



Thermogravimetric Analyzer TGA 3000



TGA 3000 Thermogravimetric Analyzer

Sylab's TGA 3000 is an automated instrument which determines Moisture content, Ash content, Volatile content, Loss on Ignition (LOI) and Fixed Carbon content in a wide range of Organic, Inorganic and Synthetic materials.

Thermogravimetric analysis replaces the traditional analytical techniques that are slow, labour intensive and involve several steps with multiple laboratory equipment such as Muffle furnaces, Ovens and Balances. The TGA 3000 with integrated balance combines drying, ashing and weighing processes. This improves the efficiency, precision and provides high sample throughput.

The TGA 3000 comes with a PC software that is easy to use and intuitively provides the user with control of the instrument, tracking of samples and measurement data throughout the analysis process.

Typical analysis is performed in air, other gases such as nitrogen and oxygen can also be used to achieve a specific test atmosphere. Samples can be heated and cooled to specified method settings.

Sylab's TGA 3000 is used to analyze samples in accordance with several international standards such as ASTM, ISO, DIN, EN and more.

Typical Sample Materials



Reliable and fast proximate analysis by TGA 3000 Thermogravimetric Analyzer

TGA 3000 provides multi-constituent analysis for upto 19 samples at a time. Typical coal analysis method consists of determination of moisture, volatile matter and ash content. The software allows for customization of the analysis steps such as temperature ramping, start temperature & end temperature, programmable gas flows, placement/removal of crucible lids and mass constancy criteria for a fully flexible instrument optimized for every user's unique needs.

Maximum Efficiency & Enhanced Precision

- High performance Thermogravimetric Analyzer.
- Automated Analysis of up to 19 samples.
- Capable to accept maximum sample weight up to 5 grams, higher range can be offered on request.
- Programmable heating ramp rates as per test methods.
- Automatic placement & removal of crucible lids.
- Windows based control software for operation of the analyzer.
- Integrated balance with 0.1 mg readability for robust and accurate mass determination.

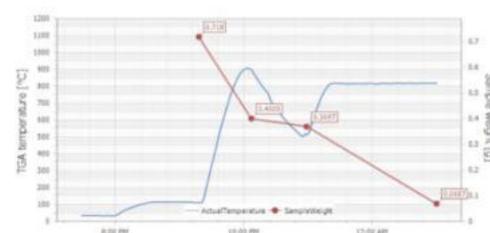


Windows Based Software

- Ensures precise control and operation of the analyzer.
- Tracks the samples and measurement data throughout the analysis process.
- Graphic display of temperature vs. weight loss measurements.
- Retrieval of sample related information at any given time during analysis.
- During analytical cycle, display of current parameters such as the real time furnace temperature, sample status and time remaining.

Turntable position: 3		Sample: 1-09-2020_3							
Empty Crucible	Lid	Sample IN							
22.4383 g	20.9136 g	1.0141 g							
Moisture Volatile Volatile Dry Ash Ash Dry Fixed Carbon Fixed Carbon Dry LOI750 LOI800									
Raw data (%)	29.188	31.309	44.220	6.775	9.568	32.718	46.212	83.2255	80.5089
Corrected (%)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Corrected (%)	29.188	31.309	44.220	6.775	9.568	32.718	46.212	83.2255	80.5089

Heating phase:						
No	Temperature	Duration	Lid	Weight OUT (raw)	CF	Sample OUT (corrected)
1	108	2000	0	23.1555 g	-0.0012 g	0.7180 g
2	900	420	1	43.7555 g	-0.0091 g	0.4025 g
3	500	80	1	43.7190 g	0.0000 g	0.3697 g
4	815	3600	0	22.5094 g	-0.0034 g	0.0687 g



Maximum Productivity

- 19 position carousel allows for high sample throughput rates.
- Two TGA 3000's can be controlled from a single PC, thereby boosting productivity and reducing costs.

Furnace Cooling

- After completion of analysis, cooling process is automatically started with user programmable furnace lid opening, to improve the cool down time.

Exceptional Performance

- Pneumatic carousel control mechanism increases the long-term reliability by eliminating oscillation and increasing position accuracy.
- Automatic control of furnace atmosphere and programmable gas flow rates (Air, Nitrogen or Oxygen).

Powerful Heating Elements

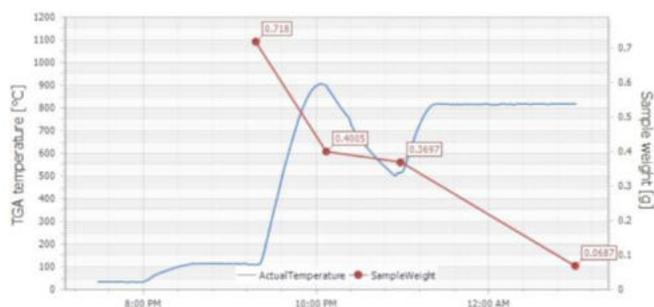
- High power heating elements provide fast temperature ramping and excellent temperature stability.
- Embedded multi-element design ensures that temperatures are uniform throughout the furnace chamber.

Automatic Analysis

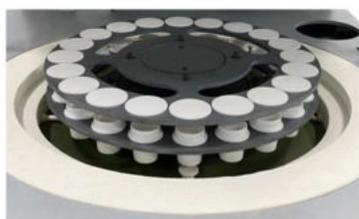
- Dual Carousel design provides automatic placement/removal of crucible lids inside the furnace.
- Automatic end point recognition, user programmable method settings, skipping of empty crucibles allow for optimized analysis time.

Integrated Precision Balance

- Insulated balance that is isolated from the heat and ambient atmosphere for stable and precise measurements.
- High precision balance accurate to 0.1mg for precise weight measurements.



Graphical representation of results



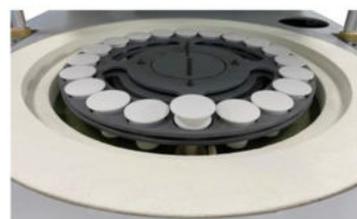
Crucible lids open



Crucible lids closed



Weighing with crucible lids open



Weighing with crucible lids closed

Dual Carousel Configuration:

- Carousel is made up of high strength technical grade ceramics.
- TGA 3000 uses dual carousel – one for holding crucibles and one for holding crucible lids.
- Second carousel allows for automatic placement and removal of crucible lids inside the furnace without opening the furnace lid.
- This provides superior volatile matter accuracy in addition to automation & avoids sample oxidization.
- Eliminates the risk of operator burns at elevated temperature (600 deg C).
- Avoids the risk of the operator dropping crucible lids into the furnace.
- Crucibles and crucible lids can be pre-weighed using an external balance to accelerate the changeover between runs.
- Can be used as a standard single carousel TGA without the second carousel when required.



Dual Carousel

Superior Performance and Accuracy

- The TGA 3000 is a powerful thermogravimetric analyzer that combines best-in-class hardware with an intuitive software housed in a rugged design providing the best analytical performance.
- Technical grade high strength ceramics prevent warping effects and corrosion under temperature stress.
- TGA 3000 is also available in a dual furnace package (TGA 3000D) which allows for two TGA's to be operated from a single PC for laboratories that require the highest sample throughput.

Technical Specification Sheet

TGA 3000 Thermogravimetric Analyzer

The TGA 3000 complies with the following international standards, among others:

Standard	Material to be analysed	Title of the standard
ASTM D7582-15	Coal and Coke	Standard Test Methods for Proximate Analysis by Macro Thermogravimetric Analysis
ASTM D5142	Coal and Coke	Standard Test Methods for Proximate Analysis by Instrumental Procedures
ISO 562	Hard Coal and Coke	Determination of volatile matter
ASTM D7348	Solid Combustion Residues	Standard Test Methods for Loss on Ignition (LOI) of Solid Combustion Residues
DIN 51718	Solid Fuels	Determination of the water content and the moisture of analysis sample
ASTM E1755	Biomass	Standard Test Method for Ash in Biomass
DIN 51719	Solid fuels	Solid mineral fuels - Determination of ash content
ISO11722	Solid mineral fuels	Hard coal - Determination of moisture in the general analysis test sample by drying in nitrogen
ISO1171	Solid mineral fuels	Determination of Ash
EN 15148	Biomass	Solid biofuels - Determination of the content of volatile matter
EN 14775	Biomass	Solid biofuels - Determination of Ash content
AS1038	Coal & Coke	Proximate analysis & Testing
BS1016	Coal & Coke	Proximate analysis

Furnace Temperature	
Minimum Temperature	Ambient
Max Temperature	1000 deg C
Temperature Control Precision	±2% (or) ±2 deg C
Temperature Stability	±2% (or) ±2 deg C
Programmable Ramp Rate	
Ramp Rate	10 deg C /minute to 50 deg C /minute
Balance	Integrated Balance
Balance Resolution	0.0001g (0.1mg)
Balance Readability	0.0001g (0.1mg)
Weight Loss	0 -100%
Sample Size	up to 5 grams (Higher range can be offered on request)
Number of Samples	19 Samples +1 Reference
Number of Carousels	Two (one for Crucibles, one for Crucible lids)
Carousel Material	High Strength Technical Grade Ceramic Material
Weighing Precision	0.02% RSD (on inert Samples)
Electrical Power Requirements	
TGA 3000	230V (± 10%) / single phase / 50/60Hz / 15A
Computer	230V (± 10%) / single phase / 50/60Hz / 2A

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