

ENGINEERING SERVICES DEPARTMENT



MOISTURE TRAP SPECIFICATION SHEET

Project	PTFE Filter Destruction Project	Unit Tag Number	Y83153
Datasheet Document No.	ENS-FDP-SPE-24044	Revision	1.0
Description	Moisture trap Y83153 is installed on the process off-gas line 100-831-GOVP-023, downstream of the wet scrubber S83123 in the PTFE Filter Destruction Facility to remove any moisture, either in the form of water or as scrubbing liquid, above the saturation level in the gas.		
Plant location	Necsa, Pelindaba, North-West Province.		
Equipment location	PTFE Filter Destruction Facility - Inside secondary enclosure Y82020 in Laboratory-131, Building V-H2.		
Safety Classification	SC-2(C) and SC-3(N)		
Quality Classification	QC-2(C) and QC-3(N)		
Fluid ^{Note 1}	Scrubber off-gas containing CO ₂ , HF, O ₂ and N ₂ ^[3] , with traces of moisture.		
Fluid state	Gas		
Solid content	Possible PTFE and solid uranium compound particulates.		
Corrosive due to	Hydrogen Fluoride (HF) gas - produced at 7.92 g/h ^[2] .		

FLUID PROPERTIES

PARAMETERS	UNITS	MINIMUM	MAXIMUM
Operating temperature	°C	44,2 ^[3]	
Operating pressure	kPa (g)	-7,9 ^[4]	
Mass flow rate	kg/h	4,64 ^[2]	22,1 ^[2]
Volume flow rate	m ³ /h	5,46	18,3
Moisture content	g/h		10,7 ^{Note 3}
Density	kg/m ³	0,85	1,21 ^[4]
Viscosity	Pa.s	2,10E-02	1,7E-05 ^[4]
Specific heat capacity (C _p)	kJ/kg.K	1,02	0,63 ^[5]
Allowable pressure drop	kPa	1 ^[4]	

MECHANICAL & ELECTRICAL PROPERTIES

Pipeline Size	100 NB, SCH 40							
Material of Construction								
Body Material	SS, ASTM A182-F304/304L							
Process Connections								
Outlet	Size	4"	Rating	150#	Flange Spec.	SS, ASTM A182-F304/304L, ASME B16.5		
Input	Size	4"	Rating	150#	Flange Spec.	SS, ASTM A182-F304/304L, ASME B16.5		
Moisture Trap Type	Electronically operated							
Electrical Supply	kW	Supplier to advise	Volts	Supplier to advise	Phase	Supplier to advise	Hz	Supplier to advise

REFERENCE DRAWINGS AND DOCUMENTS

[1] ENS-FDP-PID-24003, PTFE Filter Destruction Project P&ID Diagram - KOH Scrubber System 831
[2] ENS-FDP-CLC-24014, Mass Balance Calculation for the PTFE Destruction System
[3] ENS-FDP-CLC-24015, Energy Balance Calculation for the PTFE Destruction System
[4] ENS-FDP-CLC-24019, Pressure Balance across the PTFE Filter Destruction System

NOTES

Note 1: The composition of the exhaust scrubber off-gas changes over time due to chemical reactions which take place in the scrubber. Gas composition (% w/w) is 0.32% CO ₂ , 0.17% HF, 34.83% O ₂ and 64.68% N ₂ at the minimum flow rate, and 79.06% CO ₂ , 0.04% HF, 7.32% O ₂ and 13.59% N ₂ at the maximum flow rate.
Note 2: Moisture trap to be supplied complete with integrated automatic drain valve, which does not allow release of off-gas during drainage, only moisture.
Note 3: Estimated to be 5% of water present in feed gas to wet scrubber upstream of moisture trap, taking note that the scrubber also contains an integrated demister to prevent liquid entrainment in the off-gas stream.

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