

The dark shaded portion of the chart illustrates the region where cavitation damage may occur. The lighter shaded portion is where significant cavitation noise and vibration may occur. Operating conditions inside the dark shaded area is permissible for infrequent periods of short duration. The guide is for modulating service valves. For on/off valves, consult factory.

The chart is based on cavitation index (sigma) values as defined by Utah State University Water Research Laboratory.

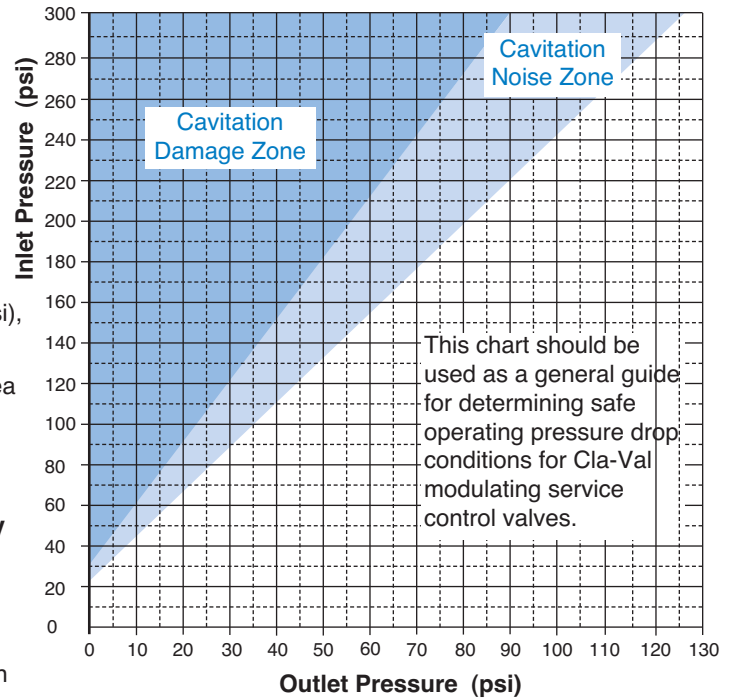
$$\sigma = \frac{(P_2 - P_v)}{(P_1 - P_2)} \quad \text{where}$$

σ = cavitation index, P_1 =inlet pressure (psi), P_2 =outlet pressure (psi), P_v = water vapor pressure (psig).

The dark shaded portion is below σ of 0.5 and the lighter shaded area is below σ of 0.8. The chart is to be used for typical valve operating conditions below 40% open at standard water temperature and elevation below 1000 feet.

More accurate cavitation conditions are determined from the **Cla-CAV** analysis program including static and dynamic inlet and outlet pressures, flow range, elevation, water temperature, and service conditions. If operation is inside the shaded areas, the **Cla-CAV** analysis can be used to determine whether added backpressure from an orifice plate, a second valve in series, or adding **KO** Anti-Cavitation trim (see 100-01KO data sheet). is necessary.

Cavitation Zones 100-01/100-20



Valve 1 100-01 100-20

Valve size: 6"

Maximum flow rate: 1000 gpm
Minimum flow rate: 500 gpm

Static inlet pressure: 120 psi
Static outlet pressure: 25 psi
Elevation above S.L.: 500 ft
Water temperature: 60 deg F

Dynam. inlet pressure: 120.0 psi
Dynam outlet pressure: 25.0 psi

Back pressure orifice: Single
Orifice backpressure: 61.9 psi
Orifice discharge to: Downstream piping

100-01 100-20

Valve operation

Continuous (>50%)

Avoid operation near (within 10%) cavitation damage level of 1.0.

Convert Units

Dynamic Pressure

Change Orifice

Add Second Valve

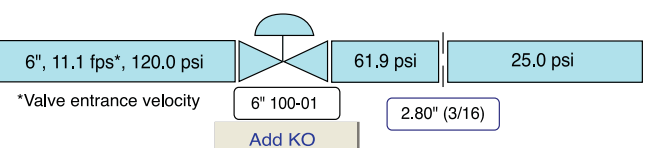
For a more detailed cavitation analysis or if operation will be outside of the above chart, request a **Cla-CAV** computer analysis. **Cla-CAV** can evaluate what options best solve any potential cavitation problem. In the example shown, a 6 inch 100-01 modulating service valve requires an orifice plate downstream to prevent damaging cavitation. For wider flow range service, either an extra valve in series or the addition of **KO** Anti-Cavitation trim to the valve may be necessary (see 100-01KO data sheet). Consult factory for a free analysis for wide open or modulating service valves.

No damage

Valve damage occurs <20 psi.

Caution - near damage

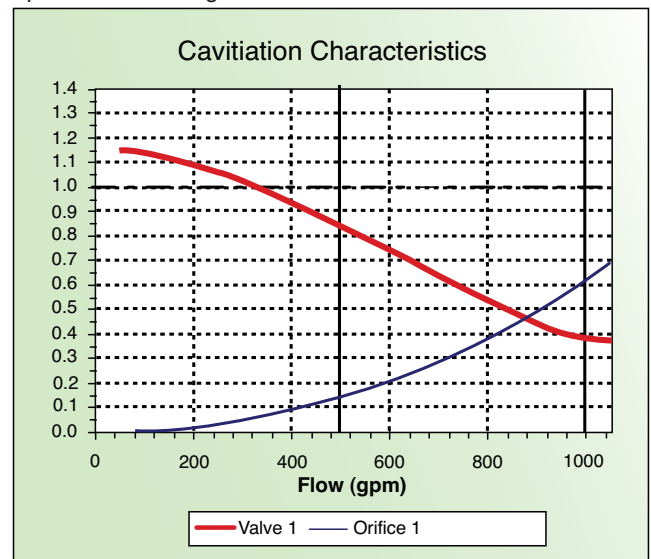
Damaging cavitation



Valve entrance velocity: 11.1 fps

Orifice: 2.80" (3/16)

Valve 1 Flow Rate GPM	Inlet (psi)	Outlet (psi)	% Open	Pipe Vel. (ft/s)	Cav Damage
50	120.0	25.1	9.1	0.6	Yes
250	120.0	27.3	19.9	2.8	Yes
500	120.0	34.2	24.9	5.6	No
750	120.0	45.8	30.7	8.3	No
1000	120.0	61.9	37.2	11.1	No



If the lines go above 1.0 there will be cavitation damage.