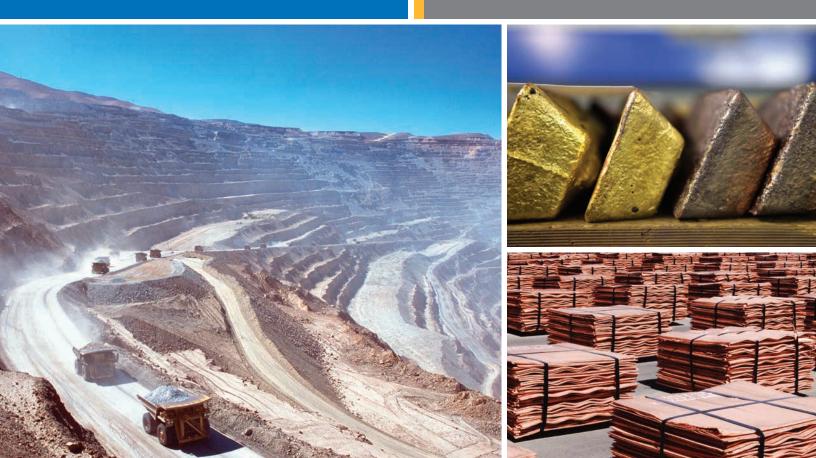


# **DeZURIK**

# VALVE SOLUTIONS FOR MINING APPLICATIONS



### **Mine Pump Station Expertise**

Let the experts at DeZURIK analyze your pump station and provide a custom report that will provide the most cost effective solution over the lifetime of your mine. The analysis takes into account pumping costs (head loss), valve budgetary pricing and relative maintenance costs of various valve types.



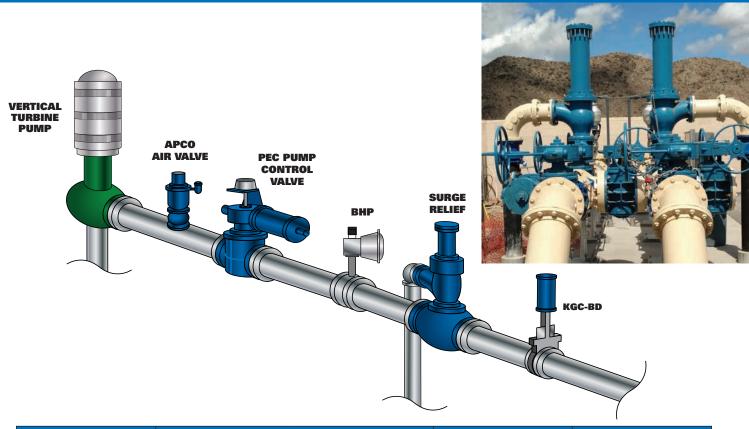
	Criteria for Optimal Pump Station Performance and Safety								
Critical Station Requirements	Pump Reversal, Backspin, Water Hammer Prevention	2nd Option: Water Hammer Prevention	Surge Protection						
Product		VCO							
	PEC/PEF Pump Check Valves	ASU Combination Air Valves	CVS Swing Check Valves	SRA Surge Relief Angle Valves					
Important Product Capabilities	Start up/shut down surge protection     Low head loss     Open & close speed control	<ul> <li>Combination air/ vacuum valve</li> <li>Slow closing - adaptable to pump characteristics</li> </ul>	Fast closure     Low head loss     Non-slam capability	Opens quickly on pressure surge event     Adjustable closing speed control					



Request DeZURIK's
Surge Investigation
and Valve Suggestions
Report by visiting
DeZURIK.com or
scan:

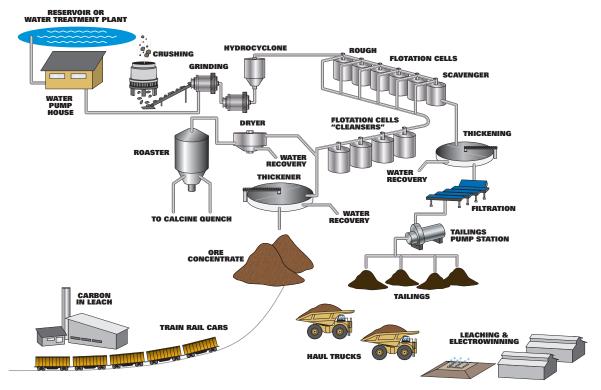
Report includes maximum surge pressure potential, surge period, line velocity, surge wave speed, pipeline constant, and total system head potential during a surge event.

# Process & System Water (Pump Station)



Pump Control	Isolation Sh	Isolation Shutoff Valves		Air Valves
				APCO
PEC/PEF Pump Check Valves	BHP High Performance Butterfly Valves	KGC-BD Bi-Directional Knife Gate Valves	SRA Surge Relief Angle Valves	ASU Combination Air Valves
Serves as both pump check & control valve  Adaptable to pump characteristic — specify operating point on pump curve  Ductile Iron body, integral nickel seat  NBR, EPDM or FKM seal	Lugged 316 Stainless Steel body  RTFE seat  2205 or 17-4 pH shaft  Handwheel or cylinder operator	316 Stainless     Steel body     316 Stainless     Steel gate     NBR, EPDM or     FKM seal     Handwheel or     cylinder operator	Ductile Iron body     ASME B16.42 ASTM     A536     Stainless body seat     NBR EPDM     FKM seal     Self-contained     hydraulic seal     Stroke counter	Dual chamber 5/16" orifice     Valve size based on fill rate or vacuum condition     Double-acting throttling device (DAT) for surge protection

## **Mining Process & Product Overview**



		KNIFE GA	TE VALVES	SLURR' GATE \	URETHANE LINED KNIFE GATE VALVES		
Systems							
	KGN RSB	KGC-ES	KGC-BD	KGC-MD	KSL-SD	KSL-LA	KUL
Grinding							
Hydrocyclone					<b>/</b>	<b>/</b>	<b>/</b>
Flotation-Column Cell					<b>/</b>	<b>/</b>	
Flotation-Supercell					<b>/</b>	<b>/</b>	<b>/</b>
Thickening Filtration					<b>/</b>	<b>/</b>	
Roasting		<b>/</b>					
Tailings	<b>/</b>	<b>/</b>		<b>/</b>	<b>/</b>	<b>/</b>	
Carbon In Leach					<b>/</b>		
Electrowinning Leaching					<b>/</b>	<b>/</b>	







		VERE SER\ FE GATE V		COMBINATION AIR VALVES	CHECK VALVES	ECCENTRIC PLUG VALVES	HIGH PERFORMANCE BUTTERFLY VALVES	CONTROL VALVES
Systems								
	H-290-B	KSV	KSV-DBB	ASU	CRF	PEC	ВНР	RCV/VPB
Grinding		<b>/</b>						
Hydrocyclone								
Flotation-Column Cell							<b>/</b>	
Flotation-Supercell		<b>/</b>					<b>/</b>	
Thickening Filtration		<b>/</b>				<b>/</b>		
Roasting							<b>/</b>	
Tailings		/	<b>/</b>	<b>/</b>	<b>/</b>	<b>/</b>		
Carbon In Leach		/				<b>/</b>	<b>/</b>	
Electrowinning Leaching								

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### **Seat & Seal Materials**

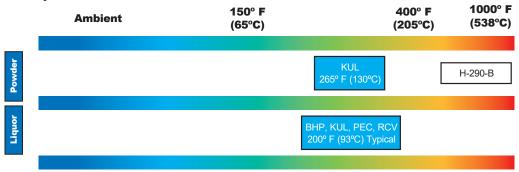
### **KUL Seat & Seal Materials**

Seat Characteristic	Description	Туре	Color	Sulfuric Acid	Sodium Cyanide	Wear Abrasion Resistance	Temperature Range
EU	Urethane, General Water Service	Polyether	Black	Not Used	Good	Excellent	-20 to 175° F (-29 to 79° C)
AUCO	Urethane, Oil Service	Polyester	Clear	Not Used	Good	Excellent	0 to 175° F (-18 to 79° C)
EUCW	Urethane, Water Service	Polyether	Clear	Not Used	Good	Excellent	-20 to 210° F (-29 to 99° C)
EUHT	Urethane, High Temp Service	Polyether	Red	Not Used	Good	Good	-20 to 265° F (-29 to 130° C)
BRPA	Urethane, Phosphoric Acid Service	Polybutadiene	Green	Good	Good	Fair	5 to 200° F (-15 to 93° C)

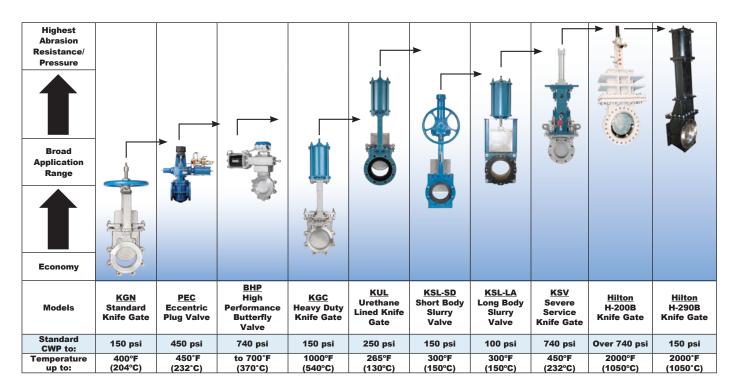
### **KSV Seat Seal & KSL Sleeve Materials**

Seat Seal or Sleeve Characteristic	Description	Valve Type	Sulfuric Acid	Sodium Cyanide	Wear Abrasion Resistance	Temperature Range
NBR	Acrylonitrile-Butadiene	KSV	Not Used	Excellent	Excellent	to 180° F (82° C)
FKM	Fluoro Rubber	KSV	Good	Excellent	Fair	to 400° F (204° C)
CR	Chloroprene	KSV	Not Used	Excellent	Good	to 180° F (82° C)
VGF	Fluorinated Hyrdro Carbon Fluoro Rubber	KSV	Fair	Excellent	Fair	to 400° F (204° C)
EPDM	Terpolymer of Ethylene, Propylene & A Diene	KSV & KSL	Fair	Excellent	Good	to 250° F (122° C)
HNBR	Hydrogenated Acrylonitrile-Butadiene	KSV & KSL	Excellent	Excellent	Good	to 300° F (150° C)
NR	Natural Rubber	KSL	Not Used	Good	Excellent	to 177° F (80° C)

### **Dry Powder & Liquor Guide**



### **Slurry Guide**



Valve				Media		
Style	Raw Water	Dirty Liquids	Light Slurry 0 - 15% Solids	Medium Slurry 15 - 30% solids	Heavy Slurry 30% Solids or More	Extreme Abrasion
KGN	May Be Used	May Be Used	May Be Used			
PEC	Typical Application	Typical Application	Typical Application	Typical Application	May Be Used	May Be Used
ВНР	Typical Application	Typical Application	May Be Used	May Be Used		
KGC	Typical Application	Typical Application	Typical Application	May Be Used	May Be Used	
KUL	Typical Application	Typical Application	Maximum Performance	Typical Application	May Be Used	
KSL-SD	May Be Used	May Be Used	Typical Application	Maximum Performance	Maximum Performance	
KSL-LA	May Be Used	May Be Used	Typical Application	Maximum Performance	Maximum Performance	
KSV	May Be Used	May Be Used	Maximum Performance	Maximum Performance	Maximum Performance	Maximum Performance
HILTION H-200B	Typical Application	Typical Application	Typical Application	May Be Used	May Be Used	May Be Used
HILTION H-290B	May Be Used	May Be Used	May Be Used	Typical Application	Typical Application	May Be Used

### **Rating System:**

May Be Used: Thoroughly evaluate the application before selecting this valve. Though this valve may have the lowest initial cost, it would seldom provide the lowest total cost of ownership.

Typical Application: Based on experience, it is very common to install this valve in the stated application.

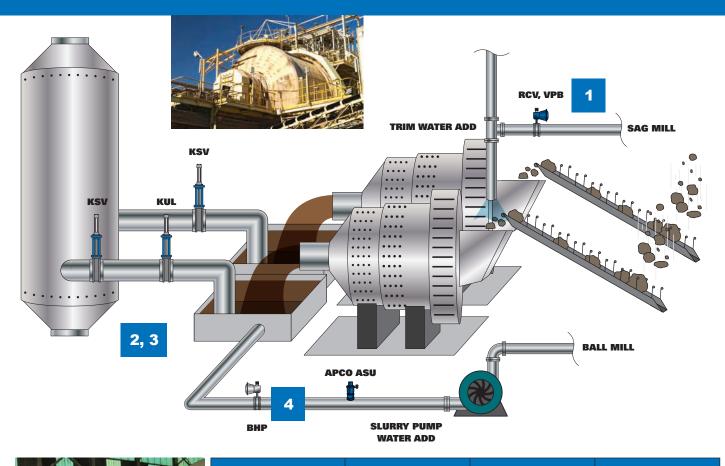
Maximum Performance: The valve listed as a Maximum Performance has been specifically designed for the stated application in most cases. Although the initial cost will be higher than other valves, the total cost of ownership is typically much lower.

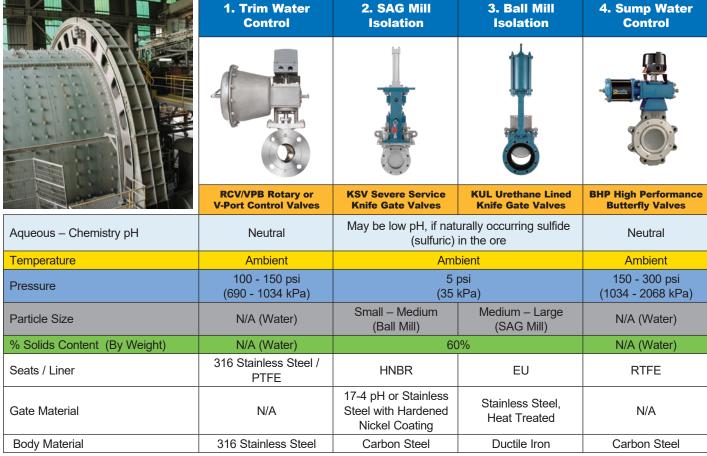
This valve selection chart is designed to provide you with a quick reference on valve style capabilities. The chart considers both cost and performance factors for a specific application when determining whether a valve style is rated Maximum Performance, Typical or May Be Used.

When evaluating a valve for any application, primary considerations are pressure rating, temperature limitations and fluid compatibility. Other considerations include importance of leak-free packing, seat leakage, and frequency of valve operation. Other factors include, but are not limited to fluid velocity, cycle frequency, speed of operation, dimensions and accessibility for installation or maintenance

For more information, contact DeZURIK, Inc. or your local representative with your specific application requirements.

### **Grinding**





## **Hydrocyclone**





Aqueous - Chemistry pH

% Solids Content (by Weight)

Gate Material / Body Material

**Temperature** 

Seats / Liner

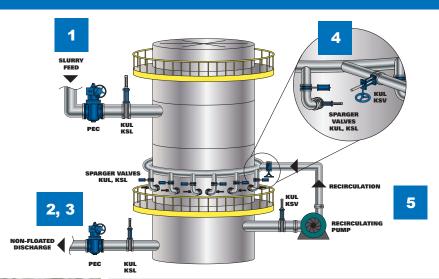
Pressure
Particle Size

# The composition of the composit

Hardened Nickel Coating / Ductile Iron

Hardened Nickel Coating / Ductile Iron

# **Flotation - Column Cell**

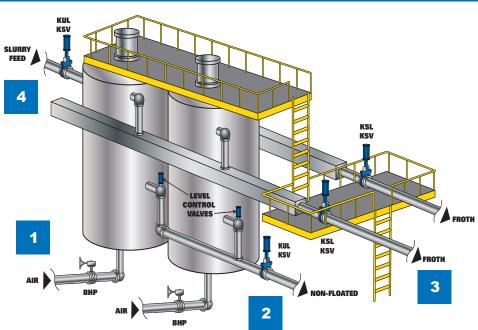




	Air Control	1. Slurry Feed	2. Non-Floated Discharge	3. Non-Floated Tank Isolation	4. Sparger Bypass	5. Slurry Recirculation
		O				
	BHP High Performance Butterfly Valves	KSL/KUL Slurry or Urethane Lined Knife Gate Valves	PEC Eccentric Plug Valves	KUL Urethane Lined Knife Gate Valves	KUL Urethane Lined or KSL Slurry Knife Gate Valves	KUL/KSV Urethane Lined or Severe Service Knife Gate Valves
Aqueous – Chemistry pH	Air		Lower	pH (trace sulfides &	reagents)	
Temperature			A	mbient		
Pressure	100 psi (690 kPa)			in Feet X 2.31 = 89 = kPa		> 150 psi (> 1030 kPa)
Particle Size	N/A			Small – Medium		
% Solids Content (by Weight)	N/A			45 - 60%		
		KSV (HNBR)			KUL (EU)	KUL (EU)
Seats / Liner	RTFE	KUL (EU)	NR	EU	KSL (NR)	KSV (Carbon) Steel Seat Ring
Gate Material /	KSV (Carbon Steel or 17-4 pH or Stainless Steel with Hardened Nickel Coating) / Carbon Steel wite Material / NA / Carbon  NA / Du		NA / Ductile	2205 or Stainless Steel with	KUL (2205 or Stainless Steel with Hardened Nickel Coating) / Ductile Iron	KUL (2205 or Stainless Steel with Hardened Nickel Coating) / Ductile Iron
Body Material	Steel Lugged	KUL (2205 or Stainless Steel with Hardened Nickel Coating) / Ductile Iron	Iron Rubber Lined	Hardened Nickel Coating / Ductile Iron	KSL (2205) / Ductile Iron	KSV (Carbon Steel or 17-4 pH or Stainless Steel with Hardened Nickel Coating) / Carbon Steel (LCC)

10

# Flotation - Tank / Super Cell



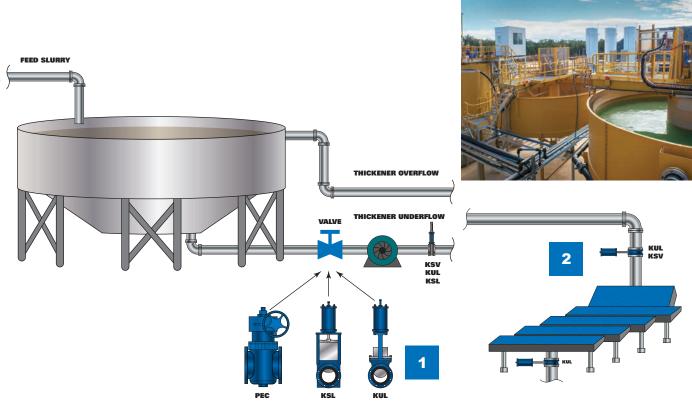


1000	1. Tank Air Feed	Non-Floated Tank Isolation	3. Froth Tank Isolation	4. Slurry Feed		
	BHP High Performance Butterfly Valves	KUL Urethane Lined Knife Gate Valves	KSL/KSV Slurry or Severe Service Knife Gate Valves	KSV/KUL Severe Service or Urethane Lined Knife Gate Valves		
Aqueous - Chemistry pH	Air	Lower PH (trace sulfides & reagents)				
Temperature		Aml	pient			
Pressure	100 psi (690 kPa)		in Feet X 2.31 = 39 = kPa	Cyclone Pump Discharge		
Particle Size	N/A		Small – Medium			
% Solids Content (by Weight)	N/A		45 - 60%			
			KUL (EU)	KUL (EU)		
Seats / Liner	RTFE	EU	KSL (NR)	KSV (Carbon Steel Seat Ring)		
		2205 or Stainless	KUL (2205 or Stainless Steel with Hardened Nickel Coating) / Ductile Iron	KUL (2205 or Stainless Steel with Hardened Nickel Coating) / Ductile Iron		
Gate Material / Body Material	NA / Carbon Steel	Steel with Hardened Nickel Coating / Ductile Iron	KSL (2205) / Ductile Iron	KSV (Carbon Steel or 17-4 pH or Stainless Steel with Hardened Nickel Coating) /		

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Carbon Steel (LCC)

# **Thickening Filtration**

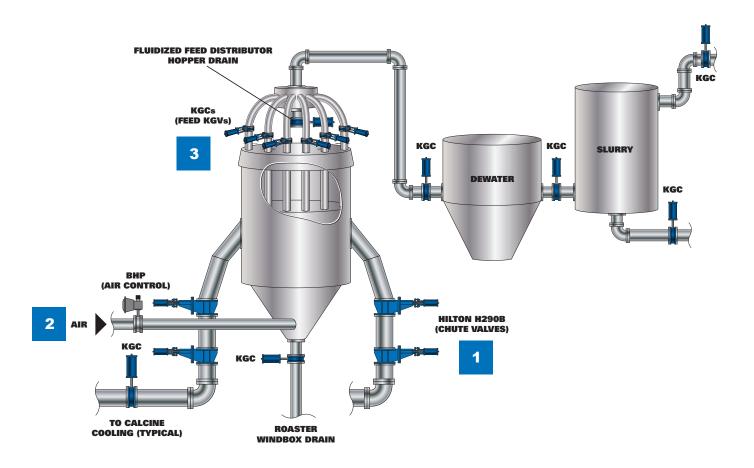


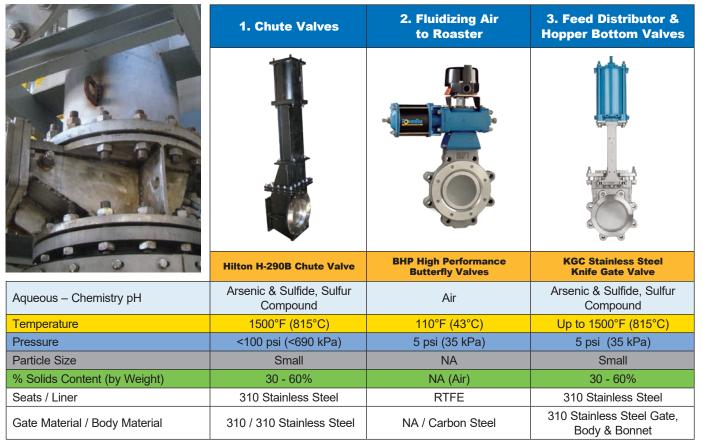


1. Under	flow Thickening D	2. Filtration Bypass		
PEC Eccentric Plug Valves	KUL Urethane Lined Knife Gate Valves	KSL Slurry Knife Gate Valves	KSV Severe Service Knife Gate Valves	KUL Urethane Lined Knife Gate Valves

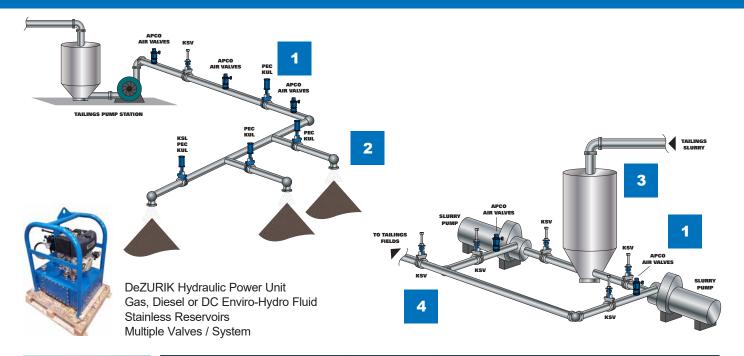
Aqueous – Chemistry pH	Higher pH (lime & trace reagents)					
Temperature		Ambient		Amt	pient	
Pressure	Gravity - (Head) 15 psi (105 kPa) Approx.			<100 psi (	<690 kPa)	
Particle Size		Fine	Fine – Coarse			
% Solids Content (by Weight)	45 - 60%			45 - 60%		
Seats / Liner	NR	EU	NR	HNBR	EU	
Gate Material / Body Material	NA / Cast Iron or Ductile Iron (Rubber Lined)	2205 or Stainless Steel with Hardened Nickel Coating / Ductile Iron	2205 or Stainless Steel with Hardened Nickel Coating / Ductile Iron	Carbon Steel or 17-4 pH or Stainless Steel with Hardened Nickel Coating / Carbon Steel (LCC)	2205 or Stainless Steel with Hardened Nickel Coating / Ductile Iron	

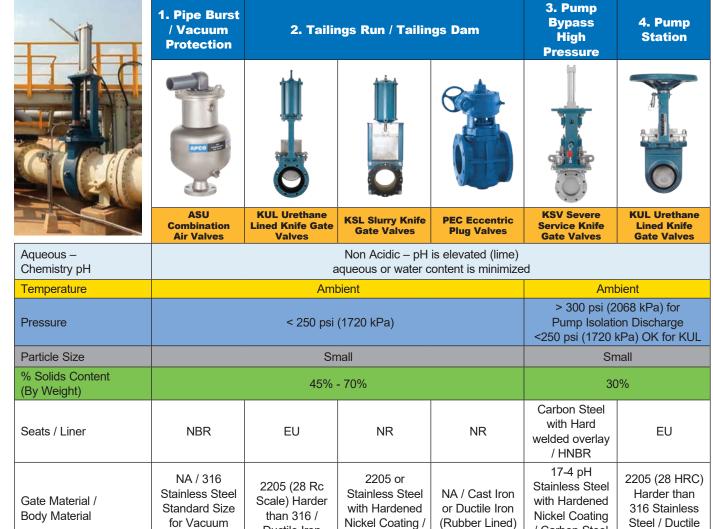
### Roasting





### **Tailings**





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Ductile Iron

/ Carbon Steel

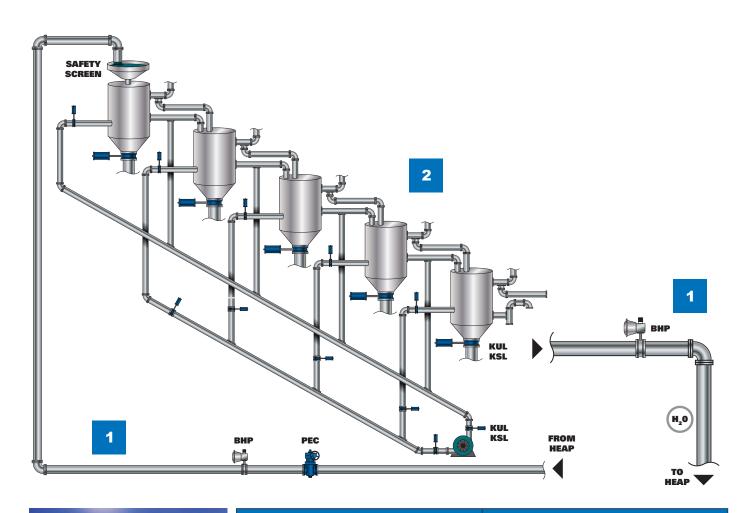
(LCC)

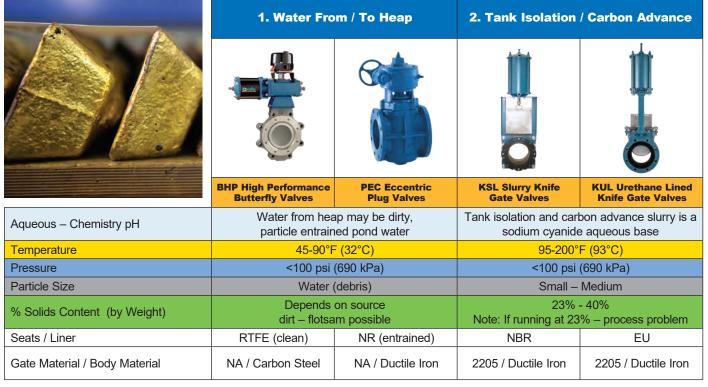
Iron

Ductile Iron

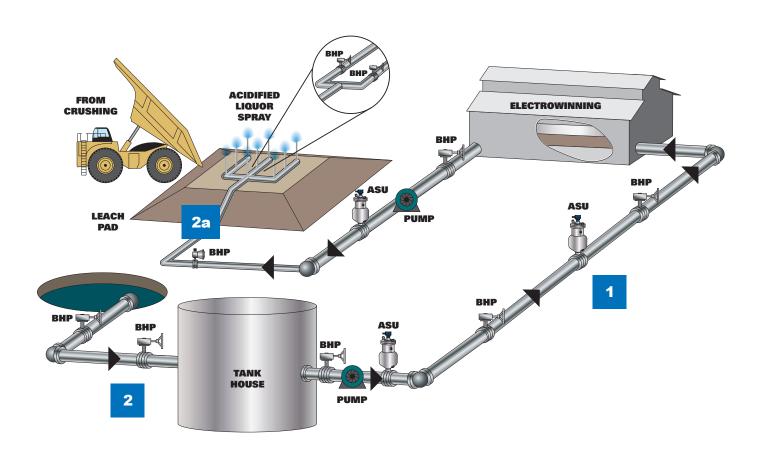
Protection

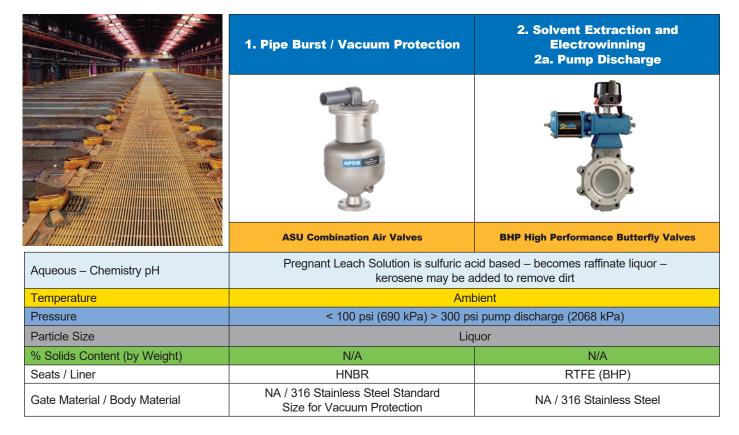
### **Carbon in Leach**



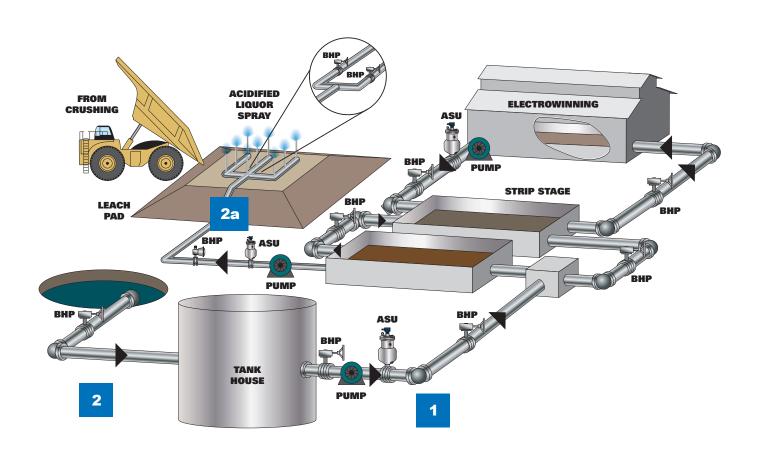


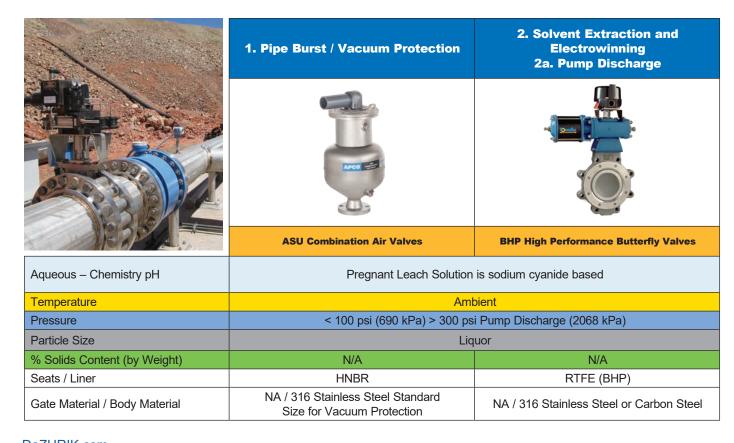
### **Leaching – Copper Electrowinning**





### Leaching – Gold Electrowinning





### Product Selection Guide General Media and Mining Process



		KNIFE GA	TE VALVES			NIFE GATE VES	URETHANE LINED KNIFE GATE VALVES
Temperatures up to	400°F (204°C)	1000°F (540°C)	400°F (204°C)	500°F (260°C)	300 °F (150°C)	300 °F (150°C)	265°F (130°C)
Pressures up to	150 psi	150 psi	150 psi	150 psi	150 psi	100 psi	250 psi
Media / Process							
	KGN RSB	KGC-ES	KGC-BD	KGC-MD	KSL-SD	KSL-LA	KUL
Slurries – Light Thickening	May Be Used	Typical	May Be Used	Typical	Typical	Typical	Typical
Slurries – Medium Grinding / Tailings	Limited	May Be Used	Limited	May Be Used	Typical	Typical	Typical
Slurries – Heavy SAG Grinding / Tailings	Limited	Limited	Limited	Limited	Limited	Typical	May Be Used
Corrosive Media / Sulfuric Acid / CIL Copper	Typical	Typical	Typical	Typical	May Be Used	May Be Used	Typical
Corrosive Media / Sodium Cyanide / CIL Gold	Typical	Typical	Typical	Typical	May Be Used	May Be Used	Typical
Steam Autoclave / Autoclave Vent	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Supply & Wash Water	Typical	Typical	Typical	Typical	May Be Used	May Be Used	Typical
Water Treatment Disposal	Typical	Typical	Typical	Typical	May Be Used	May Be Used	Typical
Dry Materials Roasting	Typical	Typical	Limited	Typical	May Be Used	May Be Used	Typical
Dry Material Column Handling Roasting	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Gases	May Be Used	May Be Used	May Be Used	May Be Used	May Be Used	May Be Used	May Be Used

### Product Selection Guide General Media and Mining Process



	HILTON CHUTE VALVES	SEVERE SERVICE KNIFE GATE VALVES		COMBINATION AIR VALVES	RUBBER FLAPPER CHECK VALVES	ECCENTRIC PLUG VALVES	HIGH PERFORMANCE BUTTERFLY VALVES	ROTARY OR V-PORT CONTROL VALVES
Temperatures up to	2000°F (1050°C)	450°F (232°C)	450°F (232°C)	180°F (82°C)	425°F (218°C)	450°F (232°C)	700°F (370°C)	1000°F (540°C)
Pressures up to	150 psi	740 psi	740 psi	150 psi	250 psi	450 psi	740 psi	740 psi
Media / Process				Tarco S				
	Н-290-В	KSV	KSV-DB	ASU	CRF	PEC	ВНР	RCV / VPB
Slurries – Light Thickening	Typical	Typical	Typical	Typical	Typical	Typical	May Be Used	Typical
Slurries – Medium Grinding / Tailings	Typical	Typical	Typical	Typical	Typical	Typical	Limited	Typical
Slurries – Heavy SAG Grinding / Tailings	May Be Used	Typical	Typical	May Be Used	May Be Used	May Be Used	Limited	May Be Used
Corrosive Media / Sulfuric Acid / CIL Copper	May Be Used	Typical	Typical	Typical	Typical	Typical	Typical	May Be Used
Corrosive Media / Sodium Cyanide / CIL Gold	May Be Used	Typical	Typical	Typical	Typical	Typical	Typical	May Be Used
Steam Autoclave / Autoclave Vent	Limited	Limited	Limited	Limited	Limited	Limited	Typical	Typical
Supply & Wash Water	May Be Used	Typical	Typical	May Be Used	Typical	Typical	Typical	Typical
Water Treatment Disposal	May Be Used	Typical	Typical	Typical	Typical	Typical	Typical	Typical
Dry Materials Roasting	Typical	Limited	Limited	Limited	Limited	May Be Used	Limited	May Be Used
Dry Material Column Handling Roasting	Typical	Limited	Limited	Limited	Limited	Limited	Limited	Limited
Gases	May Be Used	May Be Used	May Be Used	May Be Used	May Be Used	Typical	Typical	Typical

### **Facilities**



DeZURIK Corporate Headquarters and Manufacturing Facility, Sartell, MN, USA Established in 1928, 420,000 sq. ft.



DeZURIK Cambridge, Ontario, Canada Established in 1961, 50,000 sq. ft.



Rapid Fulfillment Center, Houston, TX, USA Established in 2018, 43,000 sq. ft.



DeZURIK, Redmond, WA, USA Established in 1952, 25,000 sq. ft.

### Sales and Service

For information about our worldwide locations, approvals, certifications and local representative: Web Site: <a href="mailto:pezurik.com">Dezurik.com</a> E-Mail: <a href="mailto:info@Dezurik.com">info@Dezurik.com</a>



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DeZURIK, Inc. reserves the right to incorporate our latest design and material changes without notice or obligation.

Design features, materials of construction and dimensional data, as described in this bulletin, are provided for your information only and should not be relied upon unless confirmed in writing by DeZURIK, Inc. Certified drawings are available upon request.