Val-Matic® Cam-Centric®
Rectangular Ported, Eccentric Plug Valves
Seating System

The success of the seating systems of an eccentric plug valve is predicated on three factors; the movement of the plug in and out of the seat, positioning of the plug in the seat and the resilient/welded mating surfaces.

Movement of the plug

The movement of the plug in and out of the seat is referred to as eccentric which means off-center. The valve's seat is off-set from the center line of the pivot axis. This off-set provides an eccentric action allowing the plug to rotate in and out of the seated position with minimal rubbing or wear.

Positioning the Plug

To assure a good seal, proper positioning of the plug in the seat must be assured. The Val-Matic® design relies on two factors to accomplish this. Closed positioning is assured by adjustable stops located on the cover for lever actuated valves and on the gear for gear actuated valves. Vertical positioning is provided by thrust bearings located above and below the plug.

Finally, to assure proper position as well as a leak free performance every valve is 100% tested and inspected prior to shipment.

Mating Surfaces

The mating surfaces of the Cam-Centric® Plug Valve are resilient to metal.

The standard resilient surface is a Buna-N facing. The Buna-N formulation was specially developed by Val-Matic® and leading industry rubber experts to assure that the plug would seal time and time again without loosing its origonal shape and provide maximum abrasion resistance while handling the wide variety of contaminants found in wastewater. All valves have precision molded plugs to assure an optimum seating surface for excellent seating as well as low torque during movement in and out of the seat.

The valve seat is a welded overlay of 95% pure nickel applied directly to the body on a pre-machined surface and precision machined to a smooth finish.

There are several factors which will impact the quality of a weld. One is the quality of materials. Val-Matic® requires material certifications for both the body casting and the nickel welding wire to assure high quality and consistency. The second factor is the surface. If the surface is not properly prepared the weld will be inconsistent. It is for this reason that the surface is machined prior to welding. The third factor which must be considered is the welding process itself. The temperature and the way the weld is applied are both critical when trying to achieve a high quality weld. A state-of-the-art robotic welding system is utilized which assures that each and every weld will be applied in a consistent manner. The robotic system was developed specifically for Plug Valves. The system took over three years to develop and included the welding of hundreds of test bodies. Upon Completion of development of the prototype, the production system was built, tested and installed at Val-Matic®.

The seating system has sucessfully completed all of the pressure and cycle proof of design tests in accordance with AWWA C517 and MSS-SP-108.
CAM-CENTRIC® PLUG VALVE ECCENTRIC ACTION

The Cam-Centric® Plug Valve is an eccentric acting valve. The seat is eccentrically located from the center line of the valve’s shaft. This provides an eccentric action allowing the fully rubber-encapsulated plug to rotate in and out of the seated position without rubbing or scraping, thereby preventing high torque and wear to the valve seat and plug. The valve is designed to control flow and shut off in both the direct and reverse directions.

The eccentric action forces the resilient plug firmly against the seat, assuring a positive valve shut-off. An adjustable limit stop on the actuator allows the plug to be turned further into the seat, providing extended service life.

The eccentric action pulls the plug away from the seat as it rotates open. This action provides clearance between the plug and seat preventing wear and scuffing of the plug. Throttling characteristics can be achieved in partially open positions.

With the eccentric plug rotated to the fully open position, clearance is maintained at all points around the plug. In this position, maximum flow is achieved through the full rectangular port and unrestricted flow way.
### CAM-CENTRIC® RECTANGULAR PORTED, ECCENTRIC PLUG VALVES

**PORT AREAS AND FLOW DATA**

<table>
<thead>
<tr>
<th>SIZE</th>
<th>MODEL NO.</th>
<th>PORT AREA (SQ. IN.)</th>
<th>% OF STD. WT. PIPE</th>
<th>K</th>
<th>CV</th>
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**FORMULA FOR HEADLOSS IN A WATER LINE:**

\[ \Delta H = K \left( \frac{V^2}{2g} \right) \]

**FORMULA FOR PRESSURE DROP IN A WATER LINE:**

\[ \Delta P = Sg \left( \frac{Q}{Cv} \right)^2 \]

**WHERE:**
- \( \Delta H \) = Head loss, ft. of water column
- \( K \) = Flow coefficient
- \( V \) = Flow velocity, ft./sec.
- \( g \) = Gravity, 32.2 ft./sec.²
- \( \Delta P \) = Pressure drop, psi
- \( Q \) = Flow rate, gpm
- \( Cv \) = Flow coefficient
- \( Sg \) = Specific gravity

DATA BASED ON INDEPENDENT LABORATORY TEST DATA.

(Data Revision Date: 6-2-11)

VALID MATIC®

VALVE AND MANUFACTURING CORP.

Drwg. No. SS-1234

Date 8-5-96
THE ABOVE GRAPH IS BASED ON INDEPENDENT LABORATORY TEST DATA.
THE FOLLOWING FORMULA CAN BE USED TO DETERMINE THE PRESSURE DROP ACROSS THE VALVE WHEN PLUG POSITION AND RATE OF FLOW ARE KNOWN.

\[ \Delta P = Sg \left( \frac{Q}{Cv} \right)^2 \]

WHERE:  
\( \Delta P = \) Pressure drop across valve (psi)  
\( Q = \) Rate of flow (gpm)  
\( Cv = \) Value from the above chart  
\( Sg = \) Specific gravity of fluid (water = 1)

THE ABOVE CHART WAS COMPILLED FROM INDEPENDENT LABORATORY TEST DATA.

Revised 5-15-03

Cv VALUES OF CAM-CENTRIC® RECTANGULAR PORTED PLUG VALVES AT VARIOUS PLUG POSITIONS

THE FOLLOWING FORMULA CAN BE USED TO DETERMINE THE PRESSURE DROP ACROSS THE VALVE WHEN PLUG POSITION AND RATE OF FLOW ARE KNOWN.

\[ \Delta P = Sg \left( \frac{Q}{Cv} \right)^2 \]

WHERE:  
\( \Delta P = \) Pressure drop across valve (psi)  
\( Q = \) Rate of flow (gpm)  
\( Cv = \) Value from the above chart  
\( Sg = \) Specific gravity of fluid (water = 1)

THE ABOVE CHART WAS COMPILLED FROM INDEPENDENT LABORATORY TEST DATA.