ENGINEERING SERVICES DEPARTMENT

FLAME ARRESTER SPECIFICATION SHEET

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Project	PTFE Filter Destruction Project	**Unit Tag Number**	Y83351
Datasheet Doc. No.	ENS-FDP-SPE-24045	**Revision**	2.0
Description	Flame arrester Y83351 is installed on the oxygen gas supply line 15-833-GSVP-064 to the Plasma Reactor R82018 in the PTFE Filter Destruction Facility [1], downstream of the pressure regulator PCV83345B. Its function is to allow flow of oxygen but prevent the transmission of flame from a downstream source, in the event of ignition taking place.		
Plant Location	Necsa, Pelindaba, North-West Province		
Equipment Location	PTFE Filter Destruction Facility - Outside Laboratory-131, Building V-H2		
Safety Classification	SC-3(C) and Non-classified (N)		
Quality Classification	SC-3(C) and Non-classified (N)		

Storage tank (T1602) [2], Note 1

Tank oxygen inventory/capacity	2496	kg liquid O_2					
☑ Above ground	Diameter	1,3	m	Design pressure	Note 1	kPa(g)	
☐ Buried	Height	2,5	m	Design vacuum	Note 1	kPa(g)	
☐ Insulated	Wall thickness	Note 1	m	Pumping-in rate	Note 1	m^3/h	
☐ ☐ Ins. Thickness	Note 1		mm	Pumping-out rate at 25 °C & 600 kPa(g) Note 3	7,2	m^3/h	
Blanketed	Blanketing gas	N/A		Design standard	Note 1		

Stored product

Component Name	Formula	Vol%	Mass%	Flashpoint °C	Haz. Group	MESG (mm)	Ex-Gr
Oxygen	O_2	>99	>99	N/A	2.2 (Non-Flammable Gas)	N/A	N/A

Process information

Design temperature	93 [6]	°C	Design pressure	20685 [6] and Note 4	kPa(g)
Operating temperature	Ambient		Operating pressure	600 [5]	kPa(g)
			Back pressure	N/A	kPa(g)

Installation

☑ In-line		☑ Horizontal	Distance to source of ignition	4	m
☐ End-of line		☐ Vertical	☐ Top of Tank/vessel		

Function

☐ Pressure		☐ Endurance burning proof	☐ Temperature monitored
☐ Vacuum		☐ Short term burning proof	
☐ Pressure & Vacuum		☑ Deflagration proof	☐ Pressure monitored
☑ Flame arrester		☑ Detonation proof	☐ Bi-directional

Flame arrester data

Size nominal	15 [3] Note 2	mm	Flow	2,4 [5]	m^3/h	Density	5,16 [4]	kg/m^3
Pressure nominal	400	kPa(g)	Inlet flange type		Screwed female BSPT			
Adjusted set pressure	Supplier to advise	kPa(g)	Outlet flange type		Screwed female BSPT			
Adjusted set vacuum	Supplier to advise	kPa(g)	Pressure drop		Supplier to advise			kPa(g)

Material Construction for body / flanges

Pressure carrying parts SS, 304/304L Class 1500	**Internals** SS, 304/304L Class 1500	**Lining** Carbon Steel
End connection / Facing Threaded	**Special drilling of flange connections** Supplier to advise	
Paint finish Supplier to advise	**Weather hood** Supplier to advise	**O-ring Seal** Supplier to advise

Inspection / Documentation (to be provided by supplier)

☑ Material certificate	☑ Work certificate	☑ Performance certificate

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REFERENCE DRAWINGS AND DOCUMENTS

[1] ENS-FDP-PID-24005, PTFE Filter Destruction System P&ID Diagram - Gas Supply System 833

[2] ENS-OWPVR-PID-24003, Uranium Contaminated Waste Oil Plasma Gasification Basic Engineering Design: P&ID - Gas Supply System (O2 & Ar)

[3] ENS-FDP-CLC-24004, PTFE Filter Destruction Piping System Design Calculations - Line Sizing

[4] The Engineering ToolBox (2003). Gases - Densities and Specific Weight. [online] Available at https://www.engineeringtoolbox.com/oxygen-O2-density-specific-weight-temperature-pressure-d_2082.html [27/09/2024]

[5] ENS-FDP-CLC-24014, Mass Balance Calculation for the PTFE Filter Destruction System

[6] MES-PIPE-SPE-0014, Piping Material Specification Line Class GSVP, May 2024

NOTES

Note 1: The oxygen storage tank T1602 will be incorporated into a centralized gas supply system, outside the scope of the PTFE Filter Destruction Facility. The tank will be procured as a vendor package, i.e. a bulk liquid storage tank coming with the evaporator, necessary shutoff valves, regulator(s) and safety relief valve(s) to regulate the gas supply pressure at 600 kPa(g). The tank will be equipped with instrumentation indicating the pressure and liquid inventory in the tank. The specifications of this tank are still to be confirmed by the vendor. Therefore, the tank capacity/dimensions provided in this Sheet are only an estimate at this point.

Note 2: This is the size of the schedule 40 pipeline in which the flame arrester will be installed.

Note 3: This is the maximum flowrate coming out of the bulk storage tank. The maximum pump-out rate will be experienced when both PTFE and Waste Oil Plasma Gasifcation facilities are operated simultaneously.

Note 4: Supplier to advise if a flame arrestor can be provided to meet the stipulated operating pressure, but not the design pressure. Alternative design pressures will be taken under consideration.

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