



REF: MISTEL:BHILAI

TECHNICAL INFORMATION OF MIST ELIMINATOR FOR NSPCL BHILAI 2X250 MW

A. TECHNICAL INFORMATION

Sl. No.	Description	Requirement	
1.	End Customer	NSPCL Bhilai 2X250 MW	
2.	Type	Three stage chevron type (Flat or Roof type)	
3.	Material of construction of Mist Eliminator		
i.	Complete ME Panel	Polysulfone	
ii.	Washing pipe	a) Rubber lined carbon steel or glass fiber reinforced plastics b) Polypropylene or PVC is also acceptable provided bidder has proven experience for the same. Supporting documents to be produced.	
iii.	Wash Pipe Supports	Alloy 59/C276	
iv.	Washing Nozzles	PVDF or PP as per bidder's proven practice	
v.	Hardware inside absorber	a) Alloy 59/ C276 for load bearing applications b) All metallic fasteners provided shall be of Alloy 59/C276 c) For pipe clamps, C276 Bolt, C276 Nut, C276 washer and C276 spring washer to be provided.	
4.	Quantity		
i.	Quantity of Mist Eliminators for Unit-1,2	2 sets (1 set for each unit) 1 set means Complete Mist Eliminators, Washing systems and accessories	
5.	Parameters		
i.	Gas flow	Vertical	
ii.	Casing Dimension	Length : 7900 mm	Width : 13900 mm
iii.	Design Pressure of Mist Eliminator Panel	660 mmH ₂ O (G)	
iv.	Max Allowable Pressure drop across Mist Eliminator element	20 mmH ₂ O (G) at Design point	
v.	Design Temperature	70 Deg C (Continuous) 80 – 90 Deg C (30 minutes) 90 – 100 Deg C (5 min)	
6.	Gas condition at ME Inlet	Guarantee Point	Design Point
i.	Gas Flow Rate (Nm ³ /s-wet)	308	352
ii.	Gas Flow Rate (m ³ /s-wet)	371	429
iii.	Gas Temperature (Deg C)	57.2	61.1

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Customer / Plant: NTPC BHILAI (2x250MW)							
Cont. No. : G211, G212	Rev. 00		Rev. 01		Rev. 02		Rev. 03
	Sign	Date	Sign	Date	Sign	Date	Sign Date
Engineer : VV	-sd-	20.03.20					
Reviewer : PNR/ACR	-sd-	20.03.20					
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iv.	Density (kg/m ³)	1.044	1.018
v.	Operating Pressure at Mist Eliminator inlet (mm H ₂ O (G))	48	60
vi.	Gas Flow Distribution	+ or - 20%	
7.	Gas Composition at ME Inlet		
i.	SO ₂ (Vol%-wet)	0.0071	0.0069
ii.	H ₂ O (Vol%-wet)	17.08	20.47
iii.	O ₂ (Vol%-wet)	5.72	5.48
iv.	CO ₂ (Vol%-wet)	10.19	9.78
v.	N ₂ (Vol%-wet)	67.0	64.26
vi.	HCl (ppm-wet)	<3	<3
8.	HF (ppm-wet)	<1	<1
i.	Dust (mg/Nm ³ -wet)	<50	<200
9.	Entrained Mist Condition:		
i.	Mist Concentration at Inlet –at Guarantee & Design Point	200 g/Nm ³ -dry	
ii.	Mist Concentration at Outlet –at Guarantee & Design Point	≤20 mg/Nm ³	

10.	Mist Composition	
i.	Solid	30 wt.%
ii.	Cl ⁻	19000 ppm
iii.	Mg ²⁺	7570 ppm
iv.	Ca ²⁺	1170 ppm
v.	Na ⁺	1240 ppm
vi.	SO ₄ ²⁻	8055 ppm

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B. WASHING ARRANGEMENT

1.1 Washing water condition		
a.	Flow rate - Average	13.77 m ³ /hr *1)
b.	Flow rate at M/E Inlet – Instantaneous Allowable Max	96 m ³ /hr
c.	Flow rate at M/E Inlet – Instantaneous Min	80 m ³ /hr
d.	Feed Pressure (at inlet flange of ME Wash header)	0.2 MPa (Max)
e.	Spray Nozzle –Top washing	90 °, Full Cone(vendor shall decide based on proven practice)
f.	Spray Nozzle –Bottom washing	120 °, Full Cone(vendor shall decide based on proven practice)
g.	Spray pipe level from ME Panel	< 700 mm

1.2 Washing Method							
		First Stage		Second Stage		Third Stage	
		Front Surface	Back Surface	Front Surface	Back Surface	Front Surface	Back Surface
a.	Total Washing Area m ²	7.9x13.9	7.9x13.9	7.9x13.9	7.9x13.9	7.9x13.9	7.9x13.9
b.	Washing Water Source	Refer Clause 1.2					
c.	Washing Water Average Flow rate m ³ /h	*	*	*	*	*	**
d.	Instantaneous Max Water Flow rate m ³ /h	*	*	*	*	*	**
e.	Duration of One washing for One Divided Section Sec	*	*	*	*	*	**
f.	Time of One washing Cycle (min)	*	*	*	*	*	**
*Washing method shall be confirmed by the vendor. ** Only for Maintenance *1) shall be finalized by vendor							

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C. WATER ANALYSIS

Process water is envisaged for Mist Eliminator washing. Process water analysis is provided below.

S.no	Constituents	Unit	PROCESS WATER
1.	Calcium as CaCO_3	ppm	190
2.	Magnesium as CaCO_3	ppm	121
3.	Chlorides as CaCO_3	ppm	110
4.	Sulphate as CaCO_3	ppm	93.5
5.	Alkalinity as CaCO_3	Ppm	297
6.	Iron as fe	ppm	0.55
7.	Total silica	ppm	38.5
8.	pH		7.5
9.	Turbidity	NTU	11

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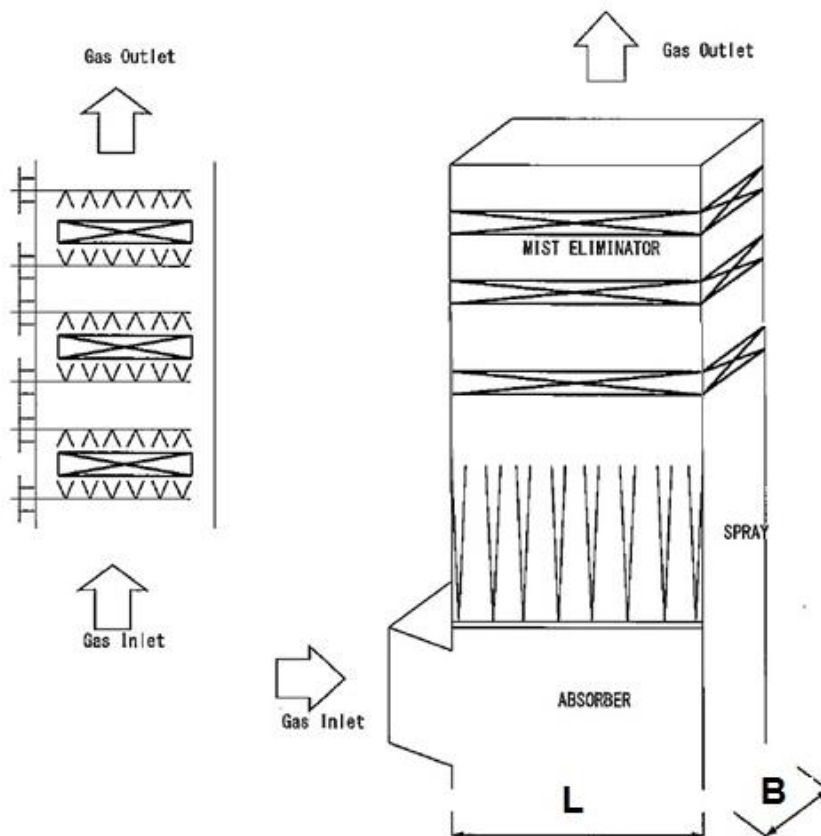


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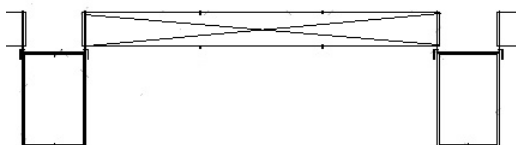
D. MIST ELIMINATOR ARRANGEMENT AND MIST PARTICLE SIZE DISTRIBUTION

Typical sketch



L-Length-7900 mm, B-Breadth-13900 mm

Mist Eliminator modules shall be provided with non slipping end stopper as given below:



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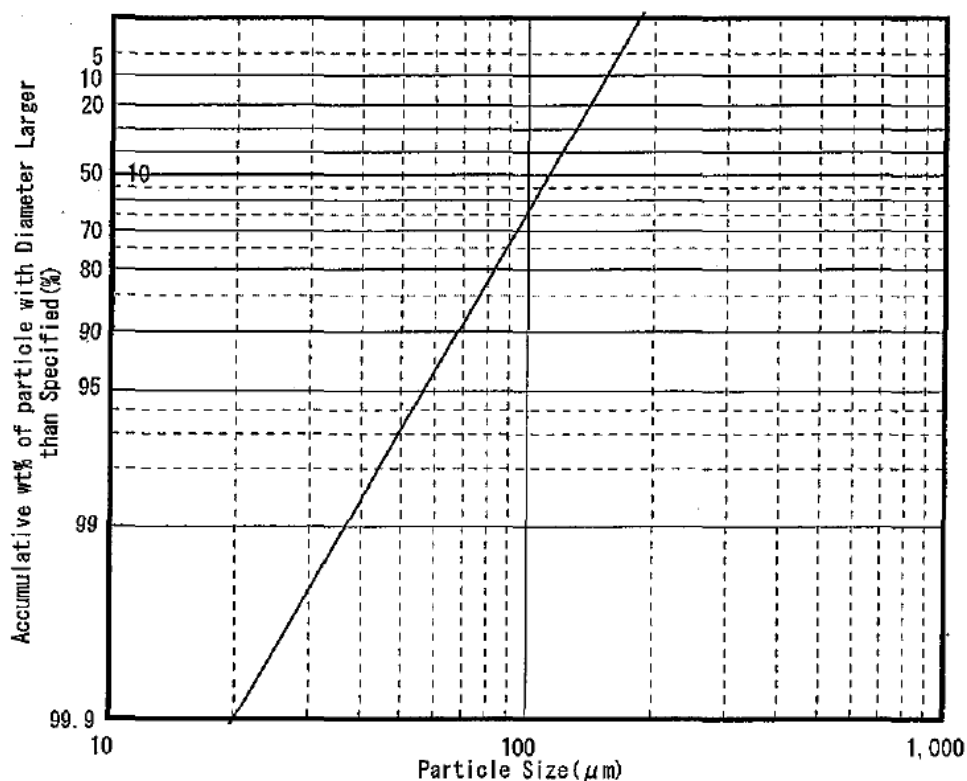
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Note:

- Bidder to decide the spray washing arrangement considering the water flow rate mentioned above.
- Only Typical arrangement is shown in the fig with Flat Type of Mist Eliminator. Bidder can also offer Roof Type Mist Eliminator for all the three stages (or) First stage flat type, 2nd and 3rd stage Roof Type.
- Three level of ME support beams will be provided by BHEL. The distance between the 1st stage and the 3rd stage ME support beam is 5.2 meter approx..

Fig.2 Mist Particle Size Distribution(EXPECTED VALUE)



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