

# Approved Methodologies to Which LECO Instruments Conform

## ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)

### Metals

<i>Instruments</i>	<i>Method</i>	<i>Elements</i>	<i>Materials</i>
CS230, C230, S230, CS600, C600, S600, TC600, TC500, TC400, TN600, TN500, TN400, RO600, RO500, RO400, WR-112	E-1019	C, S, N, O	Steel, Iron*, Nickel/Cobalt Alloys
	E-1587	C, S, N, O	Refined Nickel
	E-1941	C	Refractory and Reactive Metals
TC600, TC500, TC400, RO600, RO500, RO400	E-1409	O, N	Titanium & Titanium Alloys
	E-1569	O	Tantalum
RH-402/404, RH600, ROH600, RHEN600/602, TCH600, TCHEN600	E-1447	H	Titanium & Titanium Alloys
CS-Series, SC632-Series	E1915-97	C, S	Metal Bearing Ores and Related Materials (i.e. tailings, waste rock)
All Metals for CHNOS	E-1806	Sampling and Sample Prep	Iron and Steel

### Energy

<i>Instruments</i>	<i>Method</i>	<i>Elements/Properties</i>	<i>Materials</i>
AC-350, AC500	D-1989 D-5865	Calorific Value	Coal & Coke
	D-2382 D-240 D-4809	Calorific Value	Hydrocarbon Fuels
	D-5468	Calorific Value	Waste Materials
S632, TruSpec S	D-1552	S	Oils & Petroleum Products
	D-4239	S	Coal & Coke
	D-5016	S	Coal & Coke Ash
	D-1619	S	Carbon Black
TGA701	D-5142	Proximate	Coal & Coke
TruSpec CHN	D-5291	C, H, N	Oil
	D-5373	C, H, N	Coal & Coke
AF700	D-1857	Ash Fusion	Coal & Coke Ash
AMA254	D-6722	Hg	Coal & Combustion Residues



**AOAC (ASSOCIATION OF OFFICIAL ANALYTICAL CHEMISTS)**

<i>Instruments</i>	<i>Method</i>	<i>Constituent</i>	<i>Materials</i>
FP-528, TruSpec N	990.03	Crude Protein	Animal Feed
	992.15	Crude Protein	Meat/Meat Products & Petfoods
	992.23	Crude Protein	Cereal Grain & Oil Seed Products
	993.13	Nitrogen	Fertilizer
	997.09	Nitrogen/Protein	Beer, Wort, Brewing Grains (Total Protein by Calculation)
TFE2000	999.02	Oil	Oil Seeds
	3:2000	Crude Fat	Meat
	2:2002	Total Fat	Infant Formula (Milk-Based and Soy-Based)

**AOCS (AMERICAN OIL CHEMISTS SOCIETY)**

<i>Instruments</i>	<i>Method</i>	<i>Constituent</i>	<i>Materials</i>
FP-528, TruSpec N	BA4E-93	Protein	Oil Seeds
TFE2000	Am 3-96	Oil	Oil Seeds

**ASBC (AMERICAN SOCIETY OF BREWING CHEMISTS)**

<i>Instruments</i>	<i>Method</i>	<i>Constituent</i>	<i>Materials</i>
FP-528, TruSpec N	Combustion	Protein	Barley
	Combustion	Protein	Malt
	Combustion	Protein	Brewers' Grains
	Combustion	Protein	Wort
	Combustion	Protein	Beer
	Combustion	Protein	Adjunct Materials, Cereals

**AACC (AMERICAN ASSOCIATION OF CEREAL CHEMISTS)**

<i>Instruments</i>	<i>Method</i>	<i>Constituent</i>	<i>Materials</i>
FP-528, TruSpec N	46-30	Protein	Cereal and Cereal Products

**AWS (AMERICAN WELDING SOCIETY)**

<i>Instruments</i>	<i>Method</i>	<i>Constituent</i>	<i>Materials</i>
RC612, RC-412	A4.4M:2001	Moisture	Welding Fluxes and Electrode Flux Coverings

**COMMENTS**

The USDA accepts the AOAC Method of crude protein in meats and meat products by combustion.

AOAC Dairy Collaborative has been delayed at least two years due to the inability to determine efficiency of current Kjeldahl method.