MATERIALS OF CONSTRUCTION

Models: NP1.5B, NP2F, NP2.5F, NP3F, NP4F

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Section	103

NOTE: Temperature and viscosity ratings given below apply to individual components **Only.** For actual maximum temperatures and viscosities for the rated pump, see **"Operating Limits"** on backside.

PART NAME		STANDARD MATERIALS	AVAILABLE OPTIONS
Cylinder	1.5" – 3"	Cast Iron: ASTM A48	Cast Iron with SAE Drain (1.5 – 3")
	4"	Ductile Iron: ASTM 536, 18%	Ductile Iron with SAE Drain (4")
Heads	1.5"	Cast Iron: ASTM A48	**Jacketed Heads:** Cast Iron: ASTM A48, 3/8" NPT Connection
	2", 2.5", 3", 4"	Ductile Iron: ASTM 536, 18%	Ductile Iron: ASTM 536, 18% 3/4" NPT Connection
Packing Follower	1.5"	Cast Iron	
	2", 2.5", 3", 4"	Ductile Iron	
Bearing Covers	1.5"	Cast Iron	
	2", 2.5", 3", 4"	Steel	
Bearing Bushing		Metallized Carbon	
Rotor & Shaft		Open Rotor	Closed Rotor – (125) psi maximum differential pressure (3" & 4" only)
Rotor		Ductile Iron: ASTM 536, 18%	Cast Iron: ASTM A48
Shaft		High Strength Steel	High Strength Steel
Relief Valve (R/V)		Cast Iron: ASTM A48	Nickel Plated Cast Iron
Relief Valve Cover		Cast Iron: ASTM A48	Ductile Iron: ASTM 536, 18%
Relief Valve Cap	1.5", 2", 2.5"	Brass: ASTM B16	
	3", 4"	Ductile Iron: ASTM 536, 18%	
Relief Valve Spring		Plated Steel to 300°F (149°C)	Stainless Steel to 500°F (260°C)
R/V Spring Ranges	1.5", 2", 4"	51-75 psi (3.5-5.2 bar)	Optional springs range from 35-200 psi (2.4-13.8 bar) - See Parts List.
	2.5", 3"	51-110 psi (3.5-7.6 bar)	
O-Rings:		Fluorocarbon (FKM) to 400°F (204°C)	PTFE to 500°F (260°C)
Gaskets: RV Cap, 1.5", 2", 2.5"		Copper	
Gaskets: RV Cap, 3", 4"		PTFE	
Gaskets: NPT Flange		Composition to 500°F (260°C)	
Shaft Sealing		PTFE Packing to 500°F (260°C)	Lip Seal – Carbon Filled PTFE to 500°F (260°C) Commercial Options - See Page 2
Vanes		**Duravane -** Full Size with Stainless Steel Wear Plate to 240°F (115°C); 20,000 SSU (4,250 cP) Maximum.	**EC Laminate** - Extra-Clearance with Stainless Steel Wear Plate to 350°F (176°C); 40,000 SSU (8,500 cP) Max. (Not avail. on 1.5" models.) **EC Cast Iron** - Extra-Clearance to 500°F (260°C); 500 SSU (105 cP) Min. **EC Bronze** - Extra-Clearance to 500°F (260°C); 500 SSU (105 cP) Minimum.
Push Rods		Case Hardened Steel	
Gage Ports		1/4" NPT	

Centipoise (cP) = centistokes (cSt) at fluid specific gravity of 1.0.

BLACKMER TRIPLE –LIP SEAL

PERFORMANCE		**MATERIALS**	
Pressure	Seal to 150 PSI (10 bar)	Metal Parts	316SS
Vacuum	Full vacuum when element is facing away from vacuum source	Set Screws	Hastelloy C
Temperature	To 300ºF (150ºC) Over 300ºF Consult Factory	O-Rings	AFLAS ®
Surface Speed	To 700 fpm (3.5 m/s) dry running; Over 700 fpm consult Factory	Seal Elements	PTFE
Runout	.005" T.I.R. (.13 mm)	Sleeve Coating	Chrome oxide standard
Axial end Play	Not Affected		

Optional Commercial Mechanical Seals

John Crane #9 Max. Temperature: 350°F (176°C) Max. Viscosity: 7200 SSU (1500 cP)	**John Crane 5610** Max. Temperature: 400°F (204°C) Max. Viscosity: 7200 SSU (1500 cP)
NP1.5" ONLY: (Ni-resist, Carbon, FKM)	NP2" – 4" Models: Single Cartridge (Sil-Car, Carbon, FKM)

PIPE COMPANION FLANGES

PUMP SIZE	**STANDARD**	**OPTIONAL[1]**
1.5"	1.5" NPT Tapped Ports	
2"	2" Cast Iron, ASTM A48, NPT Tapped	2" Steel Weld, ASTM A216 WCB 2" 150# RF ANSI compatible
2.5"	2.5" Cast Iron, ASTM A48, NPT Tapped	2.5" Steel Weld, ASTM A216 WCB 2.5" 150# RF ANSI compatible
3"	3" Cast Iron, ASTM A48, NPT Tapped	3" Steel Weld, ASTM A216 WCB 3" 150# RF ANSI compatible
4"	4" Cast Iron, ASTM A48, NPT Tapped	4" Steel Weld, ASTM A105 4" 150# RF ANSI compatible

[1] Consult Factory for Availability of ANSI Compatible Raised Faced Flanges.

OPERATING LIMITS

	STANDARD MATERIALS	**OPTIONAL MATERIALS**
Maximum Temperature	240°F (115°C)	500°F (260°C) With PTFE O-Rings, Metal Vanes, Stainless R/V Spring
Maximum Viscosity	20,000 SSU (4,250 cP)	100,000 SSU (22,000 cP) with Metal Vanes & Open Rotor Consult Factory for Higher Viscosities
Maximum Jacketed Head Pressure	150 psi (10.3 Bar)	
Maximum Differential Pressure*	150 psi (10.3 Bar) – Open Rotor 125 psi (8.6 Bar) – Closed Rotor	200 psig (13.8 bar) with High Press. Relief Valve Option & Open Rotor
Maximum Working Pressure	175 psig (12.1 Bar)	225 psig (15.5 bar) with High Press. R/V Option and Mechanical Seal
Maximum Inlet Pressure	25 psig (1.7 Bar)	

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* Maximum Relief Valve Setting

Centipoise (cP) = centistokes (cSt) at fluid specific gravity of 1.0.

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