

## For Direct Fired Water Heaters and Boilers



### Maximum OD Surface in an Integrally Finned Tube

Type H/F Trufin is an integral extended surface tube designed primarily for applications which require high outside-to-inside surface area ratios, such as direct fired water heaters, boilers, and applications for heating or cooling gases.

This integral high-finned product is manufactured to a controlled inside diameter to allow insert type end connections or with the fins removed from the tube ends (stripped ends) for expanding into tube sheets or insertion into other end connections. Minimum wall thickness is held to meet code requirements for pressure designs. Maximum fin diameters are held to permit control of tube spacing.

Type H/F Trufin may be manufactured to meet the requirements of the ASME Pressure Vessel Code.

### Materials and Sizes

All sizes are produced in DHP Copper (UNS C12200-Wolverine 01) and some sizes are available in Copper-Nickel (UNS C70600 Wolverine 53) as indicated in Table 1. Sizes produced in Copper Nickel alloy UNS C70600 are indicated by a "#" before the catalog number.

### Tempers

Mechanical properties of the material in the "as finned temper" meet the requirements of "as drawn temper" specified in ASME SB-359. Annealed temper tubes are supplied with a minimum average grain size of 0.040 mm.

### Tube Ends

The Finned tube is shipped with either fully finned ends or stripped ends. In either case, the end finish is a commercial saw cut. Chamfered ends may be supplied on stripped ends.

### • Alloys Available and Application Standards

UNS C12200, DHP Copper to ASME SB-75 and ASME SB-359

UNS C-70600 90/10 Copper Nickel to ASME SB-111 and ASME SB-359

### • Product Format

Straight Lengths to 14 Feet, + 1/4-0 Inches Maximum Variation

Straight Lengths over 14 Feet, + 1/2-0 Inches Maximum Variation

Ends are supplied either saw cut or may be stripped on lengths over 12 inches.

Maximum Stripped Length: 2 1/2 inches + 3/8 inches

### • Packaging

Packaging options include wooden boxes and shipping frames.

### • Testing

All Tubes are pressure tested per specification requirements.

### Pressure Testing

Each tube (prior to cutting to the finished length) shall pass a 250 psi pneumatic leak test for a minimum of 5 seconds. A hydrostatic test at a pressure not to exceed 1000 psi may be performed as an option.

## Ordering

To order, specify the:

1. The Product Number, "61,"  
Catalog Number from Table 1,  
Alloy (C12200 or C70600):  
example: 61-0710049-C12200
2. Temper: "As Finned," or  
"Annealed"
3. Quantity in Feet
4. Length
5. Specification Requirements
6. Any Special Requirements You  
May Have

**This product is manufactured in an ISO 9002 certified facility.**

### Dimensional Data - Type H/F Trufin - 5 Fins Per Inch

Catalog Number	Nominal Inside Diameter inch (mm)	Actual Inside Diameter inch (mm)	Minimum Wall Under Fin inch (mm)	Maximum Fin Diameter inch (mm)	Minimum Fin Height inch (mm)	Minimum Root Diameter inch (mm)
61-0508065	1/2 (12.70)	0.506 (12.85)	0.061 (1.549)	1.438 (36.53)	0.350 (8.890)	0.625 (15.88)
61-0514065	7/8 (22.23)	0.881 (22.38)	0.061 (1.549)	1.854 (47.09)	0.375 (9.525)	1.000 (25.40)
61-0514072	7/8 (22.23)	0.881 (22.38)	0.068 (1.727)	1.906 (48.41)	0.350 (8.890)	1.014 (25.76)
61-0516065	1 (25.40)	1.007 (25.58)	0.061 (1.549)	1.938 (49.23)	0.350 (8.890)	1.125 (28.58)

### Dimensional Data - Type H/F Trufin - 5 Fins Per Inch

Catalog Number	Nominal Wall Thickness inch (mm)	Nominal Outside Surface Area ft <sup>2</sup> /ft (m <sup>2</sup> /m)	Surface Area Ratio Outside to Inside	Nominal Inside Cross Sectional Area in <sup>2</sup> (mm <sup>2</sup> )	Weight Per Unit Length lb/ft (kg/m)
61-0508065	0.065 (1.651)	1.158 (0.353)	8.17	0.192 (124.1)	0.987 (1.469)
61-0514065	0.065 (1.651)	1.710 (0.521)	7.41	0.610 (393.5)	1.726 (2.568)
61-0514072	0.072 (1.829)	1.964 (0.599)	8.51	0.610 (393.5)	2.107 (3.135)
61-0516065	0.065 (1.651)	1.857 (0.566)	7.04	0.796 (513.5)	1.968 (2.928)

### Dimensional Data - Type H/F Trufin - 7 Fins Per Inch

Catalog Number	Nominal Inside Diameter inch (mm)	Actual Inside Diameter inch (mm)	Minimum Wall Under Fin inch (mm)	Maximum Fin Diameter inch (mm)	Minimum Fin Height inch (mm)	Minimum Root Diameter inch (mm)
61-0706035	3/8 (9.53)	0.381 (9.68)	0.032 (0.813)	1.063 (27.00)	0.260 (6.604)	N/D
61-0708065	1/2 (12.70)	0.506 (12.85)	0.061 (1.549)	1.438 (36.53)	0.350 (8.890)	6.250 (158.75)
61-0710042	5/8 (15.88)	0.631 (16.03)	0.039 (0.991)	1.562 (39.67)	0.350 (8.890)	0.706 (17.93)
61-0710049	5/8 (15.88)	0.631 (16.03)	0.046 (1.168)	1.562 (39.67)	0.375 (9.525)	0.720 (18.29)
61-0710053	5/8 (15.88)	0.631 (16.03)	0.050 (1.270)	1.480 (37.59)	0.355 (9.017)	0.723 (18.36)
61-0710058	5/8 (15.88)	0.631 (16.03)	0.055 (1.397)	1.562 (39.67)	0.350 (8.890)	0.735 (18.67)
61-0710062	5/8 (15.88)	0.631 (16.03)	0.058 (1.473)	1.562 (39.67)	0.350 (8.890)	0.750 (19.05)
#61-0710065	5/8 (15.88)	0.631 (16.03)	0.061 (1.549)	1.562 (39.67)	0.350 (8.890)	0.750 (19.05)
61-0710069	5/8 (15.88)	0.623 (15.82)	0.066 (1.676)	1.562 (39.67)	0.350 (8.890)	0.761 (19.33)
61-0712058	3/4 (19.05)	0.756 (19.20)	0.055 (1.397)	1.688 (42.88)	0.350 (8.890)	0.863 (21.92)
61-0712072	3/4 (19.05)	0.756 (19.20)	0.068 (1.727)	1.688 (42.88)	0.350 (8.890)	0.891 (22.63)
61-0714049	7/8 (22.23)	0.881 (22.38)	0.046 (1.168)	1.859 (47.22)	0.375 (9.525)	0.968 (24.59)
61-0714062	7/8 (22.23)	0.881 (22.38)	0.058 (1.473)	1.857 (47.17)	0.375 (9.525)	0.994 (25.25)
61-0714064	7/8 (22.23)	0.881 (22.38)	0.060 (1.524)	1.857 (47.17)	0.375 (9.525)	0.998 (25.35)
#61-0714065	7/8 (22.23)	0.881 (22.38)	0.061 (1.549)	1.859 (47.22)	0.375 (9.525)	1.000 (25.40)
#61-0714068	7/8 (22.23)	0.881 (22.38)	0.064 (1.626)	1.859 (47.22)	0.375 (9.525)	1.006 (25.55)
61-0714072	7/8 (22.23)	0.881 (22.38)	0.068 (1.727)	1.906 (48.41)	0.400 (10.160)	1.014 (25.76)
61-0714172	7/8 (22.23)	0.881 (22.38)	0.068 (1.727)	*2.125 (53.98)	0.550 (13.970)	1.014 (25.76)
#61-0714472	7/8 (22.23)	0.879 (22.33)	0.068 (1.727)	1.810 (45.97)	0.375 (9.525)	1.014 (25.76)
61-0716065	1 (25.40)	1.007 (25.58)	0.061 (1.549)	1.938 (49.23)	0.350 (8.890)	1.125 (28.58)
61-0720065	1 1/4 (31.75)	1.257 (31.93)	0.061 (1.549)	2.203 (55.96)	0.350 (8.890)	1.375 (34.93)

## Dimensional Data - Type H/F Trufin - 7 Fins Per Inch

Catalog Number	Nominal Wall Thickness inch (mm)	Nominal Outside Surface Area ft <sup>2</sup> /ft (m <sup>2</sup> /m)	Surface Area Ratio Outside to Inside	Nominal Inside Cross Sectional Area in <sup>2</sup> (mm <sup>2</sup> )	Weight Per Unit Length lb/ft (kg/m)
61-0706035	0.035 (0.889)	0.870 (0.265)	8.72	0.111 (71.3)	0.585 (0.870)
61-0708065	0.065 (1.651)	1.555 (0.474)	11.70	0.192 (124.1)	1.160 (1.726)
61-0710042	0.042 (1.067)	1.727 (0.527)	10.45	0.313 (201.7)	1.210 (1.800)
61-0710049	0.049 (1.245)	1.742 (0.531)	10.53	0.313 (201.7)	1.300 (1.934)
61-0710053	0.053 (1.346)	1.680 (0.512)	10.17	0.313 (201.7)	1.385 (2.061)
61-0710058	0.058 (1.473)	1.734 (0.529)	10.50	0.313 (201.7)	1.429 (2.126)
61-0710062	0.062 (1.575)	1.736 (0.529)	10.51	0.313 (201.7)	1.438 (2.140)
#61-0710065	0.065 (1.651)	1.759 (0.536)	10.62	0.313 (201.7)	1.460 (2.172)
61-0710069	0.069 (1.753)	1.757 (0.536)	10.77	0.305 (196.8)	1.617 (2.406)
61-0712058	0.058 (1.473)	1.952 (0.595)	9.86	0.449 (289.5)	1.490 (2.217)
61-0712072	0.072 (1.829)	1.935 (0.590)	9.78	0.449 (289.5)	1.640 (2.440)
61-0714049	0.049 (1.245)	2.293 (0.699)	9.94	0.610 (393.2)	1.750 (2.604)
61-0714062	0.062 (1.575)	2.290 (0.698)	9.93	0.610 (393.2)	2.003 (2.980)
61-0714064	0.064 (1.626)	2.290 (0.698)	9.93	0.610 (393.2)	2.035 (3.028)
#61-0714065	0.065 (1.651)	2.340 (0.713)	10.13	0.610 (393.5)	1.940 (2.887)
#61-0714068	0.068 (1.727)	2.291 (0.698)	9.93	0.610 (393.5)	1.977 (2.942)
61-0714072	0.072 (1.829)	2.623 (0.800)	11.37	0.610 (393.5)	2.060 (3.065)
61-0714172	0.072 (1.829)	3.573 (1.089)	15.50	0.610 (393.5)	2.350 (3.497)
#61-0714472	0.072 (1.829)	2.342 (0.714)	10.15	0.607 (391.5)	2.100 (3.125)
61-0716065	0.065 (1.651)	2.470 (0.753)	9.37	0.796 (513.5)	2.180 (3.244)
61-0720065	0.065 (1.651)	2.880 (0.878)	8.76	1.241 (800.6)	2.360 (3.512)

## Dimensional Data - Type H/F Trufin - 8 Fins Per Inch

Catalog Number	Nominal Inside Diameter inch (mm)	Actual Inside Diameter inch (mm)	Minimum Wall Under Fin inch (mm)	Maximum Fin Diameter inch (mm)	Minimum Fin Height inch (mm)	Minimum Root Diameter inch (mm)
61-0810065	5/8 (15.88)	0.631 (16.03)	0.061 (1.549)	1.250 (31.75)	0.210 (5.334)	0.750 (19.05)
61-0814049	7/8 (22.23)	0.881 (22.38)	0.046 (1.168)	1.857 (47.17)	0.375 (9.525)	0.968 (24.59)
#61-0814065	7/8 (22.23)	0.881 (22.38)	0.061 (1.549)	1.857 (47.17)	0.375 (9.525)	1.000 (25.40)

## Dimensional Data - Type H/F Trufin - 8 Fins Per Inch

Catalog Number	Nominal Wall Thickness inch (mm)	Nominal Outside Surface Area ft <sup>2</sup> /ft (m <sup>2</sup> /m)	Surface Area Ratio Outside to Inside	Nominal Inside Cross Sectional Area in <sup>2</sup> (mm <sup>2</sup> )	Weight Per Unit Length lb/ft (kg/m)
61-0810065	0.065 (1.651)	1.108 (0.338)	6.71	0.313 (201.7)	1.336 (1.988)
61-0814049	0.049 (1.245)	2.585 (0.788)	11.21	0.610 (393.2)	1.776 (2.643)
#61-0814065	0.065 (1.651)	2.592 (0.790)	11.24	0.610 (393.2)	2.250 (3.348)

"#" indicates size is available in UNS Alloy C70600.

"\*\*" indicates nominal outside diameter only.

**Dimensional Data - Type H/F Trufin - 9 Fins Per Inch**

Catalog Number	Nominal Inside Diameter inch (mm)	Actual Inside Diameter inch (mm)	Minimum Wall Under Fin inch (mm)	Maximum Fin Diameter inch (mm)	Minimum Fin Height inch (mm)	Minimum Root Diameter inch (mm)
61-0905035	5/16 (7.94)	0.318 (8.08)	0.032 (0.813)	0.938 (23.83)	0.240 (6.096)	N/D
61-0906035	3/8 (9.53)	0.381 (9.68)	0.032 (0.813)	1.063 (27.00)	0.260 (6.604)	N/D
61-0908065	1/2 (12.70)	0.506 (12.85)	0.061 (1.549)	1.438 (36.53)	0.350 (8.890)	0.625 (15.88)
61-0910042	5/8 (15.88)	0.631 (16.03)	0.039 (0.991)	1.562 (39.67)	0.375 (9.525)	0.706 (17.93)
61-0910049	5/8 (15.88)	0.631 (16.03)	0.046 (1.168)	1.562 (39.67)	0.375 (9.525)	0.720 (18.29)
61-0910065	5/8 (15.88)	0.631 (16.03)	0.061 (1.549)	1.562 (39.67)	0.350 (8.890)	0.750 (19.05)

**Dimensional Data - Type H/F Trufin - 9 Fins Per Inch**

Catalog Number	Nominal Wall Thickness inch (mm)	Nominal Outside Surface Area ft <sup>2</sup> /ft (m <sup>2</sup> /m)	Surface Area Ratio Outside to Inside	Nominal Inside Cross Sectional Area in <sup>2</sup> (mm <sup>2</sup> )	Weight Per Unit Length lb/ft (kg/m)
61-0905035	0.035 (0.889)	0.876 (0.267)	10.52	0.077 (49.5)	0.540 (0.804)
61-0906035	0.035 (0.889)	1.085 (0.331)	10.87	0.111 (71.3)	0.630 (0.937)
61-0908065	0.065 (1.651)	1.952 (0.595)	14.69	0.192 (124.1)	1.260 (1.875)
61-0910042	0.042 (1.067)	2.180 (0.665)	13.19	0.313 (201.7)	1.306 (1.943)
61-0910049	0.049 (1.245)	2.195 (0.669)	13.57	0.313 (201.7)	1.350 (2.009)
61-0910065	0.065 (1.651)	2.177 (0.664)	13.18	0.313 (201.7)	1.480 (2.202)

**WOLVERINE TUBE, INC.**

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