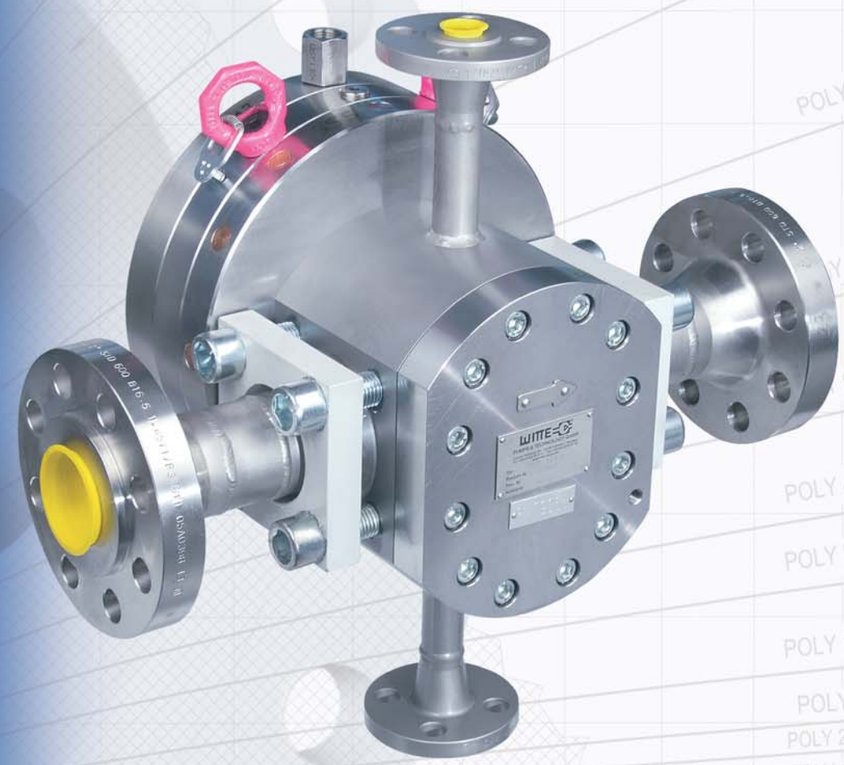
CHEM

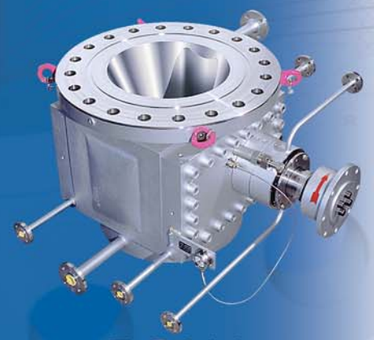
CHEM

High Precision Gear Pump

EXTRU

BOOSTER





POLY

WITTE PUMPS & TECHNOLOGY

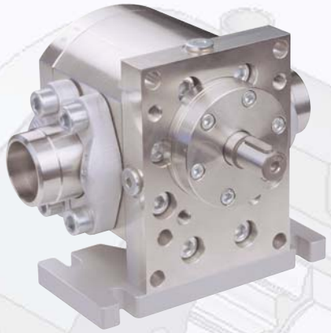
CHEM

High Precision Gear Pump

CHEM - high precision gear pump for conveying low to medium viscosity fluids

CHEM gear pump for conveying and metering of fluids with low to medium viscosity. The application range goes from classic transfer and metering tasks in the chemical and pharmaceutical industries up to the conveyance of monomers, oligomers and prepolymers during the production of polymers. Decades of experience in construction and an optimum selection of materials, make this type of pump suitable for even the most demanding tasks and are outstanding in their reliability and metering precision in both vacuum and high pressure applications. Typical areas of application for this type of pump are to be found in the chemical, cosmetic, food, petrochemical and polymer industries.

The CHEM series is also suitable for the food industry, e.g. for conveying butter, margarine or vegetable oils.
Pumps of this type can be supplied with or without heating. The WITTE modular construction system for bearings, gears and shaft seals offers a maximum of flexibility for the end customer.



Technical Features

Housing
Non-alloyed and alloyed steels · tantalum · titanium · Hastelloy · ceramic

Gears
1.4112 but also all other processable ceramics and metals, e.g. 1.4571, Ferralium, ferro titanite Hastelloy, etc. · with optional surface coating · spur gearing

Friction Bearings
Carbon · NiAg (nickel-silver) · silicon carbide · zirconium oxide · tool steel · Al-bronze · special materials · with optional surface coating

Shaft Seals
Single mechanical seal (ED) · Single mechanical seal with buffer fluid (AD) · Double mechanical seal with buffer fluid (DD) · magnetic coupling, stuffing box, viscoseal

Heating Systems
Steam · water · heat transfer oil · electrical

Operating Parameters

Viscosity
0.5 to 10000000 mPas (cP)

Temperature
Up to 300°C (580° F) · higher temperatures upon request

Inlet pressure
Vacuum to max. 15 bar (215 psig), higher with magnetic drive

Conveying Pressure / Differential Pressure
Up to 120 bar (1740 psig)

The values listed are maximum values and must not coincide under certain circumstances.

Pump Sizes
From 22/6 (1.28 ccm/rev – 20 l/h) to 280/280 (12000 ccm/rev-170000 l/h). Larger sizes available upon request.

Application Examples

Organic and inorganic chemicals
Alcohols · additives · bases · esters · glycerine · resins · hardeners · isocyanates · monomers · oils · phenol · acids · biodiesel · asphalt · bitumen · tar · hotmelt · glues · waxes · etc.

Polymers
Celluloseacetate · Nylon 66 · prepolymers · etc.

Food industry
Vegetable oils · butter · margarine · flavourings · chocolate · fudge · liquorice · chewing gum · vitamins · syrup · gelatine · etc.

Pharmaceutical and Cosmetic Products
Amino acids · lotions · shampoo · vitamins · etc.

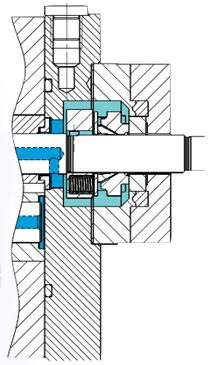
Mechanical Seals

Single mechanical seal (ED)

Suction pressure up to 15 bar (abs.) (215 psig)

Viscosity: 0.2-50000 mPas

Temperature: max. 300°C (580°F)

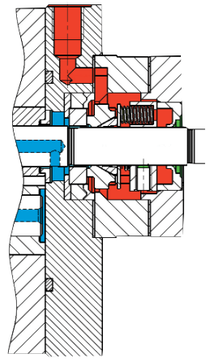


Single mechanical seal with buffer fluid (AD)

Suction pressure vacuum to max. 5 bar (abs) (75 psig)

Viscosity: 0.2-100000 mPas

Temperature: max. 250°C (500°F)

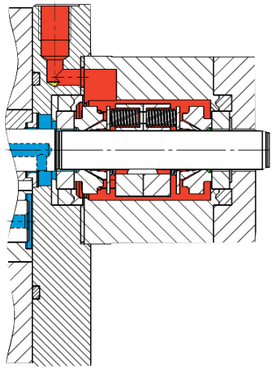


Double mechanical seal with buffer fluid (DD)

Suction pressure vacuum to max. 15 bar (abs) (215 psig)

Viscosity: 0.2-1000000 mPas (cP)

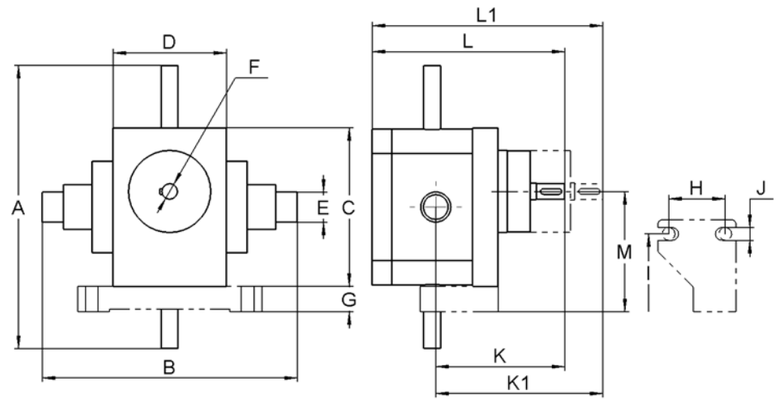
Temperature: max. 300°C (580°F)



Product **Buffer fluid**

Size (axial distance width)
Spec. displacement volume (ccm/U)
Capacity (l/h) (Dependent on the fluid characteristics and operating conditions)

Size	Spec. displacement volume (ccm/U)	Capacity (l/h)
1/1 (22/6)	1,28	20 - 200
1/2 (22/13)	2,78	40 - 400
1 (22/22)	4,7	70 - 700
2 (28/28)	10,2	140 - 1400
3 (36/36)	25,6	280 - 2800
4 (45/45)	46,3	410 - 4100
5 (56/56)	92,6	650 - 6500
6 (70/70)	176	990 - 9900
7 (90/90)	371	1600 - 16200
8 (110/110)	716	2500 - 25300
9 (140/140)	1.342	3800 - 37800
10 (180/180)	3.200	6900 - 69100
11 (224/224)	6.100	11000 - 106000
12 (280/280)	12.000	17000 - 170000



CHEM-Dimensions

Pump size	A	B	C	D	E	F	G	H	I	J	K	K1	L	L1	M	Weight
1/1 (22/6)	200	116	112	80	20x15	11	18	40	110	9	83	110	120	147	85	6 Kg
1/2 (22/13)	200	116	112	80	20x15	11	18	40	110	9	86.5	113.5	127	154	85	6 Kg
1 (22/22)	200	180	112	80	21.3x17.9	11	18	40	110	9	91	118	136	163	85	6 Kg
2 (28/28)	235	208	138	108	33.7x28.5	16	22	40	130	11	109	138	160	189	105	15 Kg
3 (36/36)	250	214	152	114	48.3x40	19	16	60	140	12	124	157	188	221	110	20 Kg
4 (45/45)	234	244	176	134	60.3x54	24	25	75	170	14	148	186	226	265	135.5	26 Kg
5 (56/56)	360	264	210	168	60.3x54	32	27	100	220	20	195.5	239.5	289.5	333.5	160	50 Kg
6 (70/70)	350	346	258	208	76.1x70	38	27	115	250	22	225.5	275.5	338.5	388.5	191	125 Kg
7 (90/90)	498	416	300	269	88.9x80.9	48	42	130	310	28	265	329	405	469	237	220 Kg
8 (110/110)	470	488	380	310	114.3x106	60	42	180	410	28	319	478	384	543	287	340 Kg
9 (140/140)	600	538	454	340	168.3x157	70	47	230	430	28	410	457	612	669	344	500 Kg
10 (180/180)	800	*	590	440	Ø 200	*	65	285	520	33	617	617	902	902	450	700 Kg

* W100 x 2,5 x 38 / DIN 5480
* Upon request

CHEM

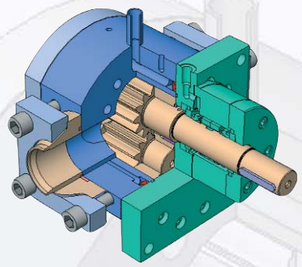
High Precision Gear Pump

CHEM - MAGNET with magnetic coupling - seal design for safe operation with critical media

The CHEM MAGNET is in principle constructed in the same way as the CHEM but with a synchronous magnetic coupling forming the shaft seal. This operates slip-free, i.e. the pump speed is always the same as the shaft speed, as long as the load torque does not exceed the nominal torque of the magnetic coupling.

The magnetic coupling lends itself to conveying poisonous or flammable substances, as well as for operation at high system pressures. Special versions can be used for inlet pressures of up to 700 bar (10152 psig).

The containment shell of the magnetic coupling can be of the double-walled type. The double wall serves heating the coupling can. The double-walled containment shell can be provided with a leakage-monitoring system for particularly critical processes. The containment shell is filled with inert gas, in order to detect damage. If this gas escapes to the inside or outside, depending upon which wall is damaged, a pressure sensor will trigger an alarm. Because one wall of the double-walled containment shell



is still intact, the possibility of the hazardous medium being conveyed leaking into the environment will be eliminated.

A particular highlight of the WITTE Magnetic Coupling is the inner magnetic rotor's separate bearing. This ensures that only torque is transferred to the pump's drive shaft. The relatively heavy weight of the inner rotor is taken up by this bearing, thus relieving the pump's bearings.

WITTE´s flange bearing design offers the additional advantage of preventing the inner rotor from touching and damaging the containment shell. In competitor´s design it is possible for the inner rotor to touch the containment shell after pump bearings wear. Our design provides the safety of an additional bearing to insure the inner rotor can not touch the containment shell.

Technical Features

Housing
Stainless steel · tantalum · titanium · Hastelloy · ceramic

Gears
1.4112 but also all other processable ceramics and metals, e.g. 1.4571, Ferralium, ferro titanite Hastelloy, etc. · with optional surface coating · spur gearing

Friction Bearings
Carbon · NiAg (nickel-silver) · silicon carbide · zirconium oxide · tool steel · Al-bronze · special materials · with optional surface coating

Heating Systems
Water · heat transfer oil

Operating Parameters

Viscosity
0.5 to 30000 mPas (cP)

Temperature
up to 550 °C (1022°F)

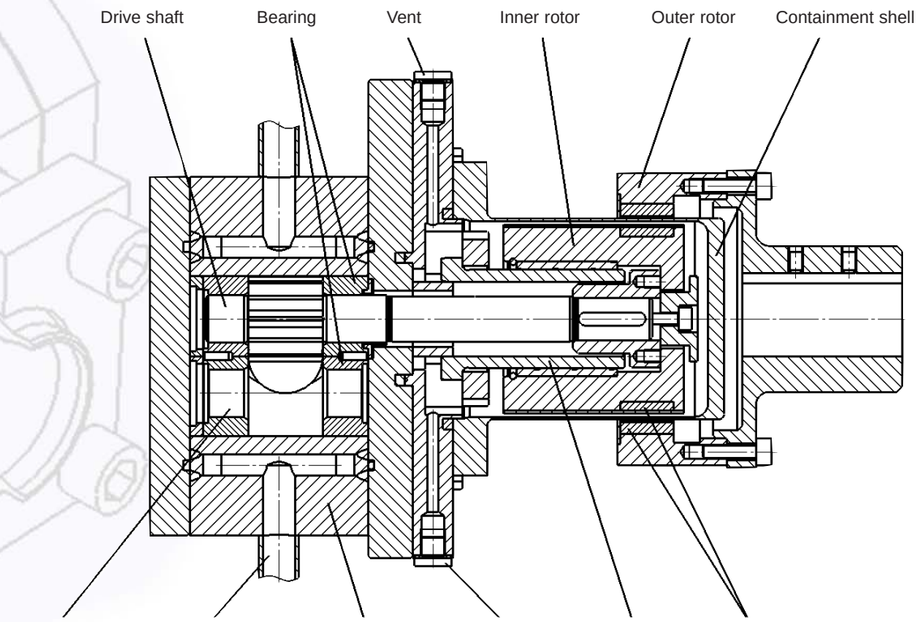
Inlet pressure
Vacuum up to max. 700 bar (10152 psig)

Conveying Pressure / Differential Pressure
Up to 120 bar (1740 psig)

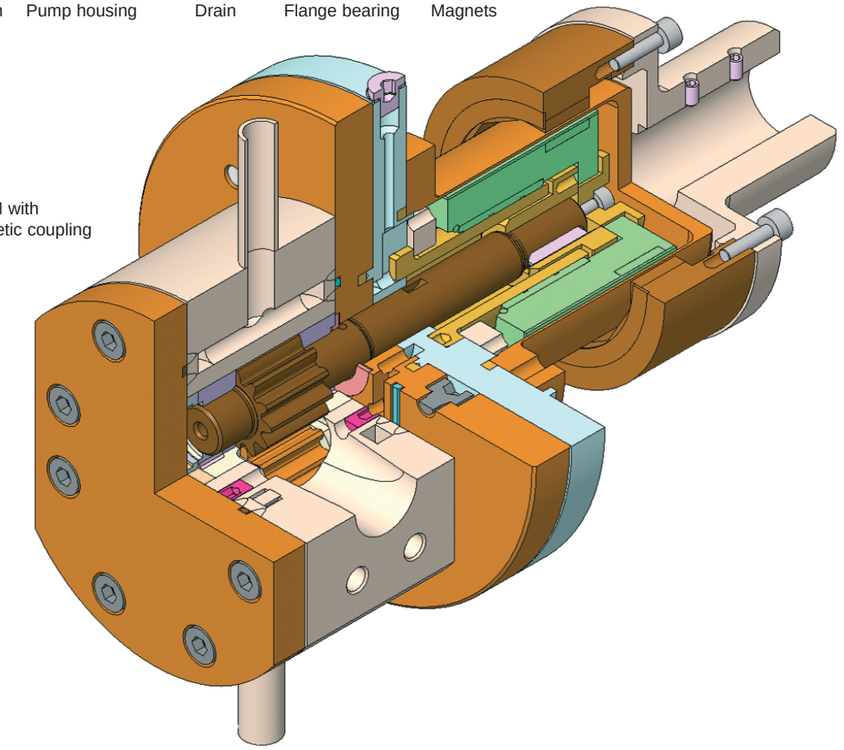
The values listed are maximum values and must not coincide under certain circumstances.

Pump Sizes
From 22/6 (1.28 ccm/rev – 20 l/h) to 180/180 (3200 ccm/rev – 69000 l/h).

CHEM with magnetic coupling - sectional drawing



CHEM with magnetic coupling



METERING SYSTEMS
SPECIAL PUMPS

Metering Systems

The WITTE metering system (WDS) enable precise volumetric metering of low to high viscosity media with gear pumps, even at high temperatures and pressures. Two series connected gear pumps, one measuring and one pressure boosting pump are precisely controlled by a PLC control system, such that a precision of better than 0.01% is achieved, depending upon the medium..

Special Pumps

In addition to our standard pumps, we offer a wide range of special pumps, e.g. made of ceramic, tantalum, titanium or immersion pumps. Many of these pumps are custom built to suit the application in question and its specific operating parameters. WITTE for example produced one such pump, made completely of ceramic, for transporting a highly corrosive medium at temperature 550° C.

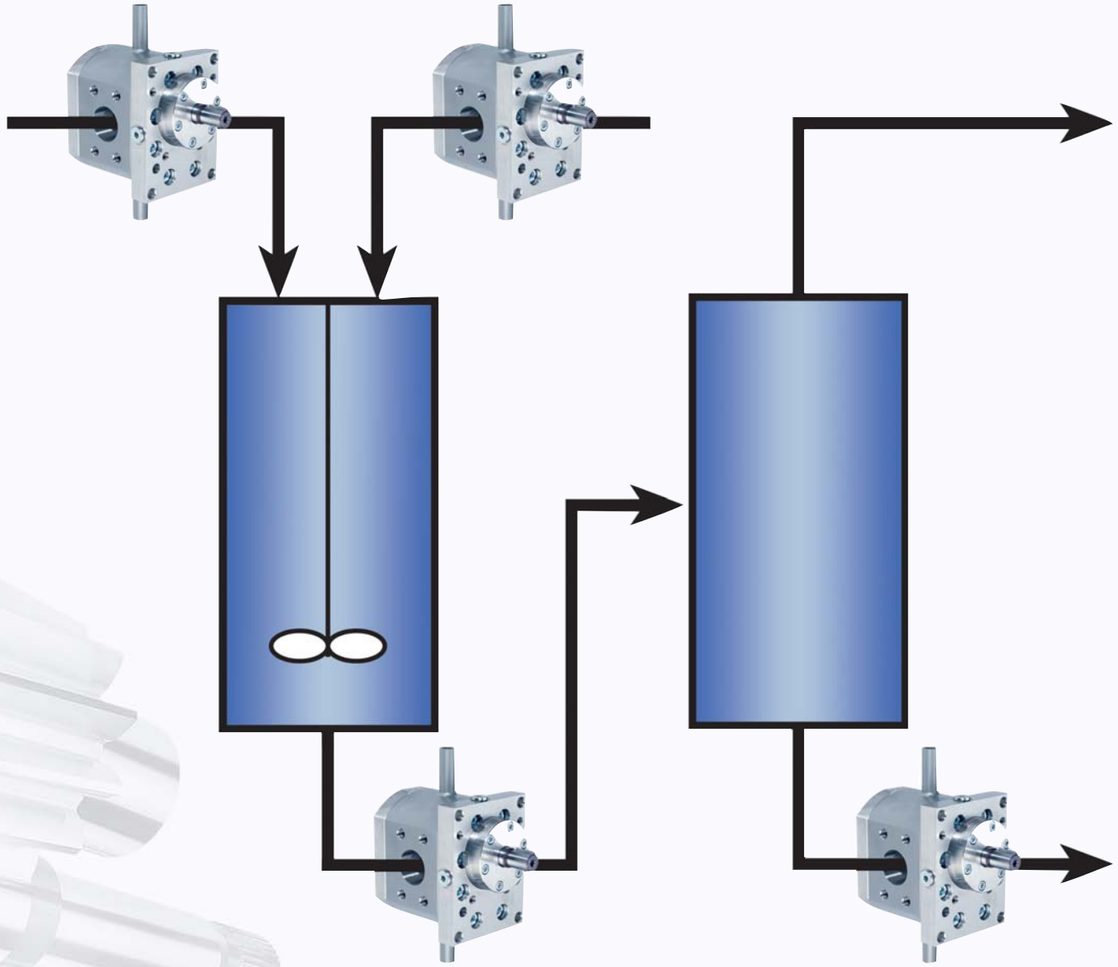
Tantalum pump

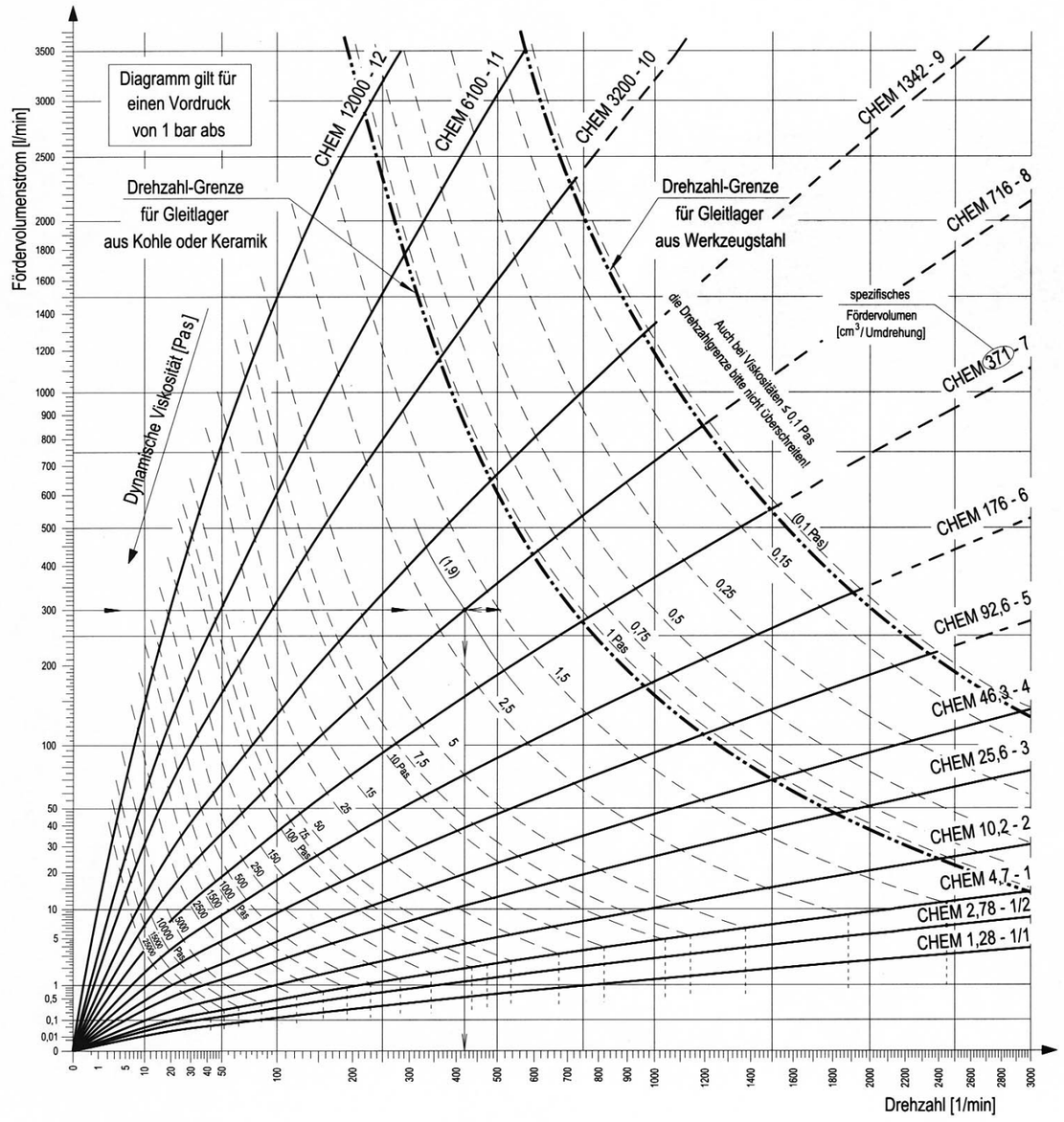
Magnetic drive

Ceramic pumps

CHEM - operating conditions

- **Transfer**
- **Metering**
- **Pressure increase**
- **Thin film evaporation**





WITTE Presence world wide

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