

# SHIVAAY PROCESS SOLUTIONS

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Ref - 23-24/72.      Date 1 / Dec/2023

NATURAL GAS INDIA PVT LTD  
36 , Model Town West  
Ghaziabad  
Uttar Pradesh  
Email: bd@naturalgasindia.com

**Subject: Torrefaction Furnace Quote, Capacity 2 Ton Per Hour**

**Kind Attn: Mr. BABAR SHAH JI.**

Dear Sir,

Thank you so much for the opportunity to quote. Please find the quote mentioned below for your kind consideration.

## **Brief:**

Fuel (N1) is heated in controlled oxygen/air to 300°C. And temperature is maintained in the furnace for approximately 30 minutes. Fuel is taken out from the Furnace in water cooled jacket. This reduces the temperature to less than 100°C. Fuel volume and Calorific value is increased by this process.

## **N1 Fuel**

The fuel of moisture 20-30% is fed inside the furnace. The size of fuel is 3 to 8mm. The size of the fuel is reduced to make the moisture escape faster and Torrefaction process also faster. To maintain the uniformity in the process the drum carrying the fuel is rotated. The speed of rotation is controlled as per the fuel quantity and quality. The final fuel received after torrefaction N3.

## **N2 Fuel**

For heating of the furnace/fuel the same fuel with higher moisture content is used. The flue gases are also re-circulated to increase the efficiency of the system. Since the fuel does not have much ash content, the flue is taken through ash room. The induced draft and forced draft fans are used for combustion.

Fuel Considered: Napier grass/Elephant grass.

Cost of the Torrefaction system = **Rs. 2,86,90,000.00** (Rupees Two Crores Eighty-Six Lacs and Ninety Thousand Only) inclusive of all taxes

## A Scope Matrix

Sno	Description	Supply	Installation	Remarks
1	External drum Construction [Furnace]	Shivaay	Shivaay	
	a. MS 2062 sheet 6mm thick			
	b. Dia 2000mm; length 5000mm			
	c. Refractory lining of IS8 Bricks			
	d. Nozzles for combustion air.			
	e. Supporting structure.			
2	Internal drum [heating of fuel for Torrefaction].	Shivaay	Shivaay	
	a. Construction of MS sheet 2062 grade.			
	b. Rotating arrangement			
	c. Shaft or rotation			
	d. Bearing and Plummer Block.			
3	Induced draft fitted with motor and Mountings base.	Shivaay	Shivaay	
4	Rotating arrangements.			
	a. Motor			
	b. Plummer Block			
	c. Pedestal			
5	Electrical Panel	Shivaay	Shivaay	
	a. IP55 protection			
	b. MCB Isolator			
	c. Motor Switchgears			
	d. Temperature Indicators			
	e. Cable (Internal)			
6	Small Pipe Chimney 12mm height.	Shivaay	Shivaay	If Pollution control department requires more height then needs to be change.
7	Dampers (Manual) for isolation in furnace.	Shivaay	Shivaay	
8	Fuel charging arrangement (Raw Material 20-30% Moisture of required size.	Shivaay	Shivaay	
9	Cooling jacket arrangement for the torrefied fuel.	Shivaay	Shivaay	
10	Flue gas ducting and hot air ducting.	Shivaay	Shivaay	
11	Commissioning of system.	Shivaay	Shivaay	
12	Tools/tackles Consumables, Mobilization and Demobilization of Manpower.	Shivaay	Shivaay	

**B     Scope Matrix**

Sno	Description	Scope	Remarks
1	Cooling arrangement	ZAK VENTURE	
	a. Chiller		
	b. Water		
	c. Pump		
	d. Pipeline		
2	Freight from workshop/Iron shop to site	ZAK VENTURE	
3	Incoming Electrical supply	ZAK VENTURE	
	a. To Electrical Panel		
	b. Earthing Pit		
	c. Earthing strip		
4	APPROVALS FROM STATUTORY AUTHORTIES	ZAK VENTURE	
5	Dust Collector/Ash room	ZAK VENTURE	
6	Electricity/Power/Water during Installation.	ZAK VENTURE	
7	Manpower-stay if away from city.	ZAK VENTURE	
8	Combustion Fuel N2 feeding arrangement.	ZAK VENTURE	
9	Manpower for supporting commissioning	ZAK VENTURE	
10	Manpower for Operation.	ZAK VENTURE	

**Payment Terms**

- a) 50% Advance along with PO
- b) 30% On delivery of material at site.
- c) 20% after completion of project.
- d) Price breakup against each activity will be shared after the order.

**Governing Law**

This Agreement shall be construed and enforced in accordance with and under the laws of the Government of India. Both parties agree that in case of any difference or dispute Arising between the **SHIVAAY PROCESS SOLUTIONS** and the BUYER will be resolved by mutual discussions and agreement. However, unresolved issues, if any, will be settled by arbitration as per the India Arbitration and Conciliation Act, and the venue of the arbitration will be Delhi/NCR.

We are very keen to work with you and we have offered a very special price and look Eagerly for an opportunity to work with you. We assure you of our best service and high quality, maintenance free building.

**Best Regards,**  
**Deepak Batra**  
**+91 9717047410**  
**For Shivaay Process Solutions**