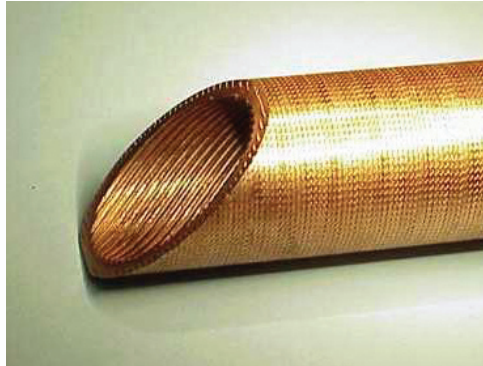




TURBO-BII®

ID/OD Enhanced Surface for Improved Boiling Heat Transfer

Turbo-BII is a more efficient version of Turbo-B and is designed for light hydrocarbon boiling. The tube is configured in variations for both high pressure and low pressure refrigerant applications. The integral helical fins on the outside of the tube are modified to enhance the initiation of nucleate boiling sites, thus improving the overall heat transfer coefficient. The inside heat transfer coefficient is improved because of increased surface area and turbulence induced by integral helical ridges on the inside surface. The availability of plain ends and intermediate lands makes Turbo-BII suitable for shell and tube evaporators.



The increased ID ridge count improves the overall heat transfer efficiency of Turbo-BII over Turbo-B, while slightly increasing the ID pressure drop.

Where there is a need for a low ID pressure drop, several sizes are available in Turbo-BII. This is accomplished by reducing the ID ridge height. It may also be supplied with a smooth bore.

Alloys Available and Applicable Standards

UNS C12200 (DHP Copper) to ASME SB75 and ASME SB359

Product Formats

Straight Lengths to 20 feet, + 1/8 inch maximum variation

Straight Lengths over 20 feet, + 5/32 inch maximum variation

Ends are supplied either brush deburred or chamfered

Packaging

Packaging options include wooden boxes and shipping frames.

Tempers Available

As fabricated temper

Testing

All tubes are tested per the requirements of ASTM E243.

TURBO-BII®

Standard Sizes			Plain End Dimensions		Finned Section Dimensions			
Catalog Number	Outside Diameter inch (mm)	Nominal Wall inch (mm)	Outside Diameter inch (mm)	Wall inch (mm)	Fin Per Inch	Finished Fin OD inch (mm)	Min. Wall Under Fins inch (mm)	Root Diameter inch (mm)

Turbo-BII High Pressure - UNS C12200

55-5050025	3/4 (19.05)	0.025 (0.635)	0.743 (18.87)	0.049 (1.24)	48	0.736 (18.69)	0.022 (0.559)	0.682 (17.32)
55-5050028	3/4 (19.05)	0.028 (0.711)	0.743 (18.87)	0.052 (1.31)	48	0.741 (18.82)	0.025 (0.635)	0.686 (17.42)
55-5050035	3/4 (19.05)	0.035 (0.889)	0.748 (19.00)	0.058 (1.47)	48	0.736 (18.69)	0.031 (0.787)	0.680 (17.27)
55-5059028	3/4 (19.05)	0.028 (0.711)	0.748 (19.00)	0.047 (1.19)	48	0.741 (18.82)	0.025 (0.635)	0.686 (17.42)
55-5059035	3/4 (19.05)	0.035 (0.889)	0.743 (18.87)	0.053 (1.35)	48	0.741 (18.82)	0.031 (0.787)	0.686 (17.42)
55-5070025	1 (25.40)	0.025 (0.635)	0.995 (25.27)	0.055 (1.40)	48	0.976 (24.79)	0.022 (0.559)	0.918 (23.32)
55-5070028	1 (25.40)	0.028 (0.711)	0.995 (25.27)	0.058 (1.47)	48	0.976 (24.79)	0.025 (0.635)	0.918 (23.32)
55-5070035	1 (25.40)	0.035 (0.889)	0.995 (25.27)	0.065 (1.65)	48	0.977 (24.82)	0.031 (0.635)	0.922 (23.42)

Turbo-BII Low Pressure - UNS C12200

55-5050125	3/4 (19.05)	0.025 (0.635)	0.743 (18.87)	0.051 (1.30)	48	0.738 (18.75)	0.022 (0.559)	0.680 (17.27)
55-5050128	3/4 (19.05)	0.028 (0.711)	0.743 (18.87)	0.054 (1.36)	48	0.741 (18.82)	0.025 (0.635)	0.684 (17.37)
55-5050135	3/4 (19.05)	0.035 (0.889)	0.743 (18.87)	0.060 (1.52)	48	0.738 (18.75)	0.031 (0.787)	0.680 (17.27)
55-5058128	3/4 (19.05)	0.028 (0.711)	0.743 (18.87)	0.055 (1.38)	48	0.744 (18.90)	0.025 (0.635)	0.684 (17.37)
55-5058135	3/4 (19.05)	0.035 (0.889)	0.743 (18.87)	0.060 (1.52)	48	0.738 (18.75)	0.031 (0.787)	0.680 (17.27)
55-5059128	3/4 (19.05)	0.028 (0.711)	0.743 (18.87)	0.048 (1.22)	48	0.738 (18.75)	0.025 (0.635)	0.686 (17.42)
55-5059135	3/4 (19.05)	0.035 (0.889)	0.748 (19.00)	0.056 (1.41)	48	0.739 (18.77)	0.031 (0.787)	0.686 (17.42)

TURBO-BII®

Standard Sizes		Inside Dimensions		Areas			
Catalog Number	Weight Per Unit Length lb/ft (kg/m)	Nominal Inside Diameter inch (mm)	Nominal Ridge Height inch (mm)	Nominal Inside Surface Area ft ² /ft (m ² /m)	Actual Inside Surface Area ft ² /ft (m ² /m)	Nominal Outside Surface Area ft ² /ft (m ² /m)	Actual Outside Surface Area ft ² /ft (m ² /m)

Turbo-BII High Pressure - UNS C12200

55-5050025	0.384 (0.571)	0.632 (16.05)	0.014 (0.356)	0.165 (0.050)	0.263 (0.080)	0.192 (0.059)	0.300 (193.5)
55-5050028	0.405 (0.603)	0.632 (16.05)	0.014 (0.356)	0.165 (0.050)	0.263 (0.080)	0.192 (0.059)	0.300 (193.5)
55-5050035	0.457 (0.680)	0.612 (15.54)	0.011 (0.279)	0.160 (0.049)	0.235 (0.072)	0.192 (0.059)	0.283 (182.6)
55-5059028	0.372 (0.554)	0.632 (16.05)	N/A	0.165 (0.050)	0.165 (0.050)	0.192 (0.059)	0.314 (202.6)
55-5059035	0.413 (0.615)	0.620 (15.75)	N/A	0.160 (0.049)	0.160 (0.049)	0.192 (0.059)	0.295 (190.3)
55-5070025	0.566 (0.843)	0.866 (22.00)	0.018 (0.457)	0.227 (0.069)	0.351 (0.107)	0.260 (0.079)	0.565 (364.5)
55-5070028	0.675 (1.004)	0.862 (21.89)	0.018 (0.457)	0.226 (0.069)	0.349 (0.106)	0.260 (0.079)	0.559 (360.6)
55-5070035	0.671 (0.999)	0.852 (21.64)	0.016 (0.406)	0.223 (0.068)	0.333 (0.102)	0.260 (0.079)	0.548 (353.5)

Turbo-BII Low Pressure - UNS C12200

55-5050125	0.384 (0.571)	0.632 (16.05)	0.014 (0.356)	0.165 (0.050)	0.263 (0.080)	0.192 (0.059)	0.300 (193.5)
55-5050128	0.405 (0.603)	0.632 (16.05)	0.013 (0.330)	0.165 (0.050)	0.263 (0.080)	0.192 (0.059)	0.300 (193.5)
55-5050135	0.457 (0.680)	0.612 (15.54)	0.011 (0.279)	0.160 (0.049)	0.235 (0.072)	0.192 (0.059)	0.283 (182.6)
55-5058128	0.410 (0.610)	0.629 (15.98)	0.013 (0.330)	0.165 (0.050)	0.255 (0.078)	0.192 (0.059)	0.298 (192.3)
55-5058135	0.457 (0.680)	0.612 (15.54)	0.011 (0.279)	0.160 (0.049)	0.235 (0.072)	0.192 (0.059)	0.283 (182.6)
55-5059128	N/A	0.632 (16.05)	N/A	0.165 (0.050)	0.165 (0.050)	0.192 (0.059)	0.314 (202.6)
55-5059135	0.427 (0.635)	0.616 (15.65)	N/A	0.161 (0.049)	0.161 (0.049)	0.192 (0.059)	0.298 (192.3)

Engineering Data

Catalog Number	Sieder and Tate ² Constant STC ⁱ	Constants used in Calculating Darcy Friction Factor ¹	
		C	D

Turbo-BII High Pressure - UNS C12200

55-5050025	0.071	0.457	0.211
55-5050028	0.071	0.457	0.211
55-5050035	0.060	0.306	0.188
55-5059028	0.027	0.316	0.250
55-5059035	0.027	0.316	0.250
55-5070025	0.070	0.457	0.211
55-5070028	N/D	N/D	N/D
55-5070035	0.058	0.453	0.222

Turbo-BII Low Pressure - UNS C12200

55-5050125	0.071	0.457	0.211
55-5050128	0.071	0.457	0.211
55-5050135	0.056	0.171	0.136
55-5058128	0.070	0.626	0.245
55-5058135	0.056	0.171	0.136
55-5059128	0.027	0.316	0.250
55-5059135	0.027	0.316	0.250

1. Constants applicable to Reynolds numbers greater than 20,000. [$f_{\text{Darcy}} = C(\text{Re})^{-D}$]

2. To calculate inside heat transfer coefficient: $h_i = (k/D_{i,\text{nom}})(\text{STC}_i)\text{Re}^{0.8}\text{Pr}^{1/3}[\mu/\mu_{\text{wall}}]^{0.14}$