KREYENBORG

Gear Pumps

Kreyenborg Gear Pumps - An Addition to our Range

The best guarantee for continuous and economic machine performance is a closed loop system with well-matched units. The Kreyenborg system, right through to pelletizing, storage and packing, is almost unique world-wide, offering reliable operation, not least due to the fact that Kreyenborg supplies the complete system, including adapters and assembly of all the individual components.

The new generation of Kreyenborg gear pumps complement our product range. In our function as a supplier of complete systems, we not only offer state-of-the art technology for individual components or complete lines, but on request we can execute trials with your material under real production conditions.

Just like all the other products of the Kreyenborg group, our gear pumps are tested meticulously on two industrial scale extrusion lines. You can see how your specific plastics material behaves - a special service rendered by Kreyenborg.

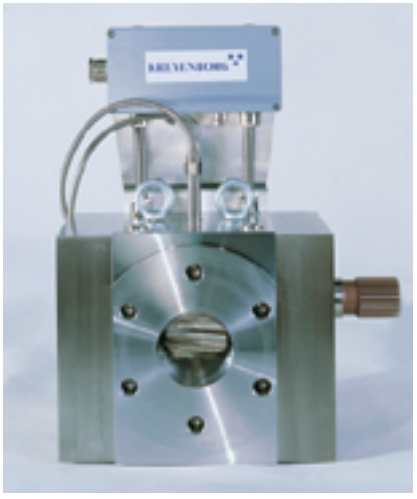
Two complete industrial size lines are used for the further development of the pumps.

Kreyenborg Gear Pumps: Advantages of a Complete System

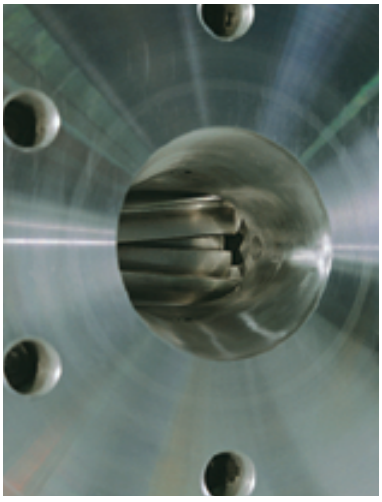
Kreyenborg gear pumps are designed in such a way that they can either be manufactured as individual units or integrated into existing lines. Of course they can also be supplied in combination with a screen changer. Each individual unit is designed according to the international standard. It goes without saying that the pump has optimised flow paths and a compact design. Thermally sensitive polymers, e.g. PC, PMMA or PA, can be pumped in the same way as common plastics, such as PE, PP, PS etc.
Some of the special features are as follows. Installation of standard heating cartridges within the pump housing guarantees a high degree of safety, there are no live electrical cables lying direct on the pump. Kreyenborg pumps are IP54 protection rated. Pressure and melt temperature sensors are standard in the pump housing for easy handling and maintenance .

Three Systems from one Source

The Kreyenborg range of Gear Pumps consists of three product lines which can be fitted into existing or new complete lines, depending on the individual requirements.
All three systems are designed for economic operation and constant process security. Whether your production process requires the conventional assembly of gear pump, adapters and screen changer, or directly-coupled gear pump and screen changer, or gear pump integral with the screen changer, Kreyenborg have the solution available.
When the equipment is supplied complete with Kreyenborg screen changers, upstream of the gear pump, complete protection is afforded to gear pump and downstream equipment, guaranteeing process security, consistency and high-quality production.

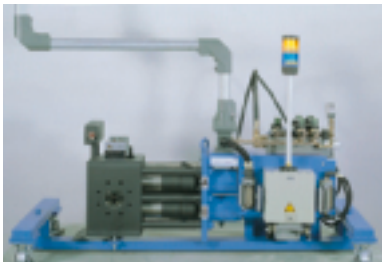


Kreyenborg gear pump
Heart of the new complete line



Precision in detail:
Kreyenborg gear pump GPE 70/70-01

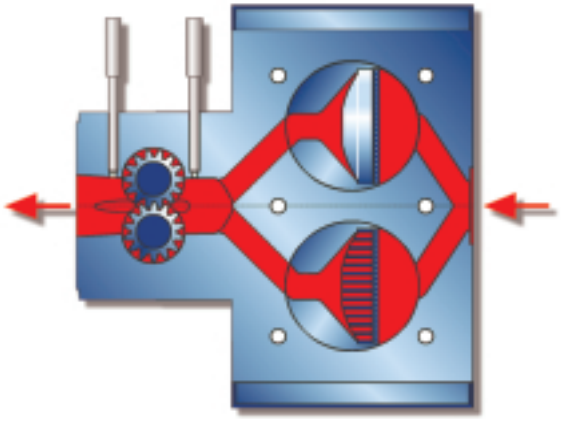
Foreign bodies are filtered out of the melt by a Kreyenborg screen changer ensuring clean production.



Kreyenborg screen changer with control system

Composite design Kreyenborg Gear Pump and Screen Changer

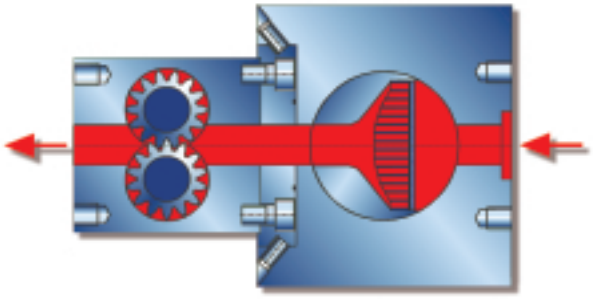
Advanced polymers particularly require a process which is mainly characterised by constant pressure and temperature.
The Kreyenborg research and development division has tackled this problem in developing a gear pump with integral screen changer that lives up to these extreme requirements. During development we particularly attached importance to compact design to keep melt channels as short as possible.



The compact composite design Kreyenborg gear pump with screen changer in one unit lives up to the high technical standards, especially for the processing of advanced polymers, which cannot stand varying pressure and temperature.

Directly-Coupled Kreyenborg Gear Pump and Screen Changer

The directly-coupled model of gear pump and screen changer is the precursor of the compact composite design. Here too the melt channels were reduced considerably to the standard dimension of this series.



Two matched components reduce variations in temperature and pressure to a minimum. Our know-how: complete solutions from flange to flange.

Advantages of composite design and direct coupling in brief:

- **100 % continuity**
- **compact design**
- **minimal installation length**
- **short melt channels**
- **rheologically-optimised melt channels, suitable for the processing of thermally sensitive products**
- **favourable price**

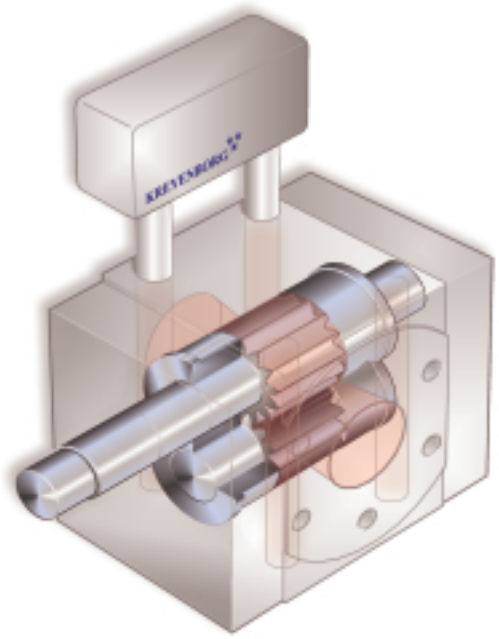
Typical applications:

Extrusion of high-quality products, such as

- **foil and sheet**
- **tube and profiles**
- **foamed products**
- **film**
- **cable coatings**

Standard Version of the Kreyenborg Gear Pump

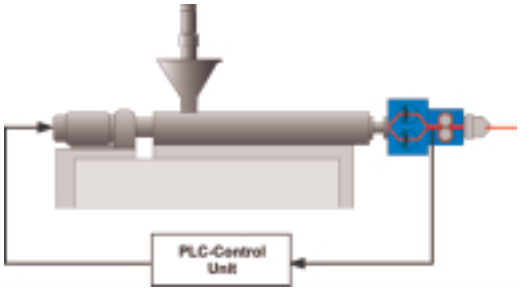
Kreyenborg is able to install gear pumps - including or excluding screen changer - in existing lines. Our customers benefit from Kreyenborg's long-standing experience in the development and production of specific adapter flanges, attaining optimal results in the individual process situation.



Streamlined, compact design permits a wide range of uses.

The Kreyenborg Gear Pump with Control System

By using gear pumps in extrusion a process separation can be achieved. The output pressure of the extruder can be adjusted to generate optimum melt conditions and the gear pump produces the necessary pressure at the die.
For protection against foreign bodies, the best place to install the gear pump is between screen changer and die. A PLC control system performs the control and the supervision of the line. The pump usually runs with a constant speed and the extruder screw speed is varied. The outlet pressure at the pump is adjusted to an optimal operating point of the extruder.



Line construction and test run in one of the two Kreyenborg industrial size lab lines.

Data acquisition for production analysis can be supplied as part of the control system providing ongoing supervision, historic trends can be recorded and recipes programmed and saved.

Polyolefines e.g. LLDPE, LDPE, HDPE, PP, EPDM

Polyvinyl chlorides e.g. PVC-P (soft PVC)

Styrene polymers e.g. PS, SAN, ABS

Acrylic resins e.g. PMMA

Polyacetals e.g. POM

Polycarbonates e.g. PC

Polyester e.g. PET, PBT, PEN

Polyamides e.g. PA 6, PA 6.6, PA 11, PA 12

Polymer blends

Thermoplastic elastomers e.g. TPE-S, TPE-O, TPE-E, TPE-A

Polyurethanes

Hot Melt adhesives e.g. basing on EVA, APAO, PA

Natural resins e.g. chewing gum

Synthetic resins e.g. epoxy resin

Technical Specification

Gear pump GPE (GEAR PUMP EXTRUSION)

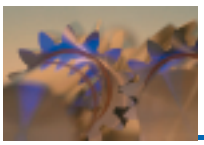
Materials:	**Housing:** tempered steel	**Gears:** tool steel	**Slide bearing:** tool steel
Heating:	Electric cartridge heaters (IP54); hydraulically heated		
Shaft seal:	visco seal on both sides		
Process data:			
Temperature:	max. 450°C		
Viscosity:	50 to 30,000 Pas		
Pump inlet:	max. 120 bar		
Pump outlet:	max. 350 bar		
Differential pressure:	max. 250 bar		

Technical design of the pump

- **Flow-optimised inlet and outlet sections guarantee a gentle treatment of the material.**
- **Pump type suitable for the use of common plastics and thermally sensitive polymers**
- **Compact design of the pump**
- **Adapter flanges enable installation in existing lines. Thanks to the compact design of the pump, the existing connection lengths can be kept (individual installation dimensions).**
- **Standard heating cartridges**
- **Electric supply cables are integrated into the pump housing: no bare and live cables**
- **Wiring in a standard housing made of aluminium**
- **IP54**
- **Borings for pressure and temperature sensors are integrated into the pump housing.**
- **Temperature sensors with adapters in the housing**

Gear pump	Capacity (cm3/U)	Operation limits plastics in general (kg/h)	Typical throughputs** HDPE pressure pipe (kg/h)	PS deep-drawing film (kg/h)
GPE22/22-01	4,7	23-36	23	26
GPE28/28-01	10,2	45-72	45	55
GPE36/36-01	25,6	105-168	105	130
GPE45/45-01	46,3	180-270	195	300
GPE56/56-01	92,6	300-490	250-300	300-545
GPE70/70-01	176	500-850	350-500	500-950
GPE90/90-01	371	900-1500	500-800	1000-1500
GPE110/110-01	716	1450-2540	700-900	1500-2300
GPE140/140-01	1482	2600-8000	–	–
GPE180/180-01	3200	2000-15000	–	–

** These values were ascertained with a filter on the suction side of the pump. Mesh size 500 ym.



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KREYENBORG

Quotation Questionnaire for Gear Pumps

Customer: _____

Contact: _____

Address: _____

Phone: _____ Fax: _____ e-mail: _____

Material data:

Type:

(trade name, short name)

Kind: ☐ pellets ☐ reclaimed material ☐ others

Properties: ☐ corrosive ☐ film-formative ☐ abrasive ____ particle size (in ym)

Fillers: ____ % (percent by volume)

Viscosity: ____ (Pas) ____ (cP) ____ MFI

Sp. gravity: ____ (g/cm³) ____ (kg/m³) ____ ( )

Sp. heat capacity: ____ (KJ/kg °K)

Process Data:

Capacity: ____ (kg/h) ____ (1/min) ____ ( )

Inlet pressure: ____ (bar) ____ (psi) ____ ( )

Outlet pressure: ____ (bar) ____ (psi) ____ ( )

Ambient temp.: ____ (°C) ____ (°F) ____ ( )

Operating temp.: ____ (°C) ____ (°F) ____ ( )

Line configuration:

____ → ____ → ____ → ____

Extruder data: ____ manufacturer ____ type

☐ single screw ☐ twin screw

____ screw diameter (mm) ____ extrusion height (mm)

Pump:

Material:

Housing: ☐ standard ____ others

Gears: ☐ standard ____ others

Slide bearing: ☐ standard ____ others

Heating: ☐ electr., voltage of heating elements: ☐ 230 V ☐ 400 V ____ others

☐ hydr.-heated ☐ thermo-oil ☐ steam

Shaft seal: ☐ visco seal (standard) ____ others

Drive:

Current supply: Feed voltage (Volt): ____ Power frequency Hz: ____

Control voltage (Volt): ____

Protection system: Ex protection system: ____ IP: ____

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