SUNNDA CORPORATION

Boost Your Bottom Line!

Mud Pump Parts & Expendables

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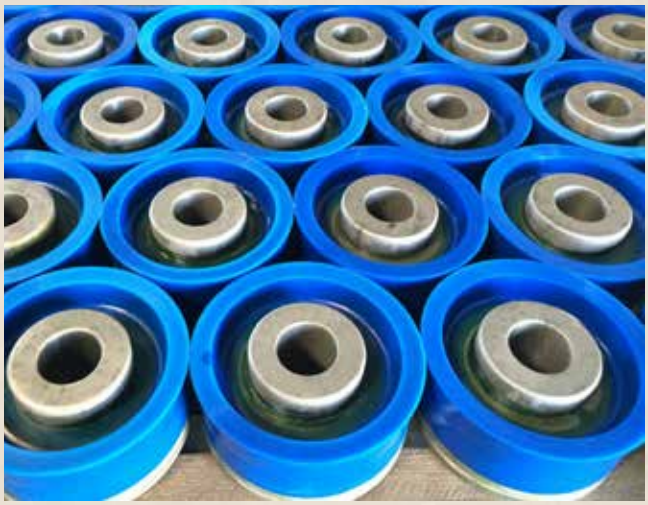
Sunnda Corporation

SUNNDA CORPORATION is an American Company headquartered in Houston, Texas, USA, a leading manufacturer and distributor of mud pump expendables and fluid end spare parts used in oil and gas well drilling operations.

We offer a full line of quality expendables and service parts for all well-known makes and models of mud pumps that are currently in operation all over the world. These items include various styles of valves, pistons, liners, piston rods, and wear plates, as well as all fluid end seals and gaskets. We also offer a complete selection of fluid end modules and major service components, such as crankshaft assemblies, gear sets, bearings, and connecting rods.

We comply with strict quality control processes, which guarantee that our products are produced to the highest industry standards. This ensures that the products you receive from Sunnda will be consistently produced to the highest quality which meet or exceed OEM specifications.

You will receive the best performing products available from us. Whether you are running Emsco, National, Bomco, Ideco, Gardner-Denver, or Oilwell pump in your rig fleet, we can supply all the parts needed to keep these pumps running daily at the highest performance.



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LINERS

Sunnda manufactures high chrome alloy sleeved liners, hardened liners, chrome plated liners and ceramic zirconia liners. We also supply authentic U.S. made rubber and urethane liner seals. All our liner products are exchangeable with OEM products and meet or exceed API-7K standards. Our liners are available in sizes ranging from 4 to 7-1/2 inches.

High Chrome Sleeve Liners

Sunnda's chrome-iron liners are the most popular type of liners used by in the drilling fields. These cost-effective chrome-iron liners offer outstanding durability. The hybrid design of these liners combine the toughness of a high strength forged- steel outer hull with the hardness and corrosion resistance of a centrifugally cast, high-chrome-iron inner sleeve.

The outer hull or shell, is manufactured from high strength carbon or alloy steel and heat-treated to provide optimum mechanical properties. CNC machined to provide exacting tolerances to keep liner concentric of the inner bore in relationship with the outer guide diameters on the hull. This reduces the possibility of misalignment on installation and provides the end user with longer liner and piston life.

The inner sleeve is made from a special, high-chrome-iron material that provides a consistent hardness in the range of 62-69 Rockwell. This means that the sleeve has excellent abrasion, erosion and corrosion resistance. The sleeve is through hardened during heat treat to provide high material hardness at all depths throughout the material. Our rigid quality-control standards ensure that these features are consistent on each liner manufactured at our facilities. The sleeve is manufactured to the bore tolerances specified by API or better to provide longer life by reducing gaps between the liner bore and piston.

Features & Advantages

- Rated for all drilling operations up to 5,000 PSI and above.
- Consistent bore hardness in the range of 62 to 69 RC (Rockwell C Hardness)
- Extremely long service life.
- High Strength & Tough forged steel outer hull.
- High Chrome alloy inner sleeve honed to tight tolerances and mirror finish to promote maximum piston life.
- Rigid Quality Control Standards to provide peace of mind during operation.

Ceramic Zirconia Liners

Sunnda's Zirconia-ceramic liner is our premium and better performer product. It offers unique durability and promotes the longest piston life in extreme drilling conditions. Effectively resistant to heat, pressure, and corrosion, it is the ultimate in liner technology available today.

Although initial costs are higher than traditional chrome-iron liners, the durability of the liner and the longer run times it promotes on pistons, equates into lower overall costs.

Sunnda's Zirconia-ceramic liner is produced from a unique Zirconium-based ceramic compound that is extremely pure. This proprietary fine-grain structure Zirconium-based matrix is free of the impurities that affect lesser products. No other ceramic-liner material has better fraction toughness, which enables us to offer a ceramic liner that is hard and long lasting, tough, crack resistant, and not susceptible to thermal shock.

Zirconia has three important property advantages over alumina ceramic liners.

1. Zirconia shows better impact strength.
2. Zirconia is harder and less brittle than alumina.
3. Zirconia can be honed to finer surface finishes than alumina. Finished to 4 RMS, the zirconia liners provide a surface finish that is three to four times finer than alumina.

Features & Advantages

- Directly extends the service life of the sleeve
- Reduces significantly the costs of replacing broken liners in the field
- Less friction with the elastomer-and-metal pump pistons translates into reduced liner and piston wear
- Increased impact characteristics.
- Lower thermal load on the liner wash system.
- Higher thermal ratings.
- Improved performance for high temperature applications.
- Zirconia offers the lowest overall cost of ownership of any liner style

PISTONS

Sunnda offers a full range of mud pump pistons for triplex and duplex pumps:

- Bonded urethane pistons.
- High temperature urethane bonded pistons
- Bonded rubber pistons.
- Replaceable rubber pistons.

Bonded Urethane Pistons

Sunnda's bonded-urethane pistons are manufactured from a proven urethane compound that delivers excellent resistance to tear, abrasion and extrusion while maintaining high mechanical properties.

The bonded design provides this piston with the strength to handle drilling pressures to 7,500 psi (51.7 MPa) and resists damage and fatigue during thousands of operating cycles.

The core of Sunnda's piston is the proprietary polyurethane compound, which is stronger and more chemically resistant that others in this field.

Our standard bonded- polyurethane piston is suitable for operation up to Maximum operating temperature is 180 °F. These standard pistons can be operated at pressures up to 7,500 psi (51.7 MPa).

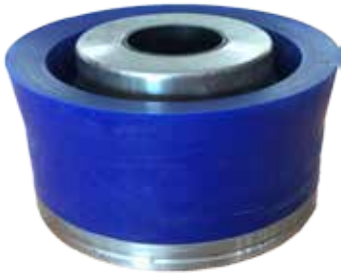
Features & Advantages

- These pistons are the best choice for oil-based and synthetic drilling fluids.
- These pistons are bonded to the hub for optimal strength and extrusion resistance.
- These pistons come complete with a hub O-ring and sleeve.
- Sunnda's urethane bonded pistons are bonded in the U.S. with authentic U.S. made urethane compounds

High Temperature Urethane Bonded Pistons

Sunnda's high temperature urethane bonded mud pump pistons improve drilling contractor economics through advances in technology, improved process control and increased drilling penetration rates. This advanced proprietary chemical formula provides increased resistance to water, oil and synthetic drilling fluids, while providing increased temperature, abrasion and particle embedment resistance.

The advanced polymer compound provides strength to withstand chemical attack from additives used in today's oil, synthetic and water based drilling fluids. The compound also has improves abrasion resistance from drilling solids suspended in drilling muds and excels in high temperature performance capable of operating in fluid temperature up to 300°F.
Our improved process control, allow us to monitor the piston body by engraving the manufacturers dates on each product. CNC machining of steel piston heads yields close tolerances for improved performance.



Features & Advantages

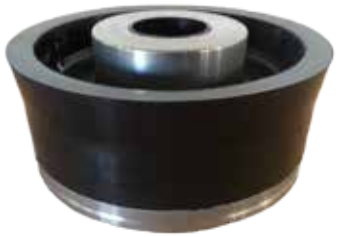
- Ideal for elevated mud temperatures
- Designed for high pressure drilling in synthetic drilling fluid
- Combined with Ceramic and Zirconia Liners for long life and economics
- Specially formulated for high working temperature
- Increased resistance to water, oil, and aggressive synthetic drilling fluids
- Sunnda's urethane bonded pistons are bonded in the U.S. with authentic U.S. made urethane compounds

Bonded Rubber Pistons

Sunnda brings the benefits of our bonded-piston design with a nitrile-based elastomer compound for water-based drilling fluids. While urethane pistons can be used in water-based muds, they perform best in oil-based and synthetic fluids. The best option for water-based drilling fluids is the nitrile-rubber compound.

Bonding the rubber to the metal hub provides the strongest, most extrusion-resistant style of piston available and also minimizes any leak paths from forming on the inner diameter of the piston. The bonded-lip design has an open inner sealing lip that also enables the rubber to expand inward as a result of thermal expansion without excess loading of the sealing lip.

With proper cooling and lubrication from the liner-wash system, the bonded-nitrile piston can be used successfully at temperatures up to 250°F (121°C).



Features & Advantages

- This piston is the best choice for all types of water-based drilling fluids.
- The piston is bonded to the hub for optimal strength and extrusion resistance.
- The open inner lip allows for thermal expansion without overloading the seal lip.
- The piston comes complete with hub O-ring and sleeve
- • High tensile strength.
- • Rated for all drilling operations.
- • Maximum operating temperature is 250°F.
- • Extended service life.

Replaceable Rubber Pistons

Sunnda's replaceable rubber piston is made with nitrile rubber to resist extrusion and abrasion. The two piece design allows for rubber replacement at lower operating pressures, while the robust construction makes it suitable for running at pressures up to 7500 PSI. In a very wide range of drilling conditions, the replaceable rubber piston can run in fluids from clear water up to heavy weight drilling mud.

These pistons are fully interchangeable with most other manufactures products. Available sizes range from 3″ through 7-1/2".

Features & Advantages

- High tensile strength.
- Rated for all drilling operations.
- Maximum operating temperature is 250°F.
- Extended service life.
- Perform well in versatile environment.
- Sunnda's replaceable rubber pistons are assembled with a premium quality U.S. made rubber kit

Replaceable Rubber Kit:

Plate, rubber insert & lock

All our piston hubs are available in size of 4" to 7" for most duplex and triplex mud pumps, for larger sizes please allow two to three weeks. All our pistons are CNC machined.

VALVES and SEATS

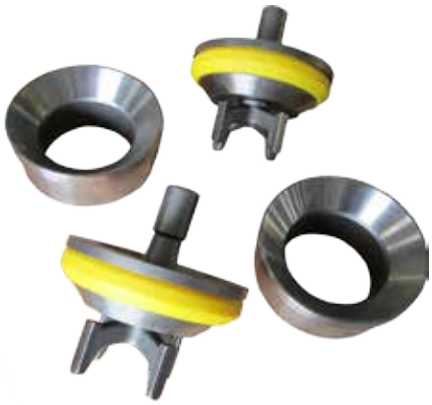
Sunnda's valves and seats are made of forged alloy steel with deep carburized wear surface, precision machined to API standards. The valves and seats we offer have two major categories, full open valves and seats, 3 web / 4 web valves and seats.

Full Open Valves and Seats

Sunnda's full-open valve is the top performing valve available for the extreme conditions seen in today's drilling environment. The single-piece, solid-body construction of this valve provides the strength and rigidity needed for high-pressure drilling operations in the 5,000- to 7,500-psi range. Both the valve and the seat are manufactured from heat- treated, forged-alloy steel.

The fully open seat design enables removal of suction- valve seats without first removing the discharge valve seats for easy access on valve-over-valve-style fluid ends. This process can result in significant time and labor savings when only a suction-valve seat requires replacement. The seat does not have the three or four internal support webs that are common on other valve styles, and the result is a uniform distribution of pressure across the entire diameter of the fluid-cylinder valve taper, which reduces the chance of seat washout and prolongs the life of the module.

The slip on or snap-on, urethane insert on the standard valve is field replaceable. For the most demanding high-pressure conditions, a non- replaceable bonded insert upgrade is available that resists extrusion and minimizes any chance for lost-circulation material or other debris to breach the seal cavity. All standard inserts are available in urethane and are good for 170° to180°F drilling temperatures. We have available a special, high-temperature compound for drilling-mud temperatures to 200°F and higher.



Features & Advantages

- The forged, solid valve-body construction, of this valve, with thick, rigid seat, provides durability at high pressures.
- The streamlined valve guide wings reduce turbulent flow through the valve for improved performance.
- The seat design simplifies maintenance and evenly distributes pressure loads around the fluid-cylinder valve taper.
- Various insert styles and materials are available to suit any drilling condition.
- Carbon-steel valve springs are standard. A long-life, stainless-steel upgrade is available.
- Large metal-bearing area on the valve seat seal surface promotes longer service life.

3 & 4 Web Valves and Seats

Three Web

The center- guided design of the three web enables the valve flange to be supported under pressure loads by the top of the center support webs in addition to the seating taper on the inside of the valve seat. This process allows for a large bearing area for the valve that minimizes stress and promotes a long service life.

The single-piece, solid-body construction of these valves 3 web design, provides the strength and rigidity needed for high-pressure drilling operations. Both the valve and seat are manufactured from heat- treated, forged-alloy steel.

The unique design of the insert helps seal fluid above the valve, even when the pump is not in operation and pressure is not available to energize the seal. This design helps to maintain prime and ensures that a good supply of mud is available to the piston—even on the first stroke of operation after extended shutdown periods. Special lips in the insert groove of the valve body lock the lip in place, eliminate washout potential, and minimize any chance for loss-circulation or other foreign materials to breach the seal cavity.

The snap-on, urethane insert can be replaced in the field. The valve is offered standard with a urethane insert suitable for mud service between 170° and 180°F
A high-temperature urethane insert is available as an option for mud temperatures to 200°F and higher.

Features & Benefits

- The forged, solid-body construction provides durability at high pressures.
- The large bearing area on the valve seat webs promotes a long service life.
- Various insert styles and materials are available to suit any drilling condition.
- Carbon-steel valve springs are standard. A long-life, stainless-steel upgrade is available.
- The valve is best suited for low- to medium-pressure drilling operations because of the two-piece assembly of the valve body

Four Web

The key feature of the four-web, center-guided valve is the preloaded urethane insert secured with a threaded retainer plate with knock-off lugs for easy disassembly. This design enables drillers to change valve inserts quickly and minimizes downtime. The valve is best suited for low- to medium-pressure drilling operations because of the two-piece assembly of the valve body.

The center-guided design enables the valve flange to be supported under pressure loads by the top of the center-support webs in addition to the seating taper on the inside of the valve seat. This allows for a large bearing area for the valve that minimizes stress and promotes a long service life.

Our standard valve is offered with urethane inserts rated for 170° to 180°F drilling-mud temperatures. We also offer a special high-temperature urethane compound as an option for high-temperature drilling conditions to 200°F and higher.

Features & Benefits

- The threaded retainer plate with knock -off lugs enables fast insert change-out
- The large bearing area on the valve promotes a long service life.
- Various insert materials are available to meet standard and high- temperature drilling conditions.

Carbon-steel valve springs are standard, with a long-life, stainless-steel upgrade available.

FLUID END MODULES

Sunnda's modules are made of premium 4135 alloy steel with strict forging and heat treatment for longer life. Every module is precisely made and has gone through rigid inspections with design pressure up to 7,500 psi. They are CNC machined and packaged for delivery with anticorrosion protection.

Sunnda's offers full lines of cylinder heads, valve lock covers, cylinder head threaded rings, cylinder head plugs, valve cover plugs, upper valve guides, lower valve guides, liner threaded rings, liner locks and wear plates, just to name a few.

Our modules and accessories are fully interchangeable with standard OEM modules from most major pump manufacturers and meet or exceed API-7K standards

PISTON RODS, EXTENSION RODS and CLAMPS

Sunnda's piston rods and extension rods (pony rods) are made with premium-grade, heat-treated alloy steel. The rods are treated to offer excellent resistance to fatigure, abrasion, corrosion and heavy loads. Our piston rods are fabricated using numerically controlled machining and polished to mirror-like finishes to ensure a perfect seal for protection of the mud pump gear end.

The rod clamps are machined to ensure perfect fit and tight grip of piston rods and extension rods.

FLUID END ACCESSORIES

Sunnda's fluid end accessories are available for most of the popular triplex mud pumps. CNC machining renders these accessories uniformly dimensional and interchangeable with OEM. Those accessories include valve and cylinder head plug, valve and cylinder head thread ring, valve and cylinder head lock, valve guide, stud and nut, etc.

Valve and Cylinder-Head Lock

Valve and Cylinder-Head Ring

Wear Plate

Valve and Cylinder-Head Plugs

Pulsation Dampeners

Sunnda offers a wide range of spherical pulsation dampeners for drilling operations. They are available from 1 gallon to 20 gallon capacities and in pressure ranges from 250 psi to 7500 psi. The body of our spherical pulsation dampeners is manufactured from a one piece steel forging, thereby eliminating the possibility of weld fatigue failure. The one piece spherical design allows for high efficiency in a small volume and does not require addition structural support.

TRIPLEX MUD PUMPS

Triplex mud pumps - SDF-500, SD F-800, SDF-1000, SDF-1300, SDF-1600, and SDF-2200, SDP-1000, SDP-550, and SD-EW-446.

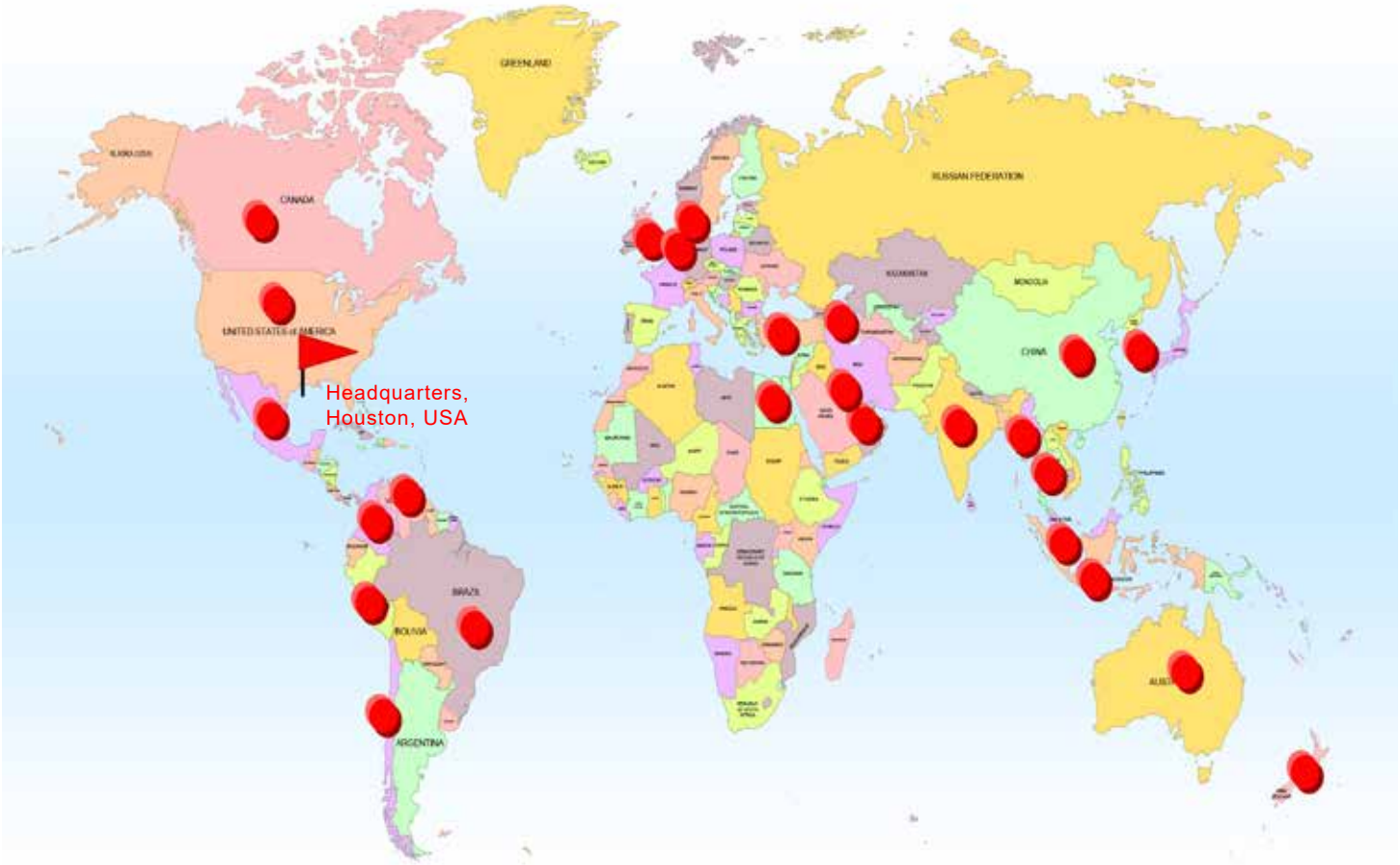
SDF-1600

SDF-2200

SDF-1000

SD-EW-446

Sunnda Customer Locations



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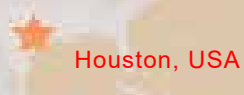

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