ENGINEERING SERVICES DEPARTMENT

Hot Demin Water Supply Pump P1704 Specification Sheet

Project	CWOPG Demonstration Facility	**Unit Tag Number**	P1704
Datasheet Document No.	ENS-OWPVR-SPE-25019	**Revision**	1
Description	Demineralised water is filled into the hot water supply tank T1702 in the Contaminated Waste Oil Plasma Gasification (CWOPG) Demonstration Facility, after which the water in the tank is heated by an electrical heater H1703 to the desired temperature of 80°C. Pump P1704 is then used to supply hot demineralised water from the tank to the oil heater H1005 to heat up the oil before the water is recirculated back to the tank at a temperature of 70°C.		
Plant Location	NECSA, Pelindaba, North-West Province.		
Equipment Location	CWOPG Demonstration Facility - Outside Laboratory 150, north side of Building V-H2.		
Safety Classification	Non-classified (N) & SC-3 (C) [h]		
Quality Classification	Non-classified (N) & QC-3 (C) [f]		

FLUID PROPERTIES

Process Fluid	Hot demineralised water.
Solids Content	Assumed to be zero due to strainer installed upstream of the pump.
Corrosive Due To	N/A

PARAMETERS	**UNITS**	**MINIMUM**	**NORMAL**	**MAXIMUM**
Operating Temperature	**°C**	50	80	100
Fluid Density	**kg/m^3**	988	972	958
Viscosity	**kg/m.s**	5,16 x 10^{-4}	3,46 x 10^{-4}	2,75 x 10^{-4}
Liquid Vapour Pressure	**kPa(a)**	12,33	47,35	101,33

HYDRAULIC PROPERTIES

PROPERTIES	**UNITS**	**MINIMUM**	**NORMAL**	**MAXIMUM**
Flow Rate [2]	**L/h**	6,24	20,80	24,96
Pump Inlet Pressure [4]	**kPa(a)**	91,26	91,19	91,13
Pump Outlet Pressure [4]	**kPa(a)**	120,34	210,86	252,49
Pressure Differential [4]	**kPa**	29,08	119,67	161,36
Required Pump Head [2]	**m**	3,00	12,55	17,17
NPSH Available [2]	**m**	4,60	4,60	4,60

GENERAL PROPERTIES

Type of Pump Recommended	Centrifugal Pump			
Pump Direction	**Horizontal:**	☑	**Vertical:**	☐

ELECTRICAL & GENERAL PROPERTIES

Volts	Supplier to advise
Phase	Supplier to advise
Hz	Supplier to advise

MECHANICAL PROPERTIES

Type of Seal	**Mechanical**	☑	**Magnetic**	☐	**Stuffing box**	☐
Dry Run Protection	Yes - Supplier to provide					
Impellor Material	Supplier to advise					
Pump Casing Material	Supplier to advise					
Type of Seal	Supplier to advise					
Shaft Material	Supplier to advise					

PIPE NOZZLE

Pipe Suction	**Size:**	15 NB	**Rating:**	Class 150	**Flange Spec. :**	SS, ASTM A182-F316/316L, ASME B16.5, RF
Pipe Discharge	**Size:**	15 NB	**Rating:**	Class 150	**Flange Spec. :**	SS, ASTM A182-F316/316L, ASME B16.5, RF

POWER

Absorbed Power	Supplier to advise
Installed Power	Supplier to advise
Noise Criteria	Maximum allowable sound level is 85 dB(A) at a distance of 1 m from pump

VENDOR DATA REQUIRED WITH TENDER

1. **Pump performance curve**
2. **Pump duty**
3. **Pump efficiency**
4. **Pump rotational speed**
5. **Pump dimensions with baseplate**

ENGINEERING SERVICES DEPARTMENT			
Hot Demin Water Supply Pump P1704 Specification Sheet			
Project	CWOPG Demonstration Facility	**Unit Tag Number**	P1704
Datasheet Document No.	ENS-OWPVR-SPE-25019	**Revision**	1

REFERENCE DRAWINGS AND DOCUMENTS

[1] ENS-OWPVR-PID-24008: Uranium Contaminated Waste Oil Plasma Gasification P&ID – Utilities System

[2] ENS-OWPVR-REP-25009: Centrifugal Pumps Sizing Report for Uranium Contaminated Waste Oil Plasma Gasification (CWOPG) Facililty

[3] ENS-OWPVR-CLC-24002, Mass & Energy Balance Calculations for the Detailed Design of the Uranium Contaminated Waste Oil Plasma Gasification Project

[4] Learman, Simon. (2009). Pump Sizing Calculator, Blackmonk Engineering Ltd

NOTES AND ABBREVIATIONS

[a] ASME - American Society of Mechanical Engineers

[b] ASTM - American Society for Testing and Materials

[c] dB - Decibel

[d] NB - Nominal Bore

[e] N/A - Nominal Applicable

[f] QC - Quality Class

[g] RF - Raised Face

[h] SC - Safety Class

[i] SS - Stainless Steel

[j] Supplier to advise on special requirements for installation of pump

Function	Name	Signature & Date
Prepared	N. Mokoena (Process Engineer)	Signed by Nkosinathi Mokoena, Nkosinathi.mokoena@necsa.co.za 06/03/2025 10:12:04(UTC+02:00) SIGNFLOW
Checked	N. Manilal (Process Engineer)	Signed by Nikhil Manilal, nikhil.manilal@necsa.co.za 06/03/2025 10:42:24(UTC+02:00) SIGNFLOW
Checked	M. Nteo (Mechanical Engineer)	Signed by Makgetha Nteo, makgetha.nteo@necsa.co.za 06/03/2025 10:44:51(UTC+02:00) SIGNFLOW
Checked	M. Correia (Senior Process Engineer)	Signed by Michelle Correia, correiam2504@gmail.com 06/03/2025 15:33:39(UTC-04:00) SIGNFLOW
Checked	S. Mngoma (Chief Mechanical Engineer)	Signed by Sibongeleni Mngoma, Sibongeleni.mngoma@necsa.co.za 10/03/2025 09:00:57(UTC+02:00) SIGNFLOW
Checked	G. Manuel (Chief C&I Engineer)	Signed by Grant Manuel, grant.manuel@necsa.co.za 10/03/2025 11:18:57(UTC+02:00) SIGNFLOW
Checked	W. van den Berg (Chief Electrical Engineer)	Signed by Willem Van Den Berg, willem.vandenberg@necsa.co.za 10/03/2025 11:57:06(UTC+02:00) SIGNFLOW
Approved	K. Moodley (Chief Process Engineer)	Signed by Kasuren Moodley, kasuren.moodley@necsa.co.za 10/03/2025 14:43:19(UTC+02:00) SIGNFLOW
Distribution	1. ES Records 2. Docman 3. W. Ludwick 4. D. Ngwenya	