



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	Ductile Iron with SAE Drain (4")
Heads	1.5"	Cast Iron: ASTM A48	Jacketed - Cast Iron: ASTM A48, 3/8" NPT Connection
	2"	Ductile Iron: ASTM 536	Jacketed - Ductile Iron: ASTM 536, 3/4" NPT Connection
	2.5", 3", 4"	Ductile Iron: ASTM 536	Jacketed - Ductile Iron: ASTM 536, 3/4" NPT Connection Electric Heat – D. Iron ASTM 536, Three 12.5 mm Bore Pots
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	
Bushing (Sleeve Bearing)		Metallized Carbon	
Rotor & Shaft		Open Rotor	Closed Rotor – (125) psi maximum differential pressure (3" & 4" only)
Rotor		Ductile Iron: ASTM 536	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	1.5" – 3"	Cast Iron: ASTM A48	Ductile Iron: ASTM 536 (with 200 psi RV spring only)
	4"	Ductile Iron: ASTM 536	
Relief Valve Cap	1.5", 2", 2.5"	Steel	
	3", 4"	Ductile Iron: ASTM 536	
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) Buna-N to 240°F (115°C)
Gaskets: RV Cap	1.5", 2", 2.5" 3", 4"	Copper	
		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. (NP4: 150 psi 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) Minimum. EC Bronze - Extra-Clearance to 500°F (260°C); 500 SSU (105 cP) Minimum.
Push Rods		Case Hardened Steel	
Gage Ports		1/4" NPT	

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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 300°F (150°C) Over 300°F 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

NP1.5" only: John Crane #9 Max. Temperature: 350°F (176°C) Max. Viscosity: 7200 SSU (1500 cP) Ni-resist, Carbon, FKM	NP2" – NP4" models: John Crane 5610 Max. Temperature: 400°F (204°C) Max. Viscosity: 7200 SSU (1500 cP) Single Cartridge, Sil-Car, Carbon, FKM
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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

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. NP4 also requires Laminate, Brass or Iron Vanes.
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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Centipoise (cP) = centistokes (cSt) at fluid specific gravity of 1.0.

* Maximum Relief Valve Setting

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