ENGINEERING SERVICES DEPARTMENT

OXYGEN FLAME ARRESTER Y1606 SPECIFICATION SHEET

Project	Contaminated Waste Oil Plasma Gasification Project	**Unit Tag Number**	Y1606
Datasheet Doc. No.	ENS-OWPVR-SPE-25031	**Revision**	2
Description	Flame arrester Y1606 is installed on the oxygen gas supply line to the Plasma Reactor R1203 in the Uranium Contaminated Waste Oil Plasma Gasification (CWOPG) Demonstration Facility [1], downstream of the pressure regulator PCV1602D. 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	NW PlasGas Demonstration Facility - Outside Laboratory-150, Building V-H2		
Safety Classification	SC-3(C) and Non-classified (N)		
Quality Classification	SC-3(C) and Non-classified (N)		

Storage tank (T1602) [1], 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 [3]	°C	Design pressure	20685 [3]	kPa(g)
Operating temperature	Ambient		Operating pressure	400 [1]	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	25 [1] Note 2	mm	Flow	42,93 [2]	kg/h	Density	5,16	kg/m^3
Pressure nominal	400	kPa(g)	Inlet flange type		Screwed female NPT			
Adjusted set pressure	Supplier to advise	kPa(g)	Outlet flange type		Screwed female NPT			
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** Supplier to advise
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-OWPVR-PID-24003, P&ID - Gas Supply System (O_2 & Ar), Uranium Contaminated Waste Oil Plasma Gasification

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

[3] 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 that is incorporated into the CWOPG. 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 the CWOPG and PTFE Filter Destruction Facilities are operated simultaneously.

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