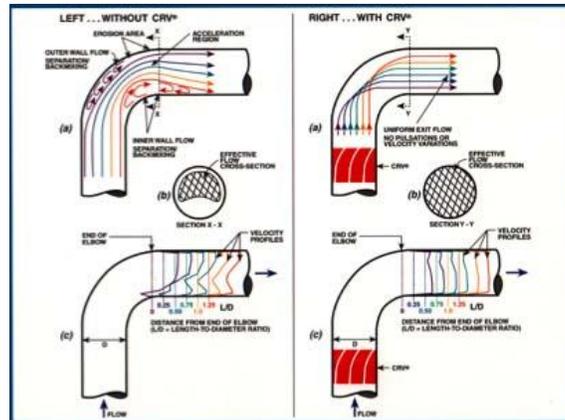


Cheng Fluid Systems, Inc.



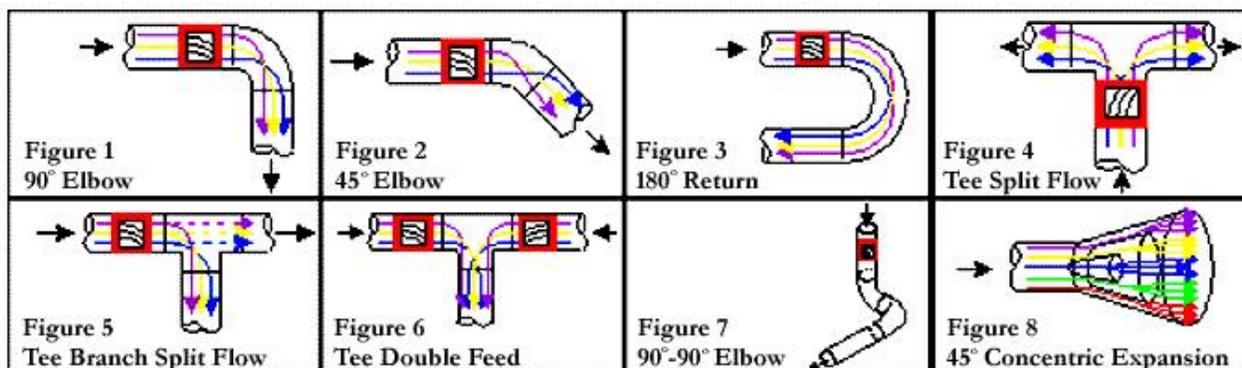
CRV® Cheng Rotation Vane: Design & Installation Guide

The CRV® consists of a set of stationary vanes in a cylindrical body which is placed immediately upstream of an elbow or tee in a piping system. The CRV® imparts to the fluid (gas or liquid) a gyroscopic motion, which counteracts the elbow induced gyroscopic motion, & enables the fluid to negotiate the turn through the elbow in a flat uniform flow across the entire cross sectional area of the pipe. With this arrangement there will be a uniform velocity profile with no downstream residual rotation.



A CRV® installed close to: pumps, compressors, check valves, control valves, flow measurement equipment, elbow erosion/noise, water hammer, condensers, exhaust section, chemical processing, and heat exchangers, will have better performance results, reliability/efficiency of any downstream equipment and will improve maintenance down times & energy costs will be reduced.

The CRV® has a significant market and a wide range of applications, from fuel systems in aircraft, automobiles, refineries, pump, power, oil, mining, nuclear, gas, large industrial and utility complexes, such as chemical processing, power plants and water distribution utilities.



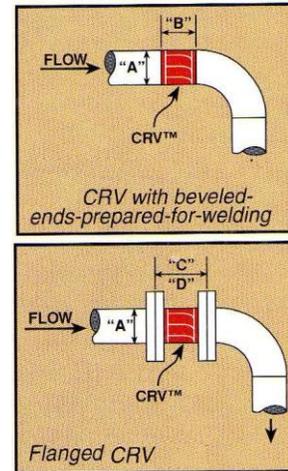
Materials of Construction: The CRV® can be manufactured from most commercially available materials, pipe diameters, pipe schedules and end connections. Special internal coatings and finishes are also available.



Dimensions: CRV[®] unit dimensions in 2-12" sizes are shown in Table 1.

TABLE 1

Nominal Pipe Diameter	CRV [™] Units		
	With Beveled-Ends-Prepared-for-Welding	With 150# RFSO Flanges	With 150# RFWN Flanges
"A"	"B"	"C"	"D"
2"	2.00"	2.5"	7.00"
3"	3.00"	3.75"	8.50"
4"	4.00"	4.75"	10.00"
6"	6.00"	6.75"	13.00"
8"	8.00"	8.75"	16.00"
10"	10.00"	10.75"	18.00"
12"	12.00"	12.75"	21.00"
≥14"	Consult Factory		



Pipe Fitting Geometry: When specifying a CRV[®], it is critical that the CRV[®] matches the geometry of the fitting to which it will be attached. The fitting schedule (wall thickness) and type of fitting must be specified. In order to assist you in proper specification of your fitting, the following nomenclature and dimensions are noted for common fittings in Table 2.

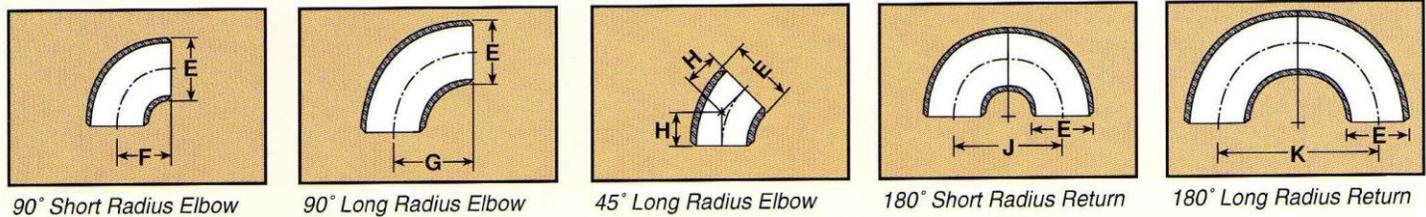


TABLE 2

Nominal Pipe Size	Outside Pipe Diameter	90° Elbow		45° Elbow	180° Return	
		Short Radius	Long Radius	Long Radius	Short Radius	Long Radius
	"E"	"F"	"G"	"H"	"J"	"K"
2"	2.375"	2"	3.0"	1.375"	4"	6"
3"	3.500"	3"	4.5"	2.000"	6"	9"
4"	4.500"	4"	6.0"	2.500"	8"	12"
6"	6.625"	6"	9.0"	3.750"	12"	18"
8"	8.625"	8"	12.0"	5.000"	16"	24"
10"	10.750"	10"	15.0"	6.250"	20"	30"
12"	12.750"	12"	18.0"	7.500"	24"	36"
≥14"	Consult Factory					

CFS is dedicated to solving our customer's fluid flow problems by using our technology and experience, along with our patented product, the Cheng Rotation Vane (CRV[®]).

Cheng Fluid systems, Inc. Reserves the right to modify dimensions, materials, or design to ensure ideal performance of CRV[®].

