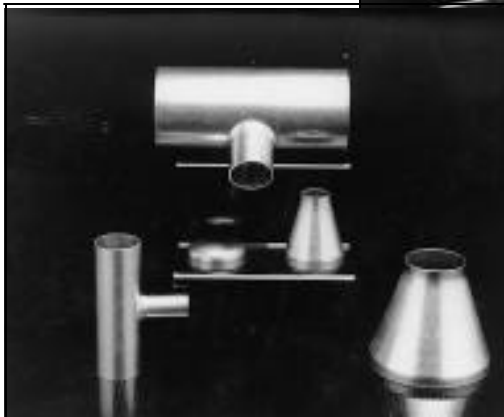


Series 23

ButtWeld Fittings
Sizes 1/2" to 10"



HPSTM Products
Vacuum Products Group
5330 Sterling Drive
Boulder, CO USA 80301
(800)345-1967 or (303)449-9861
FAX (303)442-6880



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Introduction

The HPS™ Series 23 is a family of ButtWeld Vacuum Fittings manufactured by the Vacuum Products Group of MKS Instruments Inc. They are designed to be used in conjunction with the HPS™ full line of ISO-Universal, ISO-KF and CF UHV flanges, and are easily welded to the flanges or each other during on-site installation. All components are made of type 304 stainless steel and are specifically prepared for use in high vacuum process or UHV applications.

Applications

Vacuum ButtWeld Fittings are designed to be used in any vacuum application where minimizing the number of sealed joints is critical.

- Semiconductor wafer fabrication areas for remote installations and below a raised floor
- Permanent house vacuum lines
- Vacuum utility lines for vacuum fixtures
- Pharmaceutical lines
- High temperature lines
- Burn box exhaust lines

Component Construction

The Series 23 components are constructed of 304 or 304L welded, drawn, and annealed stainless steel tubing. (316L is available on request.) For most vacuum process applications, this provides the best combination of the following critical features:

- Low outgassing under vacuum.
- Chemically resistant.
- Annealed for consistent leak free welding.
- Minimized corrosion concentration points.
- Good availability.
- Cost consistent with the above requirements.

Each component is fabricated using pulled port and 100% penetration TIG weld techniques. All welded components are leak free, carefully cleaned for high vacuum use and then packaged to remain clean until the time of installation.

Installation

The Series 23 Fittings are designed to be welded using techniques preferred for vacuum applications. These techniques include internal (socket type) welding and external butt welding. The most commonly used type of weld for high vacuum applications is a TIG (Tungsten Inert Gas) fusion weld, preferably without filler rod. These components are also suitable for orbital welding with tight

tolerances on quality, angles and tube face to centering distances. For the best results, remove components from packaging in clean conditions during installation. Handle the components with clean gloves and equipment in the absence of any fibers, fingerprint oils, or other greases. If these precautions are taken, the weld is more likely to be leak free and the integrity of the vacuum surface will remain intact and ready for use.

General hints for good vacuum welds include:

- 1.) Always start with clean and properly weld prepped components.
- 2.) For internal welds, minimize warpage by using only enough heat for 60-75% penetration.
- 3.) For external butt welds, make sure they are 100% penetration with no internal cracks or crevices.
- 4.) Do not weld internally then externally around the entire circumference of the fittings.
- 5.) Make sure there is little or no gap between pieces to be welded.
- 6.) Insure that all surfaces affected by the heat of the weld, especially the vacuum side, are purged properly with inert gas.

For more details on TIG and other vacuum joining methods, contact MKS in Boulder.

CAD Drawings

Drawings for the Series 23 ButtWeld line can be downloaded from our website at:
<http://www.mksinst.com/bws23.html>

From there, select the type of fitting you are looking for. The next page will have a table of part numbers and descriptions. If a drawing is available, the words CAD DRAWING will appear in the left-most column. Click on the words CAD DRAWING, to enter the drawing download page. The drawings are available in *.DWG format and *.DXF format. Click on the file name to download the file. For further help with our website contact the MKS webmaster at (800)227-8766 or (978)975-2350.

Ordering Information

HPS™ products are available exclusively through MKS sales and distribution centers located throughout the world. To obtain delivery, technical, or applications information, contact your nearest MKS office or the Vacuum Products Group of MKS Instruments, Inc. directly in Boulder, Colorado at (800)345-1967 or (303)449-9861.

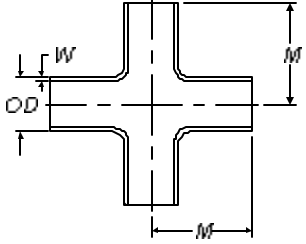
90° Elbow						in.	
	Part Number	OD	W	M	Price		
	Std Finish	Mech Polish					
	1002390050	0.50	.065	0.75			
	1002390075	0.75	.065	1.13			
	1002390100	1.00	.065	1.52			
	1002390150	1.50	.065	2.25			
	1002390200	2.00	.065	3.00			
	1002390250	2.50	.065	3.75			
	1002390300	3.00	.065	4.50			
	1002390401	4.00	.065	6.00			
1002390400	4.00	.083	6.00				
1002390600	6.00	.083	9.00				

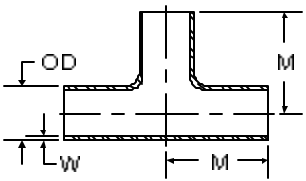
45° Elbow						in.	
	Part Number	OD	W	M	Price		
	Std Finish	Mech Polish					
	1002345050	0.50	.065	0.31			
	1002345075	0.75	.065	0.47			
	1002345100	1.00	.065	0.62			
	1002345150	1.50	.065	0.93			
	1002345200	2.00	.065	1.24			
	1002345250	2.50	.065	1.56			
	1002345300	3.00	.065	1.86			
	1002345401	4.00	.065	2.49			
1002345400	4.00	.083	2.49				
1002345600	6.00	.083	3.75				

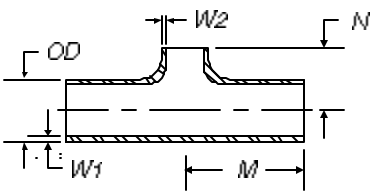
90° Elbow with Tangents							in.	
	Part Number	OD	W	M	T	Price		
	Std Finish	Mech Polish						
	1002390WT100	1.00	.065	2.06	0.56			
	1002390WT150	1.50	.065	2.94	0.69			
	1002390WT200	2.00	.065	4.06	1.06			
	1002390WT250	2.50	.065	5.19	1.44			
	1002390WT300	3.00	.065	6.31	1.81			
	1002390WT401	4.00	.065	8.31	2.31			
	1002390WT400	4.00	.083	8.31	2.31			
	1002390WT600	6.00	.083	12.60	3.60*			

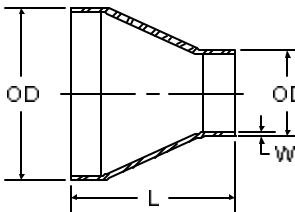
45° Elbow with Tangents							in.	
	Part Number	OD	W	M	T	Price		
	Std Finish	Mech Polish						
	1002345WT100	1.00	.065	1.19	0.56			
	1002345WT150	1.50	.065	1.63	0.69			
	1002345WT200	2.00	.065	2.31	1.07			
	1002345WT250	2.50	.065	3.00	1.44			
	1002345WT300	3.00	.065	3.69	1.82			
	1002345WT401	4.00	.065	4.81	2.33			
	1002345WT400	4.00	.083	4.81	2.33			
	1002345WT600	6.00	.083	7.33	3.60			

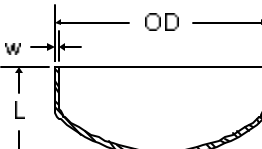
Add "MP" to the part number for mechanically polished fittings, e.g. 1002345WT100MP.
 All elbows have an industry standard radius of 1.5 times the OD.
 *Tangents are welded on.

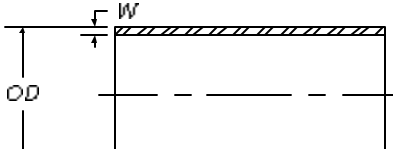
4-Way Cross					in.
	Part Number	OD	W	M	Price
	100234X050	0.50	.065	0.75	
	100234X075	0.75	.065	1.88	
	100234X100	1.00	.065	1.88	
	100234X150	1.50	.065	2.25	
	100234X200	2.00	.065	3.00	
	100234X250	2.50	.065	3.00	
	100234X300	3.00	.065	3.25	
	100234X400	4.00	.065	3.88	
100234X600	6.00	.083	5.00		

Tee					in.
	Part Number	OD	W	M	Price
	10023T050	0.50	.065	0.75	
	10023T075	0.75	.065	1.88	
	10023T100	1.00	.065	1.88	
	10023T150	1.50	.065	2.25	
	10023T200	2.00	.065	3.00	
	10023T250	2.50	.065	3.00	
	10023T300	3.00	.065	3.25	
	10023T400	4.00	.065	3.88	
10023T600	6.00	.083	5.00		

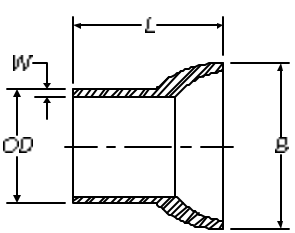
Reducing Tee							in.
	Part Number	OD	W1	W2	M	N	Price
	10023100RT050	1.00 X 0.50	.065	.065	1.88	1.00	
	10023100RT075	1.00 X 0.75	.065	.065	1.88	2.00	
	10023150RT050	1.50 X 0.50	.065	.065	2.25	1.25	
	10023150RT075	1.50 X 0.75	.065	.065	2.25	2.25	
	10023150RT100	1.50 X 1.00	.065	.065	2.25	2.25	
	10023200RT050	2.00 X 0.50	.065	.065	3.00	1.50	
	10023200RT075	2.00 X 0.75	.065	.065	3.00	2.50	
	10023200RT100	2.00 X 1.00	.065	.065	3.00	2.50	
	10023200RT150	2.00 X 1.50	.065	.065	3.00	2.50	
	10023250RT075	2.50 X 0.75	.065	.065	3.00	2.75	
	10023250RT150	2.50 X 1.50	.065	.065	3.00	2.75	
	10023250RT200	2.50 X 2.00	.065	.065	3.00	3.25	
	10023300RT075	3.00 X 0.75	.065	.065	3.25	3.00	
	10023300RT150	3.00 X 1.50	.065	.065	3.25	3.00	
	10023300RT200	3.00 X 2.00	.065	.065	3.25	3.50	
	10023300RT250	3.00 X 2.50	.065	.065	3.25	3.25	
	10023400RT075	4.00 X 0.75	.065	.065	3.88	3.50	
	10023400RT150	4.00 X 1.50	.065	.065	3.88	3.50	
	10023400RT200	4.00 X 2.00	.065	.065	3.88	3.50	
	10023600RT075	6.00 X 0.75	.083	.065	5.00	4.50	
	10023600RT150	6.00 X 1.50	.083	.065	5.00	4.50	
	10023600RT400	6.00 X 4.00	.083	.083	5.00	4.88	

Concentric Reducer					in.
	Part Number	OD	W	L	Price
	10023100CR075	1.00 X 0.75	.065	2.38	
	10023150CR075	1.50 X 0.75	.065	2.38	
	10023150CR100	1.50 X 1.00	.065	2.38	
	10023200CR100	2.00 X 1.00	.065	2.38	
	10023200CR150	2.00 X 1.50	.065	2.38	
	10023250CR150	2.50 X 1.50	.065	2.38	
	10023250CR200	2.50 X 2.00	.065	2.38	
	10023300CR150	3.00 X 1.50	.065	3.63	
	10023300CR200	3.00 X 2.00	.065	3.63	
	10023300CR250	3.00 X 2.50	.065	3.63	
	10023400CR200	4.00 X 2.00	.065	3.63	
	10023400CR250	4.00 X 2.50	.065	3.63	
	10023400CR300	4.00 X 3.00	.065	3.63	
	10023600CR300	6.00 X 3.00	.065	9.00	
10023600CR400	6.00 X 4.00	.083	9.00		

End Cap					in.
	Part Number	OD	W	L	Price
	10023C050	0.50	.065	0.25	
	10023C075	0.75	.065	0.31	
	10023C100	1.00	.065	0.38	
	10023C150	1.50	.065	0.50	
	10023C200	2.00	.065	0.75	
	10023C250	2.50	.065	1.00	
	10023C300	3.00	.065	1.25	
	10023C400	4.00	.065	1.50	

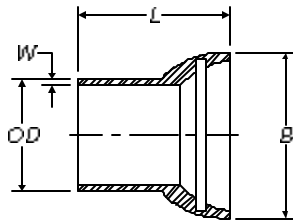
Tubing					in.
	Part Number	OD	W	Price Per Foot*	
				Std Finish	Mech Polish†
	100314300	0.50	.065		
	100314301	0.75	.065		
	100314303	1.00	.065		
	100314305	1.50	.065		
	100314306	2.00	.065		
	100764506	2.50	.065		
	100764508	3.00	.065		
	100764510	4.00	.065		
	100764511	4.00	.083		
	100764516	6.00	.083		
	100764520	8.00	.120		
	100764525	10.00	.125		

* Lengths are cut to customer specifications. Add a per cut charge to the price. 10-foot lengths are available with no cutting charge.
† Add MP to the part number for mechanically polished tubing, e.g. 100314300MP

Ball Socket Weld Stub							in.
	Part Number	OD	Coupling Size	W	L	B	Price
	100003446	1.50	50/30	.065	2.01	2.20	
	100003448	2.00	75/50	.065	2.51	3.20	
	100003929	3.00	102/75	.065	2.02	4.40	

Ball Socket Weld Stub w/ Viton® O-Ring

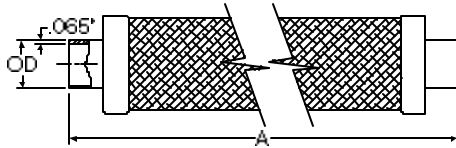
in.



Part Number	OD	Coupling Size	W	L	O-Ring Size	B	Price
100003447	1.50	50/30	.065	2.01	2-224	2.20	
100003449	2.00	75/50	.065	2.51	2-232	3.20	
100003930	3.00	102/75	.065	2.02	2-240	4.40	

Short Stub Braided Metal Hose

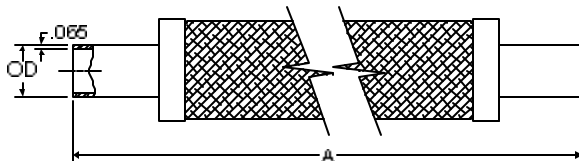
in.



Part Number	OD	A	Static Bend Radius	Price
100006287	.75	10.00	2.50	
100006288	.75	20.00	2.50	
100006289	.75	40.00	2.50	
100006290	1.00	10.00	3.00	
100006291	1.00	20.00	3.00	
100006292	1.00	40.00	3.00	
100006293	1.50	10.00	5.00	
100006294	1.50	20.00	5.00	
100006295	1.50	40.00	5.00	
100006296	2.00	10.25	6.00	
100006297	2.00	20.25	6.00	
100006298	2.00	40.25	6.00	
100006299	2.50	10.25	7.50	
100006300	2.50	20.25	7.50	
100006301	2.50	40.25	7.50	
100006302	3.00	10.25	8.75	
100006303	3.00	20.25	8.75	
100006304	3.00	40.25	8.75	
100006305	4.00	10.25	10.00	
100006306	4.00	20.25	10.00	
100006307	4.00	40.25	10.00	

Long Stub Braided Metal Hose

in.



Part Number	OD	A	Static Bend Radius	Price
100006313	.75	10.50	2.50	
100006314	.75	20.50	2.50	
100006315	.75	40.50	2.50	
100006316	1.00	12.00	3.00	
100006317	1.00	22.00	3.00	
100006318	1.00	42.00	3.00	
100006319	1.50	12.00	5.00	
100006320	1.50	22.00	5.00	
100006321	1.50	42.00	5.00	
100006322	2.00	12.25	6.00	
100006323	2.00	22.25	6.00	
100006324	2.00	42.25	6.00	
100006325	2.50	13.25	7.50	
100006326	2.50	23.25	7.50	
100006327	2.50	43.25	7.50	
100006328	3.00	13.25	8.75	
100006329	3.00	23.25	8.75	
100006330	3.00	43.25	8.75	
100006331	4.00	13.45	10.00	
100006332	4.00	23.45	10.00	
100006333	4.00	43.45	10.00	

Numerical Listing

100003446	Ball socket, 50/30, w/o groove, SS	100006325	Long stub braided hose, 2.5 OD, 13.25" long
100003447	Ball socket, 50/30, w/ groove, SS	100006326	Long stub braided hose, 2.5 OD, 23.25" long
100003448	Ball socket, 75/50, w/o groove, SS	100006327	Long stub braided hose, 2.5 OD, 43.25" long
100003449	Ball socket, 75/50, w/ groove, SS	100006328	Long stub braided hose, 3.0 OD, 13.25" long
100003929	Ball socket, 102/75, w/o groove, SS	100006329	Long stub braided hose, 3.0 OD, 23.25" long
100003930	Ball socket, 102/75, w/ groove, SS	100006330	Long stub braided hose, 3.0 OD, 43.25" long
100006287	Short stub braided hose, .75 OD, 10" long	100006331	Long stub braided hose, 4.0 OD, 13.45" long
100006288	Short stub braided hose, .75 OD, 20" long	100006332	Long stub braided hose, 4.0 OD, 23.45" long
100006289	Short stub braided hose, .75 OD, 40" long	100006333	Long stub braided hose, 4.0 OD, 43.45" long
100006290	Short stub braided hose, 1.0 OD, 10" long	10023100CR075	Concentric Reducer 1.0 X .75
100006291	Short stub braided hose, 1.0 OD, 20" long	10023100RT050	Reducing Tee, O.D. 1.0 X .50
100006292	Short stub braided hose, 1.0 OD, 40" long	10023100RT075	Reducing Tee, O.D. 1.0 X .75
100006293	Short stub braided hose, 1.5 OD, 10" long	10023150CR075	Concentric Reducer 1.5 X .75
100006294	Short stub braided hose, 1.5 OD, 20" long	10023150RT050	Reducing Tee, O.D. 1.5 X .50
100006295	Short stub braided hose, 1.5 OD, 40" long	10023150RT075	Reducing Tee, O.D. 1.5 X .75
100006296	Short stub braided hose, 2.0 OD, 10.25" long	10023150RT100	Reducing Tee, O.D. 1.5 X 1.0
100006297	Short stub braided hose, 2.0 OD, 20.25" long	10023200CR100	Concentric Reducer 2.0 X 1.0
100006298	Short stub braided hose, 2.0 OD, 40.25" long	10023200CR150	Concentric Reducer 2.0 X 1.5
100006299	Short stub braided hose, 2.5 OD, 10.25" long	10023200RT050	Reducing Tee, O.D. 2.0 X .50
100006300	Short stub braided hose, 2.5 OD, 20.25" long	10023200RT075	Reducing Tee, O.D. 2.0 X .75
100006301	Short stub braided hose, 2.5 OD, 40.25" long	10023200RT100	Reducing Tee, O.D. 2.0 X 2.0
100006302	Short stub braided hose, 3.0 OD, 10.25" long	10023200RT150	Reducing Tee, O.D. 2.0 X 1.5
100006303	Short stub braided hose, 3.0 OD, 20.25" long	10023250CR150	Concentric Reducer 2.5 X 1.5
100006304	Short stub braided hose, 3.0 OD, 40.25" long	10023250CR200	Concentric Reducer 2.5 X 2.0
100006305	Short stub braided hose, 4.0 OD, 10.25" long	10023250RT075	Reducing Tee, O.D. 2.5 X .75
100006306	Short stub braided hose, 4.0 OD, 20.25" long	10023250RT150	Reducing Tee, O.D. 2.5 X 1.5
100006307	Short stub braided hose, 4.0 OD, 40.25" long	10023250RT200	Reducing Tee, O.D. 2.5 X 2.0
100006313	Long stub braided hose, .75 OD, 10.50" long	10023300CR150	Concentric Reducer 3.0 X 1.5
100006314	Long stub braided hose, .75 OD, 20.50" long	10023300CR200	Concentric Reducer 3.0 X 2.0
100006315	Long stub braided hose, .75 OD, 40.50" long	10023300CR250	Concentric Reducer 3.0 X 2.5
100006316	Long stub braided hose, 1.0 OD, 12" long	10023300RT075	Reducing Tee, O.D. 3.0 X .75
100006317	Long stub braided hose, 1.0 OD, 22" long	10023300RT150	Reducing Tee, O.D. 3.0 X 1.5
100006318	Long stub braided hose, 1.0 OD, 42" long	10023300RT200	Reducing Tee, O.D. 3.0 X 2.0
100006319	Long stub braided hose, 1.5 OD, 12" long	10023300RT250	Reducing Tee, O.D. 3.0 X 2.5
100006320	Long stub braided hose, 1.5 OD, 22" long	10023400CR200	Concentric Reducer 4.0 X 2.0
100006321	Long stub braided hose, 1.5 OD, 42" long	10023400CR250	Concentric Reducer 4.0 X 2.5
100006322	Long stub braided hose, 2.0 OD, 12.25" long	10023400CR300	Concentric Reducer 4.0 x 3.0
100006323	Long stub braided hose, 2.0 OD, 22.25" long	10023400RT075	Reducing Tee, O.D. 4.0 X .75
100006324	Long stub braided hose, 2.0 OD, 42.25" long	10023400RT150	Reducing Tee, O.D. 4.0 X 1.57
		1002345050	45 Deg. Elbow, O.D. .50
		1002345050MP	45 Deg. Elbow, O.D. .50, mech. pol.

1002345075 45 Deg. Elbow, O.D. .75
1002345075MP 45 Deg. Elbow, O.D. .75, mech. pol.
1002345100 45 Deg. Elbow, O.D. 1.00
1002345100MP 45 Deg. Elbow, O.D. 1.00, mech. pol.
1002345150 45 Deg. Elbow, O.D. 1.50
1002345150MP 45 Deg. Elbow, O.D. 1.50, mech. pol.
1002345200 45 Deg. Elbow, O.D. 2.00
1002345200MP 45 Deg. Elbow, O.D. 2.00, mech. pol.
1002345250 45 Deg. Elbow, O.D. 2.50
1002345250MP 45 Deg. Elbow, O.D. 2.50, mech. pol.
1002345300 45 Deg. Elbow, O.D. 3.00
1002345300MP 45 Deg. Elbow, O.D. 3.00, mech. pol.
1002345400 45 Deg. Elbow, O.D. 4.00, .083" wall
1002345400MP 45 Deg. Elbow, O.D. 4.00, .083" wall, mech. pol.
1002345401 45 Deg. Elbow, O.D. 4.00, .065" wall
1002345401MP 45 Deg. Elbow, O.D. 4.00, .065" wall, mech. pol.
1002345600 45 Deg. Elbow, O.D. 6.00
1002345600MP 45 Deg. Elbow, O.D. 6.00

1002345WT100 45 Deg. Elbow, O.D. 1.00 with tangents
1002345WT100MP 45 Deg. Elbow, O.D. 1.00 with tangents, mech. pol.
1002345WT150 45 Deg. Elbow, O.D. 1.50 with tangents
1002345WT150MP 45 Deg. Elbow, O.D. 1.50 with tangents, mech. pol.
1002345WT200 45 Deg. Elbow, O.D. 2.00 with tangents
1002345WT200MP 45 Deg. Elbow, O.D. 2.00 with tangents, mech. pol.
1002345WT250 45 Deg. Elbow, O.D. 2.50 with tangents
1002345WT250MP 45 Deg. Elbow, O.D. 2.50 with tangents, mech. pol.
1002345WT300 45 Deg. Elbow, O.D. 3.00 with tangents
1002345WT300MP 45 Deg. Elbow, O.D. 3.00 with tangents, mech. pol.
1002345WT400 45 Deg. Elbow, O.D. 4.00 with tangents, .083" wall
1002345WT400MP 45 Deg. Elbow, O.D. 4.00 with tan, .083" wall, mech pol
1002345WT401 45 Deg. Elbow, O.D. 4.00 with tangents, .065" wall
1002345WT401MP 45 Deg. Elbow, O.D. 4.00 with tan, .065" wall, mech pol
1002345WT600 45 Deg. Elbow, O.D. 6.00 with tangents
1002345WT600MP 45 Deg. Elbow, O.D. 6.00 with tangents, mech. pol.

100234X050 4-Way Cross, O.D. .50
100234X075 4-Way Cross, O.D. .75
100234X100 4-Way Cross, O.D. 1.00
100234X150 4-Way Cross, O.D. 1.50
100234X200 4-Way Cross, O.D. 2.00
100234X250 4-Way Cross, O.D. 2.50
100234X300 4-Way Cross, O.D. 3.00
100234X400 4-Way Cross, O.D. 4.00
100234X600 4-Way Cross, O.D. 6.00

10023600CR300 Concentric Reducer 6.0 x 3.0
10023600CR400 Concentric Reducer 6.0 x 4.0

10023600RT075 Reducing Tee, O.D. 6.0 X .75
10023600RT150 Reducing Tee, O.D. 6.0 X 1.5
10023600RT400 Reducing Tee, O.D. 6.0 X 4.0

1002390050 90 Deg. Elbow, O.D. .50
1002390050MP 90 Deg. Elbow, O.D. .50, mech. pol.
1002390075 90 Deg. Elbow, O.D. .75
1002390075MP 90 Deg. Elbow, O.D. .75, mech. pol.
1002390100 90 Deg. Elbow, O.D. 1.00
1002390100MP 90 Deg. Elbow, O.D. 1.00, mech. pol.
1002390150 90 Deg. Elbow, O.D. 1.50
1002390150MP 90 Deg. Elbow, O.D. 1.50, mech. pol.
1002390200 90 Deg. Elbow, O.D. 2.00
1002390200MP 90 Deg. Elbow, O.D. 2.00, mech. Pol.
1002390250 90 Deg. Elbow, O.D. 2.50
1002390250MP 90 Deg. Elbow, O.D. 2.50, mech. pol.
1002390300 90 Deg. Elbow, O.D. 3.00
1002390300MP 90 Deg. Elbow, O.D. 3.00, mech. pol.
1002390400 90 Deg. Elbow, O.D. 4.00, .083" wall
1002390400MP 90 Deg. Elbow, O.D. 4.00, .083" wall, mech. pol.
1002390401 90 Deg. Elbow, O.D. 4.00, .065" wall
1002390401MP 90 Deg. Elbow, O.D. 4.00, .065" wall, mech. pol.
1002390600 90 Deg. Elbow, O.D. 6.00
1002390600MP 90 Deg. Elbow, O.D. 6.00

1002390WT100 90 Deg. Elbow, O.D. 1.00 with tangents
1002390WT100MP 90 Deg. Elbow, O.D. 1.00 with tangents, mech. pol.
1002390WT150 90 Deg. Elbow, O.D. 1.50 with tangents
1002390WT150MP 90 Deg. Elbow, O.D. 1.50 with tangents, mech. pol.
1002390WT200 90 Deg. Elbow, O.D. 2.00 with tangents
1002390WT200MP 90 Deg. Elbow, O.D. 2.00 with tangents, mech. pol.
1002390WT250 90 Deg. Elbow, O.D. 2.50 with tangents
1002390WT250MP 90 Deg. Elbow, O.D. 2.50 with tangents, mech. pol.
1002390WT300 90 Deg. Elbow, O.D. 3.00 with tangents
1002390WT300MP 90 Deg. Elbow, O.D. 3.00 with tangents, mech. pol.
1002390WT400 90 Deg. Elbow, O.D. 4.00 with tangents, .083" wall
1002390WT400MP 90 Deg. Elbow, O.D. 4.00 with tan, .083" wall, mech pol
1002390WT401 90 Deg. Elbow, O.D. 4.00 with tangents, .065" wall
1002390WT401MP 90 Deg. Elbow, O.D. 4.00 with tan, .065" wall, mech pol
1002390WT600 90 Deg. Elbow, O.D. 6.00 with tangents
1002390WT600MP 90 Deg. Elbow, O.D. 6.00 with tangents, mech. pol.

10023C050 Endcap, O.D. .50
10023C075 Endcap, O.D. .75
10023C100 Endcap, O.D. 1.00
10023C150 Endcap, O.D. 1.50
10023C200 Endcap, O.D. 2.00
10023C250 Endcap, O.D. 2.50
10023C300 Endcap, O.D. 3.00
10023C400 Endcap, O.D. 4.00

10023T050 Tee, O.D. .50
10023T075 Tee, O.D. .75
10023T100 Tee, O.D. 1.00
10023T150 Tee, O.D. 1.50

10023T200	Tee, O.D. 2.00
10023T250	Tee, O.D. 2.50
10023T300	Tee, O.D. 3.00
10023T400	Tee, O.D. 4.00
10023T600	Tee, O.D. 6.00
100314300	Tubing, SS, O.D. .50, per ft
100314300MP	Tubing, SS, O.D. .50, per ft, mech. pol.
100314301	Tubing, SS, O.D. .75, per ft
100314301MP	Tubing, SS, O.D. .75, per ft, mech. pol.
100314303	Tubing, SS, O.D. 1.00, per ft
100314303MP	Tubing, SS, O.D. 1.00, per ft, mech. pol.
100314305	Tubing, SS, O.D. 1.50, per ft
100314305MP	Tubing, SS, O.D. 1.50, per ft, mech. pol.
100314306	Tubing, SS, O.D. 2.00, per ft
100314306MP	Tubing, SS, O.D. 2.00, per ft, mech. pol.
100764506	Tubing, SS, O.D. 2.50, per ft
100764506MP	Tubing, S,O.D. 2.50 per ft, mech. pol.
100764508	Tubing, SS, O.D. 3.00, per ft
100764508MP	Tubing, SS, O.D. 3.00, per ft, mech. pol.
100764510	Tubing, SS, O.D. 4.00, per ft, .065" wall
100764510MP	Tubing, SS, O.D. 4.00, per ft, .065" wall, mech. pol.
100764511	Tubing, SS, O.D. 4.00, per ft, .083" wall
100764511MP	Tubing, SS, O.D. 4.00, per ft, .083" wall, mech. pol.
100764516	Tubing, SS, O.D. 6.00, per ft
100764516MP	Tubing, SS, O.D. 6.00, per ft, mech. pol.
100764520	Tubing, SS, O.D. 8.00, per ft
100764520MP	Tubing, SS, O.D. 8.00, per ft, mech. pol.
100764525	Tubing, SS, O.D. 10.00, per ft
100764525MP	Tubing, SS, O.D. 10.00, per ft, mech. pol.



MKS Instruments HPS™ Products

Providing Process Solutions

HPS™ Products are a line of vacuum components, valves and gauges. Some of the many applications where HPS™ Products are used include: manufacturing of semiconductors, flat panel displays, high-energy research laboratories, light bulb manufacturing, pharmaceutical processes, and automotive component manufacturing.

Vacuum Gauges

- High Vacuum Gauges - measurement range of 10^{-2} to 10^{-11} Torr
 - Cold Cathode - Series 943, Series 941 and Series 937 Gauge Controllers, Series 421 and I-Mag™ Sensors, Series 903 Transducer
 - Hot Cathode - Series 919 Gauge System
- Medium Vacuum Gauges - measurement range of Atmosphere to 10^{-3} Torr
 - Standard Pirani - Series 945 and Series 917 Gauge Controllers, Series 315 and Series 345 Sensors, Series 325 MODUCELL® Transducer
 - Convection-Enhanced Pirani - Series 947 Controller, Series 317 Sensor, Series 907 ACT Transducer

Vacuum Valves

- Vacuum Poppet Valves - Sizes $\frac{1}{2}$ " to 6", angle, inline, manual, pneumatic and electropneumatic models available
- Multiple Stage Valves - Slows system evacuation, reducing turbulence and abrupt pressure change
- Gauge Isolation Valves - Cv™ Valve and IDA™ Valve
- Specialty Valves - VACUUM SENTRY® and AUTO-SOFT®

Sublimation Traps

A line of specialty components that removes process by-products from the vacuum system, preventing contamination and product damage.

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The Series 45 line of high-quality heater jackets consistently elevate the process system temperature, while remaining cool to the touch on the outside.

Vacuum Fittings

- Series 31 ISO-KF, sizes NW 10 to NW 100 ($\frac{1}{2}$ " to 4")
- Series 76 ISO-Universal Components, sizes NW 63 to NW 630 ($2\frac{1}{2}$ " to 25")
- Series 88 CF Components, sizes $1\frac{1}{3}$ " to 10" (34 -254 mm) for use down to 10^{-13} Torr



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