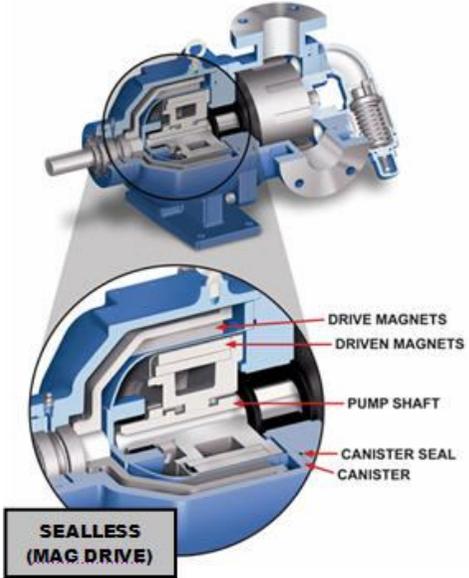


Sealing Options

Though often overlooked, shaft sealing selection can be just as critical as pump selection. Shaft seals can take many different forms, but all serve the common purpose of keeping the liquid in the pump. Here are the most commonly used shaft seal options for pumps. For additional information please see the [Liquid Containment](#) paper in the [Applications](#) section.

Shaft Seal	Description	Advantages	Disadvantages
	<p>Braided or formed rings that are compressed in the stuffing box of the pump. As the packing is tightened, it compresses against the shaft and stuffing box bore to create the seal.</p>	<ul style="list-style-type: none"> • Economical • Excellent for sealing thick, difficult to seal liquids such as chocolate, molasses, asphalt, resins, tar, and some adhesives • Seldom catastrophically fails 	<ul style="list-style-type: none"> • Poor seal for thin liquids, especially at higher pressures • Requires lubrication either externally or by the liquid being pumped; this means packing must be allowed to leak slightly (weep) • Can damage the pump shaft if adjusted too tightly
	<p>A circular elastomeric seal element in a rigid outer housing</p>	<ul style="list-style-type: none"> • Economical • Come in a wide variety including cartridge triple lip seals for higher viscosity liquids 	<ul style="list-style-type: none"> • Typically limited to lower pressures • Poor for thin, non-lubricating liquids or for abrasives • Can catastrophically fail

Shaft Seal	Description	Advantages	Disadvantages
	<p>Simplified, mechanical seals use highly polished faces (one stationary and one rotating) running against each other* to form a seal.</p> <p>*actually, seal faces only touch when at rest. While turning, they are separated by a thin film of the liquid being pumped, barrier fluid, or gas</p>	<ul style="list-style-type: none"> • Mechanical seals come in a wide variety of designs and materials for nearly every application. • Offer designs which can be easily replaced or repaired 	<ul style="list-style-type: none"> • Like lip seals, can catastrophically fail • Higher end double cartridge seals and gas barrier seals are quite expensive and require external support equipment.
	<p>A Mag Drive pump is a sealless pump that utilizes a magnetic coupling to create a static shaft seal. Drive magnets (outer) align with driven magnets (inner) and use magnetic force to turn the shaft through a static containment shell (canister).</p>	<ul style="list-style-type: none"> • Mag Drive pumps are a truly sealless design which ensures zero leakage of liquid or emissions, making them ideal for hazardous, toxic, corrosive, flammable, or expensive liquids. • Extremely reliable for maximum insurance against seal leakage and maximum seal life 	<ul style="list-style-type: none"> • More expensive than most shaft seal options, but this must also be weighed against the added costs of seal replacement, including labor and cleanup. • Typically limited to about 500°F / 260°C maximum (heat can permanently damage the magnets) • Based on the cost and risk of damage due to heat, monitoring devices are typically recommended to protect these pumps from damage.



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