WOLVERINE TUBE, INC.
Engineering Thermal Innovation

TURBO-B®

ID/OD Enhanced Surface for Improved Boiling Heat Transfer

Turbo-B 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 over all heat transfer coefficient. The inside heat transfer coefficient is improved because of increased surface area and turbulation induced by integral helical ridges on the inside surface. The availability of plain ends and intermediate lands makes Turbo-B, especially suitable for shell and tube evaporators.

Where there is a need for a low ID pressure drop, several sizes are available in Turbo-B. It may also be supplied with a smooth bore.

Alloys Available and Applicable Standards
UNS C12200 (DHP Copper) to ASME SB75 and ASME SB359

UNS C70600 (90/10 Copper Nickel) to ASME SB111 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.

Contact us at (256) 353-1310 or mkt@wlv.com

TURBO-B®

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-B Enhanced ID - UNS C12200								
54-9850025	3/4 (19.05)	0.025 (0.635)	0.743 (18.87)	0.052 (1.31)	40	0.728 (18.49)	0.022 (0.559)	0.679 (17.25)
54-9850028	3/4 (19.05)	0.028 (0.711)	0.743 (18.87)	0.055 (1.38)	40	0.735 (18.67)	0.025 (0.635)	0.685 (17.40)
54-9850035	3/4 (19.05)	0.035 (0.889)	0.743 (18.87)	0.059 (1.50)	40	0.728 (18.49)	0.031 (0.787)	0.679 (17.25)
54-9850042	3/4 (19.05)	0.042 (1.067)	0.743 (18.87)	0.065 (1.65)	40	0.728 (18.49)	0.037 (0.940)	0.697 (17.70)
54-9850058	3/4 (19.05)	0.058 (1.473)	0.743 (18.87)	0.075 (1.91)	40	0.736 (18.69)	0.049 (1.245)	0.686 (17.42)
54-9850128	3/4 (19.05)	0.028 (0.711)	0.743 (18.87)	0.052 (1.31)	40	0.735 (18.67)	0.025 (0.635)	0.685 (17.40)
54-9850435	3/4 (19.05)	0.035 (0.889)	0.743 (18.87)	0.057 (1.45)	40	0.735 (18.67)	0.031 (0.787)	0.684 (17.37)
54-9870028	1 (25.40)	0.028 (0.711)	0.998 (25.35)	0.052 (1.32)	40	0.945 (24.00)	0.025 (0.635)	0.947 (24.05)
Turbo-B Enhanced ID - UNS C70600								
54-9850028	3/4 (19.05)	0.028 (0.711)	0.743 (18.87)	0.055 (1.38)	40	0.735 (18.67)	0.025 (0.635)	0.685 (17.40)
54-9850035	3/4 (19.05)	0.035 (0.889)	0.743 (18.87)	0.059 (1.50)	40	0.730 (18.54)	0.031 (0.787)	0.680 (17.27)
54-9850128	3/4 (19.05)	0.028 (0.711)	0.743 (18.87)	0.052 (1.31)	40	0.735 (18.67)	0.025 (0.635)	0.685 (17.40)
54-9850435	3/4 (19.05)	0.035 (0.889)	0.743 (18.87)	0.057 (1.45)	40	0.735 (18.67)	0.031 (0.787)	0.684 (17.37)
Turbo-B Smooth Bore - UNS C12200								
54-9849925	5/8 (15.88)	0.025 (0.635)	0.623 (15.82)	0.043 (1.09)	40	0.608 (15.44)	0.022 (0.559)	0.556 (14.12)
54-9859928	3/4 (19.05)	0.028 (0.711)	0.743 (18.87)	0.047 (1.19)	40	0.727 (18.47)	0.025 (0.635)	0.684 (17.37)
54-9859935	3/4 (19.05)	0.035 (0.889)	0.743 (18.87)	0.053 (1.35)	40	0.727 (18.47)	0.031 (0.787)	0.684 (17.37)
54-9859949	3/4 (19.05)	0.049 (1.245)	0.743 (18.87)	0.066 (1.68)	40	0.727 (18.47)	0.044 (1.118)	0.684 (17.37)
Turbo-B Smooth Bore - UNS C70600								
54-9859928	3/4 (19.05)	0.028 (0.711)	0.743 (18.87)	0.047 (1.19)	40	0.727 (18.47)	0.025 (0.635)	0.684 (17.37)
54-9859935	3/4 (19.05)	0.035 (0.889)	0.743 (18.87)	0.053 (1.35)	40	0.727 (18.47)	0.031 (0.787)	0.684 (17.37)
54-9859942	3/4 (19.05)	0.042 (1.067)	0.743 (18.87)	0.600 (15.24)	40	0.727 (18.47)	0.037 (0.940)	0.684 (17.37)
54-9859949	3/4 (19.05)	0.049 (1.245)	0.743 (18.87)	0.066 (1.68)	40	0.727 (18.47)	0.044 (1.118)	0.684 (17.37)

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TURBO-B®

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-B Enhanced ID - UNS C12200							
54-9850025	0.410 (0.610)	0.632 (16.05)	0.020 (0.508)	0.165 (0.050)	0.252 (0.077)	0.192 (0.059)	0.294 (189.7)
54-9850028	0.422 (0.629)	0.632 (16.05)	0.020 (0.508)	0.165 (0.050)	0.252 (0.077)	0.192 (0.059)	0.294 (189.7)
54-9850035	0.459 (0.683)	0.612 (15.54)	0.015 (0.381)	0.160 (0.049)	0.229 (0.070)	0.192 (0.059)	0.278 (179.4)
54-9850042	0.493 (0.733)	0.602 (15.29)	0.014 (0.356)	0.157 (0.048)	0.221 (0.067)	0.192 (0.059)	0.267 (172.3)
54-9850058	0.574 (0.854)	0.584 (14.83)	0.010 (0.254)	0.152 (0.046)	0.198 (0.060)	0.192 (0.059)	0.257 (165.8)
54-9850128	0.400 (0.596)	0.632 (16.05)	0.017 (0.432)	0.165 (0.050)	0.239 (0.073)	0.192 (0.059)	0.301 (194.2)
54-9850435	0.442 (0.658)	0.618 (15.70)	0.015 (0.381)	0.162 (0.049)	0.227 (0.069)	0.192 (0.059)	0.288 (185.8)
54-9870028	0.556 (0.827)	0.882 (22.40)	0.020 (0.508)	0.231 (0.070)	0.337 (0.103)	0.260 (0.079)	0.594 (383.2)
Turbo-B Enhanced ID - UNS C70600							
54-9850028	0.428 (0.637)	0.632 (16.05)	0.018 (0.457)	0.165 (0.050)	0.247 (0.075)	0.192 (0.059)	0.295 (190.3)
54-9850035	0.459 (0.683)	0.612 (15.54)	0.014 (0.356)	0.162 (0.049)	0.225 (0.069)	0.192 (0.059)	0.285 (183.9)
54-9850128	0.420 (0.625)	0.632 (16.05)	0.015 (0.381)	0.165 (0.050)	0.230 (0.070)	0.192 (0.059)	0.302 (194.8)
54-9850435	0.445 (0.662)	0.618 (15.70)	0.013 (0.330)	0.162 (0.049)	0.218 (0.066)	0.192 (0.059)	0.290 (187.1)
Turbo-B Smooth Bore - UNS C12200							
54-9849925	N/A	0.505 (12.83)	N/A	0.132 (0.040)	0.132 (0.040)	0.192 (0.059)	0.200 (129.0)
54-9859928	0.370 (0.550)	0.626 (15.90)	N/A	0.164 (0.050)	0.164 (0.050)	0.192 (0.059)	0.308 (198.7)
54-9859935	0.413 (0.615)	0.610 (15.49)	N/A	0.160 (0.049)	0.160 (0.049)	0.192 (0.059)	0.292 (188.4)
54-9859949	0.516 (0.768)	0.582 (14.78)	N/A	0.152 (0.046)	0.152 (0.046)	0.192 (0.059)	0.266 (171.6)
Turbo-B Smooth Bore - UNS C70600							
54-9859928	0.370 (0.550)	0.626 (15.90)	N/A	0.164 (0.050)	0.164 (0.050)	0.192 (0.059)	0.308 (198.7)
54-9859935	0.413 (0.615)	0.610 (15.49)	N/A	0.160 (0.049)	0.160 (0.049)	0.192 (0.059)	0.292 (188.4)
54-9859942	0.468 (0.696)	0.596 (15.14)	N/A	0.156 (0.048)	0.156 (0.048)	0.192 (0.059)	0.279 (180.0)
54-9859949	0.516 (0.768)	0.582 (14.78)	N/A	0.152 (0.046)	0.152 (0.046)	0.192 (0.059)	0.266 (171.6)

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Engineering Data

Catalog Number	Sieder and Tate[2] Constant STC_i	Constants used in Calculating Darcy Friction Factor[1] C	D
Turbo-B Enhanced ID - UNS C12200			
54-9850025	0.060	0.792	0.267
54-9850028	0.060	0.792	0.267
54-9850035	0.058	0.637	0.260
54-9850042	0.049	0.540	0.250
54-9850058	0.047	0.441	0.239
54-9850128	0.058	2.450	0.386
54-9850435	0.055	3.050	0.414
54-9870028	0.061	1.393	0.311
Turbo-B Enhanced ID - UNS C70600			
54-9850028	0.058	0.730	0.263
54-9850035	0.057	0.635	0.258
54-9850128	0.048	N/A	N/A
54-9850435	0.045	N/A	N/A
Turbo-B Smooth Bore - UNS C12200			
54-9849925	0.027	0.316	0.250
54-9859928	0.027	0.316	0.250
54-9859935	0.027	0.316	0.250
54-9859949	0.027	0.316	0.250
Turbo-B Smooth Bore - UNS C70600			
54-9859928	0.027	0.316	0.250
54-9859935	0.027	0.316	0.250
54-9859942	0.027	0.316	0.250
54-9859949	0.027	0.316	0.250

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

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