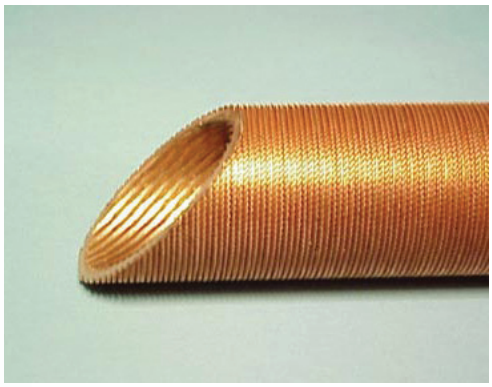
WOLVERINE TUBE, INC.
Engineering Thermal Innovation

TURBO-CIII®
For Refrigerant Applications

An Improved Refrigerant Condenser Tube



Turbo-CIII is designed for condensing refrigerants. 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 turbulation induced by integral helical ridges on the inside surface. The availability of plain ends and intermediate lands makes Turbo-CIII especially suitable for shell and tube-side condensers.

The OD enhancement, the ID ridge count, and the configuration have been modified to improve both the OD and ID heat transfer coefficients while simultaneously reducing the weigh per unit length, providing less water-side pressure drop.

Where there is a need for a low ID pressure drop, the tube is supplied with a smooth bore.

External Standards
This product is produced in alloy C12200 to meet the mechanical, chemical, and testing requirements of ASTM B75/B359 and in alloy C70600 to meet the mechanical, chemical, and testing requirements of ASTM B111/B359. For applications to the ASME pressure vessel code, the product will be produced to meet the requirements of ASME SB75/SB359 for alloy C12200 and to SB111/SB359 for alloy C70600. Other applicable standards - DIN 1787, DIN 17671, DIN 17664, and ADW 6/2 WD TUV 420/5.

Plain Sections
Plain ends and lands of 1" (25.4 mm) and over are standard. For plain ends and lands down to 5/8" (15.9 mm), contact the Wolverine Marketing Department.

Lengths
End finish shall be chamfered or brush deburred as specified by the customer. If not specified by the customer the end finish will be at the discretion of the producing plant.

Temper
Turbo-CIII is supplied as standard, in the "as finned" condition with plain ends and lands in the annealed condition. Material can be supplied in the annealed condition the entire length by special request.

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

TURBO-CIII®

For Refrigerant Applications

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-CIII Enhanced ID - UNS C12200								
95-4350025	3/4 (19.05)	0.025 (0.635)	0.743 (18.87)	0.040 (1.02)	43	0.740 (18.80)	0.022 (0.559)	0.694 (17.63)
95-4350028	3/4 (19.05)	0.028 (0.711)	0.743 (18.87)	0.040 (1.02)	43	0.740 (18.80)	0.025 (0.635)	0.694 (17.63)
95-4350035	3/4 (19.05)	0.035 (0.889)	0.743 (18.87)	0.050 (1.27)	43	0.740 (18.80)	0.031 (0.787)	0.694 (17.63)
95-4370025	1 (25.40)	0.025 (0.635)	0.995 (25.27)	0.043 (1.09)	43	0.993 (25.22)	0.022 (0.559)	0.944 (23.98)
95-4370035	1 (25.40)	0.035 (0.889)	0.995 (25.27)	0.052 (1.32)	43	0.993 (25.22)	0.031 (0.787)	0.944 (23.98)
Turbo-CIII Enhanced ID - UNS C70600								
95-4350028	3/4 (19.05)	0.028 (0.711)	0.748 (19.00)	0.044 (1.12)	43	0.740 (18.80)	0.025 (0.635)	0.694 (17.63)
95-4350035	3/4 (19.05)	0.035 (0.889)	0.748 (19.00)	0.052 (1.32)	43	0.740 (18.80)	0.031 (0.787)	0.694 (17.63)
Turbo-CIII Smooth Bore - UNS C12200								
95-4359928	3/4 (19.05)	0.028 (0.711)	0.748 (19.00)	0.038 (0.95)	43	0.741 (18.82)	0.025 (0.635)	0.691 (17.55)
95-4359935	3/4 (19.05)	0.035 (0.889)	0.748 (19.00)	0.045 (1.14)	43	0.741 (18.82)	0.031 (0.787)	0.691 (17.55)

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-CIII Enhanced ID - UNS C12200							
95-4350025	0.326 (0.485)	0.644 (16.36)	0.020 (0.508)	0.169 (0.052)	0.284 (0.087)	0.196 (0.060)	0.580 (0.177)
95-4350028	0.353 (0.525)	0.638 (16.21)	0.019 (0.483)	0.167 (0.051)	0.276 (0.084)	0.196 (0.060)	0.580 (0.177)
95-4350035	0.407 (0.606)	0.624 (15.85)	0.016 (0.406)	0.163 (0.050)	0.254 (0.077)	0.196 (0.060)	0.580 (0.177)
95-4370025	0.473 (0.704)	0.894 (22.71)	0.023 (0.584)	0.234 (0.071)	0.382 (0.116)	0.260 (0.079)	0.805 (0.245)
95-4370035	0.562 (0.837)	0.874 (22.20)	0.020 (0.508)	0.229 (0.070)	0.357 (0.109)	0.260 (0.079)	0.805 (0.245)
Turbo-CIII Enhanced ID - UNS C70600							
95-4350028	0.347 (0.516)	0.638 (16.21)	0.019 (0.483)	0.167 (0.051)	0.276 (0.084)	0.196 (0.060)	0.580 (0.177)
95-4350035	0.410 (0.609)	0.624 (15.85)	0.016 (0.406)	0.163 (0.050)	0.254 (0.077)	0.196 (0.060)	0.580 (0.177)
Turbo-CIII Smooth Bore - UNS C12200							
95-4359928	0.305 (0.454)	0.635 (16.13)	N/A	0.166 (0.051)	0.166 (0.051)	0.196 (0.060)	0.538 (0.164)
95-4359935	0.360 (0.536)	0.621 (15.77)	N/A	0.163 (0.050)	0.163 (0.050)	0.196 (0.060)	0.538 (0.164)

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

TURBO-CIII®
For Refrigerant Applications

Engineering Data			
Catalog Number	Sieder and Tate[2] Constant STC^i	Constants used in Calculating Darcy Friction Factor[1] C	D
Turbo-CIII Enhanced ID - UNS C12200			
95-4350025	0.078	2.122	0.345
95-4350028	0.078	1.773	0.331
95-4350035	0.068	0.635	0.236
95-4370025	0.077	0.715	0.243
95-4370035	0.066	1.173	0.299
Turbo-CIII Enhanced ID - UNS C70600			
95-4350028	0.078	1.773	0.331
95-4350035	0.068	0.635	0.236
Turbo-CIII Smooth Bore - UNS C12200			
95-4359928	0.027	0.316	0.250
95-4359935	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: $hi = (k/D_{i\ nom.})(STC_i)Re^{0.8}Pr^{1/3}[\mu/\mu_{wall}]^{0.14}$

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