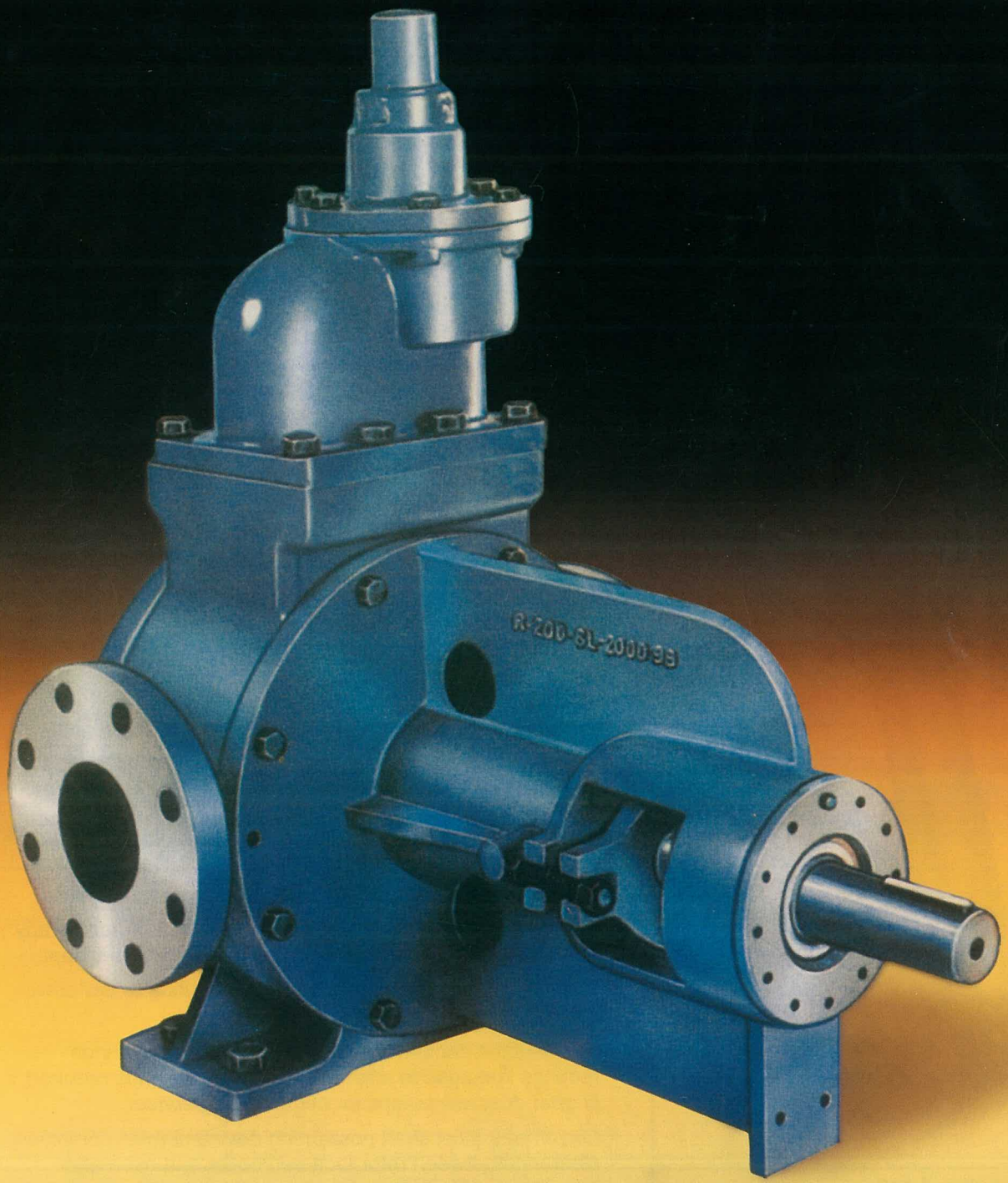
Colfax™ Corporation

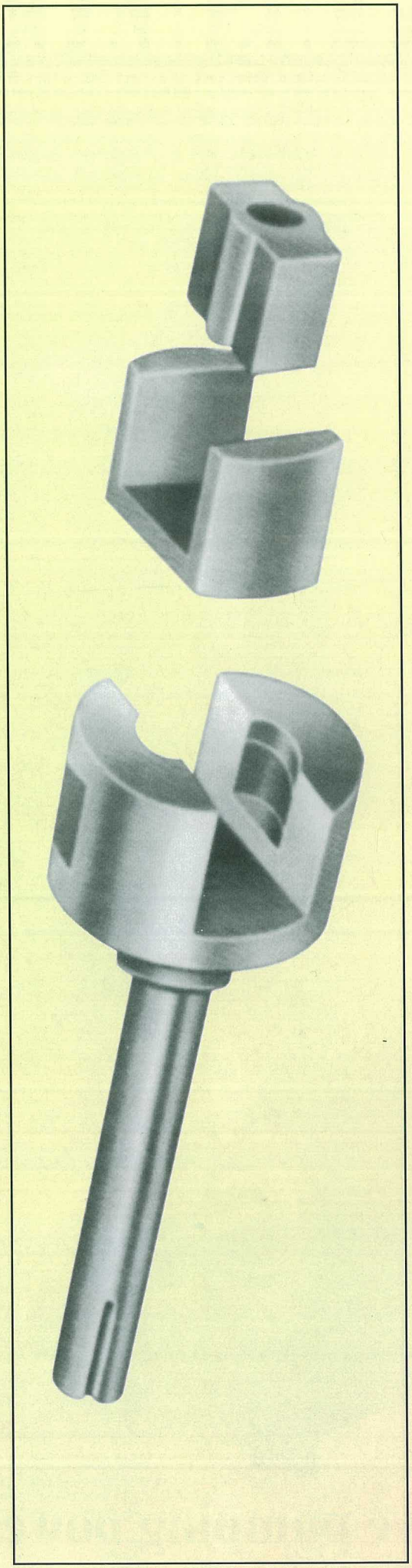
TUSHACO®

SHUTTLE BLOCK PUMPS



Performance proven positive pumping power!

TUSHACO® SHUTTLE BLOCK PUMP IS A ROTARY PISTON PUMP!



OPERATING PRINCIPLE

TUSHACO SHUTTLE BLOCK series employs a unique pumping principle - a combination of Rotary and Piston Pump. Two Double acting pistons in their respective cylinders at right angles to each other, accomplish this, while the rotor turns without the need for any valving. The shuttle block pump is a self-priming Rotary Pump.

There are only three pumping elements - ROTOR, PISTON and SHUTTLE. Rotor is keyed to a single shaft and runs concentric in pump casing. It has a rectangular slot across its face. The channel-shaped piston reciprocates within this slot. A rectangular block, shuttle, fits liquid tight in piston slot and reciprocates. The reciprocating action of piston in rotor and shuttle in piston is due to an eccentric pin fixed on the pump cover and engaging the shuttle bore as the rotor turns in the pump casing.

Like a true piston pump, this pump can handle highly viscous liquids or thin volatile material with unmatched suction characteristics and yet smoothly without pulsation. This pumping principle - unlike centrifugal or gear pumps - gently handles the product without breaking it down, emulsifying, foaming, chewing or heating. an added advantage at no extra cost. Such a simple construction has resulted in extremely rugged and maintenance-free pumps with very low noise levels. Most of the difficult pumping problems can be overcome by a shuttle Block Pump.

ADVANTAGES

- Piston type pumping action with only four overlapping strokes per revolution contributes to excellent suction. Very high viscocity fluids including pasty and lumpy substances can be pumped with ease.
- Single shaft design with one long sleeve-bearing support and external ball bearing ensures vibration-free smooth running and also permits the use of belt/chain drives. Bearing does not get contaminated with pumping fluid.
- Pump elements can be inspected and serviced at installation by 'Front Pull Out' design without the need to disconnect pipes, coupling or motor or any other parts by simply unscrewing the cover belts.
- Large contact areas between rotor elements result in low unit pressures and less wear and tear unlike in gear pumps. The elements are in hydrodynamic balance.
- Slow speed operations contribute to high reliability and excellent service life without the need for maintenance.
- Shuttle block pumping principle gently moves the product without shear, foaming, agitating, heating, emulsifying or chewing - a positive advantage over conventional gear rotary pumps.
- Pumping elements are of simple geometric form. In an emergency these parts can be locally manufactured by any small repair shops without having to shut down the plant.
- Volumetric efficiency is very high, contributing to low power requirements due to true piston action.
- Single gland construction even with external bearings reduces leakages to minimum, unlike four glands required in gear or screw pumps for comparable service.
- Micrometer axial shaft positioning device permits controlled clearence between rotor face and cover and even after long use, wear can be compensated by simple adjustment at site to restore pumping capacity.
  (Practically impossible in other designs like gear/vane/screw pumps.)

CONSTRUCTION

Shuttle block pumps can be supplied in various materials like cast iron/steel/bronze or combination. The pumps can be provided with jacket for heating or cooling and this can be done even on existing installation. Shaft sealing is normally packed gland but mechanical seal can also be provided.

DRIVE

All shuttle block pumps are designed for direct drives or through vee belts, or chain drives without the need for additional bearings supports.

APPLICATIONS

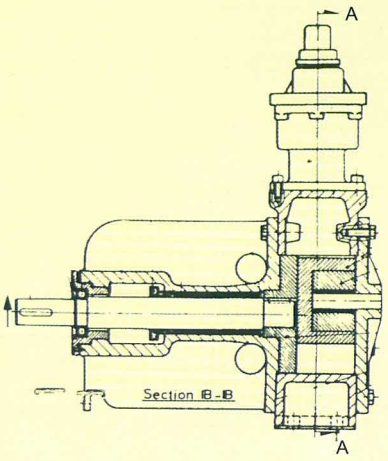
Loading, unloading, transfer, circulations and process pumping of a very wide range of products typically as thin as diesel oil to extremely viscous substances like chocolate. Common applications include unloading of tank lorries and rail cars, loading of railcars, tank lorries and barrel filling. For tank to tank transfer and process pumping the shuttle block pumps can handle situations very successfully where normal gear pumps or sophisticated screw pumps may fail to perform.

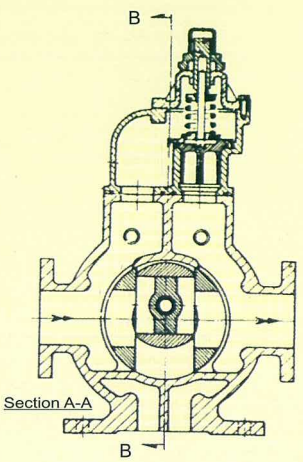
TYPICAL LIQUID LIST

Bitumen, Caustic Soda, Chocolate, Corn Syrup, Coal Tar Pitch, Crude Oil, Enamel, Edible oils, Fatty Acid, Fuel oil (LDO, LSHS, HHS, RF, O) Glue-Hot, Grease, Kerosene, Lacquer, Lard-Hot, Linseed oil, Lubricating Oil, Molasses, Naphtha, Palm oil, Paint, Petroleum, Printing Ink, Resin, Shellac, Soap liquor, Sodium Silicate, Starch, Sugar Syrup, Tar, Turpentine, Varnish, Wax, etc.

VISCOSITY CONVERSIONS

KINEMATIC VISCOSITY Cst	DEGREE ENGLER °E	SECONDS REDWOOD 1 "R	SECONDS SAYBOLT SSU
2	1.12	31	33
7	1.6	45	50
12	2	58	66
20	3	85	100
37	5	150	175
75	10	305	345
150	20	612	695
400	50	1,635	1,850
750	100	3,060	3,475
1,500	200	6,125	7,000





CHARACTERISTICS OF SHUTTLE BLOCK SERIES

TESTING OIL : LUBE OIL
VISCOSITY : 50 Cst
POWER & CAPACITY : VDMA 24284 GROUP II

TYPE: R-50-SL						SPEED: 1000 RPM
HEAD	KG/Cm²	0	2	4	6	8
	P.S.I.	0	28.45	56.89	85.34	113.79
CAPACITY	L.P.M.	260	257	253	251	244
	G.P.M.	57.77	57.11	56.22	55.77	54.22
POWER	K.W.	1.5	1.7	2.5	3.7	4.8
	H.P.	1.9	2.26	3.33	4.93	6.39

TYPE: R-100-SL						SPEED: 720 RPM
HEAD	KG/Cm²	0	2	4	6	8
	P.S.I.	0	28.54	56.89	85.34	113.79
CAPACiTY	L.P.M.	452	444	431	415	392
	G.P.M.	100.4	98.68	95.78	92.22	87.11
POWER	K.W.	1.8	2.2	3.6	5.2	6.6
	H.P.	2.39	2.93	4.8	6.93	8.79

TYPE: R-200-SL					SPEED: 400 RPM
HEAD	KG/Cm²	0	2	4	6
	P.S.I.	0	28.45	56.89	85.34
CAPACITY	L.P.M.	970	940	918	851
	G.P.M.	215.56	208	204	189
POWER	K.W.	4.85	8.31	13.02	18.00
	H.P.	6.47	11.08	17.36	24.0

USEFUL DATA

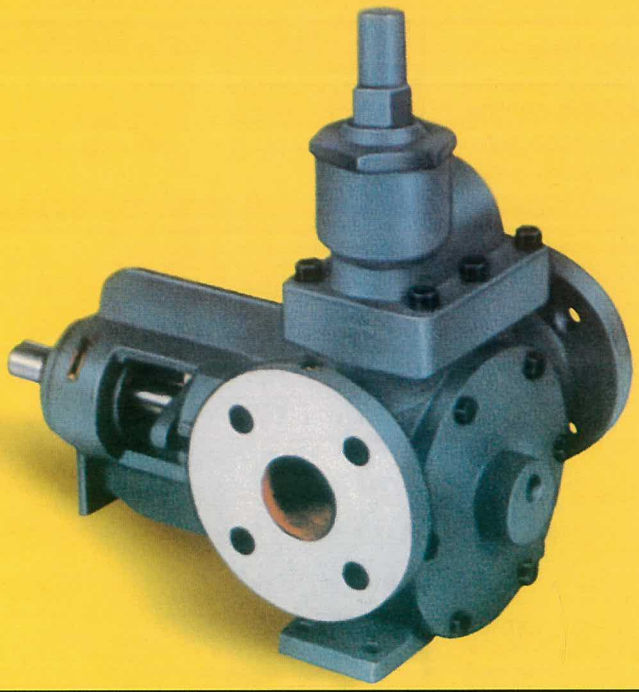
PUMP SIZE	PORT SIZE DIN-Np 16 ASA-150 #	SHAFT CENTRE HEIGHT± 0.5	SHAFT DIA k6	WT. IN. Kg.
R- 50-SL	50	100	28	40
R- 100-SL	80	133.3	28	55
R- 200-SL	100	216	48	160

OTHER TUSHACO DESIGNS OF ROTARY PUMPS:

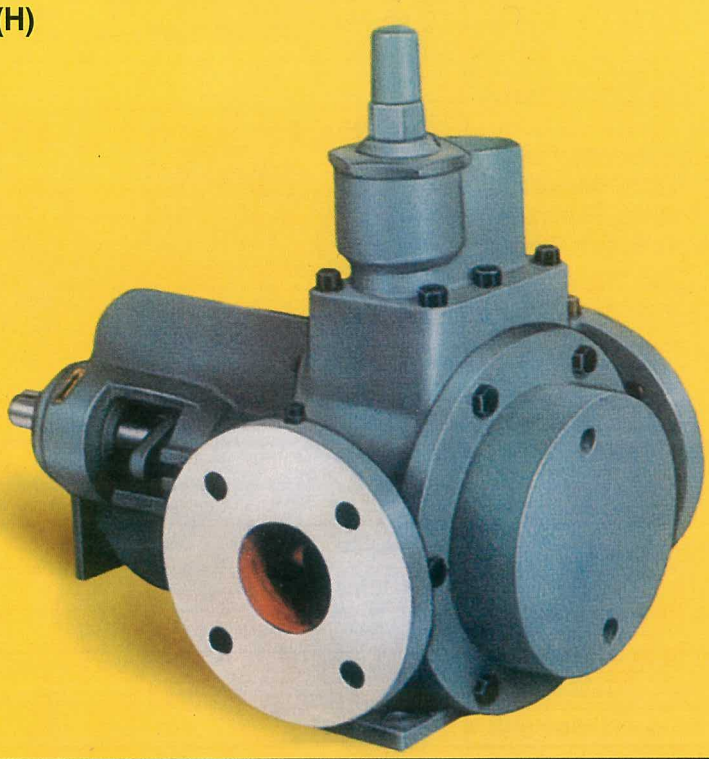
Internal Gear, External Gear,
Internal lobe (Trichoidal), Vane,
Three screw, Twin screw,
Progressive cavity.

Capacity range 3 LPM to 16,000 LPM
pressure upto 280 bar,
viscosity upto 1,00,000 cSt and more.

TUSHACO® PUMPS



R-50-SL (H)



R-100-SL (H) with Jacketed Cover

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