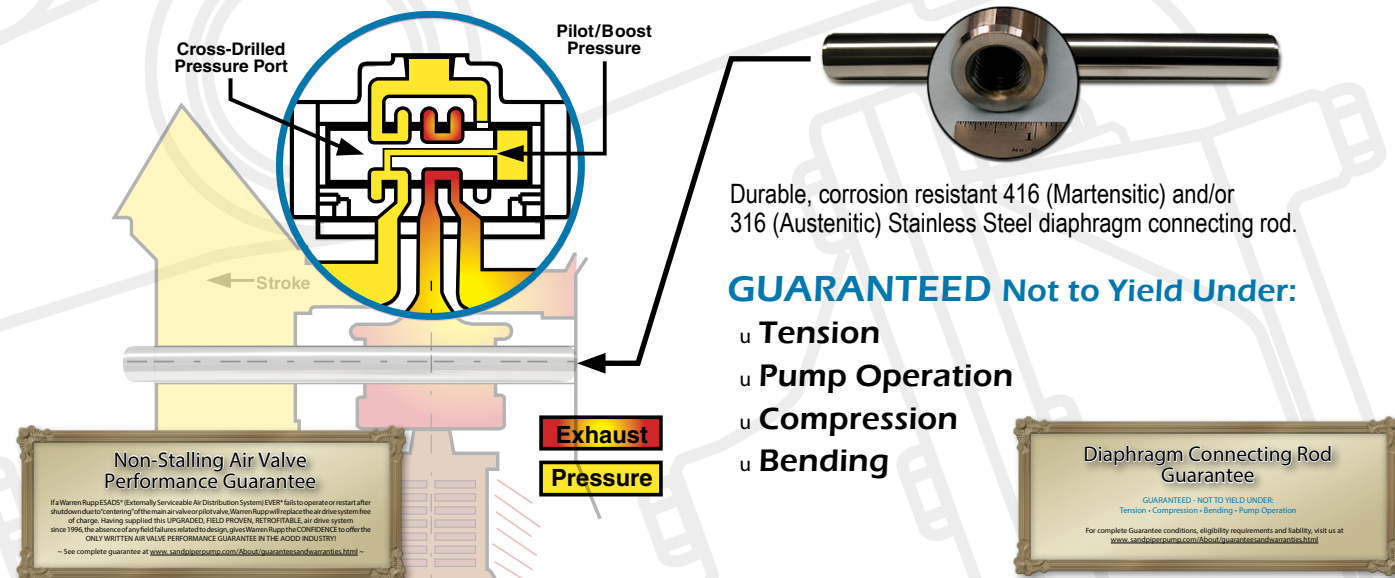


SANDPIPER® Signature Design Platform

ESADS+Plus® (Externally Serviceable Air Distribution System)

ON-OFF-ON... Reliability - GUARANTEED!

Primary system components = main directional air valve (with cross-drilled pressure ports) & pilot valve



An industry exclusive PERFORMANCE GUARANTEE!

u **FEATURES:** The cross-drilled pressure ports in the main directional air valve spool provide a pneumatic bias of the spool at either end of travel.

u **BENEFITS:** Eliminates spool from drifting due to vibration and/or unbalanced pressure or system conditions.

• **Completely IN-LINE serviceable**

- Process Reliability
- Consistent Restarts
- Lube Free

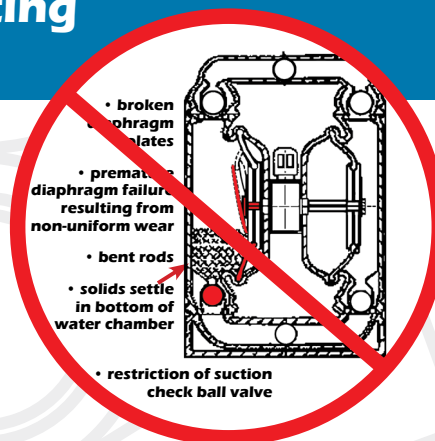


Completely "IN-LINE" Serviceable

EXCLUSIVE Bottom Discharge Porting for Line-Size Solids Handling

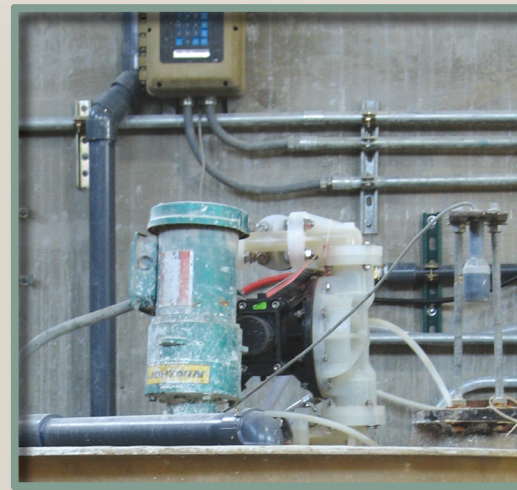
Advantages over competition:

- u **NO** Broken Diaphragm Plates
- u **NO** Premature Diaphragm Failure
- u **NO** Bent Rods
- u **NO** Solids Settle to Bottom Chamber
- u **NO** Restrictions of Suction Check Ball Valves



Competitive Standard Duty

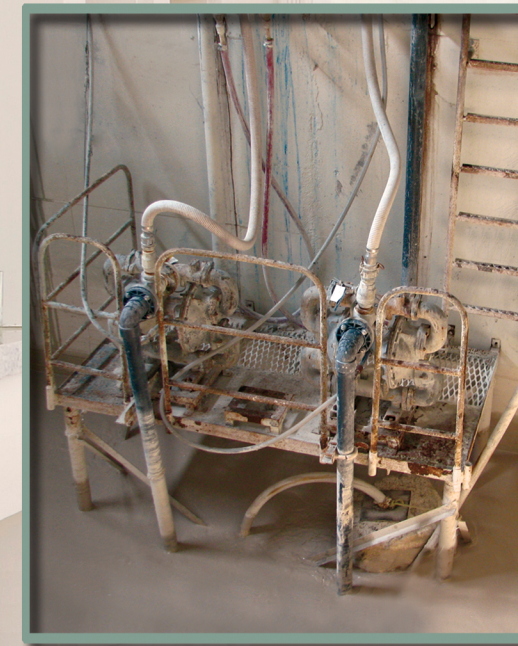
Over 45 Years Ceramic Industry Experience!



Glaze Spray

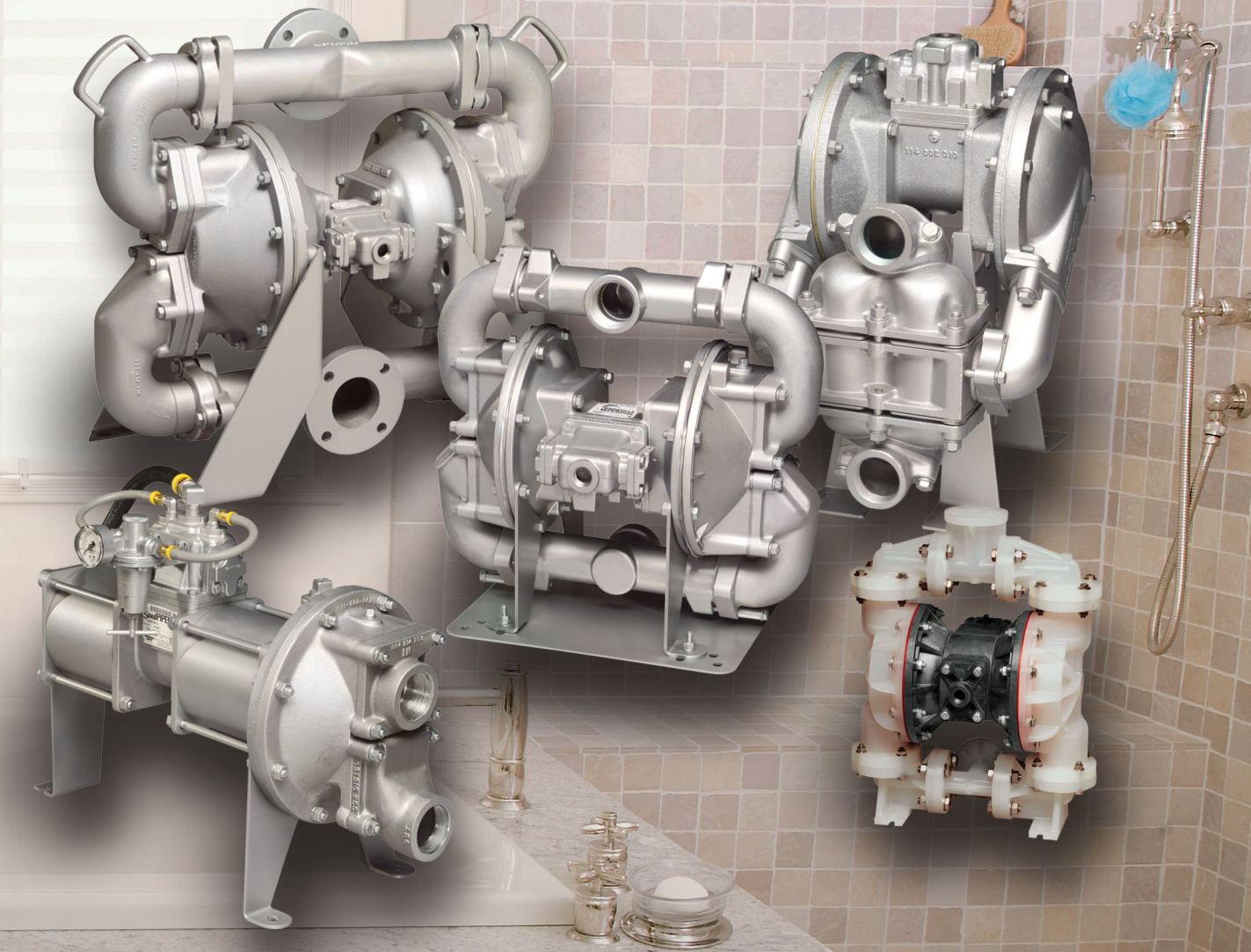


Gravity Casting



Mixing Tanks

SANDPIPER® Pumping Solutions
A WARREN RUPP, INC. BRAND
...with more ways than one



Ceramic Duty Pumps

For Ceramic Duty

**Over 45 Years
Ceramic
Industry
Experience!**

- Mixing Tanks
- Gravity Casting
- Casting Machines
- Tank Transfer
- Mold Cleaning
- Glaze Spray
- Waste Treatment
- Utility

SANDPIPER®

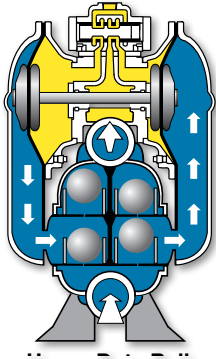
Warren Rupp, Inc., A Unit of IDEX Corporation
800 North Main Street • P.O. Box 1568
Mansfield, OH 44901-1568 USA
Tel: 419-524-8388 • Fax: 419-522-7867
www.sandpiperpump.com

IDEX
FLUID & METERING

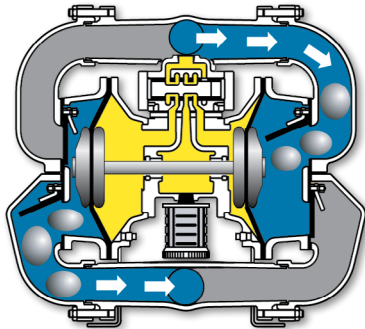
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SPCER-rev0811

SANDPIPER Signature Pump Configurations for Abrasive Ceramic Industry Applications

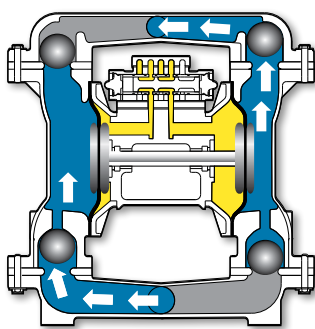
Heavy Duty Ball HDB



Heavy Duty Flap HDF



Standard Duty SD



FEATURES - BENEFITS

ESADS+Plus® • Performance Guaranteed • In-line Serviceable Air Valve System • Bolted Construction • Safe • Reliable • Easy Maintenance
Durable • Single-Purpose • Corrosion Resistant • Diaphragm Connecting Rod - Guaranteed

HDB & HDF
Bottom Discharge Porting • Eliminates Settling Solids • Thick Wall Construction
Horizontal and Vertical Manifold Connections • Free Standing Base • Reduces Downtime
Easy Re-Build • Heavy Duty Wear Package • Extends "MTBF"

HDB
Weighted Ball Check Valves
Solids Range +1/4" (6mm) to 7/8" (22mm)
Dry Primes up to 20 Ft of Water

HDF
Hinged Flap Check Valves
Solids Range +1/4" (6mm) to 3" (76mm)
Dry Primes up to 24 Ft of Water

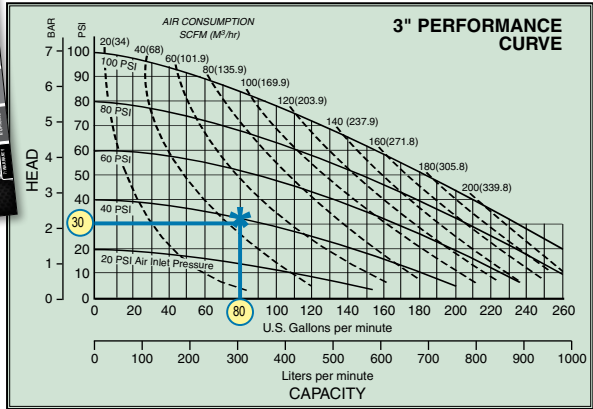
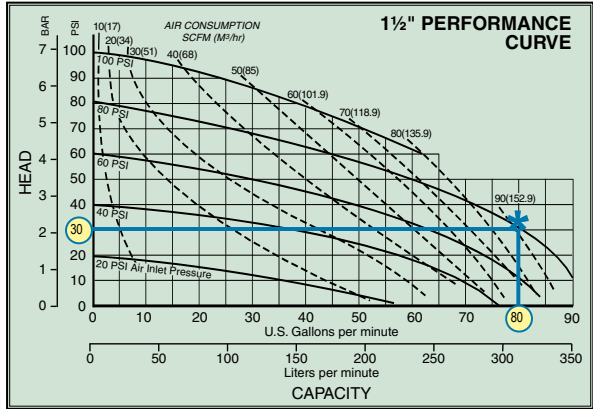
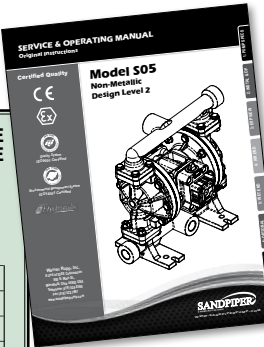
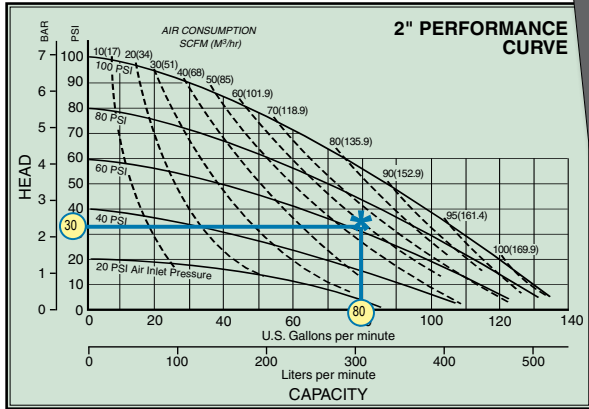
SD
Top Discharge Porting • Eliminates Entrained Air
Metallic & Non-Metallic Materials of Construction
Ball Check Valves • Light Weight • Portable
90° - 180° Manifold Connection Rotation

SD
Solids Range + 1/8" (3mm) to 1/2" (12.7mm)
Dry Primes up to 20 Ft of Water

SIZING to extend MTBF and... lower total cost of ownership

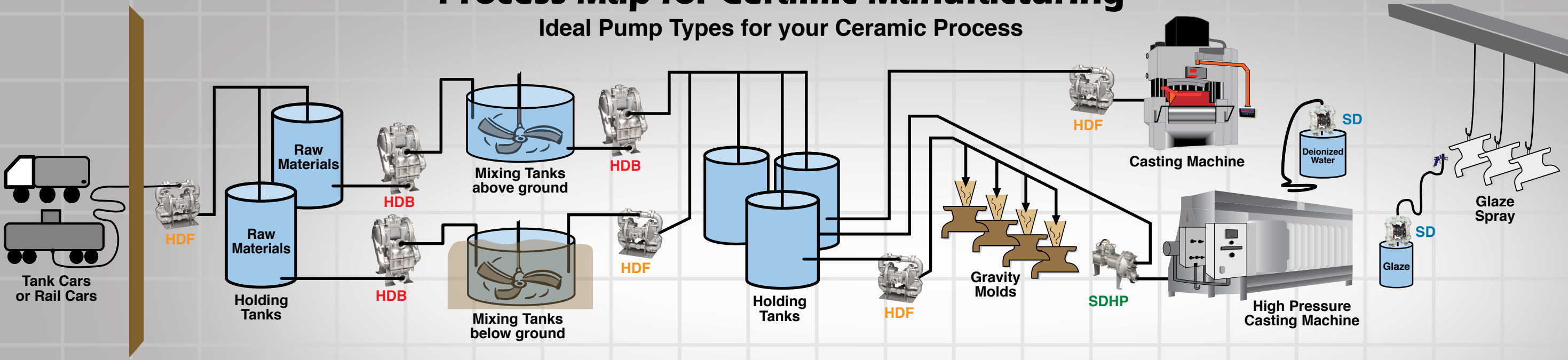
Pumping requirements (flow & head) for most applications can be met by multiple sizes of pumps. Talk to SANDPIPER'S application engineers to assist you with a size selection which best fits your total cost of ownership budget. An appropriately sized-up pump will lower the consolidated initial investment, repair, labor and energy costs. This BEST PRACTICE ensures desirable returns on the initial investment frequently measurable in weeks.

EXAMPLE: 80 GPM @ 30 PSI



Process Map for Ceramic Manufacturing

Ideal Pump Types for your Ceramic Process



Rely on the field-proven experience of SANDPIPER®

...to deliver the superior quality and performance needed for ceramic manufacturing



APPLICATIONS	Best Type	Dead Head	Settling (Non-Suspended Solids)	Abrasives	Suction Lift	High Pressure	Non-Metallic	Chemical Resistance	Other Considerations
• Tank & Rail Cars Raw materials used in the manufacture of ceramic products are often delivered to the facility in slurry form. SANDPIPER pumps are used to unload tank trucks and railway cars.	HDF		4	4	4				Choose a pump with high flow rates so that the time to unload the tank is minimized.
• Holding Tanks Filtered fluids are often recirculated then pumped from storage tanks to mixing tanks using SANDPIPER pumps.	HDB		4	4					Use a bottom ported Heavy Duty Ball Valve Pump to minimize settling while maximizing abrasion resistance.
• Mixing Tanks (Above Ground) Fluids are mixed in large mixing tanks in preparation for final casting. Sometimes mixed fluids are pumped to holding tanks before casting using SANDPIPER pumps.	HDB		4	4					Use a bottom ported Heavy Duty Ball Valve Pump to minimize settling while maximizing abrasion resistance.
• Mixing Tanks (Below Ground) Fluids are mixed in large mixing tanks in preparation for final casting. Sometimes mixed fluids are pumped to holding tanks before casting using SANDPIPER pumps.	HDF		4	4	4				A Heavy Duty Flap Valve Pump has unparalleled suction lift capability and is ideal for handling viscous and high specific gravity fluids.
• Cast Shop (Gravity Molds) Fluids are normally pumped from underground holding tanks and distributed to various casting stations to fill the molds. Gravity castings are typically manually filled with the pump "deadheaded" against a ball valve operated by the employee filling the mold.	HDF	4	4	4	4				The ESADS+Plus® On-Off-On reliability guarantee will assure that the pump works when required and when other brands won't. Use a Tranquillizer to minimize line shock.
• Cast Shop (Casting Machines) Casting machines are used to fill molds automatically. SANDPIPER pumps are used to fill the molds.	HDF	4	4	4	4				These units are normally in permanent installations so a long mean time between failures (MTBF) is key.
• Cast Shop (High Pressure Casting Machines) High pressure casting machines are used to fill molds more quickly while extracting water from the press. SANDPIPER manufactures a high pressure pump for this application.	SDHP	4	4	4	4				The Heavy Duty Ball Valve Pump design will not wear like standard high pressure ball valve pump designs.
• Cast Shop (Deionized Water) Deionized water is used to clean molds intermittently. Deionized water is pure and will not leave trace contamination. A SANDPIPER non-metallic pump is preferred.	SD						4		Use non-metallic materials to assure no contamination is introduced during the cleaning process.
• Glaze Spray Glaze is applied using manual or automatic spray guns, to give the product color and a shiny, smooth finish. SANDPIPER pumps are used to atomize the glaze.	SD	4		4			4		Choose a seat material that will handle the high velocities and abrasive characteristics of glaze spraying applications.
• Waste Water Treatment Waste generated from the manufacturing process is normally treated on site. SANDPIPER pumps are used for sumping, dosing and filter press applications.	ALL	4	4	4	4	4	4	4	Industrial waste treatment areas are excellent applications for SANDPIPER Pumps and accessories.
• Utility Pumps Basic fluid handling applications from a drum.	SD	4		4	4			4	Utility pump applications are often overlooked opportunities to install a SANDPIPER pump to improve safe and efficient fluid handling.

Heavy Duty Ball - HDB Heavy Duty Flap - HDF Standard Duty - SD Special Duty High Pressure - SDHP