



# CERTIFICATE OF ACCREDITATION

**The ANSI National Accreditation Board**

Hereby attests that

**Industrial Research Institute  
Lebanese University Campus, IRI Building,  
Hadath (Baabda) Beirut, Lebanon 11-2806**

Fulfills the requirements of

**ISO/IEC 17025:2017**

In the fields of

**TESTING and CALIBRATION**

This certificate is valid only when accompanied by a current scope of accreditation document.  
The current scope of accreditation can be verified at [www.anab.org](http://www.anab.org).

Jason Stine, Vice President

Expiry Date: 29 August 2026

Certificate Number: ACT-1898



This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.  
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory  
quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

## SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

### Industrial Research Institute

Lebanese University Campus, IRI Building,  
Hadath (Baabda) Beirut, Lebanon 11-2806

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### TESTING AND CALIBRATION

ISO/IEC 17025 Accreditation Granted: **29 August 2024**

Certificate Number: **ACT-1898** Certificate Expiry Date: **29 August 2026**

### TESTING

#### Microbiological

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Preparation of samples	ISO 8199, BS EN ISO 8199 IT-me/LMB/02 based on ISO 6887-1-2-3-4-5-6, NF EN ISO 6887-1-2-3-4-5-6, ISO 20837.	Food and animal feedstuffs, water for human consumption, wastewater	Surface plating Pour plating Filtration PCR
Total bacterial count	ISO 6222, NF EN ISO 6222, ISO 8199, NF EN ISO 8199, BS EN ISO 8199 BAM FDA ch.3, ISO 21149, NF ISO 21149, BAM FDA, IT-me/LMB/09 based on ISO 4833-1 -2, NF ISO 7218 NF V08-051 AOAC International ch.23 IT-me/LMB/01	Food and animal feedstuffs, water for human consumption, wastewater, cosmetics, wet wipes and baby diapers	Surface plating Pour plating Filtration TEMPO TVC

## Microbiological

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Salmonella	IT-me/LMB/09 based on ISO 6579-1, NF EN 12824, NF V 08-052, ISO 19250, NF ISO 19250, BAM FDA ch.5, ISO 6340, AFNOR-BRD-07/11, BAM FDA, AOAC international ch.23, IT-me/LMB/08, AFNOR-BRD 07/6.	Food and animal feedstuffs, water for human consumption, wastewater, cosmetics, wet wipes and baby diapers	Qualitative method VIDAS, RT-PCR
Staphylococci	IT-me/LMB/09 based on ISO 6888-1, ISO 6888-1/A1, NF EN ISO 6888-1, NF EN ISO 6888-1/A1, ISO 6888-2, NF EN ISO 6888-2, ISO 6888-2/A1, NF EN ISO 6888-2/A1, BAM FDA ch.12, NF V08 057-1, ISO 22718, NF ISO 22718, BAM FDA <sup>2</sup> , AOAC international ch.23, NF T90-412, ISO 6888-3, NF EN ISO 6888-3, IT-me/LMB/01.	Food and animal feedstuffs, water for human consumption, wastewater, cosmetics, wet wipes and baby diapers	Surface plating Pour plating Filtration MPN techniques TEMPO STA
Coliforms	IT-me/LMB/09 based on ISO 4832, NF ISO 4832, BAM ch.4, AFNOR BRD-07/1, NF V08 017, NF V08 050, NF V08 060, BAM FDA, AOAC International ch.23, ISO 9308-1, ISO 9308-1 AC1, ISO 4831, NF ISO 4831, NF T90-413, IT-me/LMB/01.	Food and animal feedstuffs, water for human consumption, wastewater, cosmetics, wet wipes and baby diapers	Surface plating Pour plating Filtration MPN techniques TEMPO CC

## Microbiological

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Yeasts and molds	IT-me/LMB/09 based on ISO 21527-1-2, BAM ch.18, NF V08 059, ISO 6611, ISO 7954, NF ISO 7954, BAM FDA, AOAC International ch.23, ISO 13681, NF ISO 13681, IT-me/LMB /06, IT-me/LMB/01.	Food and animal feedstuffs, water for human consumption, wastewater, cosmetics, wet wipes and baby diapers	Surface plating Pour plate Filtration TEMPO YM
Sulfite-reducing bacteria	IT-me/LMB/09 based on ISO 15213-1 , NF ISO 15213-1 BAM FDA, AOAC International ch.23 ISO 6461-2, ISO 6461-1.	Food and animal feedstuffs, water for human consumption, wastewater, cosmetics, wet wipes and baby diapers	Pour plating Filtration MPN techniques
Escherichia coli	IT-me/LMB/09 based on ISO 16649-2, NF ISO 16649-2, BAM ch.4, NF ISO 16649-1, AFNOR-BRD-07/8, ISO 11866-2, NF ISO 11866-2, ISO 11866-3, NF ISO 11866-3, ISO 21150, NF ISO 21150, BAM FDA, AOAC International ch.23, ISO 16649-1, NF ISO 16649-1, ISO 9308-1, IT-me/LMB/01, ISO 7251, NF ISO 7251.	Food and animal feedstuffs, water for human consumption, wastewater, cosmetics, wet wipes and baby diapers	Pour Plating Surface Plating Filtration TEMPO EC MPN techniques
Control of stability of preserved and assimilated products	NF V08-408	Food and animal feedstuffs, water for human consumption, wastewater, cosmetics, wet wipes and baby diapers	Pour Plating Surface Plating Filtration

## Microbiological

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Non-specific microorganisms	IT-me/LMB/04, ISO/TS 20836, NF ISO 7698, NF T90-421, ISO 7218, ISO 7218-A1, ISO 21148, NF ISO 21148, NF V 04-015, NF V08-301, NF V08-408, NF V08-501, XP V08-102, ISO 20838.	Food and animal feedstuffs, water for human consumption, wastewater, cosmetics, wet wipes and baby diapers	Pour Plating Surface Plating Filtration RT-PCR
Pseudomonas spp	IT-me/LMB/03, IT-me/LMB/09 based on NF V04-504, ISO 13720, ISO 22717, NF ISO 22717, ASTM D 5246, EN 12780, NF EN 12780, BAM FDA, AOAC International ch.23, ISO 16266, NF EN ISO 16266.	Food and animal feedstuffs, water for human consumption, wastewater, cosmetics, wet wipes and baby diapers	Pour Plating Surface Plating Filtration
Clostridium perfringens	ISO 15213-2, NF ISO 15213-2 NF V08-056, BAM FDA ch.16.	Food and animal feedstuffs, water for human consumption	Pour technique
Intestinal enterococci	IT-me/LMB/05, IT-me/LMB/09 based on BS 4285/ 3.11, NF T90-411, ISO 7899-2, NF EN ISO 7899-2, ISO 7899-1, ISO 7899-1 AC1, NF EN ISO 7899-1.	Food and animal feedstuffs, water for human consumption, wastewater	Pour Plating Surface Plating Filtration MPN techniques
Listeria monocytogenes	ISO 11290-1, NF EN ISO 11290-1, NF V08-055, NF V08-062, BAM FDA ch.10-11, AFNOR BRD-07/4, AFNOR BRD-07/12, ISO 11290-2, NF EN ISO 11290-2.	Food and animal feedstuffs	Qualitative Surface Plating

## Microbiological

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Enterobacteriaceae	ISO 21528-2, NF V08 054, ISO 7402, ISO 21528-1, ISO 8523, IT-me/LMB/01.	Food and animal feedstuffs	Pour Plating Surface Plating MPN techniques TEMPO EB
Mesophilic lactic bacteria	ISO 15214, NF ISO 15214.	Food and animal feedstuffs	Enumeration technique
Psychrotrophic microorganisms	ISO 17410, NF ISO 17410.	Food and animal feedstuffs	Enumeration technique
<i>E.coli</i> O157	ISO 16654, NF EN 16654.	Food and animal feedstuffs	Qualitative technique
GMO Screening for NOS terminator and 35S Promoter	ISO 21569	Food and animal feedstuffs	RT-PCR

## Chemical

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Moisture	IT-me/CHI/06 (based on AOAC 931.04) AOAC 920.116, AOAC 920.151, AOAC 925.10, AOAC 925.23, AOAC 925.30, AOAC 925.40, AOAC 925.45A, B and D, AOAC 926.08, AOAC 926.12, AOAC 927.05, AOAC 930.04, AOAC 930.15, AOAC 934.06, AOAC 941.08, AOAC 950.46B, AOAC 977.10, AOAC 984.20, AOAC 986.21, AOAC 969.38B. AOAC 948.12	Food and animal feedstuffs	Gravimetric Refractometer



## Chemical

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Ash	IT-me/CHI/08 (based on AACC 1995: Ash-basic method) AOAC 900.02, AOAC 920.48, AOAC 920.67, AOAC 920.153, AOAC 920.155C, AOAC 923.03, AOAC 925.11, AOAC 925.51, AOAC 930.22, AOAC 935.39B, AOAC 935.42, AOAC 940.12, AOAC 940.26 A, AOAC 945.38C, AOAC 945.46, AOAC 950.14A, AOAC 950.49, AOAC 969.36A, AOAC 972.15. AOAC 942.05, AOAC 930.30 AOAC 920.100, AOAC 920.93.	Food and animal feedstuffs	Gravimetric
Fat	IT-me/CHI/05 (based on AOAC 933.05, 963.15), AOAC 905.02, AOAC 920.39 B, C, AOAC 920.111A, AOAC 922.06, AOAC 925.32, AOAC 932.06, AOAC 933.05, AOAC 935.38, AOAC 935.39D, AOAC 938.06, AOAC 945.18A, AOAC 945.38F, AOAC 948.22, AOAC 950.54, AOAC 952.06, AOAC 960.39, AOAC 963.15, AOAC 989.05 & ISO 23319.	Food and animal feedstuffs	Gravimetric
Fatty acid composition	IT-me/CHI/02 (based on ISO 12966-1, ISO 12966-2) and Pearson's Chemical Analysis of foods 8 <sup>th</sup> ed., page 527	Food and animal feedstuffs	GC

## Chemical

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Cholesterol	IT-me/CHI/07 (based on AOAC 941.09 and AOAC 994.10 modified as in Journal of Food Composition and Analysis 21 (2008) 306–314)	Food and animal feedstuffs	GC
Protein	IT-me/CHI/11 (based on ISO 5983-1) AOAC 920.70, AOAC 920.87, AOAC 920.123, AOAC 920.152, AOAC 928.08, AOAC 930.25, AOAC 930.29, AOAC 930.33, AOAC 935.39C, AOAC 945.18B, AOAC 950.36, AOAC 950.48, AOAC 955.04, AOAC 970.22, AOAC 978.04, AOAC 984.13, AOAC 991.20, ICC standard No.105/2	Food and animal feedstuffs	Kjeldahl
Sodium	IT-me/CHI/03 (based on AOAC 975.03 and AOAC 985.35)	Food and animal feedstuffs	AAS
Sugars	IT-me/CHI/13 (based on AOAC 906.03, AOAC 930.36 and AOAC 968.28) AOAC 920.65, AOAC 920.82, AOAC 920.184, AOAC 925.35, AOAC 925.49J, AOAC 925.52, AOAC 939.03, AOAC 950.29, AOAC 975.14,	Food and animal feedstuffs	Gravimetric
Carbohydrates	AOAC, Methods of analysis for nutrition labeling, ch.1 page 8 (by calculation) year:1993	Food and animal feedstuffs [not applicable for food which has a reduced energy content (where sugars are replaced by sweeteners)]	Gravimetric



## Chemical

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Calories	AOAC, Methods of analysis for nutrition labeling, ch.1 page 5 (by calculation) year:1993	Food and animal feedstuffs [not applicable for food which has a reduced energy content (where sugars are replaced by sweeteners)]	Gravimetric
Fiber	IT-me/CHI/04 (based on Pearson's Chemical Analysis of foods 8 <sup>th</sup> ed., page 23) AOAC 962.09, AOAC 993.21	Food and animal feedstuffs	Gravimetric
Phosphorus	IT-me/CHI/14 (Based on AOAC 970.39 and AOAC 986.24)	Food and animal feedstuffs	UV Spectrophotometer
Vitamins	IT-me/CHI/10 Vit A: based on ISO 12080-2, ISO 14565, NF EN 12823-1 and NF EN 12823-2, Vit E: based on NF EN 12822, Vit C: based on AOAC 967.21 and AOAC 985.33.	Food and animal feedstuffs	HPLC Titration
Aflatoxins	IT-me/CHI/09 (based on AOAC 977.16) and Veratox (Neogen) B1, B2, G1, G2: IT-me/CHI/16 (based on ISO 16050) M1: IT-me/CHI/17 (Based on IDF 171)	Food and animal feedstuffs	ELISA and HPLC
Ochratoxins	IT-me/CHI/21 based on Veratox (Neogen)	Food and animal feedstuffs	ELISA
Ochratoxin A	IT-me/CHI/22 (based on AOAC 2000.03)	Food and animal feedstuffs	HPLC
Iron	IT-me/CHI/03 based on AOAC 975.03 and AOAC 985.35 AOAC 944.02, LS 45	Food and animal feedstuffs, water for human consumption, waste water	AAS UV Spectrophotometer

## Chemical

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Calcium	IT-me/CHI/03 (based on AOAC 975.03 AOAC 985.35), AOAC 991.21, IT-me/CHI/23, (based on AOAC 920.199), BSI 5766 (part 11), AOAC 983.19, ISO 6058, LS 45 (Lebanese Standard), IT-me/CHI/23, (based on AOAC 920.199)	Food and animal feedstuffs, water for human consumption, wastewater	AAS Titration Gravimetric
Chloride	IT-me/CHI/15 (based on ISO 9297)	Water for Human Consumption, wastewater	Titration
pH	AOAC 973.41, ISO 4316	Water for Human Consumption, wastewater	pH-meter
Conductivity	ISO 7888	Water for Human Consumption, wastewater	Conductivity meter
Chemical Oxygen Demand	ISO 6060 (Upon customer request) AOAC 973.46 (E, F)	Water and wastewater	Titration
Total Kjeldahl Nitrogen	ISO 5663 AOAC 973.48	Water and wastewater	Kjeldahl
Total suspended solids	ISO 11923 EPA 160.2	Water and wastewater	Gravimetric
Iodine	AOAC 920.159	Animal & vegetable fats & oils	Titration
Acidity	ISO 660	Animal & vegetable fats & oils	Titration
UV extinction	ISO 3656	Animal & vegetable fats & oils	UV Spectrophotometer
Peroxide value	AOAC 965.33	Animal & vegetable fats & oils	Titration
Experimental milling	AACC 26-1002, AACC 26- 2102, AACCI 26-22.01, AACC 26-31.01, AACCI 26- 95.01	Grain and flour. Cereals, pulses, feed, milled products and by- products in bulk and sac	Specific reference mills Buhler MLU 202
Moisture	ICC 110/1, AOAC 925.10, ISO 712, AACC 44-1502, NF EN ISO 712	Grain and flour. Cereals, pulses, feed, milled products and by- products in bulk and sac	Gravimetric

## Chemical

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Protein	ICC 105/2, AACC 46-11.02, AOAC 920.87, AOAC 979.09, ISO 20483	Grain and flour. Cereals, pulses, feed, milled products and by- products in bulk and sac	Digestion, distillation and titration
Ash	ICC 104/1, AOAC 923.03, AACC I 08-01.01, AACC I 08-12	Grain and flour. Cereals, pulses, feed, milled products and by- products in bulk and sac	Gravimetric
Purity of grains	ICC 102/1, ISO 605, ISO 7970, ISO 7301.	Grain and flour. Cereals, pulses, feed, milled products and by- products in bulk and sac	Conical divider, set of standard sieves
Hectoliter weight	ISO 7971-3	Grain and flour. Cereals, pulses, feed, milled products and by- products in bulk and sac	Gravimetric
Farinograph and Extensograph:	ICC 114/1, AACC 54-10.01, ICC 115/1, AACC 54-21.02, ISO 5530-1, ISO 5530-2.	Grain and flour. Cereals, pulses, feed, milled products and by- products in bulk and sac	Brabender equipment- Germany
Alveograph	ICC 121, AACC 54-3002, ISO 27971	Grain and flour. Cereals, pulses, feed, milled products and by- products in bulk and sac	Chopin equipment- France
Falling number	ICC 107/1, ISO 3093, AACC 56-81.03	Grain and flour. Cereals, pulses, feed, milled products and by- products in bulk and sac	Perten instruments- Sweden
Gluten	ICC 155, ICC 158, ISO 21415-2, ISO 21415-4, AACC 38-1202	Grain and flour. Cereals, pulses, feed, milled products and by- products in bulk and sac	Perten instruments- Sweden
Zeleny sedimentation	ICC 118, ICC 116/1, AACC 56-61.01, AACC 56-60.02, ISO 5529	Grain and flour. Cereals, pulses, feed, milled products and by- products in bulk and sac	Brabender mill.

## Chemical

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Sampling	ISO 24333, NF EN ISO 24333, AACC 45-01.01, AACC 64-50.01, AACC 64-60, AACC 64-70 .01, AACCI 64-71.02 ICC 101/1, ICC 130, AOAC 925.08	Grain and flour. Cereals, pulses, feed, milled products and by- products in bulk and sac	Pneumatic sampler, conical probes, pelican sampler

## Electrical

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Resistance to heat	IT/ELC/22 based on: IEC 60695-10-2, IEC 60335-1 (Clause 30.1), NL EN 60335-1 (Clause 30.1)	Household and similar electrical appliances	Ball pressure, Compression test, oven
Resistance to heat	IT/ELC/22 based on: IEC 60695-10-2, IEC 61558-1 (Clause 27.1), NL 216-1 (Clause 27.1)	Power transformers, power supply units and similar products	Ball pressure, Compression test, oven
Resistance to heat	IT/ELC/22 based on: IEC 60695-10-2, IEC 60884-1 (Clause 25)	Plug and socket	Ball pressure, Compression test, oven
Resistance to heat	IT/ELC/22 based on: IEC 60695-10-2, IEC 60898-1 (Clause 9.14), NL 47 (Clause 9.14)	Circuit breakers	Ball pressure, Compression test, oven
Resistance to heat	IT/ELC/22 based on: IEC 60695-10-2, IEC 60968 (Clause 11), NL IEC 60968 (Clause 10)	Self-ballasted lamps	Ball pressure, Compression test, oven
Degree of protection IPX1 - IPX2	IT/ELC/23 based on: IEC 60529 (Clause 14.1, 14.2.1, 14.2.2 and 14.3)	Enclosures	Drip box system
Degree of protection IPX3 – IPX4	IT/ELC/24 based on: IEC 60529 (Clause 14.1, 14.2.3 b, 14.2.4 b, 14.3)	Enclosures	Handheld spray nozzle

## Electrical

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Degree of protection IPX3 – IPX4	IT/ELC/25 based on: IEC 60529 (Clause 14.1, 14.2.3 a, 14.2.4 a, 14.3)	Enclosures	Oscillating tube
Degree of protection I PX5 – IPX6	IT/ELC/26 based on: IEC 60529 (Clause 14.1, 14.2.5, 14.2.6, 14.3)	Enclosures	Jet nozzle
Degree of protection IPX7 – IPX8	IT/ELC/27 based on: IEC 60529 (Clause 14.1, 14.2.7, 14.2.8, 14.3)	Enclosures	Water immersion (Barrel)
Degree of protection IP1X to IP 6X (Access to hazardous part)	IT/ELC/35 based on: IEC 60529 (Clause 12,12.1, 12.2, 12.3)	Enclosures	Test probes, finger test, steel balls
Degree of protection IP1X to IP 4X (Solid foreign object)	IT/ELC/35 based on: IEC 60529 (Clause 13, 13.1, 13.2, 13.3)	Enclosures	Test probes, finger test, steel balls
Degree of protection IPX1	IT/ELC/23 based on: IEC 60598-1 (Clause 9.1, 9.2.3)	Luminaire	Drip box system
Degree of protection IPX3 – IPX4	IT/ELC/25 based on: IEC 60598-1 (Clause 9.1, 9.2.4, 9.2.5)	Luminaire	Oscillating tube
Degree of protection IPX5 – IPX6	IT/ELC/26 based on: IEC 60598-1 (Clause 9.1, 9.2.6, 9.2.7)	Luminaire	Jet nozzle
Degree of protection IPX7 – IPX8	IT/ELC/27 based on: IEC 60598-1 (Clause 9.1, 9.2.8, 9.2.9)	Luminaire	Water immersion (Barrel)
Degree of protection IP3X to IP 4X (Solid foreign object)	IT/ELC/35 based on: IEC 60598-1 (Clause 9.2.0)	Luminaire	Test probes, finger test, steel balls
Degree of protection IP3X to IP 4X	IT/ELC/35 based on: IEC 61558-1 (Clause 17.1.1 B) NL 216-1 (Clause 17.1.1 B)	Power transformers, power supply units and similar products	Test probes, finger test, steel balls
Protection against access to live parts	IT/ELC/28 based on: IEC 60335-1 (Clause 8.1.1) NL EN 60335-1 (Clause 8.1.1)	Household and similar electrical appliances	Finger test

## Electrical

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Protection against access to live parts	IT/ELC/28 based on: IEC 61558-1 (Clause 9.1.2) NL 216-1 (Clause 9.2)	Power transformers, power supply units and similar products	Finger test
Resistance to external forces	IT/ELC/34 based on: IEC 60065 (Clause 9.1.7 a, b) NL EN 60065 (Clause 9.1.7 a, b)	Audio video apparatus	Finger test, unjointed finger, test hook
Power input and current	IT/ELC/36 based on: IEC 60335-1 (Clause 10) NL EN 60335-1 (Clause 10)	Household and similar electrical appliances	Multi-tester, Clamp meter
Vibration resistance	IT/ELC/29 based on: IEC 60068-2-6 Test Fc: Vibration (sinusoidal), IEC 60095-1 (Clause 9.8) NL 217-1 (Clause 9.8)	Lead acid batteries	Vibration machine
Vibration resistance	IT/ELC/31 based on: IEC 60068-2-6 Test Fc: Vibration (sinusoidal), IEC 60065 (Clause 12.1.3) NL EN 60065 (Clause 12.1.2)	Audio video apparatus	Vibration machine
Performance tests Batteries	IT/ELC/30 based on: IEC 60095-1 (Clause 9.1, 9.2), NL 217-1 (Clause 9.1, 9.2)	Lead acid batteries	Capacity check
Performance tests Batteries	IT/ELC/32 based on: IEC 60095-1 (Clause 8.2.2, 8.2.4) NL 217-1 (Clause 8.2.2, 8.2.4)	Lead acid batteries	Charging
Performance tests Batteries	IT/ELC/17 based on: IEC 60095-1 (Clause 9.3.1 and 10) NL 217-1 (Clause 9.3.1 and 10) IT/ELC/33 based on: IEC 60095-1 (Clause 9.10, 10) NL 217-1 (Clause 9.10, 10)	Lead acid batteries	Cranking



## Electrical

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Light emission test	IT/ELC/37 based on: NL IEC 60969 (clause 5,6,7)	Illuminating sources	Integrating sphere, digital power meter, spectrophoto- colorimeter
Provision for earthing	IT/ELC/38 based on: IEC 60335-1 (Clause 27.5), NL EN 60335-1 (Clause 27.5)	Household and similar electrical appliances	Multi-tester
Provision for earthing	IT/ELC/38 based on: IEC 61558-1 (Clause 24.4), NL 216-1 (Clause 24.4)	Power transformers, power supply units and similar products	Multi-tester
Glow wire test	IT/ELC/01 based on: IEC 60695-2-10, IEC 60898-1 (Clause 9.15), NL 47 (Clause 9.15)	Circuit breakers	Glow wire apparatus
Glow wire test	IT/ELC/01 based on: IEC 60695-2-10 IEC 60968 (Clause 12), NL IEC 60968 (Clause 11)	Self-ballasted lamps	Glow wire apparatus
Leakage current and electrical strength	IT/ELC/14 based on: IEC 60335-1 (Clause 16.2, 16.3), NL EN 60335-1 (Clause 16.2, 16.3)	Household and similar electrical appliances	AC power supply, multi-tester
Needle Flame	IT/ELC/43 based on: IEC 60695-11-5 IEC 60335-1 (Clause 30.2.4), NL EN 60335-1 (Clause 30.2.4)	Household and similar electrical appliances	Needle-Flame test apparatus
Insulation resistance	IT/ELC/39 based on: IEC 60432-1 (Clause 2.6), NL 96-1 (Clause 2.6)	Incandescent lamps	Multi-tester
Test of Tripping characteristic	IT/ELC/40 IEC 60898-1 (Clause 8.6 & 9.10), NL 47 (Clause 8.6 & 9.10)	Circuit Breakers	Power supplies
Mechanical shock	IT/ELC/41 IEC 60898-1 (Clause 9.13.1), NL 47 (Clause 9.13.1)	Circuit Breakers	Mechanical shock test apparatus
Resistance to Mechanical Stresses and Impact	IT/ELC/42 IEC 60898-1 (Clause 9.13.2), NL 47 (Clause 9.13.2)	Circuit Breakers	Mechanical Impact test apparatus



## Electrical

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Limits of error due to the variation of the current	IT/ELC/44 based on: NL CYS EN 62053-21, (Clause 8.1)	Static energy meter	Energy meter tester
Meter constant	IT/ELC/44 based on: NL CYS EN 62053-21, (Clause 8.4)	Static energy meter	Energy meter tester
Limits of error due to the variation of the current	IT/ELC/44 based on: NL CYS EN 62053-11, (Clause 8.1)	Electromechanical energy meter	Energy meter tester
Meter constant	IT/ELC/44 based on: NL CYS EN 62053-11, (Clause 8.4)	Electromechanical energy meter	Energy meter tester
Lamp power	IT /ELC/45 based on: IEC 62612 (clause 8.1) NL IEC 62612 (clause 8.1)	LED LAMPS	Integrating sphere, digital power meter, Spectroradiometer
Lamp Lumen	IT/ELC/45 based on: IEC 62612 (clause 9.1) NL IEC 62612 (clause 9.1)	LED LAMPS	Integrating sphere, digital power meter, Spectroradiometer

## Mechanical

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Water absorption (boiling method)	IT/GCS/12 based on: BS EN ISO 10545-3, 1997 (clause 5.1.1) (upon customer request)	Ceramic tiles	ISO water large
Modulus of rupture	IT/GCS/11 based on: BS EN ISO 10545-4	Ceramic tiles	Flexi 1000
Thermal expansion	IT/GCS/09 based on: BS EN ISO 10545-8	Ceramic tiles	Dilatometer
Deep abrasion	IT/GCS/10 based on: BS EN ISO 10545-6	Ceramic tiles	Abrasimeter deep unglazed
Crazing resistance	IT/GCS/20 based on: BS EN ISO 10545-11	Ceramic tiles	Autoclave

## Construction Materials

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Strength	PR/GCS/02 based on: EN196-1	Cement	Compression testing machine
Initial setting time	IT/GCS/18 based on: EN196-3 (clause 6.2)	Cement	Vicat

## CALIBRATION

### Mass and Mass Related

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Class E2 and lower	1 mg to 20 mg	0.003 mg	PR/MET/03: Mass Calibration (OIML R111-1; EA-4/02)
	50 mg	0.004 mg	
	100 mg	0.005 mg	
	200 mg	0.006 mg	
	500 mg	0.008 mg	
	1 g	0.01 mg	
	2 g	0.012 mg	
	5 g	0.016 mg	
	10 g	0.02 mg	
	20 g	0.025 mg	
	50 g	0.03 mg	
	100 g	0.05 mg	
	200 g	0.1 mg	
	500 g	0.25 mg	
	1 kg	0.5 mg	
	2 kg	1 mg	
	5 kg	2.5 mg	
	10 kg	5 mg	

	20 kg	10 mg	
Balances <sup>1</sup>	1 mg to 5 g	3 µg	PR/MET/02: Balance calibration (EURAMET cg-18; EA-4/02)
	5 g to 40 kg	2·10 <sup>-6</sup> . Applied load “m”	
	40 kg to 200 kg	2·10 <sup>-5</sup> . Applied load “m”	

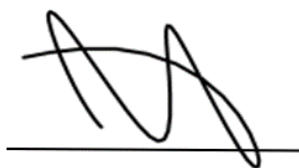
### Thermodynamic

Specific Tests and/or Properties Measured	Specification, Standard, Method, or Test Technique	Items, Materials or Product Tested	Key Equipment or Technology
Resistance thermometer and data loggers (Direct reading)	(-50 to 50) °C	80 mK	PR/MET/10 Calibration of resistance temperature detectors using stirred liquid baths and dry well calibrators (DKD – R-5-1; EA – 4/02)
	(50 to 200) °C	90 mK	
	(50 to 420) °C	0.50 K	
Noble metal thermocouples With readout (Direct reading)	(-50 to 50) °C	0.15 K	PR/MET/11 Calibration of resistance temperature detectors using stirred liquid baths and dry well calibrators (Euramet cg – 08; EA – 4/02)
	(50 to 200) °C	0.26 K	
	(50 to 420) °C	0.70 K	
Base metal thermocouples With readout (Direct reading)	(-50 to 50) °C	0.17 K	PR/MET/11 Calibration of resistance temperature detectors using stirred liquid baths and dry well calibrators (Euramet cg – 08; EA – 4/02)
	(50 to 200) °C	0.36 K	
	(50 to 420) °C	0.78 K	

Calibration and Measurement Capability (CMC) is expressed in terms of the measurement parameter, measurement range, expanded uncertainty of measurement and reference standard, method, and/or equipment. The expanded uncertainty of measurement is expressed as the standard uncertainty of the measurement multiplied by a coverage factor of 2 ( $k=2$ ), corresponding to a confidence level of approximately 95%.

#### Notes:

- On-site calibration service is available for this parameter, since on-site conditions are typically more variable than those in the laboratory, larger measurement uncertainties are expected on-site than what is reported on the accredited scope.



Jason Stine, Vice President