COASTAL RELIABILITY SOLUTIONS

Industrial & Municipal
Pumps & Sealing Solutions

RELIABILITY REALIZED

COASTAL RELIABILITY SOLUTIONS LLC

PROUDLY REPRESENTING

INDUSTRIAL & MUNICIPAL PUMPS - MECHANICAL SEALS - MECHANICAL PACKING
NON-METALLIC TANKS - HEAT EXCHANGERS - COMPRESSORS

ANSIMAG
grindex
Aca Aormann
Lutz Jesco
Pentair Industrial Pumps
Blackmer
Honeywell Sundyne
VERSAMATIC
PENTAIR FAIRBANKS NIJHUIS
VERTIFLO PUMP COMPANY
Landustrie Water Treatment Solutions
PENTAIR AURORA
Myers
flexaseal
MOUVEX
PPI
Layne PUMPS, INC.
ABAQUE PERISTALTIC HOSE PUMP
MARIC FLOW CONTROL AUSTRALIA PTY LTD
SUMMIT PUMP, Inc
TESLA DISK PUMPS™
Palmetto Inc.
ALLEN INDUSTRIES
HMD KONTRO Sealless Pumps
Pentair Industrial Pumps
PITBULL INDUSTRIAL PUMPS
HEXONIC HEAT EXCHANGERS

Emergency 24 Hr. Service

Technical Support ▪ Design ▪ Installation ▪ Fabrication ▪ Repair

Visit our Website: www.coastalreliability.com E-Mail: sales@coastalreliability.com

About Us:

Coastal Reliability Solutions, LLC is Florida and the Caribbean's premier distributor of industrial and municipal pumps, mechanical seals, mechanical packing, non-metallic tanks, heat exchangers and compressors.

We only represent those manufacturers who are committed to researching, engineering and developing innovative products that move, control and protect the flow of materials in critical applications and industries; including power generation, chemical processing, mining, pulp and paper, oil and gas, pharmaceutical, manufacturing, food and beverage, municipal water and wastewater and general and other industries.

But first, we represent you. Our focus is on the people we support – understanding your unique challenges, advocating on your behalf and providing you will nothing less than expert service. There is no "one size fits all" in this industry and that is why we offer a wide range of products to support each customer no matter the challenges they face.

Contents:

Services:

- Stocking distributor for many of our product lines with dedicated inventory and customized stocking programs for our customers.
- Full pump repair.
- Custom pump skids and fabrication.
- Control and VFD panels.
- Electric motor testing and repair.
- Mechanical seal repair (including competitive brand seals).
- Custom engineered seals.
- Machining capabilities.
- Technical support.
- Pump and system design.
- Onsite service and support.
- Onsite pump flow testing.
- Installation guidance.
- Start-up assistance.
- Failure analysis.
- Increase reliability and MTBR.
- Reliability tracking.
- Pump and seal maintenance and repair training (onsite or in-house).
- **24/7 Emergency Support** .....

CENTRIFUGAL PUMPS

ANSIMAG:

ANSIMAG is the number one manufacturer of sealless magnetic drive Teflon lined pumps in the world and are specifically designed for those who demand reliable and safe pumps.

All wetted parts are molded ETFE components that can safely handle a wide range of corrosives and solvents up to 250°F (121°C) without corrosion. A patented, fully encapsulated magnetic drive hermetically seals the inner magnets to isolate them from process fluid and maintain magnet integrity for the life of the pump. A Kevlar-fiber reinforced vinyl ester shell delivers unprecedented reliability.

ANSIMAG sealless magnetic drive pumps are more energy-efficient than mechanically sealed pumps. An innovative rear casing generates no eddy currents thus eliminating heat generation and reducing energy costs. Because ANSIMAG pumps do not have seals – there are no leaks, no emissions and no costs related to seal maintenance or support systems.

ANSIMAG pumps provide affordable replacement options for ASME/ANSI B73.3 and ISO 2858 sized pumps, because the line covers a wide range of sizes and standard external dimensions to facilitate sealless or sealed pump replacement without changing piping or baseplates.

AURORA:

For over 95 years Aurora is a leading supplier of pumps and pump systems used in a variety of markets and applications throughout the world. Their pumps are known for consistent, quality manufacturing and performance that outlasts competitors. Aurora draws on a century of experience to provide you with the pumping solutions you need. Aurora's commitment to excellence goes beyond the product line, with quick ship and fast delivery programs with constant investments in innovation.

Aurora offers an extensive line of pumps including ANSI centrifugal, split case, regenerative turbine, inline, multi-stage, vertical turbine, end suction, solids handling, skid systems and more.

BLACKMER / SYSTEM ONE PUMP:

The System One centrifugal pump is designed specifically to operate and maintain reliability even in the most severe process industries. This pump has many upgrades over the conventional ANSI centrifugal pumps including oversized bearings, solid shaft with minimal overhang, micrometer adjustment nuts, positive locking thrust bearing retainer, full support rear leg, centerline casing support, and offers the lowest shaft stiffness ratio (L3/D4) in the process industry and sets the standard for high-quality and durability. The System One was designed around the mechanical seal and bearings to provide maximum system reliability and a stronger, more vibration-resistant pump.

Also, you can bring the strength and reliability of the System One to your existing ANSI centrifugal pumps with powerend conversions.

FAIRBANKS NIJHUIS:

Fairbanks Nijhuis offers the industry's most complete set of solutions, products and services to municipal and industrial customers. A wide variety of pumps and controls serve multiple markets to support a range of needs. Manufacturing operates primarily out of Kansas City, KS, USA and Winterswijk, The Netherlands. The combination of our two world-class engineering and manufacturing groups, with over 200 years of combined expertise, is a win for our customers around the globe.

GRINDEX:

Grindex's first submersible pumps hit and took the market by storm in 1960 starting an era of supplying reliable dewatering pumps to some of the most demanding application in construction, mining, tunneling and heavy industry. Today, Grindex leads the world in its field. They take pride in making high-quality pumps for the toughest environments, their pumps are designed for continuous, unattended operations, and with an appealing life-cycle cost.

Grindex offers 5 classes of pumps so you can choose the right pump for your application, Drainage, Sludge, Stainless Steel (Inox), Slurry (Bravo) and Primo, and accessories for enhanced abilities and flexibility.

HMD KONTRO:

In 1947, HMD shattered new ground in pump and fluid handling technology by developing the very first sealless magnetic drive pump. In 1994, Sundyne combined HMD with the American company Kontro to create HMD Kontro. With more than 70 years of experience, HMD Kontro continues to be an industry leader and stands as one of the most reliable pump manufacturers operating today.

The Sundyne HMD Kontro sealless pump is ideally suited for applications where the fluid being pumped is hazardous, aggressive or a valuable product as the sealless design offers total containment. Also, the lifetime cost of a magnetic drive pump is significantly lower than a traditional sealed pump. No seals mean low maintenance and significantly reduced operating costs. There are no seals to replace and no seal support system to specify, install or maintain, and all this means less downtime and less clean-up for further savings.

NOARDLING LANDUSTRIE:

The foundations were laid around 1913, when the company was active in the agricultural sector and the evolving phases of polder drainage. As early as 1916, electrically driven pumping stations were installed with Archimedes screw pumps alongside countless wind driven pumping stations. The philosophy behind the design of their products has always been quality, keep it simple, long life and less maintenance, thus reducing lifetime costs and being better for the environment; more robust, stronger, dedicated to the job and tailored to your demands. Over the past 100+ years, Landustire's product line has grown to be your comprehensive manufacturer for wastewater solutions.

MID-AMERICA PUMP & SUPPLY, INC:

Established in 1986 Mid-America has become the premier manufacture and distributor specializing in Vertical Turbine Pumps. With decades of experience Mid-America has the capabilities to manufacture pumps that have been obsoleted by other manufacturers. They can design and build bowl assemblies, shafting, couplings and column piping with there state of the art manufacturing capabilities. They also have access to some of the worlds largest pump manufactures heads so we now have the capabilities within the state of Florida to keep and control costing. This is an exciting partnership between two family businesses dedicated to serving and advocating for our clients new and old.

MYERS:

Founded in 1870 in Ashland, OH by Francis and Philip Myers (brothers), it is one of the oldest pump manufacturers still operating today (celebrating 150 years in 2020). From their modest beginning of engineering and manufacturing the first double-acting hand pump, the line grew and evolved to meet new challenges and industries. By the early 1900's, Myers became the largest pump manufacturer in the United States. In 1986, Myers become part of Pentair vaulting the company to a position of leadership of wastewater, solids handling and submersible pumps in the world, all while never forgetting where the company originated and their devotion to excellence. With over 1-1/2 centuries of experience, you can depend on Myers to provide high quality pumps that, just like the brand, will stand the test of time.

SUMMIT PUMP:

Manufactured in Green Bay, WI, Summit offers quality centrifugal and positive displacement pumps and parts, and an alternative for your pump and solution needs. Summit's company mission statement, "provide quality pumping products in a timely manner, at a fair market price" is more than just a slogan or plaque on the wall, it is their promise and dedication to their customers and the pump market. Summit also manufacturers quality pump parts that are completely interchangeable with other major OEMs, such as Goulds®, Durco®, Gorman-Rupp®, Peerless®, Worthington, Moyno® and several more. With more than 12 million dollars in inventory, Summit is ready to ship pumps and parts for customers' needs at a moment's notice.

SUNDYNE / SUNFLO / MARELLI:

Sundyne's heritage of innovation and integrity makes it a global leader in providing process industry solutions and one of the few companies that designs and manufacturers both pumps and compressors. With more than one million potential configurations and offerings, Sundyne can custom-engineer and test to exactly meet each design requirement, even for the most demanding of applications. Sundyne has assembled industry-leading brands that provide customers with a wide range of fluid and gas handling services and solutions. Brands like Ansimag, HMD Kontro, Marelli, PPI and Sunflo have broadened the original Sundyne portfolio for a wider range of markets and to meet most standards, including ANSI, ISO and API, and offers for non-standard solutions for a range of general industrial applications.

TESLA DISK PUMPS:

Tesla Disk Pumps are designed for the most abrasive and erosive particulate, slurry and sludge applications while being highly resistant to wear, and can also gently handle the most fragile of crystals, sensitive chemicals and polymer emulsions. Tesla Disk Pumps are specifically engineered and designed to meet your challenging process requirements, with a unique design, they can move pipe-size solids without clogging or plugging. Tesla Disk Pumps use the latest improved designs of disk pump technology and follows the boundary layer and viscous drag phenomena to transfer the energy from the motor to the fluid. The Tesla Disk Pump also boast a low shaft stiffness ratio (L3/D4) aided in pump and mechanical seal reliability.

VERTIFLO:

For over 40 years, Vertiflo has been committed to manufacturing high quality vertical process, sump, end-suction and self-priming pumps in a multitude of materials to meet a wide range of demanding applications. Vertiflo, based in Cincinnati, OH, is recognized as a quality manufacturer of dependable pumps with a superior lead time, usually half the typical time frame of a competitive pump. With tens of thousands in operation worldwide, Vertiflo continuous to grow and encompass an ever-widening range of applications in the pump industry.

POSITIVE DISPLACEMENT PUMPS

ABAQUE PUMP:

Abaque Pump develops and manufactures sealless hose pumps to simplify and increase efficiency through innovative solutions. Abaque Pump has a long history of providing excellent pumping systems for their client's needs. The driving force behind the company is to provide better pump solutions and, with a range of pumps available in a wide variety of versions, they are able to fit every demand. All of Abaque's pumps are developed and manufactured in their own facilities and have the engineering and production capabilities to provide tailored solutions. Since only the inside of the hose and hose inserts are in contact with the fluid, aggressive and contaminated fluids can be pumped without the damage experienced by other pumping technologies. Abaque Pump has combined the best available materials with smarter design solutions in order to maximize run time and minimize maintenance.

BLACKMER:

In 1899, R. M. Blackmer came up with the vane-type pump design that was an important departure for the old gear-type principle. This positive displacement pump revolutionized the pumping industry with their unique sliding vane technology. This revolutionary rotary sliding vane design allows the pumps to self-adjust for wear to help maintain flow rates and creates excellent self-priming and dry-run capabilities, while also providing sustained performance and trouble-free operation. For well over a century, the Blackmer reputation for unparalleled product performance, superior service and support, innovation and a commitment has been a driving force in their organization. Today, Blackmer, part of Dover and PSG, is still the leader in sliding vane technology and father to hundreds of different pump models.

Blackmer:

Blackmer, a product of PSG, a Dover company, is a global provider of innovative, high-quality industrial gear pumps for the safe and efficient transfer of high-value and hard-to-seal fluids. Blackmer's mission is to engineer the world's safest and most reliable internal gear pumps by understanding their customers' needs. Blackmer is passionate about customer service, offering responsiveness, speed of delivery and application support unmatched by any other company in the industry.
Blackmer offers 3 series of pumps, the G-Series, a durable, flexible and efficient gear pump, the E-Series, a revolutionary, patented between-the-bearing design, mag-drive gear pump, and the V-Series, an innovative, drop-in asphalt pump with an established list of industry firsts.

LUTZ - JESCO:

Lutz-Jesco provides of the most expansive offerings for digitally and mechanically controlled chemical injection metering pumps, dosing equipment, drum pumps and accessories. By consistently meeting the highest of standards relative to the quality of equipment, customer service, delivery and flexibility, Lutz-Jesco has achieved an outstanding position within the chemical feed and metering pump technology industry. With turn-down ratios of 1000:1 and accuracies of +/- 1%, you can count of Lutz-Jesco's quality and reliability for your next project.

MOUVEX:

In 1906, Mouvex's founder Andre Petit identified the challenges that gear and lobe pump users were facing in optimizing their process and invented the eccentric disc pump as a result. Eccentric disc pumps consist of a cylinder and pumping element mounted on an eccentric shaft. As the eccentric shaft is rotated, the pumping element forms chambers within the cylinder, which increase in size at the intake port, drawing fluid into the pumping chamber. The fluid is transported to the discharge port where the pumping chamber size is decreased and squeezes the fluid out into the discharge piping. For over a century, Mouvex has provided premium performance and ultimate containment and safety earning a reputation as the ideal pumping solution for a multitude of applications worldwide.

MYERS / APLEX:

Myers, founded in 1870, and Aplex, from 1960, were brought together under Pentair to offer a broad array of high-pressure piston and plunger reciprocating pumps that are recognized worldwide for quality, service and innovation. A wide range of optional configurations are used on each application to tailor fit each customer's needs and to furnish a pump for long term, dependable performance for years. Each pump is also available with a variety of options including integral hydraulic drives, base mountings and a wide selection of auxiliary equipment to address each unique installation.
Myers/Aplex builds the most reliable reciprocating pumps in the world and is positioned to encourage customers to entrust and challenge them with any special-purpose or industrial pump application.

PITBULL:

Pitbull Industrial Pumps is an innovative, simple solution to many industry's difficult pumping applications. The Pitbull pump is an air-operated, positive displacement pumps consisting simply of a hollow chamber and two check valves. Liquid is drawn into the chamber then compressed air discharges the liquid to complete the cycle. This innovative, reliable and rugged design easily moves debris through wide diameter passages without clogging. Where other pumps would fail, this design excels in corrosive or explosion-proof environments and handles large and stringy solids, abrasive particles and corrosive materials.

SUMMIT PUMP:

Manufactured in Green Bay, WI, Summit offers quality positive displacement progressive cavity pumps and parts, and an alternative for your pump and solution needs. Summit's company mission statement, "provide quality pumping products in a timely manner, at a fair market price" is more than just a slogan or plaque on the wall, it is their promise and dedication to their customers and the pump market.
Summit also manufacturers quality pump parts that are completely interchangeable with other major OEMs, such as Moyno®, Tarby® and several more. With more than 12 million dollars in inventory, Summit is ready to ship pumps and parts for customers' needs at a moment's notice.

VERSAMATIC:

Since 1983, Versamatic has set the standard of performance for air-operated double-diaphragm (AODD) pumps. Versamatic AODD pumps are the first choice for customers who value reliability, quick delivery and convenience. In addition to having a world-class product offering, the Versamatic brand is supported by superior customer service, application engineering and after-sales support teams, including Coastal Reliability. We have been a representative and stocking distributor of Versamatic for over 10 years, also offering custom stocking and support programs for our customers. When you purchase a Versamatic pump, you're getting so much more than just an AODD pump, you're getting the support from a team of experts throughout the process, from selecting the pump to purchasing to providing post-sales support.

FLEXASEAL:

For over 40 years Flexaseal has grown to be an industry leader at the forefront of sealing solutions and technical advancements, including the development of the world's first patented two-piece split cartridge mechanical seal. Flexaseal products are designed, engineered and manufactured in the USA. Their facilities contain state of the art bellows welding capabilities, CNC machining centers, quality control and extensive inventory systems. Flexaseal offers a complete line mechanical seals including OEM replacement seals, support systems and repairing competitors seals.

PALMETTO PACKINGS:

Since 1889, Palmetto Packings has been a leading, American, manufacturer of high-quality mechanical packing. Mechanical packing is the oldest method of keeping fluid escaping past a shaft and Palmetto has been an innovator and engineered solutions provider for the technology for over a century. Palmetto is committed to bringing the most effective packings on the market to their customers and will continue investing in new solutions to meet your most critical sealing requirements.

FLOW CONTROL

MARIC FLOW CONTROL:

Maric Flow Control manufacturers fixed flow control orifices that maintain a pre-set, constant flow rate regardless of pressure even while the upstream and downstream pressures are changing. Established in 1963, Maric flow controls are engineering and manufactured in Adelaide, Australia and offer valuable protection for flow rate sensitive equipment, processes or distribution systems. The technology is based on a precision molded rubber control ring in the body, with an orifice diameter that varies in response to the pressure differential applied to it, the greater the pressure, the smaller the orifice, and vice versa, therefore maintaining a constant, pre-set flow.

STORAGE TANKS

ALLEN INDUSTRIES:

Allen Industries is continuously setting the standard for FRP tank manufacturing. Whether your tank is for holding cooling water or industrial chemicals, you can rest assured that Allen Industries will manufacturer your tank precisely to specification. Allen Ind. offers tanks in vertical, horizontal and rectangular form with flat, dome, cone or sloped tops and/or bottoms. The capacities of FRP tanks surpasses polyethylene if you need a larger non-metallic tank or storing a material that isn't a good fit in a poly tank. Allen Ind. offers tanks that range from 25 gallons to well over 40,000 gallons.

ASSMANN CORPORATION:

Assmann Corporation is a renowned manufacture of polyethylene storage tanks that are engineered and processed for even the most challenging applications. From the beginning, selecting the best virgin resins, with no re-grind, for each application coupled with Assmann's equipment, tooling, extensive processing experience and commitment, the quality of construction provides a superior storage tank than any other competitor. At Assmann, they are continuously finding ways to increase efficiency in the process but will never abandon their successful methods for any cost-cutting measure that would compromise the quality and integrity of the polyethylene tanks for which they have become known for. Even experienced tank users receiving an Assmann tank for the first time will remark favorably on how it compares to units they've used in the past or currently have in their systems. Assmann takes pride in their workmanship and being an American manufacturer and extends a welcome to all to visit the plants.

COMPRESSORS

BLACKMER:

For well over a century, the Blackmer reputation for unparalleled product performance, superior service and support, innovation and a commitment has been a driving force in their organization. As one of the few companies that designs and manufacturers both pumps and compressors, Blackmer is your complete solution for liquid and gas handling. Manufacturing single and two stage reciprocating gas compressors equipped with high efficiency valves, ductile iron pistons, self-adjusting piston rod seals and other robust features, they are designed to provide maximum performance and reliability under the most severe service conditions.

Blackmer's gas compressors are available in three model series, LB, HD and NG. The LB Series is ideal for the transfer and recovery of gases including propane, butane, LPG and anhydrous ammonia. The HD Series reciprocating gas compressors are suited for the movement, transfer and recovery of liquefied gases such as carbon dioxide and refrigerants, nitrogen, air, and numerous other industrial, petrochemical, and hazardous gases. The NG series is built for usage with natural gases.

PPI (SUNDYNE):

PPI (Sundyne) diaphragm compressors deliver total assurance of non-contaminating gas compression and handling ultra-pure, corrosive and volatile gases. Boasting a leak tight mechanism that features static seals which do not need to be purged or vented, these compressors present absolutely no leakage threat to the atmosphere, providing an ideal solution for safely handling ultra-pure, corrosive and volatile gases. Additionally, PPI diaphragm compressors are designed to isolate the process media from the piston or piston rings with a set of metallic diaphragms, completely eliminating the risk of cross contamination. Built to meet stringent API 618 standards for reciprocating compressors, these machines are available in a variety of flexible configurations and sizes, making them easily customizable to meet the ideal pressure ratio for your application.

SUNDYNE:

In 1965, Sundyne designed and built the first integrally geared vertical compressor for Union Carbide. The space saving design was based on the very successful Sundyne LMV integrally geared pump technology. Since then, more than 55 years of experience and innovation has come from thousands of deployments in oil and gas upstream, midstream and downstream plants in some of the world's most demanding environments.

Today, the Sundyne compressor line features single- and multi-stage centrifugal designs for API 617 and fit-for-purpose applications including fuel gas boost in power generation. Each model is custom built to provide pulsation- and vibration-free operation, and to deliver oil-free process gas with zero emissions. Each unit is engineered in accordance with industry standards and is designed to run continuously for 5 to 7 years without the need for costly maintenance or over-hauls. Sundyne gas compressors provide the performance envelope, the feature set, the reliability ratings and the uncompromising efficiency needed to address the Best Efficiency Point (BEP) for any application.

SUNFLO (SUNDYNE):

From the manufacturers who brought the most versatile industrial grade pump for high pressure water applications, the Sunflo Pump, also offers the Sunflo Blower. These blowers are perfectly designed for jet aircraft engine cooling, industrial manufacturing, municipalities or other applications where compact and lightweight designs are needed. These exceptionally reliable blowers feature many aspects such as pulsation free operation, oil free air delivery and generous clearances to eliminate performance deterioration caused by wear and the need for mechanical adjustment.

HEAT EXCHANGERS

HEXONIC:

Hexonic, founded in 1988, is a leading manufacturer of heat exchangers renowned worldwide for their products and quality for over 30 years. Cutting-edge technology and in-house manufacturing has been ensuring that Hexonic is providing their customers the best quality of heat exchangers. Hexonic is focused on innovation and development which is evident by the numerous awards and patents and best quality standards are proven by their certificates and approvals. Apart from standard products, like shell & tube, brazed plate and gasketed heat exchangers, Hexonic also provides tailored heat transfer solutions for petrochemical, heat, power, food, pharmaceutical and other industries, and they are eager to undertake your complex and technologically demanding projects.

COASTAL RELIABILITY SOLUTIONS IS HERE TO HELP !!!

Coastal Reliability is known for assisting engineering, maintenance and operations alike to help troubleshoot existing equipment and/or system issues and consult on new projects with product selections and sizing. We also work closely with the manufacturers we represent to ensure proper equipment selections are always made and to provide the best solutions for success no matter the challenge. Offering premier equipment and an expanding network of inside and outside associates, who receive continuous product training, you can depend on Coastal Reliability to help promote productivity, maximize reliability and support you, both, before and after the sale.

Coastal Reliability works with several engineering firms as well to expand our ability to meet and support the needs of our customers.

Continuous improvement is what every company, including ourselves, strives for every day and we are honored to help our customers do so. Working with Coastal Reliability also brings continuous education, not only by working side-by-side with you but also by offering pump and seal maintenance and repair training either onsite or in-house.

From improvements or repairs on current systems to completely new projects – Coastal Reliability is here to work as a team to support you every step of the way and beyond.

RELIABILITY REALIZED THROUGH CORRECTLY APPLIED PUMP AND SEAL TECHNOLOGY !!!

COASTAL RELIABILITY SOLUTIONS LLC

205 Tower Drive
Oldsmar, Florida 34677

Phone: (813) 749-7168
Fax: (813) 749-7175

Email: sales@coastalreliability.com

VALUABLE PUMP FORMULAS

PRESSURE

Feet of Water X 0.4333	=PSI
(PSI X 2.31)/Sp. Gr.	=Feet of Water
(Ft. Head x Sp. Gr.)/2.31	=PSI
PSI x 6.9	=kPa
ATM x 14.7	=PSI
ATM x 33.9	=Feet of Water
ATM x 760	=mm Hg
kg/cm2 x 1.42	=PSI
Meters of Water x 1.42	=PSI
Bar x 14.5	=PSI
Inches of Hg x 0.491	=PSI

PIPE VELOCITY

Velocity in Feet per Second:	GPM x 0.321 / Pipe Area in Square Inches
Rule of Thumb:	Typically, keep pipe velocities around 10 ft/second for good results.
Suction Piping:	Generally, have piping in one plane from source tank and have a straight run at least 10 times the pipes diameter leading into the pump suction.
Pipe Size:	Doubling the diameter of a pipe increases its capacity 4 times.

CENTRIFUGAL PUMPS

Liquid HP: $\frac{\text{GPM x ft. of Head x Sp. Gr.}}{3960}$

Brake HP: $\frac{\text{GPM x TDH x Sp. Gr.}}{3960 \times \text{Pump Efficiency}}$

Efficiency Overall HP: $\frac{\text{BHP}}{\text{Motor Efficiency}}$

Estimated effects of viscosity on Centrifugal Pumps

SSU	FLOW	HEAD	EFFICIENCY
35	100%	100%	80%
500	95%	98%	80%
1000	92%	97%	70%

ROTARY POSITIVE DISPLACEMENT PUMPS

Liquid HP: $\frac{\text{GPM x PSI}}{1714}$

Volumetric Efficiency: $\frac{\text{Actual GPM}}{\text{Theoretical GPM}}$

Overall Pump Efficiency: $\frac{\text{LHP}}{\text{BHP}}$

Mechanical: $\frac{\text{Overall Pump Efficiency}}{\text{Volumetric Efficiency}}$

APPROXIMATE RPM @ FULL LOAD - FOR MEDIUM SIZED MOTORS

Poles	RPM (60 Hz)	Sync Speed	RPM (50 Hz)	Sync Speed
2	3500	3600	2850	3000
4	1750	1800	1450	1500
6	1150	1200	950	1000
8	850	900	700	750

Synchronous Speed (no load) Formula

$$RPM = \frac{\text{Frequency(Hz) x 120}}{\text{Number of Poles}}$$

INSULATION CLASS NEMA 1.15 SERVICE FACTOR

A	150 °C	221 ° F
B	130 °C	266° F
F	155 ° C	311 ° F
H	180 ° C	356° F

Maximum motor temperature including temperature rise plus 40° C ambient temperature

RULES OF THUMB FOR MOTORS

A motor develops 1.5 ft-lbs per HP @ 3600 RPM	A 3-phase motor draws 1.00 Amp per HP @ 557 Volts
A motor develops 3.0 ft-lbs per HP @ 1800 RPM	A 3-phase motor draws 1.25 Amp per HP @ 460 Volts
A motor develops 4.5 ft-lbs per HP@ 1200 RPM	A 3-phase motor draws 2.50 Amp per HP @ 230 Volts

$$HP = \frac{\text{Torque (ft-lbs) x RPM}}{5252}$$

$$\text{Torque (in lbs)} = \frac{\text{HP x 63,000}}{\text{RPM}}$$

PARTICLE SIZE COMPARISON

Mesh	Inch	Micron
3250	.0002	6
1600	.0005	14
750	.0010	25
325	.0016	40
250	.0024	62
200	.0029	74
180	.0033	85
150	.0041	100
120	.0046	118
100	.0055	149
80	.0070	179
50	.0117	300
40	.0150	385
30	.0200	513
24	.0280	718
20	.0340	872
18	.0390	1000
16	.0450	1154
14	.0510	1308
12	.0600	1538
10	.0750	1923
8	.0970	2488
6	.1320	3385
4	.1590	4077
2	.2030	5205

1 Micron = 10^{-6} Meters
1 Micron = 3.9×10^{-5} inch

ATMOSPHERIC PRESSURE

Altitude in Feet	Pressure in PSIA
0	14.70
100	14.64
300	14.54
500	14.43
700	14.33
1,000	14.17
1,500	13.92
2,000	13.66
3,000	13.17
4,000	12.69
5,000	12.23
7,000	11.34
10,000	10.11
15,000	8.29
20,000	6.76
25,000	5.45
30,000	4.36
40,000	2.72
50,000	1.68
60,000	1.04

VISCOSITY

CONVERSIONS:

SSU*	= Centistokes x 4.55
Degrees Engler*	= Centistokes x 0.132
Sec. Redwood 1*	= Centistokes x 4.05
1 Stoke	= 100 Centistokes
1 Poise	= 100 Centipoises
Centistokes	= Centipoise/Sp. Gr.

*Where Centistokes are greater than 50

Definitions:

Newtonian fluids are unaffected by shear, e.g. water mineral oil.

Non-Netownian fluids are affected by shear (5 types).

Bingham-Plastic fluids have an exact shear point which once exceeded, viscosity decreases.

Pseudo-Plastic fluids have no exact yield point, but instead, viscosity decreases as the magnitude of shear rate increases.

Dilatant fluids viscosity increases as the magnitude of the shear rate increases, e.g. printing ink, candy compounds.

Thixotropic fluids decrease in viscosity both in relation to the shear magnitude and the period of time subjected to shear. Viscosity might also depend on a previous shear condition, e.g. drilling mud, starches, paint.

Rheopectic fluids increase viscosity both in relation to the shear magnitude and the period of time subjected to shear, e.g. some greases.

AFFINITY LAWS FOR CENTRIFUGAL PUMPS

These formulas can be used to estimate capacity, head and BHP for a pump speed or impeller diameter when a curve is not readily available:

1. Flow is directly proportional to the ratio of impeller speed:

$$GPM_2 = \frac{GPM_1 \times RPM_2}{RPM}$$

2. Head is directly Proportional to the square of the ratio of impeller speed:

$$Head_2 = Head1 \times \left(\frac{RPM_2}{RPM_1}\right)^2$$

3. The HP is directly proportional to the ratio of impeller speed:

$$BHP_2 = BHP_1 \times \left(\frac{RPM_2}{RPM_1}\right)$$

4. Flow is directly proportional to the ratio of impeller diameter:

$$Flow_2 = Flow_1 \times \left(\frac{\text{Impeller Diameter}_2}{\text{Impeller Diameter}_1}\right)^2$$

5. Head is directly proportional to the square of the ratio of Impeller diameter:

$$Head_2 = Head_1 \times \left(\frac{\text{Impeller Diameter}_2}{\text{Impeller Diameter}_1}\right)^2$$

6. The HP is directly proportional to the cube of the ratio of impeller diameter:

$$BHP_2 = BHP_1 \times \left(\frac{\text{Impeller Diameter}_2}{\text{Impeller Diameter}_1}\right)^2$$

NOTES:

RELIABILITY REALIZED

COASTAL RELIABILITY SOLUTIONS

205 Tower Drive
Oldsmar Florida 34677

(813) 749-7168 Office
(813) 749-7175 Fax

sales@coastalreliability.com
www.coastalreliability.com