



## World Class Clampseal® Throttling Valves

- *Replaceable Seat/Venturi*
- *Low Velocity Across Main Seat*
- *Precise Flow Control*
- *Pressure Seal Bonnet*



**Conval Clampseal® Throttling Valves are designed for a wide range of severe service applications requiring repeatable flow control and dependable shutoff.**



**STANDARD SIZES**

1/2" through 4"

**PRESSURE RATING**

ASME Class 900 through 4095

**STANDARD MATERIALS**

Forged Alloy Steel 182 F22

Other materials available upon request

**STANDARD ACCESSORIES**

Actuators - Air, Motor, Hydraulic



**DESIGN FEATURES**

***Replaceable 4400 Stainless Steel Seat/Venturi***

The venturi is an integral part of the removable seat. It is readily changed in-line should different flow characteristics be required or replacement be necessary from excessive wear. The orifice is sized to keep fluid velocity across the seat below damaging levels. The exit orifice angle is designed to minimize down stream piping erosion and noise. Several erosion-resistant materials are available. Consult factory.

***Position Indicator***

The position indicator is easy to read and an accurate indication of valve stem position.

***Axially-loaded Packing System***

The packing is uniformly axially loaded. The bonnet cartridge packing chamber with a secure leakproof bonnet allows rapid access to valve trim for ease of inspection and maintenance.

***Mated Stem Assembly***

The stem assembly is mated to the orifice for proper control. Like the orifice seat assembly, it is readily changeable should different flow characteristics be required or excessive erosion or corrosion be a problem.

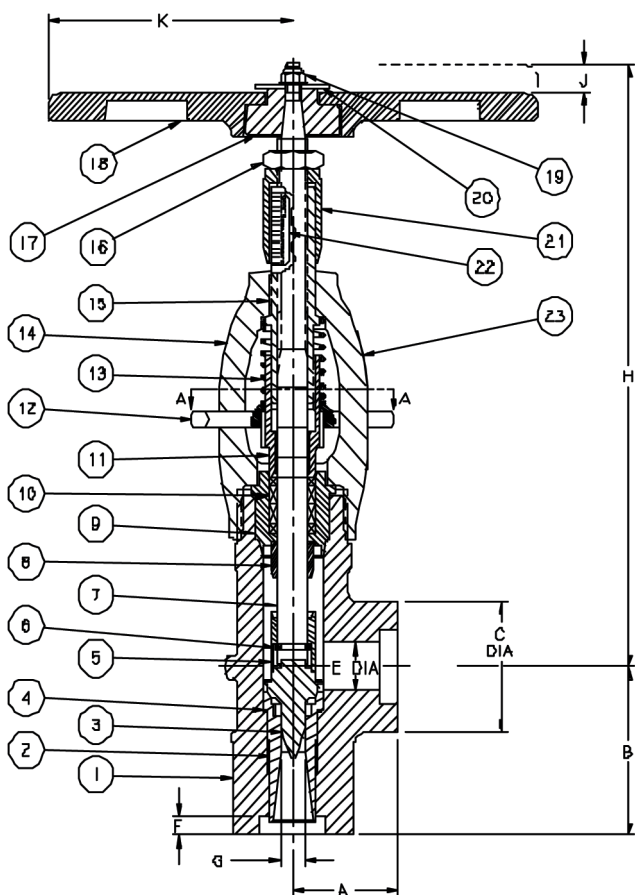
***Pressure Seal Bonnet***

A secure, leakproof bonnet allows rapid access to valve trim for inspection and maintenance. The pressure boundary is sealed at the smallest diameter possible to ensure maximum sealing capability.

***Two-Year Warranty***

Conval is committed to unsurpassed quality. We are so confident of the quality of our product, that we offer a two-year warranty.

Clampseal® Throttling Valves is a registered trademark of Conval, Inc.



## LIST OF MATERIALS

NO.	NAME	QTY	MATERIAL	SPECIFICATIONS
1	BODY	1	*FORGED ALLOY STEEL	SA182 F22
2	SEAT/ORIFICE	1	STAINLESS 440C	AMS 5352
3	NEEDLE DISC	1	STELLITE NO. 6	AMS 5387
4	O-RING	1	STAINLESS	MFR. STD.
5	RETAINER	1	STAINLESS	ASTM A582-416
6	SPLIT RING	2	STAINLESS	ASME SA479-316
7	STEM	1	STAINLESS	ASTM A 582-416
8	BACKSEAT	1	NITRONIC 60	ASME SA479 UNS S 21800
9	BONNET CHAMBER	1	STAINLESS	ASME SA479-410
10	PACKING RING	2	END/WIPER RINGS	BRAIDED CARBON YARN
		2	DIE FORMED RINGS	FLEXIBLE GRAPHITE
11	GLAND	1	STAINLESS	ATSTM A582-416
12	IGW	1	CAST STAINLESS	AMS 5360
13	SPRING	1	STAINLESS	MFR. STD.
14	YOKE	1	*FORGED ALLOY STEEL	SA 182 F22
15	YOKE BUSHING	1	ALUMINUM BRONZE	ASME SB-150 UNS C64200
16	CHECK NUT	1	STEEL	MFR. STD.
17	ADAPTER	1	MALLEABLE IRON	ASTM A47 GR. 32510
18	HANDLE	1	MALLEABLE IRON	ASTM A47 GR. 32510
19	LOCKNUT	1	STEEL	MFR. STD.
20	WASHER	1	STEEL	MFR. STD.
21	INDICATOR SLEEVE	1	STEEL	MFR. STD.
22	INDICATOR TAG	1	ALUMINUM	MFR. STD.
23	I.D. PLATE	1	STAINLESS	ASME SA240-304
24	CLAMPBOLT	1	STAINLESS	MFR. STD.

\* A105, and SA 182 F3 16 Material combinations available upon request.

## DIMENSIONS

PRESSURE CLASS	Size Code	Pipe Size	A	B	C	D	E	Wgt	
900	5E	1/2	2 5/16	4	3 5/16	9 3/4	8	13	
		15	59	100	84	248	200	59	
	5E	3/4	2 5/16	4	3 5/16	9 3/4	8	13	
		20	59	100	84	248	200	59	
	5E	1	2 5/16	4	3 5/16	9 3/4	8	13	
		25	59	100	84	248	200	59	
	7G	1	2 3/4	4 1/4	3 1/4	13 3/8	12	26	
		25	70	108	88	340	300	118	
	7G	1 1/4	2 3/4	4 1/4	3 1/4	13 3/8	12	26	
		32	70	108	88	340	300	118	
	INTERMEDIATE	7G	1 1/2	2 3/4	4 1/4	3 1/4	13 3/8	12	26
			40	70	108	88	340	300	118
1155	7G	2	2 3/4	4 1/4	3 1/4	13 3/8	12	26	
		50	70	108	88	340	300	118	
	8H	2	3	4 1/2	3 15/16	15 1/8	12	40	
		50	80	114	100	384	300	182	
	8H	2 1/2	3	4 1/2	3 15/16	15 1/8	12	40	
		65	80	114	100	384	300	182	
10K	3	5	6	4 7/8	18 5/8	18	86		
	80	125	152	124	473	450	390		
10K	4	5	6	4 7/8	18 5/8	18	86		
	100	125	152	124	473	450	390		
1500	5E	1/2	2 5/16	4	3 5/16	9 3/4	8	13	
		15	59	100	84	248	200	59	
	5E	3/4	2 5/16	4	3 5/16	9 3/4	8	13	
		20	59	100	84	248	200	59	
	5E	1	2 5/16	4	3 5/16	9 3/4	8	13	
		25	59	100	84	248	200	59	
	7G	1	2 3/4	4 1/4	3 1/4	13 3/8	12	26	
		25	70	108	88	340	300	118	
	7G	1 1/4	2 3/4	4 1/4	3 1/4	13 3/8	12	26	
		32	70	108	88	340	300	118	
	8H	1 1/4	3	4 1/2	3 15/16	15 1/8	12	40	
		32	80	115	100	384	300	182	
INTERMEDIATE	7G	1 1/2	2 3/4	4 1/4	3 1/4	13 3/8	12	26	
		40	70	108	88	340	300	118	
2155	8H	1 1/2	3	4 1/2	4 7/8	15 1/8	12	40	
		40	80	115	124	384	300	182	
	8H	2	3	4 1/2	4 7/8	15 1/8	12	40	
		50	80	115	124	384	300	182	
	10K	2 1/2	5	6	4 7/8	18 5/8	18	86	
		65	125	150	124	473	450	390	
10K	3	5	6	4 7/8	18 5/8	18	86		
	80	125	150	124	473	450	390		
10K	4	5	6	4 7/8	18 5/8	18	86		
	100	125	150	124	473	450	390		
2500	5E	1/2	2 5/16	4	3 5/16	9 3/4	8	13	
		15	59	100	84	248	200	59	
	5E	3/4	2 5/16	4	3 5/16	9 3/4	8	13	
		20	59	100	84	248	200	59	
	5E	1	2 5/16	4	3 5/16	9 3/4	8	13	
		25	59	100	84	248	200	59	
	7G	1 1/4	2 3/4	4 1/4	3 1/4	13 3/8	12	26	
		32	70	108	88	340	300	118	
	8H	1 1/4	3	4 1/2	3 15/16	15 1/8	12	40	
		32	80	115	100	384	300	182	
	INTERMEDIATE	7G	1 1/2	2 3/4	4 1/4	3 1/4	13 3/8	12	26
			40	70	115	88	340	300	118
3045	8H	1 1/2	3	4 1/2	3 15/16	15 1/8	12	40	
		40	80	115	100	384	300	182	
	8H	2	3	4 1/2	3 15/16	15 1/8	12	40	
		50	80	115	100	384	300	182	
	10K	2	5	6	4 7/8	18 5/8	18	86	
		50	125	150	124	473	450	390	
10K	2 1/2	5	6	4 7/8	18 5/8	18	86		
	65	125	150	124	473	450	390		
10K	3	5	6	4 7/8	18 5/8	18	86		
	80	125	150	124	473	450	390		

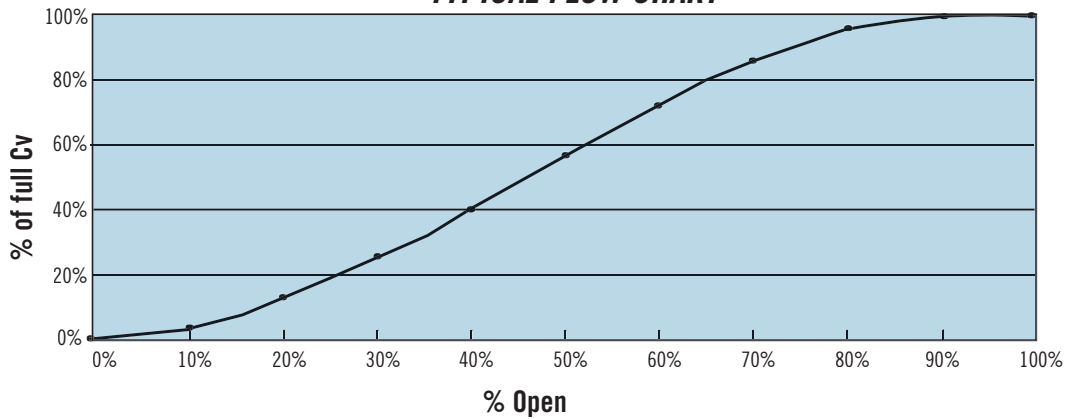
\* Socket Weld dimensions shown; Consult factory for Butt Weld dimensions.

Numbers shown in Black indicate dimensions in inches, weight in pounds. Numbers shown in blue indicate dimensions in mm, weights in kilograms.

Butt Weld dimensions determined by pipe schedule.

NOTE: All weights are approximate for shipping purposes only.

### TYPICAL FLOW CHART



### SPECIFICATIONS

Size Code Fig. No.	Pipe Size (Inches)	Cv														Wt. (lbs.)	
		Standard Orifice Size															
		1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	13/16	7/8	15/16	1	
5E	1/2 3/4 1	0.3	0.6	1.1	-	-	-	-	-	-	-	-	-	-	-	-	12
7G	1 1 1/4 1 1/2 2	-	-	1.1	1.7	2.5	3.3	4.3	5	-	-	-	-	-	-	-	26
8H	1 1/4 1 1/2 2	-	-	-	-	-	3.5	4.6	6	7	9	10	-	-	-	-	40
10K	2 2 1/2 3 4	-	-	-	-	-	-	-	6	7	9	10	12	14	16	19	86

-Socket Weld Specifications Shown. Butt Weld Available. Other orifices available upon request.

Size Code Fig. No.	Pipe Size (mm)	Cv														Wt. (kg.)	
		Standard Orifice Size															
		3	5	6	8	10	11	13	14	16	17	19	21	22	24	25	
5E	13 19 25	0.3	0.6	1.1	-	-	-	-	-	-	-	-	-	-	-	-	5.4
7G	25 32 38 51	-	-	1.1	1.7	2.5	3.3	4.3	5	-	-	-	-	-	-	-	11.8
8H	32 38 51	-	-	-	-	-	3.3	4.6	6	7	9	10	-	-	-	-	18.2
10K	51 64 76 102	-	-	-	-	-	-	-	6	7	9	10	12	14	16	19	39.0

**Example:**

Given:

Steam  
 P1 = 1000 (psi) Super heat = 105(F deg)  
 P2 = 800 (psi)  
 T = 650 (deg.F)  
 Flow Rate = 20,000 (lbs/hr)

- 1) Calculate outlet pressure as % of inlet pressure

Since outlet pressure is greater than 55% of inlet pressure, we must multiply capacity by the correction factor. From the curve, the correction factor = .85.

$$.85 (20,000) = 17,000 \text{ (lbs/hr)}$$

- 2) If steam is super heated, adjust capacity.

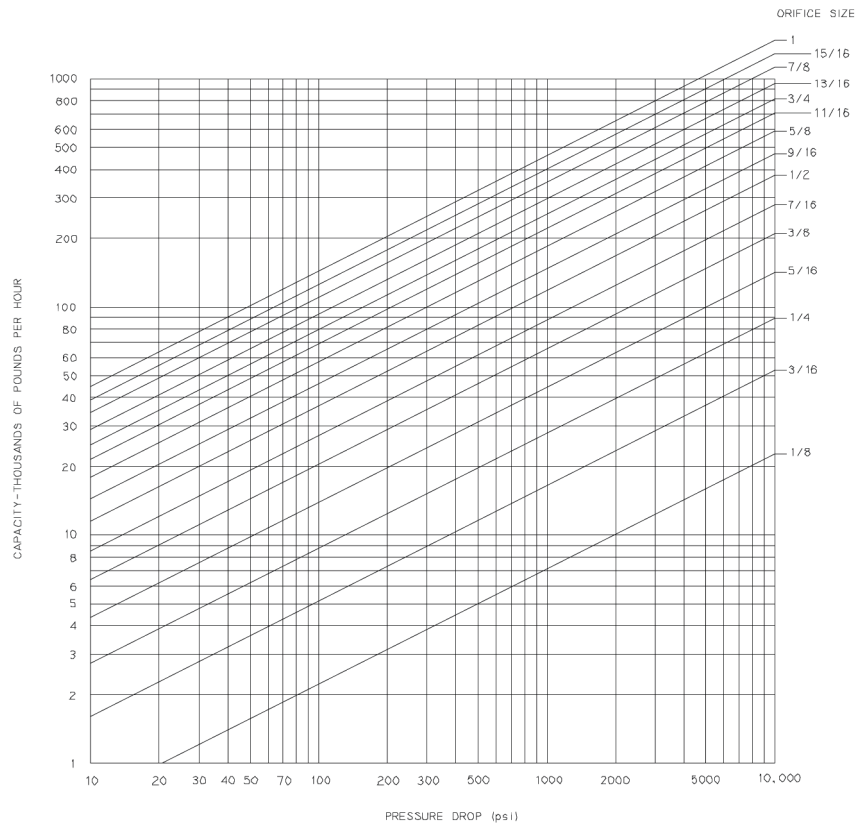
For 105 (F deg) Super Heated Steam:  
 Capacity = 17,000 [1 + .00065(105)] = 18,160 (lbs/hr)

- 3) Size Orifice from chart above using:

Inlet Pressure = 1,000 (psi)  
 Flow Rate = 18,160 (lbs/hr)

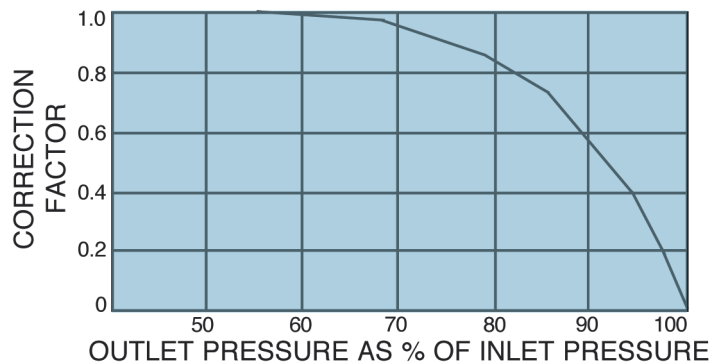
Find the intersection point on chart. Correct orifice size is directly above and to the left of the intersection point. In this case we would use an 11/16" orifice. Adjust for superheat conditions by multiplying the required flow rate by (1 + .00065 x degrees superheat) prior to cross referencing.

**Saturated Steam**



**Correction Factor**

If outlet pressure is greater than 55% of the inlet pressure, multiply capacity by the correction factor below:



**Example:**

Given:

Water

P1 = 1000 (psi)

$\Delta P = 1000$  (psi)

T = 350 (deg.F)

Flow Rate = 10,000 (lbs/hr)

Vapor Pressure = 135 (psi)

- 1) Since  $T > 300$ , we must use a corrected max. pressure drop.

$$\Delta P = .9 \times (1000 - .83 \times 135)$$

$$\Delta P = 799.155$$

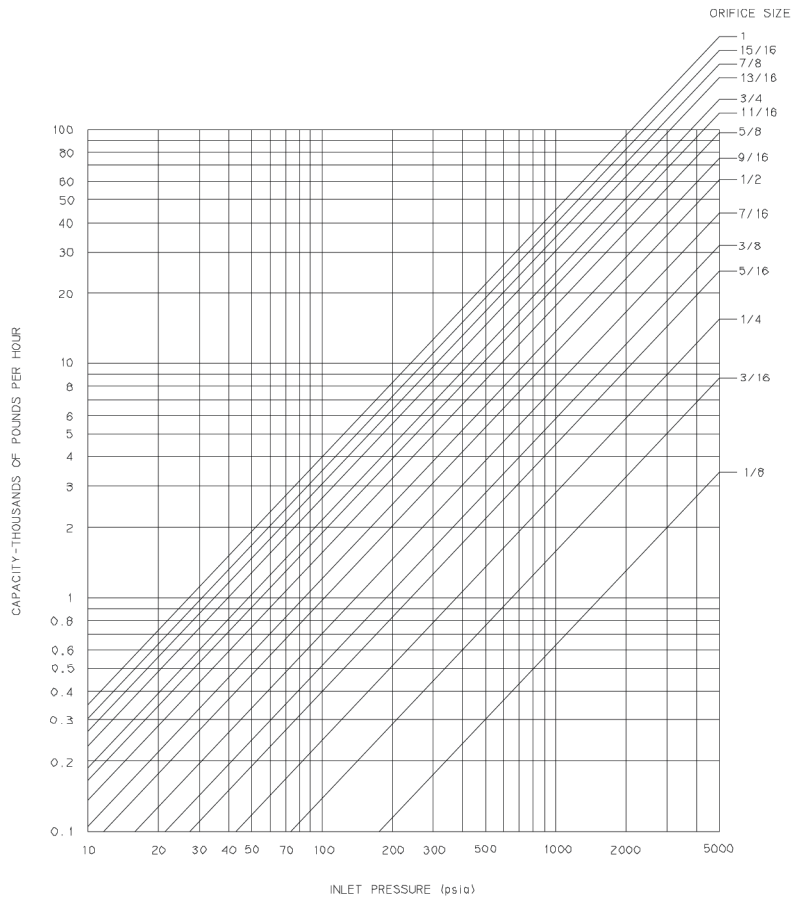
- 2) Size orifice from chart using:

$$\Delta P = 799.155$$

Flow Rate = 10,000

Find the intersection point on the chart. Correct orifice size is directly above and to the left of the intersection point. In this case we would use a 3/16" orifice.

**Liquid**



**Correction Factor**

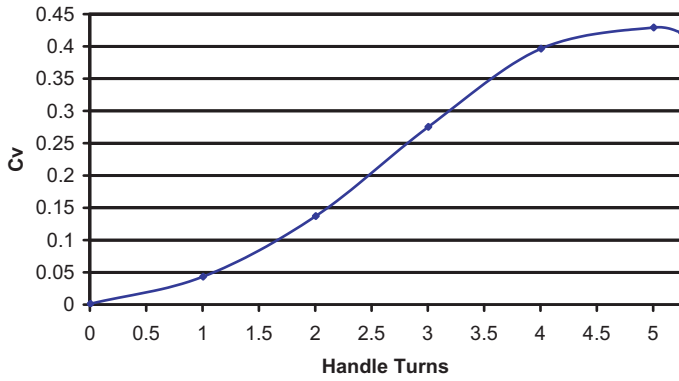
If temperature is greater than 300°F choked flow may occur. Therefore the maximum pressure drop used for sizing is given by:

$$P = .9 (P1 - .83 \times Pv)$$

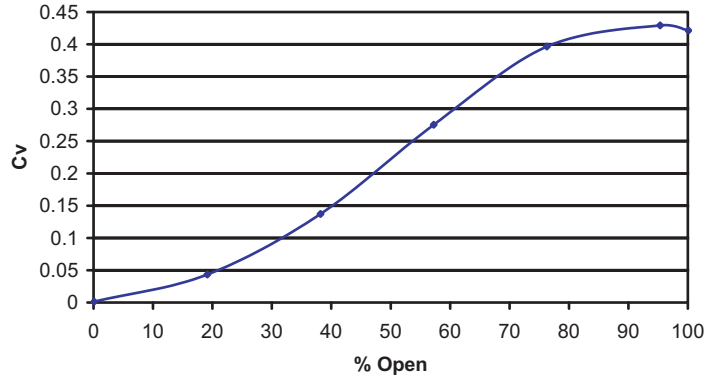
Where P1 = inlet pressure

Pv = vapor pressure

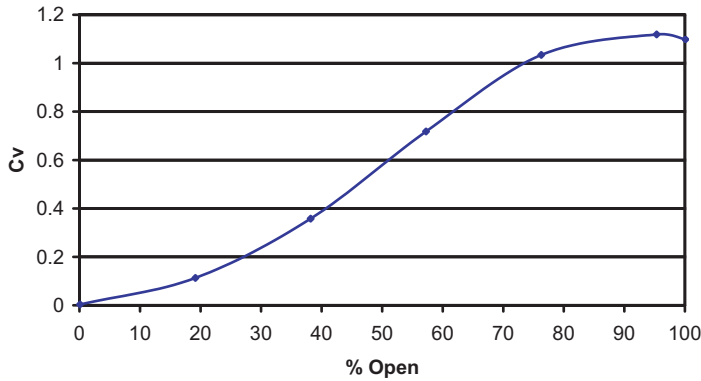
**Cv vs Handle Turns for a 5E Throttle Valve with 1/8" Orifice**



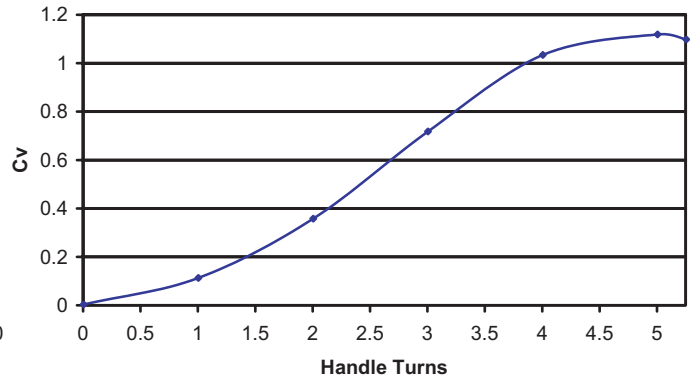
**Cv vs % Open for a 5E Throttle Valve with 1/8" Orifice**



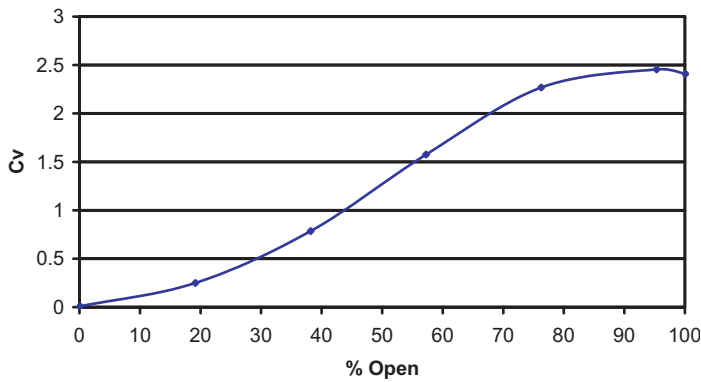
**Cv vs % Open for a 5E Throttle Valve with 3/16" Orifice**



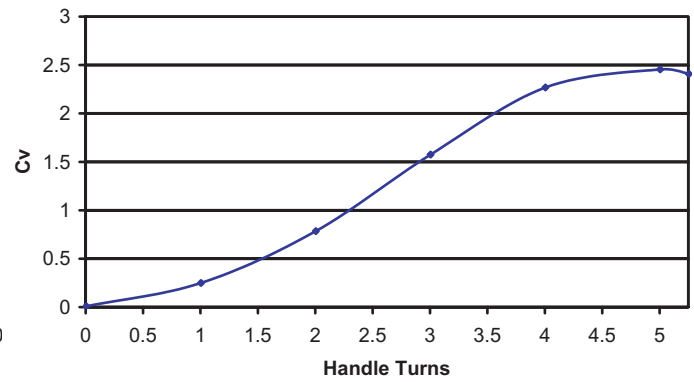
**Cv vs Handle Turns for a 5E Throttle Valve with 3/16" Orifice**



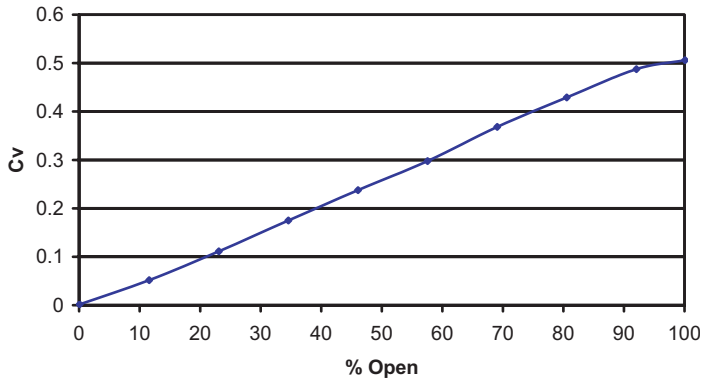
**Cv vs % Open for a 5E Throttle Valve with 1/4" Orifice**



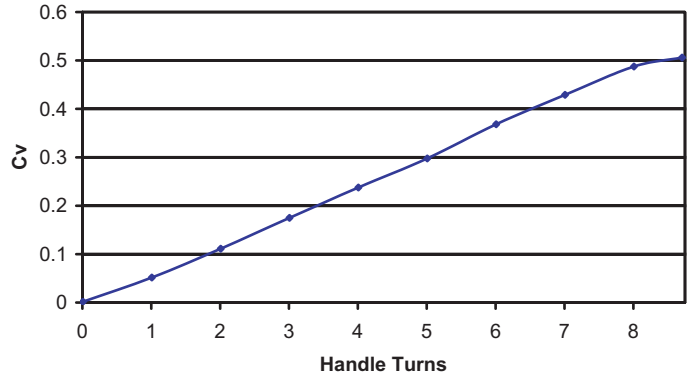
**Cv vs Handle Turns for a 5E Throttle Valve with 1/4" Orifice**



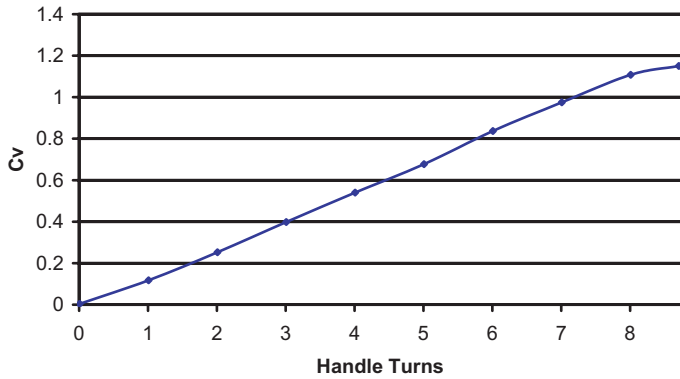
**Cv vs % Open for a 7G Throttle Valve with 1/8" Orifice**



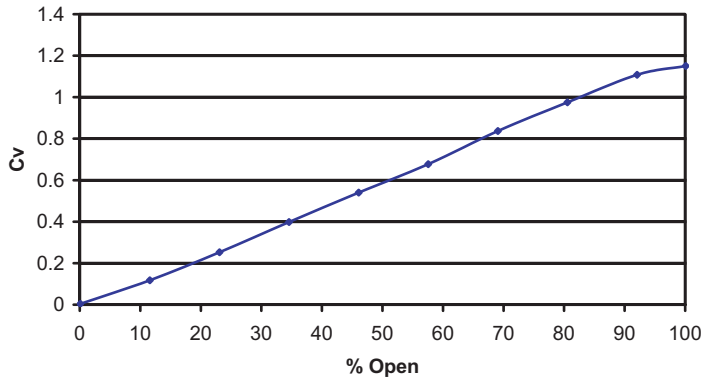
**Cv vs Handle Turns for a 7G Throttle Valve with 1/8" Orifice**



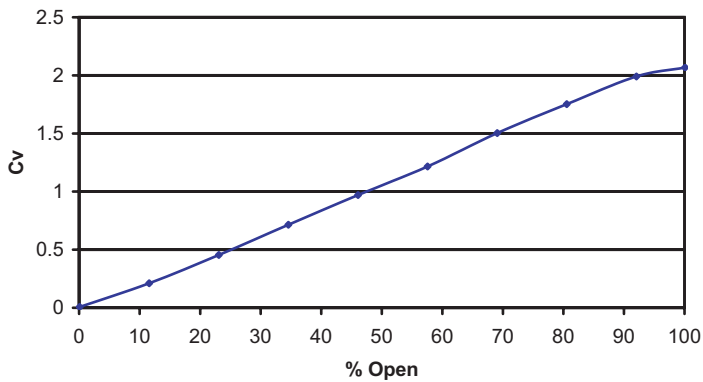
**Cv vs Handle Turns for a 7G Throttle Valve with 3/16" Orifice**



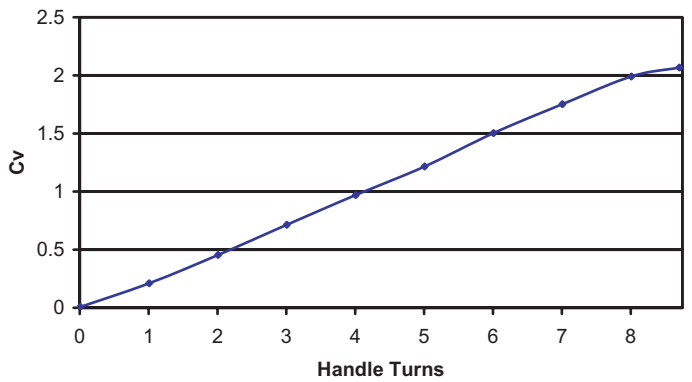
**Cv vs % Open for a 7G Throttle Valve with 3/16" Orifice**



**Cv vs % Open for a 7G Throttle Valve with 1/4" Orifice**

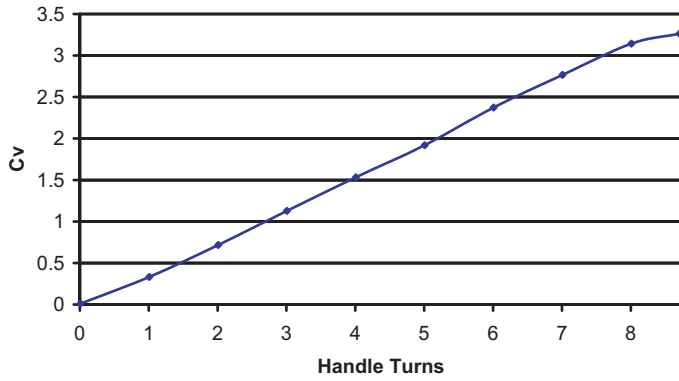


**Cv vs Handle Turns for a 7G Throttle Valve with 1/4" Orifice**

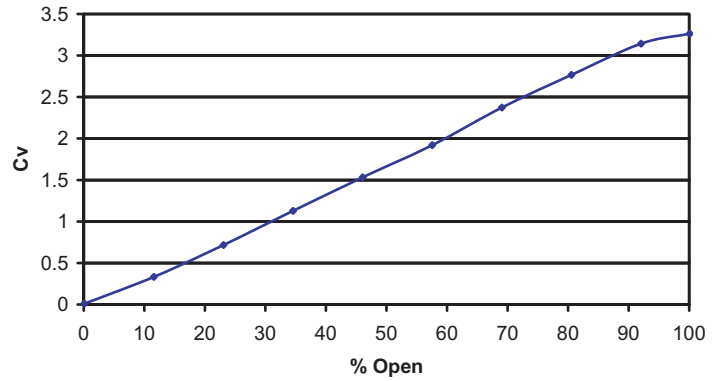




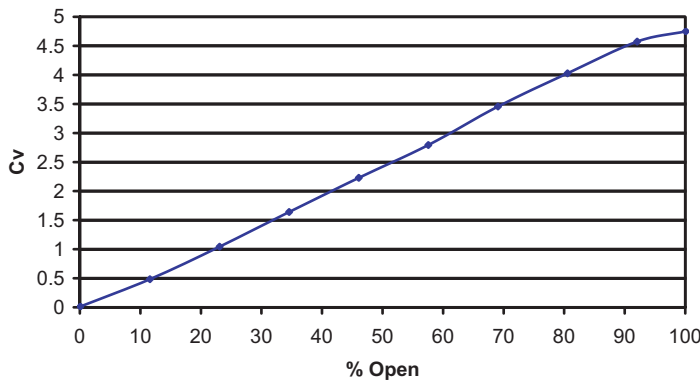
**Cv vs Handle Turns for a 7G Throttle Valve with 5/16" Orifice**



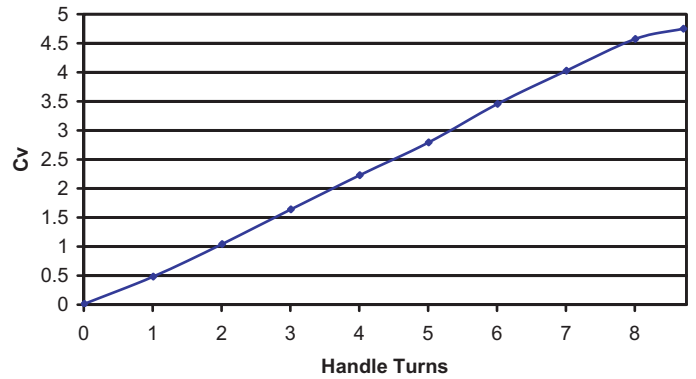
**Cv vs % Open for a 7G Throttle Valve with 5/16" Orifice**



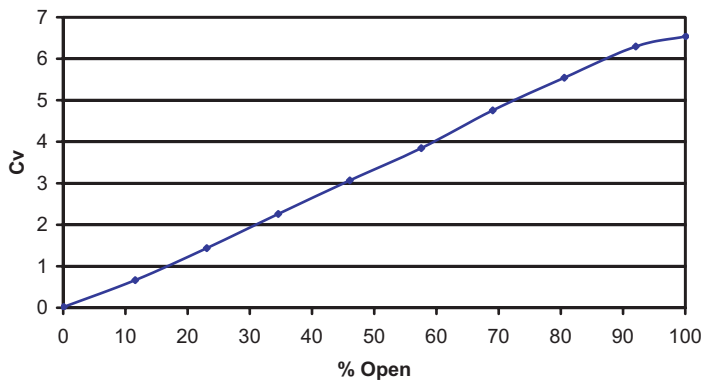
**Cv vs % Open for a 7G Throttle Valve with 3/8" Orifice**



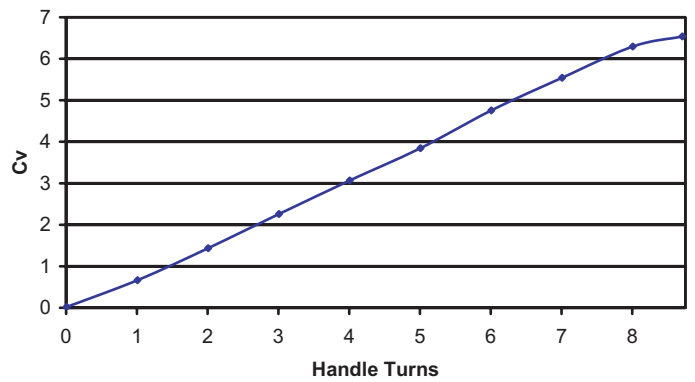
**Cv vs Handle Turns for a 7G Throttle Valve with 3/8" Orifice**



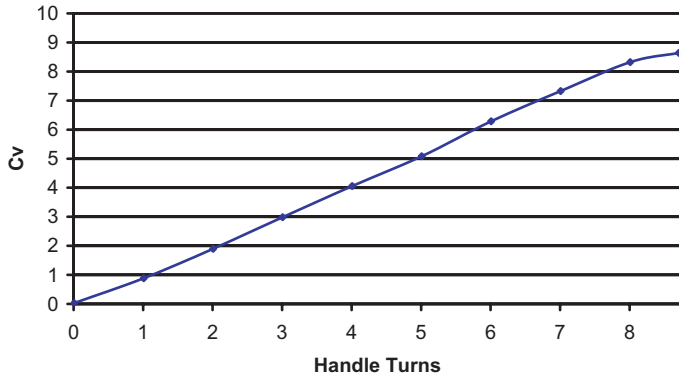
**Cv vs % Open for a 7G Throttle Valve with 7/16" Orifice**



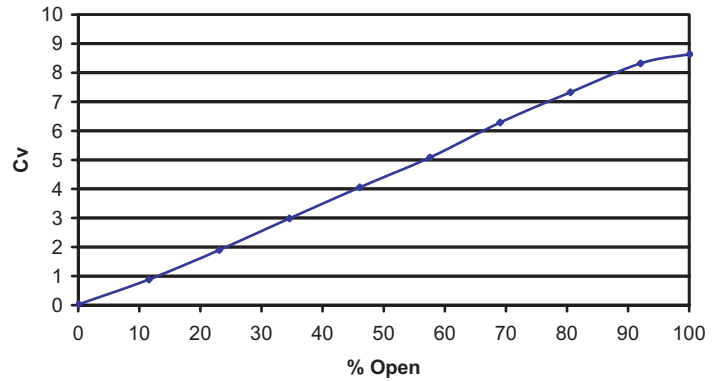
**Cv vs Handle Turns for a 7G Throttle Valve with 7/16" Orifice**



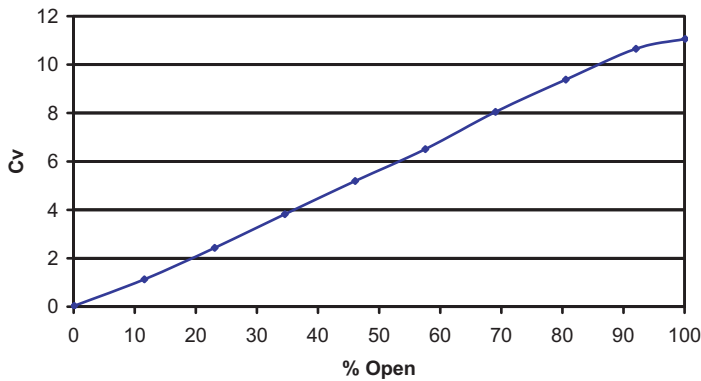
**Cv vs Handle Turns for a 7G Throttle Valve with 1/2" Orifice**



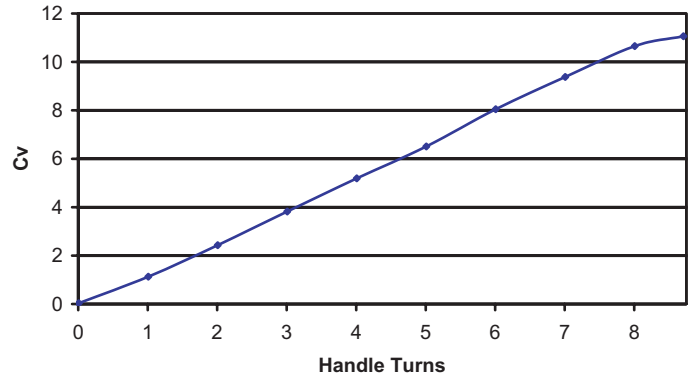
**Cv vs % Open for a 7G Throttle Valve with 1/2" Orifice**



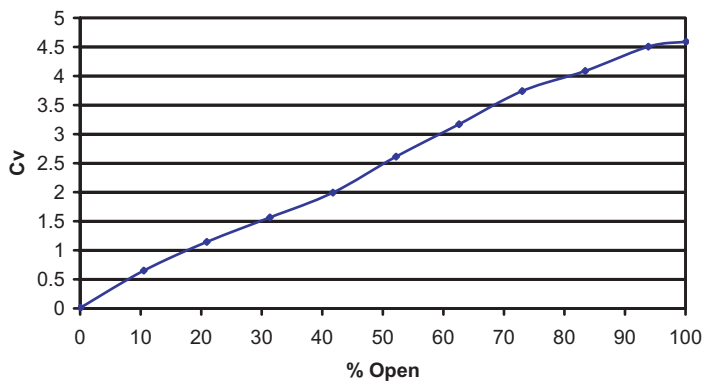
**Cv vs % Open for a 7G Throttle Valve with 9/16" Orifice**



**Cv vs Handle Turns for a 7G Throttle Valve with 9/16" Orifice**



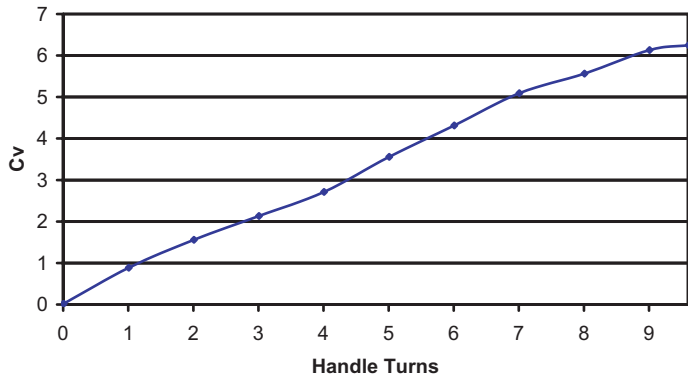
**Cv vs % Open for a 8H Throttle Valve with 3/8" Orifice**



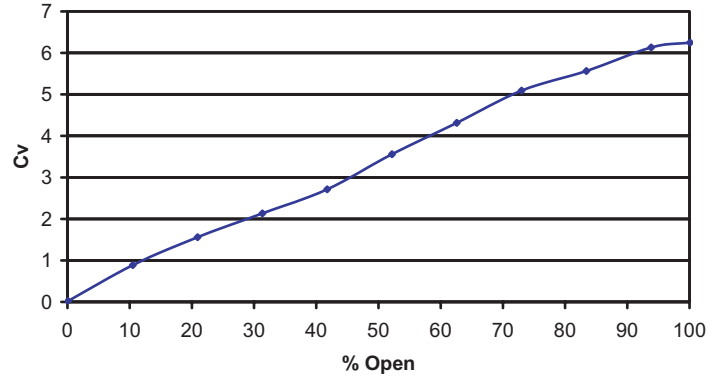
**Cv vs Handle Turns for a 8H Throttle Valve with 3/8" Orifice**



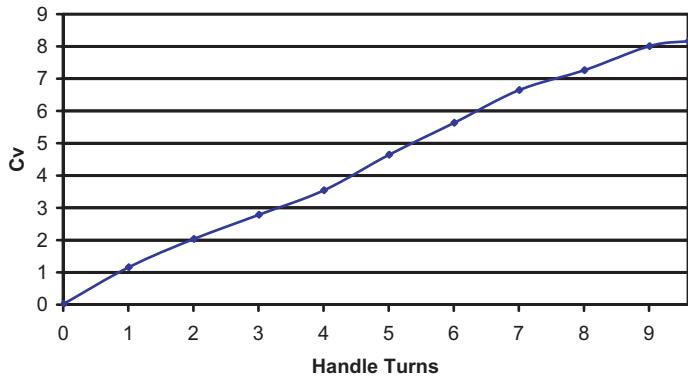
**Cv vs Handle Turns for a 8H Throttle Valve with 7/16" Orifice**



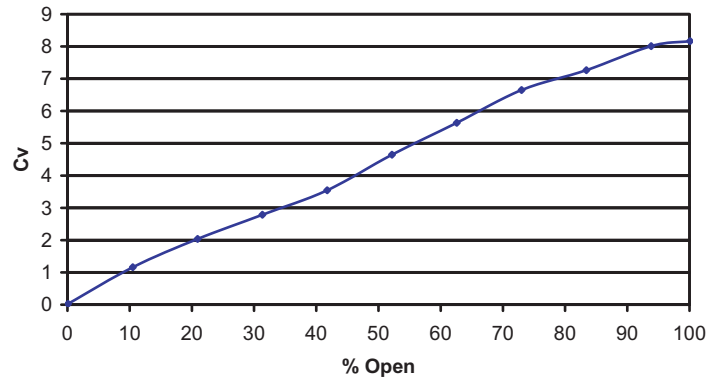
**Cv vs % Open for a 8H Throttle Valve with 7/16" Orifice**



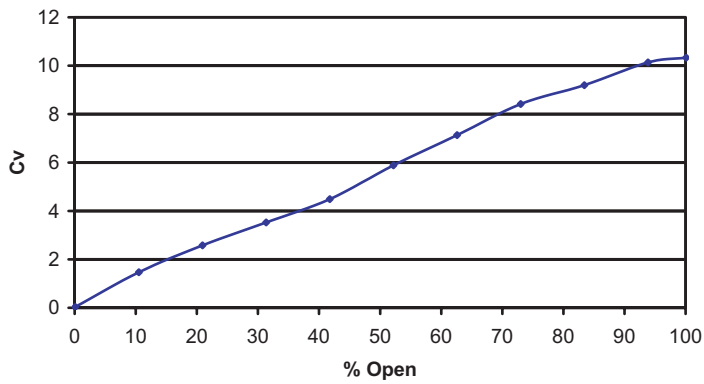
**Cv vs Handle Turns for a 8H Throttle Valve with 1/2" Orifice**



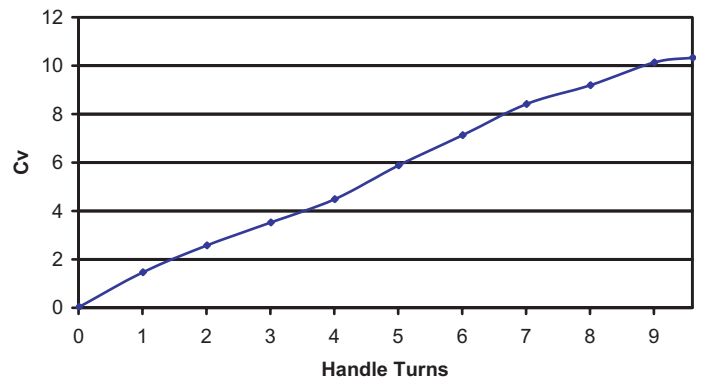
**Cv vs % Open for a 8H Throttle Valve with 1/2" Orifice**



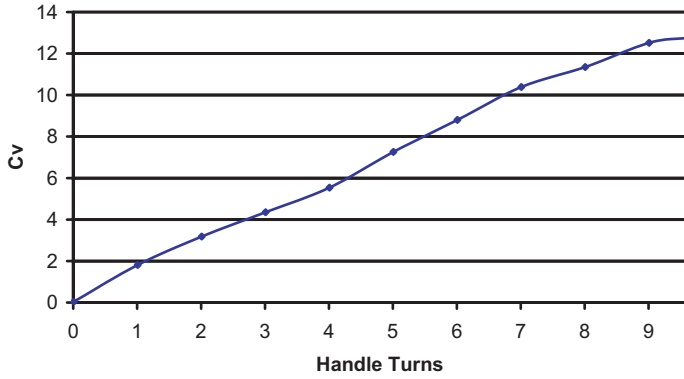
**Cv vs % Open for a 8H Throttle Valve with 9/16" Orifice**



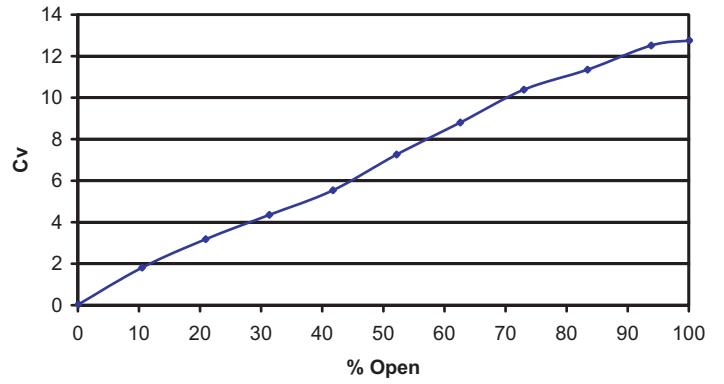
**Cv vs Handle Turns for a 8H Throttle Valve with 9/16" Orifice**



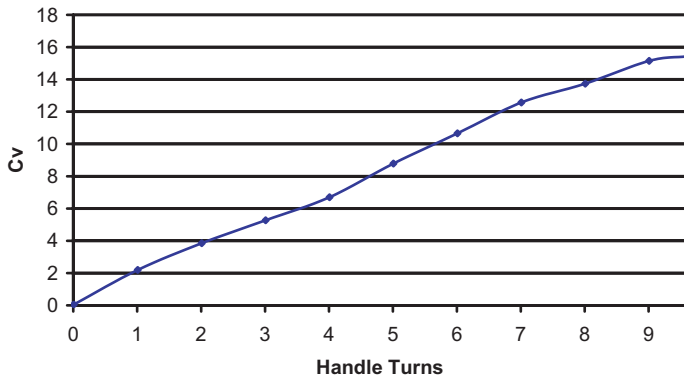
**Cv vs Handle Turns for a 8H Throttle Valve with 5/8" Orifice**



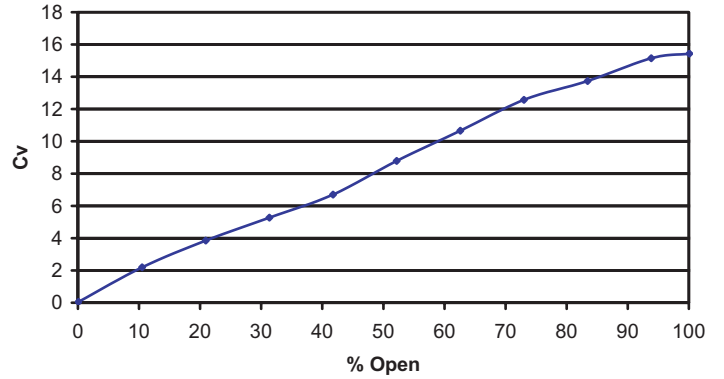
**Cv vs % Open for a 8H Throttle Valve with 5/8" Orifice**



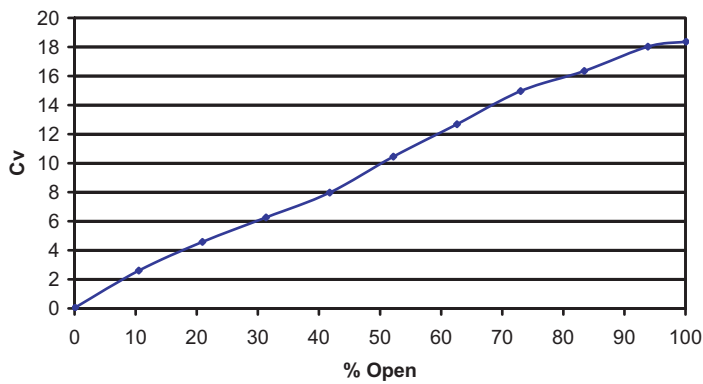
**Cv vs Handle Turns for a 8H Throttle Valve with 11/16" Orifice**



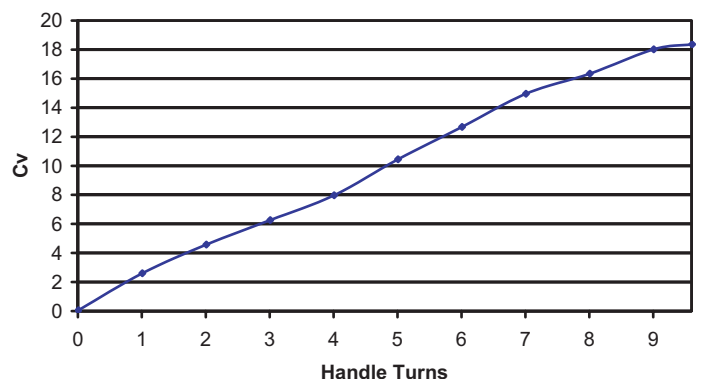
**Cv vs % Open for a 8H Throttle Valve with 11/16" Orifice**



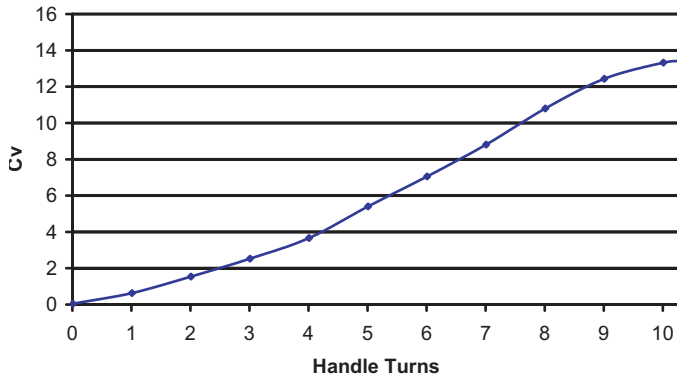
**Cv vs % Open for a 8H Throttle Valve with 3/4" Orifice**



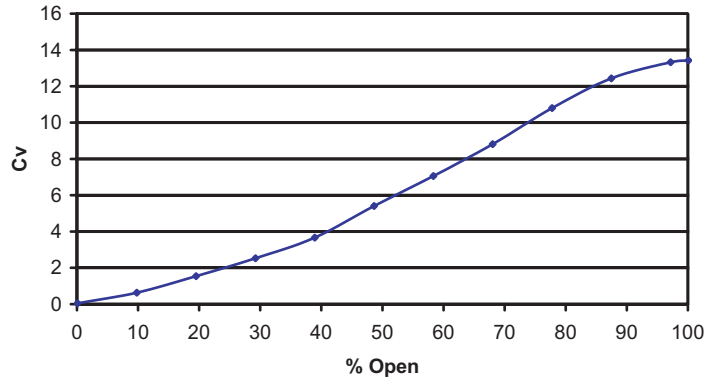
**Cv vs Handle Turns for a 8H Throttle Valve with 3/4" Orifice**



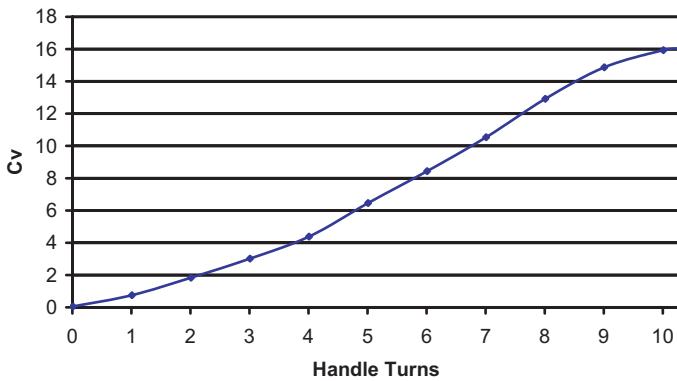
**Cv vs Handle Turns for a 10K Throttle Valve with 9/16" Orifice**



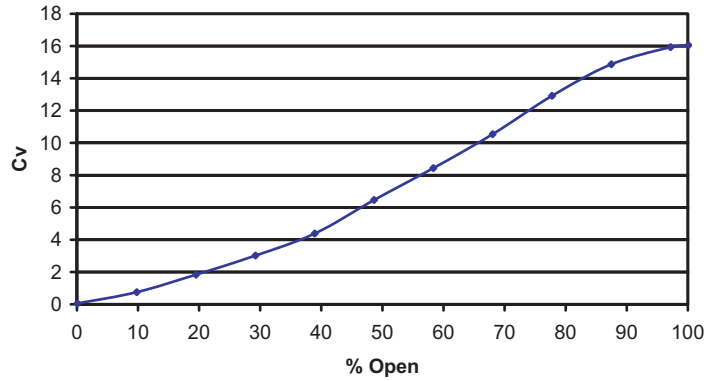
**Cv vs % Open for a 10K Throttle Valve with 9/16" Orifice**



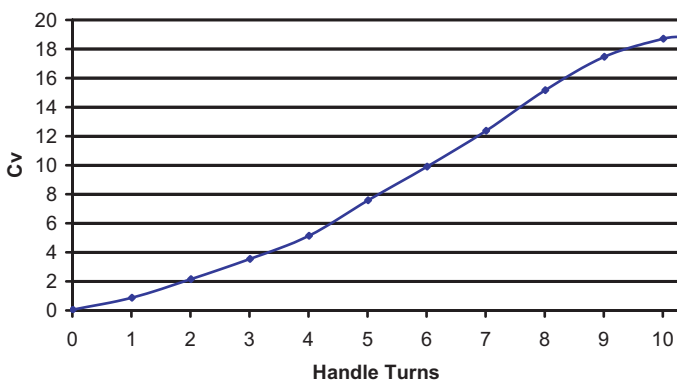
**Cv vs Handle Turns for a 10K Throttle Valve with 5/8" Orifice**



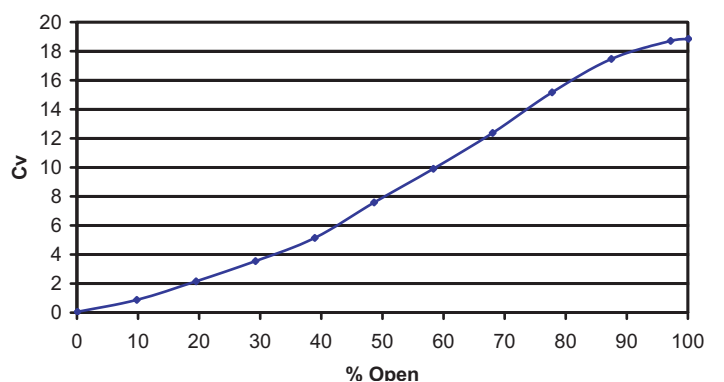
**Cv vs % Open for a 10K Throttle Valve with 5/8" Orifice**



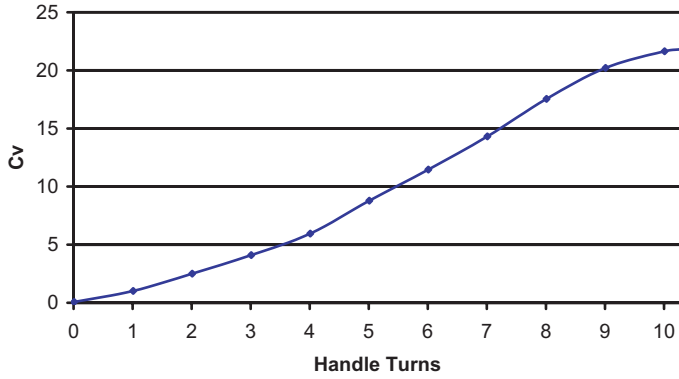
**Cv vs Handle Turns for a 10K Throttle Valve with 11/16" Orifice**



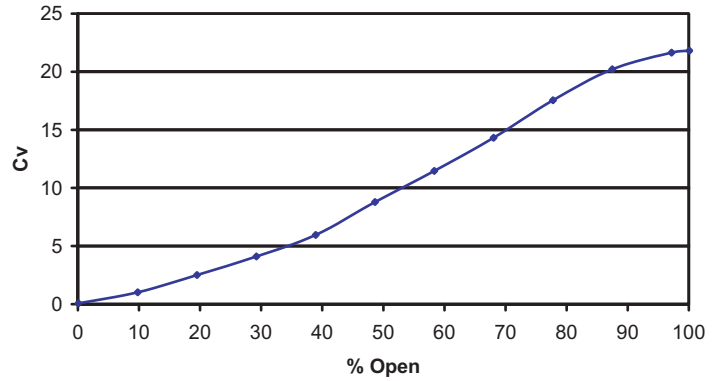
**Cv vs % Open for a 10K Throttle Valve with 11/16" Orifice**



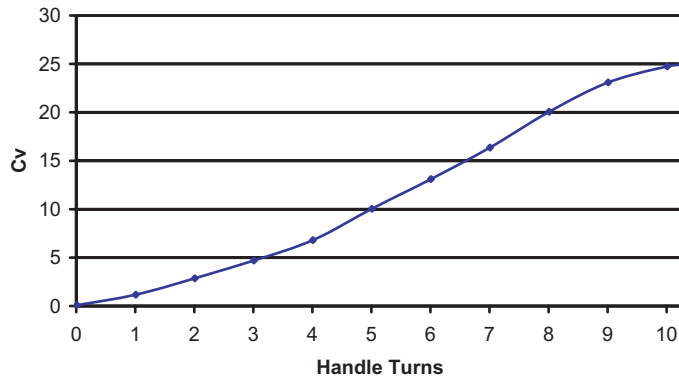
**Cv vs Handle Turns for a 10K Throttle Valve with 3/4" Orifice**



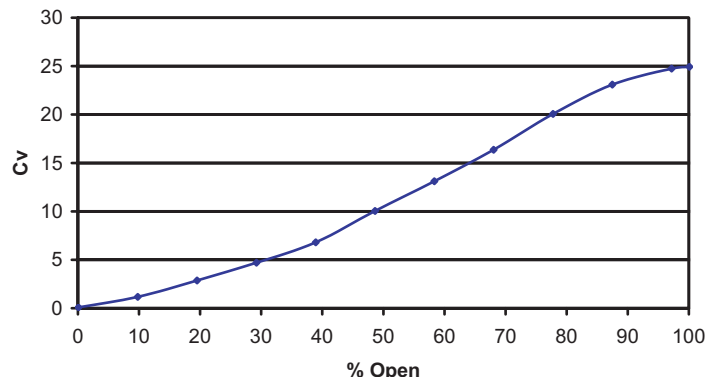
**Cv vs % Open for a 10K Throttle Valve with 3/4" Orifice**



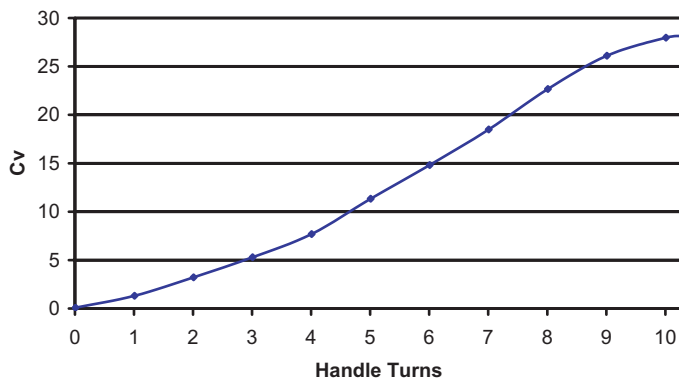
**Cv vs Handle Turns for a 10K Throttle Valve with 13/16" Orifice**



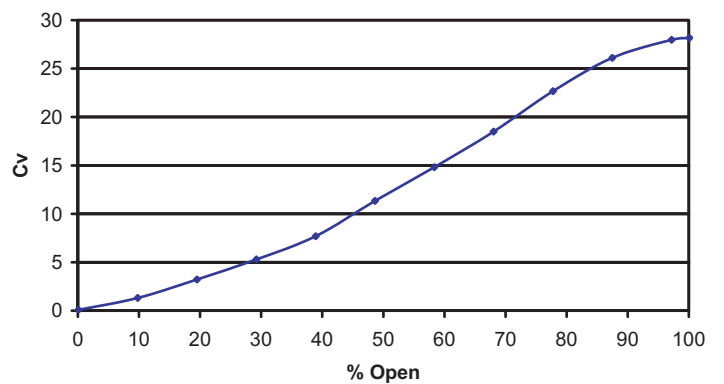
**Cv vs % Open for a 10K Throttle Valve with 13/16" Orifice**



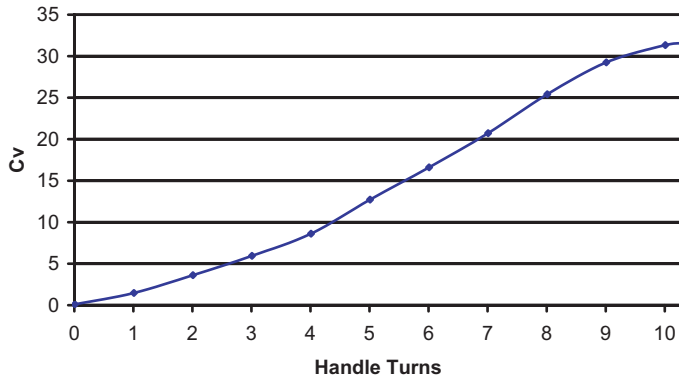
**Cv vs Handle Turns for a 10K Throttle Valve with 7/8" Orifice**



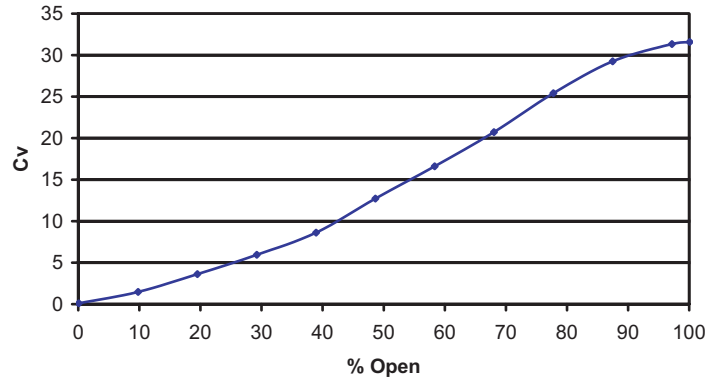
**Cv vs % Open for a 10K Throttle Valve with 7/8" Orifice**



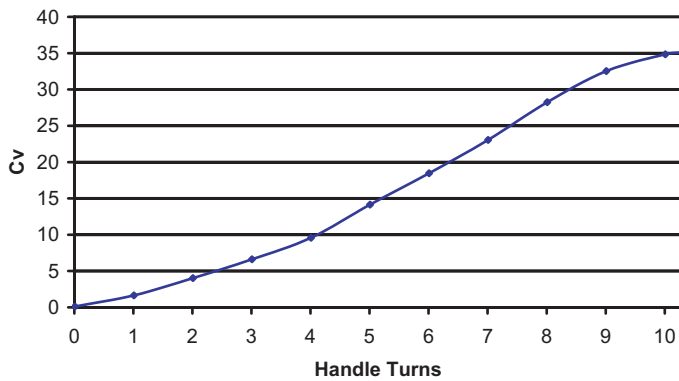
**Cv vs Handle Turns for a 10K Throttle Valve with 15/16" Orifice**



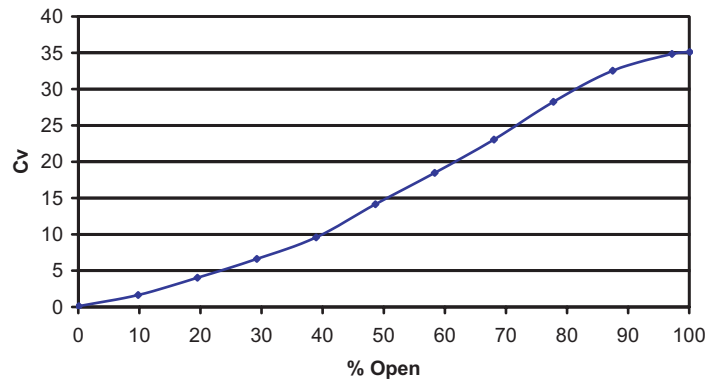
**Cv vs % Open for a 10K Throttle Valve with 15/16" Orifice**



**Cv vs Handle Turns for a 10K Throttle Valve with 1" Orifice**



**Cv vs % Open for a 10K Throttle Valve with 1" Orifice**



## The Conval Story

In 1962, Mr. Chester Siver completed designs for a revolutionary line of high-pressure, forged steel valves. Hamilton Standard (now Hamilton Sunstrand), a division of United Technologies Corporation, was asked to use their then-new Electron Beam Welding technology for joining of parts into valves for subassemblies. Hamilton Standard became intrigued with the valve as an ideal application of the Electron Beam Welding technique, and negotiated a contract for the rights to manufacture and sell the valve. Mr. Siver served as manager of the valve project.



The first CLAMPSEAL® valves were introduced to the market by Hamilton Standard in 1964. However, in the mid-1960's, growing demand for the firm's popular aerospace products forced Hamilton Standard to make the decision to abandon its industrial products projects. The rights to the CLAMPSEAL valve reverted back to Mr. Siver. Since CLAMPSEAL valves were born in Connecticut, Mr. Siver founded "Conval" (short for Connecticut Valve) in 1967. Today, the valves are still manufactured in Connecticut, a state with a longstanding reputation for technological innovation and manufacturing excellence.

Conval is celebrating its 40th anniversary in 2007 with the launch of the new Camseal Ball Valve. Conval has grown into a leader in valves for the world's most demanding applications. We have a global team of experts to help to meet your most challenging needs. We invite you to contact us today.

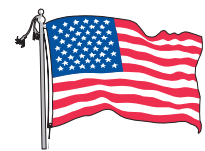
**High-pressure, high-temperature ball, bellows, bonnetless, check, gate, globe, throttling, and urea service valves for the world's most demanding applications.**



**1967-2007**

***Celebrating 40+ years of excellence!***

***Thank you for your business.***



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***ISO 9001 certified since  
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Phone (860) 749-0761 Fax (860) 763-3557

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