



**SPECIFICATION
FOR
CARBON & SULPHUR DETERMINATOR**

No: CFF/SFQC-20
Rev No.: 00
Date: 29/05/2017
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1.0. OBJECTIVE :

This technical specification covers the supply, installation & commissioning of Carbon & Sulphur Determinator for analysis carbon and sulphur complete with necessary auxiliary equipments & accessories.

2.0. TECHNICAL REQUIREMENTS:

- 2.1 Carbon & Sulphur Determinator shall be capable of analyzing C & S in low alloy steels, stainless steel, Slag, Cast Iron, Ferro-Alloys, Lime, Refractories fluorspar.
- 2.2 The ranges expected in the samples are:
C: 0.010 - 10.000 % and
S: 0.0001 - 1.000 %
- 2.3 Instrument shall have the measurement precision :
C: 2ppm or 1% of the reading, whichever is greater.
S: 2ppm or 1.5% of the reading, whichever is greater.
- 2.4 The Supplier shall specify the uncertainty of measurement of both Carbon & Sulphur.
- 2.5 Instrument shall be capable of analyzing samples in solid, turnings, powder forms. Supplier shall indicate the maximum & minimum size of the sample in terms of volume/weight.
- 2.6 Instrument must be complete with necessary accessories like Induction furnace & weighing balance with Least Count of 0.0001 gm. Weighing Balance along with calibration certificate shall be provided with weigh box and calibrated weights.
- 2.7 The instrument shall be computer controlled and the computer provided with the equipment shall be with 21" TFT monitor, Laser coloured printer & necessary hardware/software.
- 2.8 Applicable Software shall be easy to operate and shall be supplied in suitable storage media (External Hard disk min 500 GB). Back-up of licensed software shall be provided by the Supplier.
- 2.9 Equipment should be capable to store analysis of 50000 test results. Necessary software support shall be provided for storing all the data for easy retrieval.
- 2.10 Instrument should be capable of analyzing a sample normally within 60 seconds. Instrument should have option to auto load minimum 10 samples.
- 2.11 Instrument shall be provided with self diagnostic cum fault detection & display capabilities for easy maintenance.
- 2.12 Instrument shall be provided with auto leak check for detecting any leakage
- 2.13 Instrument shall be provided with Furnace auto-cleaning facility.

Agreed Department			Quality Management		
SMS QC	J D Sahana	<i>[Signature]</i>	Prepared By	Arun K Agarwal	<i>[Signature]</i>
SMS	M K Sahu	<i>[Signature]</i>	Checked By	K Chakraborty	<i>[Signature]</i>
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- 2.14 Instrument shall be supplied with necessary gas regulators with one in spare of each type.
- 2.15 Supplier shall list all necessary standard samples for calibration of the equipment for analysis of various materials as per CL3.1 & provide a price list. Supplier shall also provide enough standard samples for trouble free operation for at least two years from the date of commissioning with system without any extra cost.
- 2.16 Supplier shall provide all consumable items, calibration standards required for 10,000 analysis and quote separately for the same or for at least two years from the date of commissioning (whichever is later) with system without any extra cost.
- 2.17 Supplier shall provide Specifications of all the consumable items.
- 2.18 The equipment should be capable to run & generate accurate results at 99.5% purity of oxygen.
- 2.19 The equipment should run on Power Supply of $230 \pm 10\%$ Volts AC single phase, 50 cycles per second. Necessary power protection (including voltage stabilizer, UPS for computer etc.) for all the equipments shall be provided by the Supplier.
- 2.20 CFFP shall give samples of known concentration & the same shall be tested at the time of Pre-Inspection. The test results shall meet the specification limit/accuracy limit. Repeatability test on 5 samples shall be done & the variation shall lie within the permissible error.
- 2.21 Equipment shall confirm to international safety norms.

3.0. GENERAL REQUIREMENTS:

- 3.1 Instrument shall be guaranteed for good working for at least two years from the date of commissioning. If the instrument remains out of order during this period, guarantee period will stand extended for double the corresponding period.
- 3.2 The equipment shall be commissioned at our works by the supplier. All capabilities of the instrument shall be demonstrated.
- 3.2 The equipment should be tropicalized for operating temperatures from 10°C to 30°C , humidity 20-80 % (RH).
- 3.3 The equipment should be rated dust and water resistant to protect against the hazards.
- 3.4 Supplier should provide three sets of operation and maintenance manual in hard copies and also in digital form.
- 3.5 Training to be provided to BHEL personnel for operating & maintaining the equipment at our site.
- 3.6 All Supplier Specification/communication shall be in English only.

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