

ENGINEERING SERVICES DEPARTMENT									
BLOWER P1510 SPECIFICATION SHEET									
Project		NW PlasGas and CWOPG Projects			Unit Tag Number		P1510		
Datasheet Document No.		ENS-NWPVR-SPE-25007			Revision		2		
Description		Blower P1510 provides the driving force to extract the off-gas from the wet scrubber S1501 in the Low-level Waste Plasma Gasification (NW PlasGas) and Uranium Contaminated Waste Oil Plasma Gasification (CWOPG) Demonstration Facilities, and discharges the gas into the process ventilation system.							
Plant Location		Necsa, Pelindaba, North-West Province							
Equipment Location		Integrated NW PlasGas and CWOPG Demonstration Facilities Process area inside Laboratory 150, Building V-H2							
Safety Classification		SC-2(C) and SC-3(N)							
Quality Classification		QC-2(C) and QC-3(N)							
FLUID PROPERTIES									
Fluid		Off-gas mixture containing CO ₂ , HCl, HF, O ₂ and N ₂ ^{Note 4*}							
Solids content		Trace (<0,001 w/w) ^{[3], Note 5*}							
Moisture Content		Trace (<0,001 w/w) ^{[1], Note 6*}							
Installation		<div> <div>Outdoor</div> <div><input type="checkbox"/></div> <div>Indoor</div> <div><input checked="" type="checkbox"/></div> </div>							
Corrosive due to		HCl(g) - entering blower at a maximum rate of 10 g/h ^[1] HF(g) - entering filter at a maximum of 0.2 g/h only in the CWOPG Facility ^[9]							
PARAMETERS		UNITS		MINIMUM		MAXIMUM			
Operating temperature		°C		35 ^[1]		65 ^[1]			
Suction		kPa(g)		-		-12.5 ^[8]			
Discharge		Pa(g)		-25 ^{Note 8*}		Atmospheric ^{Note 9*}			
Fluid density		kg/m ³		0,84 ^{[5], Note 1}		2,1 ^{[5], Note 1*}			
Viscosity ^[7]		Pa.s		1,57E-05		0,0413			
Mass flow rate		kg/h		12,5 ^{[6], Notes 4 & 10*}		50,5 ^{[1], Note 4}			
Volume flow rate		m ³ /hr		14,88 ^{Note 2*}		24,05 ^{Note 2*}			
Pressure differential		kPa		12.5		-			
MECHANICAL, ELECTRICAL & GENERAL PROPERTIES									
Type of fan recommended		Regenerative		Insulation		TBD Vendor ^{Note 3*}		Application	
Electrical (Y/N)		Y		Volts		TBD Vendor		Off-gas extraction	
Wheel diameter		TBD Vendor		Blade Type		TBD Vendor		Phase	
Fan length		TBD Vendor		Fan width		TBD Vendor		Freq.	
Shaft dimensions		TBD Vendor		TBD Vendor		TBD Vendor		TBD Vendor	
Vibration Sensor (Y/N)		TBD Vendor		TBD Vendor		TBD Vendor		TBD Vendor	
Instruments on equipment		Run (Status) Indicator ^[2] - to communicate with centralized plant monitoring system in control room							
Motor specifications		Variable speed adjustment required. Supplier to advise further.							
Noise criteria		Maximum allowable sound level is 85 dB(A) at a distance of 1 m from blower							
PROCESS CONNECTION									
Pipe Suction Nozzle		Size		100NB		Rating		150#	
Pipe Discharge Nozzle		Size		100NB		Rating		150#	
Flange Spec.		SS, ASTM A182-F304/304L, ASME B16.5, RF		Flange Spec.		SS, ASTM A182-F304/304L, ASME B16.5, RF		Flange Spec.	
MATERIAL OF CONSTRUCTION									
Casing		TBD Vendor		Shaft		TBD Vendor		Shaft sleeves	
Fan Impellor		TBD Vendor		Base Plate		TBD Vendor		Seal type	
Hub		TBD Vendor		Belt		TBD Vendor		Helical Time gear	
VENDOR DATA REQUIRED WITH TENDER									
1 Fan performance curve				4 Fan dimensions					
2 Fan duty				5 Fan sound pressure level					
3 Fan efficiency				6 Fan rotational speed					
ACCESSORIES									
Inlet & Outlet Silencer		To Be Included		To Be Included		To Be Included		To Be Included	
Common Base Plate		To Be Included		To Be Included		To Be Included		To Be Included	
REFERENCE DRAWINGS AND DOCUMENTS									
[1] ENS-OWPVR-CLC-24002: Mass Balance & Energy Balance Calculations for the Basic Engineering Design of the Uranium Contaminated Waste Oil Plasma Gasification.									
[2] ENS-NWPVR-PID-24002: NW PlasGas Demonstration Plant P&ID Diagram - KOH Scrubber Sub-system 15									
[3] ENS-NWPVR-DES-24002: Process description for the NW PlasGas system									
[4] ENS-NWPVR-CLC-24018: Pressure Balance across the NW PlasGas Facility									
[5] Howard F. Rase, 1963: Piping Design for Process Plants, John Wiley & Sons, New York									
[6] ENS-NWPVR-CLC-24011: Mass Balance across the NW PlasGas Demonstration Facility									
[7] Robert Reid, 1987: The Properties of Gases and Liquids Fourth Edition									
[8] ENS-OWPVR-CLC-25010: Pressure Balance for the Uranium Contaminated Waste Oil Plasma Gasification Demonstration Facility									
[9] ENS-OWPVR-CLC-25006: Scrubber Design for the Uranium Contaminated Waste Oil Plasma Gasification Demonstration Facility									

NOTES			
Note 1. The minimum and maximum densities correspond to lower and upper extremities of the off-gas compositions obtained at any scrubbing phase from both the NW PlasGas and CWOPG Facilities, respectively.			
Note 2. These volumetric flowrates are obtained by taking the quotient of the mass flows obtained in [6] with the fluid densities estimated for the different scrubbing phases in this document.			
Note 3. "TBD Vendor" refers to information that will be specified by the vendor responsible for supplying the equipment.			
<p>Note 4. In both the NW PlasGas and CWOPG Facilities, the composition of the scrubber off-gas changes over time due to chemical reactions which take place in the scrubber. The gas compositions are as follows for the two facilities:</p> <p>[a] NW Plas Gas Facility: Gas composition (% w/w) is 1.3% CO₂, 0.1% HCl, 51.9% O₂ and 46.7% N₂ at the start of the process (phases 1 and 2 of scrubbing), and 74% CO₂, 0.02% HCl, 13.7% O₂ and 12.3% N₂ at the end of the process (phase 3 of scrubbing).</p> <p>[b] CWOPG Facility: Gas composition (% w/w) is 10.3% CO₂, 0.01% HCl, <0.01% HF, 56.7% O₂ and 33.0% N₂ at the start of the process (phases 1 and 2 of scrubbing), and 69.6% CO₂, Traces of HCl, Traces of HF, 19.2% O₂ and 11.2% N₂ at the end of the process (phase 3 of scrubbing).</p>			
Note 5. Two HEPA filters F1508A&B and F1509 are installed in series upstream of the blower			
Note 6. A moisture trap Y1511 is installed in the suction line upstream of the blower.			
Note 7. Inspection and testing shall be done in supplier facility.			
Note 8. This represents the suction pressure of the process ventilation system into which the blower P1510 discharges.			
Note 9. Atmospheric pressure on the Necsa site is typically 88 kPa(a).			
Note 10. The minimum flow rate is achieved at the start of the process (phases 1 and 2 of scrubbing) in the NW PlasGas facility, while the maximum flow rate is achieved at the end of the process (phase 3 of scrubbing), also in the NW PlasGas facility.			
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