CHEMICAL COMPOSITION MECHANICAL PROPERTIES

70/30 BRASS TUBES Product Application Areas: Sugar Industry, Hand Pumps, Plumbing, Furniture, General Engineering, Ammunitions And it is Commonly known as "Sugar Brass Tubes"

Standard	BS 2871 Part	ASTM B-135	NFA 51 102	IS 407	JIS H3300	AS 1572	DIN 17671	IS 1545
Symbol	CZ 126	C 26000	CuZn 30	CuZn 30As	C2600	259	CuZn 30 20265	CuZn 30 As
Cu	69.0 - 71.0	68.5 - 71.5	68.5 - 71.5	68.5 - 71.5	68.5-71.5	69.0-71.0	69.0-71.0	69.0-71.0
Sn	-	-	-		•	-	.05	-
Al							.02	
Pb	0.07	0.07	0.07	0.07	0.07	0.05	0.05	0.07
Ni		-	-	-	-	-	0.2	-
Fe	0.06	0.05	0.06	0.06	0.05	0.05	0.05	0.06
Zn	Remainder	Remainder	Remainder	Remainder	Remainder	Remainder	Remainder	Remainder
As	0.02-0.06	-	0.02 - 0.06	-	•	0.02 - 0.06	-	0.02 - 0.06
otal Impurites Max.	0.03	-	0.03	0.03	-		0.1	0.30
	М	H58	-	0	0	0	F28	0
Condition	TA	H80	-	TA	OH	1/4H	F35	TA
	0			HD	1/2H	1/2H	F42	HD
Yield						Н	180 Max	
Strength		-					200 Max	
N/mm2							320 Max	
Tensile		370 Min		285Mps/Min	275 Min	280-350 Mps	280-350	375 Max
N/mm2		455 Min		300Mps/Min	275 Min		350-420	340 Min
				400Mps/Min	373 Min	320 Mps Min	420 Min	385 Min
					451 Min			
						400 Mps Min		
Elongation					45 Min	40 Min		
%	-	-			45 Min	35 Min	-	55 Min
	•				20 Min			
Hardness HV 5	150 Min			75 Max		80 Max		80 Max
	85-105	-	80-105	80-110	•	80-105	*	80-105
	75 Min			135 Min		95-130		130 Min
						150 Min		
Grain Size	0.05 Max	2-1	010 - 045	-	025 - 060	0.065Max		
Mm (75X)				-	035 Min	0.035Min		

CHEMICAL COMPOSITION MECHANICAL PROPERTIES

ADMIRALITY BRASS TUBES Product Application Areas: Heat Exchangers, Refineries Power Plants, Desalination Plants, Ship Building & Ship Repairs, Condensers, Ferrules, Distillers

Standard	BS 2871 PART 3	ASTM B-111	DIN 1785	NFA 51 102	JIS H3300	IS 1575
Symbol	CN 111	C 44300	CuZn28 Sa 1	CuZn 29 Sa1	C4430	CuZn 29 SN 1 A
Cu	70.0 - 73.0	70.0 - 73.0	70.0 - 72.5	70.0 - 73.0	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	0.9 - 1.5
Pb	0.07	0.07	0.07	0.07	0.05Max	0.07
Ni			0.1			
Fe	0.06	0.06	0.07	0.06	0.05Max	0.06
Zn	Remainder	Remainder	Remainder	Remainder	Remainder	Remainder
As	0.02-0.06	0.02-0.06	0.02-0.35	0.02-0.06	0.02-0.06	0.02-0.06
P	•		0.1			-
Total Impurites Max.	0.30		0.1	0.30	-	0.30
	M	O 61	F36	-	0	0
Condition	TA		F 32			TA
	0					HD
Yield		105	140 - 220	*		-
Strength			100 - 170			
N/mm2						
Tensile		310	360 Min	-	315Min	375 Mps Max
N / mm2			320 Min	-		-
						340 Mps Min
						385 Mps Min
Elongation		*	45 Min		30 Min.	-
%	-		55 Min	-		35 Min
Hardness HV 5	150 Min	*		80-120	125	80 Max
	85-105			80-110		80-105
	75 Min					130 Min
						150 Min
Grain Size	0.05 Max	010 - 045		010-045	010-045	010-045
Mm (75X)						

Characteristics: A Copper Zinc Alloy containing tin and small amount of arsenic which is added as an inhibitor against dezincification. The pressure of Tin imparts to the alloy good corrosion resistance in a moderately polluted river water and clean sea water, either stagnant or slow moving (up to about 2 mtrs/sec.). The most common and wrought form of tube is tube for heat exchange equipment.

GUIDE TO THE SELECTION OF TUBE MATERIAL: CLEAR, RIVER, LAKE OR CANAL WATER.: a) Dissolved salts more than from 2000 ppm • b) Suspended solids more than 25 ppm • c) H2S or Ammonia is less than 1 ppm • d) Choloride less than 20 ppm • e) For temperature more than 200*** C and less than 450**** C Permissible average velocity of water 2.0 – 2.5 meters/sec.

CHEMICAL COMPOSITION MECHANICAL PROPERTIES

ALUMINIUM BRASS TUBES

Product Application Areas: Heat Exchangers, Refineries Power Plants, Desalination Plants, Ship Building & Ship Repairs, Condensers, Ferrules, Distillers.

Standard	BS 2871 PART 3	ASTM B-111	DIN 1785	NFA 51 102	JIS H3300	IS 1545
Symbol	CZ 110	C 68700	CuZn20 Ai 1	CuZn Ai 2	C 6870	CuZn21 Ai 2 As
Cu	76.0 - 78.0	76.0 - 79.0	76.0 - 79.0	76.0 - 79.0	76.0 - 79.0	76.0 - 78.0
Al	1.8 - 2.3	1.8 - 2.5	1.8 - 2.3	1.8 - 2.5	1.8 - 2.5	1.8 - 2.3
Pb	0.07	0.07	0.07	0.07	0.05	0.07
Ni	•		0.1	-	27.5	7;
Fe	0.06	0.06	0.07	0.06	0.06	0.06
Zn	Remainder	Remainder	Remainder	Remainder	Remainder	Remainder
As	0.02-0.06	0.02-0.06	0.02-0.35	0.02-0.06	0.02-0.06	0.02-0.06
Р			0.1	-		
Total Impurites Max.	0.30		0.1	0.30	*	0.30
	M		F 39			0
Condition	TA	0 61		*	0	TA
	0		F 34			HD
Yield	-		150 - 230	14		400 Mps Max
Strength		125	120-180	-	*	355 Mps Max
N/mm2						415 Mps Max
Tensile			390 Min			
N / mm2	*	345	340 Min	*	375	
						-
Elongation			45 Min	清		85 Max
%	•		55 Min	-	40	80-110
	-					130 Min
Hardness HV 5	150 Min			-	7.	1
	85-110		80-130	14		
	75 Min				-	-
Grain Size	0.05 Max	010 - 045	7.	010-045	010-045	010-045
Mm (75X)						

Characteristics: A Copper Zinc Alloy containing Aluminium and small amount of arsenic which is added as an inhibitor against dezincification. Inhibited Aluminium Brass resists the action of high velocity salt and brackish water and is commonly used for condenser tube. The outstanding characteristics of Aluminium Brass is the high resistance to impingement attack. Tubes of this alloy are recommended for use in marine and land power stations where cooling water velocity are high and where inhibited admiralty brass has failed from impingement

GUIDETOTHE SELECTION OF TUBE MATERIAL:

Sea Water: (a) Dissolved salts more than from 2000 ppm. • (B) Suspended solids more than 30 ppm • (C) H2S or Ammonia is less than 1 ppm. Permissible average velocity of water 2.0 – 2.5 meters/sec.

CHEMICAL COMPOSITION MECHANICAL PROPERTIES

70/30 CUPRONICKEL TUBES

PRODUCT APPLICATION AREAS: Heat Exchangers, High Capacity Power Plants, Ship Building & Ship Repairs, Condensers, Offshore Oil rigs, Distiller Tubes, Evaporators, Ferrules.

Standard	BS 2871 PART 3	ASTM B-111	DIN 1785	NFA 51 102	JIS H3300	IS 1545
Symbol	CN 107	C 71500	CuNi30 Mn 1 Fe	CuNi30 Mn 1 Fe	C 7150	CuZn 30 Mn 1 Fe
Cu	Remainder	Remainder	Remainder	Remainder	Remainder	Remainder
Pb	0.01	0.05	0.03	0.05	0.05	0.05
				Sn+Pb		
Ni	30.00 - 32.0	29.0 - 33.0	30.0 - 32.0	29.0- 32.0	29.0- 33.0	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	0.4 - 1.0
Mn	0.5 - 1.0	1.0	0.5 - 1.5	0.5 - 1.5	0.2 - 1.0	0.5 - 1.0
S	0.05		0.05	0.02	-	-
С	0.06		0.30	0.10	-	0.30
Total Impurites Max.	0.30	7.	0.1	0.30	Rem (Cu+Ni+ Fe+Mn 99.5 Min)	0.30
	M	0 61	F37	-	0	0
Condition			F 42			
	0	HR 50				D
Yield	=	125 Min	120 - 220 150 - 260	1=1	-	-
Strength	-	345 Min				
N/mm2						
Tensile		360 Min	370 Min		363 Min	360 Min
N / mm2	-	495 Min	420Min	-	-	480 Min
Elongation	-	12/15*	35 Min	(40)	30 Min.	-
%	-		30 Min	17.0		
Hardness HV 5	150	-	-	90-130	-	115 Max
	90 - 120					140 Min
Grain Size	0.05 Max	-		010-045	010-045	-
Mm (75X)						

^{* 12%} Wall thickness upto 1.21mm, including: 15% wall thickness over1.21mm characteristics:

GUIDE TO THE SELECTION OF TUBE MATERIAL:

a) Dissolved salts from 10000 ppm. • b) Absence of abrasive suspended solids. • c) Polluted with H2S and Ammonia, Permissible average velocity of water 3 - 4 meters/sec.

A Copper Nickel alloy having small amount of iron and manganese to improve corrosion resistance in high velocity (from 1 to about 4 mtrs/sec.) waters, including sea water. The alloy is relatively insensitive to stress corrosion. It has good cold and hot working properties and is readily weldable.

TECHNICAL SPECIFICATION COPPER ALLOY TUBES CHEMICAL COMPOSITION MECHANICAL PROPERTIES

90/10 CUPRONICKEL TUBES

Product Application Areas: Heat Exchangers, Application, Refineries, Power Plants, Desalination Plants, Ship Building & Ship Repairs, Condensers, Offshore Oil rigs, Car Braking Systems etc...

Standard	BS 2871 PART 3	ASTM B-111	DIN 1785	NFA 51 102	JIS H3300	IS 1545
Symbol	CN 102	C 70600	CuNi28 Fe 1 Mn	CuNi10 Fe 1 Mn	C 7060	CuNi 10 Fe
Cu	Remainder	Remainder	Remainder	Remainder	Remainder	Remainder
Pb	0.01	0.05	0.03	0.05 Sn+Pb	0.05	0.05
Ni	10.0-11.0	9.0 - 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	1.0-1.8
Mn	0.5-1.0	1.0	0.5 - 1.0	0.3 - 1.0	0.2 - 1.0	0.5 - 1.0
Zn	2	1.0	0.5	0.5	0.5	0.5
S	0.05	-	0.05	0.05	-	-
С	0.06	-	0.05	0.05	-	-
Total Impurites Max.	0.30	17	0.01 Max	0.02	Rem (Cu+Ni+ Fe+Mn 99.5 Min)	0.30
	M	0 61	F 29	2	0	0
Condition						
	0	HR 55				HD
Yield	-	105 Min	90-180	7		15
Strength	1-1	240 Min				
N/mm2						
Tensile	-	275 Min	290 Min	-	275 Min	295 Min
N/mm2	-	310 Min		-	-	285 Min
Elongation	(*).	-	30 Min	-	30 Min.	35 Min
%	5.	-		37		
Hardness HV 5	150	(=)	=	70-100	-	110 Max
	80 - 110					130 Min
Grain Size	0.05 Max		-	010-045	010-045	0.01-0.05
Mm (75X)						

Characteristics: This alloy has very high erosion and corrosion resistance. It has very high weldability, easy for installation and high anti fouling properties against sea microorganisms. Relatively high iron content provides better impingement attack resistance. The alloy is unique to stress corrosion cracking.

GUIDE TO THE SELECTION OF TUBE MATERIAL:

a) Dissolved salts more than from 1500 to 3000 ppm. • (b) Suspended solids more than 25 ppm. • (c) H2S or Ammonia is less than 1 ppm. Permissible average velocity of water 2.5 - 2.7 meters/sec

PHYSICAL PROPERTIES OF COPPER & COPPER BASED ALLOY

Density z		Melting	Point	Coefficient of thermal expansion	Specific heat (at 20 °C)	Thermal Conductivity	Electrical Conductivity
Gms/Ćm		Solidus Temp. °C	Liquidus Temp. °C	(20-300 °C) X 10	Cal/gm/	(at 20 °C Cal) CM/Sec/	at 20 °C%IACS
Electrolytic Cu (ETP)	8.89-8.9	1069	1083	17.7	0.092	0.934	101%
DHP Cu	8.94	1065	1083	177.7	0.092	70-87	70-80
DPA Cu	8.94	1065	1082	18.0	0.092	35-45	35-45
Tellurium Cu (0.5 Tel)	8.94	1050	1080	17.8	0.092z	0.88	95%
70/30 Cartridge Brass	8.53	915	955	19.9	0.090	0.29	28%
Admiralty Brass	8.53	900	935	20.2	20.2	0.090	0.26 25%
Aluminium Brass	8.33	930	970	18.5	0.090	0.24	23%
70/30 Cu. Ni.	8.94	1100	1150	17.1	0.090	0.11	9%
90/10 Cu. Ni.	8.94	1170	1240	16.2	0.090	0.07	4.6%

WEIGHT CALCULATING FORMULA

Tubes	K	gs. Per foot (TUBES) (D & t in inches)	Kgs. per meter (TUBE	ES) (D & t in mm)
Copper T Cu. Ni. T		0-t) x t x 5.529	(D-t) x t x 0.0281	D = Outside diameter
70/30 Bra Ad Brass		0-t) x t x 5.269	(D-t) x t x 0.0268	t = Wall Thickness
Al Brass	(0)-t) x t x 5.149	(D-t) x t x 0.0262	
RODS	K	gs. Per foot (RODS) (D in inches)	Kgs. per meter (ROD	S) (D in mm)
Copper Pb Brass	D	81 ° x 1.304	D ² x 0070 D ² x 00663	D = Outside diameter
STRIPS	BUS BARS	Kgs. Per foot (STRIPS)	Kgs. per meter (STRI	PS)
Copper		Width x Thickness 369	Width x Thickness x	3.281 or Width x Thickness x 0.0089

TOLERANCES ON WALL THICKNESS

Specified Wall Thickness	Tolerances on Specified Wall Thickness (Plus and Minus)	Maximum Wall Thickness at any point	Minimum Wall Thickness at any point
(1) MM	(2) MM	(3) MM	(4) MM
0.5	0.05	0.58	0.43
0.6	0.07	0.71	0.51
0.8	0.07	0.91	0.71
1.0	0.10	1.16	0.86
1.2	0.10	1.37	1.06
1.5	0.12	1.70	1.35
2.0	0.15	2.23	1.82
2.5	0.16	2.70	2.2
3	0.20	3.25	2.64
4	0.25	4.47	3.66
5	0.31	5.5	4.6
6	0.36	6.50	5.50
8	0.39	8.50	7.50
10	0.50	11.00	9.30
12	0.60	13.00	11.00
16	0.80	17.00	15.00
20	1.00	21.00	19.00

- TOLERANCES ON MEAN OUTSIDE DIAMETER -

		TOLERANCE
Outside Diameter Specification	Normal	Reduced
mm	mm	mm
	+	+
-	-	-
Up to 10	0.08	0.045
Over 10 to 18	0.10	0.045
Over 18 to 32	0.12	0.055
Over 32 to 50	0.15	0.070
Over 50 to 80	0.20	_
Over 80 to 125	0.25	-
Over 125 to 200	0.50	_
Over 200 to 250	0.80	-
Over 250 to 315	1.00	_

IMPORTS & SUPPLIES

In Form Of Pipes, Tubes, Sheets, Plates, Round Bar, Fittings, Flanges, Wire, Rod Etc

IMPORTS:

To enhance its offerings, Indigo imports a range of products that include other Non ferrous Metals like Stainless Steel of all grades, Higher Nickel base alloys in form of pipes, tubes, sheets, plates, round bars, fittings, flanges, wires, rods etc.

Item	Description	Specification	on		Grade
Stainless Steel	Pipes & Tubes	ASTM A-312, A-358, A-213, A-249 [Seamless 왔면]		-213, A-249	 TP 304, 304H, 304L, 304LN, TP 316, 316H, 316L, 316LN, 316T TP 309, 310, 317L, 321, 347, TP 409,410, 420,430, 440A, 440B, 440C 446, 202 Etc.
	Buttweld [B/W] Fitting	A-403 B/W ANSI B16.9 [Seamless & Welded [ERW]]			
	Forged Fitting	A-182, ANSI B16.11 S/W & SCRD [NPT / BSP]		SCRD [NPT / BSP]	
		Plate : A-240, ANSI B16.5		A-240, ANSI B16.5	
	Flanges	Forged :		A-182 ANSI B16.5	
	Sheet, Plate, Strip, Flat & Blank	A-240			
	Bar [Rod] & Wire	A-479			
Carbon Steel	Pipes & Tubes	A-106 Gr. B, A-333 Gr. 6, BS 3059, API 5L Etc.		S 3059, API 5L Etc.	With IBR Test Certificate & Manufacturers Test Certificate
	Buttweld [B/W] Fitting	A-234 WPB, A-420 WPL 6 B/W ANSI B16.9		3/W ANSI B16.9	
	Forged Fitting	A-105, A-350 LF2 ANSI B16.11 S/W & SCRD		i.11 S/W & SCRD	
	Flanges	Plate : A-105, A-350 Lf2 ANSI B16.5			
		Forged: IS 2062, A-516 Gr.70 ANSI B16.5			
	Sheet, Plate, Strip, Flat & Blank	IS 2062, IS 2002, A-516 Gr.70 Etc.		70 Etc.	
	Bar [Rod] & Wire	A-105, LF2, EN Series			
Alloy Steel, Tool & Die Steel	Pipes & Tubes	Pipes : ASTM A-335		TM A-335	P5, P9, P11, P12, P21, P22 & P91 Etc. [with IBR Test Certificate]
		Tubes: ASTM A-213		TM A-213	T-11, T-12, T-22, T-5, T-9 Etc. [with IBR Test Certificate]
	Buttweld [B/W] Fitting	A-234 WP B/W ANSI B16.9			P5, P9, P11, P12, P21, P22 & P91.
	Forged Fitting	A-182 ANSI B16.11 S/W & SCRD		SCRD	F5, F9, F11, F12, F21, F22 & F91.
	Flanges	Forged: ASTM A-182 ANSI B16.5			
	Sheet, Plate, Strip, Flat & Blank	ASTM A-387			Gr. 11, Gr. 12, Gr. 22, Gr. 5 Cl. 2
	HSS & EN Flat	DIN, BS, IS & EN Series			M2, M3, M35, M42 Etc.
	Bar [Rod] & Wire	A-182			F5, F9, F11, F12, F21, F22, F51 & F91
		DIN, BS, IS & EN Series		HSS, HCHCR & OHNS: M2, M3, M35, M42, T-1, T-4, T-15, T-42 D2, D3, H11, H13 & OHNS-01	
	High Speed Steel [HSS] & EN Series			EN Series : EN-1A, EN-3B, EN-8, EN-9, EN-16, EN-18, EN-19, EN-24, EN-29B, EN-31, EN-32B, EN-36, EN-36C, EN-42J, EN- EN-47, EN-48A, EN-52, EN-100, EN-1 EN-202, EN-352, EN-353, EN-117 Etc	

Mild Steel [M. S.] / G. I.	Pipes & Tubes	IS 1239, IS 3589 [Fe 330, Fe 410] Etc. IS 4310 ANSI B16.9 [Welded], ISI Mark S/W & SCRD ANSI B16.11				
	Buttweld [B/W] Fitting					
	Forged Fitting					
	Flange	Plate :	IS 2002 ANSI B16.5	With Manufacturers Test Certificate & With Guarantee Letter		
	Sheet, Plate, Strip, Flat & Blank	IS 2062				
	Angle, Channel, Beam, 'T' Etc.					
	Bar [Rod] & Wire	IS, BS, DIN Etc.				
Item	Description	Specification		Grade		
Nickel Alloy:	Pipes & Tubes	IS, BS, ASTM, UNS Etc. IS, BS, ANSI, ASTM, UNS Etc.		Hastelloy: C276, B-2 Nickel: 200 / 201 / 205 Inconel: 600, 601, 625 & 825 Incolloy: 800, 800H Monel: K400 & 500 Ferro Nickel: 55/45, 60/40, 70/30 Nimonic Nichrome: 80:20 Cobalt, Sanicro: 28, SS 904L Alloy 20, Titanium, Tungston, Kanthal Etc. Hastelloy (UNS No.: N10665, N10276, N06455 Nickel (UNS No.: N02200, N02201, N02205) Monel (UNS No.: N04400, N05500) Inconel (UNS No.: N06600, N06601, N06625, N08800, N08825) Alloy 20, Titanium, Tungston, Kanthal, Nimonic Nichrome, Cobalt, Sanicro (28) Etc.		
 Hastelloy (UNS No. : N10665, N10276, N06455) 	Buttweld [B/W] Fitting					
	Forged Fitting	ASTM, BS, DIN Etc.				
Nickel (UNS No. :	Flanges	ASTM, BS, DIN Etc.				
N02200, N02201, N02205)	Sheet, Plate, Strip, Flat & Blank	IS, BS, ASTM, UNS Etc				
N04400, N05500) Inconel (UNS No. : N06600, N06601, N06625, N08800, N08825) Alloy 20, Titanium, Tungston, Kanthal, Nimonic Nichrome, Cobalt, Sanicro (28) Etc.	Bar [Rod] & Wire	ASTM, BS, DIN Etc.				
Duplex Steel	Pipes	As Per UNS No		 UNS No. S31803 TD 2205 17.4 PH UNS No. : S32550, S32750, S32900, S17400, S31200, S32201, S32205 		
	Forged Fitting					
	Flanges					
	Bar					
	Profile					
	Sheet, Plate, Plate Cut					
Metal Alloys	Brass Alloys	Brass Coils, Brass Bars, Brass Fittings, Brass Sheets, Brass Wires, Brass Rods, Brass Strips				
	Aluminum Alloys	Aluminum Brass Alloys, Aluminum Plates, Aluminum Sheets				
	Steel Alloys	Stainless Steel Angles, Stainless Steel Channels, Stainless Steel Bars, Stainless Steel Bolts, Stainless Steel Fasteners, Stainless Steel Fittings, Steel Flanges, Pipe Joints, Pipe Connectors, Clamps, Tee Fittings				
	Other Metal Alloys	Brass, Bronze & Copper Blanks, Bronze Bars, Bronze Plates, Aluminum Alloys, Non Ferrous Alloys, Titanium Alloys, Brass Alloys, Copper Alloys, Nickel Alloys, Steel Alloys, Tungsten Alloys				



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