

ANNEXURE – C to TENDER BAP/CAP/2015-16/OT-10
SPECIFICATION FOR DUST SAMPLING KITS: US EPA method 17
(annexure to indent no. C86640004 dt. 25-07-14)

Supply of US EPA method 17 sampling kit as per the following specification – 14 sets:

The kit shall meet the requirement of US EPA method 17 for flue gas particle sampling.

The kit shall consist of the following accessories :

S – type pitot shall have extension provision up to 3.5 meters. Each extension piece shall not exceed 1 meter in length. The assembly shall be provided with a probe box with locking arrangement.

Digital manometer for measuring dynamic head using the above pitot tube.

Sampling kit with flow meter (shall have precision of +/- 2 % with resolution of 0.01 Liters per minute).

Dry gas meter shall have precision of +/- 2% with measurement from 0.02 to 2.5 Cu. M per hour.

Timer shall be provided for noting down the sampling time with reset feature.

Vacuum pump shall be of capacity 6 Cu. m³ per hr.

The kit shall be suitable for sampling flue gas from 0 to 400 Deg. C. Adequate cooler, dryer and condensate separator.

The sampling probe shall be suitable for measurement up to 3.5 meters with extension pieces. Each extension shall not exceed 1.25 meters housed in a separate box with locking provision and shall be portable for easy of transportation.

It shall have provision for measuring the wet, dry, gas meter and case temperature readings.

The temperature sensors shall be of K type thermocouple with range 1- 800 Deg. C.

The kit shall be having automatic particle sampling for real time iso-kinetic flow rate as well as provision for manual adjustment with calculated flow rate.

Sampling and pitot hoses shall be suitable for high temperature flue gas sampling for the specified operating and ambient condition given in this specification. The length of hoses shall be of 20 meters.

The dust collector / thimble shall be designed for collecting 0.1 micron particles and shall withstand at least 400 Deg. C. The thimble shall withstand collection of dust up to 20 grams (net weight). The material of thimble shall be Quartz fiber or equivalent.

The thimble holder shall have nozzles from 5 mm to 12 mm. The set of nozzles shall be placed in the accessories box.

Separate accessories box with glass jars for keeping thimble (10 nos. per box), necessary tools for the kit assembly, spanners etc., shall be provided with ease of transportation.

The dimension and weight details of the kit shall be furnished during offer stage.

The pitot, probe and housing boxes shall be of made of rust proof material

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The kit shall be suitable for the following operating and ambient conditions:

Ambient:

- Ambient temperature : 6 to 50 deg. C
- Humidity : 95% at 50 Deg. C
- Environment : the atmosphere will be very dusty. The units shall be suitably designed for such environment.

Operating conditions:

- Flue gas temperature : 0 – 400 Deg. C
- Static pressure : +50 to – 500 mmWC.
- Velocity : 1 - 40 m / Sec.,
- Dust concentration : 100 gm / Nm³ at inlet
5 mgm / Nm³ at outlet.
- Sampling duct size : 4 m X 4 m maximum
- Sampling test pocket size : 80 mm opening.

Power supply:

The operating power supply shall be suitable for 230 V +/- 10 %,AC, 50 Hz.

If kit available for universal power supply, offer for the same shall also be furnished in the offer stage.

As per specification	To be read or understand as
The kit shall be having automatic particle sampling for real time iso-kinetic flow rate as well as provision for manual adjustment with calculated flow rate.	The kit shall have the facility to simultaneously measure velocity and conduct iso kinetic sampling using pitot and probe. Indication for flow rate of sampled gas and pitot head should be available on the operator console/ control unit.

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Bill of quantities:

Sl no.	Description	Quantity	Remarks
01.	Sampling kit complete for US EPA method 17	14 sets	
02.	Pitot assembly complete with extensions housed in a box.	14 sets	
03.	Probe assembly complete with extensions housed in a box.	14 sets	
04.	Vacuum pump housed in a metallic box with lock if not forming part of serial no. 01.	14 sets	
05.	Quartz fiber thimble	3000 nos.	
06.	Pitot hose	14 sets (20 m length each)	
07.	Probe hose	14 sets (20 m length each)	
08.	Accessories box with all tools required for conducting the sampling and assembling of kits.	14sets	
09.	Box suitable for preserving 10 thimbles along with glass jars. The jars shall be suitable for keeping in oven at 200 Deg C.	14 boxes (10 glass jars in each box)	The dimension of the jars shall be suitable for the thimbles used.
10.	Carrying metallic case for ease of transportation of all items	14sets.	
11.	Operating manual with detailed calculations for all the conditions	6 sets – hardcopy and 1 set in CDROM.	
12.	Hand held digital temperature indicator for suitable for K type thermocouple	14 sets	
13	*Spares for 3 years trouble free operation	As per annexure I	* Indicate the split up price with part number separately.
14	Training / Demonstration: Vendor shall demonstrate the working principle, calculations, and presentations and carry out one full pledged test at one of the working plant after supply of equipment.		

The above bill of quantities are indicative and minimum requirement. If any additional items are required for particulate sampling, same shall be supplied without any additional cost.

Break for each item in the bill of quantity shall be furnished.

*Spares requirement:

The minimum spares required for 3 years trouble free operation shall be supplied along with the main equipment.

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Annexure I

Procurement of dust sampling kits method USEPA17 – 14 sets.

Spares requirement for 3 years operation

Sl.no	Item	Qty.
1.	Dry gas meters with adopter	6 sets
2.	Fitting for hoses (Clamps for tight fit)	10 sets
3.	Temperature indicator	6 nos.
4.	Thermocouples	6 sets
5.	Valves for adjusting flow	6 sets
6.	Vacuum pumps completed assembly	6 sets
7.	Pump oil	1000 ml

If any other spare required than the above, specify with quantity.