



Specialist for Pumping Technology

Session 35– Vertical Sump Pumps (Type VS4)

Simon Smith Oct 2024



Presenter Profile – Simon Smith

Simon graduated with an honours degree in Chemical Engineering from the University of Surrey in 1978 and began a long career in the engineered pump industry spanning 44 years (so far!) with Peerless Pump, BW/IP International / Flowserve, SPP Pumps, Ruhrpumpen and Ebara Cryodynamics.

Over his long career he has filled various roles as Applications Engineer / Manager, Project Manager, Key Account Specialist, Vertical Pump Product Specialist, International Sales Engineer / Manager / Director and he has considerable experience in Training & Mentoring young engineers.





Ruh*RP*umpen Short Courses

Here is a listing of all the previous courses.

- No 1 – API610 12th v 11th editions
- No 2 - Curve Shape (1)
- No 3 – The Importance of System Curves (1)
- No 4 - Selecting the Right Pump for the Application
- No 5 - NPSH & Nss
- No 6 - Mechanical Seals & Systems (1)
- No 7 - Firepumps
- No 8 - BB5 Barrel Pumps
- No 9 - Pump Instrumentation
- No 10 – Non-Destructive Examination
- No 11 - Vertical Pumps (Part 1) Type VS1, VS2, VS3
- No 12 – Vertical Pumps (Part 2) Type VS4, VS5, VS6 & VS7
- No 13 – Performance Testing of Centrifugal Pumps; the What, the Why & the How
- No 14 – Testing & Inspection of API 610 Pumps
- No 15 – Start-Up, Commissioning & Troubleshooting Centrifugal Pumps
- No 16 – Introduction to Positive Displacement (Plunger) Pumps
- No 17 – Refresher Session
- No 18 – Overhung Process Pumps OH1 & OH2

Continued next slide

Any you have missed you can get from our website www.ruhrumpen.com

and follow the menu bar link to [RP Short Courses](#)

Ruhr*RP*umpen Short Courses

Here is a listing of all the previous courses. Contd

- No 19 – Vertical Overhung Process Pumps OH3-OH6
- No 20 – New Developments in the VS6 Market
- No 21 – BB4 Multistage Pumps for the Power Industry
- No 22 – Coking Process and Hydraulic Decoking Equipment
- No 23 – Pumps for the Desalination Market
- No 24 – Cryogenic Pumps
- No 25 – Magnetic Drive Pumps
- No 26 – Mechanical Seals & Systems (2)
- No 27 – The Importance of System Curves (2)
- No 28 – NPSH & Nss Made Simple (2)
- No 29 – Curve Shape, Head Rise & Allowable Tolerances (2)
- No 30 – Selecting the Right Pump for the Application (2)
- No 31 Comparison of API610 12th & 11th Editions (2)
- No 32 Pump Instrumentation (2)
- No 33 Handling Viscous Fluids with Centrifugal Pumps
- No 34 Fire Pumps for the Oil & Gas Industries (2)

Any you have missed you can get from our website www.ruhrpumpen.com
and follow the menu bar link to [RP Short Courses](#)



RuhRPumpen Short Courses

www.ruhrpumpen.com



More Articles

- Introducing the new Ruhrpumpen Website
- Impeller Lift Procedure
- Newsletter Ruhrpumpen Fire Systems - December 2022
- VTP pumps for major water transfer project in Bolivia
- COVID-19 UPDATE
- Introducing the RP ANSI Process Pump Range
- Ruhrpumpen Resources
- Coolant System Maintenance
- RP delivers API 674 pumps for Gas Dehydration Package in Algeria
- Packing strips and packing gland tightening procedure

All Courses

Don't miss our
short course #25
COMING SOON



Simon Smith
Solutions Expert





Ruh*RP*umpen Short Courses

SHORT COURSE 30

Selecting the Right Pump for the Application

- Full Session
- Download presentation
- Q&A Report

SHORT COURSE 31

Comparison of API610 12th and 11th Editions

- Full Session
- Download presentation
- Q&A Report

SHORT COURSE 32

Pump Instrumentation

- Full Session
- Download presentation
- Q&A Report

SHORT COURSE 33

Handling Viscous Fluids in Centrifugal Pumps, & Handling Slurries in Centrifugal Pumps

- Full Session
- Download presentation
- Q&A Report

Session 35 – Vertical Sump Pumps (Type VS4)

Aimed at Process, Mechanical, and Consultant Engineers who specify pumping equipment for the Water, Wastewater and Oil & Gas Industries as well as Applications & Sales Engineers selecting and quoting them.

While engineers generally have a good understanding of horizontal pumps, their exposure to vertical pumps is more limited and as a result they are frequently misunderstood and under-utilised.

This course will look to put that right and explain the features and benefits of vertical sump pumps and how they can frequently be problem solvers.

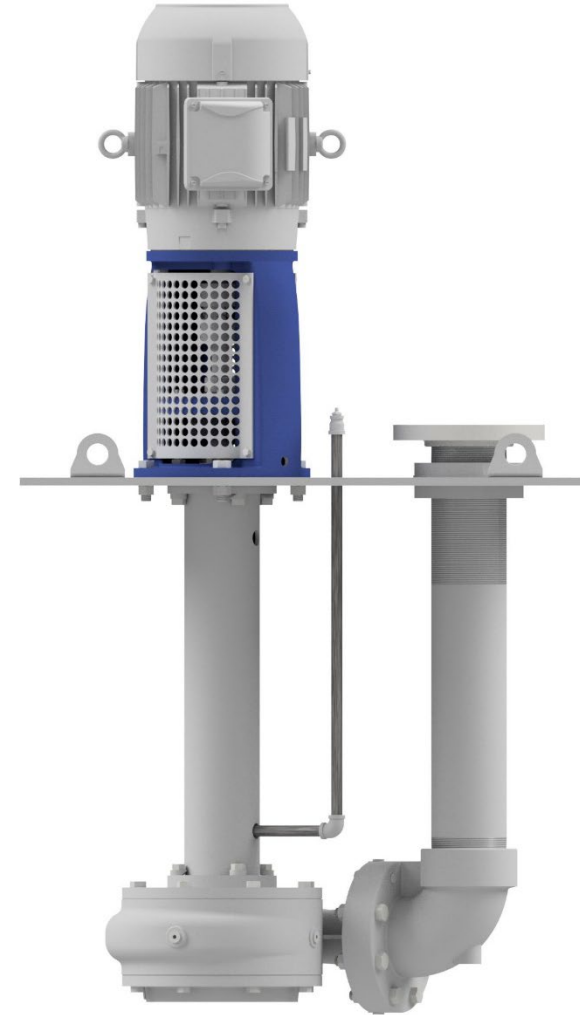


VSP

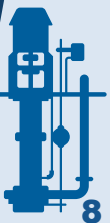
General Description

VSP are vertically suspended single casing pumps with separated discharge, semi open or closed impeller designed for wet pit applications.

VSP Pumps can be built according API 610 latest edition (Type VS4).



VSP





Product Line



VSP

VSP



VSP Chem





Product Line

VSP



- HI design
- Single stage, vertical centrifugal pump
- Solid handling up to 1 5/8" (41mm) diameter
- Semi-open / Closed Impeller
- Standard construction in Cast Iron
- Grease lubrication for line shaft bearings
- Grease lubrication for thrust bearings.
- Threaded discharge pipe 150# RF
- Available in 44 hydraulic sizes
 - 11 Non-Clog (SHD)
 - 33 Standard (GSD)





Product Line

VSP – NON CLOG - SHD



Description

- Enclosed Non-clog Impeller
- Handling solids up to 6" diameter
- Cast Iron & 316SS construction
- H.I. Design

Application

- Sanitary wastes
- Industrial waste
- Waste treatment
- Storm water
- Pollution control
- Food factory waste

VSP





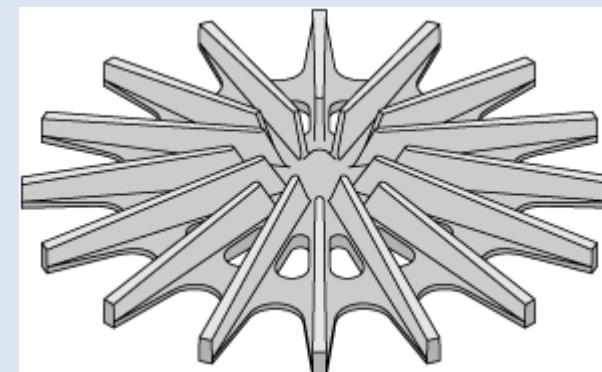
Product Line

VSP - Chem



- HI & API Design
- Single stage, vertical centrifugal pump
- Semi-Open Impeller and HH-LF
- Standard/API materials
- Grease/External/Self lubrication for line shaft bearings
- Grease/oil bath lubrication for thrust bearings
- Threaded or welded discharge pipe design
- Flanges in 150# and 300# ratings
- Available in 27 hydraulic sizes

Barske Impeller –
Low Flow High Head



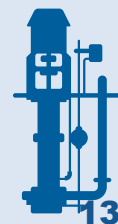


Application Range

Wide range of industrial, chemical and municipal applications such as:

Application

- Sump drainage
- Flood control
- Air wash systems
- Power plants
- Industrial processes
- Condensation control
- Pollution control
- Dewatering service
- Process plants
- Utility service
- Wet pit
- Water treatment
- Effluent
- Hydrocarbon processing
- General industry
- Automotive Solvents
- Polymers
- Plating and electroplating
- Pharmaceuticals
- Chemical / Petrochemical industry





Application Range

VSP-Chem

HYDROCARBON PROCESSING (OIL & GAS)

Flanged ANSI/ASME option for horizontal tank





Application Range

VSP

FLOOD CONTROL

Square/round RP std mounting plate for open pit



GENERAL INDUSTRY/CHEMICAL INDUSTRY/WASTEWATER

VSP Pumps are used to collect disposal/effluent for many processes in general industry





Performance Range



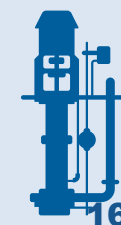
**Twice the flow range of Flowserve,
Sulzer or Goulds**

VSP

VSP		
Capacity	up to 974 m ³ /h	4288 U.S. gpm
Head	2 to 104 m	5 to 342 feet
Temperature	-30°C to +135°C	-20°F to +275°F

VSP (Non-Clog)		
Capacity	up to 864 m ³ /h	3802 U.S. gpm
Head	3 to 76 m	7 to 249 feet
Temperature	-30°C to +135°C	-20°F to +275°F

VSP-Chem		
Capacity	up to 1908 m ³ /h	8403 U.S. gpm
Head	12 to 262 m	38 to 861 feet
Temperature	-30°C to +135°C	-20°F to +275°F

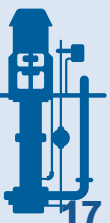




Maximum Solids Diameter

VSP

VSP MODEL	RP MODEL(PUMP END)	SERIES	MODEL	SIZE	MAX SOLIDS DIAMETER(IN)
GSD	VSP	4501	1	1 1/2X1X6	0.375
			1 1/2	2X1 1/2X6	0.687
			2 1/2	3X2 1/2X7	1.000
		4511	1 1/2	2X1 1/2X8	0.438
			2	2 1/2X2X8	0.688
			3	4X3X8	1.125
			1 1/2	2X1 1/2X10	0.438
			2	3X2X10	0.625
			3	4X3X10	1.188
			4	5X4X10	1.500
		4521	6	6X6X10	1.375
			1 1/2	2X1 1/2X12	0.437
		4051H	1	1 1/2X1X6	0.375
			1 1/2	2X1 1/2X6	0.688
		4521H	1 1/2	2X1 1/2X8	0.438
			2	2 1/2X2X8	0.688
			3	4X3X10	1.188
		4565	3	4X3X12	0.688
			4	6X4X12	1.500
			4	6X4X12M	1.500
			6	6X6X12	1.500
		4566	3	4X3X12	0.688
			4	6X4X12M	1.500
			6	6X6X12	1.500
			6	8X6X12	1.563
			8	8X8X12	1.500
		4568	6	8X6X12	1.563
			8	8X8X12	1.500
			10	10X10X12	1.625

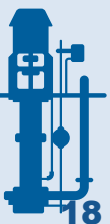




Maximum Solids Diameter

VSP -Chem

VSP MODEL	RP MODEL(PUMP END)	SERIES	MODEL	SIZE	MAX SOLIDS DIAMETER(IN)
VSP-CHEM	IPP	3062	AA6	1-1/2 x 1 x 6	0.375
			AB6	3x1-1/2x6	0.5
			AA8	1-1/2 x 1 x 8	0.375
			AB8	3x1-1/2x8	0.5
		3065	A05	2x1x9 1/2	0.250
			A10	3x2x7-1/4	0.438
			A50	3x1-1/2x9-1/2	0.375
			A60	3x2x9-1/2	0.625
			A70	4x3x9-1/2	0.750
			A20	3x1-1/2x12	0.375
			A30	3x2x12	0.375
			A40	4x3x12	0.688
			A80	6x4x12	1.000
		3066	A20	3x1-1/2x12	0.375
			A30	3x2x12	0.375
			A80	6x4x15	1.000

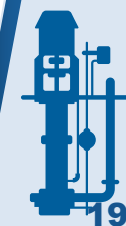




Maximum Solids Diameter

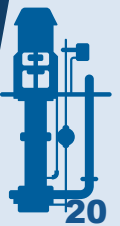
VSP-Non Clog

VSP MODEL	RP MODEL (PUMP END)	SERIES	MODEL	SIZE	MAX SOLIDS DIAMETER (IN)
VSP-CHEM	PS	FR		4PS-121	1.000
				4PS-162	1.920
				6PS-172	2.120
				8PS-172	2.550
		FRB		3PSB-141	1.000
VSP			7563	SHD 4x4x7 1/4	3.000
				SHD 4x4x9 1/2	2.000
VSP-NON CLOG	SHD	7560	7565		3.000
				SHD 4x4x12	2.000
				SHD 6x4x12	3.000
				SHD 8x6x12	3.000
			7566	SHD 4x4x12	2.000
				SHD 6x4x12	3.000
				SHD 8x6x12	3.000
				SHD 6x4x15	3.000
			7568	SHD 8x8x15	3.000
				SHD 8X8X16	4.000
			7569	SHD 12X12X14	4.375
					4.000
				SHD 16X16X19	4.500
					6.000





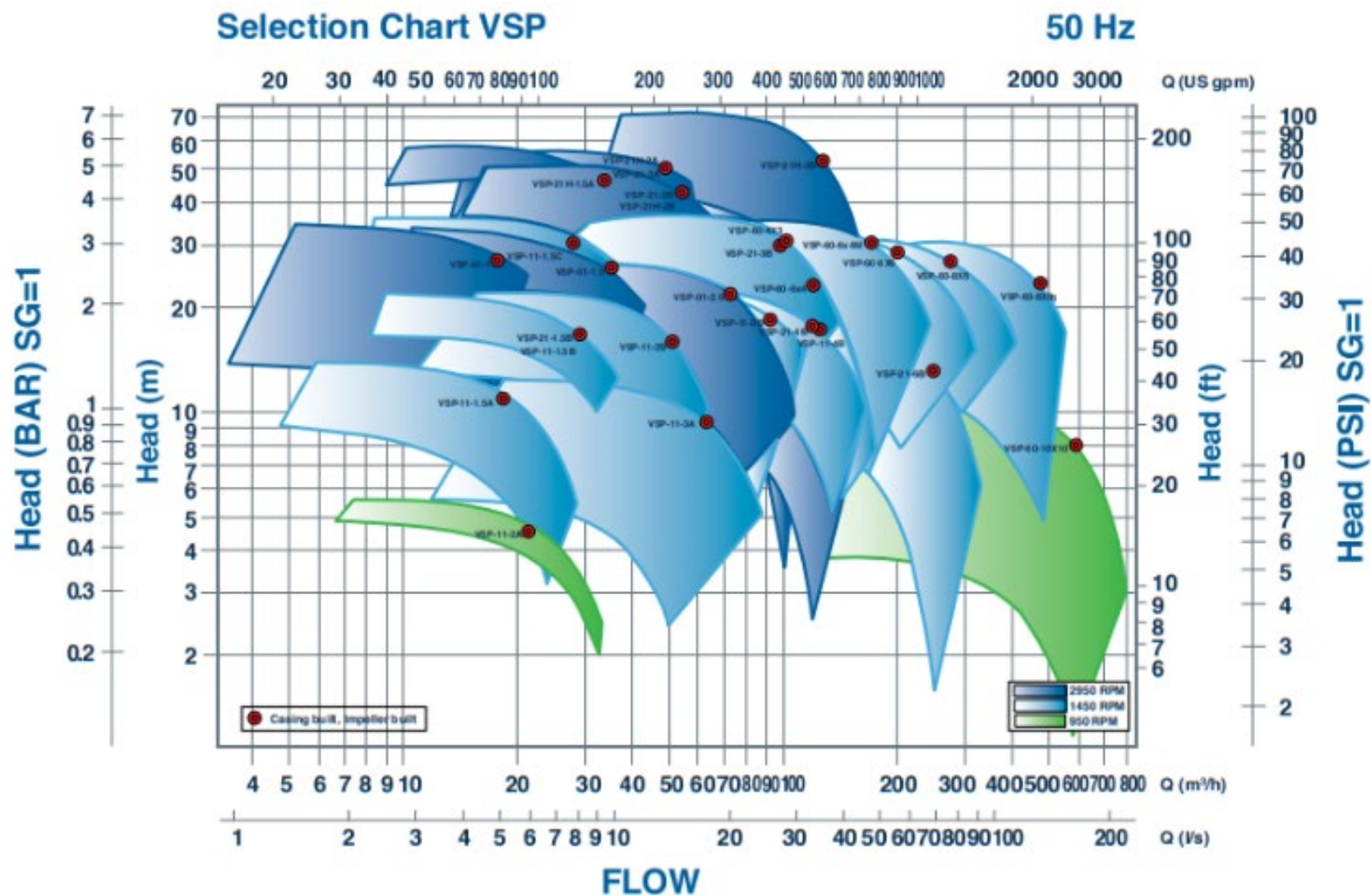
VSP



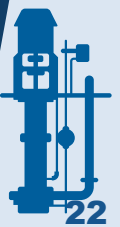


Selection Chart

VSP



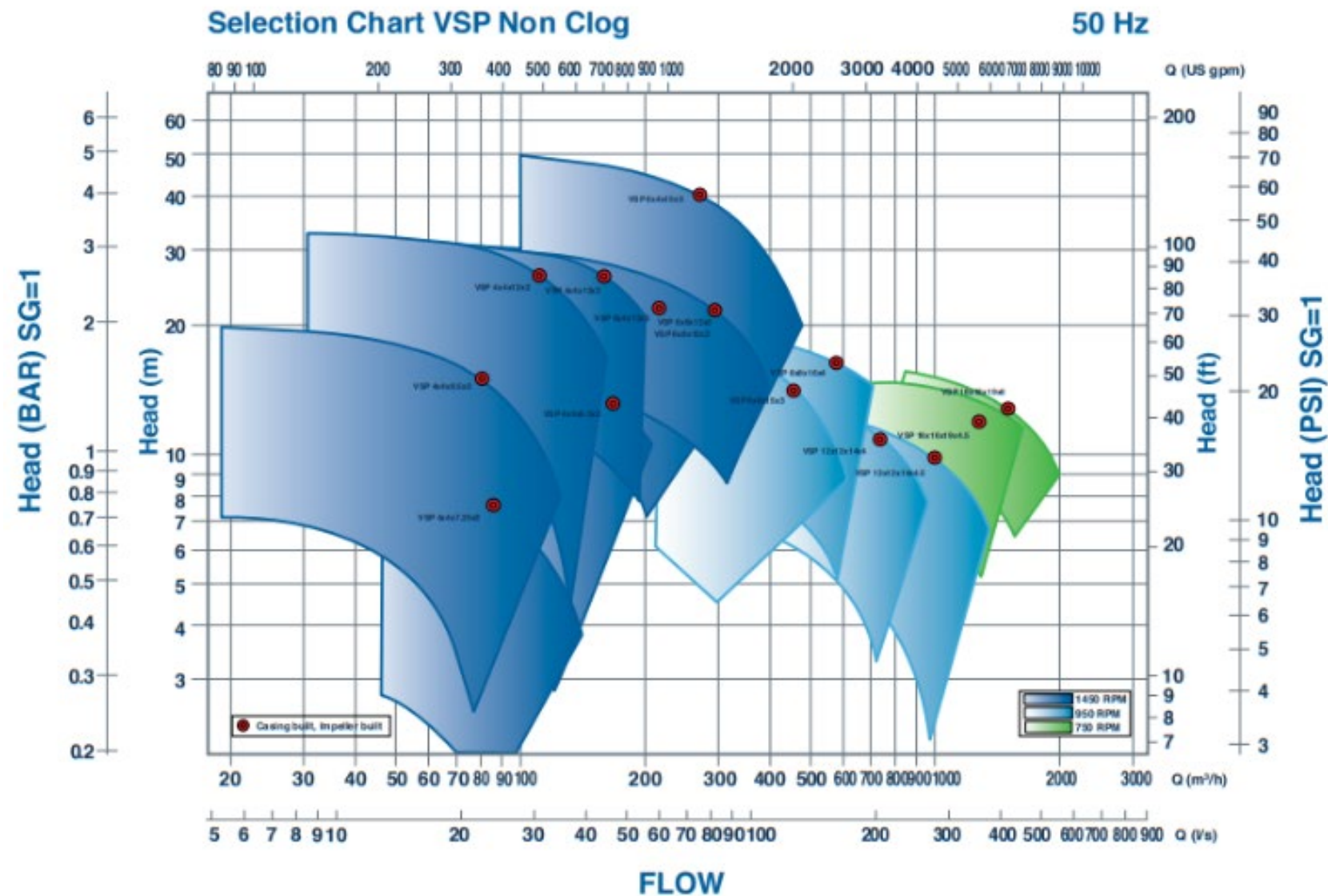
VSP

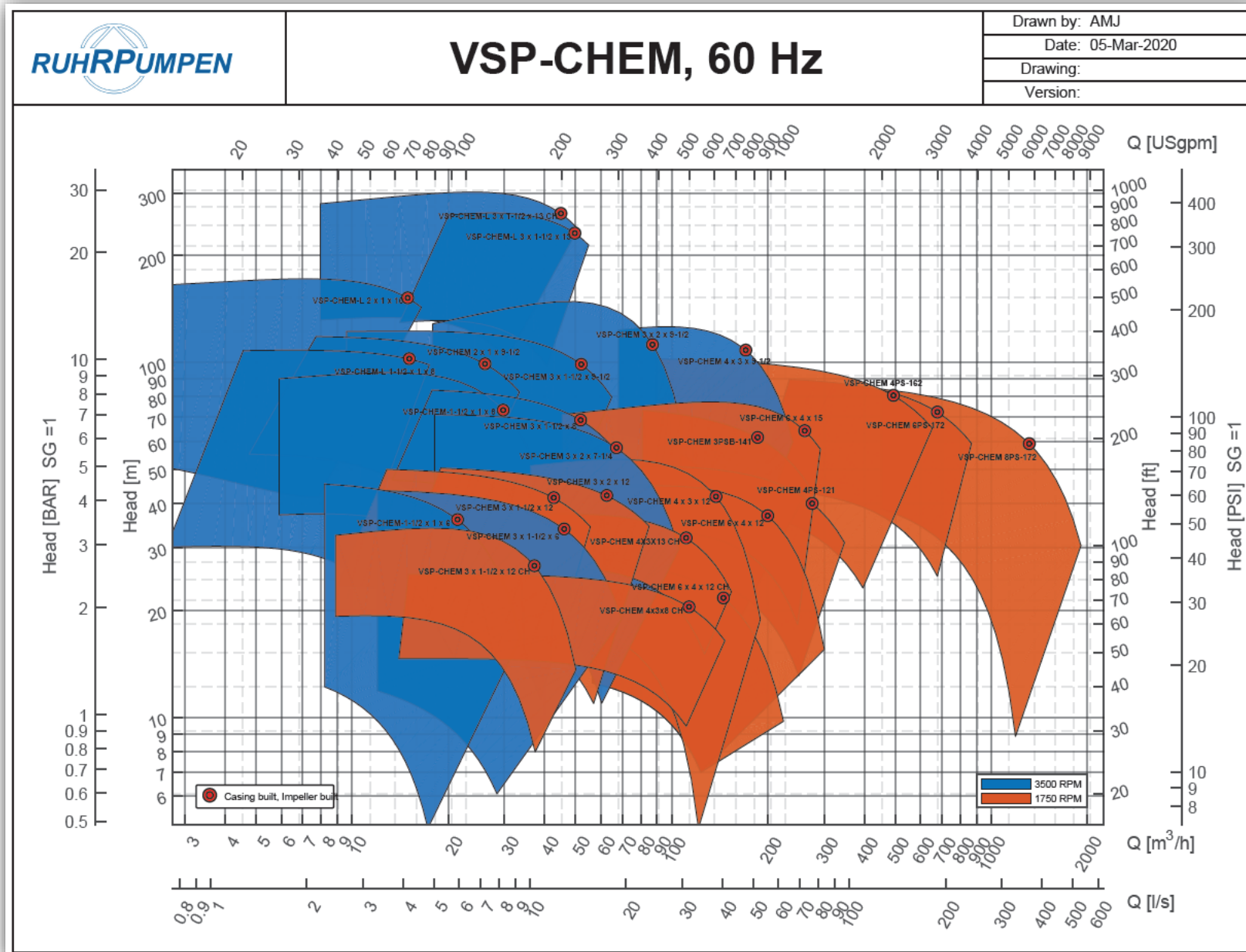




Selection Chart

VSP





Industrial Pump – Type VSP

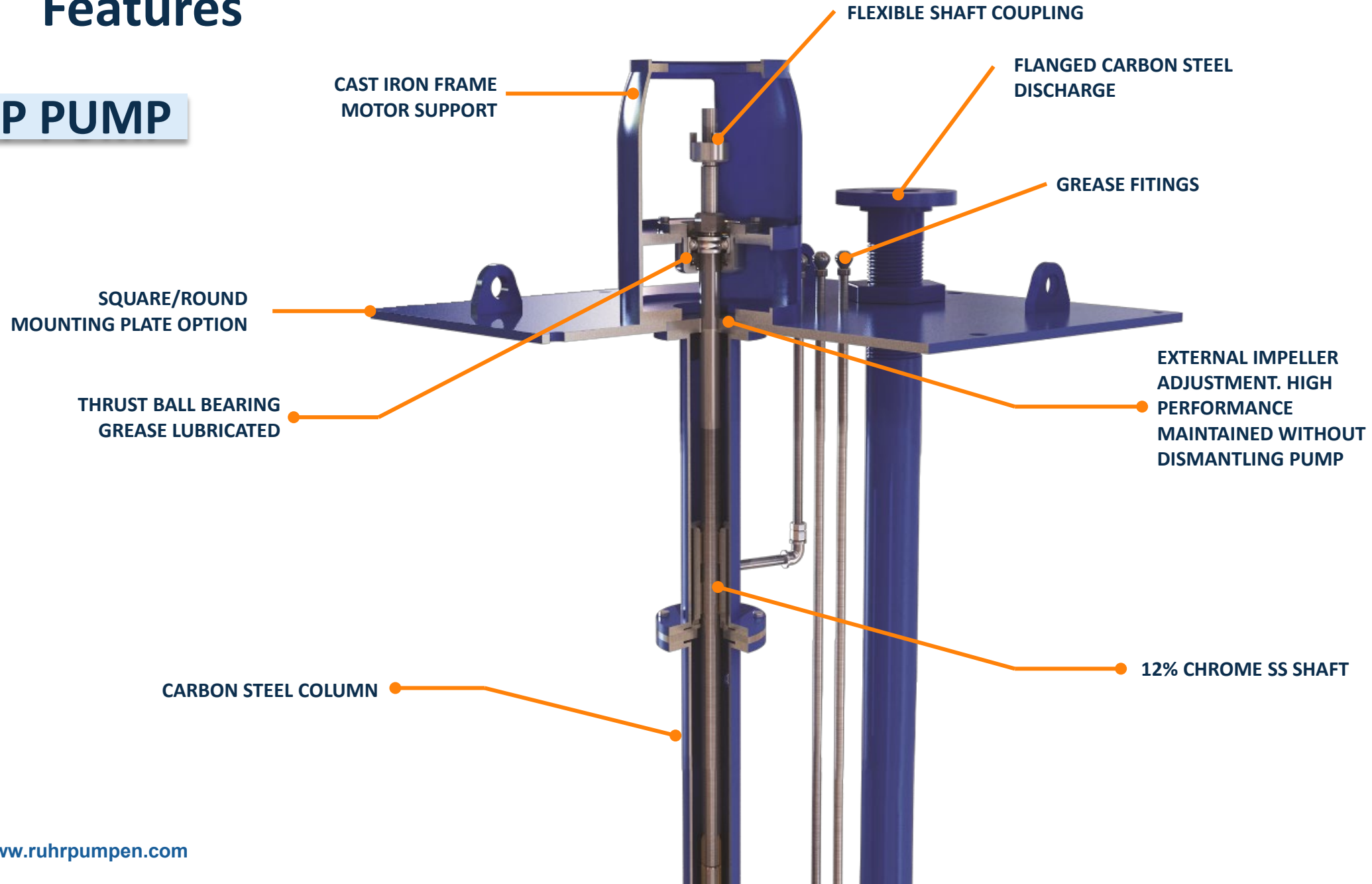
Features



Features

VSP

VSP PUMP

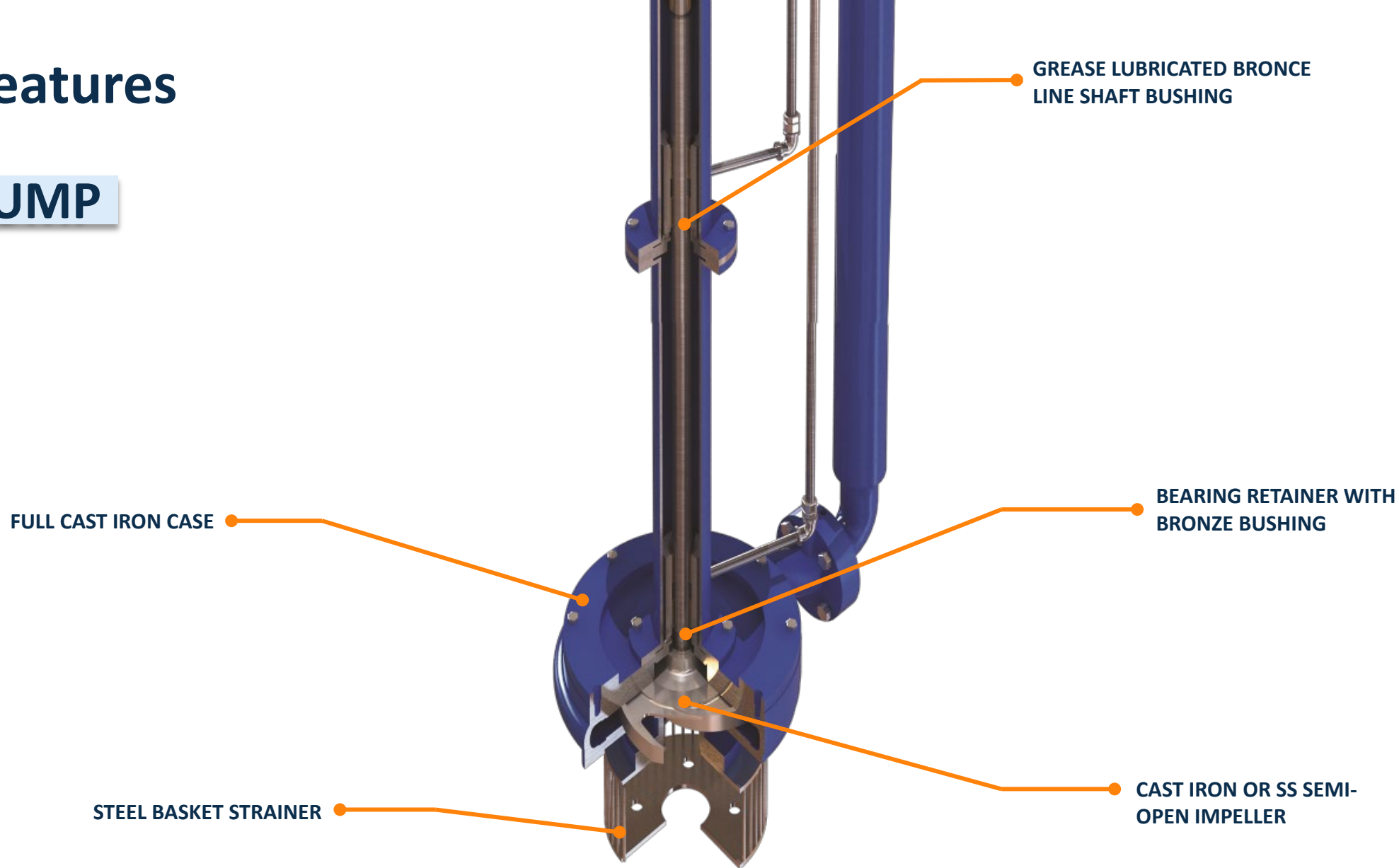




Features

VSP

VSP PUMP





Features

VSP

- **COUPLING GUARD**
- **MOTOR SUPPORT**
- **ELECTRICAL MOTOR**

MOTOR SUPPORT

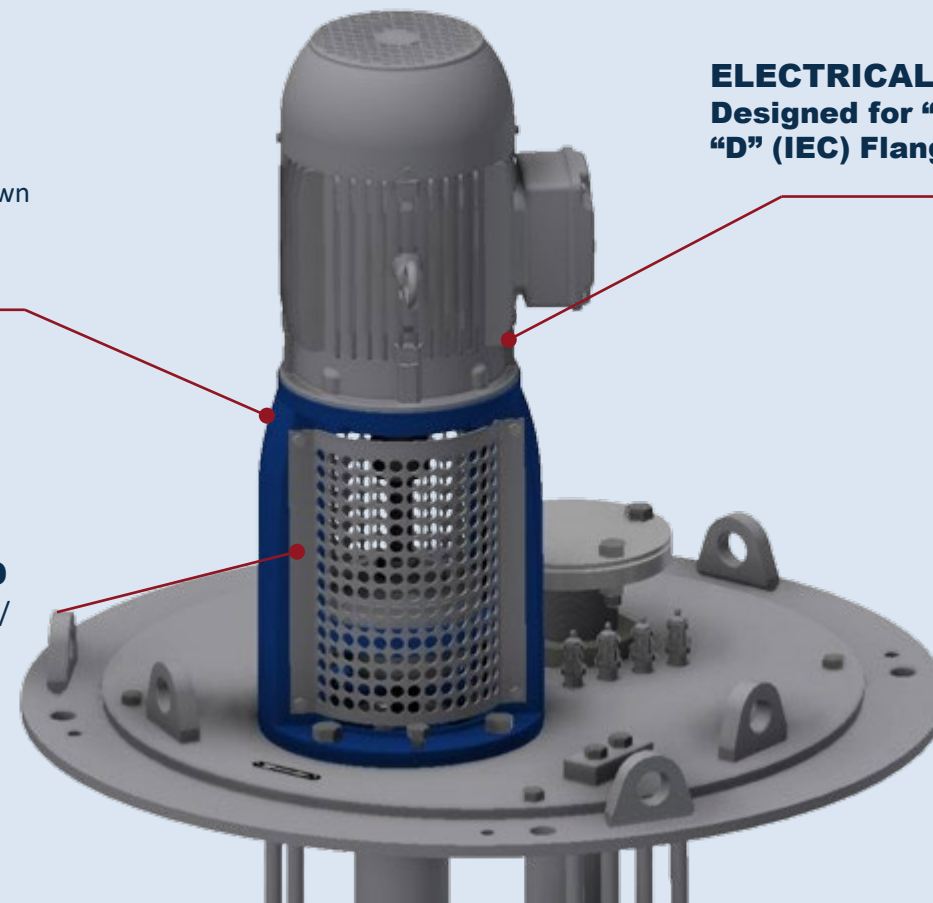
Designed to withstand the down axial thrust.

COUPLING GUARD

Fabricated in Carbon steel / Aluminum

ELECTRICAL MOTORS

Designed for "C", NEMA and "D" (IEC) Flange

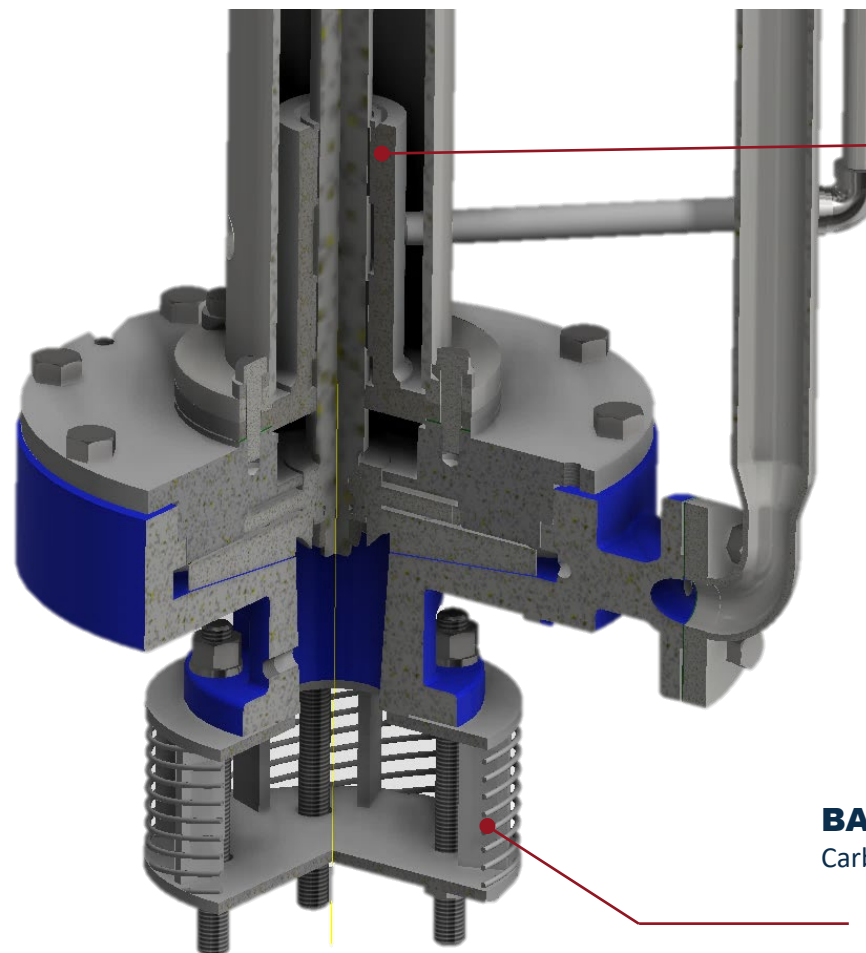




Features

VSP

- BEARING
- BASKET STRAINER



BEARINGS FOR VSP

Bronze as standard design

BASKET STRAINER

Carbon steel or galvanized

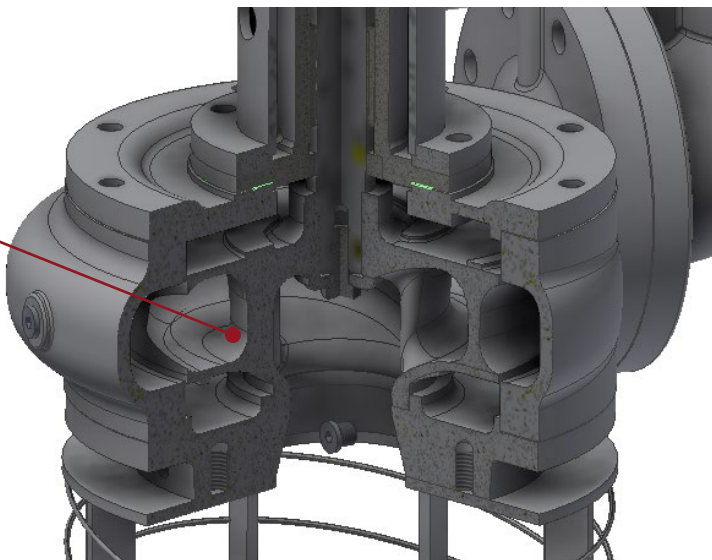


Features

VSP

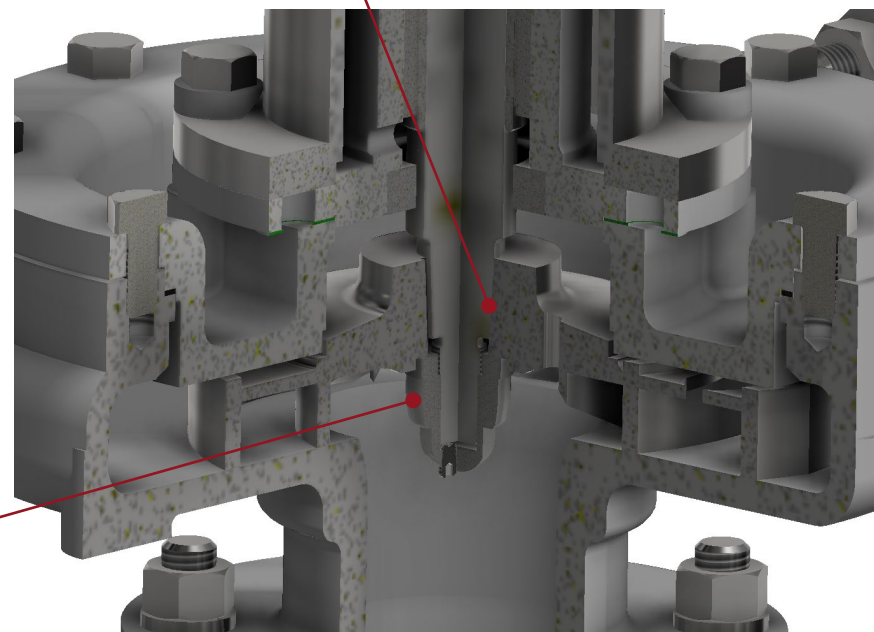
VSP-SHD

IMPELLER
Non-clogging
impeller



IMPELLER
Keyed

VSP



IMPELLER NUT
For reverse rotation purposes

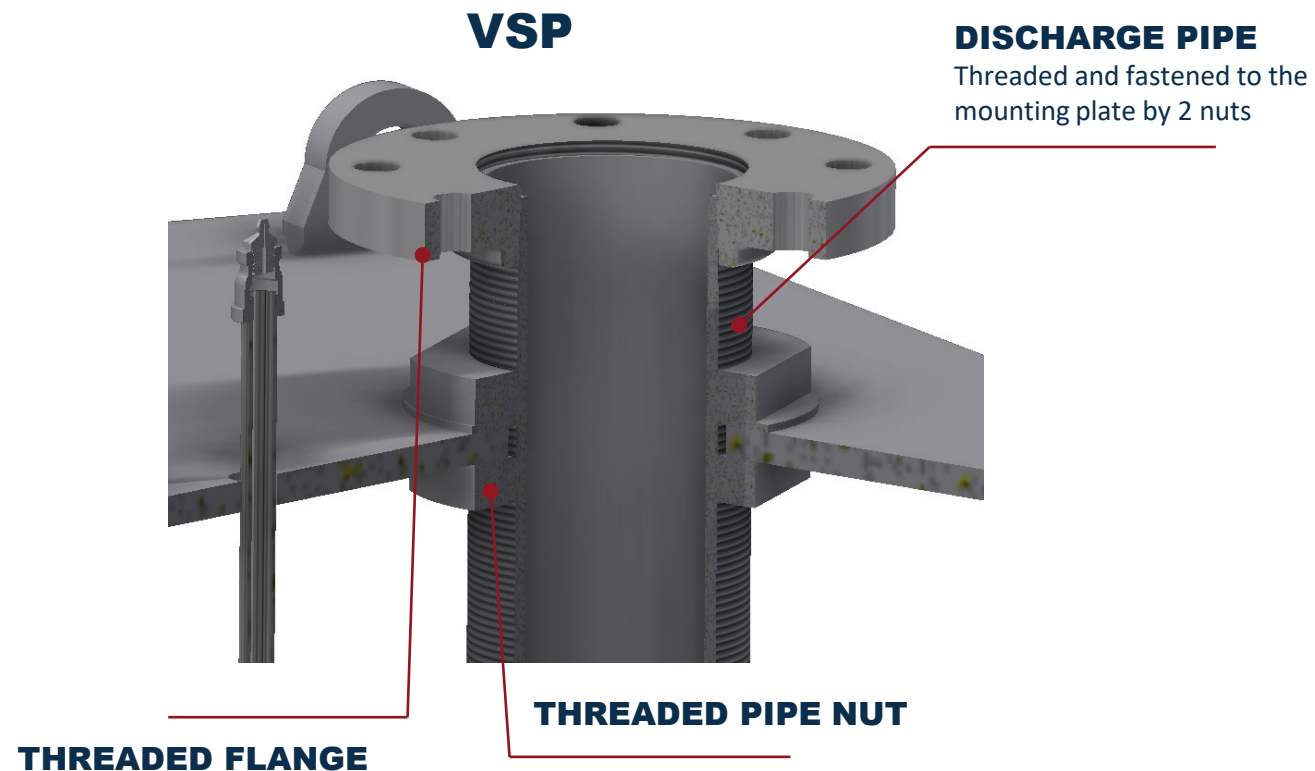
- IMPELLER KEY
- IMPELLER NUT



Features

VSP

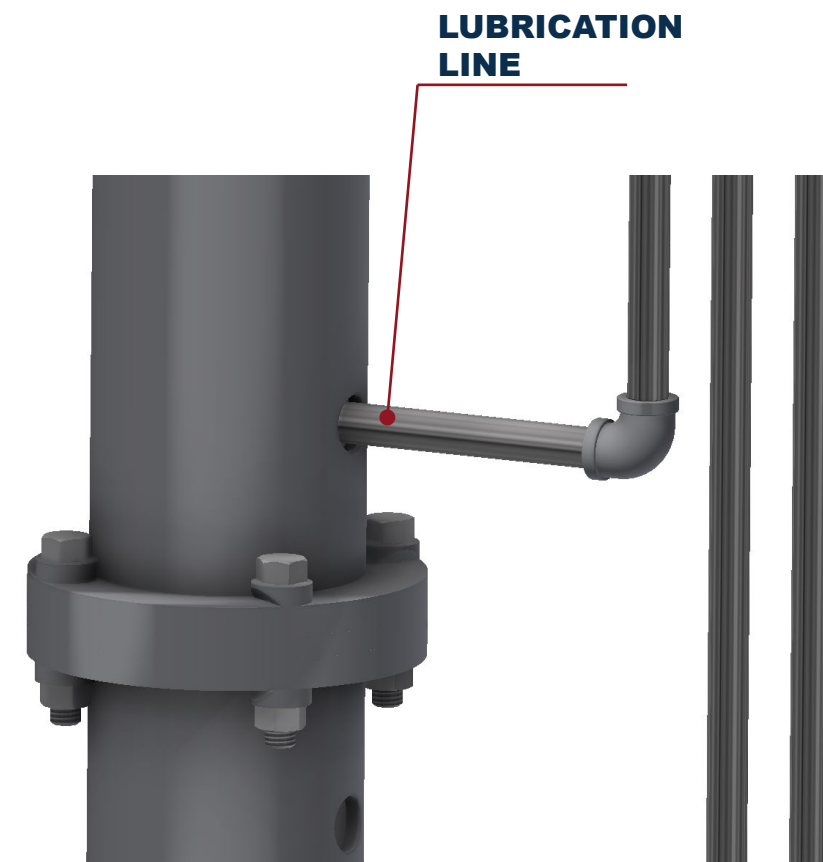
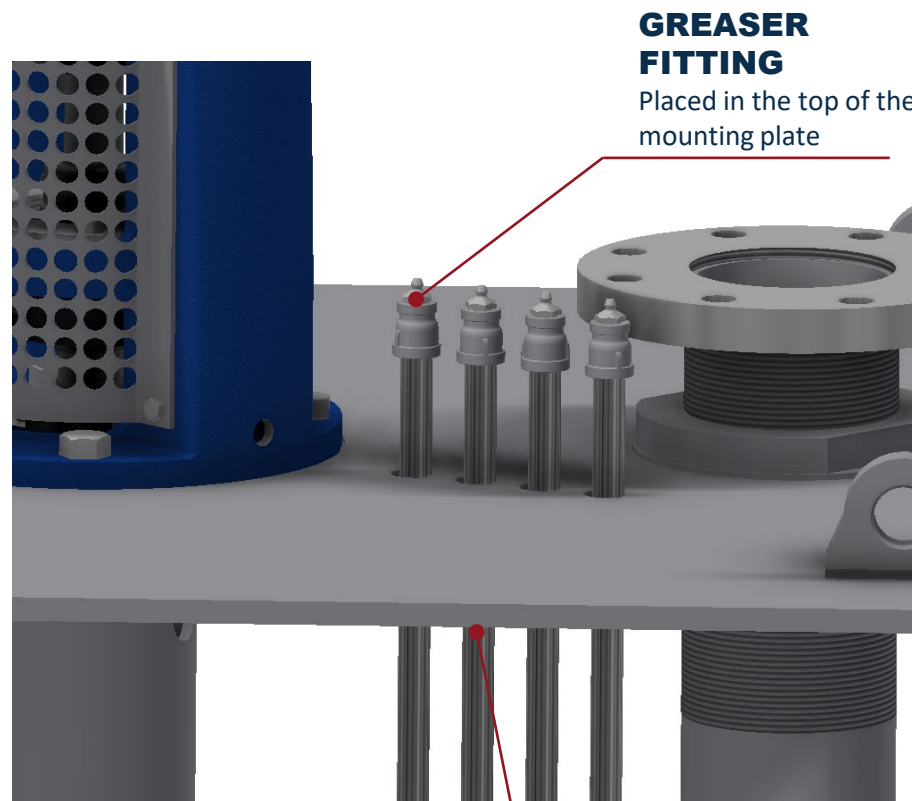
- DISCHARGE PIPE
- THREADED FLANGE
- THREADED PIPE NUT





Features

VSP

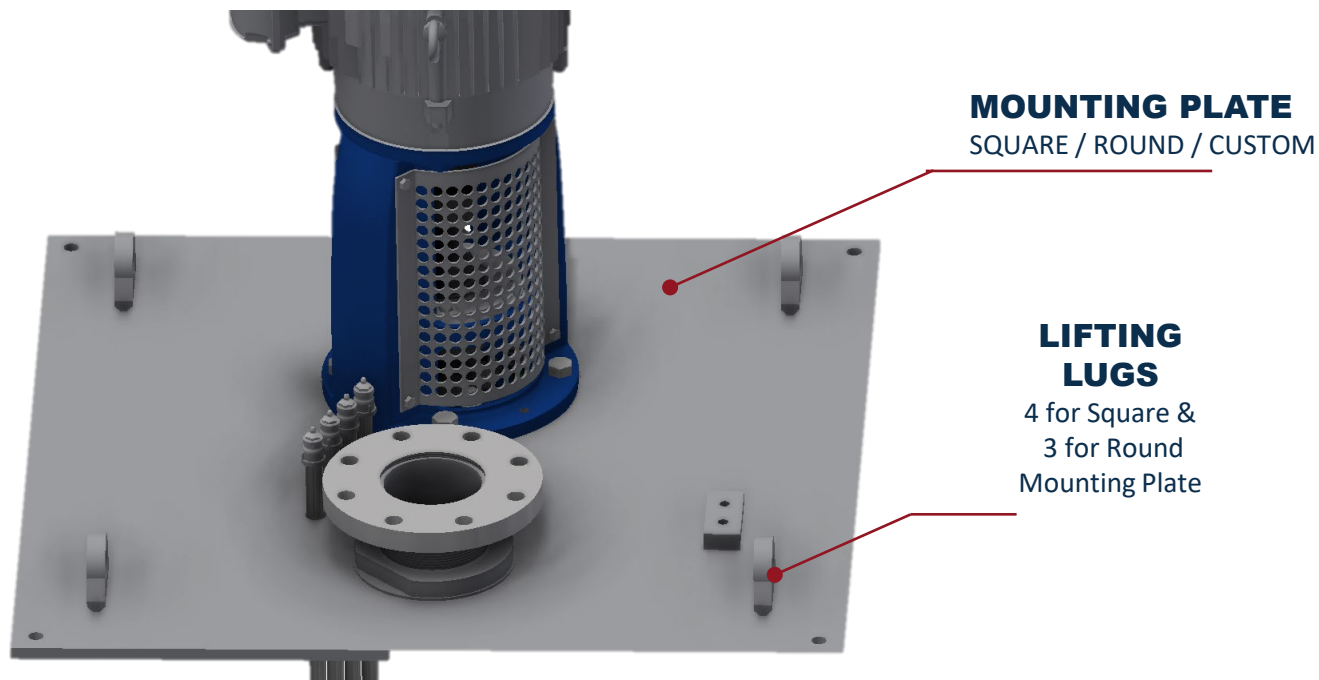


- GREASE FITTING
- LUBRICATION LINE



Features

VSP



- **LIFTING LUGS**
- **MOUNTING PLATE**



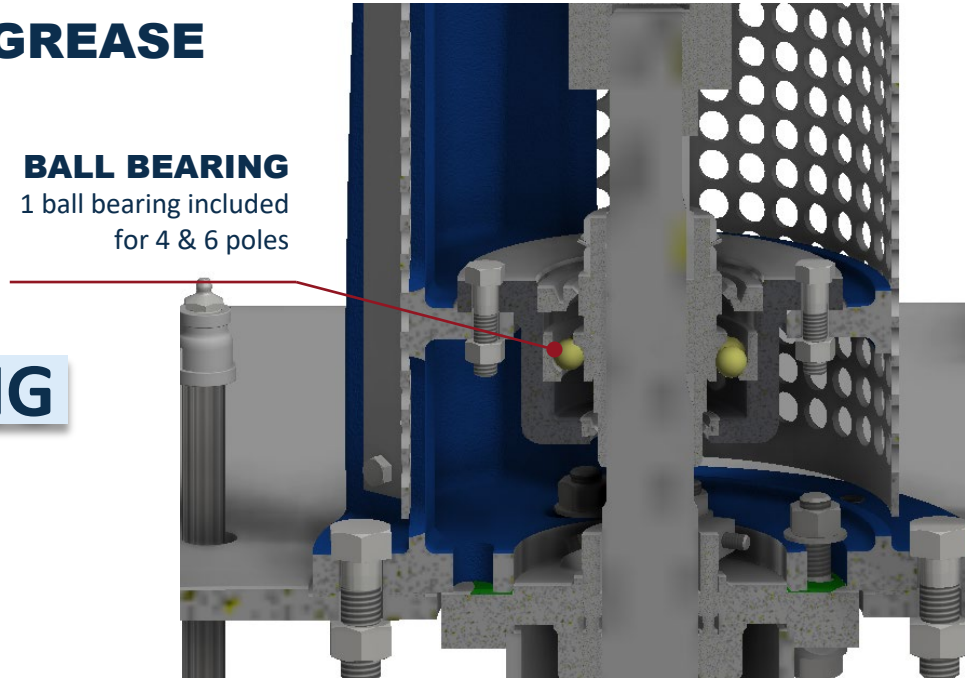
Features

VSP

GREASE

BALL BEARING

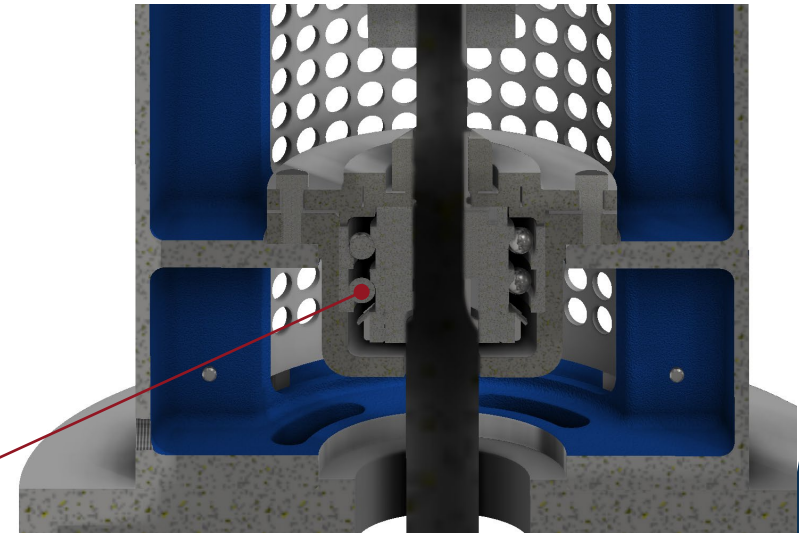
1 ball bearing included
for 4 & 6 poles



- BALL BEARING

BALL BEARINGS

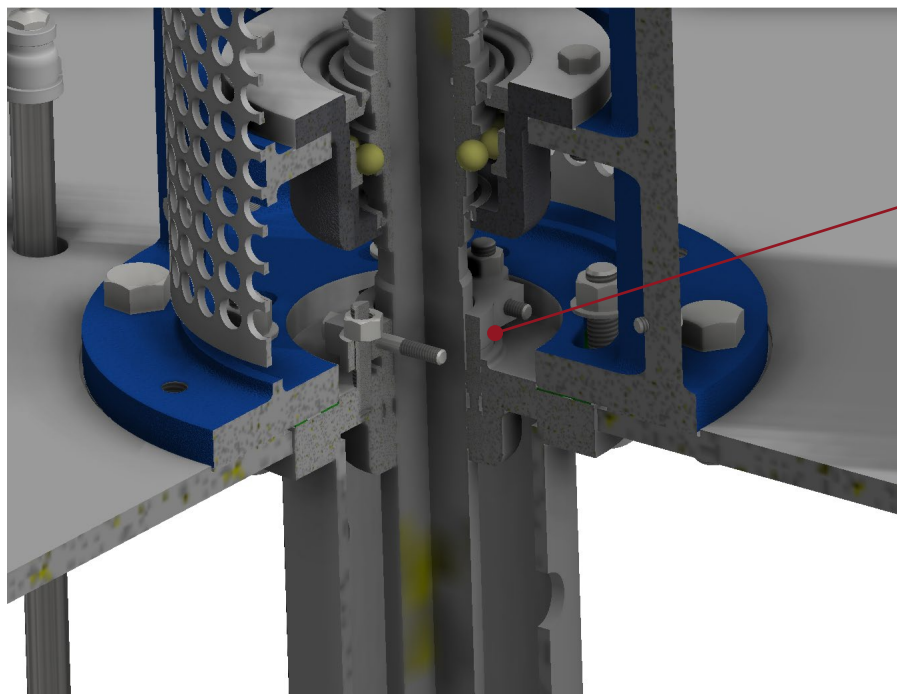
2 ball bearings when the
pump runs at 2 poles



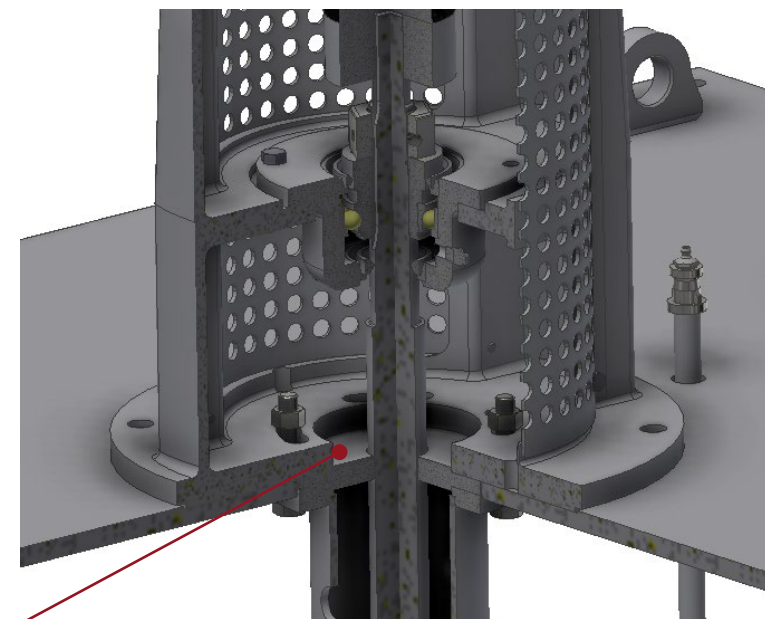


Features

VSP



PACKING
Odor containment



NO SEAL
Standard configuration

- **PACKING**
- **NO SEAL**

Chemical / API Build Pump – Type VSP-Chem

Features



Features

- **COUPLING GUARD**
- **MOTOR SUPPORT**
- **ELECTRICAL MOTOR**

VSP-CHEM

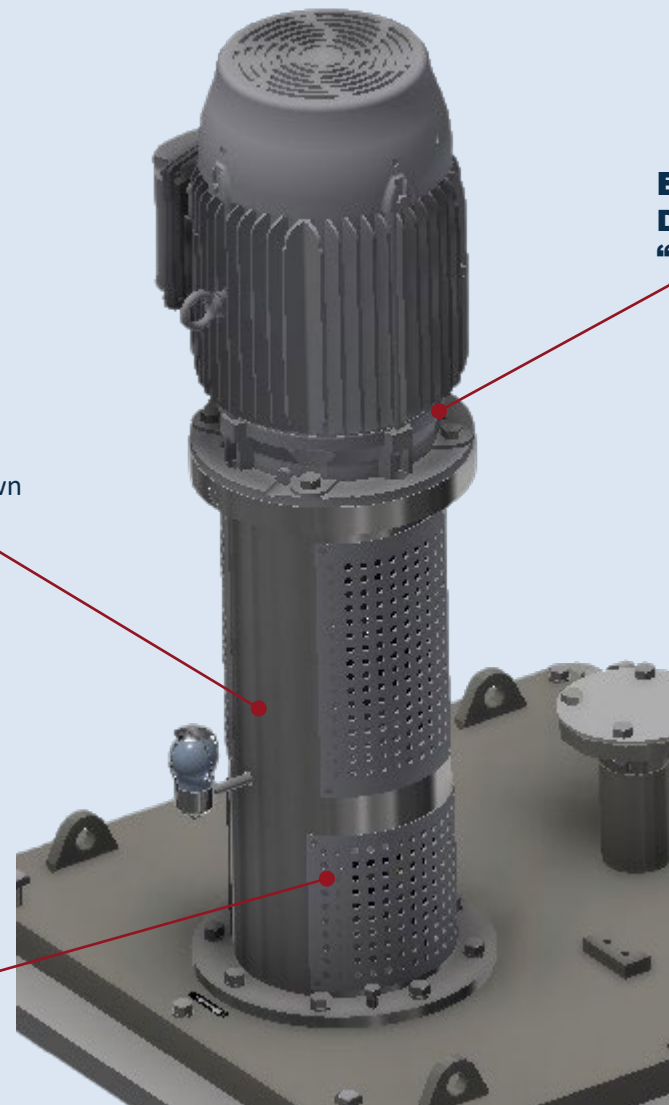
MOTOR SUPPORT

Designed to withstand the down axial thrust.

COUPLING GUARD

Fabricated in Carbon steel / Aluminum

ELECTRICAL MOTORS
Designed for "C", NEMA and "D" (IEC) Flange





Features

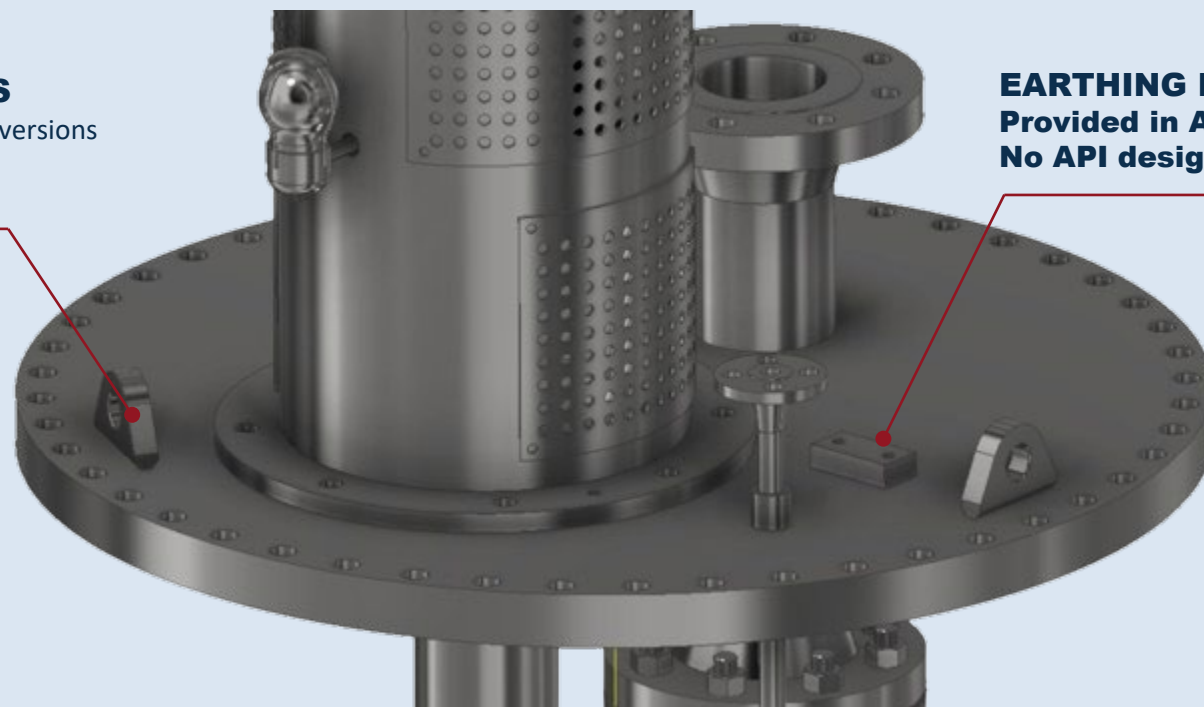
VSP-CHEM

- **LIFTING LUGS**
- **EARTHING LUGS**

LIFTING LUGS

Included in our two versions
3 for round plates &
4 for square plates

EARTHING LUGS Provided in API and No API design





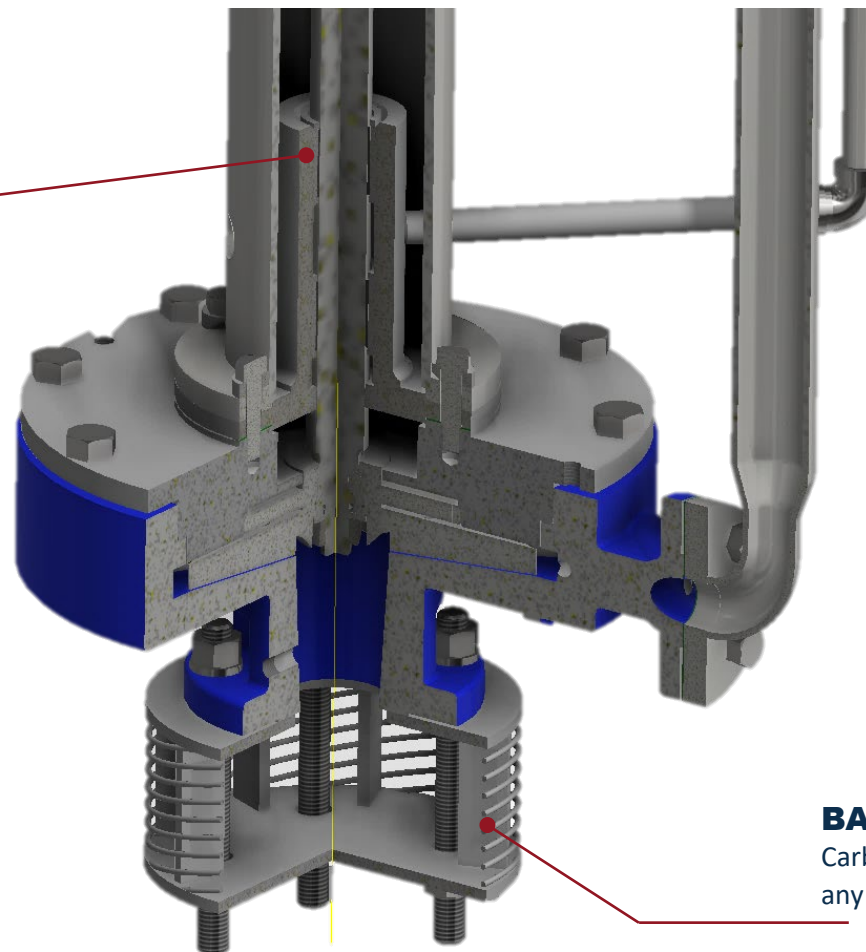
Features

VSP-CHEM

BEARINGS WITH PETROCOKE TAPE FOR VSP-CHEM

Major durability and resistance to
abrasion and wear.

- PETROCOKE TAPE
- BASKET STRAINER



BASKET STRAINER

Carbon steel galvanized (Optional in
any other material)

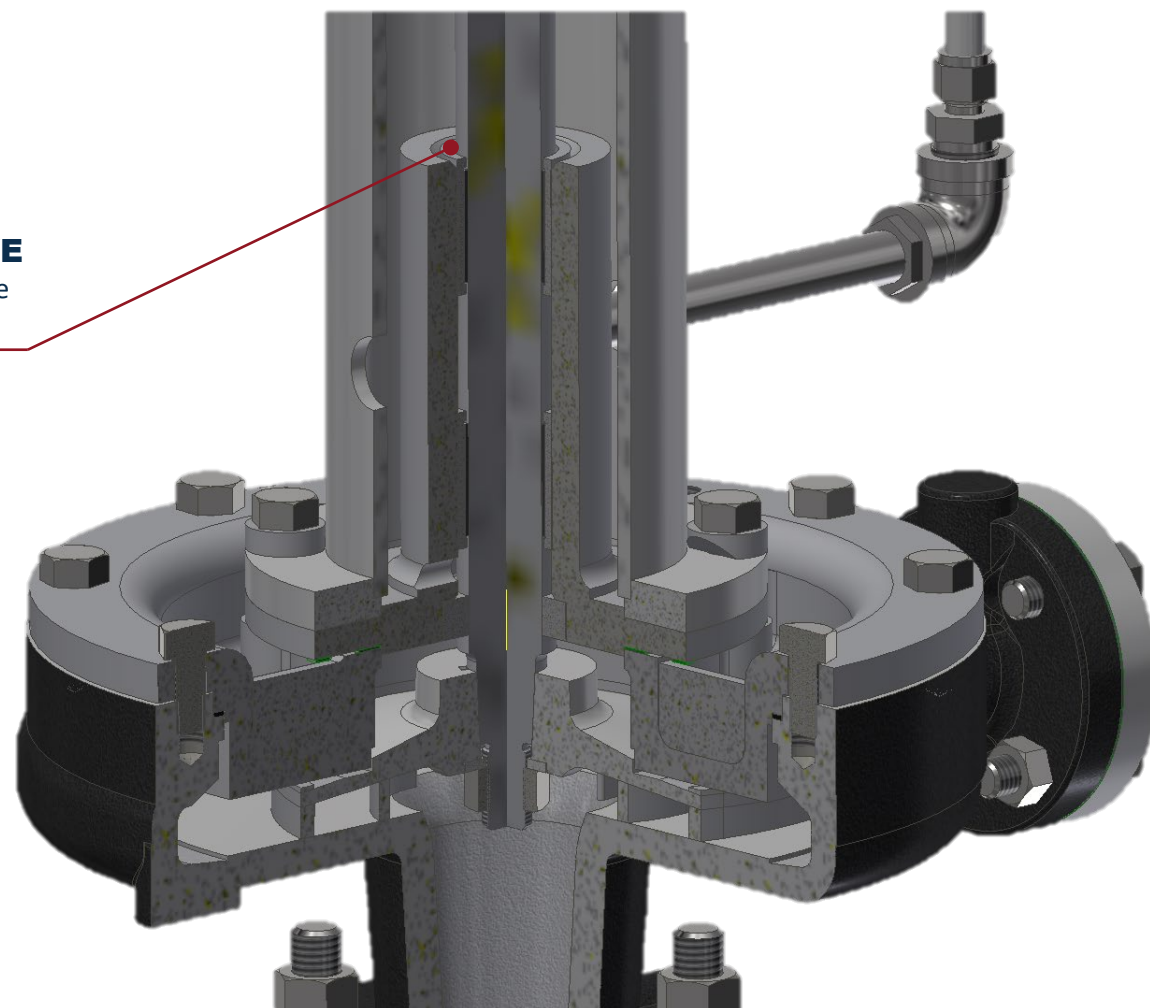


Features

VSP-CHEM

- **SHAFT SLEEVE**

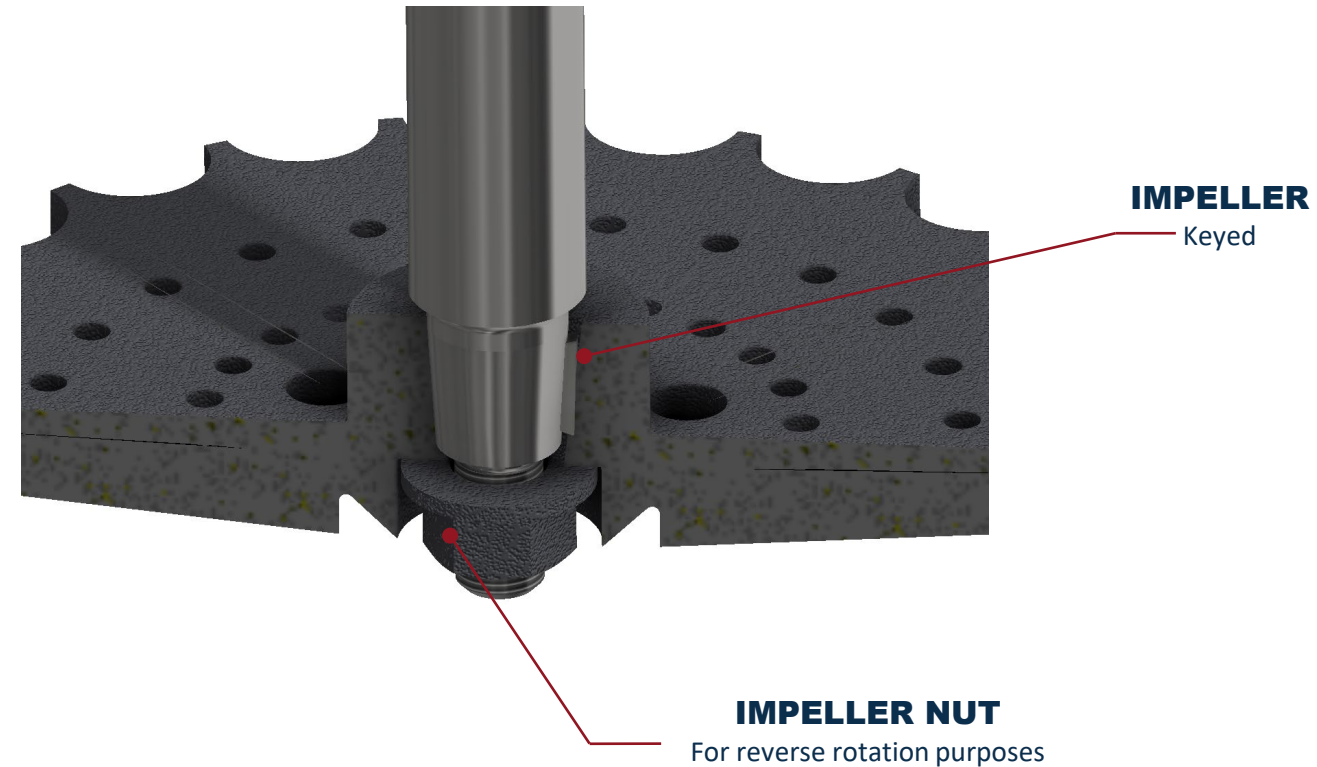
SHAFT SLEEVE
Optional for abrasive
liquids



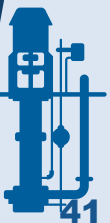


Features

VSP-CHEM



- IMPELLER KEY
- IMPELLER NUT





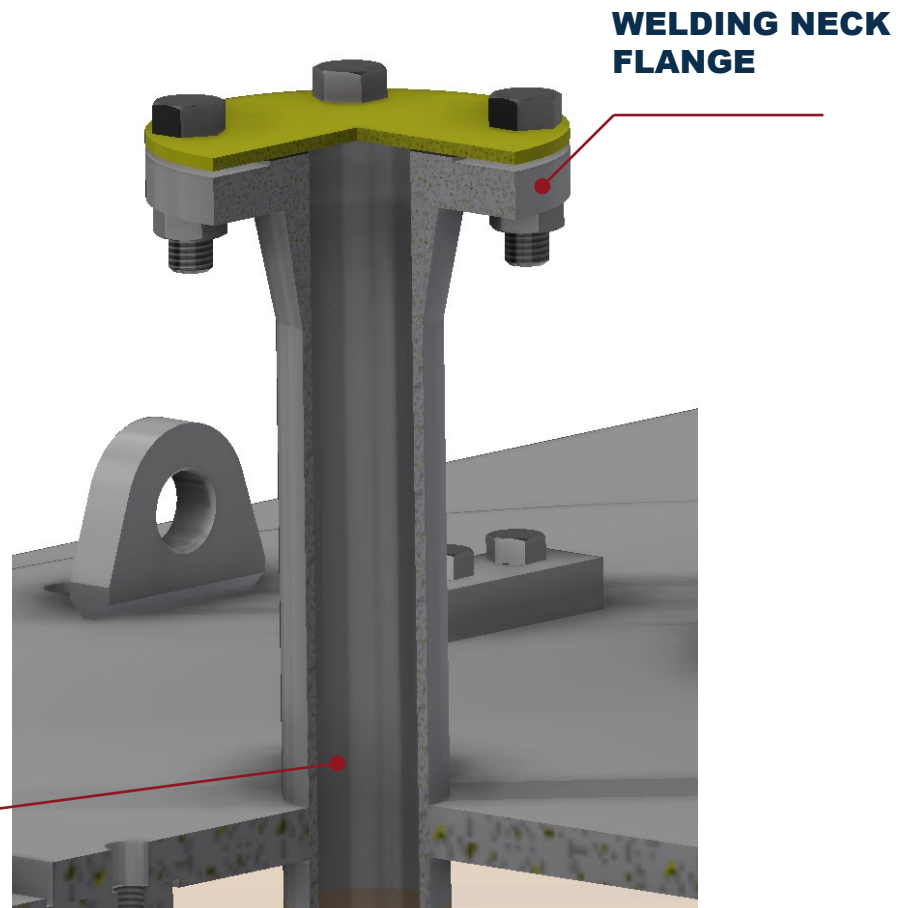
Features

VSP-CHEM

- DISCHARGE PIPE
- WELDING NECK FLANGE
- WELDED DISCHARGE PIPE

WELDED DISCHARGE PIPE

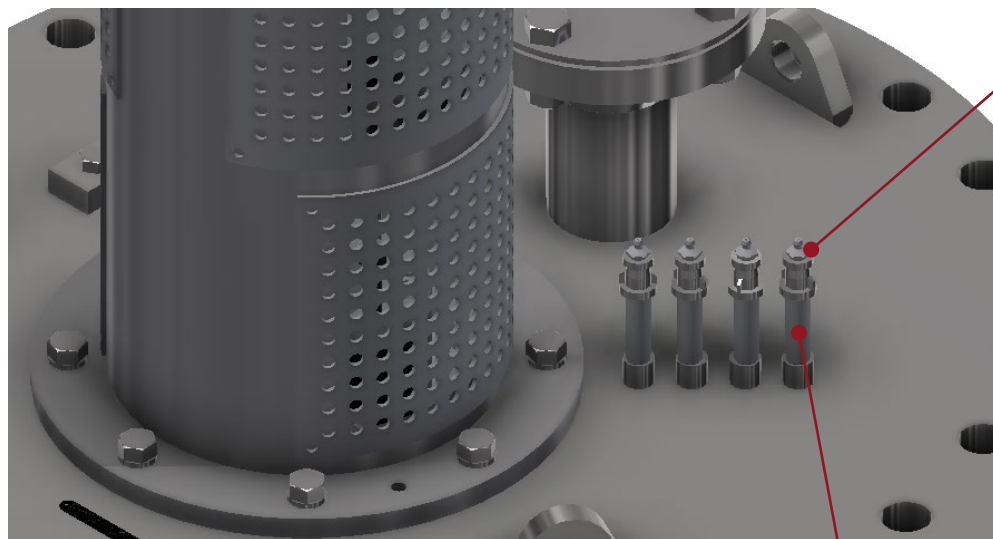
In API design or with Mechanical seal only





Features

VSP-CHEM

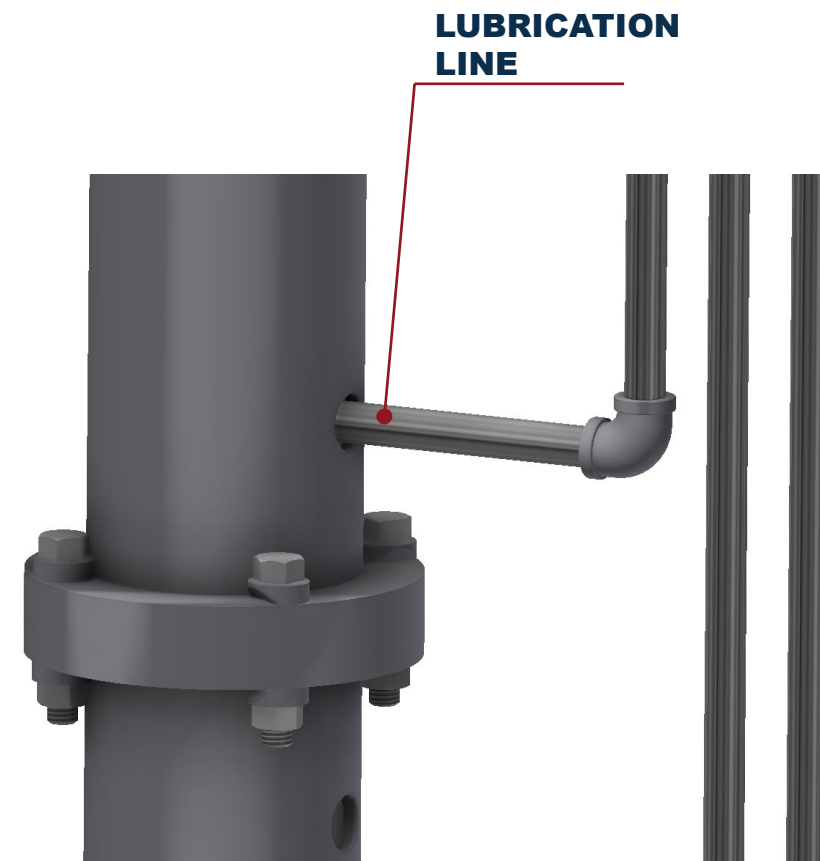


GREASER FITTING

Placed in the top of the mounting plate

LUBRICATION LINE

- GREASE FITTING
- LUBRICATION LINE



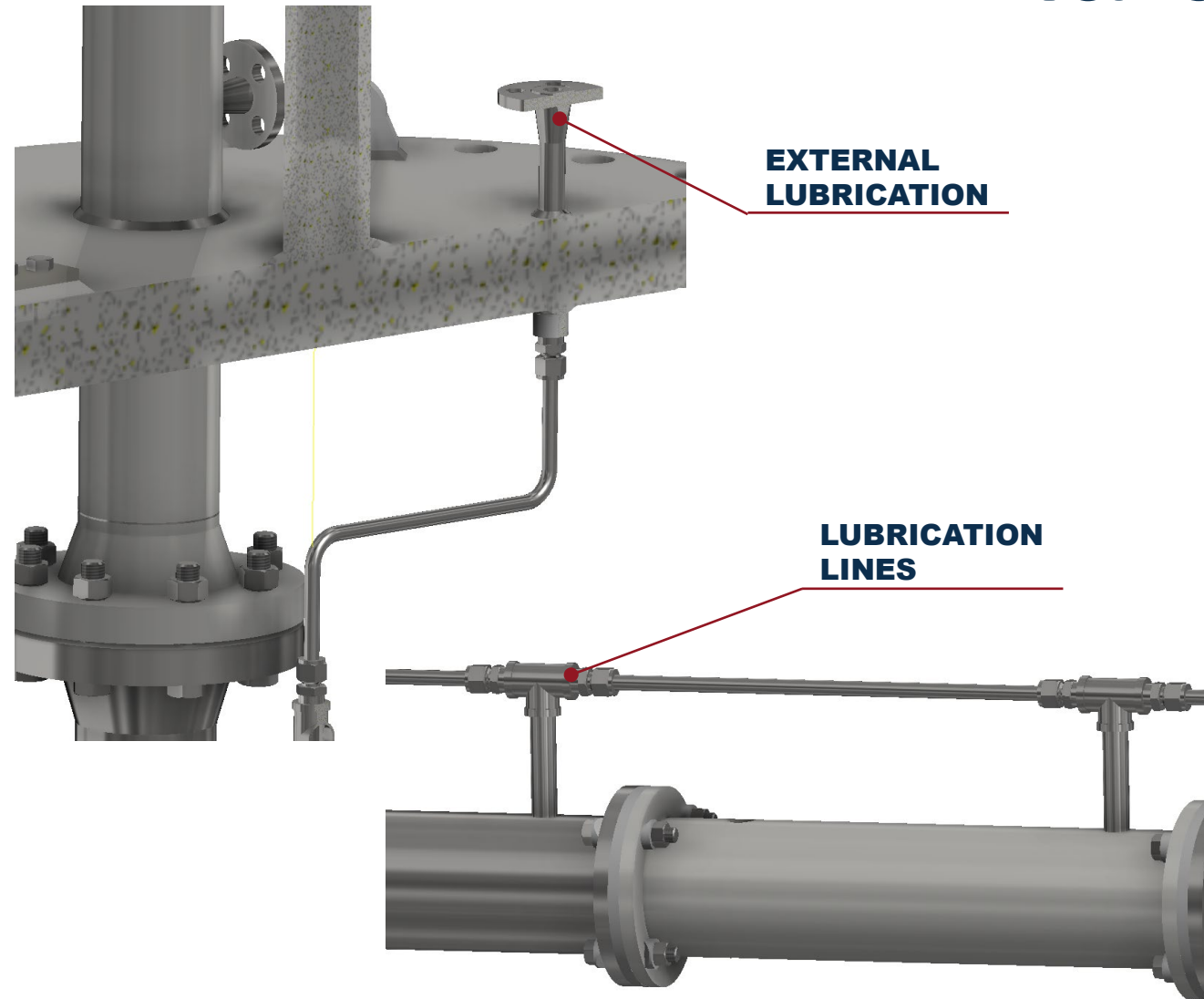
LUBRICATION LINE



Features

VSP-CHEM

- LUBRICATION LINES
- EXTERNAL LUBRICATION





Features

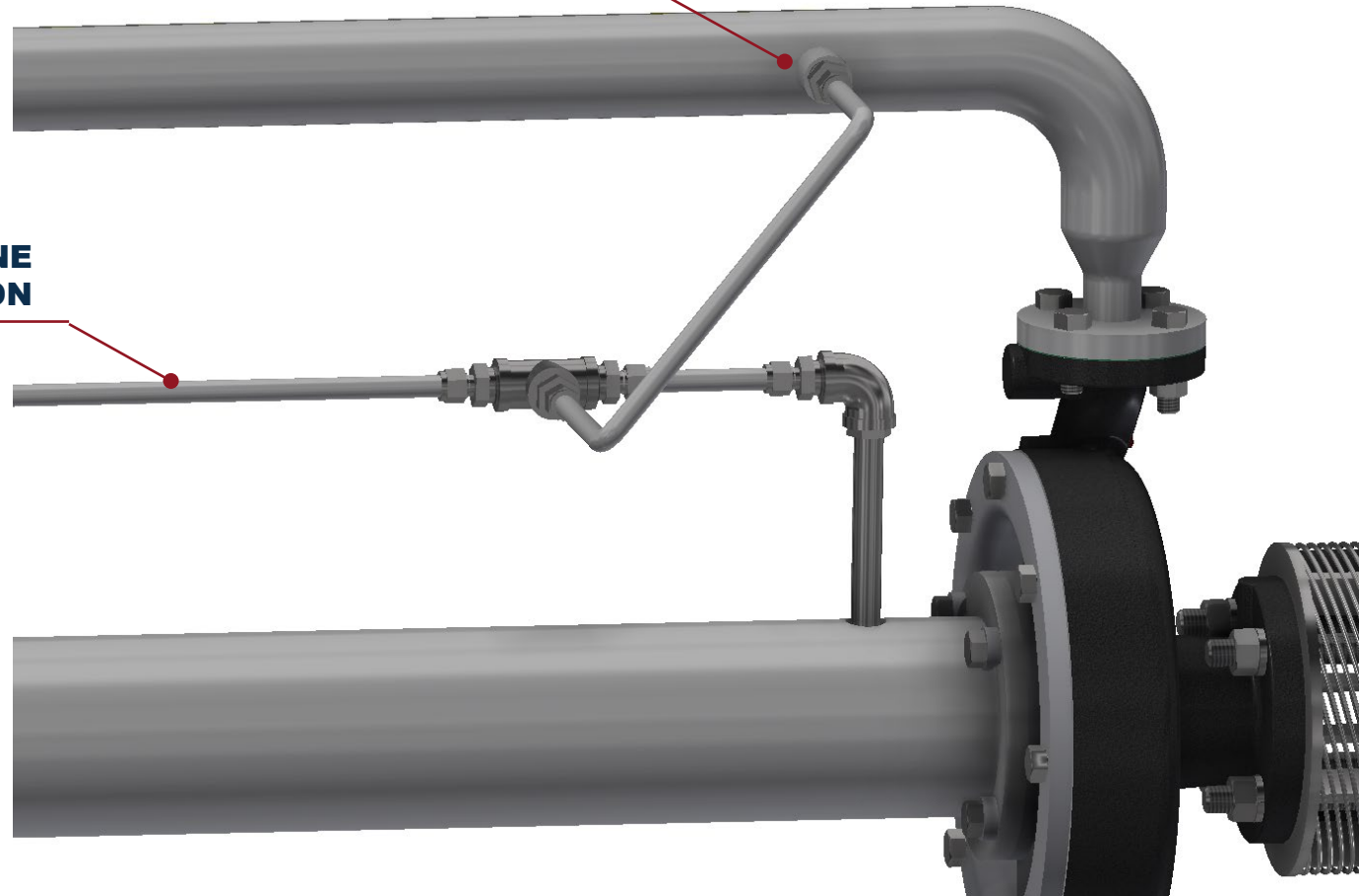
VSP-CHEM

SELF LUBRICATION

From the discharge pipe

LINE CONNECTION

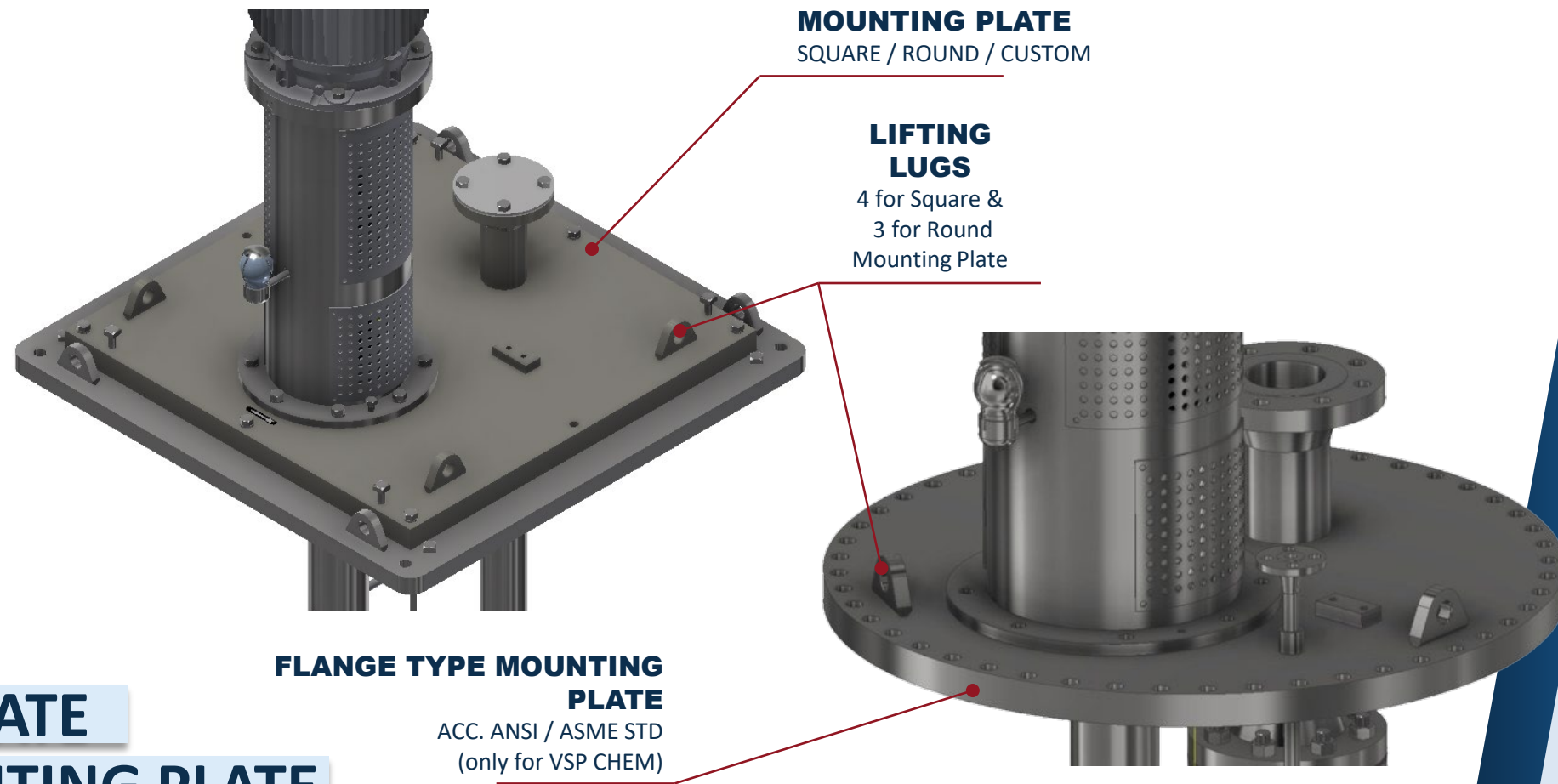
- SELF LUBRICATION
- LINE CONNECTION





Features

VSP-CHEM



- LIFTING LUGS
- MOUNTING PLATE
- FLANGE MOUNTING PLATE



Features

VSP-CHEM

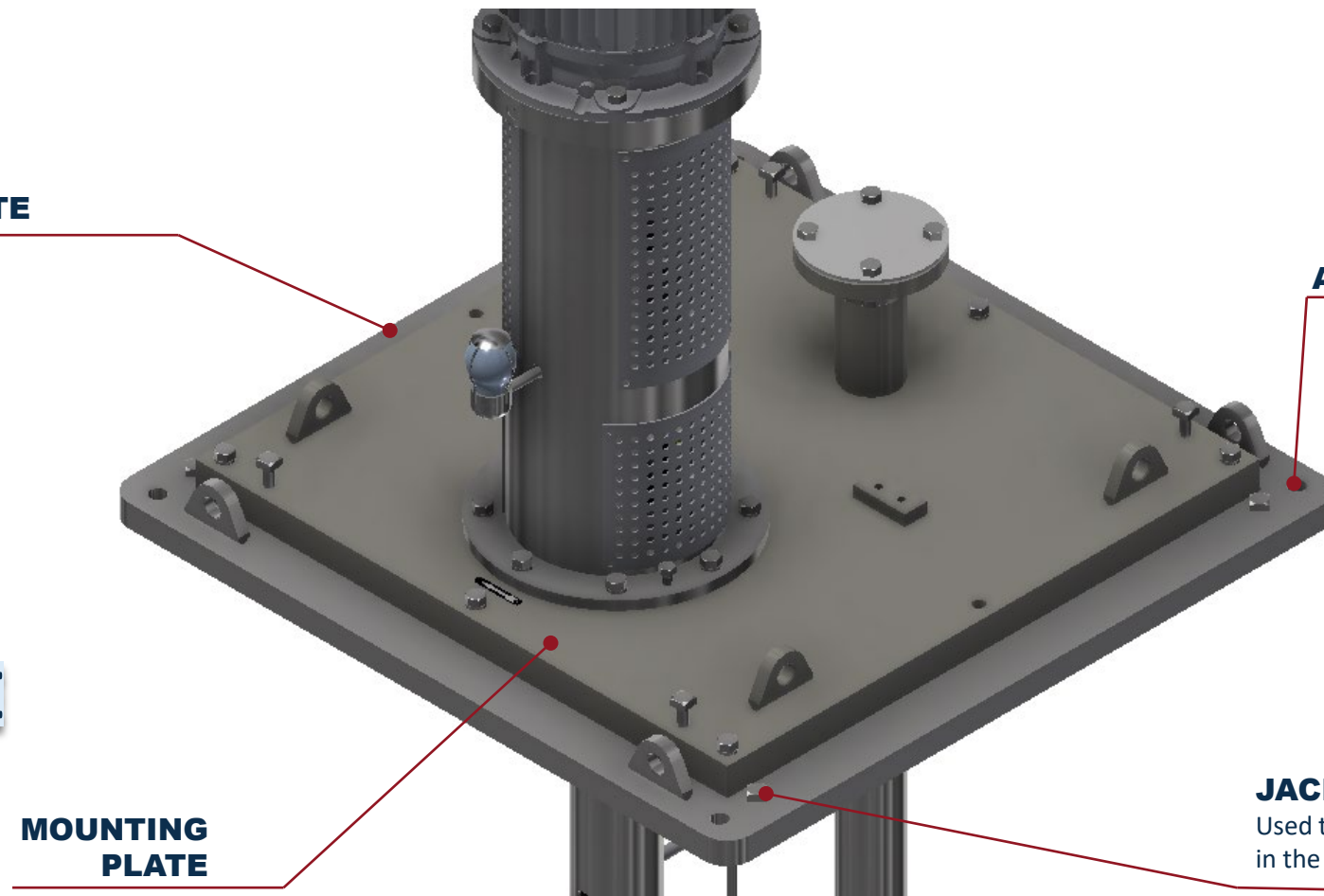
- SOLEPLATE
- JACK SCREWS
- ANCHOR HOLES
- MOUNTING PLATE

SOLEPLATE

ANCHOR HOLES

**MOUNTING
PLATE**

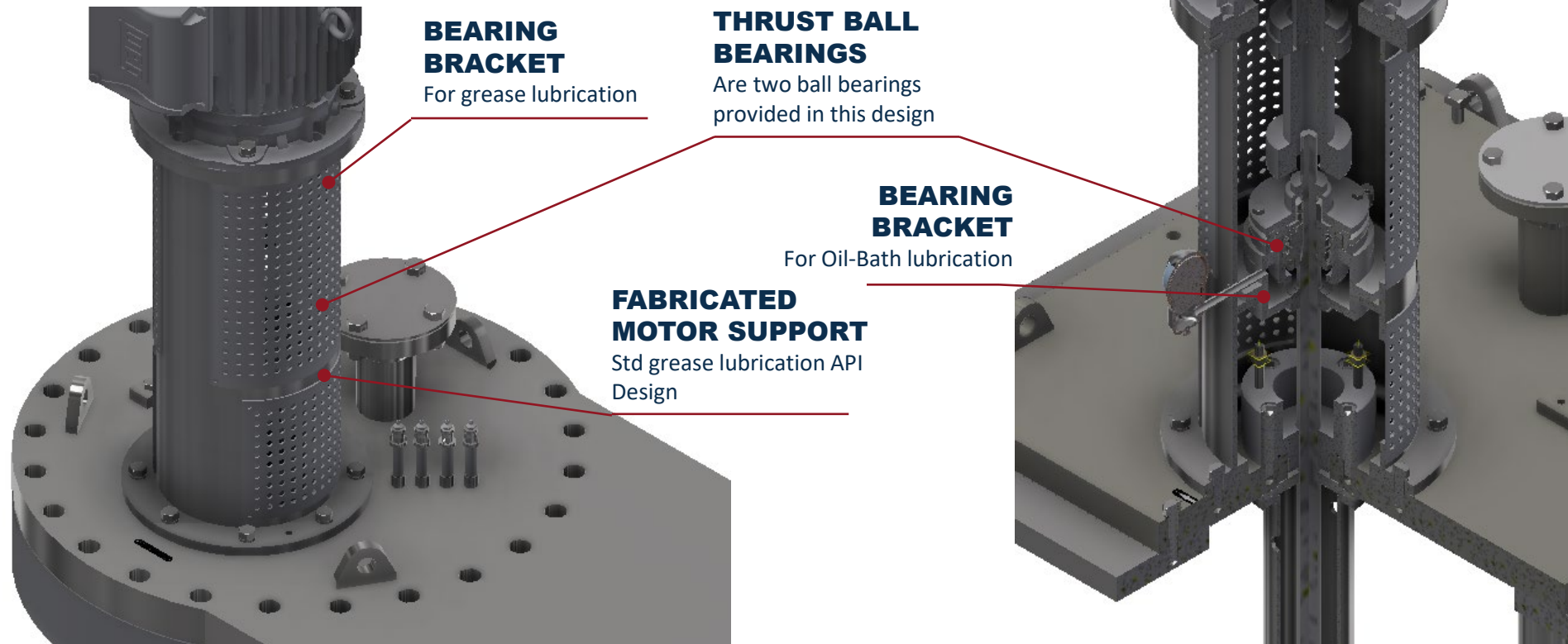
JACK SCREWS
Used to level the pump
in the tank





Features

VSP-CHEM

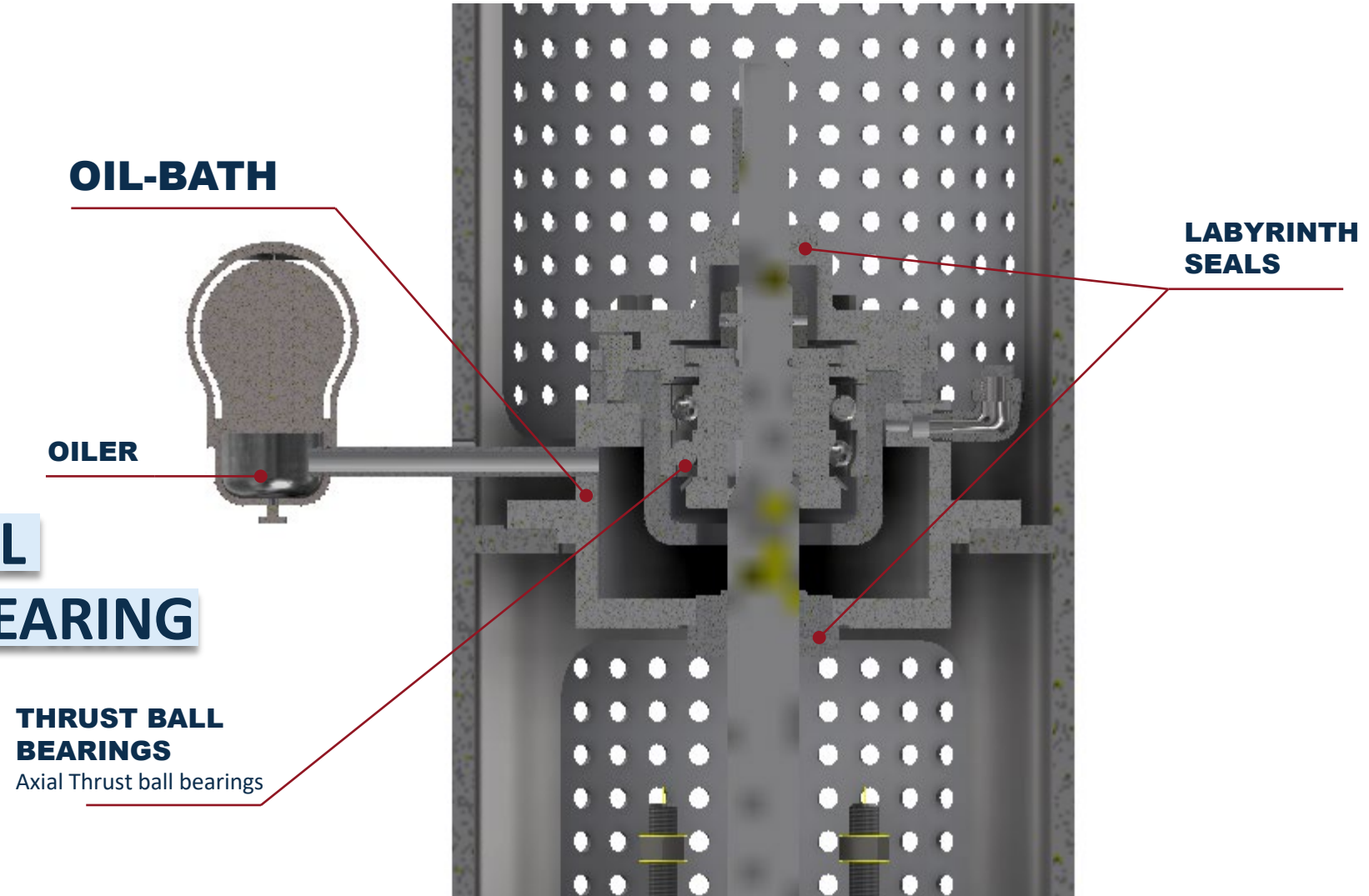




Features

VSP-CHEM

- OILER
- OIL-BATH
- LABYRINTH SEAL
- THRUST BALL BEARING





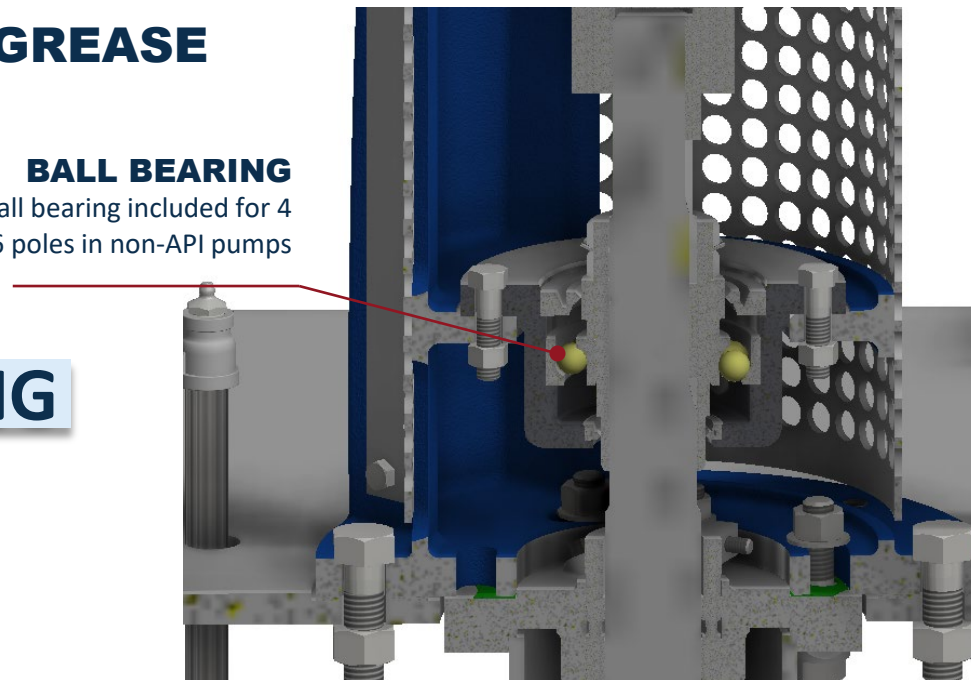
Features

VSP-CHEM

GREASE

BALL BEARING

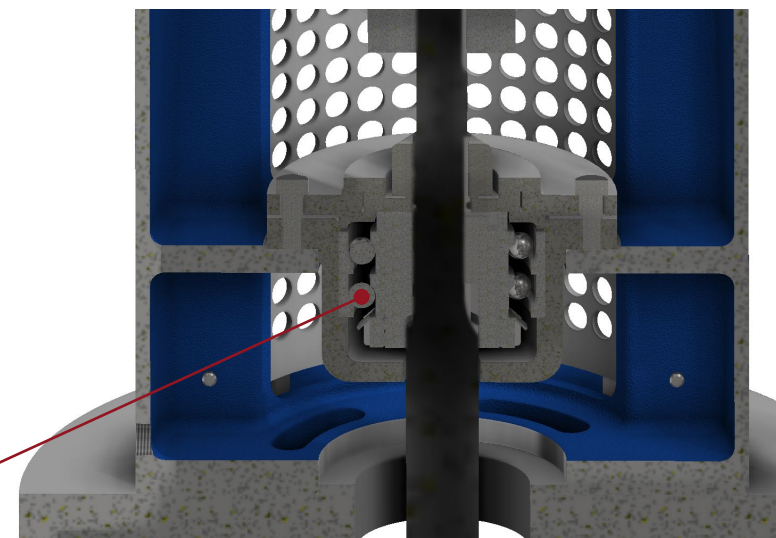
1 ball bearing included for 4 & 6 poles in non-API pumps



- BALL BEARING

BALL BEARINGS

2 ball bearings when the pump runs at 2 poles & API pumps

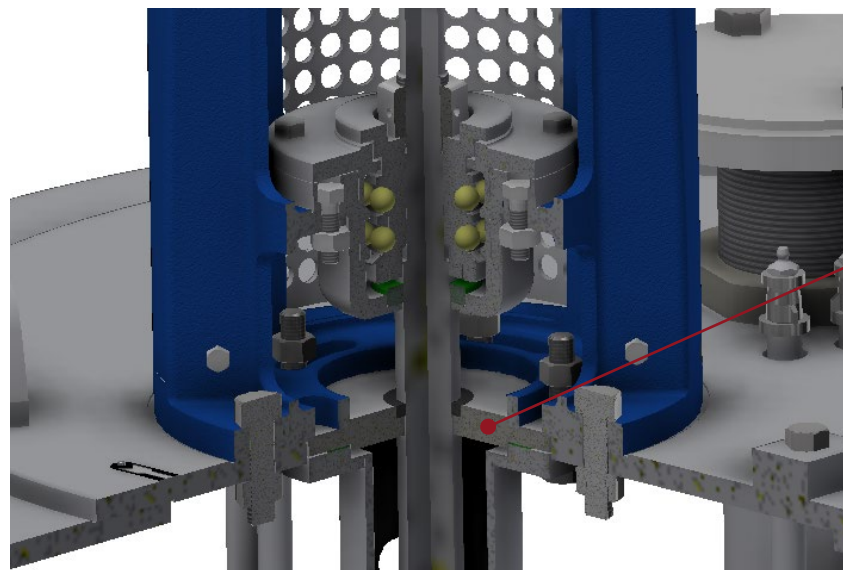
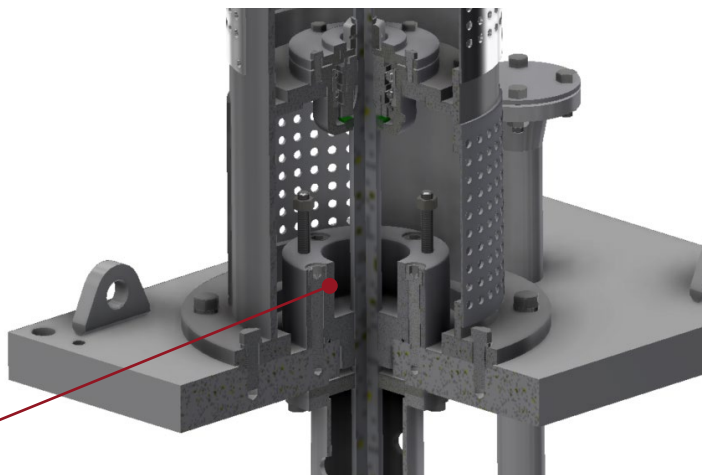




Features

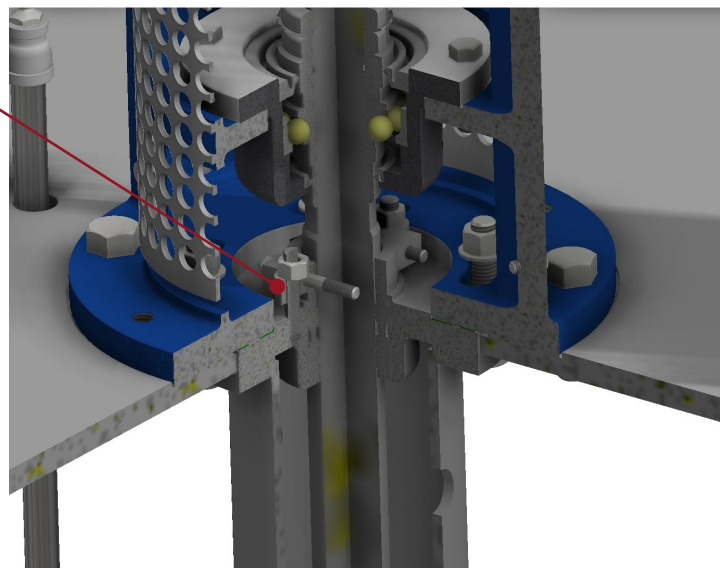
VSP-CHEM

**API STANDARD:
MECHANICAL SEAL**
Chemical/O&G applications -
single dry seal

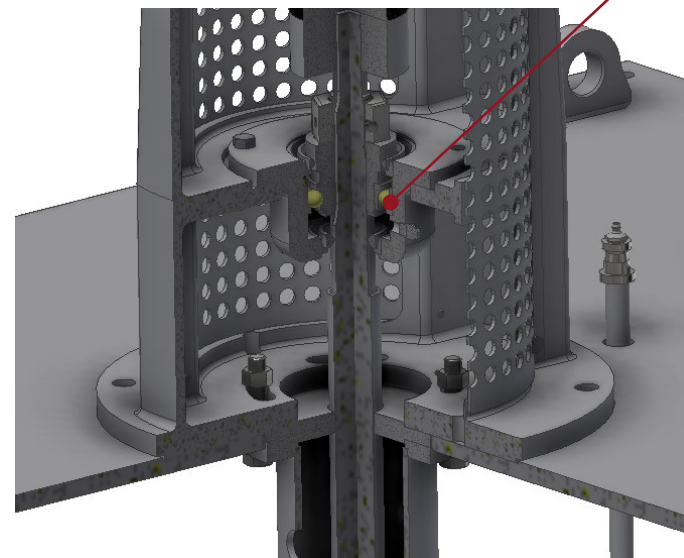


LIP SEAL
Placed in the column
adapter

PACKING
Odor containment



NO SEAL

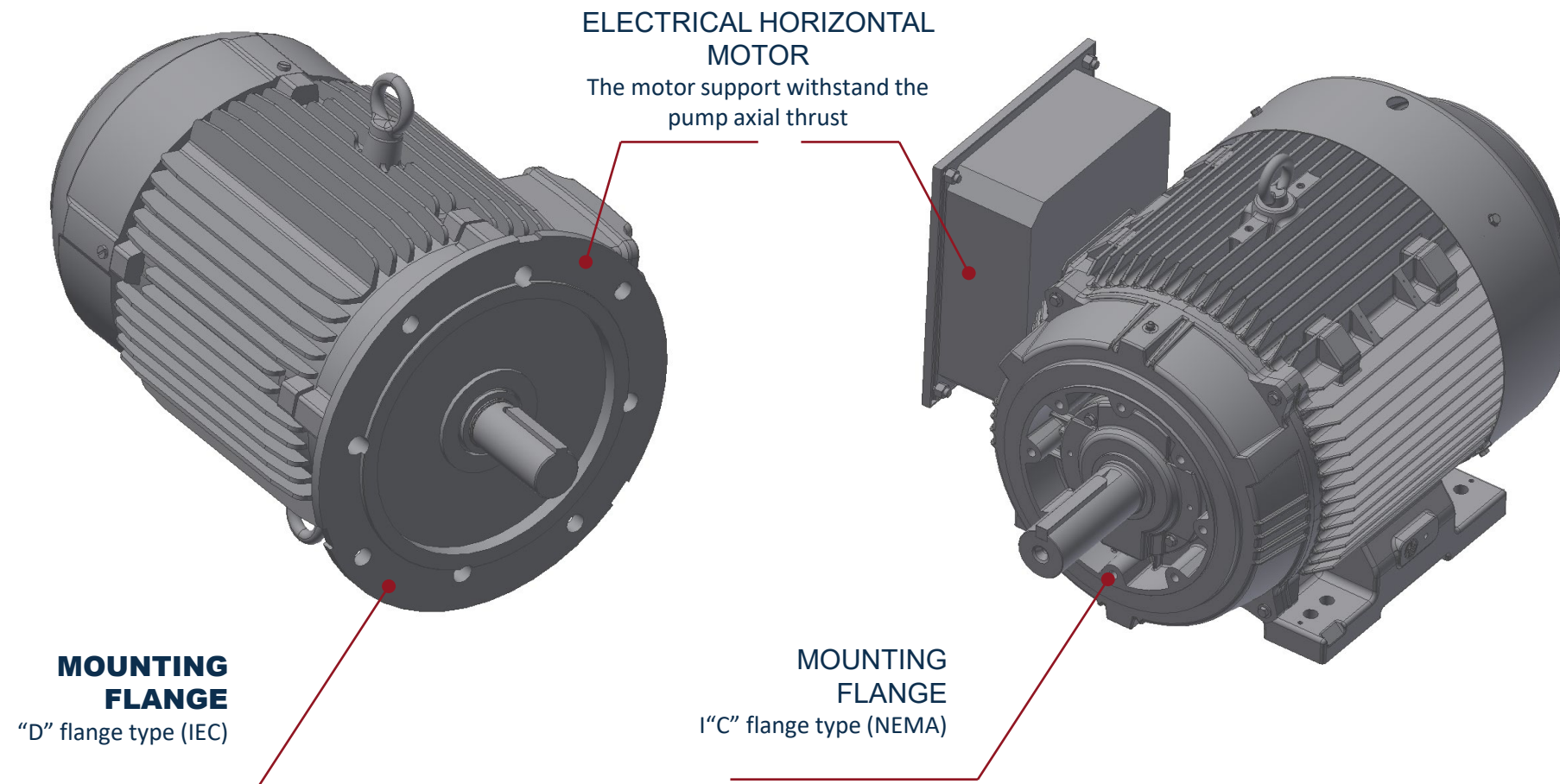


- **MECHANICAL SEAL**
- **PACKING**
- **LIPSEAL**
- **NO SEAL**



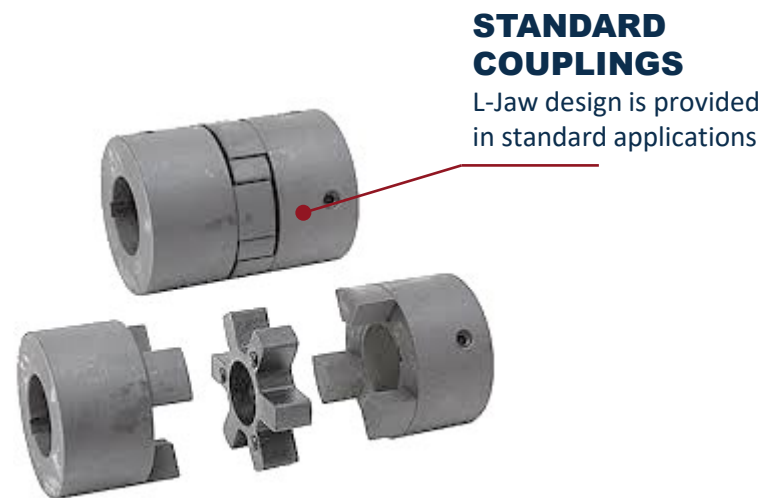
Features

VSP / VSP-Chem





Features



STANDARD COUPLINGS

L-Jaw design is provided in standard applications

FLEXIBLE COUPLING FOR VSP-CHEM

Without spacer

VSP / VSP-Chem



- FLEXIBLE API COUPLING
- STANDARD COUPLING

FLEXIBLE COUPLING FOR VSP-CHEM

With spacer

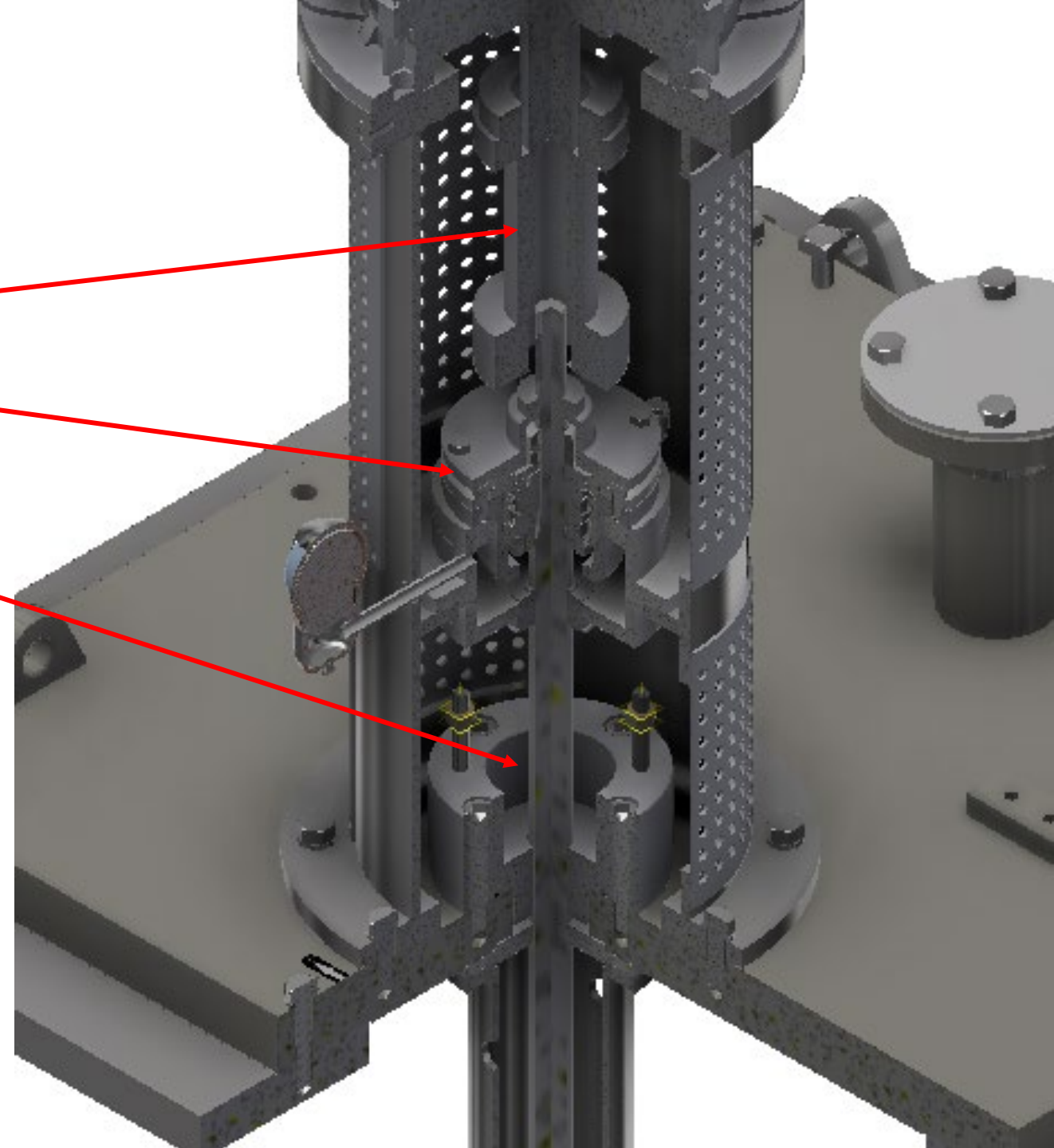


Features

Spacer or Non-Spacer Coupling?

API 610 would require a spacer coupling to allow you to remove the thrust bearing And any mechanical seal without removing the motor.

But on smaller pumps it is generally easier to remove the motor to access these than to access them through the coupling spacer





Features

VSP / VSP-Chem



LEVEL INDICATORS

Float or Ultrasonic

TEMPERATURE INDICATOR RTD



VIBRATION INDICATORS

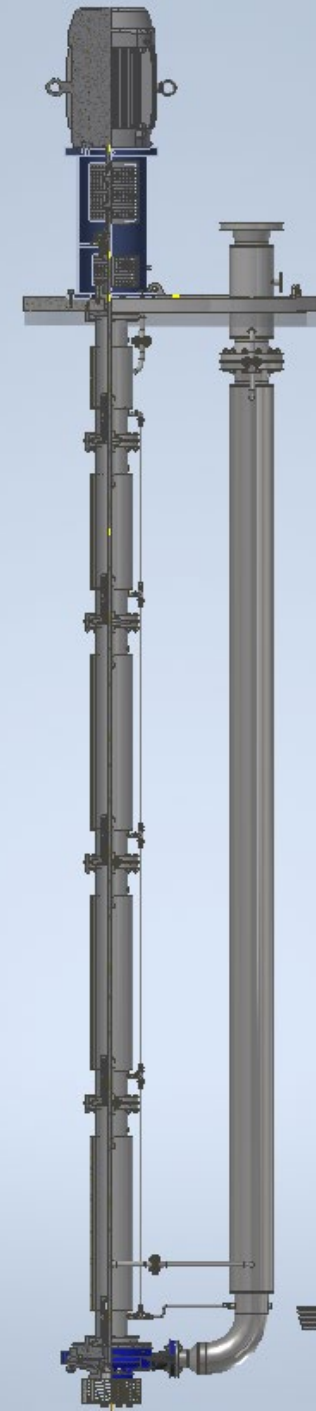
Accelerometer



Extra Features – Jacketed Pumps

Some fluids, such as molten Sulphur, need to maintain a certain temperature in the pump. This is possible with a steam jacket. The steam flows through the whole pump heating the fluid avoiding crystallization or any change in the operation conditions.

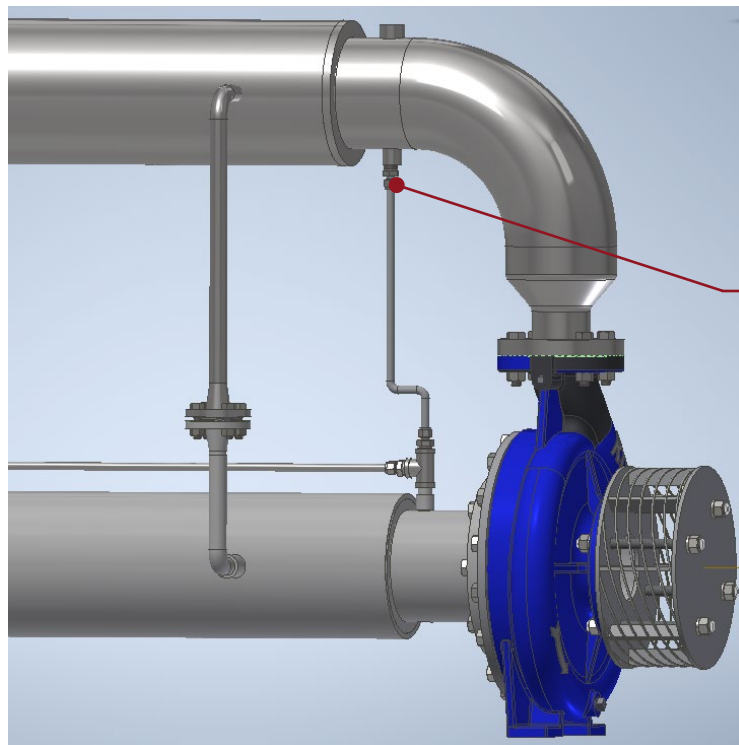
- Pressure of jacket: Up to 14 bar (200 psi)
- Materials: Available in all principal alloys according to API





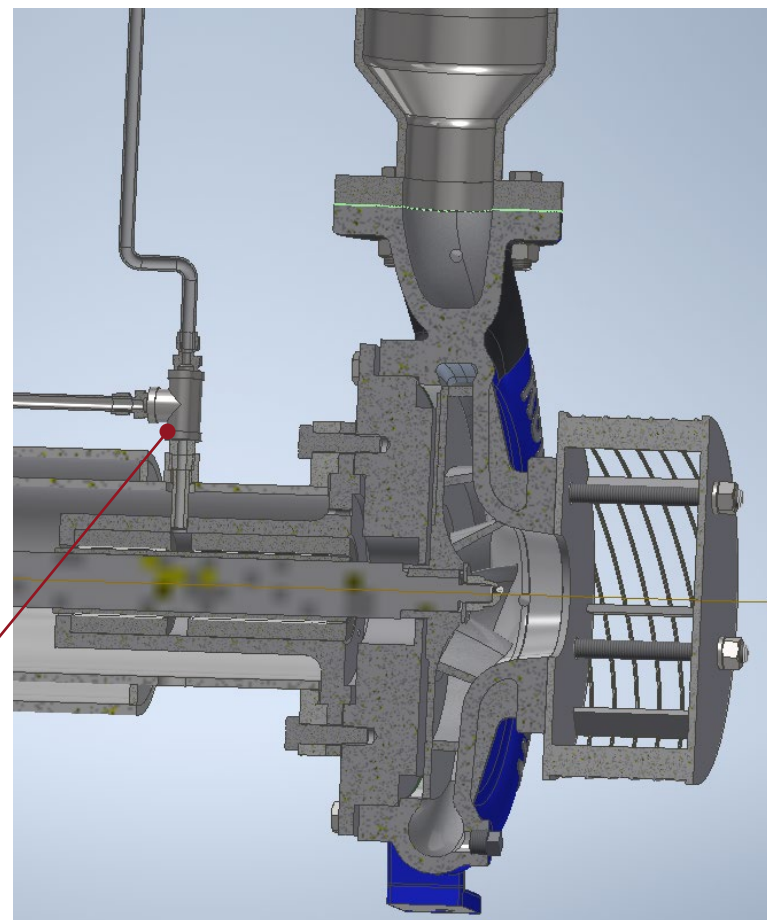
Extra Features – Jacketed Pumps

VSP-Chem



LUBRICATION LINE

The fluid past through an auxiliary connection taken from the discharge pipe



LUBRICATION LINE

Bearings are lubricated by product



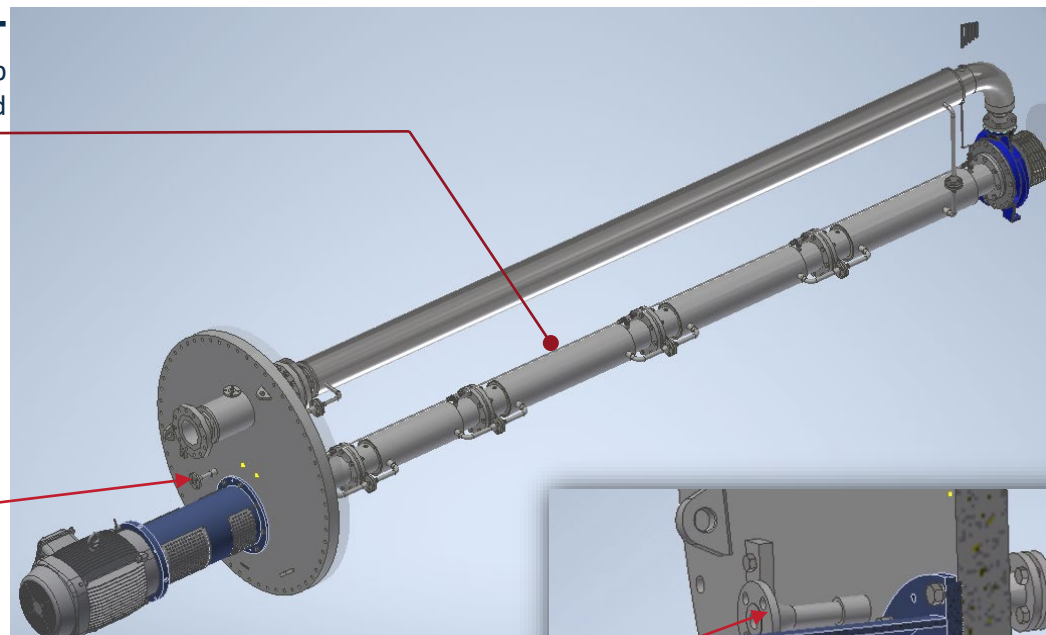
Extra Features – Jacketed Pumps

VSP-Chem

COLUMN JACKET

The column pipe is jacketed to keep the temperature of the fluid

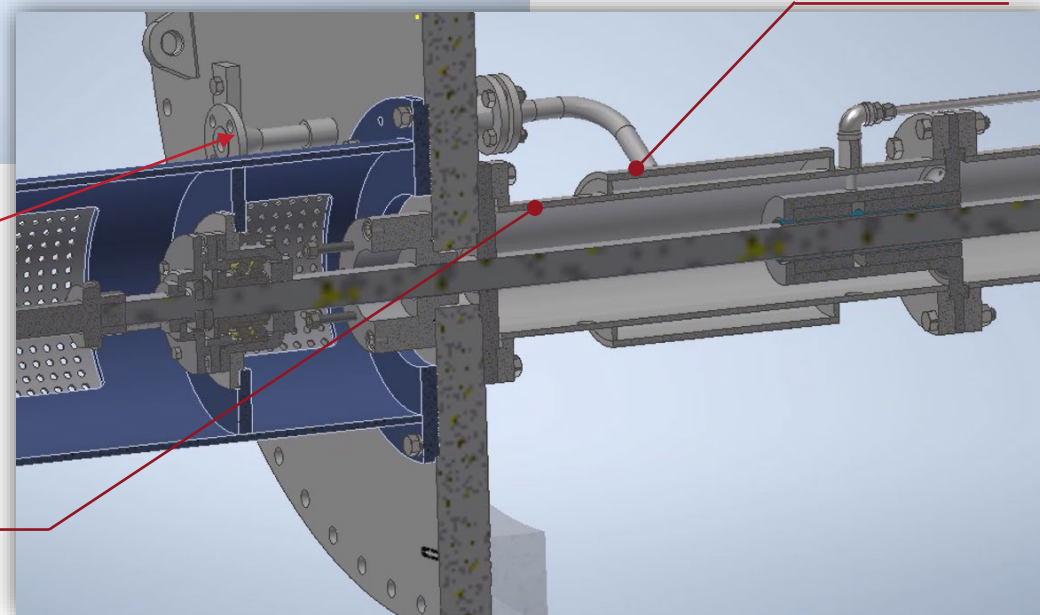
Steam In



COLUMN JACKET

Steam In

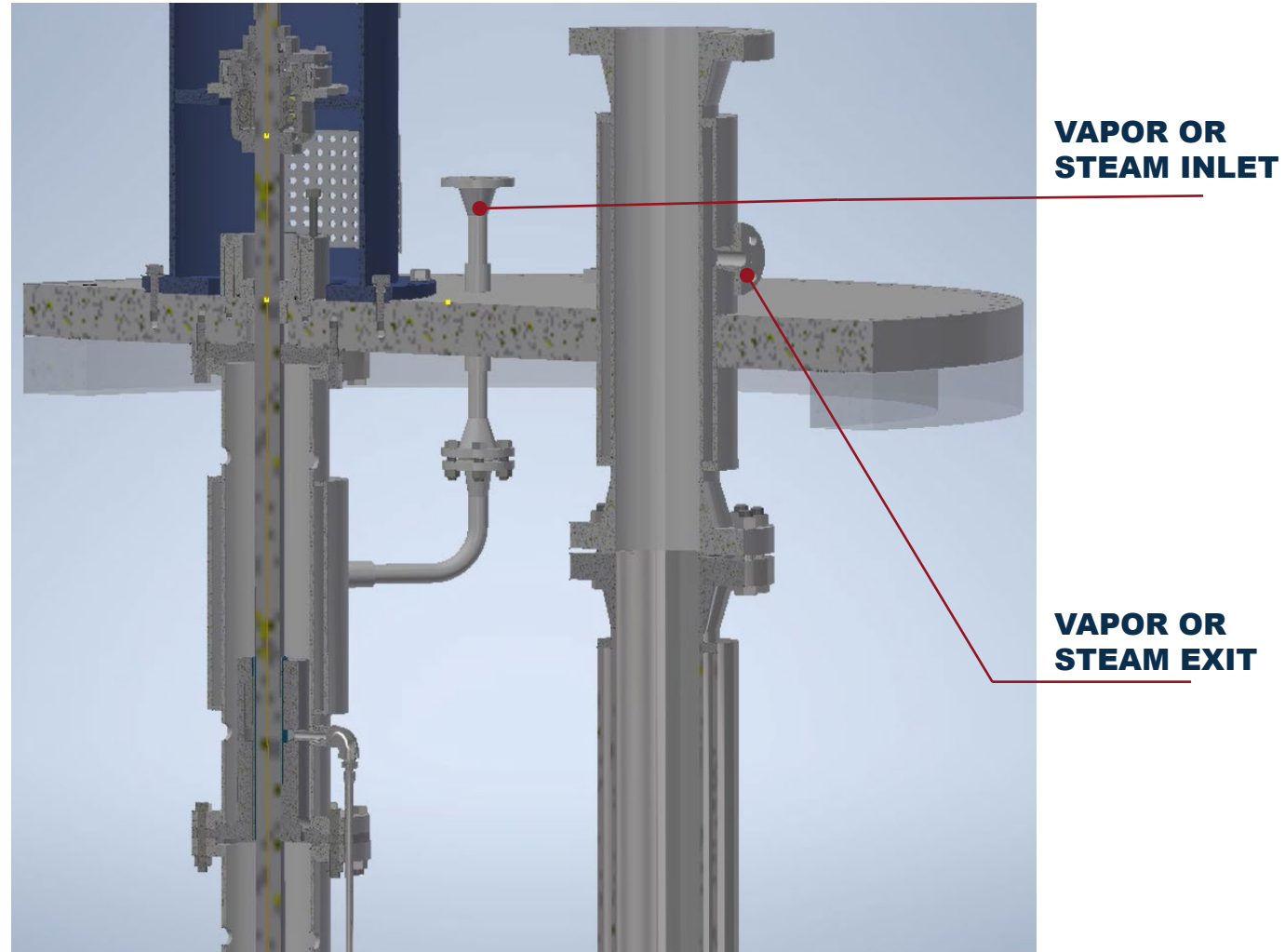
COLUMN PIPES





Extra Features – Jacketed Pumps

VSP-Chem



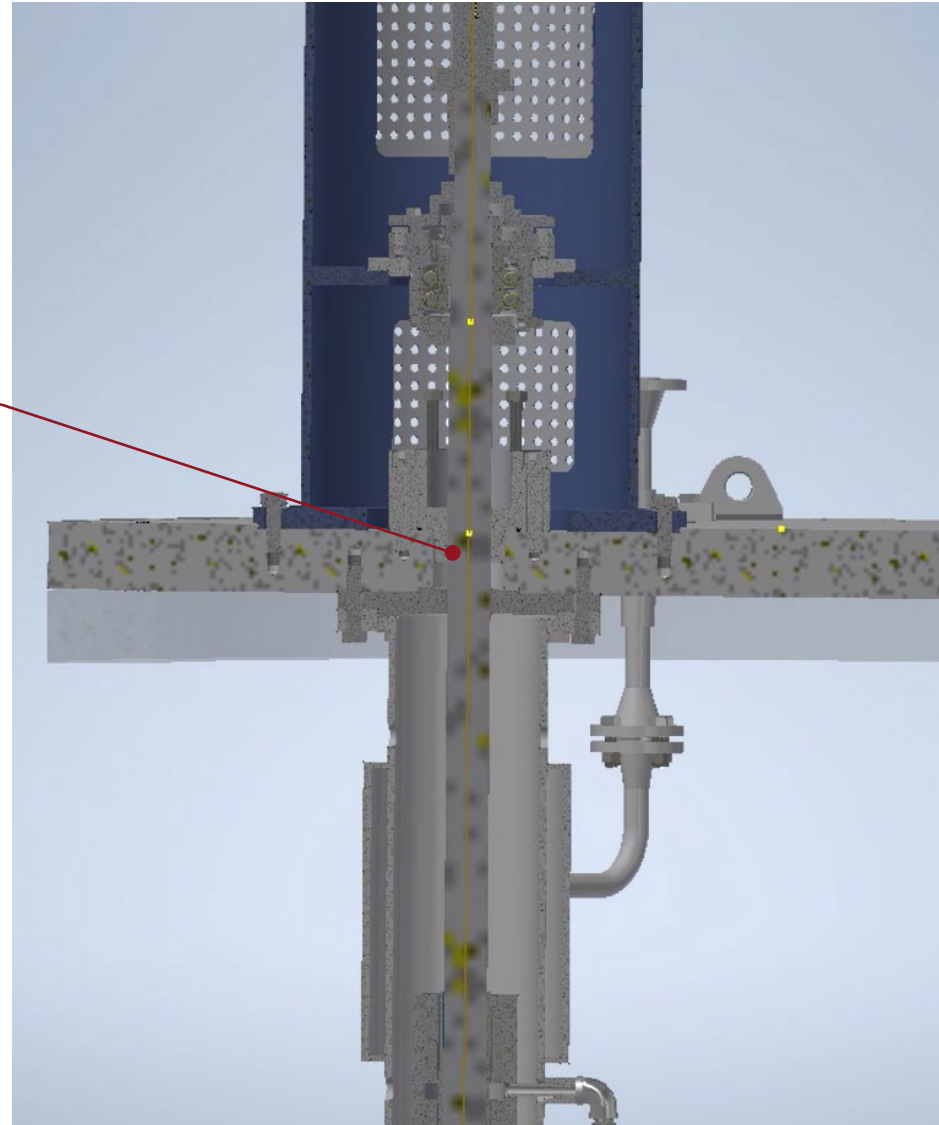


Extra Features – Jacketed Pumps

VSP-Chem

SEALING METHOD

Mechanical seal is used in almost all the case
(Packing is possible with a pressurized plan 74)



VS4 BUSINESS UNIT

- Length up to 20 ft
- ATEX Certification (Zone 1 Category 2)
- Custom mounting plate to fit in with major competitors (ITT, Federal, Flowserve, etc.)
- Quick ship program for STD pump construction. Only 4 weeks!

Product Line Delivery Times

VSP

VSP-STD

Standard MOC: FULL CI

4 Weeks (Quick Ship Program)

* Delivery times can vary for special options/materials such as 316



VSP-CHEM

Standard MOC : CI, WCB & 316

16-20 Weeks

* Delivery times can vary for special options/materials such as API versions, 12%Chrome, 316, D1, D2, Alloy 20, etc.





Competitors – ITT Goulds

VSP



Product Description

API 610 11th edition, compliant VS4 sump pump

The Model 3171 is the Veteran vertical sump and process pump. Thousands of installations in industrial process, sump drainage, corrosive liquids, pollution control, molten salts attest to the 3171's remarkable performance. Simple mounting.

Specifications

- Capacities to 3180 GPM (722 m³/h)
- Heads to 344 Feet (105 m)
- Temperatures to 450° F (232° C)
- Pit Depths to 20 Feet (6 m)

Design Features

- Self-Priming
- Rugged Double Row Thrust Bearing
- Heavy Duty One-piece Shaft
- External Impeller Adjustment
- Available in a Wide Range of Alloys
- Open Impeller Design
- Vapor Proof Option: Choice of packing, mechanical or fluid sealing methods to seal sump vapors



Sump Pumps - CPXV

The Flowserve CPXV is a vertical sump pump incorporating state-of-the-art hydraulic design for efficient and reliable service. The CPXV can be customized to meet a wide range of needs. Compliant with ISO 5199, the CPXV is available in more than 40 hydraulic wet-ends and numerous materials of construction. It is also available with multiple mechanical seal options and sump depths. Also, for oil and gas installations, the CPXV is available with many ISO 13709/API 610 compliant features.





Competitors – Flowserve

VSP

Operating Parameters

- Flows to 1400 m³/h (6160 gpm)
- Heads to 250 m (820 ft)
- Pressures to 25 bar (365 psi)
- Temperatures from -40°C (-40°F) to 400°C (752°F)

Features and Benefits

- Heavy-duty casing with integral foot and multi-ribbed discharge flange provides superior resistance to pipe loads
- Standard front vane open-style impeller design delivers high-efficiency performance
- Reverse vane impeller available
- Additional column lengths are provided up to a maximum of 10 m (32 ft)
- Heavy-duty thrust bearings with axial adjustment made above soleplate level
- Recessed impeller version is available for enhanced solids handling capability
- Suction strainer is optional
- Fully jacketed version available for molten sulfur applications
- ATEX Category 1 (Zone 0) build for high risk explosive environments





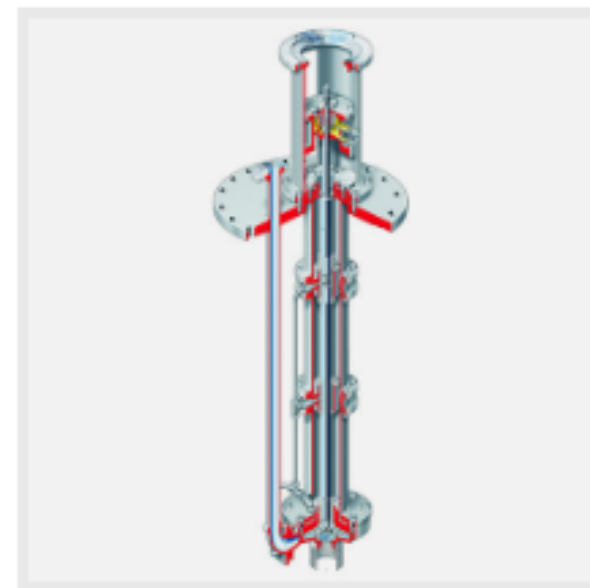
Competitors – Flowserve

VSP

Sump Pumps - ECPJ

The ECPJ single-stage, vertical lineshaft sump pump is designed to perform tough jobs reliably, under a variety of difficult conditions. Based on a modular design system, this rugged pump is fully compliant with the latest ISO 13709/API 610 (VS4) standards and may be custom engineered for the specific application in which it will be used.

Brand: Worthington





Competitors – Flowserve

VSP

Operating Parameters

- Flows to 1000 m³/h (4400 gpm)
- Heads to 150 m (500 ft)
- Temperatures from -46°C (-51°F) to 350°C (660°F)
- Pressures to 20 bar (285 psi)

Design Range

Size Range:

- 45 sizes
- Setting length up to 8 m (26 ft)

Features and Benefits

- ECPJ vertical sump pumps are proven performers in chemical and hydrocarbon processing, delivering reliable performance in a wide range of applications
- The ECPJ is available in three ISO 13709/API 610 compliant hydraulic designs: closed, open and free-flow impeller
- A steam jacketed version for applications where it is critical to maintain a high temperature is available (such as liquid sulfur service)
- For low NPSHa service the ECPJ can be equipped with inducers
- A broad range of materials, including ISO 13709/API 610, NACE MR0175 and NACE MR0103 compliant alloys and specialty materials such as titanium are available
- ECPJ pumps can be provided in compliance with ATEX Zone 0 / Category 1.



CVT vertically suspended sump pump

Vertical pumping expertise in ANSI markets

The CVT can be applied to any sump application with moderate solid content.



✓ Main benefits

- Interchangeable casing and impeller with CPT ANSI B73.1 chemical pump
- Ductile iron or Duplex SS casing with Duplex SS impeller for long life
- Heavy duty shaft in variety of materials for improved corrosion resistance and high torque capacity
- Variety of level switches, level transducers and other instrumentation available

✓ Main applications

- Drainage Sumps
- Oily Water Sumps
- Lube Oil Supply
- Tank Transfer

Capacities	Up to 750 m ³ /h / 3,200 US gpm
Heads	Up to 120 m / 550 ft
Pressures	Up to 26 bar / 375 psi
Temperatures	-45 to 205°C / -40 to 400°F
Discharge sizes	50 to 200 mm / 2 to 8 inches

- Bearing spacing follows API 610 to assure first critical speed of shaft system is above operating speed
- Epoxy coated carbon steel mounting plate standard
- Grease lubricated 7300 series BECBM thrust bearing with machined brass cages

Coming Attractions ☺

“Engineered Packages & Systems”

Thurs 21st November – 08.00 (UK GMT) (Eastern Hemisphere) & 17.00 (UK GMT) (Western Hemisphere)

*For those occasions when you would prefer to buy a **complete engineered pumping package** rather than buying just the pumps from a pump supplier and having to design, purchase and build the rest of the installation yourselves (skids, enclosures, piping, valves, heat exchangers, filters, control equipment, instrumentation, engineering etc). RuhRPumpen has the expertise and experienced engineering teams to meet your needs however great or small.*

Aimed at Process and Mechanical Engineers and Consultant Engineers specifying equipment for refineries, oilfields, and general industrial installations; and at Applications & Sales Engineers selecting and quoting them.

Future subjects in preparation include:

- Double Case Pumps (Barrel Pumps – BB5)



Specialist for Pumping Technology

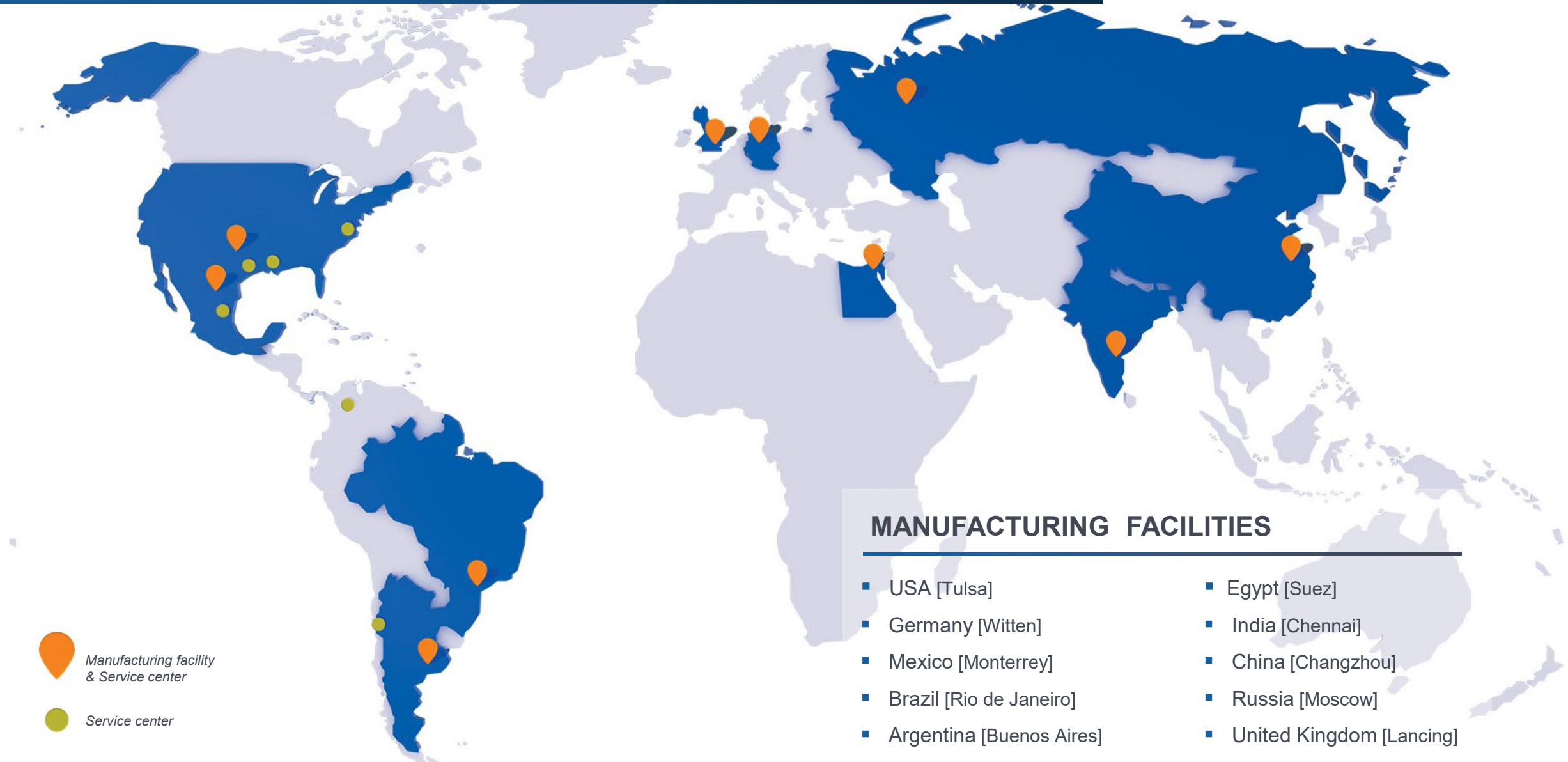
Q & A

ssmith@ruhrpumpen.com

www.ruhrpumpen.com

marketing@ruhrpumpen.com

A GLOBAL COMPANY



RUHRPUMPEN AT A GLANCE

**VERTICAL
INTEGRATION**

**SALES
OFFICES IN
+35 COUNTRIES**

**MANUFACTURING
FACILITIES
IN 10 COUNTRIES**

**+70 YEARS
OF EXPERIENCE**

**+2,000
EMPLOYEES**

**15 SERVICE
CENTERS**

+70,000 PUMPING SOLUTIONS INSTALLED WORLDWIDE

MARKETS WE SERVE

Our commitment to create innovations that offer reliable solutions to our customers allow us to provide a complete range of pump systems to support **core markets** as:





OUR PUMP LINES

Ruhrpumpen offers a broad range of highly engineered and standard pumping products that meet and exceed the requirements of the most demanding quality specifications and industry standards.

Our pumps can handle head requirements as high as 13,000 ft (4,000 m) and capacities up to 300,000 gpm (68,000 m³/hr).

Moreover, our pump designs cover temperatures from cryogenic temperatures of -310 °F (-196 °C) up to 752 °F (400 °C).



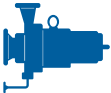
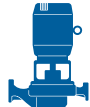
Products include:

- Single Stage Overhung Pumps
- Between Bearings Pumps
- Horizontal Multi-Stage Pumps
- Vertical Multi-Stage Pumps
- Vertical Mixed Flow & Axial Flow Pumps
- Positive Displacement Pumps
- Full Range of Industrial Pumps
- Submersible Pumps
- Magnetic Drive Pumps
- Decoking Systems
- Packaged Systems
- Fire Systems



OUR PUMPS

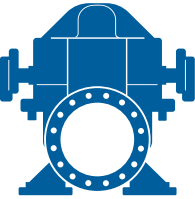
OVERHUNG PUMPS

CATEGORY	RP MODEL	DESIGN STANDARD	
Sealless Magnetic Drive Pumps	CRP-M / CRP-M-CC	ISO 2858 & 15783 HI design (OH11)	
	SCE-M	API 685	
Foot Mounted OH1 and General End Suction Pumps	IPP	HI design (OH1)	
	CPP / CPP-L	HI design (OH1) ANSI B73.1	
	CPO / CPO-L	HI design (OH1) ANSI B73.1	
	CRP	HI design (OH1) ISO 2858 & 5199	
	GSD	HI design (OH0)	
	SHD / ESK / SK / SKO SKV / ST / STV	HI design (OH1)	
	SWP	HI design (OH3A)	
Centerline Mounted	SCE	API 610 (OH2)	
Vertical In-Line Pumps	SPI	API 610 (OH3)	
	IVP / IVP-CC	HI design (OH4 / OH5)	
	IIL	HI design (OH5) Dimensionally compliant with ANSI B73.2	
	SPN	API 610 (OH5)	





BETWEEN BEARING PUMPS

CATEGORY		RP MODEL	DESIGN STANDARD	
1 and 2 stage	Axially split	HSC / HSD / HSL HSR / ZW	HI design (BB1)	
		HSM	HI design (BB3)	
		ZM / ZMS ZLM / ZME	API design (BB1)	
	Radially split	HVN / J	API design (BB2)	
		RON / RON-D	API design (BB2)	
Multi-stage	Axially split	SM / SM-I	API design (BB3)	
		JTN	API design (BB3)	
	Radially split <i>single casing</i>	GP	API design (BB4)	
	Radially split <i>double casing</i>	A LINE	API design (BB5)	





VERTICAL PUMPS

CATEGORY		RP MODEL	DESIGN STANDARD	
Single casing	Diffuser	VTP	HI & API 610 (VS1)	
		VCT	HI & API 610 (VS1)	
		HQ	HI & API 610 (VS1)	
		VLT	HI & API 610 (VS1)	
	Volute	DSV / DX	HI & API 610 (VS2)	
	Discharge through column – Axial flow	VAF	HI & API 610 (VS3)	
Double casing	Separate discharge line	VSP / VSP-Chem	HI & API 610 (VS4)	
	Diffuser	VLT / VMT	HI & API 610 (VS6)	
	Volute	DSV / DX	HI & API 610 (VS7)	
Submersible pumps		SMF	HI design (OH8A)	
		VLT-Sub / VTP-Sub	HI design (VS0)	





SPECIAL SERVICE PUMPS

CATEGORY	RP MODEL	DESIGN STANDARD	
Pitot tube pumps	COMBITUBE	HI design	
Reciprocating pumps	RDP	API 674 ISO 13710	
Vertical turbine generator	VTG	HI design (VS6)	
Barge	LS BARGE	HI design	
Floating dock pumps	ZVZ	HI design	
	LVZ	HI design	
Cryogenic pumps	SVNV	-	
	VTG Cryogenic	-	
	VLT Cryogenic VLTV	-	
Pre-packaged fire pump systems	Fire systems incorporate pumps, drivers, control systems and pipework in a single container. They can be skid mounted, with or without enclosure and supplied with electric motor or diesel engine.		 NFPA-20-850 UL and FM approved components

