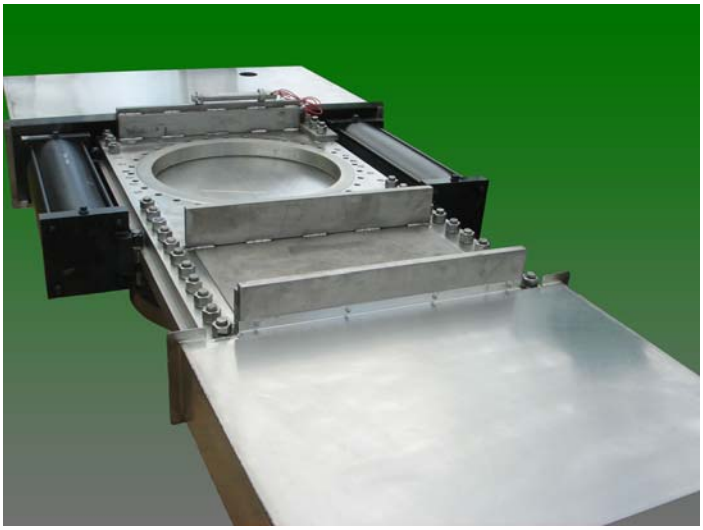
STAINLESS VALVE CO.

Div. of ***B+E Manufacturing Co. Inc.***

Tuesday, September 20, 2016

CUSTOM SOLUTIONS for CRITICAL and UNIQUE VALVE APPLICATIONS



SVC Profile

Founded on March 1, 1973, Stainless Valve Co. is a specialty valve manufacturer that custom designs and engineers specialty valve products for unique, critical, and demanding valve applications where standard valve products do not perform. Our Stargate-O-Port-Valve® line of products have routinely taken some of the most severe and difficult applications in process industry and committed the problems associated with those applications to history. The vast majority of our valve installations are in severe and critical service applications where primarily ball valves fail to perform. While roughly 80% of our installations are the direct replacement of non-performing ball valves, we do also replace butterfly, gate, knife gate, and plug valves in those applications where superior performance is desired and required.

SVC manufactures relatively large size valves between 4" (DN100) and 60" (DN1500) diameter and pressure classes up to 1500# (PN200) with temperatures ranging from -40F (-40C) to 2100F (1150C); ANSI, JIS and DIN. Valves are automated; pneumatic, hydraulic or electric, but are also available in manually operated versions. These are certainly not our limitations and we welcome any challenge.

SVC manufactures our Stargate-O-Port-Valve® products in stainless steels, Hastelloy, Inconel, titanium, carbon steel, or *any other material available in a plate form*.

SVC is not a manufacturer of cheap, off-the-shelf commodity valves but gets involved when such valves fail to perform, necessitate extensive maintenance, or cause reliability issues in critical service. Our Stargate-O-Port-Valve® line of products allow operations, maintenance, and reliability engineers to rest easy knowing they can count on personalized, timely support, and unrivaled performance over the long term.

STAINLESS VALVE CO. Inc. *- Division of* ***B+E Manufacturing Co. Inc.***
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http://www.stainlessvalveco.com

Our company is certified ISO9001:2008 / Certificate No.: CERT-0090755

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SVC Market

After serving pulp manufacturers successfully for 17 years SVC first ventured outside the pulp and paper industry in 1990. Since 1995 this trend has intensified and in 2002 for the first time more valves were supplied to heavy process industries outside of pulp and paper. In 1990 SVC has also for the first time supplied valves outside the USA, initially to Norway, then Canada.

Today, SVC serves customers in 18 countries and counting around the world in the mining, power generation, chemical, petro-chemical, biomass/waste energy, pulp & paper, and food industries. There are many more applications in other industries where SVC valves offer distinct advantages in unique, critical, and demanding applications where commodity and other severe service valves leave performance to be desired.

SVC serves the worldwide process industry with the specific intention for providing solutions to non-performing ball, gate, butterfly, and plug valves with the custom specialty Stargate-O-Port-Valve®

...diverse industry installation base worldwide...Made in the USA.

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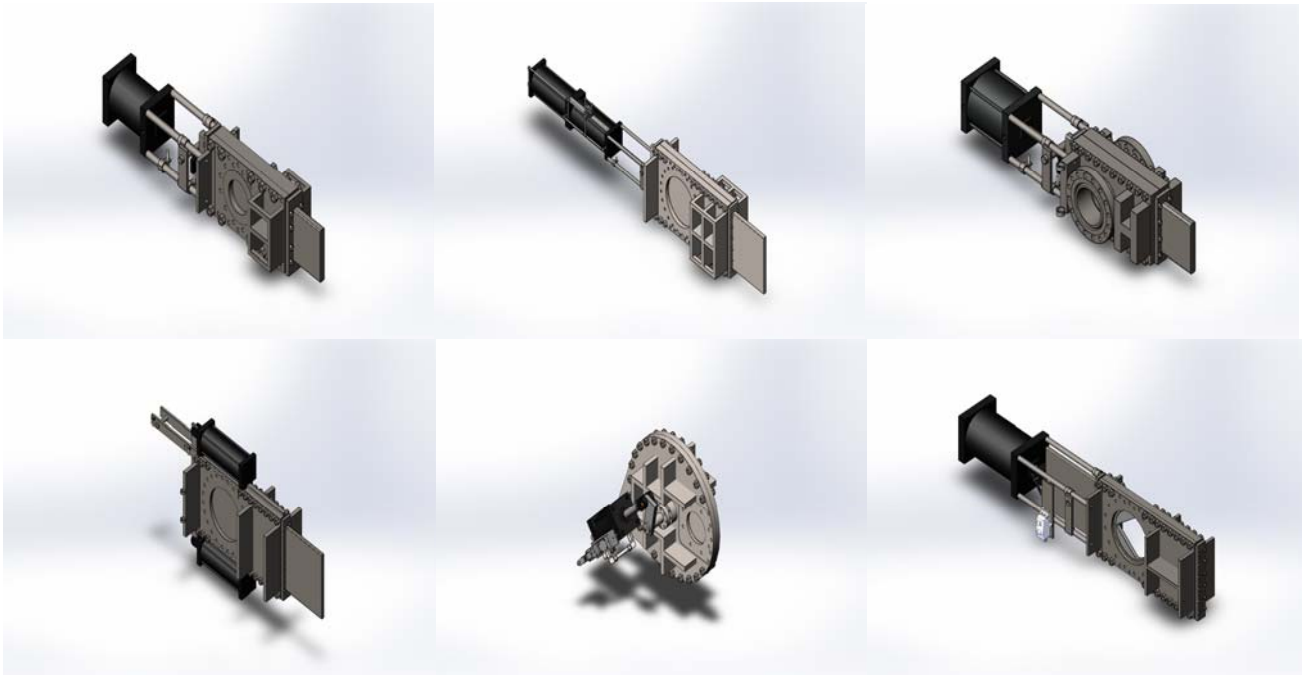
SVC Products

Stargate-O-Port-Valve®, Big Blow™, Big Cap™, Big-Knife™, Big Screen™ and Big Wafer™ are our trade names. The valves are targeted to applications where other valves do not perform, cause reliability issues, or have high maintenance requirements. Our mission is to offer the lowest cost of ownership of any valve product.



The ***Star of Valves***, the **Stargate-O-Port-Valve®**

It is not a knife-gate valve!

We offer complete solutions that meet your needs.
We supply a diverse industry base.
We offer quality, custom engineered products.
We offer unique solutions to your most pressing valve problems.
We offer unmatched after sales support, service, and repairs.
We are your partner in offering valve solutions that directly impact the bottom line

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Applications:

The SVC Stargate-O-Port-Valve® is used in heavy process industry applications where standard valves do not perform or cause operational and reliability problems. Here is just a small sample of some of the applications in which our SVC Stargate-O-Port-Valve® has been put in service:

- Isolation valves on process gas in PTA manufacturing
- Mixing pump isolation and control
- Bleaching tower isolation
- Batch digesters blow down
- Continuous digester isolation and liquor circulation
- Blow tank diverters and isolation
- Washer isolation
- Stock pump isolation
- Liquor heater acid wash isolation
- Liquor/chemical supply line
- Lime storage bins
- Recovery boiler BL solids
- Green liquor clarifiers
- Pulp HD storage tanks
- Manifolds for high consistency stock
- Fly ash bins
- Filling valves on reactors
- Catalyst recycling reactors

SVC Stargate-O-Port-Valve® is best suited for the most severe service applications where a solution is required to maximize reliability and reduce maintenance costs. SVC looks for the "problem applications" and designs solutions. Solving your "problem application" is our core competency.

What Is A SVC Stargate-O-Port-Valve®? What Are The Advantages?

Also known as a slide-gate valve, thru conduit, or through-port valve, the basic concept of this type of valve, is the precision-guided blade passing through both ends of the valve body, having an orifice in the blade. This basic concept for the Stargate-O-Port-Valve® has a series of advantages:

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- Process Media: Solids, Slurries, Liquids, and Gases are easily handled even in the most severe service conditions.
- Reliable Actuation: There is no change in volume inside the valve as it actuates, thus no material can accumulate to prevent proper actuation.
- Superior Shutoff: The valves have a drip-tight shut-off, independent of the pressure differential between upstream and downstream side of the valve frim strong vacuum to full rated pressure differential.
- Minimal Maintenance: The valves do not require maintenance (including lubrication) other than the occasional packing adjustments.
- Versatility: The valves can be used as on/off isolation valves, flow control valves, and/or line blinds when properly specified.
- Flow Characteristics: Even in a partially open position the valves have a linear flow characteristic for the process media, different from ball valves where the flow is re-directed twice each time directly impacting the seats.
- Takeout dimension: Short face to face dimension, a fraction of the space requirement of a ball valves in the pipe run direction.
- Protected Seats: Seals are never directly exposed to process even with the valve in a partial open position.
- Severe Service: Pressure shock waves (vapor flashing) and aggressively corrosive, abrasive, and scale forming flow media are easily managed by the Stargate-O-Port-Valve®
- Installation Orientation: The Stargate-O-Port-Valve® may be installed in any position in the pipe; there is not a preferential flow direction or actuator orientation.
- Over 97% of the body thickness is solid material, resulting in a very stiff valve body. 3% or less is the 0.030” – 0.060” gap between the blade and the side plates.

Characteristics of the SVC Stargate-O-Port-Valve® Design

- Substantial and rugged design manufactured to tight tolerances
- No metal-to-metal contact. Blades move in PTFE, PEEK, or Graphite guides, depending on the application. For high temperature applications (>1000F) metal seats necessitate exception to this rule.
- Customized Sealing to the specific application based on SVC knowledge base.
- Mechanical locking mechanism locks blade in open and/or closed position for greater safety.
- Full port (discharge area equal to pipe area) is standard even at takeout dimensions of reduced port ball valves or shorter. No flow restrictions exist due to smooth unobstructed discharge area. This assures maximum production throughput and minimal wear to valve components.

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Materials of Construction

- The Stargate-O-Port-Valve® is available in virtually any material commercially available in plate form.
- Typical wetted parts materials include 300 series Stainless Steel, Duplex Stainless Steel, Hastelloy, titanium, and Inconel. Despite the name of the company, we do also manufacture valves in carbon steel where appropriate.
- Seats and blade guides can be specified in any variety of compatible materials. Various grades of PTFE, TFE and PEEK are common. For higher temperatures Graphite, soft metals and coated metals may be specified depending on the installation service. Food grade materials are also available as required.
- Body Seals: Depending on the application credentials, EPDM, FKM, FFKM, or graphite may be provide the best long term service. SVC has a considerable knowledge base on the various materials is a wide variety of process conditions to ensure the best material is selected for the specific application.
- Packing: As with the Body Seals, packing arrangements will be application specific.

Actuation

Variety of actuation types available:

- Manual gear operators
  - 90^0 or inline hand wheel/chain wheel operators.
  - Gear ratios from 2:1 to 12:1

- Pneumatic actuators
  - Typically double acting. Spring return available
  - Operating speeds from 1”/s to 10”/s
  - High quality A type actuators for severe service environments. Epoxy coated w/ stainless stem.
  - 60psi - 250psi supply pressure.

- Hydraulic actuators
  - Double acting.
  - Operating speeds from 1”/s to 10”/s
  - High quality A type actuators for severe service environments. Epoxy coated w/ stainless stem.
  - 750psi - 3000psi supply pressure.

- Electric actuators:
  - Power, features, and brand per the user specification.

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Locking Devices

Pneumatic actuated valves are supplied with LO locking devices, for mechanically locking the valves in the closed position. This allows maintenance activities behind the valve without removing the actuator or air supply connection to the valve. . The pin of the locking device is heavy enough to allow the valve actuators to be charged with 250 psi air pressure without damage to the locking device. The LO locking device for locking in the open position is available as an option.

For safety critical applications where valve may not be opened until certain conditions have been met, pneumatic locking devices are interlocked with pressure or temperature transmitters on the reactor to ensure that the blade remains in the locked position until the correct conditions are met to actuate the valve.

Control Options

- Limit Switches: Micro limit switches, Go proximity switches or any other limit switches based on customer preference indicating open or closed position are provided.
- Solenoid Valves: For on/off control, the solenoid valves are mounted and piped to the valve actuator.
- Throttling Control: SVC valves are suitable for throttling services. Different port shapes in the body and the blade allow different flow and regulating characteristics. Control is managed by a valve controller/positioner. The user may specify the brand preference.

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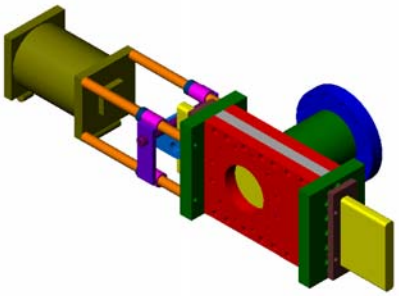
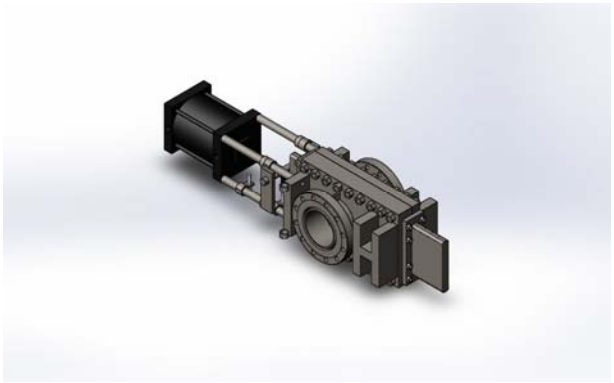
Further Options

- *Take-out dimensions:* As most of the valve applications that the Stargate-O-Port-Valve® is installed in are for the direct replacement of ball valves, the Stargate-O-Port-Valve® can match those dimensions. Custom takeout dimensions are easily accommodated to the user's needs. Spool pieces can thus be avoided and the Stargate-O-Port-Valve® is a drop in replacement.

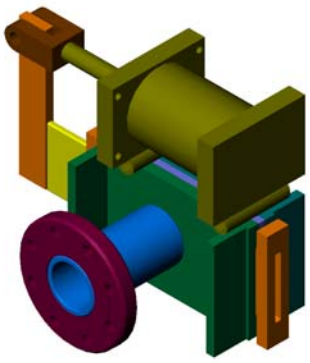


8" 300# Stargate-O-Port-Valve® w/ 22"F2F (Asymmetric)

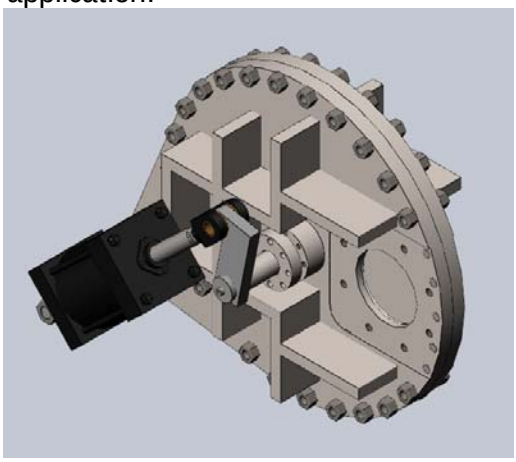


8" 300# Big Blow™ w/ 16.5" F2F (Symmetric)

- *Limited Space Envelop:* If space constraints exist, there are several design options that may be considered for fit to the specific application.



4" Stargate-O-Port-Valve®; Side Mounted Actuator



6" 150# Stargate-O-Port-Valve® 360

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- *Abrasion/Erosion:* For the most severe abrasive and erosive applications, the Stargate-O-Port-Valve® can be designed with interchangeable seats with the valve remaining in line.

Refurbishment

After many years of service, the Stargate-O-Port-Valve® may require refurbishment. Refurbishment may not only cover the soft goods but also the valve hardware and design. Stainless Valve Co. has the necessary technical expertise, the personnel, spare parts, and equipment to perform this service fast and economically. Whenever possible, products are updated to the latest state of art design technology to further improve the already superior performance of the valve. Do not trust your valuable investment to a local valve repair shop or non-qualified/non-OEM service person.

Where refurbishment lead time is not feasible for OEM refurbishment on the Stargate-O-Port-Valve®; SVC offer on-site training and support to ensure that the user's technicians are properly completing the refurbishment.

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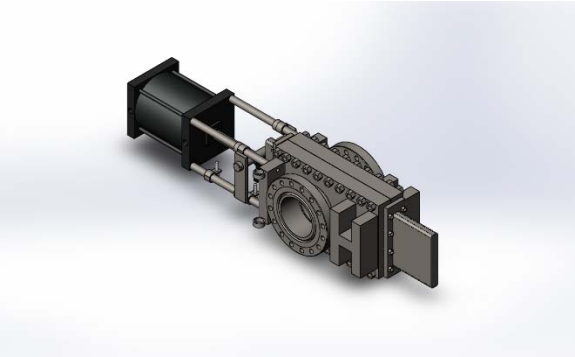
Big Blow[tm]

THE Batch Digester Blow Down Valve



Forty Eight Years of Un-Matched Application Specific Service

The Big Blow[tm] valve has a long history of providing un-matched reliability and low maintenance requirements in one of the most severe, critical, and demanding services in the pulp and paper industry. The batch digester blow down valve is central to the efficient, safe, and reliable operation of batch digesters, whether the mill has common headers or individual blow lines.

The digester blow valve application is quite violent. Shockwaves of over 10,000psi have been measured as a result of vapor flashing and accelerated material mass impacting valves in common header systems. Digester and blow line movement adds to the stresses that the blow down valve must accommodate. Despite this severe service, the Big Blow[tm] valve performs very well over a long service life between refurbishments. It is reasonable to expect 3-7 years between scheduled refurbishments. This is unmatched by any ball valve or Big Blow[tm] copycat offering.

Design

The Big Blow[tm] is designed specifically for the critical and demanding digester blow down valve application. The valve has several characteristics that make it the ideal valve for this application starting with the robust design and material allotment. The valve body and blade are substantial for the pressure rating.

Details lead to Un-rivaled Performance

- *Integrated and reinforced packing glands:* Developments by SVC and New England Braiding have brought about a material that maintains the seal even under elastic deformation of the valve body. This material is used in addition to Self-Mold to ensure that there is no leakage from the valve despite heavy shock waves and slurry material in the line.
- *Soft seats:* Reinforced and modified PTFE seats fully retained to maintain position despite shock waves. Preloaded seats maintain a tight shutoff regardless of pressure differential. The Big Blow[tm] valve can successfully utilize soft seats where ball valves must resort to metal seated designs that are susceptible to damage from direct impacts on the ball and seat surfaces.
- *Proprietary weld design:* Flanges-Nipple-Body welds are designed specifically to handle external forces

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from digester system on the valve. Indicator gussets provide visual indication of the loads placed on the valve and when the valve should be pulled for evaluation

- *Auto-adjusting blade guides:* Specifically suited for handling abrasive, erosive media along with vapor flashing and mechanical shock waves. Proper guiding of blade ensures optimized seal performance and wear life.
- *Loaded Seats:* fully loaded seats prevent process material from getting under the seats and causing binds or premature seat wear.

Performance Guarantee

Perhaps the most unique "feature" to the Big Blow[tm] is the unsurpassed Performance Guarantee: 10 years on the valve and 3 years on the wear parts. SVC stands behind our product and have full confidence in the long term performance of the Big Blow[tm] valve. The Big Blow[tm] valve will offer the lowest long term cost of ownership of any valve product in the digester blow down application.

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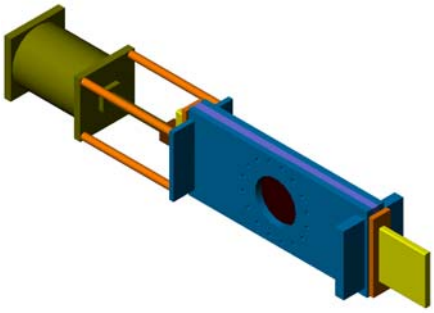
Stargate-O-Port-Valve®
Anti-Scale Valve

The Solution to the Sticky, Scaling Problem



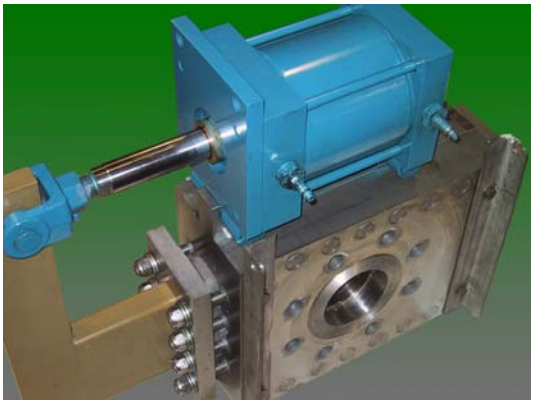
10" 300# Stargate O-Port-Valve® AS (Inserted Design)

The Problem

When scale formation occurs on the moving elements of ball, butterfly, plug, or gate valves the consequence is either locking of the valve movement or damage to the valve seats, guides and packing along with the consequent leaking through or out of the valve.

The Solution

Since its development in 1995 the Stargate O-Port-Valve® AS anti-scale valve has eliminated scale formation concerns and related issues in a variety of industrial settings. Using a combination of coatings, seat design, and valve internal features, the negative aspects of scale formation or sticky flow media are mitigated. Experience tells us that no two scale forming process applications are the same and SVC applies this experience to the valve design specific to each application. Variables such as temperature, pressure, precipitating materials, flow characteristics, and process chemicals will dictate different configurations of design features.



4" 1500# Stargate O-Port® AS with "High Build"

The Stargate O-Port-Valve® AS anti-scale valve is installed in a variety of applications including mine dewatering isolation, food processing, liquor heaters, lime storage, and fly ash bins with great success. One application in a hydrometallurgy autoclave for a gold mine 12" knife gate valves were used that had to be replaced every six weeks. The customer has installed Stargate O-Port-Valve® AS anti-scale that provided 6 years of reliable service without refurbishment. The Stargate O-Port-Valve® AS anti-scale valve has exhibited similar results in other applications involving sticky or scaling materials that tend to seize or damage other valve designs and configurations.

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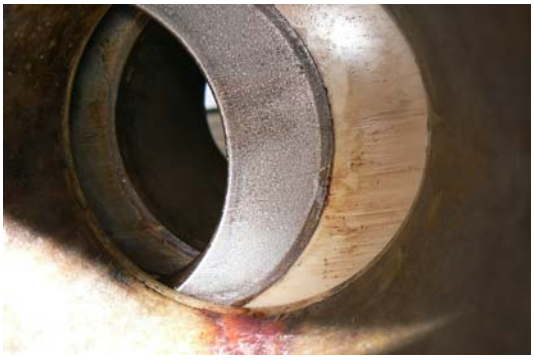

Example of metallic scale formation. Valve in service in partial open position

Scale removed without damage to sealing surface

As the Stargate O-Port-Valve® AS anti-scale is applied to more unique, critical, and demanding applications where scale formation is the cause of many valve failures with standard valves, the Stargate O-Port-Valve® AS anti-scale has evolved even further. The older versions of the AS valve feature inserted body and blade assemblies that eliminate material contact with the metal component of the valve body. FEP and PFA coatings were also used in older designs. SVC has moved beyond the commodity coatings solutions offered under a variety of fancy monikers. The modern Stargate O-Port-Valve® AS anti-scale uses not only the latest in coating and plating technology and knowledge, but also unique seat designs/materials, along with a variety of internal configurations to combat the negative effects of scale formation. The Stargate O-Port-Valve® AS anti-scale does not rely on mechanical scrapers, secondary processes, or constant maintenance to provide reliable and consistent performance.

Where to use

The Stargate O-Port-Valve® AS anti-scale services applications where standard valves require oversized actuators, purge ports, or chemical acid cleans in order to counteract the effects of scale formation and maintain a semblance of reliability. The Stargate O-Port-Valve® AS anti-scale is compatible with gas, liquids, solids, and corrosive/abrasive slurries at temperatures up to 1000F in both low pressure and high pressure applications.

We invite your inquiries into how the Stargate O-Port-Valve® AS anti-scale can provide solutions in a variety of industrial settings from ***Mining*** and ***Food*** industry to the ***Pulp*** and ***Petrochemical*** industries. The Stargate O-Port-Valve® AS anti-scale is the solution for your most difficult applications involving scale and severe service conditions.

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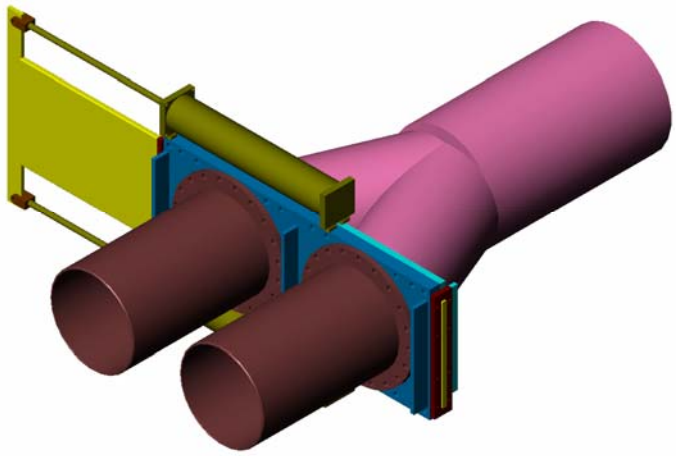
Stargate-O-Port-Valve®
Diverter Valve

Re-direct efficiently

The Stargate-O-Port-Valve® Diverter Valve can be applied to a variety of applications where flow of material has to be diverted from one line to another. The Stargate-O-Port-Valve® Diverter Valve has been used in chip feed applications to divert chip flow from one digester to another. The Stargate-O-Port-Valve® Diverter Valve can also be use in place of two single valves around a positive displacement pump. This valve guarantees uninterrupted media flow when the flow of a positive displacement pump is redirected to a different pipe. This valve can also be supplied with an additional position for complete shut-off, replacing two single valves.



A recently developed special application for the Stargate-O-Port-Valve® Diverter Valve is in common header systems. The Stargate-O-Port-Valve® Diverter Valve can be used to convert a common header system into a system where each vessel has an individual flow path to the next step in the process. Based on the application this can prevent damage to other components in the system and increase flow speed.

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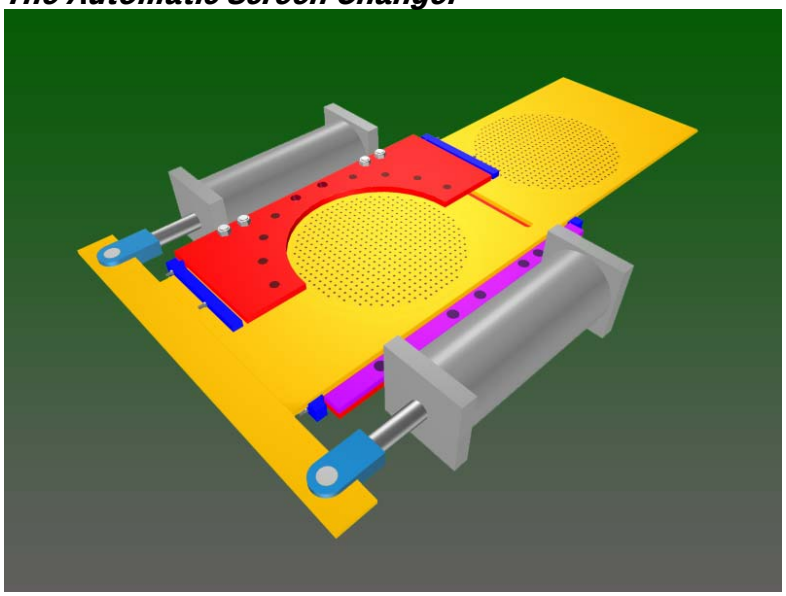
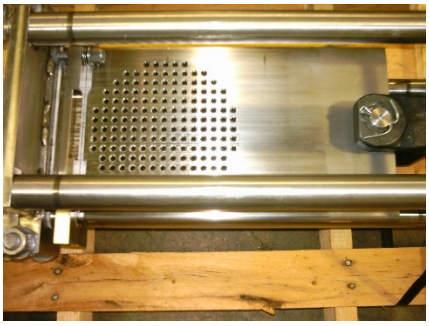
Stargate O-Port-Valve®
Big Screen

The Automatic Screen Changer



Stopping production, taking flanges loose, and dropping pipes simply to replace a screen is a time consuming task that cuts into equipment availability. Big Screen™ will reduce/eliminate the down time for maintenance purposes. Install a clean screen without stopping production.



The advantages of Big Screen™

- Big Screen™ replaces screens without stopping production, reducing/eliminating downtime.
- The actuator moves the screens, bringing the one that is to be exchanged outside the body and at the same time the clean one into the flow area.
- Cut rings shear the protruding matter from the screen surface, protecting the seats and ensuring a tight seal. With the dirty screen outside of the process, the operator can clean/replace the screen as applicable.

Applications:

- Vent on a steaming vessel for turpentine recovery. Rather than replacing screens at every outage, the valve is actuated at an appropriate interval to allow access for the operators to clean the screen. All of this is done with the process running continuously.
- Back up screen behind the rotary screen for the recovery boiler, reducing possible plugging of the heat exchangers and burners.
- Mill water intake. Screen will prevent larger objects (branches, rocks, and debris) from entering the supply line.
- Custom applications including:
    - Automated back flush
    - Valve-Screen combination for isolating a line for maintenance.
    - Fully adaptable to various screen configurations. Blade integrated or replaceable screens

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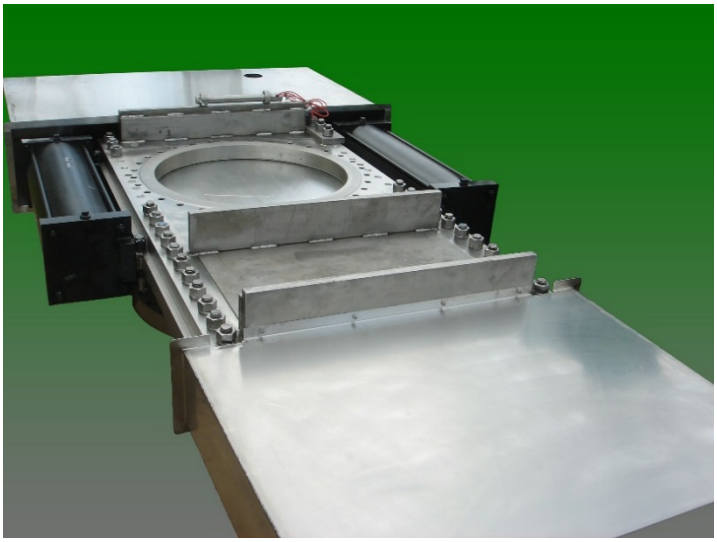
Stargate-O-Port-Valve®
Big Cap

Capping without compromise



For full automation of reactor fill operations, capping valves are used instead of manually installed blanks.

The Stargate-O-Port-Valve® Big Cap™ utilizes very rugged, purpose built design characteristics for long life under the unique application challenges.

Replace ball valves, butterfly valves, and other non-performing, high maintenance, low reliability valves with a purpose built specialty solution.

The advantages of the SVC Stargate-O-Port® Big Cap:

- Safe, reliable operation without hang-ups, binding, or plugging.
  - o *Material cannot prevent blade actuation:* The Big Cap™ valve handles overfilling of a digester without seat damage by moving overfilled chips into the valve body - pressure free - and bringing back the overfilled material for the next cycle. With knife gate valves, the chips will accumulate in the "bottom" of the valve and prevent proper closure of the capping valve. Ball valves will accumulate chips behind the ball that will eventually damage the seats. The damage to the leading edge of the orifice typically seen on chrome plated ball valves will not occur with the Big Cap™ valve.
  - o *Safety Interlocks:* Interlocks are placed between 1) the automated locking device and one pressure sensor and 2) the actuators and a redundant pressure sensor. This arrangement provides two safety iterations to prevent the capping valve from being opened while there is

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Our company is certified ISO9001:2008 / Certificate No.: CERT-0090755

still pressure in the digester above set-point for safe opening of the capping valve.

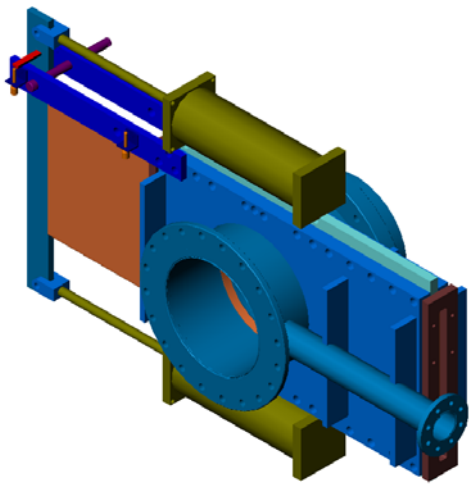
- o *High Performance Actuators:* Pneumatic, hydraulic, or electric actuation depending on end user requirements. Big Cap[tm] valves utilize heavy duty industrial actuators purpose specified to ensure on-demand reliable actuation even in high cycle applications.

Other Characteristics to set the Stargate-O-Port-Valve® Big Cap[tm] apart:

- *Short takeout dimension:* Compared to ball valves typically used in capping applications the Big Cap[tm] has a significantly shorter takeout. The shorter takeout is beneficial to system stack-up dimensions, particularly when considering overall roof height in modular systems or systems that are roof height limited. Depending on the design of the reactor neck, the Big Cap[tm] valve is designed with a thru bolt flange to allow for clearances to other equipment at the capping location or to allow connection to a lugged reactor flange.

- *Low maintenance:* The only regular PM item is the occasional tightening of pusher bolts to ensure the tight seal around the blade of the valve. The Big Cap[tm] does not require lubrication of any sort.

- *Application specific customization:* The Big Cap[tm] allows adaptation to the special needs of the application, such as Partial Stroke Testing without compromising seal, automated multi-position locking devices, custom face to face dimensions, and restricted space envelopes. Integrated functionality such as steam assisted filling for reduced charge time, double block and bleed, process evacuation, and customized solutions for fugitive emissions applications are all available with the SVC approach of designing around the application rather than "pull and ship". Please contact the SVC representative with your specific application needs and prepare for exactly what you want to be delivered.



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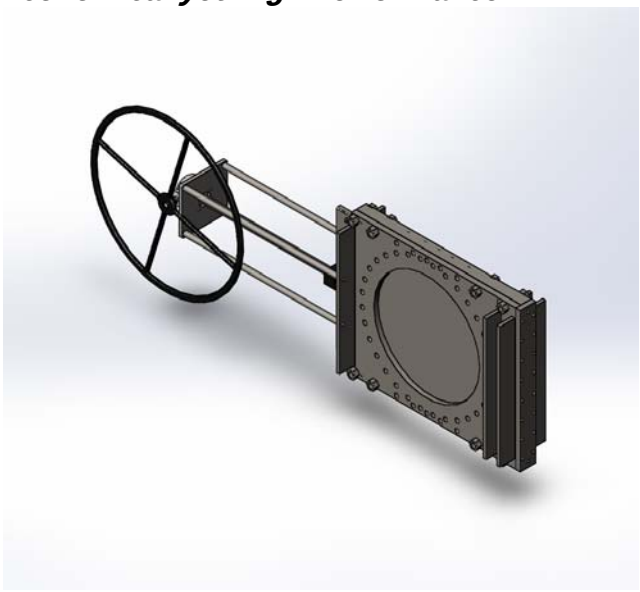
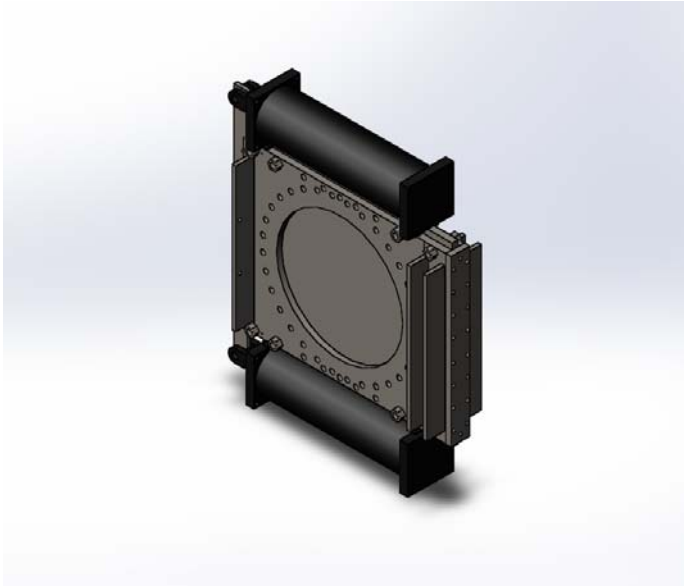
September 2016

Big-Knife^{tm}

Economical yet High Performance



36" Big-Knife^{tm} Valve; Manual



36" Big-Knife^{tm} Valve; Pneumatic Actuators

Big-Knife^{tm} valves are a development to bridge the gap between the typical knife-gate valves, which are often called throw-away valves with all their many technical disadvantages, and the more expensive Stargate-O-Port-Valve®.

- When knife-gate valves are used in applications with solids in the flow media, these valves tend to compress the solids into the seat area, over time preventing the valve from closing properly. The SVC Big-Knife^{tm} valves are designed for applications with low percentage of solids.
- SVC Big-Knife^{tm} valve are designed to allow solids to accumulate in the bottom of the valve, to a certain extent, as the valve is being closed. The bottom of the valve can be flushed out in order to prevent compaction of material in that area. The amount of accumulated solids depends on valve size, particle size and percentage of solids in the flow. The other advantage of SVC Big-Knife^{tm} design over other knife gate valves is the possibility to clean out the valve bottom if material cannot be flushed out and to do this while the valve is in line. The bottom lid is opened for clean-out.
- SVC Big-Knife^{tm} valves still retain the bi-directional shut-off feature of our other valve designs. The gate is being guided between spring loaded seats through its entire travel.
- There are no bent gates at high pressure on reverse flow because of the heavy-built design of the valve.

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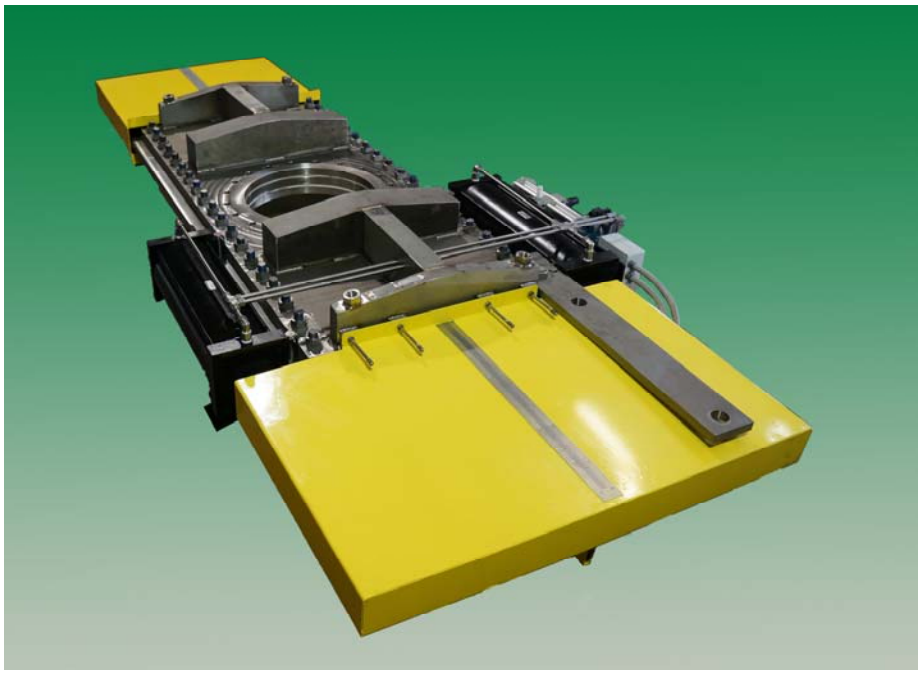
The SVC Advantage

SVC manufactures valves specific to the customer application typically to address problems experienced with other valve types. With a wide range of products and custom design knowledge, SVC will cater the valve solution to perform in applications where standard valves will not. The Stargate-O-Port-Valve is the solution for your most critical, demanding, and unique valve application problems.

Stargate-O-Port-Valve® ...Solutions Realized!



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