

# COPPER FITTINGS FOR HVACR APPLICATIONS

<b>Job Name</b>	<b>Contractor</b>
<b>Job Location</b>	<b>Wholesaler</b>
<b>Engineer</b>	<b>Streamline<sup>®</sup> Rep</b>

**Product Description:**

Streamline<sup>®</sup> Wrot Copper fittings for use in refrigeration applications. Available sizes ranging from 1/8" to 8-1/8" in outside diameter. Product is designed to join ASTM B280 and ASTM B88 seamless copper tube.

**Material:**

Streamline<sup>®</sup> Wrot Copper fittings shall be made from material in compliance with UNS C12200 grade of copper.


**Key Specifications:**

Streamline<sup>®</sup> Wrot Copper pressure fittings shall conform to ASME B16.22 and MSS SPI04. Streamline<sup>®</sup> Wrot Copper pressure fittings are third party verified in select sizes<sup>1</sup> through Underwriters Laboratories (UL) for operating pressure of 700psi at 250°F.

**Installation:**

Installations shall comply with the latest applicable building codes for the local jurisdiction. For detailed installation instructions, consult the Copper Development Association at copper.org.

**References:**

Product Line	Product Type	Outer Diameter
1 Copper Fittings 	Streamline <sup>®</sup> Wrot Solder-Joint Pressure	1/8" – 2-5/8"

\*700PSI at 250°F in select patterns

- |             |   |
|-------------|---|
| C12200      | 99.9% Pure Copper   |
| ASME B16.22 | Wrot Copper and Copper Alloy Solder Joint Pressure Fittings |
| MSS SPI04   | Wrot Copper Solder and Joint Pressure Fittings              |

**Other Applicable Standards**

- |           |   |
|-----------|---|
| ASTM B88  | Seamless Copper Water and Gas Tube (Types K, L, M)          |
| ASTM B280 | Seamless Copper Tube for Air Conditioning and Refrigeration |

## COPPER FITTINGS - HVACR SOLDER/BRAZE JOINT PRESSURE WROT & CAST

**NOTE: ALL SIZES ARE OD**

### ADAPTER

#### FEMALE WC-402

Part	Size	Box	Ctn	Wt
W 01204	1/4 x 1/2	100	300	0.1
W 01205	x 3/8	100	700	0.05
W 01206	x 1/4	100	900	0.04
W 01207	x 1/8	100	1,500	0.04
W 01214	3/8 x 3/8	50	750	0.06
W 01215	x 1/4	50	750	0.04
W 01216	x 1/8	100	1,500	0.03
W 01223	1/2 x 3/4	50	300	0.16
W 01224	x 1/2	50	500	0.1
W 01225	x 3/8	50	750	0.07
W 01226	x 1/4	50	750	0.06
W 01230	5/8 x 3/4	25	250	0.16
W 01231	x 1/2	50	500	0.1
W 01232	x 3/8	50	500	0.07
W 01233	x 1/4	50	500	0.06
W 01238	3/4 x 3/4	50	500	0.15
W 01239	x 1/2	50	500	0.09
W 01245	7/8 x 1	25	250	0.27
W 01246	x 3/4	25	250	0.14
W 01247	x 1/2	25	250	0.11
W 01261	1-1/8 x 1-1/4	10	100	0.28
W 01263	x 1	25	250	0.25
W 01264	x 3/4	25	250	0.22
W 01265	x 1/2	20	200	0.25
W 01270	1-3/8 x 1-1/2	10	100	0.5
W 01271	x 1-1/4	10	100	0.45
W 01272	x 1	10	100	0.33
W 01278	1-5/8 x 2	-	60	0.74
W 01279	x 1-1/2	10	100	0.53
W 01280	x 1-1/4	5	50	0.39
W 01287	2-1/8 x 2	-	50	0.57
W 01288	x 1-1/2	5	50	0.74
W 01296	2-5/8 x 2-1/2	-	25	1.22
W 01297	3-1/8 x 3	-	15	

### ADAPTER

#### FITTING WC-405

Part	Size	Box	Ctn	Wt
W 01514	3/8 x 3/8	50	750	0.06
W 01524	1/2 x 1/2	50	350	0.1
W 01525	x 3/8	50	750	0.05
W 01526	x 1/4	50	750	0.06
W 01531	5/8 x 1/2	50	450	0.11
W 01532	x 3/8	50	750	0.07
W 01546	7/8 x 3/4	25	250	0.17
W 01547	x 1/2	50	500	0.11
W 01563	1-1/8 x 1	25	250	0.24
W 01564	x 3/4	25	250	0.18
W 01571	1-3/8 x 1-1/4	10	100	0.4
W 01579	1-5/8 x 1-1/2	10	100	0.46
W 01587	2-1/8 x 2	-	50	0.65
W 01596	2-5/8 x 2-1/2	-	25	1.2

### ADAPTER

#### MALE WC-401

Part	Size	Box	Ctn	Wt
W 01105 †	1/4 x 3/8	50	750	0.06
W 01106 †	x 1/4	50	1,200	0.03
W 01107 †	x 1/8	50	2,400	0.02
W 01109 †	5/16 x 3/8	50	800	0.07
W 01110 †	x 1/4	50	1,200	0.03
W 01113 †	3/8 x 1/2	50	500	0.08
W 01114 †	x 3/8	50	750	0.06
W 01115 †	x 1/4	50	1,200	0.03
W 01116 †	x 1/8	50	2,000	0.02
W 01123 †	1/2 x 3/4	25	250	0.17
W 01124 †	x 1/2	50	500	0.09
W 01125 †	x 3/8	50	500	0.06

### ADAPTER CONT.

W 01126 †	x 1/4	50	750	0.05
W 01129 †	5/8 x 1	15	150	0.3
W 01130 †	x 3/4	25	250	0.17
W 01131 †	x 1/2	50	500	0.06
W 01132 †	x 3/8	50	500	0.07
W 01133 †	x 1/4	25	600	0.06
W 01138 †	3/4 x 3/4	25	250	0.14
W 01139 †	x 1/2	25	250	0.12
W 01145 †	7/8 x 1	10	100	0.29
W 01146 †	x 3/4	25	250	0.13
W 01147 †	x 1/2	25	250	0.12
W 01161 †	1-1/8 x 1-1/2	10	100	0.48
W 01162 †	x 11/4	10	100	0.39
W 01163 †	x 1	10	100	0.24
W 01164 †	x 3/4	10	100	0.17
W 01165 †	x 1/2	10	100	0.18
W 01170 †	1-3/8 x 1-1/2	10	100	0.48
W 01171 †	x 1-1/4	10	100	0.41
W 01172 †	x 1	10	100	0.24
W 01173 †	x 3/4	10	100	0.21
W 01178 †	1-5/8 x 2	-	50	0.78
W 01179 †	x 1-1/2	10	100	0.51
W 01180 †	x 1-1/4	10	100	0.37
W 01181 †	x 1	10	100	0.38
W 01187 †	2-1/8 x 2	5	50	0.57
W 01188 †	x 1-1/2	-	50	0.64
W 01189 †	x 1-1/4	-	50	0.57
W 01196 †	2-5/8 x 2-1/2	-	20	1.26
W 01197 †	x 2	-	20	0.98
W 01198 †	x 1-1/2	-	22	0.98
W 01199	3-1/8 x 3	-	20	1.7
W 01150	4-1/8 x 4	-	16	3.71

### ADAPTER

#### FITTING WC-404

Part	Size	Box	Ctn	Wt
W 01425 †	1/2 x 3/8	50	750	0.05
W 01431 †	5/8 x 1/2	50	500	0.09
W 01432 †	x 3/8	50	750	0.06
W 01446 †	7/8 x 3/4	50	500	0.15
W 01447 †	x 1/2	50	500	0.13
W 01463 †	1-1/8 x 1	25	250	0.23
W 01464 †	x 3/4	25	250	0.19
W 01471 †	1-3/8 x 1-1/4	10	100	0.41
W 01479 †	1-5/8 x 1-1/2	10	100	0.49
W 01487 †	2 1/8 x 2	-	50	0.76
W 01496 †	2-5/8 x 2-1/2	-	20	1.95

### BUSHING

#### FLUSH WC-106

Part	Size	Box	Ctn	Wt
W 01706 †	3/8 x 1/4	100	4,000	0.01
W 01712 †	1/2 x 3/8	100	4,000	0.01
W 01714 †	x 1/4	100	2,400	0.02
W 01715 †	5/8 x 1/2	100	1,500	0.02
W 01717 †	x 3/8	100	1,500	0.04
W 01720 †	3/4 x 5/8	50	750	0.03
W 01721 †	x 1/2	50	750	0.06
W 01722 †	x 3/8	50	750	0.08
W 01725 †	7/8x 3/4	50	500	0.04
W 01726 †	x 5/8	50	500	0.07
W 01727 †	x 1/2	50	500	0.11
W 01737 †	1-1/8 x 7/8	50	500	0.12
W 01738 †	x 3/4	50	500	0.18
W 01739 †	x 5/8	25	250	0.22
W 01743 †	1-3/8 x 1-1/8	10	200	0.16
W 01745 †	x 7/8	10	200	0.3
W 01750 †	1-5/8 x 1-3/8	10	100	0.22
W 01751 †	x 1-1/8	10	100	0.41
W 01758 †	2-1/8 x 1-5/8	10	100	0.68
W 01759 †	x 1-3/8	5	50	0.94
W 01767 †	2-5/8 x 2-1/8	-	50	0.92

### BUSHING

#### FLUSH WC-417

Part	Size	Box	Ctn	Wt
A 07812	5/8 x 1/8	100	1,600	0.04
A 07813	x 1/4	50	1,200	0.02
A 07814	7/8 x 3/8	50	450	0.08
A 07815	1-1/8 x 1/2	50	300	0.17
A 07816	1-3/8 x 3/4	10	160	0.25
A 07817	1-5/8 x 1	10	90	0.34
A 07819	2-1/8 x 1-1/2	10	90	0.48

### CAP

#### FLUSH WC-415

Part	Size	Box	Ctn	Wt
W 07002	1/4	50	2,000	0
W 07004	3/8	50	2,000	0.01
W 07006	1/2	50	1,000	0.01
W 07007	5/8	100	1,000	0.02
W 07008	3/4	50	2,000	0.03
W 07009	7/8	50	500	0.04
W 07011	1-1/8	50	500	0.08
W 07012	1-3/8	25	250	0.11
W 07013	1-5/8	25	250	0.18
W 07014	2-1/8	-	100	0.3
W 07015	2-5/8	-	50	0.48
W 07016	3-1/8	-	50	0.73
W 07017	3-5/8	-	25	1.15
W 07018	4-1/8	-	20	1.5

### COUPLING

#### NO STOP WC-400NS

Part	Size	Box	Ctn	Wt
W 01900 †	1/4	100	4,000	0
W 01901 †	3/8	50	2,000	0.01
W 01902 †	1/2	50	1,700	0.01
W 01903 †	5/8	100	1,000	0.03
W 01904 †	3/4	25	375	0.04
W 01905 †	7/8	50	500	0.06
W 01906 †	1-1/8	25	250	0.11
W 01907 †	1-3/8	25	250	0.15
W 01908 †	1-5/8	10	100	0.25
W 01909 †	2-1/8	-	75	0.4
W 01910 †	2-5/8	-	50	0.66
W 01911	3-1/8	-	25	1.03
W 01913	4-1/8	-	15	2.15

### COUPLING

#### ROLLED STOP WC-400

Part	Size	Box	Ctn	Wt
W 01000 †	1/8	100	4,000	0
W 01001 †	3/16	100	4,000	0
W 01003 †	1/4	100	4,000	0
W 01009 †	3/8	50	2,000	0.01
W 01017 †	1/2	50	1,700	0.01
W 01022 †	5/8	100	1,000	0.03
W 01028 †	3/4	50	500	0.05
W 01034 †	7/8	50	500	0.06
W 01040 †	1	25	250	0.09
W 01047 †	1-1/8	25	250	0.11
W 01055 †	1-3/8	25	250	0.15
W 01062 †	1-1/2	-	150	0.22
W 01063 †	1-5/8	10	100	0.21
W 01072 †	2-1/8	-	75	0.4
W 01082 †	2-5/8	-	50	0.66
W 01092	3-1/8	-	25	1.03
W 01000	3-5/8	-	20	1.18
W 01017	4-1/8	-	15	2.11

† UL Recognized to 700 PSI (select sizes)

## COPPER FITTING DATA

<b>TEMPERATURE - PRESSURE RATINGS OF SOLDER/BRAZE JOINTS</b>					
ALLOYS USED FOR JOINTS	SERVICE TEMPERATURE °F	STANDARD TUBE SIZE, TYPES K, L, AND M			
		WATER AND NON-CORROSIVE LIQUIDS & GASES			
		1/4 to 1	1-1/4 to 2	2-1/2 to 4	5 to 8
50 / 50 Tin Lead Solder Not to be used in potable water systems	100	200	175	150	135
	150	150	125	100	90
	200	100	90	75	70
	250	85	75	50	45
95 / 5 Tin-Antimony Solder	100	1090	850	705	660
	150	625	485	405	375
	200	505	395	325	305
	250	270	210	175	165
Alloy E Solder	100	710	555	460	430
	150	475	370	305	285
	200	375	290	240	225
	250	320	250	205	195
Alloy HB Solder	100	1035	805	670	625
	150	710	555	460	430
	200	440	345	285	265
	250	430	335	275	260
Brazing Alloys (melting at or above 1000°F)	Pressure-temperature ratings is that of the tubing being used				

Note: Ratings are those given in ASME B 16.22 "Wrought Copper and Copper Alloy Solder Joint Pressure Fittings." (a) Solder alloys are covered by ASTM Standard Specification B32. The Safe Drinking Water Act Amendment of 1986 prohibits the use of any solder having a lead content in excess of 0.2% for potable water systems.

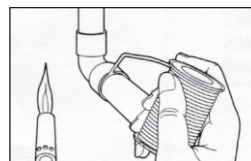
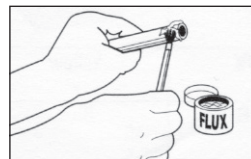
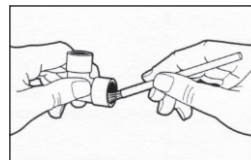
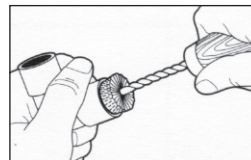
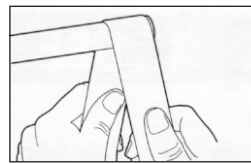
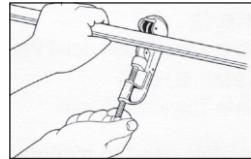
We believe HVACR connections should be made by brazing (using filler metals that melt above 800° F), which is primarily because solder alloys may not be suitable to high vibration and aggressive thermal-cycling environments.

<b>PRESSURE LOSS IN FITTINGS EXPRESSED AS EQUIVALENT LENGTH OF TUBE, FEET</b>						
Outer Diameter in Inches	Wrot Copper Fittings					
	90 Degree El	45 Degree El	Tee Straight Run	Tee Side Branch	Coupling	180 Degree Bend
1/2	0.5	0.5	0.5	1	-	0.5
5/8	0.5	0.5	0.5	1	-	1
3/4	0.5	0.5	0.5	2	-	1
7/8	1	0.5	0.5	2	-	2
1-1/8	1	1	0.5	3	-	2
1-3/8	2	1	0.5	4	0.5	3
1-7/8	2	2	1	5	0.5	4
2-1/8	2	2	1	7	0.5	8
2-5/8	2	3	2	9	0.5	16
3-1/8	3	4	-	-	1	20

# COPPER TUBE AND SOLDER/BRAZE TYPE FITTINGS

1. Cut tube square with the cutter and remove burrs
2. Clean outside end of copper tube thoroughly with sand cloth or sandpaper equal depth of fitting. Leave no dark spots.
3. Clean inside of fitting carefully to tube stop with wire brush. Note: Sand cloth or sandpaper may also be used.
4. Using a brush, apply light uniform coat of flux to the outside of the tube and inside of the fitting.
5. Slip tube into fitting to tube stop. Turn tube back and forth once or twice to distribute flux evenly.
6. Apply heat uniformly around the fitting with torch. When filler metal melts upon contact with heated fitting, the proper brazing temperature has been reached. Remove flame and feed filler metal slightly off center at the bottom of the joint. Proceed across the bottom of the fitting and up to the top center position. Return to the starting point, and then proceed up the incomplete side to the top, again, overlapping the filler metal. Wipe off surplus with a piece of cloth.

**CAUTION: No not overheat the joint or direct the flame into the face of the fitting cup. Overheating could burn the flux, which will destroy its effectiveness and the filler metal will not enter the joint properly.**



1. Cut tube to length & remove burrs.
2. Clean outside of tube with sandpaper or sand cloth.
3. Clean inside of fitting with wire brush, sand cloth or sandpaper.
4. Apply flux thoroughly to inside of fitting.
5. Apply flux thoroughly to outside of tube - assemble tube and fitting.
6. Apply heat with torch. When filler metal melts upon contact with heated fitting, the proper temp for brazing has been reached. Remove flame & feed filler metal to the joint at one or two points until a ring of filler metal appears at the end of the fitting.