



**An ISO 9001:2015 company**

39/55, "Shaan", Lane No.9, Prabhat Road, Pune - 411004. INDIA.

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CIN No. : U 29120MH 1979 PTC 021188

MATERIAL OF CONSTRUCTION	Type 1	Type 2	Type 3	Type 4	Type 5
	11 FPI	16 FPI	19 FPI	26 FPI	28 FPI
<b>COPPER FINNED TUBES</b> (SB-111 UNS NO.C-12200) (SB-111 UNS NO.C-12220) (SB-111 UNS NO.C-12000)	●	●	●	●	●
<b>COPPER FINNED WITH INTERNAL RIBS TUBES</b> (SB-111 UNS NO.C-12200) (SB-111 UNS NO.C-12220) (SB-111 UNS NO.C-12000)			●		
<b>CUPRO-NICKEL FINNED TUBE</b> (SB111 UNS No.C-71500) (SB111 UNS No.C-70600) (SB111 UNS No.C-70400)	●	●	●	●	●
<b>ADMIRALTY BRASS FINNED TUBE</b> (SB111 UNS No.C-44300)	●	●	●	●	●
<b>ALUMINIUM BRASS FINNED TUBE</b> (SB-111 UNS No.C-68700)	●	●	●	●	●
<b>ALUMINIUM FINNED TUBE</b>	●	●	●	●	●
<b>CARBON STEEL SEAMLESS FINNED TUBE</b> (SA – 179) (SA – 334 (Gr. 1,3,6)) (SA – 210 (Gr. A1))		●	●	●	●
<b>CARBON STEEL SEAMLESS WITH INTERNAL RIBS FINNED TUBE</b> (SA – 179)		●	●		
<b>CARBON STEEL WELDED FINNED TUBE</b> (SA – 214)		●	●	●	●
<b>STAINLESS STEEL SEAMLESS FINNED TUBE</b> (SA – 213 TP – 304/304L) (SA – 213 TP – 316/316L) (SA – 213 TP – 321/321L) (SA – 213 Gr. T11) (SA – 688)		●	●	●	●
<b>STAINLESS STEEL WELDED FINNED TUBE</b> (SA – 249)		●	●	●	●
<b>DUPLEX STAINLESS STEEL SEAMLESS FINNED TUBE</b> (SA – 789)		●	●		

AND OTHER MATERIAL GRADES ON REQUEST.

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## Technical Parameters

### 19 FPI – 748 fins/ m

Fin pitch = 1.33 mm

Mean fin thickness = 0.38 mm

Fin height = 1.30 mm

Plain Section Average Diameter (mm)	Plain Section Average Wall (mm)	Nominal Root Diameter (mm)	Wall Under Fin Minimum (mm)	Outside Area Ao (m <sup>2</sup> /m)	Inside Area Ai (m <sup>2</sup> /m)	Approx. Area Ratio Ao/Ai
12.70	1.24	10.10	0.63	0.101	0.027	3.746
12.70	1.43	10.10	0.78	0.101	0.036	2.826
12.70	1.65	10.10	0.94	0.101	0.024	4.180
12.70	1.83	10.10	1.11	0.101	0.023	4.410
15.88	1.24	13.28	0.63	0.128	0.037	3.436
15.88	1.47	13.28	0.78	0.128	0.036	3.576
15.88	1.65	13.28	0.94	0.128	0.034	3.699
15.88	1.83	13.28	1.11	0.128	0.033	3.828
15.88	2.11	13.28	1.47	0.128	0.031	4.054
19.05	1.24	16.45	0.63	0.154	0.047	3.265
19.05	1.47	16.45	0.78	0.154	0.046	3.368
19.05	1.65	16.45	0.94	0.154	0.045	3.453
19.05	1.83	16.45	1.11	0.154	0.044	3.541
19.05	2.11	16.45	1.47	0.154	0.042	3.692
19.05	2.41	16.45	1.83	0.154	0.040	3.876
19.05	2.76	16.45	2.11	0.154	0.037	4.113
22.22	1.24	19.62	0.63	0.181	0.057	3.158
22.22	1.47	19.62	0.78	0.181	0.056	3.238
22.22	1.65	19.62	0.94	0.181	0.055	3.303
22.22	1.83	19.62	1.11	0.181	0.054	3.370
22.22	2.11	19.62	1.47	0.181	0.052	3.484
22.22	2.41	19.62	1.83	0.181	0.050	3.616
22.22	2.76	19.62	2.11	0.181	0.048	3.784
25.40	1.65	22.80	0.94	0.208	0.065	3.202
25.40	1.83	22.80	1.11	0.208	0.064	3.257
25.40	2.11	22.80	1.47	0.208	0.062	3.347
25.40	2.41	22.80	1.83	0.208	0.060	3.452
25.40	2.76	22.80	2.11	0.208	0.058	3.581
25.40	3.04	22.80	2.41	0.208	0.056	3.691

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**Technical Parameters****26 FPI – 1026 fins/ m****Fin pitch = 0.97 mm****Mean fin thickness = 0.33 mm****Fin height = 1.24 mm**

Plain Section Average Diameter (mm)	Plain Section Average Wall (mm)	Nominal Root Diameter (mm)	Wall Under Fin Minimum (mm)	Outside Area Ao (m <sup>2</sup> /m)	Inside Area Ai (m <sup>2</sup> /m)	Approx. Area Ratio Ao/Ai
12.70	1.24	10.22	0.63	0.122	0.028	4.410
12.70	1.43	10.22	0.78	0.122	0.026	4.676
12.70	1.65	10.22	0.94	0.122	0.025	4.912
12.70	1.83	10.22	1.11	0.122	0.024	5.174
15.88	1.24	13.40	0.63	0.154	0.038	4.070
15.88	1.47	13.40	0.78	0.154	0.036	4.232
15.88	1.65	13.40	0.94	0.154	0.035	4.368
15.88	1.83	13.40	1.11	0.154	0.034	4.517
15.88	2.11	13.40	1.47	0.154	0.032	4.773
19.05	1.24	16.57	0.63	0.185	0.048	3.872
19.05	1.47	16.57	0.78	0.185	0.046	3.993
19.05	1.65	16.57	0.94	0.185	0.045	4.089
19.05	1.83	16.57	1.11	0.185	0.044	4.194
19.05	2.11	16.57	1.47	0.185	0.042	4.365
19.05	2.41	16.57	1.83	0.185	0.039	4.759
19.05	2.76	16.57	2.11	0.185	0.038	4.845
22.22	1.24	19.74	0.63	0.217	0.058	3.747
22.22	1.47	19.74	0.78	0.217	0.057	3.839
22.22	1.65	19.74	0.94	0.217	0.055	3.917
22.22	1.83	19.74	1.11	0.217	0.054	3.996
22.22	2.11	19.74	1.47	0.217	0.053	4.125
22.22	2.41	19.74	1.83	0.217	0.051	4.284
22.22	2.76	19.74	2.11	0.217	0.048	4.475
25.40	1.65	22.92	0.94	0.249	0.065	3.801
25.40	1.83	22.92	1.11	0.249	0.064	3.864
25.40	2.11	22.92	1.47	0.249	0.063	3.969
25.40	2.41	22.92	1.83	0.249	0.061	4.094
25.40	2.76	22.92	2.11	0.249	0.059	4.243
25.40	3.04	22.92	2.41	0.249	0.057	4.369

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**Technical Parameters****28 FPI – 1102 fins/ m****Fin pitch = 0.90 mm****Mean fin thickness = 0.30 mm****Fin height = 0.88 mm**

Plain Section Average Diameter (mm)	Plain Section Average Wall (mm)	Nominal Root Diameter (mm)	Wall Under Fin Minimum (mm)	Outside Area Ao (m <sup>2</sup> /m)	Inside Area Ai (m <sup>2</sup> /m)	Approx. Area Ratio Ao/Ai
12.70	1.24	10.92	0.63	0.101	0.028	3.567
12.70	1.43	10.92	0.78	0.101	0.027	3.777
12.70	1.65	10.92	0.94	0.101	0.025	3.964
12.70	1.83	10.92	1.11	0.101	0.024	4.170
15.88	1.24	14.10	0.63	0.127	0.038	3.315
15.88	1.47	14.10	0.78	0.127	0.037	3.442
15.88	1.65	14.10	0.94	0.127	0.036	3.547
15.88	1.83	14.10	1.11	0.127	0.035	3.666
15.88	2.11	14.10	1.47	0.127	0.033	3.870
19.05	1.24	17.27	0.63	0.153	0.048	3.157
19.05	1.47	17.27	0.78	0.153	0.047	3.254
19.05	1.65	17.27	0.94	0.153	0.046	3.334
19.05	1.83	17.27	1.11	0.153	0.045	3.418
19.05	2.11	17.27	1.47	0.153	0.043	3.553
19.05	2.41	17.27	1.83	0.153	0.038	3.996
19.05	2.76	17.27	2.11	0.153	0.038	4.062
22.22	1.24	20.44	0.63	0.179	0.059	3.061
22.22	1.47	20.44	0.78	0.179	0.057	3.135
22.22	1.65	20.44	0.94	0.179	0.056	3.198
22.22	1.83	20.44	1.11	0.179	0.055	3.260
22.22	2.11	20.44	1.47	0.179	0.053	3.386
22.22	2.41	20.44	1.83	0.179	0.051	3.494
22.22	2.76	20.44	2.11	0.179	0.049	3.646
25.40	1.65	23.62	0.94	0.205	0.066	3.114
25.40	1.83	23.62	1.11	0.205	0.065	3.159
25.40	2.11	23.62	1.47	0.205	0.063	3.245
25.40	2.41	23.62	1.83	0.205	0.061	3.345
25.40	2.76	23.62	2.11	0.205	0.059	3.465
25.40	3.04	23.62	2.41	0.205	0.058	3.567

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## Standard Norms for Finning

### STANDARD NORMS

- **ASTM A1012:** Standard Specification for Seamless and Welded Ferritic, Austenitic and Duplex Alloy Steel Condenser and Heat Exchanger Tubes with Integral Fins
- **ASTM B924:** Standard Specification for Seamless and Welded Nickel Alloy Condenser and Heat Exchanger Tubes with Integral Fins
- **ASTM A498:** Standard Specification for Seamless and Welded Carbon, Ferritic and Austenitic Alloy Steel Heat Exchanger Tubes with Integral Fins
- **ASTM B359:** Standard Specification for Copper and Copper-Alloy Seamless Condenser and Heat Exchanger Tubes with Integral Fins
- **ASTM B891:** Standard Specification for Seamless and Welded Titanium and Titanium Alloy Condenser and Heat Exchanger Tubes with Integral Fins

### TOLERANCES

FINS PER INCH:	+ / - 1 FPI
FIN HEIGHT:	+ / - 0.15 mm
FIN THICKNESS:	+ / - 0.10 mm
TOTAL LENGTH:	+ 5 / - 0 mm
PLAIN PORTION OF BOTH ENDS:	+ / - 5 mm
INTERMEDIATE LANDINGS:	+ / - 5 mm
LAND AT TANGENT: (U-Bends)	+ / - 5 mm
WALL THICKNESS:	See data sheet.
FINNED SECTION DIAMETER:	O.D. tolerances per material spec.

### INSPECTION & TESTING

#### 1. Dimension Check:

Ensure dimensional accuracy of OD, Thickness, Fin OD, Side Landings, Total length etc.

#### 2. Fin Profile:

To ensure that on profile projector of Fin height, Fin Thickness, No. of fins etc.

#### 3. Surface Check:

To ensure that finished tubes are free from scale, crack, dent etc.

#### 4. Non-Destructive Test:

All tubes Hydro Test Up to 380 kg/cm<sup>2</sup>(g). To check that there should not be any leakage & pressure drop.

Air under water test also perform up to 20 kg/cm<sup>2</sup>(g).

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