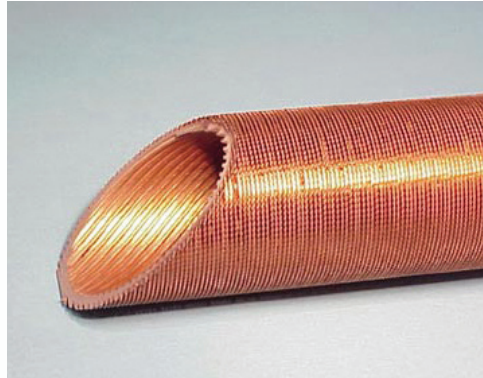




TURBO-CII®

ID/OD Enhanced Surface for Improved Heat Transfer

Turbo-CII is designed for light hydrocarbon condensing. The integral helical fins on the outside of the tube are modified to enhance the condensing 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- characteristics



CII especially suitable for shell and tube condensers.

The increased ID ridge count improves the overall heat transfer efficiency of Turbo-CII over Turbo-C, while slightly increasing the ID pressure drop. Where there is a need for a low ID pressure drop, several sizes are available in Turbo-CII. 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-CII®

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-CII Enhanced ID - UNS C12200

52-4053825	3/4 (19.05)	0.025 (0.635)	0.743 (18.87)	0.047 (1.19)	40	0.742 (18.85)	0.022 (0.559)	0.667 (16.94)
52-4053828	3/4 (19.05)	0.028 (0.711)	0.743 (18.87)	0.050 (1.27)	40	0.742 (18.85)	0.025 (0.635)	0.667 (16.94)
52-4053835	3/4 (19.05)	0.035 (0.889)	0.743 (18.87)	0.056 (1.42)	40	0.742 (18.85)	0.031 (0.787)	0.667 (16.94)
52-4073825	1 (25.40)	0.025 (0.635)	0.995 (25.27)	0.051 (1.28)	40	0.990 (25.15)	0.022 (0.559)	0.918 (23.32)
52-4073828	1 (25.40)	0.028 (0.711)	0.993 (25.22)	0.054 (1.37)	40	0.995 (25.27)	0.025 (0.635)	0.919 (23.34)

Turbo-CII Smooth Bore - UNS C12200

52-4059928	3/4 (19.05)	0.028 (0.711)	0.743 (18.87)	0.047 (1.19)	40	0.744 (18.90)	0.025 (0.635)	0.667 (16.94)
52-4059935	3/4 (19.05)	0.035 (0.889)	0.743 (18.87)	0.053 (1.35)	40	0.742 (18.85)	0.031 (0.787)	0.667 (16.94)
52-4059942	3/4 (19.05)	0.042 (1.067)	0.743 (18.87)	0.058 (1.47)	40	0.742 (18.85)	0.037 (0.940)	0.667 (16.94)
52-4079925	1 (25.40)	0.025 (0.635)	0.995 (25.27)	0.055 (1.40)	40	0.976 (24.79)	0.022 (0.559)	0.918 (23.32)

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-CII Enhanced ID - UNS C12200

52-4053825	0.372 (0.554)	0.618 (15.70)	0.015 (0.381)	0.162 (0.049)	0.258 (0.079)	0.196 (0.060)	0.681 (0.208)
52-4053828	0.394 (0.587)	0.612 (15.54)	0.015 (0.381)	0.160 (0.049)	0.257 (0.078)	0.196 (0.060)	0.681 (0.208)
52-4053835	0.438 (0.652)	0.602 (15.29)	0.011 (0.279)	0.158 (0.048)	0.224 (0.068)	0.196 (0.060)	0.685 (0.209)
52-4073825	0.545 (0.811)	0.866 (22.00)	0.020 (0.508)	0.227 (0.069)	0.347 (0.106)	0.260 (0.079)	0.879 (0.268)
52-4073828	0.586 (0.873)	0.863 (21.92)	0.020 (0.508)	0.226 (0.069)	0.347 (0.106)	0.260 (0.079)	0.924 (0.282)

Turbo-CII Smooth Bore - UNS C12200

52-4059928	0.361 (0.537)	0.607 (15.42)	N/A	0.159 (0.048)	0.159 (0.048)	0.196 (0.060)	0.681 (0.208)
52-4059935	0.413 (0.615)	0.598 (15.19)	N/A	0.157 (0.048)	0.157 (0.048)	0.196 (0.060)	0.681 (0.208)
52-4059942	0.457 (0.680)	0.589 (14.96)	N/A	0.154 (0.047)	0.154 (0.047)	0.196 (0.060)	0.681 (0.208)
52-4079925	0.566 (0.843)	0.866 (22.00)	N/A	0.227 (0.069)	0.227 (0.069)	0.260 (0.079)	0.563 (0.172)

Engineering Data

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

Turbo-CII Enhanced ID - UNS C12200

52-4053825	0.068	1.414	0.314
52-4053828	0.068	1.414	0.314
52-4053835	0.064	0.348	0.194
52-4073825	0.068	0.484	0.209
52-4073828	0.027	0.316	0.250

Turbo-CII Smooth Bore - UNS C12200

52-4059928	N/D	N/D	N/D
52-4059935	0.064	0.348	0.194
52-4059942	0.027	0.316	0.250
52-4079925	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: $h_i = (k/D_{i \text{ nom}})(\text{STC}_i)\text{Re}^{0.8}\text{Pr}^{1/3}[\mu/\mu_{\text{wall}}]^{0.14}$