

# LECO Reference Material

LECO Corporation; Saint Joseph, Michigan USA

Description: Calcium Oxalate

Part No: 502-091

Lot No: 1048



LECO

#### Material:

LECO 502-091 Calcium Oxalate Monohydrate ( $\text{CaC}_2\text{O}_4 \cdot \text{H}_2\text{O}$ ) is a pure compound with a minimum purity of 98%. This LECO Reference Material (LRM™) is intended for use as a check sample for verification of weight loss during thermo-gravimetric analysis (TGA). It can also be used to calibrate moisture determinators such as the RC612. The material has theoretical values as follows:

Temperature	% Weight loss	Component Lost
200°C	12.3	H <sub>2</sub> O
450°C	19.2	CO
850°C	30.1	CO <sub>2</sub>

The results obtained on Lot 1048 were as follows:

Category	Reference Value	+/- *
% Weight loss @ 200°C	12.1	0.1
% Weight loss @ 450°C	19.1	0.1
% Weight loss @ 850°C	30.1	0.1

- +/- only applies to the weight loss on the LECO Thermo-gravimetric analyzer.
- +/- indicates two times the standard deviation (2s).
- Refer to the reverse side of certificate for additional information regarding calculations.

This LRM™ may be analyzed on a variety of analytical instrumentation. A minimum sample mass of 1 g is recommended for TGA analysis. Refer to instrument manufacturer recommendations for nominal sample mass.

#### Homogeneity:

Homogeneity of this material was confirmed through analysis of a random selection of bottled material and was found to be highly homogeneous.

#### Traceability:

This material is traceable to a primary method of Thermo-gravimetric analysis.

#### Preparation:

This LRM™ must be dried at 105°C for 1 hour prior to use to remove residual H<sub>2</sub>O. Residual moisture at the time of certification was approximately 0.48%. A residual moisture determination step can be added to the analysis of this LRM™ on the LECO TGA701. The LRM™ should be handled using clean laboratory utensils.

#### Analysis:

LECO analytical instruments were used to characterize this material. This material was analyzed by thermo-gravimetric analysis utilizing the LECO TGA701.

Category	Method	n=
% Weight loss @ 200°C	TGA	30
% Weight loss @ 450°C	TGA	30
% Weight loss @ 850°C	TGA	30

Certificate Number: 502-091-1048.0

Page 1 of 2

Reference Material

Analysis Data:

Data Set	Number of Analyses	% Weight loss @ 200°C	% Weight loss @ 450°C	% Weight loss @ 850°C	Method	Instrument
1	10	12.10	19.08	30.16	TSL-C007	LECO TGA701
2	10	12.17	19.15	30.08	TSL-C007	LECO TGA701
3	10	12.14	19.11	30.09	TSL-C007	LECO TGA701
Average		12.14	19.11	30.11		
Std Dev		0.03	0.03	0.04		

- Each Data Set value represents an average of the sample analyses.
- Underline indicates lost significant digit.

Expiration:

ISO Guide 31 States that the certificate should contain an expiration date for all materials where instability has been demonstrated or considered possible, after which the certified value is no longer guaranteed by the certifying body. This LRM™ is valid within the stated deviation until April 13<sup>th</sup>, 2021 provided the LRM™ is stored in its original bottle at room temperature. This LRM™ is nullified if it is contaminated or otherwise altered.

Participating Laboratories:

**Lab:**  
LECO Technical Services Laboratory

**Accreditation:**  
A2LA Accredited to ISO 17025:2005 Cert. # 3285.01

Calculations:

In compliance with the requirements of ISO Guides 31, 34 and 35 for the production of Reference Materials, the values for this material were calculated using a mean and standard deviation of the overall data.

References:

LECO TSL-C007: In house method for the analysis of pure compound materials.

ISO Standard 17025:2005 General requirements for the competence of testing and calibration laboratories.

ISO Guide 30:2015 Terms and definitions used in connection with reference materials.

ISO Guide 31:2015 Reference Materials-Contents of certificates and labels.

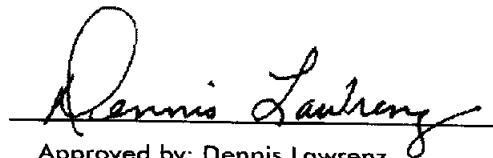
ISO Guide 33:2015 Uses of certified reference materials.

ISO Guide 34:2009 General requirements for the competence of reference material producers.

ISO Guide 35:2006 Reference Materials-General and statistical principles for certification.

ASTM Documents available from ASTM, 1916 Race Street, Philadelphia, PA, 19103

ISO Guides and Standards available from Global Engineering – [www.global.ihs.com](http://www.global.ihs.com)



Approved by: Dennis Lawrenz  
Technical Services Laboratory Director  
Date of release: April 13<sup>th</sup>, 2016

No warranties of description, merchantability, or fitness for a particular purpose or any other express or implied warranties arise out of LECO's sale of this product. Remedies for any claimed defect in this product will be limited to replacement of the product or refund of the purchase price. In no event shall LECO be liable for incidental or consequential damages.

LECO Corporation • Technical Services Laboratory  
3000 Lakeview Avenue • St. Joseph, MI, USA 49085  
Phone: 800-292-6141 • Fax: 269-982-8977 • [www.leco.com](http://www.leco.com)  
[info@leco.com](mailto:info@leco.com) • A2LA Accredited to ISO 17025:2005 Cert. # 3285.01  
LECO is a registered trademark of LECO Corporation.

