spirax sarco®

Steam Sizing Chart

Determining the Value C_V

C_V calculation is an interactive process requiring knowledge of valve dynamics, piping geometry factors, and outlet velocities. In practice, this sizing chart is based on emperical values and will cater for most applications.

This chart is for example only. A complete chart for sizing is overleaf.

How To Use the Chart

Example 1. To find Cv value for critical flow application.

Steam Demand	1500 lb/hr
Upstream Pressure	55 psi guage
	70 psi absolute

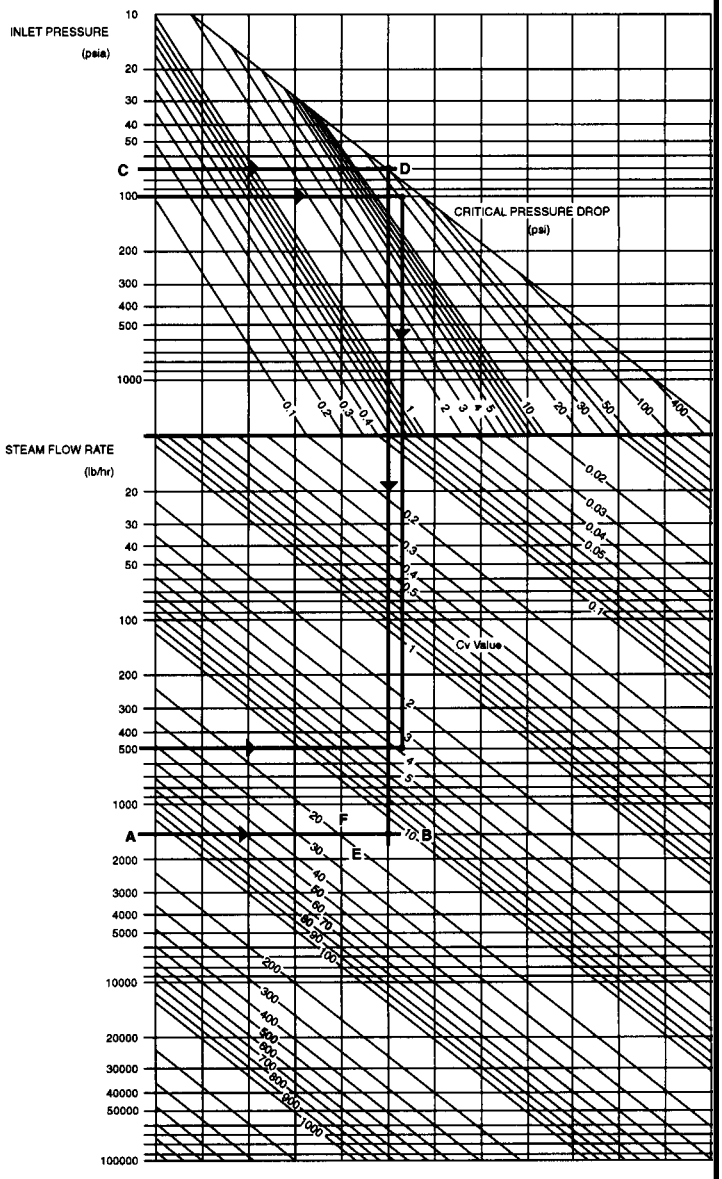
Refer to Selection Chart Opposite.

1) Draw 1500 lb/hr flow line (A-B)
2) Draw a horizontal line from 70 psi absolute to critical pressure drop line (C-D). At this intersection drop a vertical line.
3) At the crossing point of these two lines, read off the C_V value required, i.e. C_V 13
4) Select valve size required from the appropriate valve type technical information sheet.

Example 2. To find Cv value for non critical flow application.

Steam Demand	500 lb/hr
Upstream Pressure	85 psi guage
	100 psi absolute
Downstream Pressure	65 psi quage
	85 psi absolute

1) Draw 500 lb/hr flow line.
2) Draw a horizontal line from 100 psi absolute
   At the intersection with 20 psi pressure drop, draw a vertical line.
3) At the crossing point with the 500 lb/hr horizontal line read off the Cv value required, i.e. Cv 3.8
4) Select valve size required from the appropriate valve type technical information sheet.



How to Use Formula

Proceed by calculating the required Cv from given flow data, having prior determined whether the flow is critical or sub-critical. The following equations have been adapted from the ISA S75.01 standard to allow for practical everyday use without significant sacrifice in accuracy.

For Steam Service

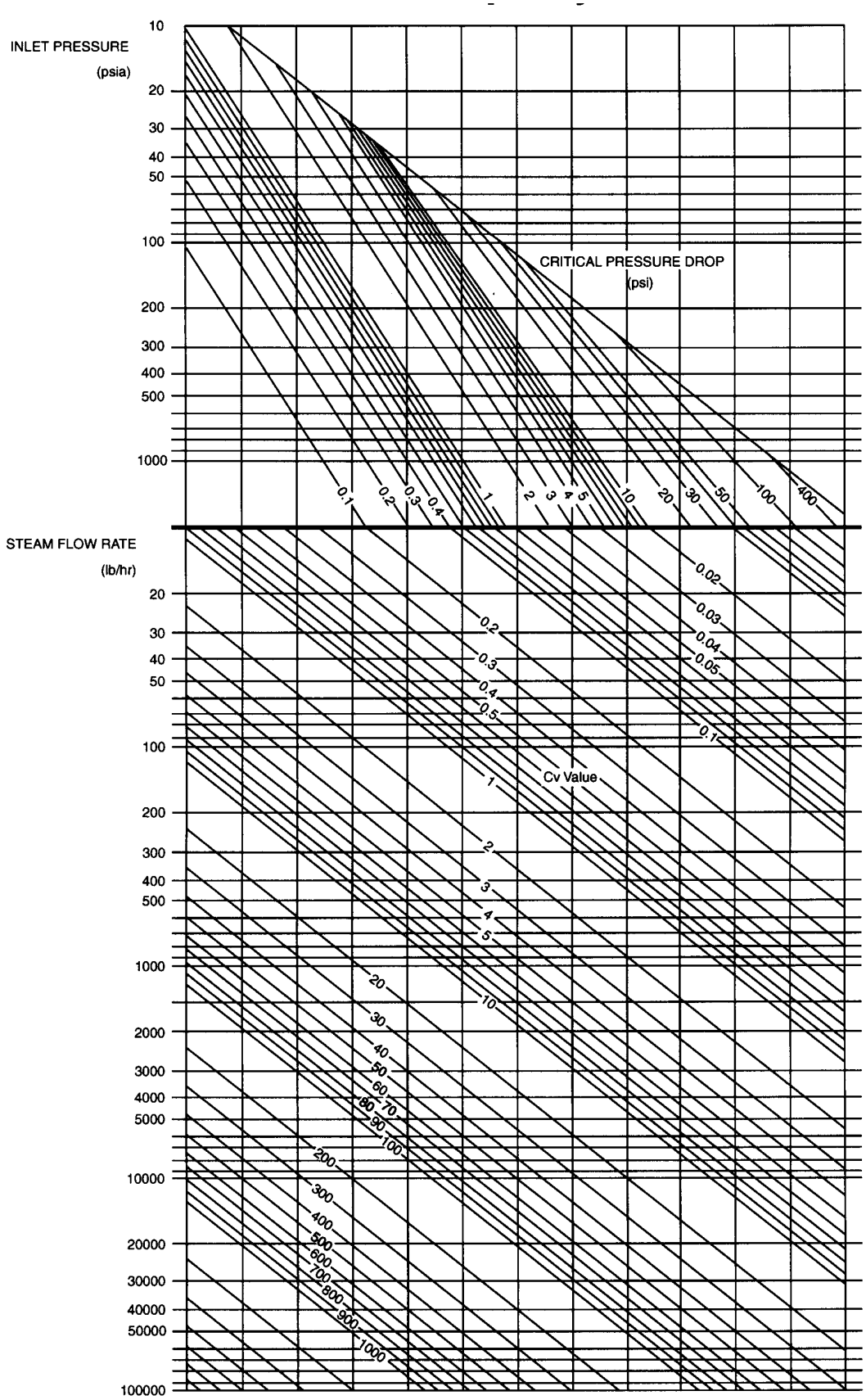
Subcritical Flow	Critical Flow
When ΔP is less than $.81\ (P_1/2)$	When ΔP is greater than $.81\ (P_1/2)$

For Saturated Steam

$$Cv = \frac{w}{2.1\sqrt{\Delta P\ (P_1+P_2)}} \qquad Cv = \frac{w}{1.647\ (P_1)}$$

Cv = Valve Coefficient
P1 = Upstream Pressure, psia
P2 = Downstream Pressure, psia
ΔP = Pressure drop $P_1 - P_2$, psia
w = Flow Rate, lb/h

Steam Capacity Chart



Spirax Sarco, Inc., 1150 Northpoint Blvd, Blythewood, SC 29016 Telephone: (803) 714-2000 FAX (803) 714-2222