Discussion of a Typical Chemical Injection System:

A typical chemical injection system consists of the following components:

NOTE: Refer to diagram on page 3

- **Holding Tank** – used to store chemical, having material properties that are compatible with the chemical being stored.

- **Pump Suction Filter** – usually termed “Y” Strainer, used to prevent large particles form entering pump suction chamber.

- **Pump** – usually a positive displacement type, having sufficient capacity to satisfy all injection demand, having sufficient pressure rating to satisfy design requirements.

- **Pressure Relief Valve (PRV)** – usually a spring loaded, normally closed, adjustable valve used to allow fluid to exit from the pump discharge line when pressure reaches Maximum Allowable Working Pressure (MAWP).

- **Pulsation Damper** – used to decrease pressure spikes in pump discharge caused by piston type pumps. Can be bladder type or piston type. Bladder type is more efficient for eliminating pump pulsation in fluid stream and is recommended when using SkoFlo Back Pressure Regulator. Needs Nitrogen pre-charge.

- **Pressure Gauge** – used to monitor pressure level in the pump discharge line.

- **SkoFlo Back Pressure Regulator (BPR)** – used to maintain constant pressure in the pump discharge line while allowing unused chemical to return to the Holding Tank.

- **Pump Discharge Filter** – Used to prevent plugging of the SkoFlo control valves, must be rated for System MAWP, material selection must be compatible with chemical.

- **Isolation Valve** – used to isolate SkoFlo control valve from Injection System.

- **SkoFlo Control Valve** – used to maintain constant fluid output into injection point.

- **Three Way Valve** – used to allow calibration samples of SkoFlo valve output.

- **Check Valve** – used to prevent fluid from flowing into SkoFlo control valve in the reverse direction.
SkoFlo Chemical Injection System Operation:

To ensure each SkoFlo control valve receives adequate chemical supply, the pump should be adjusted to deliver at least 10% more fluid than the sum of all combined injection point volume. This condition will cause pressure to rise in the discharge line and is termed Supply Pressure.

The SkoFlo Back Pressure Regulator (BPR) is adjusted to maintain System Pressure level at desired set point while allowing unused chemical to return to the Holding Tank. System Pressure Set Point is determined by adding the value of pressure loss through the SkoFlo control valve to the value of injection point having the greatest process pressure.

EXAMPLE:
There are 5 injection points in our example system described below;

1.) 200 GPD (757 L/D) at 1500 PSI (103 barg)
2.) 150 GPD (568 L/D) at 1000 PSI (69 barg)
3.) 300 GPD (1136 L/D) at 2000 PSI (138 barg)
4.) 50 GPD (189 L/D) at 800 PSI (55 barg)
5.) 50 GPD (189 L/D) at 200 PSI (14 barg)

In this case, our SF5000C would be selected as the recommended model. Our SF5000C requires 200 PSI (14 barg) Differential Pressure (dP) to properly operate.

Pump output volume should be adjusted to 825 GPD (3123 L/D).

System Pressure should be set to 2200 PSI (152 barg).

Calibration of SkoFlo Control Valve:

The SkoFlo control valve can be calibrated by manually collecting fluid in a graduated beaker for a specific period of time or by installing a flow meter in the injection system.

For manual calibration, a three way valve is need in the SkoFlo control valve outlet line. The three way valve needs to be installed so that one position routes fluid to the injection point and another position routes fluid to be collected for measurement.

To perform the calibration step, route injection fluid through the three way valve to CALIBRATION POSITION and capture the fluid. After the collected fluid is measured, adjustments can be made to SkoFlo control valve by turning the adjustment handle. This calibration procedure should be performed while the injection system is in normal operating condition.

After successful adjustment to SkoFlo control valve has been accomplished, return three way valve to INJECTION position.
Notes:
1. Any number of injection points can be served by a single pump and header system. The only limitation is the flow capability of the pump.
2. Check valve must be installed within 5 feet from the SkoFlo Valve.