Milwaukee ULTRAPRESS®

System Fittings

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Quick and Easy

The Milwaukee UltraPress® System is user friendly, quick and easy to install. Installation can be completed in less time than traditional solder, threaded, brazed or grooved copper systems. Significant time savings means tight budgets and deadlines are met while project delays and cost overruns are avoided.

Flameless

The Milwaukee UltraPress® System is easier and safer to use because there is no flame, solder or flux required. Connections can even be made on a wet tube!

Reliable

With the Milwaukee UltraPress® System, a watertight joint is formed between the EPDM seal and the crimped fitting or valve providing a permanent connection. Milwaukee Valve's background in the commercial, industrial, and very specialized marine business for the United States Navy should give you reliability you can count on.

Approvals, Standards and Performance

The Milwaukee UltraPress® System has undergone extensive and rigorous internal and external testing and meets various worldwide, industry and governmental standards and codes. Compliant with the following except where otherwise noted: ASME 16.51 Performance • International Residential Code® (IRC) • International Plumbing Code® (IPC) • International Mechanical Code® (IMC) • Uniform Plumbing Code* (UPC) • Uniform Mechanical Code* (UMC) • State of Massachusetts (Plumbing).

*Uniform Plumbing Code and Uniform Mechanical Code are copyrighted publications of the International Association of Plumbing and Mechanical Officials.

Third-party certified to: IAPMO PS 117, Copper, Copper Alloy, Carbon Steel, and Stainless Steel Piping System with Press-Type and Nail-Type Connections ICC-ES LC1002, Press-Connection Fittings for Potable Water Tube and Radiant Heating Systems ½" thru 2" ASME B16.51, Copper and Copper Alloy Press-Connect Pressure Fittings NSF/ANSI 61, Drinking Water Systems Components—Health Effects NSF/ANSI 372, Drinking Water Systems Components—Lead Content.

All valves and fittings are manufactured under a Quality Management System conforming to the current version of ISO 9001 standards.

Applications

The Milwaukee UltraPress® System can be used in new construction or repair work and is designed for potable water, HVAC and process water systems for commercial, industrial and residential applications.

Professional Appearance

The Milwaukee UltraPress® System creates a clean joint without the mess of excess solder or discoloration.

Joint Integrity

The Milwaukee UltraPress® System uses engineered tools, jaws and chains that are tested and approved to ensure a consistent, reliable crimp.

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The information presented on this sheet is correct at time of publication. Milwaukee Valve reserves the right to change design and/or materials without notice. For our Installation, Operation and Maintenance Manual and the most current product information go to www.milwaukeevalve.com.
⚠ State of California Prop 65 **WARNING:** Cancer and Reproductive Harm. For more information visit www.p65warnings.ca.gov.

Press Fitting Applications Chart

Types of Service	Comments	Pressure	Temperature	Compatible with EPDM Seal
Fluids/Water				
Hot and Cold Potable Water		200 psi	32°F to 250°F	●
Rainwater/Gray Water	Subject to local codes/authority having jurisdiction with appropriate precautions to prevent systems from freezing Propylene Glycol	200 psi	-20°F to 250°F	●
Chilled Water	Up to 50% Ethylene Glycol/Propylene Glycol solution appropriate for the application temperature range	200 psi	-20°F to 250°F	●
Hydronic Heating		200 psi	-20°F to 250°F	●
Cooling Water		200 psi	-20°F to 250°F	●
Ethanol		200 psi	-20°F to 250°F	●
Gasses				
Compressed Air	Less than 25mg/m^3 Oil Content	200 psi	Up to 140°F	●
Oxygen - O_2 (non-medical)	Keep Oil and Fat Free/Non-Liquid O_2	140 psi	Up to 140°F	●
Nitrogen - N_2		200 psi	Up to 140°F	●
Argon	Welding Use	200 psi	Ambient	●
Hydrogen - H_2		125 psi	Up to 250°F	●
Vacuum		Max 29.2 in. of Mercury-Hg	Up to 140°F	●
Carbon Dioxide - CO_2	Dry	200 psi	Up to 140°F	●
Low Pressure Steam		15 psi	Up to 250°F	●

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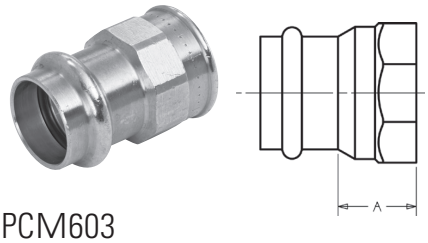
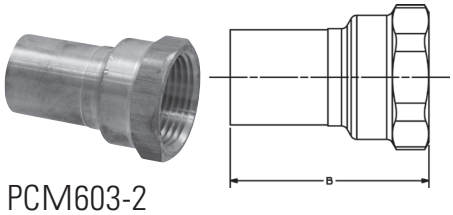
ADAPTERS



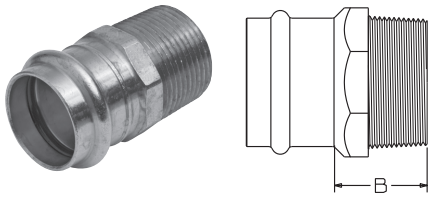
PCM603
Adapter P x F – Wrot

NOM. SIZE	APPROX. NET WT./LBS.	DIM. A INCHES
1/2	.103	13/16
1/2 x 3/8	.081	21/32
1/2 x 3/4	.151	31/32
3/4	.158	27/32
3/4 x 1/2	.153	25/32
1	.237	15/16
1 x 1/2	.172	3/4
1 x 3/4	.217	13/16
1 x 1 1/4	.436	1 3/16
1 1/4	.372	1 1/16
1 1/4 x 1	.359	1 1/16
1 1/4 x 1 1/2	.425	1 7/32
1 1/2	.518	1 1/16
1 1/4 x 2	.276	1
1 1/2 x 1 1/4	.515	1
2	.672	1
2 1/2	1.222	1 13/32
3	1.756	1 23/32
4	3.238	1 7/8



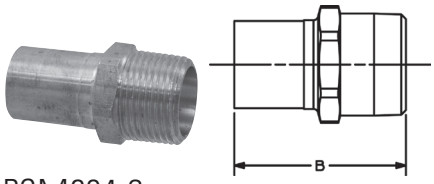
PCM603-2
Extended Adapter FTG x F – Wrot

NOM. SIZE	APPROX. NET WT./LBS.	DIM. B INCHES
1/2 x 3/8	0.064	1 17/32
1/2	0.096	1 3/4
1/2 x 3/4	0.132	1 27/32
3/4 x 1/2	0.107	1 25/32
3/4	0.145	1 7/8
1 x 1/2	0.146	2
1	0.220	2 1/16
1 1/4 x 1/2	0.193	2 3/16
1 1/4	0.289	2 3/8
1 1/2	0.431	2 21/32
2	0.683	2 15/16



PCM604
Adapter P x M – Wrot

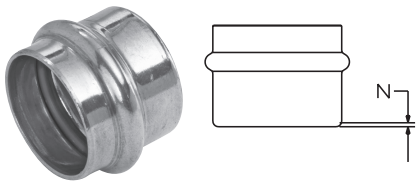
NOM. SIZE	APPROX. NET WT./LBS.	DIM. B INCHES
1/2	.103	7/8
1/2 x 3/8	.105	27/32
1/2 x 3/4	.191	1 1/4
3/4	.180	1 1/16
3/4 x 1/2	.189	31/32
3/4 x 1	.268	1 3/16
1	.255	1 3/32
1 x 3/4	.253	1 1/32
1 x 1 1/4	.457	1 17/32
1 1/4	.467	1 13/32
1 1/4 x 1	.335	1 3/16
1 1/4 x 1 1/2	.537	1 1/2
1 1/2	.696	1 1/2
1 1/2 x 1 1/4	.603	1 3/8
1 1/2 x 2	.784	1 7/16
2	.856	1 7/16
2 x 1 1/2	1.087	1 19/32
2 1/2	1.322	1 27/32
3	2.104	2 1/8
4	3.298	2 9/32



PCM604-2
Extended Adapter FTG x M – Wrot

NOM. SIZE	APPROX. NET WT./LBS.	DIM. B INCHES
1/2 x 3/8	0.056	1 3/4
1/2	0.101	1 29/32
1/2 x 3/4	0.145	2 1/16
3/4 x 1/2	0.100	1 15/16
3/4	0.136	2 1/16
1 x 3/4	0.175	2 1/16
1	0.243	2 5/16
1 1/4	0.408	2 17/32
1 1/2	0.530	2 7/8
2	0.782	3 11/32

CAPS



PCM617
Cap P – Wrot

NOM. SIZE	APPROX. NET WT./LBS.	DIM. N INCHES
1/2	.046	5/32
3/4	.087	5/32
1	.125	1/8
1 1/4	.171	3/32
1 1/2	.314	3/32
2	.493	3/32
2 1/2	.476	7/32
3	.713	7/32
4	1.491	1/4

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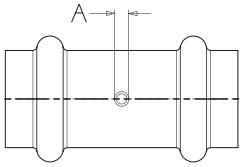
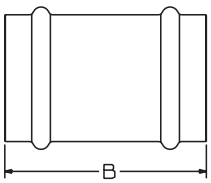
COUPLINGS



PCM600-DS
Coupling P x P – Wrot

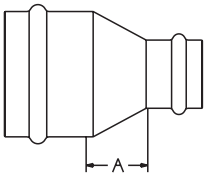
NOM. SIZE	APPROX. NET WT./LBS.	DIM. A INCHES
1/2	.083	3/16
3/4	.157	5/32
1	.198	5/32
1 1/4	.271	5/32
1 1/2	.530	3/16
2	.691	5/32
2 1/2	.669	1/8
3	.979	1/8
4	2.134	7/32



PCM601 (No Stop)
Repair Coupling P x P – Wrot

NOM. SIZE	APPROX. NET WT./LBS.	DIM. B INCHES
1/2	.082	1 3/4
3/4	.157	2 1/4
1	.190	2 1/4
1 1/4	.271	2 15/32
1 1/2	.511	3 11/32
2	.691	3 5/8
2 1/2	.669	2 15/16
3	.979	3 5/16
4	1.878	4 5/16

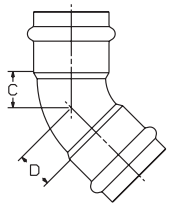
COUPLINGS *(Cont.)*



PCM600-R
Reducing Coupling P x P – Wrot

NOM. SIZE	APPROX. NET WT./LBS.	DIM. A INCHES
3/4 x 1/2	.121	1/4
1 x 1/2	.139	7/16
1 x 3/4	.184	13/32
1 1/4 x 3/4	.245	1/2
1 1/4 x 1	.231	7/16
1 1/2 x 3/4	.382	15/32
1 1/2 x 1	.370	13/32
1 1/2 x 1 1/4	.399	9/32
2 x 3/4	.516	29/32
2 x 1	.552	11/16
2 x 1 1/4	.570	11/16
2 x 1 1/2	.662	7/16
2 1/2 x 1	.620	31/32
2 1/2 x 1 1/4	.644	1
2 1/2 x 1 1/2	.678	23/32
2 1/2 x 2	.699	11/32
3 x 1 1/2	.956	1 1/16
3 x 2	1.032	23/32
3 x 2 1/2	.951	1/2
4 x 2	1.949	1 5/32
4 x 2 1/2	1.807	1
4 x 3	1.960	27/32

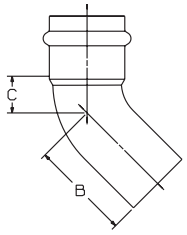
ELBOWS



PCM606
45° Elbow P x P – Wrot

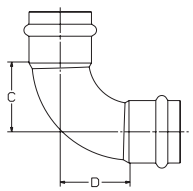
NOM. SIZE	APPROX. NET WT./LBS.	DIM. C INCHES	DIM. D INCHES
1/2	.092	3/8	3/8
3/4	.181	1/2	1/2
1	.251	5/8	5/8
1 1/4	.403	25/32	25/32
1 1/2	.666	15/16	15/16
2	1.063	1 3/16	1 3/16
2 1/2	1.041	29/32	29/32
3	1.536	1 1/8	1 1/8
4	3.375	1 11/16	1 11/16

ELBOWS (*Cont.*)

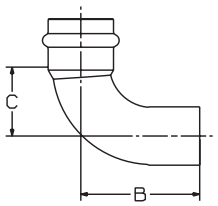
PCM606-2
45° Elbow Ftg x P – Wrot

NOM. SIZE	APPROX. NET WT/LBS.	DIM. B INCHES	DIM. C INCHES
1/2	.094	1 5/16	7/16
3/4	.171	1 13/32	17/32
1	.248	1 17/32	9/16
1 1/4	.368	1 3/4	11/16
1 1/2	.673	2 5/16	13/16
2	1.057	2 5/8	1
2 1/2	1.050	2 3/16	29/32
3	1.526	2 19/32	1 5/32
4	3.284	3 3/32	1 17/32

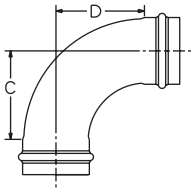
PCM607
90° Elbow P x P – Wrot

NOM. SIZE	APPROX. NET WT./LBS.	DIM. C INCHES	DIM. D INCHES
1/2	.110	23/32	23/32
3/4	.223	1 3/32	1 3/32
3/4 x 1/2	.201	1 1/32	1 5/32
1	.331	1 7/16	1 7/16
1 x 3/4	.321	1 5/16	1 7/16
1 1/4	.528	1 27/32	1 27/32
1 1/2	.895	2 7/32	2 7/32
2	1.480	2 15/16	2 15/16
2 1/2	1.224	1 5/8	1 5/8
3	1.900	2	2
4	3.935	2 15/32	2 15/32

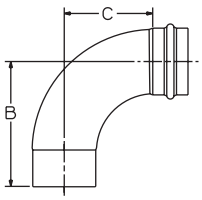
PCM607-2
90° Elbow Ftg x P – Wrot

NOM. SIZE	APPROX. NET WT/LBS.	DIM. B INCHES	DIM. C INCHES
1/2	.110	1 21/32	27/32
3/4	.219	2 7/32	1 1/16
1	.319	2 1/2	1 13/32
1 1/4	.490	3 3/32	1 29/32
1 1/2	.871	3 15/16	2 7/32
2	1.474	4 17/32	2 29/32
2 1/2	1.356	3 7/32	1 19/32
3	2.065	3 13/16	2
4	3.920	4 3/4	2 15/32

PCM607-LT
90° Long Radius Elbow
P x P – Wrot

NOM. SIZE	APPROX. NET WT/LBS.	DIM. C INCHES	DIM. D INCHES
2 1/2	2.066	3 11/16	3 11/16
3	2.810	4 1/32	4 1/32
4	5.696	5 1/4	5 1/4

PCM607-2-LT
90° Long Radius Elbow
Ftg x P - Wrot

NOM. SIZE	APPROX. NET WT/LBS.	DIM. B INCHES	DIM. C INCHES
3	3.037	5 3/4	4 1/32

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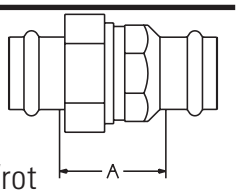
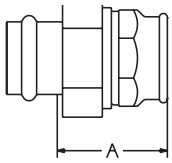
ELBOWS (*Cont.*)

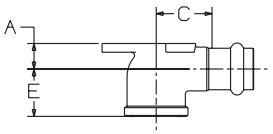
PCM633 ⚠
Union P x P – Wrot

NOM. SIZE	APPROX. NET WT./LBS.	DIM. A INCHES
1/2	.383	$1^{5}/_{16}$
3/4	.527	$1^{9}/_{32}$
1	.804	$1^{11}/_{32}$
1 1/4	1.107	$1^{19}/_{32}$
1 1/2	1.703	$1^{21}/_{32}$
2	2.368	$1^{27}/_{32}$

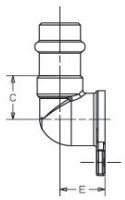
PCM633-3 ⚠
Union P x F – Wrot

NOM. SIZE	APPROX. NET WT./LBS.	DIM. A INCHES
1/2	.374	$1^{7}/_{16}$
3/4	.527	$1^{17}/_{32}$
1	.841	$1^{5}/_{8}$
1 1/4	1.178	$1^{15}/_{16}$
1 1/2	1.610	$1^{29}/_{32}$
2	2.445	$2^{5}/_{32}$

PCM707-3-5-LF
90° Drop Elbow P x F – Cast
*Lead Free

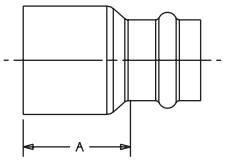
NOM. SIZE	APPROX. NET WT. LBS.	DIMENSIONS INCHES A	C	E
1/2	.252	$^{17}/_{32}$	$^{7}/_{8}$	$^{27}/_{32}$
3/4	.588	$^{23}/_{32}$	$1^{5}/_{8}$	$^{31}/_{32}$

PCM707-3-5-A
Hi-Ear Elbow P x F – Cast *Lead Free

NOM. SIZE	APPROX. NET WT/LBS.	DIM. C INCHES	DIM. E INCHES
1/2	.192	$^{7}/_{8}$	$^{27}/_{32}$

FITTING REDUCERS

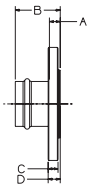



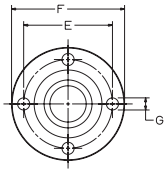
PCM600-2
Fitting Reducer Ftg x P – Wrot

NOM. SIZE	APPROX. NET WT/LBS.	DIM. A INCHES
1/2	.610	$^{21}/_{32}$
3/4 x 1/2	.092	$1^{7}/_{16}$
3/4	.126	$^{31}/_{32}$
1 x 1/2	.123	$1^{7}/_{16}$
1 x 3/4	.151	$1^{13}/_{32}$
1	.162	$1^{1}/_{8}$
1 1/4 x 1/2	.155	$1^{19}/_{32}$
1 1/4 x 3/4	.175	$1^{13}/_{32}$
1 1/4 x 1	.181	$1^{7}/_{16}$
1 1/4	.215	$1^{3}/_{16}$
1 1/2 x 1/2	.243	$2^{3}/_{32}$
1 1/2 x 3/4	.248	$1^{31}/_{32}$
1 1/2 x 1	.251	$1^{13}/_{16}$
1 1/2 x 1 1/4	.251	$1^{25}/_{32}$
1 1/2	.382	$1^{5}/_{16}$
2 x 1/2	.394	$2^{1}/_{2}$
2 x 3/4	.405	$2^{11}/_{32}$
2 x 1	.398	$2^{7}/_{32}$
2 X 1 1/4	.420	$2^{3}/_{32}$
2 x 1 1/2	.507	$1^{31}/_{32}$
2	.619	$1^{9}/_{16}$
2 1/2 x 1	.707	$2^{1}/_{2}$
2 1/2 x 1 1/4	.776	$2^{9}/_{16}$
2 1/2 x 1 1/2	.840	$2^{13}/_{32}$
2 1/2 x 2	.839	2
3 x 1 1/4	.882	$2^{13}/_{16}$
3 x 1 1/2	1.055	$2^{13}/_{16}$
3 x 2	1.084	$2^{3}/_{8}$
3 x 2 1/2	.820	$2^{1}/_{4}$
4 x 2	1.832	$3^{5}/_{8}$
4 x 2 1/2	1.837	$3^{1}/_{32}$
4 x 3	2.013	$3^{1}/_{32}$

FLANGES

NOTE: Maximum pressure 105 psi CWP, 90 psi at 250°F. Use in U.S. drinking water applications is prohibited after January 3, 2014.



PCM641
Companion Flange
P x Flange - Wrot

NOM. SIZE	APPROX. NET WT. LBS.	DIMENSIONS INCHES A	B	C
3/4	1.518	$1^{21}/_{32}$	$2^{17}/_{32}$	$^{7}/_{16}$
1	2.013	$1^{23}/_{32}$	$2^{19}/_{32}$	$^{1}/_{2}$
1 1/4	2.623	$1^{21}/_{32}$	$2^{21}/_{32}$	$^{9}/_{16}$
1 1/2	3.342	$1^{1}/_{2}$	$2^{7}/_{8}$	$^{5}/_{8}$
2	4.884	$1^{15}/_{32}$	$2^{11}/_{32}$	$^{5}/_{8}$
2 1/2	6.418	$^{3}/_{4}$	$2^{25}/_{32}$	$^{5}/_{8}$
3	7.409	$^{15}/_{32}$	$2^{15}/_{16}$	$^{21}/_{32}$
4	10.920	$^{21}/_{32}$	$3^{3}/_{8}$	$^{23}/_{32}$

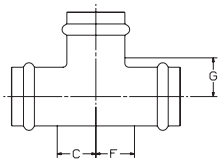
NOM. SIZE	DIMENSIONS INCHES D	E	F	G
3/4	$^{9}/_{16}$	$2^{3}/_{4}$	$3^{7}/_{8}$	$^{5}/_{8}$
1	$^{5}/_{8}$	$3^{1}/_{8}$	$4^{1}/_{4}$	$^{5}/_{8}$
1 1/4	$^{11}/_{16}$	$3^{1}/_{2}$	$4^{5}/_{8}$	$^{5}/_{8}$
1 1/2	$^{25}/_{32}$	$3^{7}/_{8}$	5	$^{5}/_{8}$
2	$^{25}/_{32}$	$4^{3}/_{4}$	6	$^{3}/_{4}$
2 1/2	$^{3}/_{4}$	$5^{1}/_{2}$	7	$^{3}/_{4}$
3	$^{13}/_{16}$	6	$7^{1}/_{2}$	$^{3}/_{4}$
4	1	$7^{1}/_{2}$	9	$^{3}/_{4}$

NOTE: 4" requires (8) "G" holes equally spaced.

NOTE: Mates with ANSI Class 125/150 flanges.

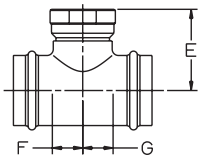
Milwaukee ULTRAPRESS® Fittings

TEES



PCM611
Tee P x P x P – Wrot

NOM. SIZE	APPROX. NET WT. LBS.	DIMENSIONS INCHES C	F	G
1/2	.176	23/32	23/32	15/32
1/2 x 1/2 x 3/4	.314	2 1/16	2 1/16	15/16
1/2 x 1/2 x 1	.491	1 7/32	1 7/32	7/8
3/4	.320	25/32	25/32	21/32
3/4 x 1/2 x 1/2	.281	5/8	29/32	21/32
3/4 x 1/2 x 3/4	.320	21/32	1 1/16	11/16
3/4 x 3/4 x 1/2	.276	21/32	21/32	21/32
3/4 x 3/4 x 1	.461	1 1/32	1 1/32	29/32
1	.501	7/8	7/8	29/32
1 x 1/2 x 3/4	.400	23/32	1 1/4	27/32
1 x 1/2 x 1	.513	13/16	1 5/32	27/32
1 x 3/4 x 1/2	.440	13/16	1 1/16	1 5/32
1 x 3/4 x 3/4	.459	25/32	31/32	13/16
1 x 3/4 x 1	.578	13/16	1 1/16	7/8
1 x 1 x 1/2	.324	21/32	21/32	7/8
1 x 1 x 3/4	.388	3/4	3/4	27/32
1 x 1 x 1 1/4	.723	1 1/8	1 1/8	7/8
1 1/4	.759	1	1	15/16
1 1/4 x 1/2 x 11/4	.690	31/32	1 17/32	31/32
1 1/4 x 1 x 1/2	.674	31/32	1 5/32	1 5/8
1 1/4 x 3/4 x 1/2	.682	15/16	1 9/32	1 5/8
1 1/4 x 3/4 x 3/4	.565	3/4	1 7/32	1 1/32
1 1/4 x 3/4 x 1	.709	31/32	1 1/4	1 5/16
1 1/4 x 3/4 x 1 1/4	.698	31/32	1 9/32	15/16
1 1/4 x 1 x 3/4	.753	27/32	1 3/16	1 13/32
1 1/4 x 1 x 1	.725	31/32	1 7/32	1 9/32
1 1/4 x 1 1/4 x 1/2	.408	1	1	1 17/32
1 1/4 x 1 1/4 x 3/4	.589	23/32	23/32	15/16
1 1/4 x 1 1/4 x 1	.508	7/8	7/8	31/32
1 1/2	1.179	15/16	15/16	1 3/32
1 1/2 x 1/2 x 1 1/2	1.263	29/32	1 29/32	1
1 1/2 x 3/4 x 3/4	1.101	29/32	1 13/16	1 3/4
1 1/2 x 1 x 3/4	1.217	15/16	1 3/4	1 13/16
1 1/2 x 1 x 1	1.105	13/16	1 11/16	1 19/32
1 1/2 x 1 x 1 1/2	1.146	27/32	1 21/32	1 1/8
1 1/2 x 1 1/4 x 3/4	1.164	31/32	1 5/8	1 7/8
1 1/2 x 1 1/4 x 1	1.105	7/8	1 19/32	1 5/8
1 1/2 x 1 1/4 x 1 1/4	1.160	15/16	1 9/16	1 19/32
1 1/2 x 1 1/2 x 1/2	.639	3/8	3/8	1 1/8
1 1/2 x 1 1/2 x 3/4	.740	19/32	19/32	1 3/32
1 1/2 x 1 1/2 x 1	.785	11/16	11/16	1 3/16
1 1/2 x 1 1/2 x 1 1/4	1.262	7/8	7/8	1 19/32
2	1.771	1 13/32	1 13/32	1 13/32
2 x 1/2 x 2	1.663	1 13/32	2 1/2	1 7/16
2 x 1 x 1	1.764	1 13/32	2 1/4	2 7/32
2 x 1 x 2	1.564	1 13/32	2 5/32	1 13/32
2 x 1 1/4 x 1 1/4	1.471	1 11/32	2 1/16	2 1/8
2 x 1 1/2 x 3/4	1.542	1 11/32	1 29/32	2 1/4
2 x 1 1/2 x 1	1.546	1 3/8	1 29/32	2 1/4
2 x 1 1/2 x 1 1/4	1.543	1 3/8	1 29/32	2 5/32
2 x 1 1/2 x 1 1/2	1.670	1 1/8	1 9/16	1 13/32
2 x 1 1/2 x 2	1.787	1 5/32	1 11/16	1 1/2
2 x 2 x 1/2	1.576	1 3/8	1 3/8	2 7/16
2 x 2 x 3/4	1.256	3/4	3/4	1 1/2
2 x 2 x 1	1.530	29/32	29/32	1 11/16
2 x 2 x 1 1/4	1.576	1 3/8	1 3/8	2 1/8
2 x 2 x 1 1/2	1.770	1 1/8	1 1/8	1 1/2
2 1/2	2.082	1 9/16	1 9/16	1 7/8
2 1/2 x 3/4 x 2 1/2	2.294	1 21/32	2 7/8	1 13/16
2 1/2 x 1 x 2 1/2	2.004	1 1/2	2 1/2	1 25/32
2 1/2 x 1 1/4 x 2 1/2	2.081	1 21/32	2 17/32	1 13/16
2 1/2 x 1 1/2 x 2 1/2	2.973	1 25/32	2 7/16	1 7/8
2 1/2 x 2 x 3/4	2.934	1 13/16	1 31/32	2 15/16
2 1/2 x 2 x 1	2.907	1 27/32	2 1/32	2 3/4
2 1/2 x 2 x 1 1/4	2.954	1 11/16	2	2 19/32
2 1/2 x 2 x 1 1/2	2.976	1 23/32	2	2 15/32
2 1/2 x 2 x 2	3.046	1 13/16	1 31/32	2 1/4
2 1/2 x 2 x 2 1/2	2.150	1 13/16	1 31/32	1 7/8
2 1/2 x 2 1/2 x 1/2	2.117	1 21/32	1 21/32	3 1/4
2 1/2 x 2 1/2 x 3/4	2.011	1 9/16	1 9/16	2 15/16
2 1/2 x 2 1/2 x 1	2.010	1 11/16	1 11/16	2 3/4
2 1/2 x 2 1/2 x 1 1/4	2.075	1 21/32	1 21/32	2 21/32
2 1/2 x 2 1/2 x 1 1/2	2.966	1 27/32	1 27/32	2 1/2
2 1/2 x 2 1/2 x 2	2.957	1 25/32	1 25/32	2 1/4
3	3.122	1 15/16	1 15/16	2 1/32
3 x 3/4 x 3	3.049	1 7/8	3 1/2	2 3/16
3 x 1 x 3	3.043	1 7/8	3 3/16	2 3/16
3 x 1 1/4 x 3	2.986	1 7/8	2 15/16	2 1/8
3 x 1 1/2 x 3	3.811	2 1/32	2 25/32	2 13/32
3 x 2 x 2	3.829	1 31/32	2 21/32	2 3/4
3 x 2 x 2 1/2	3.761	2 1/32	2 21/32	2 1/2
3 x 2 x 3	3.866	2	2 21/32	2 3/8
3 x 2 1/2 x 2	3.081	1 7/8	2 7/16	2 13/16
3 x 2 1/2 x 2 1/2	3.010	1 13/16	2 15/32	2 1/2
3 x 2 1/2 x 3	3.194	1 13/16	2 15/32	2 3/16
3 x 3 x 1/2	2.945	1 7/8	1 7/8	3 17/32
3 x 3 x 3/4	2.941	1 7/8	1 7/8	3 1/2
3 x 3 x 1	2.987	1 7/8	1 7/8	3 5/16
3 x 3 x 1 1/4	2.957	1 7/8	1 7/8	2 15/16
3 x 3 x 1 1/2	3.056	1 7/8	1 7/8	2 13/16
3 x 3 x 2	3.145	1 7/8	1 7/8	2 11/16
3 x 3 x 2 1/2	3.034	1 15/16	1 15/16	2 1/2
4	7.169	2 13/32	2 13/32	2 17/32
4 x 2 x 4	7.069	2 3/8	3 19/32	2 19/32
4 x 2 1/2 x 4	6.984	2 3/8	3 25/32	2 23/32
4 x 3 x 2	6.965	2 3/8	3 9/16	3 25/32
4 x 3 x 2 1/2	6.990	2 3/8	3 9/16	3 29/32
4 x 3 x 3	7.085	2 3/8	3 9/16	3 1/2
4 x 3 x 4	6.993	2 3/8	3 23/32	2 23/32
4 x 4 x 1/2	4.328	1 11/32	1 11/32	3 11/32
4 x 4 x 3/4	4.415	1 11/32	1 11/32	3 5/16
4 x 4 x 1	4.414	1 11/32	1 11/32	3 1/8
4 x 4 x 1 1/4	4.730	1 7/16	1 7/16	3 3/32
4 x 4 x 1 1/2	7.144	2 11/32	2 11/32	3 31/32
4 x 4 x 2	7.094	2 11/32	2 11/32	3 13/16
4 x 4 x 2 1/2	6.925	2 3/8	2 3/8	3 29/32
4 x 4 x 3	7.083	2 3/8	2 3/8	3 1/2



PCM612
Tee P x P x F – Wrot

NOM. SIZE	APPROX. NET WT. LBS.	DIMENSIONS INCHES E	F	G
1/2	.257	1 31/32	23/32	23/32
3/4	.434	2 11/32	25/32	25/32
3/4 x 3/4 x 1/4	.385	23/32	23/32	2 1/32
3/4 x 3/4 x 1/2	.258	2 5/32	21/32	21/32
1 x 1 x 1/2	.393	2 1/4	21/32	21/32
1 x 1 x 3/4	.516	2 27/32	21/32	21/32
1 1/4 x 1 1/4 x 1/2	.494	2 13/32	5/8	5/8
1 1/4 x 1 1/4 x 3/4	.679	2 5/8	11/16	11/16
1 1/2 x 1 1/2 x 1/2	.733	2 11/16	3/8	3/8
1 1/2 x 1 1/2 x 3/4	.885	2 7/8	19/32	19/32
2 x 2 x 1/2	1.699	3 27/32	1 3/8	1 3/8
2 x 2 x 3/4	1.370	3 3/16	3/4	3/4
2 1/2 x 2 1/2 x 3/4	1.049	2 15/32	11/16	11/16
2 1/2 x 2 1/2 x 2	1.925	3 7/32	1 9/32	1 9/32
3 x 3 x 3/4	1.435	2 3/4	11/16	11/16
3 x 3 x 2	2.097	3 15/32	21/32	21/32
4 x 4 x 3/4	2.786	3 1/4	11/16	11/16
4 x 4 x 2	3.675	4	1 9/32	1 9/32

The information presented on this sheet is correct at time of publication. Milwaukee Valve reserves the right to change design and/or materials without notice. For our Installation, Operation and Maintenance Manual and the most current product information go to www.milwaukeevalve.com.
⚠ State of California Prop 65 **WARNING:** Cancer and Reproductive Harm. For more information visit www.p65warnings.ca.gov.

Milwaukee ULTRAPRESS® Tools and Jaws

Approved Tool and Jaw Compatibility Matrix

Press tool, jaw and chain sets are an integral part of ensuring a reliable, permanent connection between Milwaukee UltraPress® System fittings, valves and copper piping. **Only use pressing tools, jaws and chain sets that have been tested and approved for use with UltraPress® System fittings.**

The following table details compatibility of approved pressing tools, chains and jaws with the UltraPress® System fittings.

		1/2" - 1" NIBCO® Press System Mini Pressing Jaws (PC-1M, PC-2M, PC-3M)	1/2" - 1" RIDGID® ProPress® Compact Pressing Jaws	1/2" - 1-1/4" RIDGID® ProPress® C1 Compact Kit (C1 Actuator & Press Rings)	Rothenberger Compact Pressing Jaws	Stanley® VIRAX® Press Inserts	1/2" - 1 1/4" Milwaukee® M12™ Pressing Jaws	1/2" - 2" NIBCO® Press System Standard Pressing Jaws (PC-10S, PC-11S, PC-12S, PC-13S,PC-14S, PC-15S)	1/2" - 2" RIDGID® ProPress® Standard Pressing Jaws	1/2" - 1-1/4" RIDGID® ProPress® V1 Kit (V1 Actuator & Press Rings)	1/2" - 2" Rothenberger Standard Pressing Jaws	1/2" 2" REMS Standard Pressing Jaws	Stanley® VIRAX® Pressing Jaws	1/2" - 2" Milwaukee® M18™ Pressing Jaws	1/2" - 2" DEWALT DCE200 Pressing Jaws	2 1/2" - 4" NIBCO® Pressing Chains (PC-2, PC-3, PC-4)
	SIZE	**1/2" - 1"**						**1/2" - 2"**								**2½" - 4"**
PRESSING TOOLS	NIBCO® PC-280	—	—	—	—	—	—	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	—	—	**YES**
	NIBCO® PC-100	—	—	—	—	—	—	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**	—	—	**YES**
	RIDGID® 320-E	—	—	—	—	—	—	**YES**	**YES**	**YES**	—	—	—	—	—	—
	RIDGID® RP 330-B	—	—	—	—	—	—	**YES**	**YES**	**YES**	—	—	—	—	—	—
	RIDGID® CT400	—	—	—	—	—	—	**YES**	**YES**	**YES**	—	—	—	—	—	—
	RIDGID® RP 330-C	—	—	—	—	—	—	**YES**	**YES**	**YES**	—	—	—	—	—	—
	RIDGID® RP 340	—	—	—	—	—	—	—	**YES**	—	—	—	—	—	—	—
	Rothenberger ROMAX® Pressliner	—	—	—	—	—	—	—	—	—	**YES**	—	—	—	—	—
	Rothenberger ROMAX® AC ECO	—	—	—	—	—	—	—	—	—	**YES**	—	—	—	—	—
	REMS Akku-Press	—	—	—	—	—	—	—	—	—	—	**YES**	—	—	—	—
	REMS Power-Press	—	—	—	—	—	—	—	—	—	—	**YES**	—	—	—	—
	Stanley® VIRAX® P20+	—	—	—	—	—	—	—	—	—	—	—	**YES**	—	—	—
	DEWALT DCE200	—	—	—	—	—	—	**YES**	—	—	—	—	—	—	**YES**	—
	NIBCO® PC-20M Mini	**YES**	—	—	**YES**	—	—	—	—	—	—	—	—	—	—	—
	NIBCO® PC-10M Mini	**YES**	—	—	**YES**	—	—	—	—	—	—	—	—	—	—	—
	RIDGID® 100-B Compact	—	**YES**	**YES**	—	—	—	—	—	—	—	—	—	—	—	—
	RIDGID® RP 210-B Compact	—	**YES**	**YES**	—	—	—	—	—	—	—	—	—	—	—	—
	RIGID® RP 200-B	—	**YES**	**YES**	—	—	—	—	—	—	—	—	—	—	—	—
	Rothenberger Compact	**YES**	—	—	**YES**	—	—	—	—	—	—	—	—	—	—	—
	Stanley® VIRAX® M20+ Compact	—	—	—	—	**YES**	—	—	—	—	—	—	—	—	—	—
	Milwaukee® M12™ Force Logic™	—	—	—	—	—	**YES**	—	—	—	—	—	—	—	—	—
	Milwaukee® M18™ Force Logic™	—	—	—	—	—	—	—	—	—	—	—	—	**YES**	—	—

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ROMAX® is a regis–tered trademark of ROTHENBERGER
VIRAX® is a registered trademark of Stanley Works
Milwaukee® is a registered trademark of Milwaukee Electric Tool Corporation
FORCE LOGIC™ is a registered trademark of Milwaukee Electric Tool Corporation
DEWALT® is a registered trademark of The Black & Decker Corporation

CAUTION:

UltraPress® system fittings and valves (21/2", 3", 4" ends) to be installed **ONLY** with NIBCO® pressing tools & chains.

Engineering Data

Milwaukee ULTRAPRESS® Fittings Engineering Data

Copper and Copper Alloy Fittings

Standards

O-ring seal joints are not new to the piping industry, but joining techniques like the Milwaukee UltraPress® System are providing new alternatives for copper piping assembly.

Applications

The Milwaukee UltraPress® System fittings are designed to join with ASTM B 88 seamless copper water tube in hard drawn/half-hard condition, Type K, L, and M; as well as, with annealed tubing in 1/2", 3/4" and 1" sizes for residential and commercial potable, hot, chilled and process water applications for plumbing and HVAC systems. Copper and copper alloy materials and EPDM elastomeric seals have a long history of compatibility with common chemicals used in these systems. A chemical resistance chart should always be referenced when other fluids are to be introduced.

NOTE: FLUIDS CONTAINING HYDROCARBON-BASED OILS ARE NOT COMPATIBLE WITH THE EPDM SEAL.

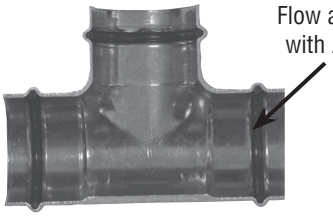
Pressure/Temperature Limitations

-20°F to 250°F up to 200 psiG, non-shock working pressure except where otherwise noted.

Materials:

- Wrot Copper
  - ◆ ASTM B 75 Alloy C12200
- Cast Copper Alloy
  - ◆ ASTM B584-12a Alloy C87600 and C84400
- Elastomeric Seals
  - ◆ EPDM O-rings compliant with IAPMO PS-117 and ASME B16.51

Milwaukee UltraPress® System fittings meet all performance requirements of ASME B16.51



NOTE: Freezing weather precaution — subsequent to testing a piping system, valve should be in an open position to allow complete drainage.

Performance

The following performance tests were conducted per ASME B16.51. The fitting dimensions, materials of construction and performance tests were witnessed and verified by internationally recognized NSF. A letter of verification is available upon request:

1. **Dimensional Verification**
   a. Inside diameter of press cup and waterway
   b. Outside diameter of press cup and waterway
   c. Wall thickness
   d. Threaded ends conformance to ASME B1.20.1
2. **Hydrostatic Minimum Burst Strength Pressure**
   a. Fitting samples hydrostatically tested to a minimum of 600 psi (three times the rated internal working pressure) at 73°F.
3. **Unrestrained Hydrostatic Pressure Test at 68°F (20°C) and 200°F (93°C)**
   a. Fitting assemblies were filled with water and pressurized to 600 psiG at 68° and 200°F for 48 hours.
4. **Static Torque**
   a. Fittings were filled with water, had a minimum torque applied and released. Each fitting was then pressurized to 400 psiG for 48 hours.
5. **Bending Test**
   a. A sample fitting was installed between two equal lengths of hard-drawn copper tubing supported six (6) feet apart. A concentrated load was applied to the center of the fitting. The 1/2" thru 2" assemblies were subjected to 600 psiG water pressure and 2-1/2" thru 4" were subjected to 400 psi water pressure for one (1) hour at 68°F (20°C) .
6. **Vacuum Pressure Test**
   a. Fittings were subjected to a vacuum pressure of 24.5 inches of mercury for one (1) hour at 68°F (20°C).
7. **Cyclic Pressure Test**
   a. Fittings were subjected to a hydraulic shock pressure of 400 psi for 10,000 cycles.
8. **Vibration Test**
   a. Fitting assemblies were subjected to a hydrostatic cyclic vibration test at 400 psiG and 2-1/2" thru 4" were subjected to 400 psi wat pressure for 1,000,000 cycles. After cycling, the 1/2" thru 2" assemblies were pressurized to 600 psiG for 30 minutes and 2-1/2" thru 4" were pressurized to 400 psi for 48 hours.
9. **Thermocycling Test**
   a. Test assemblies were constructed using type L copper tube and press connect fittings. The test assemblies were subjected to flowing water at 145 psi cycled between 68°F (20°C) and 200°F (93°C) for a period of 15 minutes at each temperature for nominal size 2" and smaller. Nominal size 2 1/2" and larger were pressurized with air and immersed in water at 68°F (20°C) and 200°F (93°C). Cycling continued for 5,000 cycles for sizes 2" and smaller and 2,500 cycles for 2 1/2" and larger size fittings.
10. **Dynamic Torque at 68°F (20°C) and 200°F (93°C)**
    a. Fittings were assembled between two lengths of hard-drawn copper tubing. With one tube fixed, the other tube twisted ±5° for 10,000 cycles at 68°F (20°C) or 200°F (93°C). Each assembly was then subjected to 400 psiG water pressure at 68°F (20°C) or 200°F (93°C) for 1 hour.

Tests were performed with K and M hard drawn tubing. The thermocycle test used L hard drawn tube.

Milwaukee ULTRAPRESS® Fittings

Sample Specifications

FITTINGS

2" and Smaller:

Fittings shall comply with NSF 61, CSA, UPC and be approved by the local jurisdiction. The Milwaukee UltraPress® System may be used at the contractor's option for the following building services piping - 20°F to +250°F up to 200 psi:

- Hot and Cold Domestic Water
- Potable Water
- Condenser and Chilled Water Service
- Hot Water Heating Service

Wrot copper press fittings shall be made from commercially pure copper mill products per ASTM B 75 Alloy C12200. Cast copper alloy press fittings shall be made from materials with a minimum of 78% copper and a maximum of 15% zinc. The press fittings connections shall be compatible with seamless K, L or M copper tube made to ASTM B 88 as well as 1/2", 3/4" and 1" annealed copper tubing. Fittings shall have a maximum non-shock working pressure of 200 psi between the temperatures of -20°F and +250°F. Elastomeric seals shall be made of EPDM material, and the fittings shall be manufactured with an inboard bead design. All fittings shall be installed in accordance with the manufacturer's installation instructions and according to local plumbing and mechanical codes.

2½" through 4":

Fittings shall comply with NSF 61, CSA, UPC and be approved by the local jurisdiction. The Milwaukee UltraPress® System may be used at the contractor's option for the following building services piping - 20°F to +200°F up to 200 psi:

- Hot and Cold Domestic Water
- Potable Water
- Condenser and Chilled Water Service
- Hot Water Heating Service

Wrot copper press fittings shall be made from commercially pure copper mill products per ASTM B 75 Alloy C12200. Cast copper alloy press fittings shall be made from materials with a minimum of 78% copper and a maximum of 15% zinc. The press fittings connections shall be compatible with seamless K, L or M copper tube made to ASTM B 88. Fittings shall have a maximum non-shock working pressure of 200 psi between the temperatures of -20°F and +250°F. Elastomeric seals shall be made of EPDM material, and the fittings shall be manufactured with an inboard bead design. All fittings shall be installed in accordance with the manufacturer's installation instructions and according to local plumbing and mechanical codes.

Milwaukee ULTRAPRESS® Fittings

Installation Instructions

Milwaukee ULTRAPRESS® Fittings

Installation Instructions

Milwaukee UltraPress® System

The Milwaukee UltraPress® System, when used with tested and authorized pressing tools and jaws, is designed to mechanically crimp fittings and valves onto copper tubing to create a watertight, permanent seal. When the switch on the pressing tool is depressed a small hydraulic pump generates thousands of pounds of crimping force to install the specially designed fittings and valves.

System Components

Fittings

Milwaukee UltraPress® System copper or bronze fittings

Tubing

ASTM B 88 seamless Hard Drawn Copper Water Tube: Types K, L and M as well as 1/2", 3/4" and 1" annealed copper tubing.

Pressing Tools, Chains and Jaws

The pressing tool, chain and jaw are important parts of ensuring a reliable, permanent connection between Milwaukee UltraPress® System fittings and the copper water tube.

Pressing Tool Safety

• Keep fingers and hands away from jaws during pressing cycle. Your fingers or hands can be crushed, fractured or amputated if they become caught between the jaw tips or between the jaw and any other object.

• Always wear safety glasses while using pressing tools and jaws.

• Never attempt to repair a damaged jaw set. A jaw that has been modified in any manner can fail during crimping resulting in serious injury. Discard the entire damaged jaw set. Replace with a new jaw set.

WARNING: Please read these installation instructions and the manufacturer's pressing tool and jaw operators manual(s) carefully prior to installation of the Milwaukee UltraPress® System. Failure to understand and follow the contents of this manual may result in extensive property damage, severe personal injury or death.

Galvanic Potential in Piping Systems

Galvanic corrosion or dissimilar metal corrosion is an electrochemical process that is created through the electrical interaction of two different metals under the influence of a conductive media (i.e. an electrolyte). An electrolytic cell, much like a battery, is generated by these dissimilar metals using water as the electrolyte. The electrical charge, developed within the electrolytic cell, drives a preferential attack on the more electrically active metal with the water acting as the recipient of the discarded metal ions. Such galvanic attack is often encountered in service where iron or steel components are installed, and later corrode, in a largely copper piping system.

Milwaukee ULTRAPRESS® Fittings

Installation Instructions

Installation Instruction for 1/2” - 2” Press Fittings

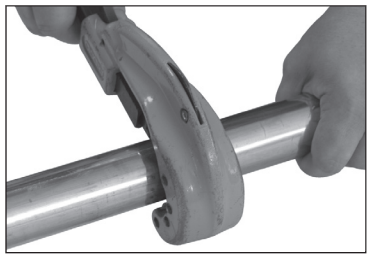
WARNING: To prevent serious injury, inspect the pressing tool, battery charger (if applicable) and jaw sets according to the procedure outlined in the pressing tool instruction manual prior to beginning installation.

Failure to clean jaws can result in an improper connection that can lead to extensive property damage.

Preparing the Copper Tube

1. Select clean, undamaged copper tube and cut to desired length. Cut tube end square using a tube cutter or fine-toothed saw. Do not crimp over damaged, scratched, gouged, or otherwise damaged tubing ends. Do not crimp over etch print streams on tubing. (Figure 1).

Figure 1: Cut tube to desired length



2. Deburr the tube inside and outside diameter using a half-round file or a deburring tool.

3. Clean the tube end of all dirt, oil and grease. (Emery cloth or sandpaper to clean the tube or remove oxidation **should not be used**.)

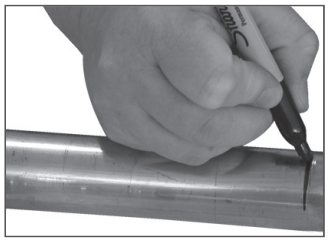
Inserting the Tube into the Fitting

1. Check the fitting to make sure the EPDM seal is in place, clean and free of dirt and debris (Figure 2).

Figure 2: Check for EPDM Seal

WARNING: Never lubricate the EPDM seal in the Milwaukee UltraPress® System fitting with anything other than water. Oil-based lubricant, dirt or debris may damage the seal. An improper seal can lead to extensive property damage.

Figure 3: Marking for insertion depth



2. Mark the tube with a permanent marker to indicate the proper tube insertion depth (Figure 3).

3. Refer to the minimum insertion depth table for correct depths

4. Insert the tube into the fitting or valve using a twisting motion. Make sure that the tube is fully inserted into the fitting stop or shoulder.

Tube Size	Insertion Depth (min.)	
Inches	Inches	mm
1/2	11/16	18
3/4	7/8	22
1	7/8	22
1¼	1	25
1½	1⅜	35
2	1½	38

CAUTION: Tubing that is difficult to insert may have burrs or could be out-of-round. Burrs must be removed and tubing end must be undamaged. Make sure tube is inserted to the proper depth. Failure to do so may result in an improper seal.

Attaching Pressing Jaws

1. Make sure the battery is removed or the cord is unplugged on the pressing tool prior to attaching or changing the crimp jaws.

2. Push and twist to open the jaw set mounting pin. (Figure 4).

Figure 4: Pushing and twisting to open the jaw set mounting pin

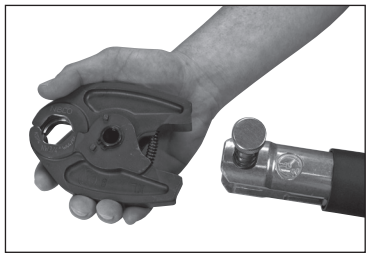
3. If press tool contains a jaw set, slide it out of the crimping tool.

Milwaukee ULTRAPRESS® Fittings

Installation Instructions

4. Select the jaw set that corresponds to the size of the joint to be crimped and insert the jaw set into the pressing tool (Figure 5).

Figure 5: Inserting the jaw



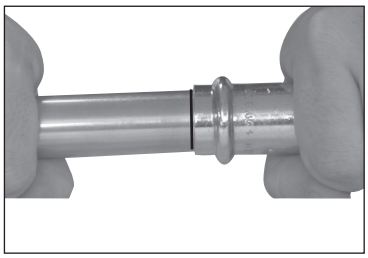
5. Push the jaw set mounting pin until it clicks into position.

NOTE: The tool will not properly press unless the pin is fully engaged.

Crimping a Milwaukee UltraPress® System Fitting

1. Make sure the tubing is inserted to the proper depth in the fitting. (Figure 6).

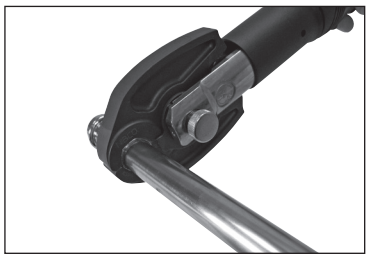
Figure 6: Inserting the tube to proper depth



2. Squeeze jaw arms to open the jaw set.

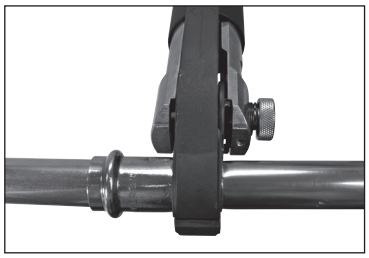
3. Place the open jaws around the fitting and ensure that the contour of the jaw is properly aligned with the contour of the fitting (Figure 7).

Figure 7: Open the jaw set and place around the fitting



4. Make sure the tool is perpendicular to the tubing and depress the switch (Figure 8). Keep the trigger depressed from the time the cycle begins and the rollers contact the jaw arms until the end of the entire crimp cycle.

Figure 8: Jaw set should be square to tubing



5. Once the crimp is complete, press the jaw arms to open the jaw and remove from the fitting.

If the tool displays an LED flash or emits an audible alarm, please refer to the tool instruction manual for troubleshooting suggestions.

CAUTION Avoid handling sharp edges that may have formed on the fitting during the crimping operation.

Inspecting the Crimp

1. Inspect the crimped fitting to ensure proper crimp.

2. Inspect the crimped fitting checking the connection for the following problems:

- Not fully inserted tube, double check depth marks
- Incorrect jaw alignment with the fitting contour

If any problems are found, a new section of tubing and a new fitting will need to be prepared, installed and crimped.

3. Test the Milwaukee UltraPress® System in accordance with crimp intergrity testing instructions for fittings and valves in this catalog.

Milwaukee ULTRAPRESS® Fittings

Installation Instructions

Installation Instruction for 2 1/2” - 4” Press Fittings

WARNING: To prevent serious injury, the pressing tool, battery charger (if applicable) and pressing chains should be inspected according to the procedure outlined in the pressing tool instruction manual prior to beginning installation. Failure to clean pressing chains can result in an improper connection that can lead to extensive property damage.

Preparing the Copper Tube

1. Select clean, undamaged copper tube and cut to desired length. Cut tube end square using a tube cutter or fine-toothed saw. Do not crimp over damaged, scratched, gouged, or otherwise damaged tubing ends. Do not crimp over etch print streams on tubing. (Figure 1).

Figure 1: Cut tube to desired length using a tube cutter

2. Deburr the tube inside diameter using a half-round file or a deburring tool. Remove any copper shavings or filings (Figure 2 & 3).

Figure 2: Deburr inside diameter using a half-round file

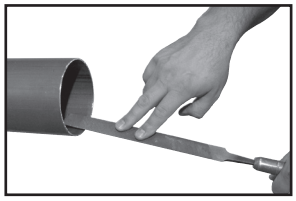
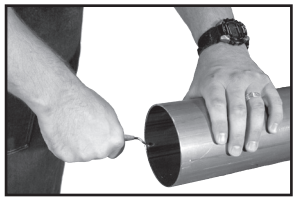
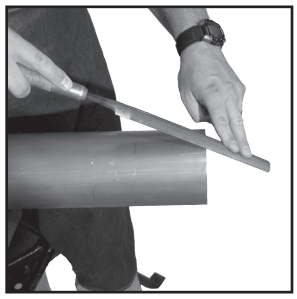


Figure 3: Deburr inside diameter deburring tool



3. Deburr the tube outside diameter using a half-round file to prevent damage to the EPDM seal (Figure 4).

Figure 4: Deburr outside diameter using a half-round file



4. Clean the tube end of all contamination, oils and shavings. A smooth transition chamfer is recommended to ease tube insertion past the seal. (Emery cloth or sandpaper to clean the tube or remove oxidation **should not be used**.)

Inserting the Tube into the Fitting

1. Check the fitting to make sure that the seal in in place and is free of oil or grease. Only original Milwaukee EPDM seals are to be used when making a press connection with Milwaukee UltraPress® System fittings. If it is necessary to lubricate the seals, use water onlly. DO NOT use any petroleum-based lubricants (Figure 5).

Figure 2: Check for EPDM seal

WARNING: Never lubricate the EPDM seal in a Milwaukee UltraPress® System fitting with anything other than water. Oil-based lubricants, dirt or debris may damage the seal. An improper seal can lead to extensive property damage.

2. Mark the proper insertion depth on the tube with a permanent marker prior to insertion, based on insertion depth chart. Refer to minimum insertion depth table for correct depths.

Milwaukee UltraPress® System Fittings Insertion Depth Chart			
Tube Size	2 1/2”	3”	4”
Insertion Depth (min.)	1 1/2”	1 5/8”	2 1/8”

3. Insert the tube into the fitting using a twisting motion. Make sure that the tube is fully inserted into the fitting.

WARNING: If tube is not inserted to the proper depth, an inadequate seal may result.

CAUTION: Tubing that is difficult to insert may have burns or could be out-of-round. Burrs must be removed and tubing end should be undamaged. Make sure tube is inserted to the proper depth. Failure to do so may result in an improper seal.

Milwaukee ULTRAPRESS® Fittings

Installation Instructions

Crimp a Milwaukee UltraPress® Fitting System

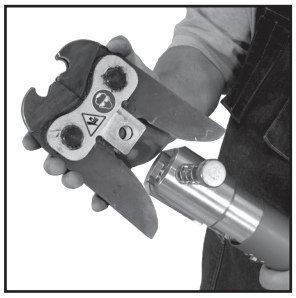
1. Make sure that the battery is removed or that the cord is unplugged on the pressing tool prior to attaching or changing the adapter jaw.

2. Select the correct size pressing chain. Pull the pin on the chain which allows the segments to open. Position the chain on the raised bead and wrap the chain around the fitting with the "pipe side" designation facing the tube. When the chain is fully wrapped around the fitting, reinsert the pin to secure the chain on the assembled joint. Visually inspect the mark made for insertion depth, to ensure the tube remained in position (Figure 6).

Figure 6: Placement of the pressing chain onto fitting or valve

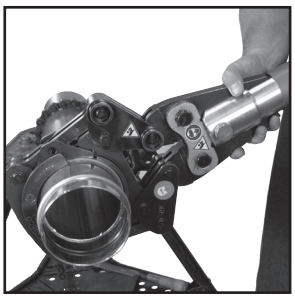
3. Release the pin (push and twist) on the jaw holder of the pressing tool, and install the adapter jaw on the tool. Return the pin to its original position, securing the jaw. The red sleeve on the tool must be in the back position to allow for crimping sizes 2½", 3" and 4" (Figure 7).

Figure 7: Placement of adapter jaw into the tool



4. Squeeze adapter jaw arms to open the jaw. Rollers must be fully retracted to open the adapter jaw. Place the open adapter jaw into the grooves in the pressing chain and let go of the jaw arms (Figure 8).

Figure 8: Placement of adapter jaw into pressing chain



5. Make sure the tubing is inserted to the proper depth in the fitting or valve, and that the tube and fitting or valve are aligned properly.

6. With the pressing tool perpendicular to the tube, begin the pressing cycle by pulling the trigger of the pressing tool.

7. Keep the trigger depressed from the time the cycle begins and the rollers contact the jaw arms until the end of the entire cycle. Remove the pressing tool and adapter jaw from the pressing chain. Remove the pressing chain from the fitting.

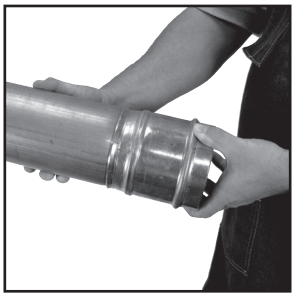
If the tool displays an LED flash or emits an audible alarm, please refer to the toolinstruction manual for troubleshooting suggestions.

CAUTION: Avoid sharp edges that may have formed on the fitting during the crimping operation.

Inspecting the Crimp

1. Inspect the crimped fitting or valve to ensure proper crimp. The final crimp should appear pressed uniformly around the fitting (Figure 9).

Figure 9: Inspection of final crimp



2. Inspect the crimped fitting checking the connection for the following problems:

- Not fully inserted tube, double check depth marks
- Incorrect chain alignment with the fitting contour

If any problems are found, a new section of tubing and a new fitting will need to be prepared, installed, and crimped.

3. Test the Milwaukee UltraPress® System in accordance with crimp integrity testing instructions for fittings and valves in this catalog.

Milwaukee ULTRAPRESS® Fittings

Installation Instructions

Crimp Integrity Testing Instructions for Fittings

PRESSURE TESTING:

Milwaukee Valve recommends the following leak testing procedures when installing Milwaukee UltraPress® System with the leak detection feature. These test procedures allow the installer to find un-pressed connections while the system is being tested under pressure.The uniquely designed EPDM o-ring allows fluids or gases to flow past the seal and leak when the fitting has not yet been pressed. When the fitting has been pressed, the o-ring will create a water tight seal around the tube.

AIR LEAK TESTING:

1. Pressurize system up to 15 psi maximum using dry, oil free compressed air, carbon dioxide, or nitrogen.
2. Allow system pressure to stabilize for a minimum of 2 hours.
3. If system pressure has dropped, add more air to bring entire system up to 15 psi maximum. If system pressure increases above 15 psi, bleed off excess pressure to ensure system is at a maximum pressure of 15 psi.
4. If the system pressure continues to drop, inspect all joints for un-pressed fittings. The Milwaukee UltraPress® System press fittings with the leak detection feature are designed to leak in an un-pressed condition.
5. Check all press joints for air leaks using a commercially available leak test solution or a soap and water mixture. Do not use a soap that contains Mineral Spirits or a Hydrocarbon/ petroleum that might attack the EPDM O-rings.
6. Once the system has been confirmed to be leak free, pressure can be increased to the recommended working pressure to verify system integrity.

WATER LEAK TESTING:

1. Pressurize system up to 50 psi maximum using potable water.
2. Allow system pressure to stabilize for a minimum of 2 hours.
3. If system pressure has dropped, add more water to bring entire system up to 50 psi maximum. If system pressure increases above 50 psi, bleed off excess pressure to ensure system is at a maximum pressure of 50 psi.
4. If the system pressure continues to drop, inspect all joints for un-pressed fittings. The Milwaukee UltraPress® System press fittings with the leak detection feature are designed to leak in an un-pressed condition.
5. Check all press joints for leaking water.
6. Once the system has been confirmed to be leak free, water pressure can be increased to the recommended working pressure to verify system integrity.

SYSTEM INTEGRITY TESTING*:

Once a system has been confirmed to be properly installed and no press connections have been left uncrimped, the system is recommended for testing up to the maximum non-shock working pressure of 200 psi hydrostatic.

NOTE: While Milwaukee UltraPress® System products are tested to pressures as high as 600 psi, the product system rating limitation of 200 psi is in place to ensure a safety factor of three-times proof-testing according to ASME B16.51 Copper and Copper Alloy Press-Connect Pressure Fittings.

SYSTEM INTEGRITY TESTING AT HIGHER PRESSURES*:

Milwaukee UltraPress® System products can be tested at hydrostatic pressures higher than 200 CWP, not exceeding a maximum pressure of 300 psi hydrostatic for a maximum test duration of 24 hours, when assembled and tested according to the methods prescribed above.

CAUTION: These testing parameters and protocols apply only to Milwaukee Valve products as detailed above: Milwaukee Valve accepts no responsibility or liability for any other manufacturer's products that may be damaged as a result of such testing.

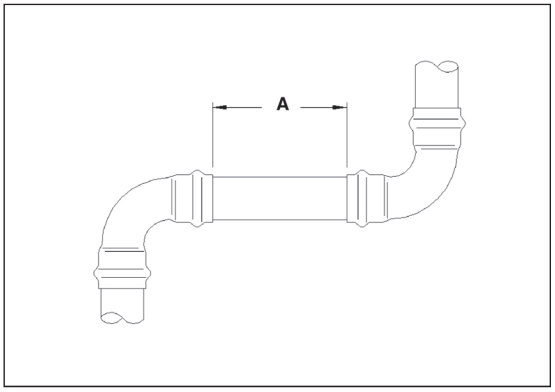
*System integrity testing applies to leak detect and non-leak detect fittings and valves.

Milwaukee ULTRAPRESS® Fittings

Installation Instructions

Minimum Distance Between Joints

To prevent distortion of the tubing, certain fitting sizes require a minimum distance between crimp joints (refer to *Chart 1* below). Failure to provide this minimum distance may result in an improper seal.



Tube Dia.	A (min.)	
	Inches	mm
½"*	0	0
¾"*	0	0
1"*	0	0
1¼"*	0	0
1½"*	0	0
2"*	0	0
2½"	⅜"	10
3"	⅜"	10
4"	⅜"	10

***No minimum distance required.**

System Support

CAUTION — In any installation, the system should be suported to ensure the minimum stress is imposed on the tube and joints. The Milwaukee UltraPress® System should be supported in accordance with normal practice and to local jurisdiction piping code.

Softening of Copper Tubing

A Milwaukee UltraPress® System installation should not be conducted within 12" of a **brazed** joint. The high temperature required for capillary joinery may cause the copper tube to become annealed and render it too soft for proper crimping. However, a Milwaukee UltraPress® System product may be crimped adjacent to a **soldered** joint, as normal temperatures created by silver soldering are not hot enough to cause the copper tube to become annealed.

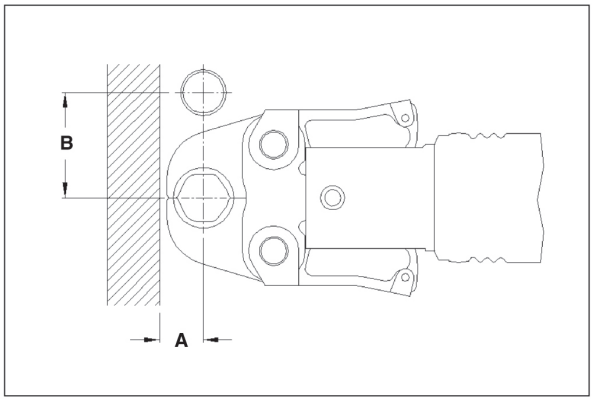
CAUTION — Brazing or soldering should not be conducted within 12" of an existing Milwaukee UltraPress® System connection as this may damage the EPDM seal. If there is any concern about heat damage to the O-ring, a cold, wet cloth should be wrapped around the crimped connection prior to soldering or brazing.

Spacing

1. Sufficient clearance must be left around each joint to allow room for the pressing tool and jaw to be attached without interference.

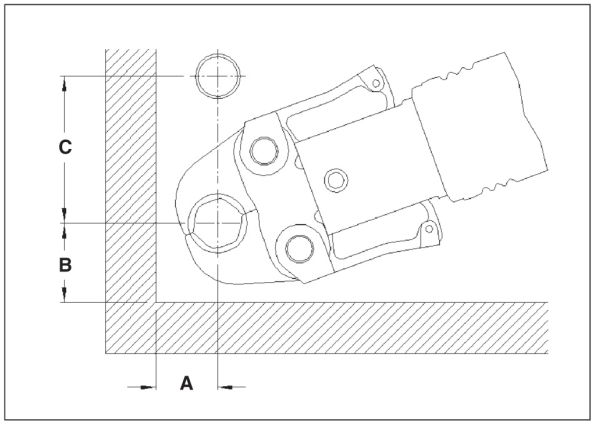
Clearance Requirements — Standard Jaw Sets

Tool perpendicular to wall



Tube Dia.	A (min.)		B (min.)	
	Inches	mm	Inches	mm
1/2	15/16	24	1 5/8	41
3/4	7/8	22	2 1/8	54
1	1 1/4	31	2 1/2	64
1 1/4	1 1/8	29	2 7/8	73
1 1/2	2	51	4 3/8	111
2	2	51	4 3/8	111

Tool angled to wall



Tube Dia.	A (min.)		B (min.)		C (min.)	
	Inches	mm	Inches	mm	Inches	mm
1/2	1 1/8	28	1 3/8	35	2 1/2	64
3/4	1	26	1 1/2	38	2 1/2	64
1	1 5/16	34	1 3/4	45	3	76
1 1/4	1 1/4	32	2 1/4	57	3 1/8	80
1 1/2	2 1/8	54	3 1/8	80	5	127
2	2 1/8	54	3 1/8	80	5	127
2 1/2	3 5/8	92	6	152	3 1/2	89
3	3 7/8	98	6 1/2	165	4	102
4	4 7/8	124	7 5/8	194	4 1/4	108

NOTE: Clearance dimensions for 2½", 3" & 4" are for wrapping pressing chains around fittings.

Milwaukee ULTRAPRESS® Fittings

Frequently Asked Questions

What is the system temperature rating?

The Milwaukee UltraPress® System is rated at 200 psi over a temperature range of -20°F to 250°F.

What are the approved system applications?

Approved applications include residential and commercial potable, hot, chilled and process water for plumbing and HVAC systems. The Milwaukee UltraPress® System is designed for use with water glycol mixtures of ethylene or propylene glycol up to 50% at 200°F.

What was the testing protocol for the Milwaukee UltraPress® System fittings?

Milwaukee UltraPress® System fittings were subjected to a wide range of performance tests including dimensional verification, thread end specification, hydrostatic burst strength, unrestrained pressure, static torque, bending, vacuum pressure, cyclic pressure, vibration, thermo-cycling and dynamic torque. The testing protocol included testing to a 3X safety factor above the 200 psi system rating.

Milwaukee Valve testing was witnessed and validated by the internationally recognized NSF.

Can a Milwaukee UltraPress® System connection be re-crimped?

If for any reason the press cycle is interrupted, it is possible to re-crimp a Milwaukee UltraPress® System connection. However, when re-crimping the connection, the jaws must be properly aligned so that the crimp is performed in the same location as the original.

How long will the EPDM seal last?

Accelerated life tests show that the EPDM seals used with the Milwaukee UltraPress® System fittings and valves have a life expectancy of 50 years.

Are Milwaukee UltraPress® System fittings available with solder or threaded by Press System connection?

Milwaukee Valve offers many Press System fitting combinations by soldered or threaded connection. Please note, always solder the standard wrot connection first when possible. Prior to soldering, remove the press end EPDM ring, solder, allow the fitting to cool, insert the EPDM O-ring, and then press the connection.

Can a fitting be soldered close to a Press System connection?

Milwaukee Valve recommends soldering at least 12 inches away from the Press System connection. If this length is not possible, either solder the joint prior to connecting the press fitting or wrap the connection with a cold wet cloth.

Is the Milwaukee UltraPress® System approved for underground use?

In accordance with local plumbing codes, the Milwaukee UltraPress® System can be installed underground.

Is the Milwaukee UltraPress® System compatible with standard disinfectant cleaning agents commonly utilized in a new water system?

Yes, the Milwaukee UltraPress® System is typically compatible.