ENGINEERING SERVICES DEPARTMENT

PLATE HEAT EXCHANGER H1603 SPECIFICATION SHEET

Project	NW PlasGas and WOPG	**Unit Tag Number**	H1603
Datasheet Document No.	ENS-NWPVR-SPE-24023	**Revision**	3

Description	Heat exchanger H1603 cools primary cooling water returning from users in the NW PlasGas Facility and the WOPG Facility. This is a plate exchanger, in which primary cooling water is contacted with secondary cooling water from cooling tower T1604, before it is returned to the primary cooling water tank, T1601.
Plant Location	Merged NW PlasGas Demonstration Facility and WOPG Facility Note 1
Equipment Location	At the cooling tower T1604 (outside Building V-H2, Laboratory 150)
Safety Classification	Non-classified(N) and SC-3 (C)
Quality Classification	Non-classified(N) and QC-3 (C)
Duty	207,85 kW [1] , Note 2

FLOW MEDIA

	UNITS	HOT MEDIUM		COLD MEDIUM	
		NW PlasGas	WOPG	NW PlasGas	WOPG
Media		Demineralised water		Process water	
Inlet temperature	**°C**	40 [1]		25 [1]	
Outlet temperature	**°C**	30 [1]		35 [1]	
Design temperature	**°C**	100		100	
Flow rate	**kg/s**	4,97	4,67 [3]	4,97	4,67 [3]
Maximum operating pressure	**kPa(g)**	600		600	
Permissible pressure drop	**kPa**	70		70	
Calculated pressure drop	**kPa**	Supplier to advise		Supplier to advise	
Design pressure	**kPa**	2000		2000	

FLUID PROPERTIES (at average temperature)

Density	**kg/m^3**	994 [2]	997 [2]
Specific heat capacity	**kJ/kg.K**	4,18 [2]	4,18 [2]
Thermal conductivity	**W/m.K**	0,622 [2]	0,614 [2]
Viscosity	**kg/m.s**	7,2E-04 [2]	7,64E-04 [2]
Corrosive		No	No
Erosive		No	No
Abrasive		No	No
Toxic		No	No
Presence of solids		No	No
Presence of uranic material		No	No

DESIGN DATA

Plate heat exchanger type		Supplier to advise	
Design duty (calculated)	**kW**	Supplier to advise	
Frame type		Supplier to advise	
Frame size (height, width, thickness)	**mm**	Supplier to advise	
Number of plates		Supplier to advise	
Maximum number of plates allowed		Supplier to advise	
Total active heat transfer area	**m^2**	Supplier to advise	
Nominal plate gap	**mm**	Supplier to advise	
Flow arrangement		Supplier to advise	Supplier to advise
Packed size	**mm**	Supplier to advise	
Mass of empty unit	**kg**	Supplier to advise	
Volume of fluid in exchanger	**m^3**	Supplier to advise	Supplier to advise

MECHANICAL PROPERTIES

Process connections	**Pipe size**	50NB, Sch 40	**Pipe size**	50NB, Sch 40
	Type	Raised Flanged (RF); 150 lb	**Type**	Raised Flanged (RF); 150 lb
	Material	304L Stainless Steel	**Material**	304L Stainless Steel
Material of construction	**Casing**	Carbon Steel	**Plates**	304L Stainless Steel
Surface finish	**Casing**	Supplier to advise	**Plates**	Supplier to avdise
Surface protection	**Casing**	Supplier to advise	**Plates**	Supplier to avdise
Corrosion allowance	**Casing**	0.00"	**Plates**	0.00"
Pressure rating	**Casing**	150 lb	**Plates**	150 lb

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SITE CONDITIONS

Altitude	**m**	1300
Site location		Pelindaba East, H-Building
Atmospheric pressure	**kPa(a)**	Min: 87,4 kPa: Max: 88,3 kPa
Ambient Temperature (min./max)	**°C**	Min: 2°C: Max: 32°C

REFERENCE DRAWINGS AND DOCUMENTS

[1] ENS-NWPVR-CLC-24012: Energy Balance Calculations for NW PlasGas Demonstration Facility

[2] www.engineeringtoolbox.com

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

NOTES

Note 1: The NW PlasGas and WOPG facilities will not be operated simultaneously. Therefore this heat exchanger will only be servicing one of the facilities at a time.

Note 2: The duty for the NW PlasGas facility is the enveloping duty. The duty for WOPG is lower (195,09 kW [3]).

Note 3: The heat exchanger shall be fully drainable in situ, with the drainage mechanism normally closed.

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