

PATENTED SHAFT STABILIZATION

PackRyt®
Patent #: 6834862



The PackRyt system is a unique stuffing box sealing arrangement that for the first time incorporates a bearing and flush channel system together.

The advantages of this system are numerous and are listed below for easy reference:

Machined – in close – clearance bearing stabilises shaft.

- Cavitation caused deflection is minimised.
- Minimal clearance sharply throttles solids, which allows the low-flush to keep them out of the shaft area.
- Flush – use reduction averages 2/3.

Fewer sealing rings required.

- As few as two rings of packing required.
- Results in minimal friction to sleeve / shaft.
- Little, or in some cases, no leakage from gland.
- Eliminates need to constantly adjust packing.
- High performance, ultra pure heat conductive sealing rings can virtually eliminate sleeve/shaft wear.

High performance thermoplastic bearing block.

- The bearing material has a very high compressive strength.
- Is impervious to most chemicals.
- Virtually has no dimensional growth up to 260 Deg C.
- Split, pinned, drilled and tapped for easy installation and removal.
- Available as split bearing without lantern ring groove.

Automatically positions flush channel correctly.

- Lantern ring cannot move past flush inlet.
- Flush flow remains constant.

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PackRyt Enquiry Data Sheet

Please fill in all requested information and sign off before submitting to Klinger Limited for recommendation and quotation.

DISTRIBUTOR: _____ EQUIP. MFR. _____
 CUSTOMER: _____ MODEL: _____
 LOCATION: _____ APPLICATION: _____
 CONTACT: _____
 CONTACT INFO: _____



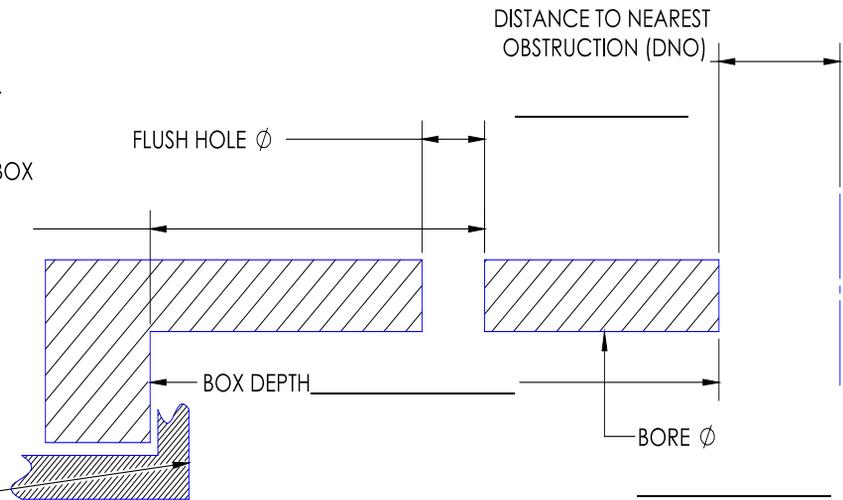
LOCATION OF FLUSH FROM BOTTOM OF BOX TO OUTER R RDGE OF FLUSH HOLE (EDGE CLOSEST TO ATMOSPHERE)

IS DEPTH TO A WEAR RING/BUSHING/ETC?

YES

NO

DON'T KNOW



PACKRYT RFQ DATA SHEET

APPLICATION DATA:

INCH MM

SHAFT/SLEEVE Ø _____

RPM _____

TEMP (°F) _____

MEDIA _____

MEDIA PRESSURE _____

FLUSH PRESSURE AVAIL _____

NOTES:

DATE: ___ / ___ / ___

Signature of customer: _____

Please fax or email enquiry sheet to +61 8 93509286 or sales@klinger.com.au

trusted. worldwide.

PATENTED SHAFT STABILIZATION

The root cause of most rotating equipment failure is shaft movement. SealRyt's patented technology has proven its ability to seal, support shafts, and increase reliability.

Key Features of PackRyt Sealing Technology:

Shaft Stabilization

Equipment sealing reliability is derived directly from stabilizing shafts. The PackRyt sealing system brings shafts into concentricity and keeps them there, significantly increasing sealing reliability. Return on investment improvements with PackRyt sealing systems are realized with both difficult to seal and everyday sealing applications. Examples of equipment types which present shaft movement that benefit from PackRyt sealing technology include:

Agitators - overhung shaft design

Vertical Pumps - Long shaft, little support

Split Case Horizontals - Middle shaft sag

Large, Slow equipment - Run-out, spiralling leakage as well as any equipment not running at its best efficiency point.

Water Conservation

Water in some cases may be plentiful outside the plant, quietly expensive inside. Whether the issue is the treatment of wastewater, evaporating water from the process, or water getting into bearings, the use of water must be sharply curtailed to reduce operating costs.

Use of the PackRyt sealing system guarantees a substantial reduction of flush water used. Due to very close clearances between bearing and sleeve, water entry to the process is severely throttled. This throttling is inherent and automatic.

Unlike conventional sealing bushings, PackRyt's do not require flow meters to reduce flow.

Below are typical maximum flow rates experienced on example pumps @ 15 psi differential, little or no leakage to atmosphere, without flow meter adjustment.

Goulds 3196MT- 0.147 gpm

Goulds 3175S - 0.837 gpm

Ahlstrom 2LRS15/20 - 1.074 gpm

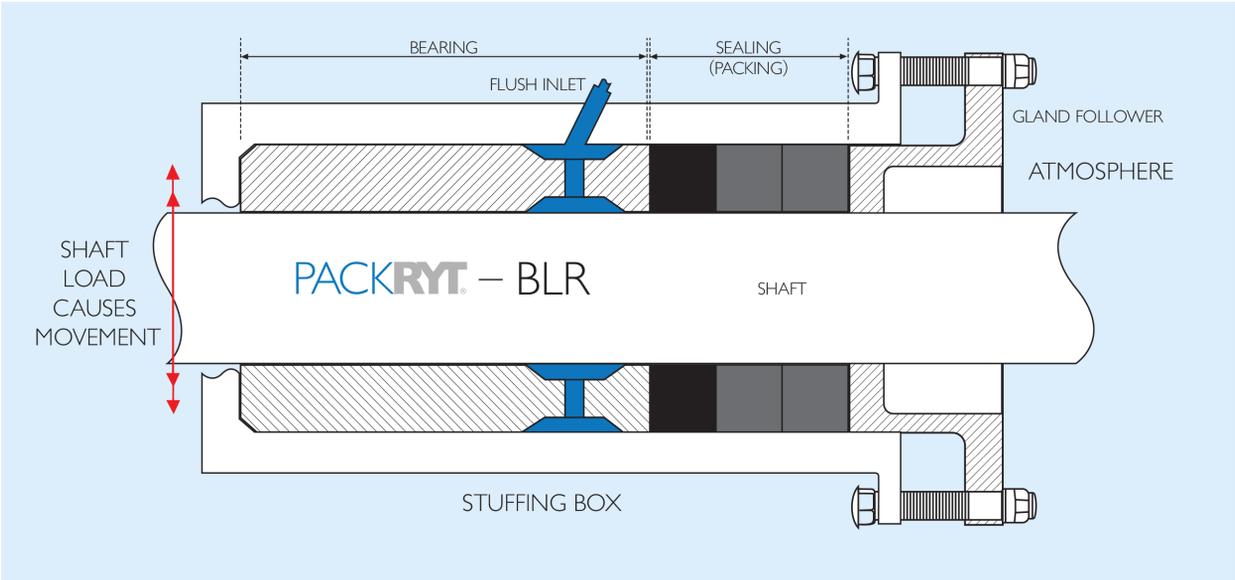
Goulds 3175L - 1.252 gpm

Energy Conservation

Actual field tests routinely show that, after an approximate 10-30 minute break in period, the PackRyt system draws the same or less amps than a single mechanical seal on the same or identical pump.

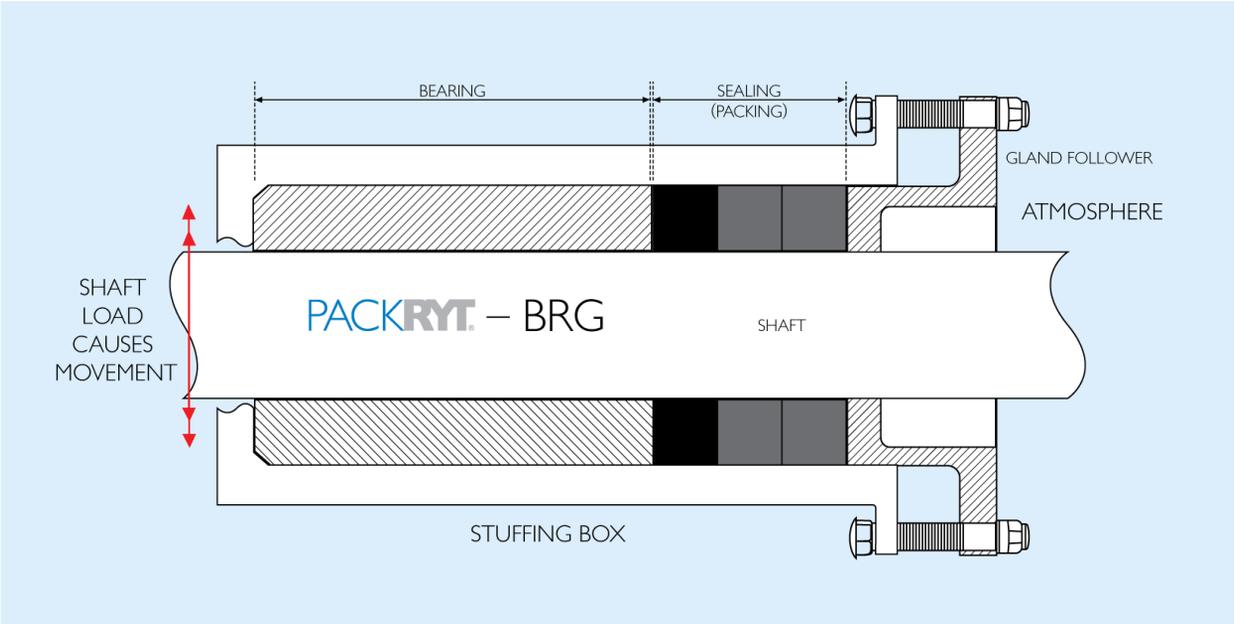
PackRyt BLR

The PackRyt Sealing System is a unique stuffing box sealing arrangement that incorporates a bearing and flush channel system together. This replaces outdated packing/lantern ring/packing configurations. Our system brings shafts into concentricity and keeps them there, significantly increasing sealing reliability



PackRyt BRG

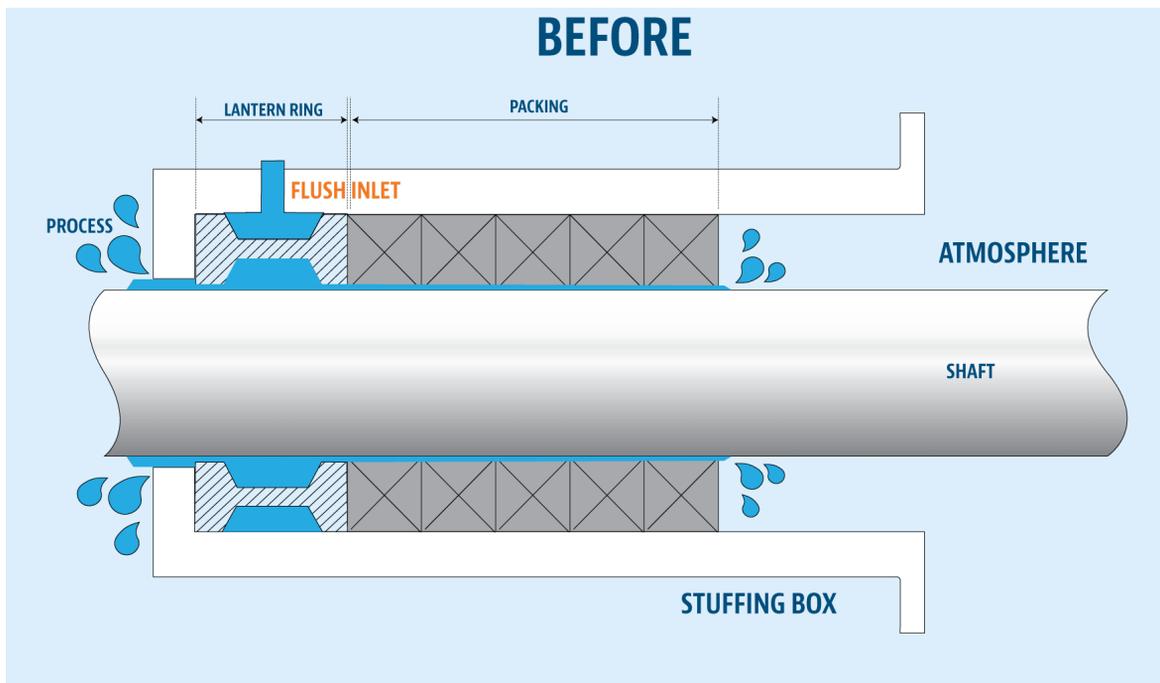
The PackRyt Bearing Sealing System is a unique stuffing box sealing arrangement that incorporates a bearing custom made to close tolerances for your application. This replaces outdated braided-packing-only configurations. Bearing and high quality braided packing for applications where flush media is not available to the stuffing box.



DIVERTER[®] – Flush Relocation Without Stuffing Box Modification

The PackRyt Diverter is a unique stuffing box sealing arrangement that incorporates a flush channel relocation system internally within the composite bearing. This replaces outdated lantern ring/packing configurations that dump excess water into the process. The Diverter relocates the flush deposit and drastically throttles flush volume. Our system ALSO brings shafts into concentricity and keeps them there, significantly increasing sealing reliability.

Traditional Inefficient Sealing Method



Lantern Ring at the Bottom of the Box

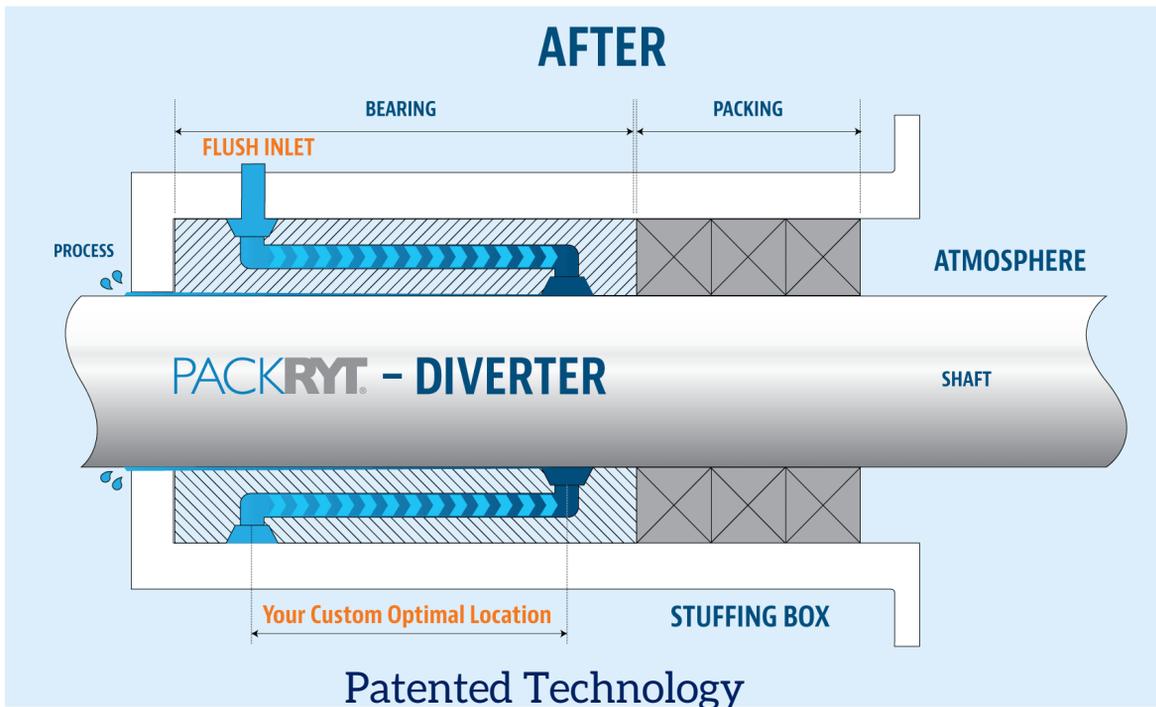
The Problem

- Many pump and equipment manufacturers locate the flush water port at the bottom of the stuffing box.
- Flush water is allowed to flow in very high volumes to process unchecked.
- Manually reducing flush flow allows slurry to enter the stuffing box and destroy expensive hard parts.

DIVERTER[®] – Flush Relocation Without Stuffing Box Modification

Moving Flush Deposit away from the process Drastically Reduces Volume used.

DIVERTER Bearing Sealing System



The Solution

The PackRyt Diverter solves the problem and more.

- Flush water is relocated to the optimal position for YOUR application using channels within the bearing.
- Shaft stabilization technology prevents shaft movement such as run-out and deflection.
- No equipment modifications required.
- The PackRyt Diverter Sealing System greatly increases sealing reliability and equipment bearing life.

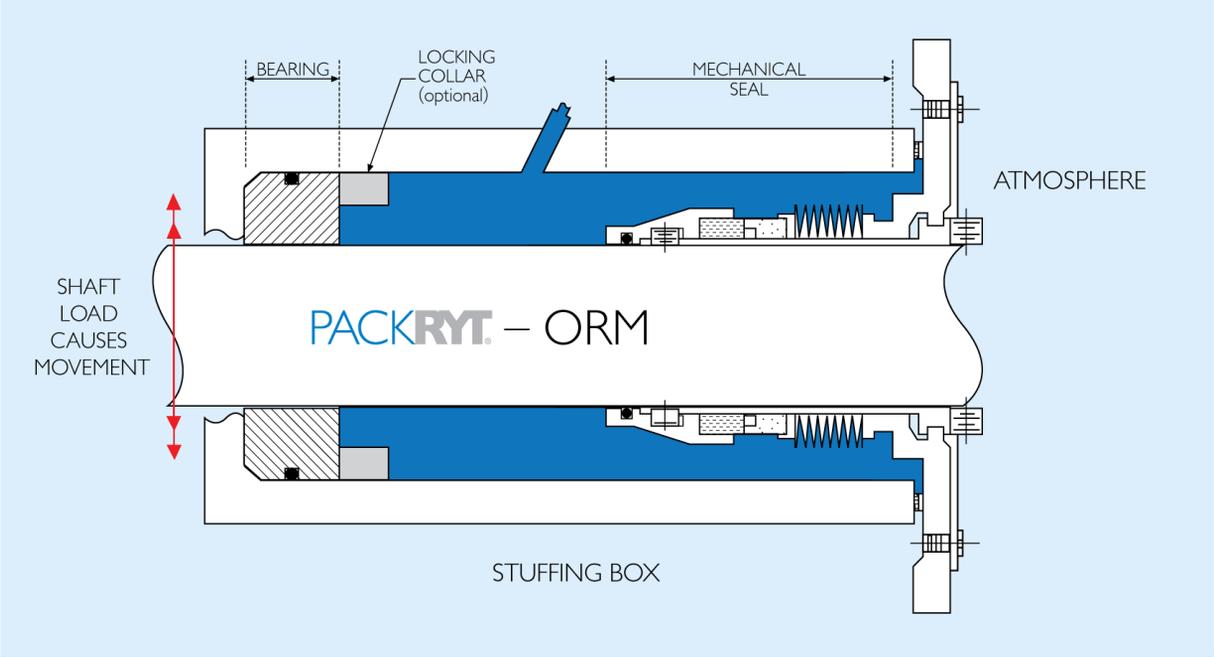
UP TO 85% REDUCTION IN FLUSH AUTOMATICALLY!

PackRyt ORM

Save Face – Let us bear the load

Mechanical seals are ultra-precision devices with seal faces carefully lapped to less than 1.8 microns. This type of precision is expensive and downtime, due to seal face parting and failure, is even more costly.

Bearing with O-ring mounted on outside diameter for use with mechanical seals to keep seal face concentric. Optional locking collar available.



PackRyt - Line Shaft Bearings

- The use of SealRyt Line Shaft Bearings, by centring the shaft and keeping it there, optimizes the delivery end of the equipment.
- Any shaft utilizing a steady bushing for support, whether vertical or horizontal, is a candidate for a SealRyt Line Shaft bearing.
- These locations can be found inside tanks on agitator shafts, vertical pump columns, auger screw supports, powder blade mixers, marine drive shafts and so on.
- OEM bushings are supplied of many materials with normal clearances of .015" (0.381 mm) to .020" (0.508mm). These materials tend to wear rapidly, the clearances open, and the shaft is no longer steadied.
- The SealRyt Corporation manufactures bearings to replace these OEM bushings with much closer clearances, each one built to specific customer-supplied dimensions and each designed to greatly extend service life and optimize the application.
- Depending on the holding mechanism, the SealRyt Line shaft Bearings can be held in place with anti-rotation pins, shrunk or press fit, or end caps. All these methods are designed into our bearings reflective of holder requirements.
- The use of SealRyt Line shaft Bearings , by centering the shaft and keeping it there, optimizes the delivery end of the equipment, whether props, impellers, blades or flights. Further, this long-term stabilization minimizes wear and tear on the outside roller bearing support systems.



Physical properties, PackRyt (P.R.) bearing versus Glass filled Teflon (GFT) and Carbon/molly filled Teflon (CMFT).

<u>PROPERTY</u>	<u>ASTM</u>	<u>UNITS</u>	<u>P.R.</u> Standard Grade	<u>GFT</u>	<u>CMFT</u>
Specific gravity	D1457-62	GR/CC	1.5	2.22	2.1
Tensile strength	D638	PSI	5,171	2,300	2,010
Elongation	D638	%	< 1	270	62
Flexural strength	D790	PSI	7,600	1,275	1,375
Flexural modulus	D790	KPSI	781	190	160
Compressive strength	D695	PSI	16,900	1,460	975
Coef/therm/expansion	D696	10-6 in/in F	13 (-94 to 185 F)	64	54
Coef / friction	D1894-95	Static/kinetic	0.14/0.11	0.11	0.08
Hardness	Shore	D	85	62	60
Heat Distortion Temperature	D648	F	500	150	150

These properties are typical without regard for variances in compounding, manufacturer to manufacturer.

● Higher grades of Pack Ryt bearing material are available if required for application.

Improved Reliability in thousands of Applications Worldwide

Pulp & Paper

All Fibreline Equipment
Outlet Device
Top Separator
Steaming Vessel
High-Pressure Feeder
Low-Pressure Feeder
Chip Chute Pump
Tramp Material Separator
Digester liquor pumps
Liquor transfer pumps
Brown/bleached stock washers
Drop leg trunnions
Brown stock refiners
Dissolving tank agitators
Blow tank agitators
MC mixer pumps
Green/white liquor pumps
Lime slurry pumps
Thick stock pumps
Stock chest agitators
Stock pumps
White water pumps
Raw water intake pumps
Hydro-pulper's
Refiners
Shower pumps
Condensate pumps
Glue/starch pumps

WASTE WATER

Pumps
Digester Circulation
Thickened Sludge
Lift Station Vertical
Influent
Shower
Activated Sludge
Sewerage pumps

Mining

Tailings pumps
Process slurry pumps
Crushers
Autoclaves
Booster pumps
Agitators
Reclamation pumps
Filter screens
Thickeners
Vertical turbine pumps
De-watering

Power Generation

River water intake pumps
Circulating water pumps
Vertical turbine pumps
Condensate pumps
Fly ash pumps
Heater drain pumps
Ash sluice pumps
Cooling water pumps
Boiler recirculation pumps
Mud pumps
Lime/gypsum slurry pumps
Slurry agitators
Soot Blowers

Hydro Electric

Main turbine shafts
Wicket gates
River water pumps
Circulation pumps
Penstocks

Chemical

Dry Powder Mixers
Slurry
Mixer/Agitator
Reactors

Food and Beverage

Brewery Mash Cookers
Steam Peelers
Poultry By-products Pumps
Screw Conveyors
Food or Beverage Direct
Contact
Whiskey Pumps
Mixers
Rinse Water Pumps
Evaporator/Dryers/Blenders
/Cookers
Ammonia Valves
Sugar crushing & refining

Refineries

Compressors
Ammonia Pumps
Condensate Centrifugal
Pumps
Cooling Tower Pumps
Control Valves
Residual Pumps
Heat Transfer Fluid Pumps
Refrigeration
Steam Turbines
Steam Valves

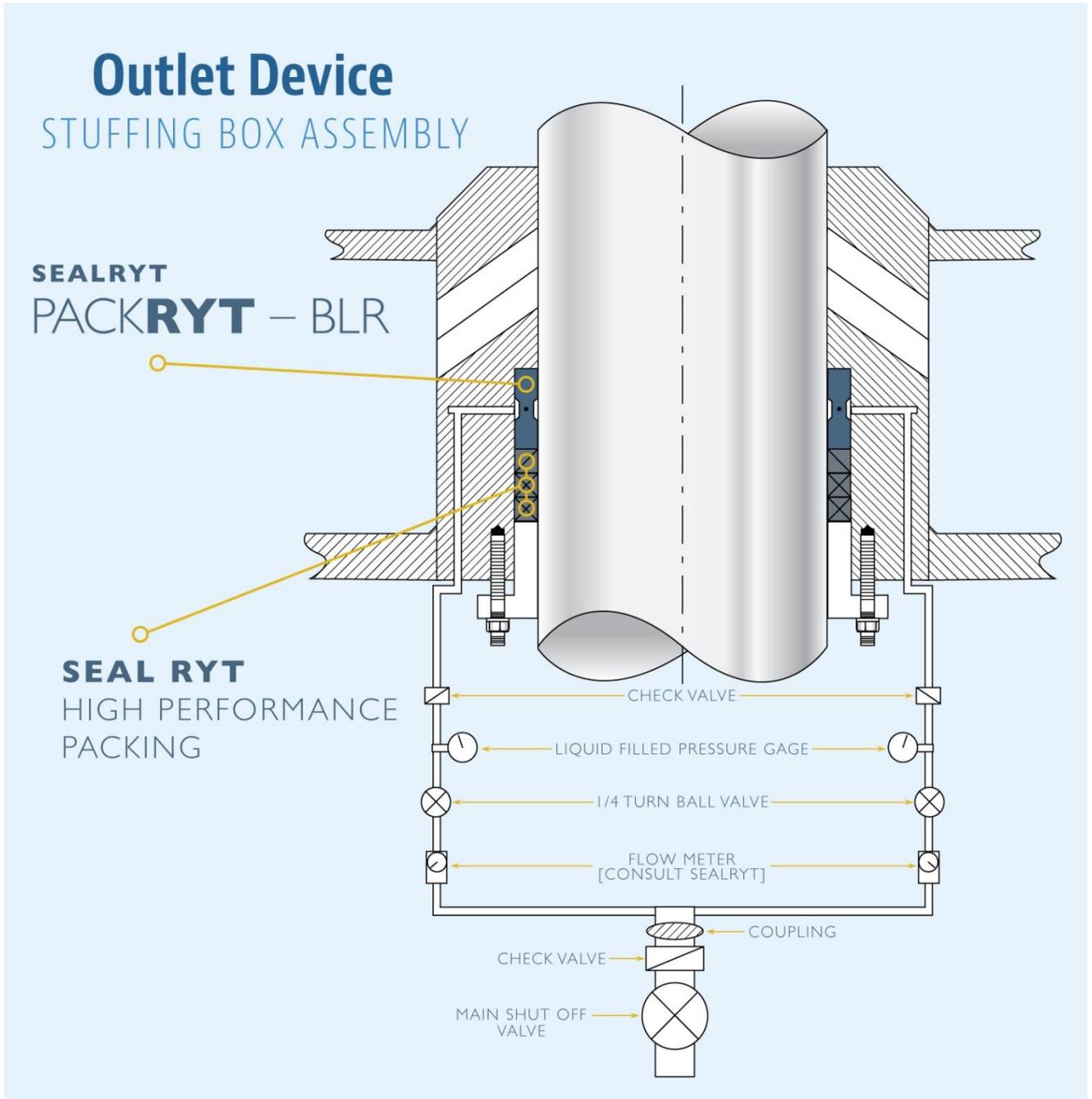
Ships & Shipping

Boiler Feed Pumps
Fire Pumps
Process Valves
Discharge Pumps
Stern Tube
Chemical Injection Pumps
Steam Valves

As an OEM supplier of specific sealing devices to Andritz, Inc, The SealRyt Corporation routinely teams up with Andritz , Inc, to provide substantially upgraded sealing systems through Andritz engineering and their authorized rebuild facilities.

trusted. worldwide.

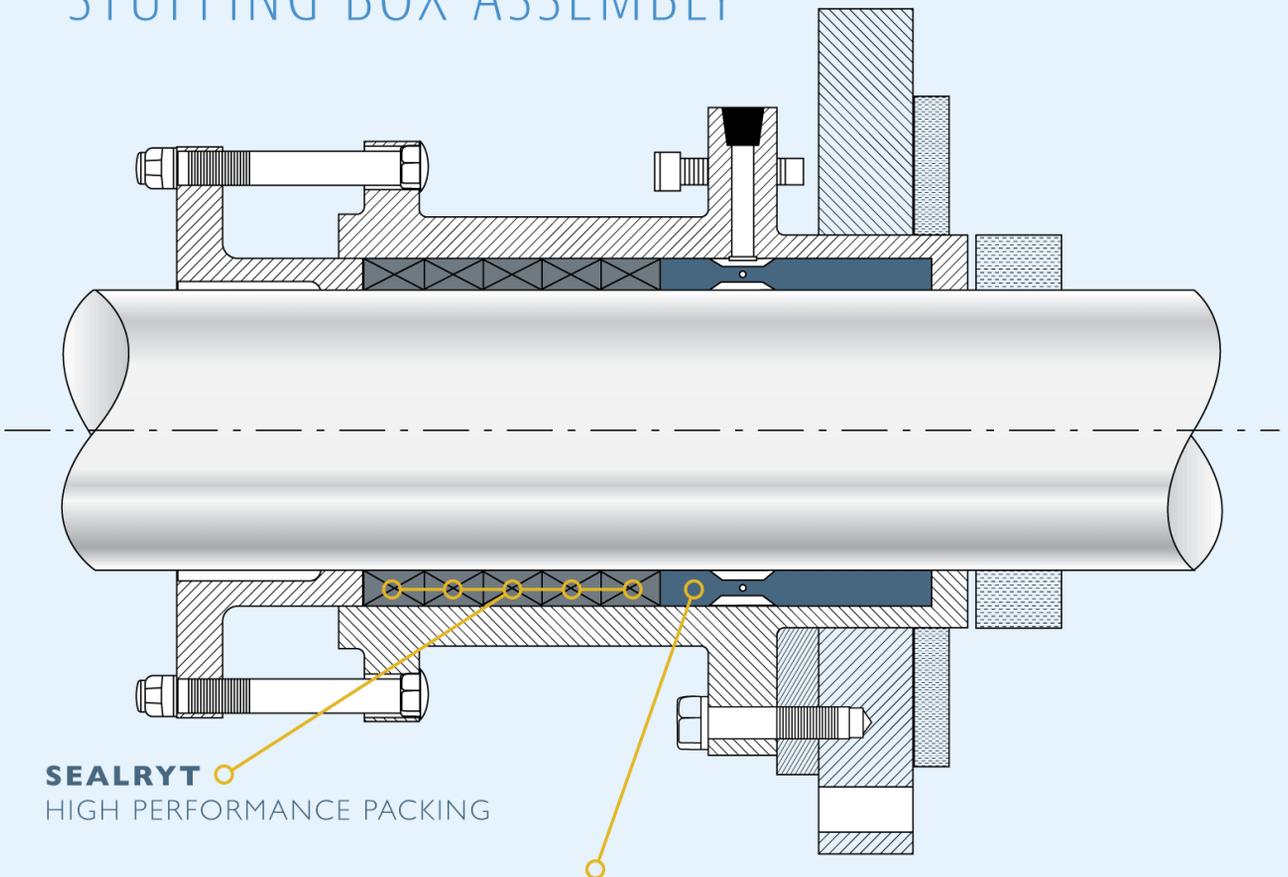
Outlet Device – Stuffing box assembly



Agitator – Stuffing box assembly
Same system applicable to top and
bottom entry Agitators

Sidewall Agitator

STUFFING BOX ASSEMBLY



SEALRYT
HIGH PERFORMANCE PACKING

SEALRYT
PACKRYT – BLR

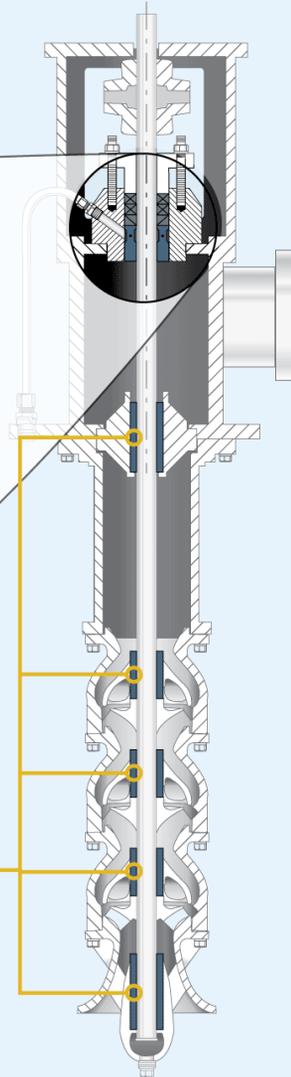
Vertical Turbine Pump – Stuffing box assembly

Vertical Turbine Pump STUFFING BOX ASSEMBLY

SEALRYT
HIGH PERFORMANCE
PACKING

SEAL RYT
PACKRYT – BLR

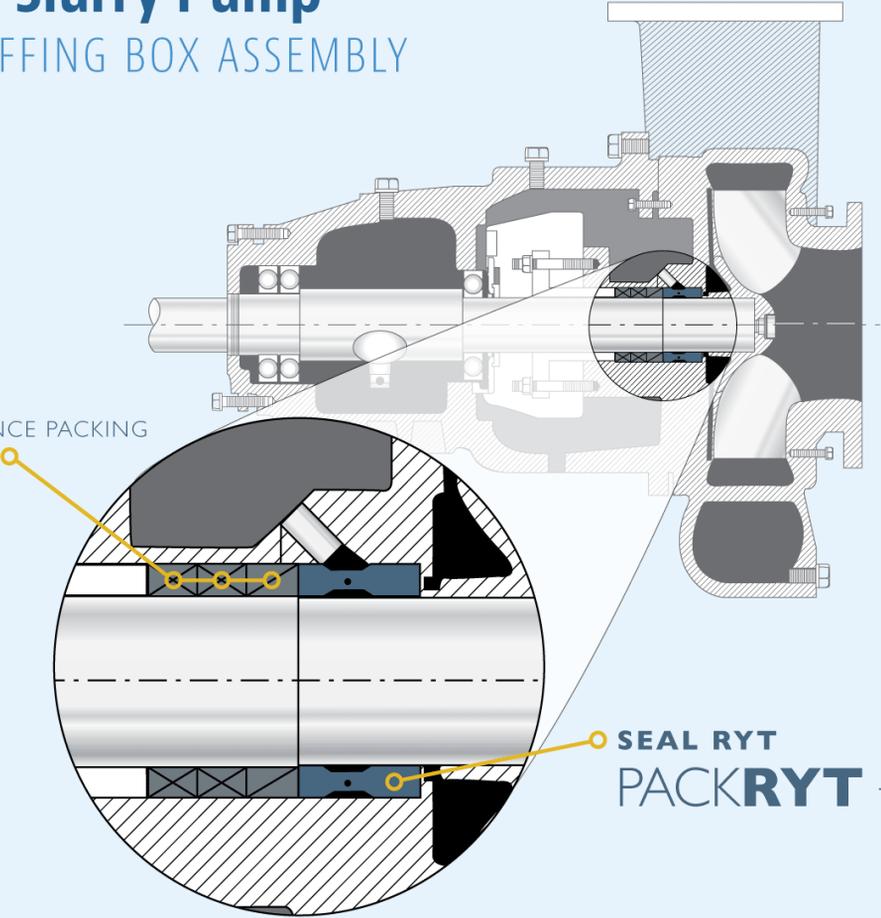
SEAL RYT
PACKRYT – BRG



Slurry Pump – Stuffing box assembly

Slurry Pump STUFFING BOX ASSEMBLY

SEAL RYT
HIGH PERFORMANCE PACKING

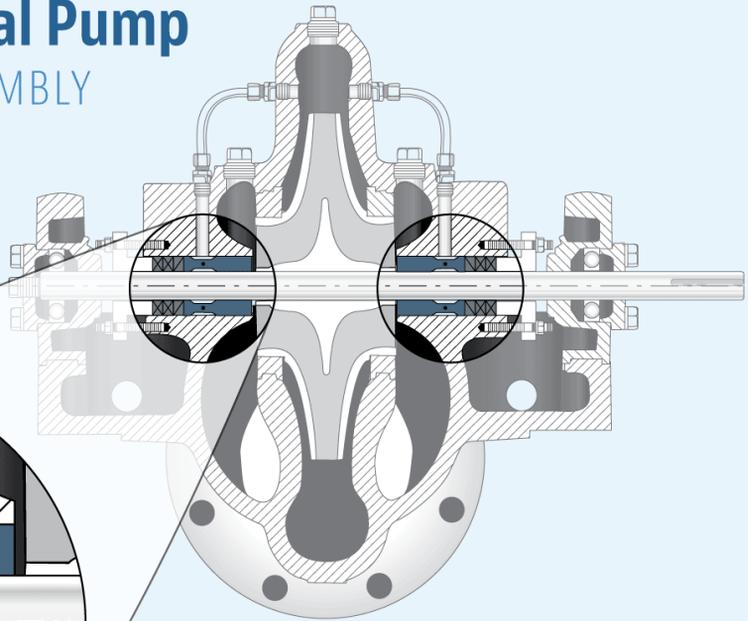
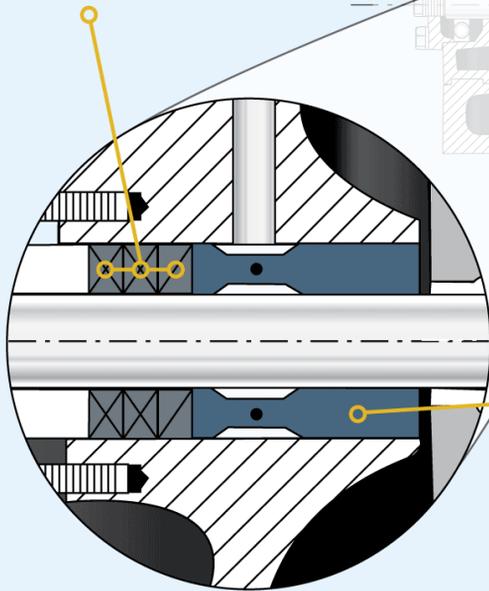


SEAL RYT
PACKRYT – BLR

Split Case Horizontal Pump – Stuffing box assembly

Split Case Horizontal Pump STUFFING BOX ASSEMBLY

SEAL RYT
HIGH PERFORMANCE PACKING

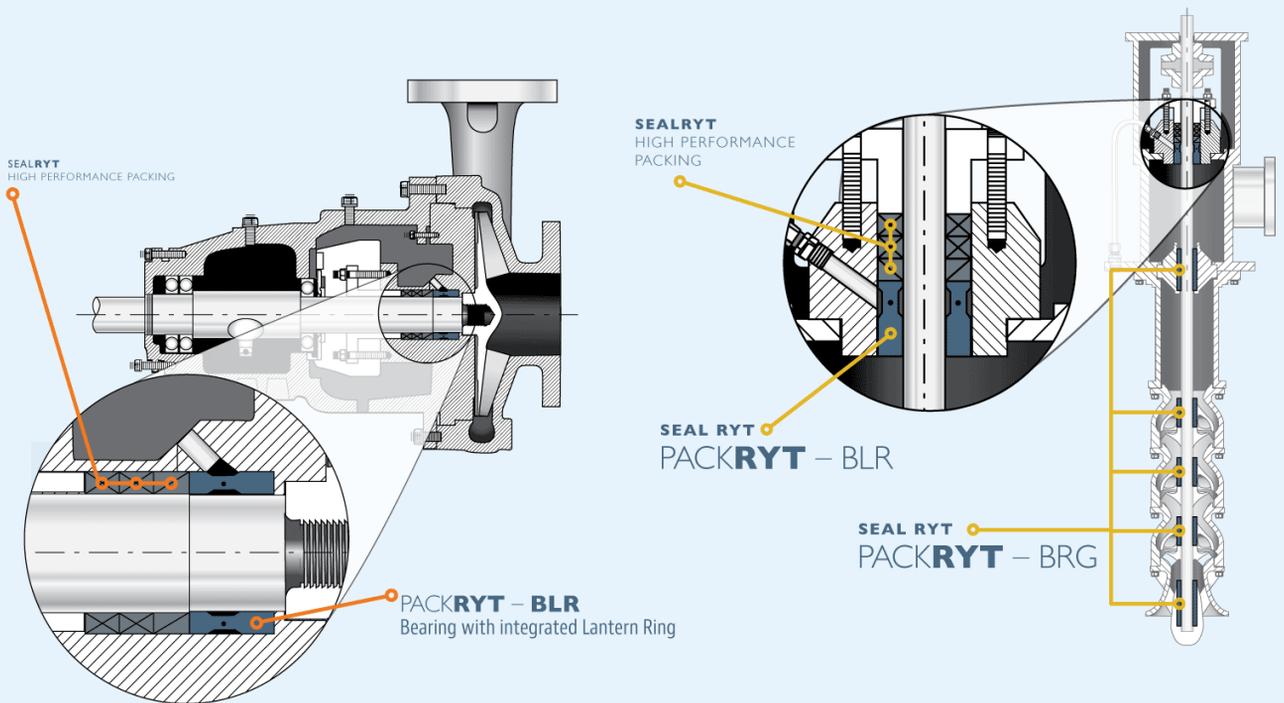


SEAL RYT
PACKRYT – BLR

Condensate Pump Variations – Stuffing box assembly

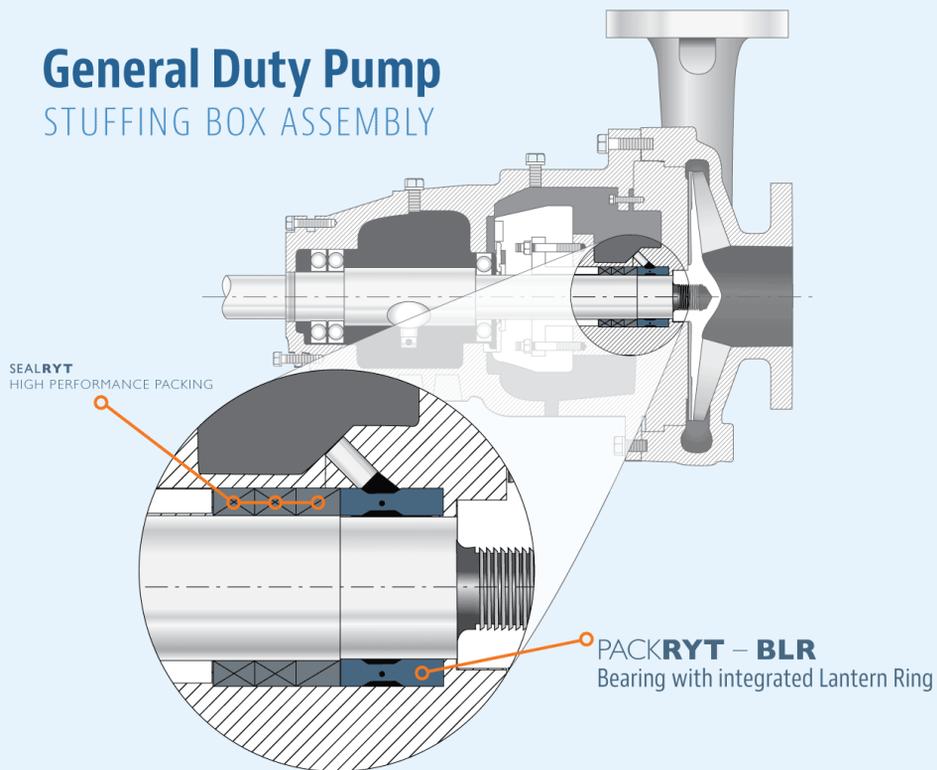
Condensate Pump Variations

STUFFING BOX ASSEMBLY

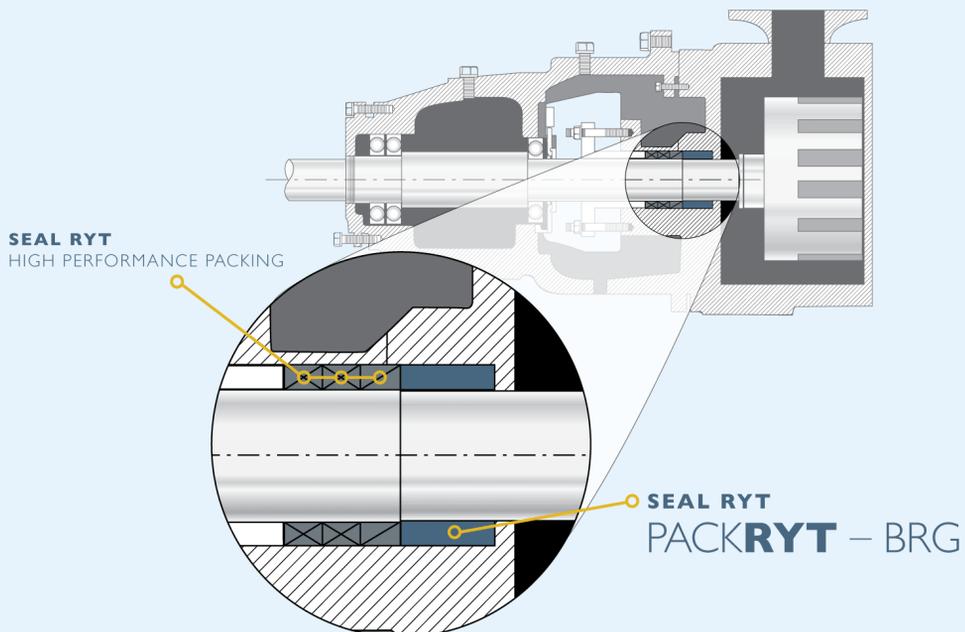


General Duty and Gear Pump – Stuffing box assembly

General Duty Pump STUFFING BOX ASSEMBLY



Gear Pump STUFFING BOX ASSEMBLY



PackRyt Installation Instructions

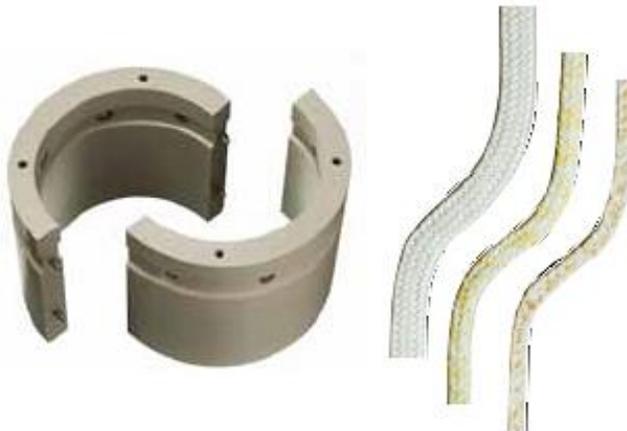
1. Remove all old packing, lantern ring, etc. and thoroughly clean the shaft and stuffing box. Be sure no solids are present in the sealing area. Disconnect any discharge flush lines and plug the hole, leaving only the “ in “ line, so all flush goes only towards the bearing and the packing.
2. Split the bearing and re-assemble over the shaft making sure the extraction holes are facing you as you slide the bearing in.
3. If the bearing will not pilot, use a Porta-Power or other device to centre the shaft and then let it relax once you have installed all parts. If significant bore corrosion prevents installation, you may lightly and evenly sand the O.D. with fine crocus cloth.
4. Make sure the bearing is fully seated in the bottom of the box. Taking depth measurements beforehand will let you know if you have accomplished this.
5. Install each packing ring individually, staggering the joints.
6. If the set contains all 396C, bring the gland follower to the packing and seat firmly. Do not over crush the packing. Then back off the nuts and let the packing relax for 10 to 15 minutes. Bring the nuts back up to the follower finger tight and you are ready to run.
7. If the packing portion contains 317, 357 or 7413, tamp each ring firmly during installation and tighten the follower nuts finger tight or as recommended. For some applications it is possible to pull the packing down firmly before starting up, please consult Klinger Limited Australia.
8. If you are using the BLR configuration (with a lantern ring groove) turn the service water on full force before starting the pump. Ensure that there is controlled water leakage out of the gland during start up. The leak free process is achieved through gradual and controlled pulling up of the gland follower.
9. Make packing adjustments no more than 2 flats on all nuts at a time. Wait a few minutes between adjustments.

If you encounter any difficulty accomplishing these steps or have any questions regarding installation or performance please contact the technical department of Klinger Limited Australia, on :+61 08 92511600.

The PackRyt can be used on many applications and a few additional examples are:

Vacuum Pumps
Screens
Asphalt pumps
Fry oils
Glue / Starch pumps
Fire water pumps
Caustic pumps
Ash pumps
Mixed juice pumps
Raw juice pumps
Syrup pumps
Dry powders
Animal fat
Slurry pumps
Lime pumps
Titanium Tetrachloride
+ many more

Other exceptional products and custom designs
available through **Klinger Limited Australia** from the
SealRyt Corporation

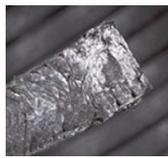


**SPECIALTY AND FDA/USDA COMPLIANT
BEARING AND TEXTILE MATERIALS AVAILABLE**

Specialist compression and valve packing



Style 7413



Style 396



Style 357



Style 396C



Style 2017



Style 2000

PackRyt Bearings and Water Conservation

The information in this presentation has been supplied by the Sealryt Corporation, the manufacturers of the PackRyt sealing system.

Water Conservation & PackRyt

What Does Close Clearances Really Mean

Paper Mill Average Seal Water to a Stuffing Box
= 3.496 GPM

Using the Pack-RYT

- Goulds 3196 MT = .147 GPM
- Goulds 3175 S = .837 GPM
- Goulds 3175 M = .988 GPM
- Goulds 3175 L = 1.252 GPM

International Paper Franklin, Virginia

Daily Water Usage 35,000,000 Million Gallons Per Day

Water Source 18 Deep Wells and River

Annual Usage 12.25 Billion Gallons @ Average 350 Days

Estimated Annual Flush Water Usage 3.6 Billion Gallons

2043 Pieces of Rotating Equipment Packed or Sealed

Average Water Usage Per Piece 1.76 Million GAL/YR.

Average Gallons Per Minute Per Piece 3.496 GPM

Annual Flush Water Costs to Franklin \$2,700,000. Million USD

Franklin Water Survey May 2007

Seal/Pack	Flush Flow in	Flow to drain	Flow from Stuffing Box	in to process	Type of equipment	GPM with PackRyt	
Pack	8.53 GPM	3 GPM	.500 GPM	5 GPM	Gould's 3175 S	.540 GPM	
Pack	11.41 GPM	6.50 GPM	1.50 GPM	3.40 GPM	AC PWO 16 x 6 - 21	1.580 GPM	
Pack	11.44 GPM	6.50 GPM	1.50 GPM	3.40 GPM	AC PWO 16 x 6 - 21	1.580 GPM	
Pack	10.27 GPM	***	***	***	AC PWO 16 x 6 - 21	1.580 GPM	
Pack	4.93 GPM	2.00 GPM	.500 GPM	2.500 GPM	Sulzer APT 53-8	.613 GPM	
Pack	5.02 GPM	2.00 GPM	.500 GPM	2.500 GPM	Sulzer APT 53-8	.613 GPM	
PackRyt	meter does not read	NONE	.001 GPM		Sulzer APT 53-8	.613 GPM	
Pack	6.46 GPM	Pluged	2.00 GPM	**	AC PWO 14 x 12 -21		
Pack	6.06 GPM	Pluged	2.00 GPM	**	AC PWO 14 x 12 -21		
Pack	4.20 GPM	Pluged	1.00 GPM	**	AC PWOFBA1 8x4x17	.501 GPM	
Pack	3.55 GPM	Pluged	1.00 GPM	**	AC PWOFBA1 8x4x17	.501 GPM	
Pack	22.26 GPM	**	3.00 GPM	**	Bingham CB4CF 12x12x17	.700 GPM	
Pack	9.48 GPM	**	1.500 GPM	**	Bingham CF 10x10x14	.700 GPM	
Pack	10.22 GPM	**	1.500 GPM	**	Bingham CF 10x10x14	.700 GPM	
Pack	7.04 GPM	2.00 GPM	1.500 GPM	3.50 GPM	Bingham HHCAD 4 x 6	.119 GPM	
Pack	6.300 GPM	Pluged	.500 GPM	**	Sulzer APT 52-14	.617 GPM	
Pack	4.10 GPM	Pluged	1.00 GPM	**	Sulzer APT 52-14	.617 GPM	
Pack	2.05 GPM	Pluged	.500GPM	**	Sulzer APT 44-12	.165 GPM	
Pack	2.52 GPM	Pluged	.500GPM	**	Sulzer APT 41-8	.190 GPM	
Pack	3.21 GPM	Pluged	.500 GPM	**	Sulzer APT 32-2B	.143 GPM	
Pack	4.498 GPM	Pluged	1.00 GPM	**	Sulzer APT 43-10	.182 GPM	
Pack	2.510 GPM	Pluged	.500 GPM	**	Sulzer APT 41-8	.190 GPM	
Pack	3.02 GPM	Pluged	.500 GPM	**	Sulzer APT 32-4	.143 GPM	
Pack	4.52 GPM	1.500 GPM	.500 GPM	2.500 GPM	Goulds 3175 M	.638 GPM	
Pack	5.46 GPM	**	.500 GPM	**	Goulds 3405 L	.128 GPM	
Pack	2.06 GPM	**	.500 GPM	**	Goulds 3405 L	.128 GPM	
	Total Flush GPM					Estimate GPM	
	161.118 GPM					12.781 GPM	
		Savings with PackRyt Bearing Sets				148.33 GPM	

Net Savings

26 Pumps = 148.33
Gallons Per Minute



Annual Savings 76.8 Million Gallons

PackRyt

Why it Works

Feature

Benefit

- Polyphenylene Sulfide, Carbon, & Graphite.
 - Close clearance fits
 - Integral lantern ring
 - Compression molded and then machined
 - Engineered Product
 - O-ring and sleeve bearing configurations available
 - Excellent Chemical Resistance
 - Patented and Proven Design in Mills Worldwide
- True Bearing Grade material.
 - Forces shafts concentric to the bore, Minimizes shaft deflection,
 - Drastically reduces water usage
 - Always keeps lantern ring in the proper location
 - Allows manufacturing flexibility, infinite number of sizes and configurations available
 - Can Be Used to Improve Seal Life
 - Is Compatible with Paper Mill Chemicals
 - This is not another bushing, Engineering services are available for every application

Reasons For PackRyt Success and Acceptance in Industry Worldwide.

1. Extends Life of Stuffing Box Sealing Device When Used In Accordance To Factory Specifications.
 - A. Good Mechanical Conditions.
 - B. Good Measurements for Proper Fit
 - C. Set Flush At Positive Flow over System Pressure
2. Reduces Flush Water Usage By As Much As 80% Automatically.
 - A. Close Clearances Reduces Flow
 - B. Plugged Stuffing Box Discharge Port eliminates flow directly to drain.
3. When Maintenance is Necessary Usually You Only Need To Replace Three Rings Of Packing. Because of Special Bearing Material, Wear Usually is not A Problem.
4. When All Benefits Of Extended Life, Water Savings, Less Maintenance and Repack Are Added Together, The Savings are Great.

Fewer Modes of Failure

Because of the PackRyt Creative Design, We have Eliminated Or Minimized Common Modes Of Failure That We See In The Average Stuffing Box.

Drastically Reduces Flush Water Usage

Because Very Close Clearances are Designed into Each PackRyt, Flush Water Savings are Automatic.