

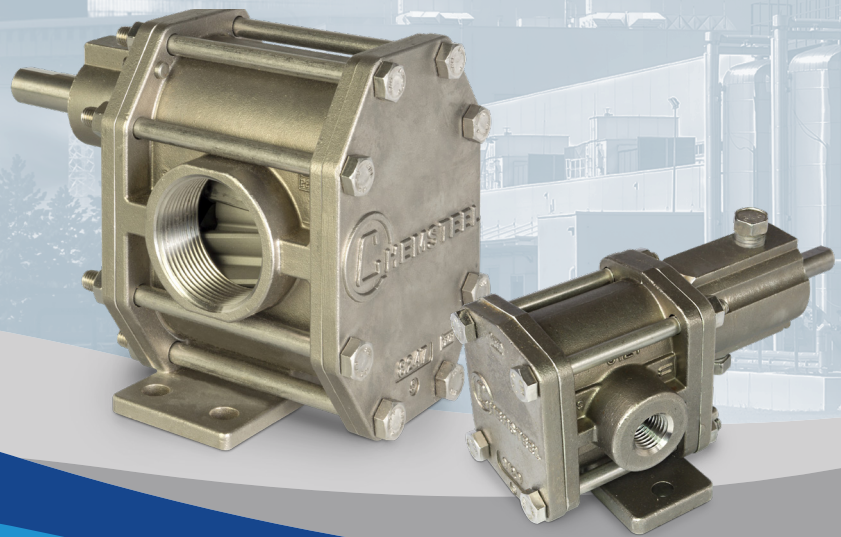


# OBERDORFER®

An Ingersoll Rand Business

## Chemsteel®

STAINLESS STEEL AND ALLOY C PUMPS  
FOR DEMANDING APPLICATIONS



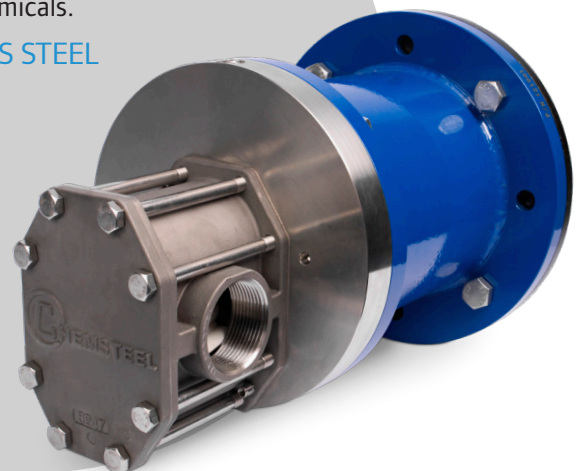
## Why Professionals Choose Oberdorfer Chemsteel Series Pumps

- **OPTIONAL BEARING FLUSH PORTS**
  - To extend bearing life when pumping non-lubricating fluids or fluids with a small degree of fine solids
- **EXTENDED LIFE**
  - Gear & bearing combinations of metallic and non-metallic wear surfaces
  - Slotted bearings to lubricate shaft and gear surfaces
  - Hydraulic porting to balance axial thrust
- **BI-DIRECTIONAL OPERATION**
  - For applications requiring reversing flow
- **COMBINED BEARING AND WEARPLATE**
  - Full size bearings match the gear diameter and eliminate the need for separate wear plates
  - Gear trimming for temperature compensation
  - Made of carbon-graphite, PTFE or Rulon®
- **HELICAL GEARS**
  - Noise reduction up to 10 db
- **INTERFACING TO WORLD STANDARDS**
  - NPT and BSPT porting
  - Metric pump hardware
  - Close-coupled adapters for NEMA and IEC standard motor frame sizes
- **METALLIC**
  - Wide range of capability
  - Effective weight and cost selection
- **SEAL HOUSINGS**
  - Ported for flush, drain, barrier fluid
  - Access to seals without removal of cover
- **BODY/COVER STATIC O-RINGS**
  - PTFE encapsulating silicone for sealing with a memory
- **UPPER DRIVE STANDARD**
  - Lends itself to in-line pump seal maintenance without leakage of trapped chemicals
  - Easily converted to a lower drive configuration
- **DYNAMIC SEAL OPTIONS**
  - Single or double mechanical wedge and bellows styles
  - Lip seals

### Mag Drive Pumps

Chemsteel Magnetic Gear Pumps are engineered to safely handle hazardous, toxic, highly corrosive or explosive chemicals.

- **STAINLESS STEEL**
- **ALLOY C**



## Construction

### • BODY

- 316 Stainless Steel—an all purpose austenitic stainless, excellent corrosion resistance; premium choice of all 300 series alloys.
- Alloy C—Superior corrosion resistance for severe alkaline and acidic pumping applications

### • GEARS

- Precision machined metallic gears of 316SS, W88 stainless, and Alloy C. Also available in PTFE, PPS and carbon reinforced PEEK.

### • SHAFTS

- Shafts are 316 stainless steel or Alloy C.

### • BEARINGS

- Full gear diameter carbon sleeve bearings for maximum chemical resistance and high load capacity. PTFE or Rulon® plastic bearings available for product purity.

### • SEALS

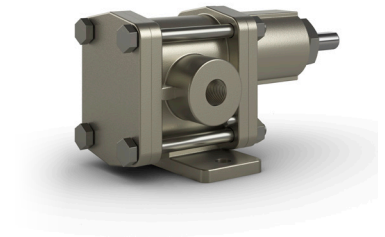
- Single and/or double mechanical seals are offered in elastomer bellows and PTFE wedge designs. Bellows design available with Viton® or EPDM formed elastomer shaft seal. Wedge designs available with PTFE wedge shaft seal and perfluoroelastomer stationary seat o-rings.

### • BODY/COVER O-RINGS

- PTFE encapsulating, silicone o-rings provide elastic memory to assure an effective long lasting seal avoiding the re-torquing required of pumps using pure TFE.

### • CLOSE-COUPLED MAG DRIVE PUMPS

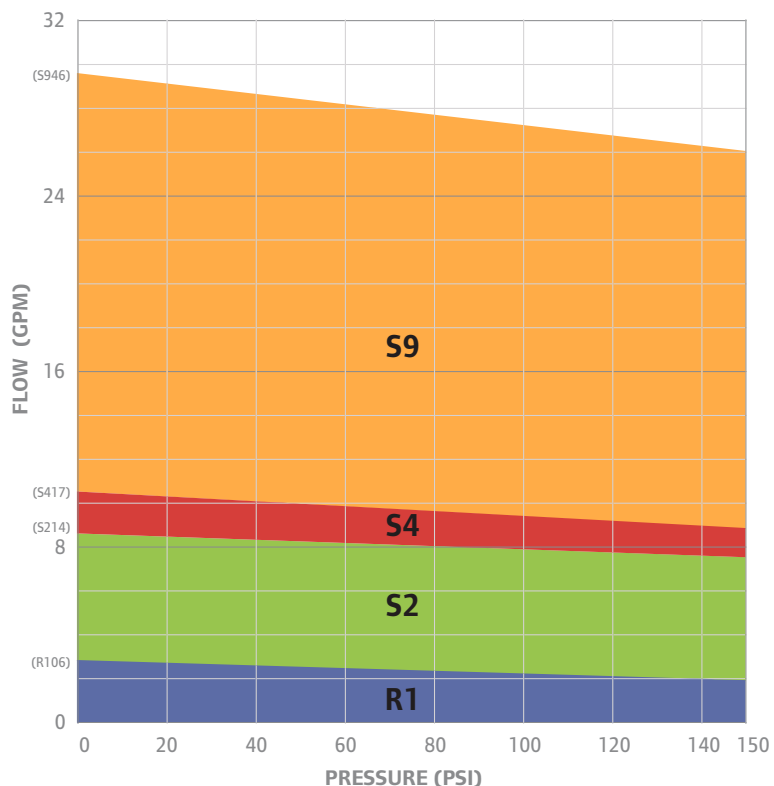
- Body 316 SS and Alloy C constructions
- Gears PPS, Peek, 316 SS, W88, Alloy C and PTFE
- Shafts 316 SS or Alloy C
- Bearings Carbon, PTFE and Rulon®
- Samarium cobalt magnets
- Close-Coupled Adapters for NEMA and IEC standard motor frame sizes
- 316 Stainless Steel, and Alloy C containment cans
- 1/2 to 30 GPM



## Chemsteel Features

- Rugged, reliable pumps to meet your most demanding applications
- Wide range of gear and bearing materials to fit your application
- Flows from 0.5 to 30 GPM at 1750 RPM
- Standard Pump Pressures to 150 PSI
- MAG Drive Pump Pressures to 110 PSI
- Slotted bearings to lubricate shaft and gear surfaces
- Effective housing seals with elastic memory prevent leakage of corrosives

**CHEMSTEEL HYDRAULIC RANGE @ 1750 RPM**



## Chemsteel Series Overview

FAMILY	MAX FLOW (GPM)	BODY MATERIALS	SEAL TYPES	GEAR OPTIONS
R1	3	Stainless Steel, Alloy C	Mechanical, double lip	Stainless Steel, Alloy C, PPS, PEEK, W88, PTFE
S2	8	Stainless Steel, Alloy C	Mechanical, double lip	Stainless Steel, Alloy C, PPS, PEEK, W88, PTFE
S4	10	Stainless Steel, Alloy C	Mechanical, double lip	Stainless Steel, Alloy C, PPS, PEEK, W88, PTFE
S9	30	Stainless Steel, Alloy C	Mechanical, double lip	Stainless Steel, Alloy C, PPS, PEEK, W88, PTFE
RM1	3	Stainless Steel, Alloy C	Mag drive	Stainless Steel, Alloy C, PPS, PEEK, W88, PTFE
SM2	8	Stainless Steel, Alloy C	Mag drive	Stainless Steel, Alloy C, PPS, PEEK, W88, PTFE
SM4	10	Stainless Steel, Alloy C	Mag drive	Stainless Steel, Alloy C, PPS, PEEK, W88, PTFE
SM9	30	Stainless Steel, Alloy C	Mag drive	Stainless Steel, Alloy C, PPS, PEEK, W88, PTFE

## Chemsteel® Numbering System

### Example

S20716CCB

- Additional Options  
(Tandem, BSPT threads, Lower shaft, etc.)
- Shaft Seal Style, Materials
- Bearing Material Carbon Graphite
- Gear Material Combination W88
- Housing and Shaft Material 316 SS
- Flow Rate 07 (4 gpm @ 1725)
- Basic Pump Series S2

### 1. Basic Pump Series

SEAL-LESS MAG-DRIVE		SEALED	Flow Rate	Max Flow (0 psi)
Code	Metal	Code	Code	GPM @ 1725 RPM
RM1	X	R1	02	.5
	X		03	1.5
	X		04	2
	X		06	3
SM2		S2	03	1.5
			04	2
			05	2.8
	X		07	4
	X		10	5.6
	X		14	8
SM4	X	S4	17	10
			17	10
SM9	X	S9	23	15
	X		30	20
	X		35	23
	X		46	30

### 2. Housing and Shaft Material

CODE	HOUSING MATERIAL	SHAFT MATERIAL
1	316 Stainless Steel	316 Stainless Steel
3	Alloy C	Alloy C

Teflon® is a registered trademark of DuPont, an equivalent fluoropolymer may be used  
 Ryton® is a registered trademark of Chevron Phillips Chemical, an equivalent polyphenylenesulfide may be used  
 Peek® is a registered trademark of Victrex, an equivalent polyetheretherketone may be used  
 Grafoil® is a registered trademark of UCAR Carbon Technology, an equivalent may be used  
 Viton® is a registered trademark of DuPont Dow Elastomers, an equivalent fluoroelastomer may be used  
 Kalrez® is a registered trademark of DuPont Dow Elastomers, an equivalent perfluoroelastomer may be used  
 Rulon® is a registered trademark of Saint-Gobain, an equivalent compounded PTFE based material may be used

### 3. Gear Material Combination

CODE	DRIVE	IDLE
1	RYTON®	RYTON®
2	316 SS	PEEK®
3	PEEK®	PEEK®
4	Alloy C	Alloy C
5	Alloy C	Teflon®
6	W88	W88
7	Teflon®	Teflon®
8	W88	Teflon®
9	Alloy C	PEEK®
A	Alloy C	RYTON®
B	316 Stain. Steel	RYTON®
C	W88	RYTON®
D	W88	316 Stain. Steel
E	316 Stain. Steel	316 Stain. Steel
F	316 Stain. Steel	Teflon®
H	W88	PEEK®

### 4. Bearing Material

CODE	MATERIAL
C	Carbon Graphite Resin
P	Teflon®
J	Rulon®

### 5. Shaft Seal

CODE	STYLE			MATERIAL			
				Rotary Head	Stationary Head		
	Design	Seals	Case	Face	Elastomer	Face	O-Ring
B	Bellows	Single	316	Carbon	Viton®	Ceramic	Viton®
J	Bellows	Single	316	Silicon Carbide	EPDM	Silicon Carbide	EPDM
H	Bellows	Double	316	Teflon®	Viton®	Ceramic	Viton®
Z	Bellows	Single	316	Silicon Carbide	Viton®	Silicon Carbide	Viton®
A	Wedge	Single	316	Carbon	Teflon®	Ceramic	Kalrez®
C	Wedge	Single	316	Carbon	Teflon®	Silicon Carbide	Kalrez®
D	Wedge	Single	Alloy C	Carbon	Teflon®	Ceramic	Kalrez®
F	Wedge	Single	Alloy C	Carbon	Teflon®	Silicon Carbide	Kalrez®
V	Wedge	Single	Alloy C	Silicon Carbide	Teflon®	Silicon Carbide	Kalrez®
G	Wedge	Double	316	Carbon	Teflon®	Silicon Carbide	Kalrez®
L	Two Lips Seals		304	Viton® Backed By Teflon®			
W	Mag-Coupled			Samarium Cobalt			

### 6. Additional Options

CODE	OPTION
C1 through C7	Factory Installed Options
T1 through T13	Non-Metallic Gear • Temperature Trim
B	Bearing Flush Ports
E	BSPT Threads
XX	Specials - Consult Factory
M1 -M7	Factory Installed Close Coupled Adapter - Mag-Coupled



## Chemsteel Pump Selection Guide

The selection of the appropriate Chemsteel pump to fit a given application depends upon full knowledge of the application including both system parameters and fluid properties. Follow the guidelines given below when selecting a Chemsteel gear pump.

**CHEMICAL COMPATIBILITY:** Select the basic materials of construction for the pump based upon chemical compatibility. Refer to Chemical Resistance Charts to decide on acceptable materials of construction. Then, consider the fluid's lubricity.

**LUBRICITY:** As a general rule, use only metal/plastic, plastic/plastic, or W88/W88 gear combinations for non lubricating fluids, typically viscosities less than 25 centipoise. Drive/idle gear combinations of 316/316 and Alloy-C/Alloy-C must only be used with lubricating fluids to avoid galling.

**PRESSURE:** Refer to the following table for limitations on pressure for various constructions. (Not applicable to tandem pumps, consult factory.)

### A. Housing and Shaft Material

GEAR COMBINATION	MAXIMUM DIFFERENTIAL PRESSURE		
	Carbon Bearings	Teflon Bearings	Rulon Bearings
Plastic/Plastic	50 psi	50 psi	50 psi
Metal/Plastic	100 psi	50 psi	75 psi
Metal/Metal*	150 psi	Not Available	100 psi

### B. Housing

HOUSING	MAXIMUM DIFFERENTIAL PRESSURE	MAXIMUM SYSTEM PRESSURE
Metal	150 psi	300 psig, R1 and R2 Series
Metal	150 psi	225 psig, S4 and S9 Series

**TEMPERATURE:** Refer to the following table for selection of the appropriate Trim Code when using plastic gears. Teflon or PEEK gears must be trimmed for applications exceeding 110°F. Ryton gears (to a maximum temperature of 200°F) in either a Ryton or metal housing are thermally stable and do not require trimming.

TRIM CODE	TEFLON/RULON	PEEK
T1	115-134°F	200-239°F
T2	135-154°F	240-279°F
T3	155-174°F	280-319°F
T4	175-194°F	320-359°F
T5	195-215°F	360-400°F
T6	216-236°F	
T7	237-257°F	
T8	258-278°F	
T9	279-299°F	
T10	300-320°F	
T11	321-341°F	
T12	344-362°F	
T13	363-383°F	

CODE	MAGNET MATERIAL	TEMPERATURE LIMIT
W	Samarium Cobalt	400°F

Chemsteel pumps can be applied for temperatures as low as -40°F for pumps of plastic construction, or -50°F for pumps of metal construction.

**SPEED:** All Chemsteel pumps are rated for operation at a speed of 1750 RPM.

**LIFE AND NOISE:** Pump life will always be extended and noise reduced by selection of either a plastic/plastic or metal/plastic gear combination. Also, the Chemsteel product line provides the user with the quietest operation possible by offering both plastic combinations of gears and a helical gear profile.

**RHEOLOGY:** The power requirement for a given pump will increase with fluid viscosity. For Newtonian fluids (where viscosity is not a function of shear) the table in the following section can be used directly. For non-Newtonian fluids, some adjustment must be made.

For shear thinning fluids (Thixotropic or Pseudo Plastic), the dynamic viscosity may be considered to be approximately 25% of the viscosity tabulated in the literature. For those fluids that are shear thickening (Dilatant, Bingham Plastic), extra care should be taken when selecting the appropriate pump and motor requirements. Usually, a trial would be well advised.

**VISCOSITY:** When pumping viscous fluids, the horsepower required of the drive motor will increase. Refer to the following table for the appropriate multiplier to be used against the horsepower required when pumping water. “Water horsepowers” are available by reference to the individual flow curves that are available for all Chemsteel pumps.

Also, the pump speed must be reduced for viscous fluids. Follow the guideline below for maximum shaft speed. Users should be advised to increase the pipe size by one size over the pump’s standard connection size on the inlet of the pump. On the discharge of the pump, the line size may similarly be increased if the user encounters excessive back pressure.

### Chemsteel Pumps - High Viscosity Fluids, Power Requirement

I. VISCOSITY				II. MAXIMUM SHAFT SPEED	III. MULTIPLIERS FOR HORSEPOWER (MULTIPLY X WATER HORSEPOWER)					
Liquid @ 70°F	Centipoise CP @ 0.8 S.G.	Centistokes CS	Viscosity SSU	RPM	2 psi	20 psi	40 psi	60 psi	80 psi	100 psi
Water	1	1	5	1750	1.00	1.00	1.00	1.00	1.00	1.00
	9	11	50	1750	1.00	1.05	1.00	1.00	1.00	1.00
No. 2 Fuel Oil @ 57°F	17	22	100	1700	1.10	1.10	1.05	1.05	1.00	1.00
	43	54	250	1600	1.20	1.15	1.10	1.10	1.05	1.05
SAE 10 Oil @ 62°F	86	108	500	1500	1.30	1.25	1.20	1.15	1.10	1.10
	130	162	750	1400	1.45	1.35	1.25	1.20	1.15	1.15
SAE 30 Oil @ 72°F	173	216	1000	1300	1.60	1.50	1.40	1.30	1.25	1.20
	432	540	2500	1200	1.90	1.75	1.60	1.45	1.35	1.30
SAE 60 Oil @ 70°F	864	1080	5000	1000	2.20	2.00	1.80	1.60	1.50	1.40
	1296	1620	7500	850	2.60	2.30	2.00	1.80	1.70	1.60
SAE 70 Oil @ 60°F	1728	2160	10000	600	3.00	2.60	2.20	2.00	1.90	1.80
	4320	5400	25000	500	3.50	3.00	2.70	2.40	2.20	2.00
No. 6 Fuel Oil @ 70°F	8640	10800	50000	400	4.00	3.60	3.20	2.80	2.50	2.20
	12960	16200	75000	300	4.50	4.10	3.60	3.15	2.75	2.35
No. 6 Fuel Oil @ 60°F	17280	21600	100000	200	5.00	4.50	4.00	3.50	3.00	2.50

# Keeping Industries Flowing Since 1890

Oberdorfer™ Pumps has been propelling the pumping industry forward since we manufactured our first pump in 1890.

## We manufacture Stainless Steel and Alloy C pumps for demanding applications.

Our Chemsteel pumps are used in the following industries and applications, among others:



### CHEMICAL PROCESSING

- Acid and caustic pumping and metering
- Pumping adhesives and coatings



### GENERAL INDUSTRIAL

- Acid and caustic pickling and finishing
- Chemical mixing and blending



### OIL AND GAS

- Blending and metering for chemicals in fracking trailers



### FOOD AND BEVERAGE

- Brine Injection
- Raw material handling
- Clean-in-place systems dispensing cleansing chemicals



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