Rotary Gear Pump Selection Guide

Rotary gear pumps are positive displacement pumps that are commonly used for liquid circulation, lubrication, pressure boosting, filtering, medium pressure spraying, sump draining, drum and vat filling, and general fluid transfer applications. Gear pumps are ideal for pumping viscous fluids; they are not suitable for pumping fluids with suspended solids. Gear pumps are self-priming with gears and are capable of suction lifts of up to 25 ft. under ideal conditions, depending on model. Dry starts are not recommended, however, due to possible premature seal and/or pump failure. Grainger offers external-style gear pumps, meaning the pumps are constructed with two gears side by side, with teeth meshed together. One gear drives the other to provide a nearly pulseless flow due to the small volume of fluid transferred through multiple cavities at a high rate.

Two gear types are available:

Spur gears provide excellent suction lift, are ideal for water or light oils, are bi-directional (reversible), and are the most economical.

Herringbone gears are ideal for viscous fluids, offer quiet operation in a non-clogging design, but are uni-directional.

Gear pumps are available in two mounting configurations: motor mount (directly coupled to a motor) or pedestal (can be driven by a variety of motor types, using pulleys/belts, gear boxes, or other coupling devices). Pedestal pumps are ideal for reduced-speed applications such as with viscous fluids or to meet specific flow requirements.

Gear pumps are available with or without internal pressure relief valves. Pressure relief valves are intended to be used as a safety device to prevent pump or motor damage that can occur when the discharge line is closed. Extended pump operation under shut-off conditions will cause damage to pump.

Teel brand spur gear pumps are available in cast iron, bronze, and stainless steel, with flow rates to 24 GPM and pressure capability to 125 psi.

HOW TO SELECT PUMPS

Step 1
Determine total pump discharge pressure required. Add suction lift (in feet) to discharge elevation (in feet); divide total by 2.31. To this figure add the discharge pressure required, in psi. This sum is the total pump pressure needed.

Step 2
Select pump and motor HP that delivers the flow (in GPM) required, at or above the total pump pressure calculated in step 1.

Step 3
Consider fluid viscosity. The viscosity/temperature of the liquid pumped will affect the pump speed (RPM). Where the viscosity/temperature SSU (Saybolt Seconds Universal) is greater then 500 SSU, recommended pump RPM is shown in table at right.

Step 4
Consider the specific gravity of the fluid to be pumped and how it will affect horsepower requirements. If the specific gravity of the fluid is below 1.0 (specific gravity of water), consult the pump's performance table for a recommended motor horsepower. If the specific gravity of the fluid is greater than 1.0, multiply the recommended horsepower in the pump's performance table by this figure. The result is the required motor horsepower.

Step 5
Consider liquid compatibility with pump materials. Liquids being pumped must be compatible with pump construction. See individual listings of pumps for the specific materials used in the construction of the pump. Gear pumps are not intended for use with flammable liquids unless stated otherwise in the description of a particular model.

Viscosity SSU	Recommended Pump RPM	Viscosity SSU	Recommended Pump RPM
PERFORMANCE FOR VISCOUS MATERIALS (STEP 3)			
50 to 500	1725	6000 to 9000	900
600 to 5000	1200	10,000 to 40,000	650