

DISCFL DISC PUMPS

SP Series of Sanitary Pumps

THE FUTURE OF PUMP TECHNOLOGY



DESIGNED FOR

*sanitary applications
in the food, beverage,
dairy, bio-medical &
pharmaceutical
processing industries*

PUMPS

*abrasive, viscous and/or
high solids fluids*

ELIMINATES

*damage to delicate and
shear sensitive products*

BUILT

*to meet 3-A sanitary
and international
hygiene standards and
USDA requirements*

DISCFLO *and* *the* DISC PUMP



DISCFLO'S SP SERIES OF SANITARY DISC PUMPS IS A REAL BREAKTHROUGH IN PUMP TECHNOLOGY.

Using a unique operating system, known as the Discpac, the disc pump allows you to achieve an unheard-of level of productivity and exceptionally low Life Cycle Costs in difficult sanitary applications.



- The disc pump can solve some of the toughest pumping problems in the sanitary market. It is able to pump delicate foodstuffs such as corn, soft fruits, sugar crystals and fish, without damaging the product, and highly shear sensitive products like animal fats, dairy products, and citrus oils, without emulsifying the product, thereby increasing yields. In non-food industries, the pump is able to move delicate products such as blood platelets, enzyme solutions and catalysts without destroying the integrity of the product.

The disc pump design is also ideal for viscous and abrasive slurries, and slurries with up to 80% solids, large and stringy solids, and/or slurries with high levels of entrained air. Its unique, non-impingement design, coupled with laminar, pulsation-free flow, eliminates pump clogging, and excessive wear due to abrasion.

- The disc pump technology was developed in the late 1970s. The pumps are manufactured exclusively by the Discflo Corporation, founded in 1982, at its international headquarters in southern California, USA.

The Discflo SP Series pumps allow you to achieve an unheard-of level of productivity, versatility and exceptionally low Life Cycle Costs in all your sanitary applications.

DISCFLO'S MISSION

is to become the number one manufacturer of sanitary pumps for hard-to-pump applications

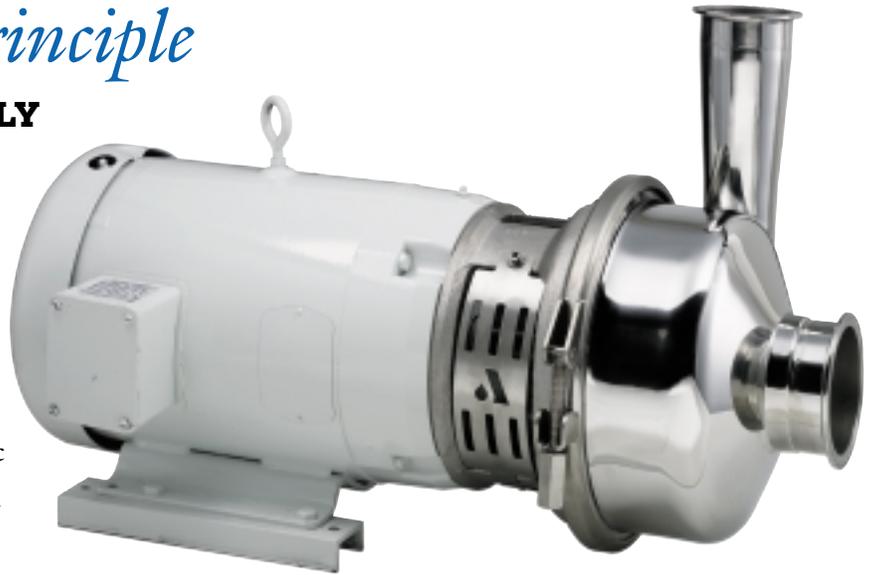
We plan to achieve this through continuous innovation in pump design and technology, attention to quality in our manufacturing process and dedication to excellent customer service.

In reaching our goal, we can help you reach yours—to solve your pump operating and maintenance problems and produce a superior end-product.

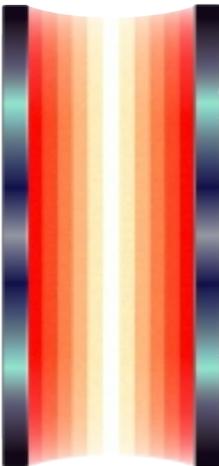
The Disc Pump Principle

THE DISC PUMP IS A HIGHLY INNOVATIVE PUMP.

The disc pump is a highly innovative pump. From the outside, it has the appearance of a centrifugal unit, but it performs the work not only of centrifugals, but also progressive cavity pumps, lobe and gear type pumps, and in some cases, chopper pumps. The SP Series of disc pumps achieves flow rates from 2 to 3000 GPM [680 m³/h] and heads up to 800 ft [250 m].



- Disc pumps operate on the principles of boundary layer and viscous drag. This pumping mechanism is new in the world of pumps, although these principles are known in other areas of fluid engineering, such as causing friction loss through a piping system. Under laminar flow conditions, streams of liquid travel at different velocities through a pipe. Fluid in the layer closest to the pipe is stationary due to drag forces, forming a boundary layer between the pipe and the rest of the fluid, while successive fluid layers flow faster towards the center of the pipe.

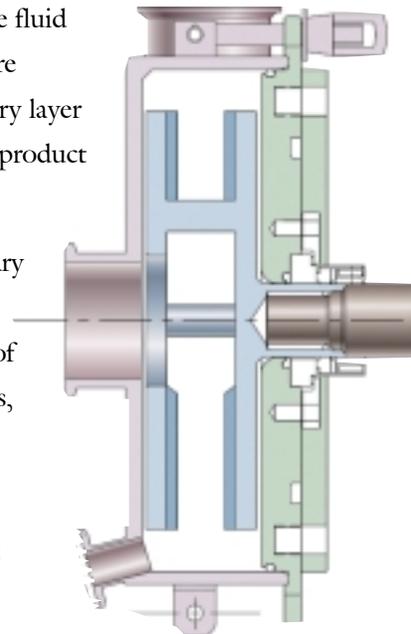


Disc pumps employ the principles of boundary-layer adhesion and viscous drag, which produce pulsation-free, laminar flow.

- Similarly, when a fluid enters the disc pump, its molecules adhere to the surfaces of the Discpac, a series of parallel discs which are the heart of the disc pump. This creates a boundary layer. As the discs rotate, energy is transferred to successive layers of molecules in the fluid between the discs through viscous drag, generating velocity and pressure gradients across the width of the Discpac. This combination of boundary layer and viscous drag causes a powerful dynamic force field that “pulls” the product through the pump in a smooth, pulsation-free flow.

Disc pumps have a non-impingement pumping action, with minimal contact between pump and fluid.

- The fluid being pumped moves parallel to the discs, and the boundary layer creates a molecular buffer between the disc surfaces and the fluid. Consequently there is no impingement of the fluid on the moving parts of the pump. This distinguishes the Discflo pump from other pump systems, all of which use some kind of impingement device—such as a vane, impeller, lobe, hose or screw—to “push” product through the pump.
- By minimizing contact between the pump and the material being pumped, wear on the disc pump components is greatly reduced, pump breakdown is almost unknown and, in the case of delicate and shear sensitive materials, damage to the product by the pumping system is virtually eliminated. The disc pump’s problem-solving ability in hard-to-pump applications is unparalleled in the world of pumps . . . making the disc pump truly the future of pump technology.

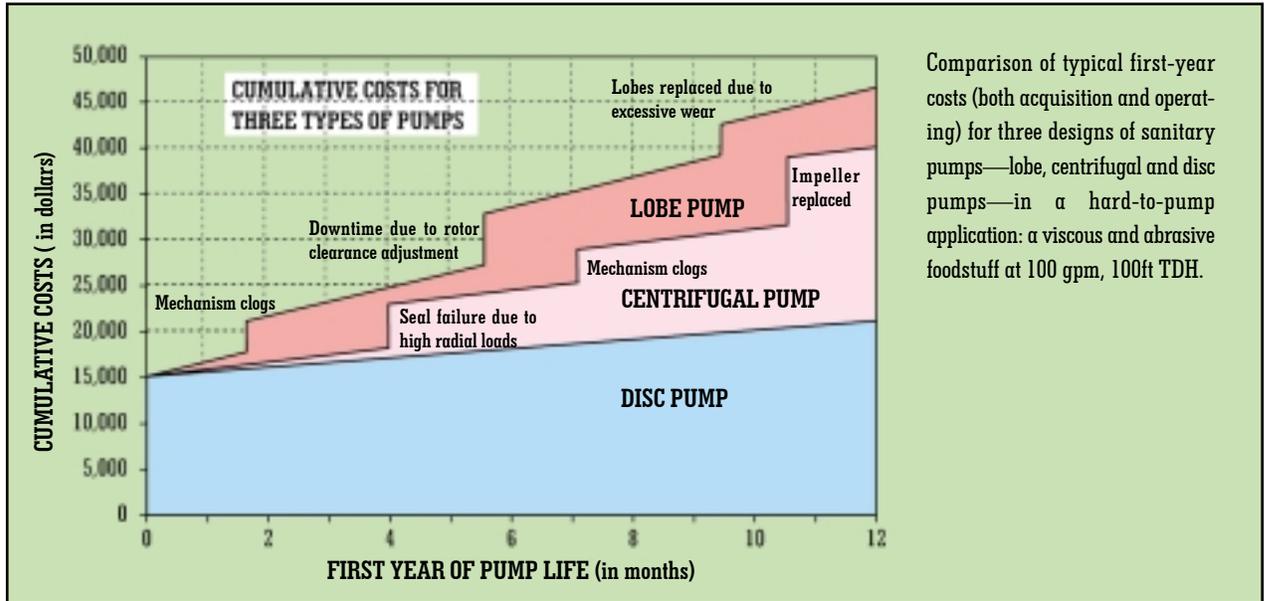


Features of the SP Series Pumps

OPERATING DESIGN FEATURES

- **Very Low Life Cycle Costs**

Proven reduction in spare parts required, maintenance and downtime, compared to all other sanitary pumps in hard-to-pump applications. Also, increased product yield, due to no damage to delicate foodstuffs or other sanitary products. See graph below.



Comparison of typical first-year costs (both acquisition and operating) for three designs of sanitary pumps—lobe, centrifugal and disc pumps—in a hard-to-pump application: a viscous and abrasive foodstuff at 100 gpm, 100ft TDH.

- **Pulsation-free Laminar Flow**

Pulsation-free laminar flow ensures no degradation of delicate products or damage to shear sensitive fluids, no dampening required later in the process, and less wear on the surrounding pipework.

- **Non-impingement Pumping**

Once the boundary layer is formed, the product does not impinge on the Discpac, thereby reducing the level of abrasive wear to the pump, and eliminating damage to delicate and shear sensitive products.

- **No Close Tolerances**

The disc pump is designed with no close tolerance, allowing the pump to handle large and stringy solids as well as fluctuations in solids size and volume, without clogging.

- **Low NPSH Requirement**

The disc pump's NPSH requirement is about one half to a third that of a standard centrifugal pump in the same service conditions due to the smooth laminar flow within the disc pump.

- **Ability to Run Bone Dry**

The disc pump is able to run dry indefinitely because there is no direct metal-to-metal contact in the pump.

Note: the mechanical seal must still be protected under these conditions.

- **Deadheading Discharge/Starving Suction**

It is possible to deadhead the discharge and/or starve the suction for extended periods of time at normal operating speeds, without damaging the pump. *Note: seal flushing must be continued under these conditions.*

- **No Radial Loads**

In-house testing at Discflo proves that there are no radial loads on the disc pump shaft during operation, ensuring longer seal, bearing and shaft life.

- **Highly Versatile Design**

Handles a wide variety of difficult fluids efficiently and effectively, without breaking down in service. The same system can handle fluctuations in temperature, pressure, solids content and even product, without breakdown.

Features of the SP Series Pumps

DESIGN FEATURES AND OPTIONS FOR SP SERIES DISC PUMPS

- Supplied in **Clean-in-Place** and **Steam-in-Place** versions, to suit application.
- **Close-coupled** and **frame-mounted** models available.
- Variety of sanitary flanges available, in addition to ANSI and DIN flanges.
- Standard pump casing with increased suction size available for highly viscous liquids.
- Electrical motor, either three-phase, or single-phase, available in all domestic and foreign voltages.
- All metal product areas are 316L stainless steel with minimum 150 grit surface finish to meet 3-A and international hygiene standards, USDA requirements.
- Two standard seal designs are used: external balanced seal with water cascade and water-pressured balanced double seal. Other types of seal are available on request.
- Motor housings come in TEFC (Totally Enclosed Fan Cooled) or wash down duty versions. Other styles available on request.
- Casing available with matte or electro-polished finish.

STANDARD PUMP CONFIGURATIONS & OPERATING RANGE

The SP Series of Sanitary Disc Pumps are an engineered product, manufactured to meet 3-A and international hygiene standards, and USDA requirements. They are configured to meet users' needs by varying the size and spacing of the two discs in the Discpac. The standard SP Series pump configurations:

- **Discharge pressures:** up to 800 ft [240 m] TDH
- **Working pressures:** up to 1400 psi [95 atm]
- **Hydraulic flow capacities:** 2–3000 GPM [0.5–680 m³/h] *
- **Operating temperatures:** ambient to 300°F [150°C] *
- **Suction pressures:** low NPSHr
- **Solids size (max):** 3 inches [76 mm] *
- **Viscosities:** up to 300,000 cPs
- **Drivers:** electric, diesel, hydraulic, air

* Disc pumps for higher flow rates, larger solids sizes and higher temperature operation are available on request. Contact Discflo factory for information.

Model	Discharge size		Suction size		Discpac diameter	
	(in)	(mm)	(in)	(mm)	(in)	(mm)
SP 1.5 × 1.5 × 6	1.5	40	1.5	40	6	152
SP 1.5 × 2 × 8	1.5	40	2	50	8	203
SP 2 × 3 × 8	2	50	3	80	8	203
SP 2 × 3 × 10	2	50	3	80	10	254
SP 2 × 3 × 12	2	50	3	80	12	305
SP 3 × 4 × 12	3	80	4	100	12	305
SP 4 × 6 × 12	4	100	6	150	12	305
SP 2 × 4 × 14	2	50	4	100	14	356
SP 3 × 4 × 14	3	80	4	100	14	356
SP 4 × 6 × 14	4	100	6	150	14	356

Note: Suction and discharge sizes can be modified to suit operating conditions. Contact Discflo factory for information.





Types of Fluids Pumped

- **Delicate and Shear Sensitive Products**

Virtually eliminates product damage during pumping. Proven success in handling delicate foodstuffs, such as soft fruits, corn, rice, shrimp and fish, as well as shear sensitive dairy products, citrus oils and sugar crystals.



Butter

- **Highly Viscous Fluids**

Because the disc pump uses friction, the higher the viscosity, the more efficiently it pumps. Fluids—including dairy sludge, molasses, peanut butter and pet food slurry—up to several 100,000 cPs can be pumped.

- **Fluids Containing Large and/or Stringy Solids**

Discs in the Discflo pump can be spaced as far as 20 inches apart to handle large solids, including whole chickens and other parts, soft fruits and live fish. Solids entering the pump move to the midway point between the discs and pass through the pump without impinging on the moving parts.



- **Slurries with a High Solids Content**

Handles slurries containing up to 80%+ solids without clogging, wearing excessively or coming to a standstill. Examples include pumping rice and corn slurries and vegetable soup.



Brown sugar

- **Severely Abrasive Fluids**

Pumps the most severely abrasive fluids with minimal wear to the internal pump mechanism, due to the non-impingement operation. Examples include pumping slaughter house waste, sugar solutions and oyster shell slurries.

- **Fluids with High Volumes of Entrained Air/Gas**

Handles fluids with very high levels of air/gas entrainment without vapor-locking or causing pump cavitation, including yeast and brewery sediment, egg whites, and cake mixes. Food and beverage industry applications



Disc Pumps - Your route to increasing productivity, and reducing operating costs



DISC PUMP FOOD AND BEVERAGE APPLICATIONS

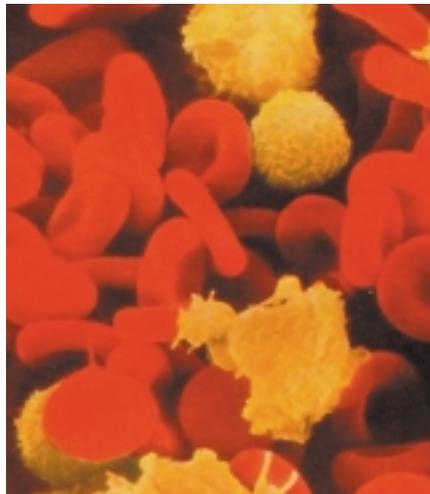
Affination magma	Candy premix	Gelatin	Mushrooms	Soybean	
Animal blood	Caramel	Glucose	Mustard	mash	
Apple butter	Carrots	Grain mash	Oil - animal	Starch	
Apricots	Cheese spread	Grapes	Oil - vegetable	Sugar	
Avocado slurry	Cherries	Gravy	Olives	beet	
Baby food	Chicken parts	Grease	Orange pulp	Sugar	
Bakery sludge	Chicken fat	Honey	Oyster shell slurry	solution	
Banana puree	Chickens	Hydrolyze	Palm oil	Sugar	
Barley	-whole	vegetable	Peanut butter	magma	
Batter	Chocolate	protein	Peas	Syrup - corn	
Beef tallow	Citrus oil	Ice cream	Pet food	Syrup - sugar	
Beer	emulsions	Jams and jellies	Potatoes - whole	Tomato paste	
Blueberry	Corn - whole	Juice concentrate	Potato slurry	Turkey parts	
Bone chips in water	Corn - slurry	Ketchup	Puree - fruit		
Brewery waste	Cream	Lard	Puree - tomato		
Butter	Diary sludge	Live fish	Renderings		Turkey sludge
Cake premix	Diary products	Magma C	Rice - whole		Vegetables - whole
	Edible oils	Malt extract	Rice - par-boiled		Vegetable - slurry
	Egg whites	Malt syrup	Salad dressing		Waste sludge
	Fats and oils	Margarine	Sauces		Water/fat emulsion
	Fermentation	Mayonnaise	Shrimp		Whey concentrate
	broth	Milk concentrate	Slaughter house waste		Winery sediment
	Fish in gravy	Milk sludge	Sliced potatoes		Yeast slurry
	Flocculated sludge	Meat parts	Soft drink syrup	Yogurt	
	Fruit pulp	Meat waste	Soup w/solids		
	Fruit puree	Molasses A, B, C	Soup concentrate		
		Muffin mix			



OTHER SANITARY APPLICATIONS

Animal tissues	Living cells
Biotechnology	Pharmaceuticals
Blood	Protein
Catalyst solution	Steam-in-place
Clean-in-place	Toiletries
Enzyme solution	Ultrafiltration
Ion exchange resin	Vitamin oils

Blood platelets

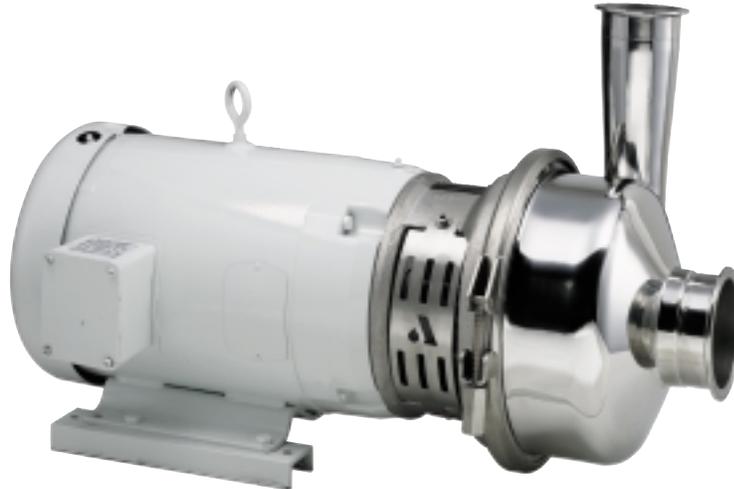


Disc pumps are suitable for all shear sensitive applications

SP SERIES DISC PUMPS...

The Future of Pump Technology

SP Series disc pumps are available both from Discflo Corporation direct and through your local disc pump distributor. For information about your nearest distributor or the use of this pump technology in sanitary applications, contact Discflo Corporation at the address below, or visit our web-site www.discflo.com.



Disc pump have been successfully installed in a wide range of other industries, including the following:

- Chemical and petrochemical industries
- Pulp & Paper manufacturing industry
- Oil refining and drilling operations
- Metal, mining and mine de-watering industries
- Municipal wastewater and utility plants

Disc pumps and the Discpac technology are covered by United States and foreign patents.

Find out what Discflo can do for you today!

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