



# 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 2028

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: **26 August 2026**

Certificate Number: **ACT-1898** Certificate Expiry Date: **29 August 2028**

### 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<br>IT-me/LMB/02 based on<br>ISO 6887-1-2-3-4-5-6,<br>NF EN ISO 6887-1-2-3-4-5-6,<br>ISO 20837.                                                                                                                            | Food and animal feedstuffs,<br>water for human<br>consumption, wastewater                                              | Surface plating<br>Pour plating<br>Filtration<br>PCR       |
| Total bacterial count                     | ISO 6222, NF EN ISO 6222,<br>ISO 8199, NF EN ISO 8199,<br>BS EN ISO 8199<br>BAM FDA ch.3, ISO 21149,<br>NF ISO 21149,<br>BAM FDA,<br>IT-me/LMB/09 based on<br>ISO 4833-1 -2,<br>NF ISO 7218 NF V08-051<br>AOAC International ch.23<br>IT-me/LMB/01 | Food and animal feedstuffs,<br>water for human<br>consumption, wastewater,<br>cosmetics, wet wipes and<br>baby diapers | Surface plating<br>Pour plating<br>Filtration<br>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<br>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<br>Pour plating<br>Filtration<br>MPN techniques<br>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<br>Pour plating<br>Filtration<br>MPN techniques<br>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<br>Pour plate<br>Filtration<br>TEMPO YM                     |
| Sulfite-reducing bacteria                                  | IT-me/LMB/09 based on ISO 15213-1 , NF ISO 15213-1<br>BAM FDA, AOAC International ch.23<br>ISO 6461-2, ISO 6461-1.                                                                                                                                                                               | Food and animal feedstuffs, water for human consumption, wastewater, cosmetics, wet wipes and baby diapers | Pour plating<br>Filtration<br>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<br>Surface Plating<br>Filtration<br>TEMPO EC<br>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<br>Surface Plating<br>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<br>Surface Plating<br>Filtration<br>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<br>Surface Plating<br>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<br>Surface Plating<br>Filtration<br>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<br>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<br>Surface Plating<br>MPN techniques<br>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<br>(based on AOAC 931.04)<br>AOAC 920.116, AOAC 920.151,<br>AOAC 925.10, AOAC 925.23,<br>AOAC 925.30, AOAC 925.40, AOAC 925.45A, B and D,<br>AOAC 926.08, AOAC 926.12,<br>AOAC 927.05, AOAC 930.04,<br>AOAC 930.15, AOAC 934.06,<br>AOAC 941.08, AOAC 950.46B, AOAC 977.10,<br>AOAC 984.20, AOAC 986.21, AOAC 969.38B.<br>AOAC 948.12 | Food and animal feedstuffs         | Gravimetric<br>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<br>(based on AACC 1995:<br>Ash-basic method)<br>AOAC 900.02, AOAC 920.48,<br>AOAC 920.67, AOAC 920.153, AOAC 920.155C,<br>AOAC 923.03, AOAC 925.11,<br>AOAC 925.51, AOAC 930.22, AOAC 935.39B,<br>AOAC 935.42, AOAC 940.12, AOAC 940.26 A,<br>AOAC 945.38C, AOAC 945.46, AOAC 950.14A,<br>AOAC 950.49, AOAC 969.36A, AOAC 972.15.<br>AOAC 942.05, AOAC 930.30<br>AOAC 920.100, AOAC 920.93. | Food and animal feedstuffs         | Gravimetric                 |
| Fat                                       | IT-me/CHI/05 (based on<br>AOAC 933.05, 963.15),<br>AOAC 905.02, AOAC 920.39<br>B, C, AOAC 920.111A,<br>AOAC 922.06, AOAC 925.32, AOAC 932.06,<br>AOAC 933.05, AOAC 935.38, AOAC 935.39D,<br>AOAC 938.06, AOAC 945.18A, AOAC 945.38F,<br>AOAC 948.22, AOAC 950.54,<br>AOAC 952.06, AOAC 960.39,<br>AOAC 963.15, AOAC 989.05<br>& 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)<br>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)<br>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<br>[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<br>[not applicable for food which has a reduced energy content (where sugars are replaced by sweeteners)] | Gravimetric                 |
| Fiber                                     | IT-me/CHI/04<br>(based on Pearson's Chemical Analysis of foods 8 <sup>th</sup> ed., page 23)<br>AOAC 962.09, AOAC 993.21                                                 | Food and animal feedstuffs                                                                                                           | Gravimetric                 |
| Phosphorus                                | IT-me/CHI/14<br>(Based on AOAC 970.39 and AOAC 986.24)                                                                                                                   | Food and animal feedstuffs                                                                                                           | UV Spectrophotometer        |
| Vitamins                                  | IT-me/CHI/10<br>Vit A: based on ISO 12080-2, ISO 14565, NF EN 12823-1 and NF EN 12823-2,<br>Vit E: based on NF EN 12822,<br>Vit C: based on AOAC 967.21 and AOAC 985.33. | Food and animal feedstuffs                                                                                                           | HPLC<br>Titration           |
| Aflatoxins                                | IT-me/CHI/09<br>(based on AOAC 977.16) and Veratox (Neogen)<br>B1, B2, G1, G2: IT-me/CHI/16 (based on ISO 16050)<br>M1: IT-me/CHI/17<br>(Based on IDF 171)               | Food and animal feedstuffs                                                                                                           | ELISA and HPLC              |
| Ochratoxins                               | IT-me/CHI/21<br>based on Veratox (Neogen)                                                                                                                                | Food and animal feedstuffs                                                                                                           | ELISA                       |
| Ochratoxin A                              | IT-me/CHI/22<br>(based on AOAC 2000.03)                                                                                                                                  | Food and animal feedstuffs                                                                                                           | HPLC                        |
| Iron                                      | IT-me/CHI/03 based on AOAC 975.03 and AOAC 985.35<br>AOAC 944.02, LS 45                                                                                                  | Food and animal feedstuffs, water for human consumption, waste water                                                                 | AAS<br>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<br>(based on AOAC 975.03<br>AOAC 985.35), AOAC<br>991.21,<br>IT-me/CHI/23,<br>(based on AOAC 920.199),<br>BSI 5766 (part 11), AOAC<br>983.19, ISO 6058,<br>LS 45 (Lebanese Standard) | Food and animal feedstuffs,<br>water for human<br>consumption, wastewater                         | AAS<br>Titration<br>Gravimetric            |
| Chloride                                  | IT-me/CHI/15 (based on ISO<br>9297)                                                                                                                                                               | Water for Human<br>Consumption, wastewater                                                        | Titration                                  |
| pH                                        | AOAC 973.41, ISO 4316                                                                                                                                                                             | Water for Human<br>Consumption, wastewater                                                        | pH-meter                                   |
| Conductivity                              | ISO 7888                                                                                                                                                                                          | Water for Human<br>Consumption, wastewater                                                        | Conductivity meter                         |
| Chemical Oxygen Demand                    | ISO 6060 (Upon customer<br>request)<br>AOAC 973.46 (E, F)                                                                                                                                         | Water and wastewater                                                                              | Titration                                  |
| Total Kjeldahl Nitrogen                   | ISO 5663<br>AOAC 973.48                                                                                                                                                                           | Water and wastewater                                                                              | Kjeldahl                                   |
| Total suspended solids                    | ISO 11923<br>EPA 160.2                                                                                                                                                                            | Water and wastewater                                                                              | Gravimetric                                |
| Iodine                                    | AOAC 920.159                                                                                                                                                                                      | Animal & vegetable<br>fats & oils                                                                 | Titration                                  |
| Acidity                                   | ISO 660                                                                                                                                                                                           | Animal & vegetable<br>fats & oils                                                                 | Titration                                  |
| UV extinction                             | ISO 3656                                                                                                                                                                                          | Animal & vegetable<br>fats & oils                                                                 | UV Spectrophotometer                       |
| Peroxide value                            | AOAC 965.33                                                                                                                                                                                       | Animal & vegetable<br>fats & oils                                                                 | Titration                                  |
| Experimental milling                      | AACC 26-1002, AACC 26-<br>2102, AACCI 26-22.01,<br>AACC 26-31.01, AACCI 26-<br>95.01                                                                                                              | Grain and flour. Cereals,<br>pulses, feed, milled products<br>and by- products in bulk and<br>sac | Specific reference mills<br>Buhler MLU 202 |
| Moisture                                  | ICC 110/1, AOAC 925.10,<br>ISO 712, AACC 44-1502,<br>NF EN ISO 712                                                                                                                                | Grain and flour. Cereals,<br>pulses, feed, milled products<br>and by- products in bulk and<br>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<br>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:<br>IEC 60695-10-2,<br>IEC 60335-1 (Clause 30.1),<br>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:<br>IEC 60695-10-2,<br>IEC 61558-1 (Clause 27.1),<br>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:<br>IEC 60695-10-2,<br>IEC 60884-1 (Clause 25)                                   | Plug and socket                                             | Ball pressure, Compression test, oven |
| Resistance to heat                        | IT/ELC/22 based on:<br>IEC 60695-10-2,<br>IEC 60898-1 (Clause 9.14),<br>NL 47 (Clause 9.14)         | Circuit breakers                                            | Ball pressure, Compression test, oven |
| Resistance to heat                        | IT/ELC/22 based on:<br>IEC 60695-10-2,<br>IEC 60968 (Clause 11),<br>NL IEC 60968 (Clause 10)        | Self-ballasted lamps                                        | Ball pressure, Compression test, oven |
| Degree of protection IPX1 - IPX2          | IT/ELC/23 based on:<br>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:<br>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:<br>IEC 60529<br>(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:<br>IEC 60529<br>(Clause 14.1, 14.2.5, 14.2.6, 14.3)            | Enclosures                                                  | Jet nozzle                            |
| Degree of protection IPX7 – IPX8                                 | IT/ELC/27 based on:<br>IEC 60529<br>(Clause 14.1, 14.2.7, 14.2.8, 14.3)            | Enclosures                                                  | Water immersion (Barrel)              |
| Degree of protection IP1X to IP 6X<br>(Access to hazardous part) | IT/ELC/35 based on:<br>IEC 60529<br>(Clause 12,12.1, 12.2, 12.3)                   | Enclosures                                                  | Test probes, finger test, steel balls |
| Degree of protection IP1X to IP 4X<br>(Solid foreign object)     | IT/ELC/35 based on:<br>IEC 60529<br>(Clause 13, 13.1, 13.2, 13.3)                  | Enclosures                                                  | Test probes, finger test, steel balls |
| Degree of protection IPX1                                        | IT/ELC/23 based on:<br>IEC 60598-1<br>(Clause 9.1, 9.2.3)                          | Luminaire                                                   | Drip box system                       |
| Degree of protection IPX3 – IPX4                                 | IT/ELC/25 based on:<br>IEC 60598-1<br>(Clause 9.1, 9.2.4, 9.2.5)                   | Luminaire                                                   | Oscillating tube                      |
| Degree of protection IPX5 – IPX6                                 | IT/ELC/26 based on:<br>IEC 60598-1<br>(Clause 9.1, 9.2.6, 9.2.7)                   | Luminaire                                                   | Jet nozzle                            |
| Degree of protection IPX7 – IPX8                                 | IT/ELC/27 based on:<br>IEC 60598-1<br>(Clause 9.1, 9.2.8, 9.2.9)                   | Luminaire                                                   | Water immersion (Barrel)              |
| Degree of protection IP3X to IP 4X<br>(Solid foreign object)     | IT/ELC/35 based on:<br>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:<br>IEC 61558-1 (Clause 17.1.1 B)<br>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:<br>IEC 60335-1 (Clause 8.1.1)<br>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:<br>IEC 61558-1 (Clause 9.1.2)<br>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:<br>IEC 60065 (Clause 9.1.7 a, b)<br>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:<br>IEC 60335-1 (Clause 10)<br>NL EN 60335-1 (Clause 10)                                                                                                      | Household and similar electrical appliances                 | Multi-tester, Clamp meter                |
| Vibration resistance                      | IT/ELC/29 based on:<br>IEC 60068-2-6<br>Test Fc: Vibration (sinusoidal),<br>IEC 60095-1 (Clause 9.8)<br>NL 217-1 (Clause 9.8)                                                    | Lead acid batteries                                         | Vibration machine                        |
| Vibration resistance                      | IT/ELC/31 based on:<br>IEC 60068-2-6 Test Fc: Vibration (sinusoidal),<br>IEC 60065 (Clause 12.1.3)<br>NL EN 60065 (Clause 12.1.2)                                                | Audio video apparatus                                       | Vibration machine                        |
| Performance tests Batteries               | IT/ELC/30 based on:<br>IEC 60095-1 (Clause 9.1, 9.2),<br>NL 217-1 (Clause 9.1, 9.2)                                                                                              | Lead acid batteries                                         | Capacity check                           |
| Performance tests Batteries               | IT/ELC/32 based on:<br>IEC 60095-1 (Clause 8.2.2, 8.2.4)<br>NL 217-1 (Clause 8.2.2, 8.2.4)                                                                                       | Lead acid batteries                                         | Charging                                 |
| Performance tests Batteries               | IT/ELC/17 based on:<br>IEC 60095-1 (Clause 9.3.1 and 10)<br>NL 217-1 (Clause 9.3.1 and 10)<br>IT/ELC/33 based on:<br>IEC 60095-1 (Clause 9.10, 10)<br>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:<br>NL IEC 60969 (clause 5,6,7)                                                     | Illuminating sources                                        | Integrating sphere, digital power meter, spectrophoto- colorimeter |
| Provision for earthing                    | IT/ELC/38 based on:<br>IEC 60335-1 (Clause 27.5),<br>NL EN 60335-1 (Clause 27.5)                       | Household and similar electrical appliances                 | Multi-tester                                                       |
| Provision for earthing                    | IT/ELC/38 based on:<br>IEC 61558-1 (Clause 24.4),<br>NL 216-1 (Clause 24.4)                            | Power transformers, power supply units and similar products | Multi-tester                                                       |
| Glow wire test                            | IT/ELC/01 based on:<br>IEC 60695-2-10,<br>IEC 60898-1 (Clause 9.15),<br>NL 47 (Clause 9.15)            | Circuit breakers                                            | Glow wire apparatus                                                |
| Glow wire test                            | IT/ELC/01 based on:<br>IEC 60695-2-10<br>IEC 60968 (Clause 12),<br>NL IEC 60968 (Clause 11)            | Self-ballasted lamps                                        | Glow wire apparatus                                                |
| Leakage current and electrical strength   | IT/ELC/14 based on:<br>IEC 60335-1 (Clause 16.2, 16.3),<br>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:<br>IEC 60695-11-5<br>IEC 60335-1 (Clause 30.2.4),<br>NL EN 60335-1 (Clause 30.2.4) | Household and similar electrical appliances                 | Needle-Flame test apparatus                                        |
| Insulation resistance                     | IT/ELC/39 based on:<br>IEC 60432-1 (Clause 2.6),<br>NL 96-1 (Clause 2.6)                               | Incandescent lamps                                          | Multi-tester                                                       |
| Test of Tripping characteristic DC        | IT/ELC/46 based on:<br>IEC 60898-3 (Clause 8.6 & 9.10)                                                 | DC Circuit Breakers                                         | DC Power Supply                                                    |
| Test of Tripping characteristic           | IT/ELC/40<br>IEC 60898-1 (Clause 8.6 & 9.10),<br>NL 47 (Clause 8.6 & 9.10)                             | Circuit Breakers                                            | Power supplies                                                     |
| Mechanical shock                          | IT/ELC/41<br>IEC 60898-1 (Clause 9.13.1),<br>NL 47 (Clause 9.13.1)                                     | Circuit Breakers                                            | Mechanical shock test apparatus                                    |

## Electrical

| Specific Tests and/or Properties Measured           | Specification, Standard, Method, or Test Technique                          | Items, Materials or Product Tested | Key Equipment or Technology                                |
|-----------------------------------------------------|-----------------------------------------------------------------------------|------------------------------------|------------------------------------------------------------|
| Resistance to Mechanical Stresses and Impact        | IT/ELC/42<br>IEC 60898-1 (Clause 9.13.2),<br>NL 47 (Clause 9.13.2)          | Circuit Breakers                   | Mechanical Impact test apparatus                           |
| Limits of error due to the variation of the current | IT/ELC/44 based on:<br>NL CYS EN 62053-21,<br>(Clause 8.1)                  | Static energy meter                | Energy meter tester                                        |
| Meter constant                                      | IT/ELC/44 based on:<br>NL CYS EN 62053-21,<br>(Clause 8.4)                  | Static energy meter                | Energy meter tester                                        |
| Limits of error due to the variation of the current | IT/ELC/44 based on:<br>NL CYS EN 62053-11,<br>(Clause 8.1)                  | Electromechanical energy meter     | Energy meter tester                                        |
| Meter constant                                      | IT/ELC/44 based on:<br>NL CYS EN 62053-11,<br>(Clause 8.4)                  | Electromechanical energy meter     | Energy meter tester                                        |
| Lamp power                                          | IT /ELC/45 based on:<br>IEC 62612 (clause 8.1)<br>NL IEC 62612 (clause 8.1) | LED LAMPS                          | Integrating sphere, digital power meter, Spectroradiometer |
| Lamp Lumen                                          | IT/ELC/45 based on:<br>IEC 62612 (clause 9.1)<br>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:<br>BS EN ISO 10545-3, 1997 (clause 5.1.1)<br>(upon customer request) | Ceramic tiles                      | ISO water large             |
| Modulus of rupture                        | IT/GCS/11 based on:<br>BS EN ISO10545-4                                                  | Ceramic tiles                      | Flexi 1000                  |
| Thermal expansion                         | IT/GCS/09 based on:<br>BS EN ISO10545-8                                                  | Ceramic tiles                      | Dilatometer                 |
| Deep abrasion                             | IT/GCS/10 based on:<br>BS EN ISO 10545-6                                                 | Ceramic tiles                      | Abrasimeter deep unglazed   |
| Crazing resistance                        | IT/GCS/20 based on:<br>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:<br>EN196-1                     | Cement                             | Compression testing machine |
| Initial setting time                      | IT/GCS/18 based on:<br>EN196-3 (clause 6.2)        | Cement                             | Vicat                       |

## CALIBRATION

### Mass and Mass Related

| Parameter/Equipment | Range         | Expanded Uncertainty of Measurement (+/-) | Reference Standard, Method, and/or Equipment                                 |
|---------------------|---------------|-------------------------------------------|------------------------------------------------------------------------------|
| Class E2 and lower  | 1 mg to 20 mg | 0.003 mg                                  | In Comparison to<br>PR/MET/03:<br>Mass Calibration<br>(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                                  | In Comparison to<br>PR/MET/02:<br>Balance calibration<br>(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” |                                                                                   |

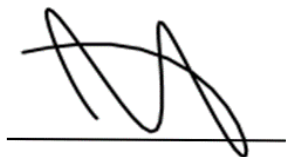
### Thermodynamic

| Parameter/Equipment                                      | Range          | Expanded Uncertainty of Measurement (+/-) | Reference Standard, Method, and/or Equipment                                                                                                                   |
|----------------------------------------------------------|----------------|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Resistance thermometer and data loggers (Direct reading) | (-50 to 50) °C | 80 mK                                     | In Comparison to PR/MET/10<br>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                                    | In Comparison to PR/MET/11<br>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                                    | In Comparison to PR/MET/11<br>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:

1. 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

