GEAR PUMPS
Rubber Application
high precision gear pump for metering and pressure generation tasks
Made For Rubber Applications

Gear pumps provide a reliable means to increase capacity of existing lines, improve the dimensional stability of extruded profiles, efficiently build high pressure required for strainer applications and provide an excellent return on investment. The benefits of gear pump assisted extrusion are well known for thermoplastic applications and many of the same benefits can be realized for rubber. The key to a successful rubber pump installation is the correct pump design and pump size selection. Witte’s ability to provide proven solutions for the rubber industry and our strength in providing an engineered solution to our customer’s unique requirements gives our customers an advantage.

Gear pumps for rubber applications

**Housing:** Alloy steel with stainless steel options

**Gears:** Through hardened and nitrided H13 tool steel

**Friction Bearings:** Through hardened D2 tool steel
optional: other materials

**Shaft Seal:** Viscoseal
optional: other materials

**Heating/cooling:** Jacketed pump housing and tempered gearshafts for use with pressurized hot water temperature system

Applications

**Typical applications:** EPDM, CR, NR, NBR, SBR, NR FPM, BR and others.

Pump Operation Parameters

**Viscosity:** Up to 30,000 Pas

**Temperature:** Up to 160 °C (320 °F), for rubber 80°C (176 °F) to 110°C (230 °F)

**Suction Pressure:** Up to 120 bar (1.740 psig)

**Differential Pressure:** Up to 250 bar (3.626 psig) with high pressure design up to 350 bar (5.076 psig)

**Discharge pressure:** Up to 350 bar (5.076 psig) with high pressure design up to 450 bar (6.526 psig)

*The values listed are maximum values and must not coincide under certain circumstances.*
## Special Gear Design

### Helical Gear Design
- Standard for rubber pumps
- Reduced pulsation (compared to spur gears)
- Self wiping design

### Spur Gear Design
- Standard for high pressure gear pumps
- Best volumetric efficiency
- No axial thrust

### Herringbone Gear Design
- Lowest pulsation
- No axial thrust
- Optimized temperature profile across rubber flow

### Example: comparison of pulsation

![Comparison of pulsation graph](image)
Advantages

Advantages of Gear Pump Assisted Rubber Extrusion

- Reduced pressure on the rubber extruder allows the rubber extruder to operate more efficiently and at higher throughput.
- Ability to control extruder head pressure as an independent process parameter with control system.
- Able to handle higher discharge pressure with less temperature rise for straining and high pressure applications.
- Accurate metering of rubber compound to downstream equipment giving improved control on the final product.
- Handle operating conditions which have not been possible previously.
- Increase productivity of existing lines.

Suitable for typical rubber compounds

| EPDM | CR | NBR | SBR | NR | FPM | BR | and many others |

Flexible suitable for products as

- hose
- sheet
- tube
- and many others

Different gear designs available

Special seal solution for many different application cases

Optional equipment

- frame
- drive
- gear box
- and many others
Designed for Rubber

Pump Cross Section

Shaft Cooling System
Cooled shafts to avoid excessive heat

Temperature measurement of housing

Temperature measurement of endplates

Pressure monitoring for inlet and discharge sides

Drive Shaft

Driven Shaft

Viscoseal
depending on the sensitivity of the rubber the pump can be designed so that product from the bearings can be recirculated back to the pump inlet or can be bled out to atmosphere

Example Rubber Application

Temperature measurement for pump outlet

Die Head

Screen changer or breaker plate

Gear pump for pulsation free rubber transfer

Special inlet port design for constant material flow to gears

Product flow from feeding extruder

Static mixer