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**PRODUCT SPECIFICATION SHEET**

**Material :** Graphite from electrodes

**Size :** 0,00 – 0,20 mm. 0,00 – 1,0 mm. 0,20 – 0,50 mm. 0,50 – 1,00 mm.  
 0,50 – 2,00 mm. 0,50– 4,00 mm 2,00 – 4,00 mm. 4,00 – 8,00 mm

**Comercial name :** Graphite from electrodes + size (example: Graphite from electrodes 0,50-2,00 mm)

**Chemical analysis :**

Parameter	Method / Instrument of Determination	Typical Specification (*)
Moisture	Humidity balance GRAM PRECISIOM SERIE SV In an oven at 106°C, due to weight loss	0'25 %
Fixed carbon (dry base)	By difference: % C. F. = 100 % - (% Ashes + %Volatiles)	99,23 %
Ash (dry base)	ISO 1171 (= UNE 32004)	0'41 %
Volatile matter (dry base)	ISO 562 (= UNE 32019)	0'36 %
Sulphur	ASTM D4239-05 - LECO SC 132 / LECO SC 432	0'013 %
Nitrogen	ASTM D5373-08 - ELTRA ONH 2000	0'020 %

**Granulometric Analysis :**

Parameter	Method / Instrument of Determination	Typical Specification (*)
> upper limit of the particle size range	% of the total weight retained on the sieve of the upper limit of the particle size range.	5,80 %
< lower limit of the particle size range	% of the total weight passing through the sieve of the lower limit of the particle size range.	8,46 %

**Packaging / Packing:**

- ✓ 25 kgs sacks on pallet of 1.000 kgs. with retractable plastic cover.
- ✓ Big bags of 1,000 kgs. - 1.200 kgs. on pallet.
- ✓ Bulk.

**Identification / Quality documentation:**

- ✓ The product shall be delivered identified with the name of the manufacturer, name of the product and manufacturing batch number.
- ✓ With each delivery, the Analysis Bulletin of the corresponding manufacturing batch will be sent. Analytical determinations are carried out in our laboratory using the methods and instruments indicated. The values of each of the parameters reflected in the analysis bulletins of each batch correspond to the average value of the different determinations carried out for that parameter and in that batch.
- ✓ The analytics verification and the preparation of standard samples for certain parameters are carried out, according to standardised methods, by SGS Española de Control, S.A, which has laboratories.

(\*)Date of update typical specification

31/12/2020

**Technical specification**

GRAPHITE FROM ELECTRODES



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accredited according to NBN EN ISO / IEC 17025:2005 for the performance of tests relating to all the parameters contained in this specification.

**Notes :**

- ✓ The product specification sheet shall be reviewed at least every six months to collect as typical values the average values obtained in our laboratory, during that period, for the different parameters of the total lots analyzed of this material.
- ✓ Maximum and minimum values of the analysis parameters according to the specified determination methods and instruments:
  - Humidity: 0.50% Max.
  - Fixed Carbon: 98.40% Minimum
  - Ashes: 0.80% Max.
  - Volatiles: 0,80 % Max.
  - Sulphur: 0.05 % Max.
  - Nitrogen: 0,05 % Max.
  - Upper granulometry limit: ≤10%.
  - Lower granulometry limit: ≤10%.
- ✓ The following table shows the revisions carried out due to substantial parameter changes in the product specification (determination method, maximum/minimum parameter values,...), except for typical specification values obtained each semester.

Review	Date	Reason or cause for review
1	22/06/09	1) Grouping of the different granulometries in the same product sheet. 2) Inclusion of determination methods associated with existing equipment: - LECO SC 132 calibrated using controlled standard samples according to ASTM D4239-05 - LECO TN 114 calibrated using controlled standard samples according to ASTM D5373-08 3) Inclusion of the typical values as average values of the determinations carried out for the different parameters and lots during the period 01/01/2.009 to 22/06/2.009.
2	31/12/09	1) Inclusion of typical values as average values of the determinations carried out for the different parameters and lots during the period 22/06/2009 to 31/12/2009
3	30/06/10	1) Inclusion of typical values as average values of the determinations carried out for the different parameters and lots during the period 31/12/2009 to 30/06/2010
4	31/12/10	1) Inclusion of typical values as average values of the determinations made for the different parameters and lots during the period 01/07/2.010 to 31/12/2.010
5	30/06/11	1) Inclusion of typical values as average values of determinations carried out for the different parameters and lots during the period 31/12/2.010 to 30/06/2.011 2) Inclusion of new determination equipment: - ELTRA ONH 2000 calibrated using controlled standard samples
6	31/12/11	1) Inclusion of typical values as average values of determinations carried out for the different parameters and lots during the period 01/07/2.011 to 31/12/2.011.
7	30/06/12	1) Inclusion of typical values (typical specification) as average values of determinations carried out for the different parameters and lots during six-month periods (January-June, July-December) of each calendar year.
8	31/12/2017	Inclusion of new equipment for Sulfur determination: LECO SC 432. Calibration using controlled standard sample according to ASTM D5373-05.
9	31/12/2017	Withdraw of the equipment LECO TN 114 for determination of Nitrogen.