



Your Partner in Alumina Refining

tyco / Flow
Control

TYCO ALUMINA GROUP

A vital part of Alumina

A worldwide network of solution providers bring you over forty years of experience, research, development, design, manufacturing and service.

We work with site engineers, consultants and contractors to bring solutions to your process.

Our ability to provide and manage total project packages will save you time and money. Actuation packages help to solve your health and safety issues.

We have developed dual cast wear resistant metals, metal finishes and elastomers for your abrasive and caustic environment.

Global sites
bringing Global services



Stafford, Texas USA
Anderson Greenwood Safety Relief



Reno, Nevada, USA
Clarkson Products



Houston, Texas USA
Keystone K-Lok Products



Lons-le-Saunier France
Klein Products



Perth Western Australia
Keystone Slurry Products



Brisbane, Queensland Australia
Lunkenheimer Products

KEYSTONE

NeoTecha

CLARKSON

ANDERSON GREENWOOD

LUNKENHEIMER

Klein



The Tyco Alumina Group has a package of proven product solutions for the alumina refining industry. We bring you the respected names of Lunkenheimer, Klein, Keystone, Morin, Clarkson, Sapag, Anderson Greenwood Crosby and Neotecha with their large installed base to provide a solution for every application. Our suitability matrix shows the valves that can be used on a variety of media. There is seldom a single solution, since pipe layout and space availability can affect the choice and the ever-increasing use of automation across the whole size range demands different solutions. Tyco manufactures a complete range of manual, electric, pneumatic and hydraulic actuator packages for our range of valve, which we continue to develop to reflect the changing requirements of health and safety. If there is an application you can rely on us to have the solution.

Tyco Alumina Group - a vital part of your plant.



Grupo de Alumina da Tyco oferece um pacote com uma série de produtos de comprovada eficiência para a indústria de Alumina.
Composta de marcas reconhecidas como Lunkenheimer, Klein, Keystone, Morin, Clarkson, Sapag, Anderson Greenwood, Crosby e Neotecha com uma grande gama de produtos para cada aplicação.
Nossa matriz especifica as válvulas mais adequadas a serem utilizadas para cada tipo de fluido.
Raramente haverá somente apenas uma opção, tendo em vista que a disposição da tubulação e disponibilidade de espaço pode afetar a especificação dos produtos.
Ademas, o crescente aumento da automação e diversidade de espaço requerem diferentes soluções.
Tyco fabrica uma gama completa de atuadores manuais, elétricos, pneumáticos e hidráulicos para nossa série de válvulas as quais são continuamente aprimoradas para atender os requisitos mais exigentes de saúde e segurança industrial.
Se houver uma aplicação voce pode confiar em nós para ter a solução.

Grupo de Alumina da Tyco uma parte vital de sua planta.



Le Groupe Alumine de TYCO, propose des produits qui ont fait leurs preuves dans l'industrie de production de l'alumine. Nous vous donnons ci-après, les noms de Lunkenheimer, Klein, Keystone, Morin, Clarkson, Sapag, Anderson Greenwood Crosby et Neotecha, sociétés ayant des structures capables de fournir des solutions pour chaque application. Notre tableau d'utilisation montre les vannes pouvant être utilisées sur une grande variété de fluides. Il y a rarement une solution simple, puisque le tracé des tuyauteries et l'espace disponible peuvent affecter le choix et l'utilisation toujours croissante d'automatismes dans toute la gamme des dimensions, d'où la nécessité de proposer différentes solutions. TYCO fabrique des séries complètes de commandes manuelles, d'actionneurs électriques, pneumatiques et hydrauliques, pour toutes nos gammes de vannes, que nous continuons à développer pour tenir compte des besoins changeants liés à l'hygiène et la sécurité. Si il y a un besoin, vous pouvez compter sur nous pour vous trouver la solution.

Le Groupe Alumine TYCO - une partie essentielle de votre usine.



Η ομάδα αλουμινίας Tyco έχει μια συσκευασία των αποδεδειγμένων λύσεων προϊόντων για τη βιομηχανία καθαρισμού αλουμινίας. Σας φέρνουμε τα σεβαστά ονόματα Lunkenheimer, Klein, βάση, Morin, Clarkson, Sapag, του Αντερσον greenwood Crosby και Neotecha με τη μεγάλη εγκατεστημένη βάση τους για να παρέχουμε μια λύση για κάθε εφαρμογή. Η μήτρα καταλληλότητάς μας παρουσιάζει ότι οι βαλβίδες που μπορούν να χρησιμοποιηθούν σε ποικίλα μέσα είναι εκεί σπάνια μια ενιαία λύση, δεδομένου ότι το σχεδιάγραμμα σωλήνων και η διαστημική διαθεσιμότητα μπορούν να έχουν επιπτώσεις στην επιλογή και η συνεχώς αυξανόμενη χρήση της αυτοματοποίησης πέρα από ολόκληρη τη σειρά μεγέθους απαιτεί τις διαφορετικές λύσεις. Οι κατασκευαστές Tyco μια πλήρης σειρά του χειρωνακτικού ηλεκτρικού, πνευματικού και υδραυλικού ενεργοποιητή συσκευάζουν για τη σειρά βαλβίδας μας, την οποία συνεχίζουμε να αναπτύσσουμε για να απεικονίσουμε τις μεταβαλλόμενες απαιτήσεις της υγείας και της ασφάλειας εάν υπάρχει μια εφαρμογή μπορείτε να στηριχθείτε σε μας για να έχετε τη λύση.

Ομάδα αλουμινίας Tyco - ένα ζωτικής σημασίας μέρος των εγκαταστάσεών σας



Tyco Alumina Group - Le ofrece un paquete con una serie de productos de comprobada eficacia para la industria de la refinería de alumina. Le brindamos las respetadas marcas Lunkenheimer, Klein, Keystone, Morin, Clarkson, Sapag, Anderson Greenwood, Crosby y Neotecha con sus amplias instalaciones para proveer una variedad de productos para cada aplicación. Nuestra matriz indica las válvulas adecuadas para utilizarse en los diversos medios. Raramente hay una sola opción, ya que la distribución de la cañería y la disponibilidad de espacio pueden afectar la elección. Además el creciente uso de automatización a través de la variedad de tamaños requiere diferentes soluciones. Tyco fabrica una selección muy completa de actuadores manuales, eléctricos, neumáticos e hidráulicos para nuestra serie de válvulas, las cuales estamos continuamente mejorando para reflejar los cambiantes requerimientos de la salud y seguridad industrial. Puede confiar en nosotros ya que le traeremos lo mejor para cualquier aplicación.

Tyco Alumina Group es una parte vital de su industria.



Il gruppo dell'allumina di Tyco ha un pacchetto delle soluzioni provate del prodotto per l'industria di raffinamento dell'allumina. Vi portiamo i nomi rispettati di Lunkenheimer, di Klein, chiave di volta, di Morin, di Clarkson, di Sapag, di Anderson Greenwood Crosby e di Neotecha con la loro grande base installata per fornire una soluzione per ogni applicazione. La nostra tabella di idoneità mostra che le valvole che possono essere utilizzate su una varietà di mezzi là è raramente una singola soluzione, poiché la disposizione del tubo e la disponibilità dello spazio possono interessare la scelta e l'uso sempre crescente di automazione attraverso l'intervallo di grandezza intero richiede le soluzioni differenti. I fornitori di Tyco una gamma completa di martinetti idraulico manuale, elettrico, pneumatico ed impacca per la nostra gamma di valvola, che continuiamo a sviluppare per riflettere i requisiti cambianti di sanità e sicurezza; se ci è un'applicazione potete contare su noi per avere la soluzione.

Gruppo dell'allumina di Tyco - una parte vitale della vostra pianta.

A v i t a l p a r t o f A l u m i n a

Media Product Matrix

Our Media / Product matrix shows alternative valves for the same service. There is seldom a single solution, since pipe layout and space availability can affect the choice and the ever increasing use of automation across the whole size range demands different solutions. The changing economics and safety within alumina refining is driving innovation and new thinking, Tyco Global Alumina reflect this with our range of site tested and proven products and although your parameters may not be exactly those where we have installed product, we are always willing to work with you to obtain the solution.

Service

| Mode | Valve Type | Spent liquor | Hot spent liquor | Green (pregnant) liquor | Liquor and cleaning liquor < (300g/l) | Digestion slurry | Mud slurry & sand slurry | Bauxite slurry | Washer overflow (20g/l) | Settler overflow (200g/l) | Flocculant | Leach mix (Sodium Aluminate@350°C) | Spent Liquor and oxalate slurry | Alumina Hydrate fine seed slurry | Alumina Hydrate slurry | Powerhouse and water treatment | Process condensate | Steam > 450kPa | Low pressure steam | Contaminated vapour return | Lime slurry | |
|------------|-------------------------------------|--------------|------------------|-------------------------|---------------------------------------|------------------|--------------------------|----------------|-------------------------|---------------------------|------------|------------------------------------|---------------------------------|----------------------------------|------------------------|--------------------------------|--------------------|----------------|--------------------|----------------------------|-------------|---|
| On/Off | Keystone F990 | ● | | | | | | | | | ● | | | | | | | | | | | |
| Modulating | Keystone F990 | ● | | | | | | | | | ● | | | | | | | | | | | |
| On/Off | Keystone F2000 | | | | | ● | | | | ● | | | | | | | | | | | | |
| Modulating | Keystone F2000 | | | | | ● | | | | ● | | | | | | | | | | | | |
| On/Off | Keystone F618 | | | | | ● | | | | ● | | | | | | | | | | | | |
| Modulating | Keystone F618 | | | | | ● | | | | ● | | | | | | | | | | | | |
| On/Off | Keystone K-Lok F360/370-158 | ● | ● | ● | ● | | | | | | | | | | | | ● | | | ● | | |
| Modulating | Keystone K-Lok F360/370-158 | ● | ● | ● | ● | | | | | | | | | | | | ● | | | ● | | |
| On/Off | Keystone K-Lok uhmwpe seat | | | | | | | | | | | ● | ● | ● | | | | | | | | |
| On/Off | Vanessa triple off-set zero leakage | | | | | | | | | | | | | | | | | ● | | | | |
| Modulating | Vanessa triple off-set zero leakage | | | | | | | | | | | | | | | | | ● | | | | |
| Modulating | Keystone F634 Teflon-Lined | | | ● | | | | | | | | | | | | | | | | | | |
| Modulating | Keystone F637 Short Body | | ● | | | | | | ● | | | | | | | | ● | | | ● | ● | |
| Modulating | Keystone F638 SE Extended Body | | ● | | | ● | ● | ● | | ● | | | | | | | | | | | | |
| Modulating | Keystone F638 S2 Extended Body | | | | | ● | ● | ● | | ● | | | | | | | | | | | | ● |
| Modulating | Clarkson C Valve | | | | | ● | ● | ● | | | | | | | | | | | | | | |
| On/Off | Keystone F955 knife gate | | | | | | ● | ● | | | | | ● | | | | | | | | | |
| On/Off | Clarkson KGA | | | ● | | | ● | ● | | ● | | | | ● | | | | | | | ● | |
| On/Off | Clarkson KGF | | | | | ● | ● | ● | | ● | | | ● | ● | | | | | | | | |
| On/Off | Klein tankbottom | ● | ● | ● | ● | ● | ● | ● | | | | ● | ● | ● | ● | | | | | | | |
| On/Off | Klein 'inline' valve | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | | | | | | ● |
| On/Off | Klein actuated | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | | | | | | |
| On/Off | Klein check | ● | ● | ● | ● | ● | ● | ● | | | | ● | ● | ● | ● | | | | | | | |
| On/Off | Lunkenheimer F603 Angle | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | | | | | | |
| On/Off | Lunkenheimer F604 Bayonet | ● | ● | ● | ● | ● | ● | ● | | | | ● | ● | ● | ● | | | | | | | |
| On/Off | Lunkenheimer F605 Combination | | | | | ● | | | | | | | | | | | | | | | | |
| On/Off | Lunkenheimer F606 Drain | ● | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | | | | | | | |
| On/Off | Lunkenheimer F607 Check | ● | ● | ● | ● | ● | ● | ● | | | | ● | ● | ● | ● | | | | | | | |
| On/Off | Keystone F628 Tank autogrind | | | ● | | | | | | | | | | | ● | | | | | | | |
| On/Off | Keystone F624 Angle autogrind | | | ● | | | | | | | | | | | | | | | | | ● | |

Note: Our matrix is general in nature, for more specific applications please contact your local agent/distributor or the addresses shown on the back page.

A v i t a l p a r t o f A l u m i n a

Rotary & Knife style Valves

Valves for the control and isolation of liquors, light and heavy, throughout the Bayer process. Our installed base and experience over many years of operation and improvement ensures the right valve for every application.



F990 CEE2/CEE4

Size:
25-500mm

Pressure:
Up to 1000kPa

Temperature:
Up to 120°C

Flanges:
ANSI 150 & AS 2129

Features:

- One piece thin stainless steel disc.
- Compact, light weight wafer style body
- Bi-directional bubble tight shut-off.

F2000/F618

Size:
50-500mm

Pressure:
1400kPa/1800kPa

Temperature:
120°C

Flanges:
ANSI 150 & AS 2129

Features: F2000

- Wafer style body.
- Bi-directional, bubble tight resilient seated valve.
- Steel reinforced SBR seat.
- High strength thru-shaft.
- Air quench hardened ductile disc.

Features: F618

- Bi-directional, bubble tight resilient seated valve.
- Steel wafer body.
- Higher pressures.
- Higher temperatures.
- Hardened steel disc.
- Duplex stainless shaft.

Neotecha PTFE Lined Butterfly

Size:
40-600mm

Pressure:
Up to 1000kPa

Temperature:
Up to 200°C

Flanges:
ANSI, AS 2129

Features:

- PTFE lined internals.
- Utilises mechanical stem seal.
- Wide PTFE sealing face.
- Suitable for shut-off or control of highly corrosive media.

K-LOK F360/370-158 Isolation & Control

Size:
50-900mm

Pressure:
ANSI 150, 300

Temperature:
Up to 535°C

Flanges:
ANSI, AS 2129

Features:

- Double offset disc-stem for reduced opening /closing torque.
- Range of interchangeable seat options.
- Cast Steel body.
- Nickel edge disc.
- R.T.F.E. seats.
- U.H.M.W.P.E. seats.
- Encapsulated seat design.

Vanessa 30000 Series

Size:
80-3600mm

Pressure:
Up to ANSI 900

Temperature:
Up to 815°C

Flanges:
ANSI 150, 300, 600 & 900

Features:

- Unique triple offset metal seated valve.
- Zero leakage.
- One piece cast body.
- Stellite seat standard.
- Full range of actuators available.

F637-032 Hi-Chrome Internals Short Body

Size:
50-600mm

Trim:
28% Chrome Iron

Pressure:
1400kPa

Temperature:
230°C

Flanges:
ANSI 150 FF

Features:

- Wafer style body.
- Short body.
- Bi-directional control valve.
- Swing through disc with minimum leakage.
- Multiple Elastomer stem seals.
- Hard wearing 28% chrome iron (650 Brinell hardness) liner and disc.
- F634-038 all Teflon coated internals.

F638 026/032 Hi-Chrome Internals Extended Body

Size:
40-600mm

Trim:
026 - Extreme Duty
032 - Heavy Duty

Pressure:
ANSI 150, 300

Temperature:
230°C

Flanges:
ANSI FF

Features:

- Unique extended body design to ensure that the medium impinges within the valve body not the pipeline.
- Multiple Viton stem seals.
- Hard wearing 28% chrome Iron (650 Brinell hardness) liner and disc.
- Ceramic trim 026 available.

F638 S2/SE Extended Body Wing Disc

Size:
40-200mm

Trim:
S2/SE - Severe Duty

Pressure:
ANSI 150, 300

Temperature:
230°C

Flanges:
ANSI FF

Features:

- Unique extended body design to ensure that the medium impinges within the valve body.
- High chrome & tungsten carbide internals.
- KTFE stem seals for acid & caustic resistance.
- Wing disc for erosion reduction.
- High CV
- High rangeability.

F955 - Through Conduit Valve

Size:
50-750mm

Pressure:
Up to 1600kPa

Temperature:
Up to 120°C

Flanges:
ANSI, AS 2129

Features:

- Rugged thru port design.
- Bi-directional sealing.
- Dual hardness reinforced elastomer seats.
- Flushing ports.

Clarkson Knifegate KGA -KGF

Size:
80-1350mm

Pressure:
2100 kPa - KGF
700 kPa - KGA

Temperature:
Up to 200°C

Flanges:
ANSI 150, 300

Features: KGF Flanged

- Field replaceable seats.
- Extra heavy duty.
- Tight shut-off.

Features: KGA Flanged

- Suitable for use in wet or dry service.
- Field replaceable seats.
- Heavy duty.
- Tight shut-off.
- Full ported flow.

A v i t a l p a r t o f A l u m i n a

Globe Angle & In-line Valves

Heavy duty globe, angle and in-line style isolation valves for the heaviest bauxite and hydrate slurries. Actuated solutions for all plant conditions make us your first choice.



Klein Inline 'Y' type Valve

Size:
50-800mm

Pressure:
ANSI 150, 400, 300, 600 & 900

Temperature:
-29°C to 455°C

Flanges
ANSI 150, 300, 400, 600, 900

- Features:
- Split or monobloc body.
 - Venturi design body on LP, full bore on HP, oversized seat on monobloc body.
 - Over spec wall thickness.
 - Large range of actuators.
 - Proven design.
 - PED approved.



Klein Tank Bottom Valves

Size:
50-800mm

Pressure:
ANSI 150, 300, 400 & 600

Temperature:
-29°C to 455°C

Flanges
ANSI 150, 300, 400, 600

- Features:
- Venturi design body on LP, full bore on HP.
 - Installation on pipe or on tank.
 - Over spec wall thickness.
 - Large range of actuators.
 - Proven design.
 - PED approved.



Klein Actuated Valves

Size:
Across the whole range

Pressure:
ANSI 150 to 900

Temperature:
- 29°C to 455°C

Flanges
As per manual types

- Features:
- 'Easygrind' manual.
 - Electric.
 - Pneumatic.
 - Hydraulic.
 - Combination.
 - Special applications.



Klein Lunkenheimer Check Valves

Size:
50-600mm

Pressure:
ANSI 150, 300 & 600

Temperature:
- 29°C to 455°C

Flanges
As per manual types

- Features:
- Bottled cap angle piston type.
 - Monobloc 'Y' type spring assist.
 - Over spec wall thickness.
 - PED approved.



F603 Lunkenheimer Angle Valve

Size:
50-900mm

Pressure:
ANSI 150, 300 & 600

Temperature:
-29°C to 455°C

Flanges
ANSI 150, 300, 600

- Features:
- Regrindable seat.
 - Over spec wall thickness.
 - Large range of actuators.
 - Proven design.
 - PED approved.



F604 Lunkenheimer Bayonet Valve

Size:
50-900mm

Pressure:
ANSI 150, 300, 600

Temperature:
-29°C to 455°C

Flanges
ANSI 150, 300, 600

- Features:
- Regrindable seat.
 - Over spec wall thickness.
 - Large range of actuators.
 - Proven design.
 - PED approved.



F605 Lunkenheimer Combination Valve

Size:
50-900mm

Pressure:
ANSI 150, 300, 600

Temperature:
- 29°C to 455°C

Flanges
ANSI 150, 300, 600

- Features:
- Regrindable seat.
 - Over spec wall thickness.
 - Large range of actuators.
 - Proven design.
 - PED approved.



F606 Lunkenheimer Drain Valve

Size:
50-150mm

Pressure:
ANSI 150, 300, 600

Temperature:
-29°C to 455°C

Flanges
ANSI 150, 300, 600

- Features:
- Compact one piece design.
 - Regrindable seat.
 - Proven design.
 - PED approved.



F624 Hydraulic Angle Valve

Size:
200-600mm

Pressure:
ANSI 150

Temperature:
230°C

Flanges:
ANSI 150

- Features:
- Hydraulically operated.
 - Offers opening, closing and seal grinding in a single operation.
 - Dual plug cutting action.
 - Fully retractable cutter.
 - Remote and automatic control available.



F628 Tank Valve

Size:
200-500mm

Pressure:
1200kPa

Temperature:
230°C

Flanges:
ANSI 150

- Features:
- Hydraulic powered self grinding valve.
 - Automatic scale removal on opening and closing.
 - Cuts and grinds on seating.

A v i t a l p a r t o f A l u m i n a

Pressure Relief & Boiler Control Valves

Solutions for steam, condensate and process safety with products from Anderson Greenwood and Crosby, Sempell, Dewrance, Yarway and Raimondi - all specialists in their field. Tyco Alumina offer real solutions from a single source.



Boiler Safety Valves

Size:
12mm to 750mm

Pressure:
ANSI 150 to ANSI 4500

Types:
Spring, Pilot and Power Operated

Brands:
Anderson Greenwood, Crosby, Sapag.

Steam Isolation Valves

Size:
10mm to 3600mm

Pressure:
ANSI 150 to ANSI 4500

Types:
Wedge Gate, Parallel Slide, Globe, 1/4 turn

Brands:
Dewrance, Fasani, Raimondi, Sempell, Vanessa.

Pilot Operated Relief Valves

Size:
12mm to 500mm

Pressure:
ANSI 150 to ANSI 2500

Types:
Pilot Operated

Brands:
Anderson Greenwood, Crosby.

Pressure Relief Valves

Size:
12mm to 500mm

Pressure:
ANSI 150 to ANSI 2500

Types:
Spring, weight and Power Operated

Brands:
Anderson Greenwood, Crosby, Kunkle, Sapag.

Desuperheaters

Size:
40mm to 100mm

Pressure:
ANSI 150 to ANSI 4500

Types:
Multiple Nozzle Control

Brands:
Yarway, Narvik.

Boiler Level Indicators

Pressure:
Up to 3000 psig

Types:
Mechanical, Magnetic, Ultrasound, Electric

Brands:
Yarway, Penberthy.

Pump Protection

Size:
12mm to 300mm

Pressure:
ANSI 300 to ANSI 4500

Types:
Automatic recirculation valve with check by-pass

Brands:
Yarway.

Blow-Off/Blowdown Valves

Size:
6mm to 150mm

Pressure:
ANSI 150 to ANSI 2700

Types:
Needle, V-Port, Globe, Seatless

Brands:
Yarway, Hancock, Sempell.

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