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# Calibration Report n° LTCXXXXXX_65432

# Issued 23/04/2026

## Customer

| | |
|---|---|
| Name | C**USTOMER** |
| Address | A**DDRESS** |
| | A**DDRESS** |
| Country | C**OUNTRY** |

## Order

| | |
|---|---|
| Number | RMG043136 |

## Instrument

| | |
|---|---|
| Type | LOW TEMPERATURE CHECK |
| Model | LOW TEMPERATURE CHECK (MACCHINA BASE) |
| Producer | GIBITRE INSTRUMENTS SRL |
| Serial Number | LTCX**XXXXX** |

## Calibration

| | | |
|---|---|---|
| Date of the measures | **09/04/2026** | |
| Technician | **Francesco Ajazi** | Habilitation for Calibration |

## Reference Standard

The calibration is made in accordance to the requirements of the following standards:

**ISO 2921: Rubber, vulcanized -- Determination of low-temperature retraction (TR test)**

**ISO 812: Rubber, vulcanized or thermoplastic -- Determination of low-temperature brittleness**

The measurement uncertainties stated in this document have been determined according to the ISO/IEC Guide 98 and to EA-4/02. Usually they have been estimated as expanded uncertainty obtained multiplying the standard uncertainty by the coverage factor k corresponding to a confidence level of about 95%. Normally, this factor k is 2.

Calibration made by:

Francesco Ajazi

Calibration Report approved by:

**Ivan Locatelli**

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*The measurement results reported in this Calibration Report were obtained following the procedures given in the following pages, where the reference standards or instruments are indicated which garantee the traceability chain of the laboratory, and the related calibration certificates in the course of validity are indicated as well. They relate only to the calibrated item and they are valid for the time and conditions of calibration, unless otherwise specified.*

| Reference Instruments | Producer | Serial N. | Gibitre Code | Certificate N. | Calibration Laboratory | Issue Date | Due Date | Uncertainty | Unit |
|---|---|---|---|---|---|---|---|---|---|
| PT100 Thermoresistance + Calibrator | Gibitre Instruments srl | C1-T-PTA | C1-GB3-CAL-1 + C1-T-PTA(T<0°C) | LAT_128T_1417_22 | ELLAB S.r.l. | 25/09/22 | 25/09/2027 | 0,05 | °C |
| Oscilloscope | Tektronic | B022027 | OSC01 [5-2000 ms] | LAT 101 0719_2023_ACCR_EO | TESI S.R.L. | 04/10/23 | 04/10/2028 | 0,01 | ms |
| Chronometer | RS COMPONENTS | GBT.CN.01/13 | CRO02 [60-54000 s] | LAT 056 23-0199_2023 | GAMMA MISURE | 09/02/23 | 09/02/2028 | 0,15 | s |
| Digital Caliper | Mitutoyo | 1019218 | CLB02 | LAT 051 CT-CC-0227-2022 | TRESCAL | 23/05/22 | 23/05/2027 | 0,01 | mm |
| Optical Coordinate Measuring Machine | OGP HOMMEL Italia srl | SKL2252499 | MDI02 [Ø 0,5-5 mm] | MDI02_21172 | GIBITRE INSTRUMENTS | 26/02/25 | 26/02/2028 | 0,00 | mm |
| Gauge Block 0.14mm. | Mitutoyo | 950016 | BPP02 | LAT 051 C1242D4FA0 | TRESCAL | 31/01/24 | 31/01/2028 | 0,00 | mm |
| Gauge Block 0.31mm. | Mitutoyo | 950504 | BPP03 | LAT 051 C1242D4FA0 | TRESCAL | 31/01/24 | 31/01/2028 | 0,00 | mm |
| Gauge Block 2mm. | MG | 9765 | BPP04 | LAT 051 C1242D4F90 | TRESCAL | 31/01/24 | 31/01/2028 | 0,00 | mm |
| Gauge Block 25 mm | MG | 9510 | BPP08 | LAT 051 C1242D4F90 | TRESCAL | 31/01/24 | 31/01/2028 | 0,00 | mm |
| Gauge Block 0,5 mm | Mitutoyo | 130191 | BPP42 | LAT 051 C1232CA5F0 | TRESCAL | 19/10/23 | 19/10/2028 | 0,00 | mm |
| Cylinder Gauge 0,400 mm | MG | 04/633 | SPI01 | LAT 136 0178_CL_23 | BOCCHI | 28/03/23 | 28/03/2026 | 0,00 | mm |
| Cylinder Gauge 1,25 mm | MG | 04/634 | SPI02 | LAT 136 0179_CL_23 | BOCCHI | 28/03/23 | 28/03/2026 | 0,00 | mm |
| Cylinder Gauge 2,500 mm | MG | 04/635 | SPI03 | LAT 136 0180_CL_23 | BOCCHI | 28/03/23 | 28/03/2026 | 0,00 | mm |
| Cylinder Gauge 25 mm | Mitutoyo | AA501 | TAM01 | LAT 136 0181_CL_23 | BOCCHI | 28/03/23 | 28/03/2026 | 0,00 | mm |
| Elettronic balance CP8021-OCE | Sartorius | 13713388 | BIL02 [0-8200 g] | LAT 134 B 022-2025 | SOCIETA BILANCIAI PORRO | 26/01/25 | 26/01/2027 | 0,08 | g |

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| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Chronometer + Calibrator | Gibitre Instruments srl | C13-CH-1 | C13-GB3-CAL-1 + C13-CH-1 | CAL113_32198 | GIBITRE INSTRUMENTS | 02/09/25 | 02/09/2026 | 0,16 | s |
| Weight | Gibitre Instruments srl | C13-WT-LT1 | C13-WT-LT1 | CAL113_32198 | GIBITRE INSTRUMENTS | 02/09/25 | 02/09/2026 | 0,00 | g |
| Weight | Gibitre Instruments srl | C13-WT-LT2 | C13-WT-LT2 | CAL113_32198 | GIBITRE INSTRUMENTS | 02/09/25 | 02/09/2026 | 0,00 | g |
| Thickness Block | Gibitre Instruments srl | C13-L-50 | C13-L-50 | CAL113_32198 | GIBITRE INSTRUMENTS | 02/09/25 | 02/09/2026 | 0,01 | mm |
| Thickness Block | Gibitre Instruments srl | C13-L-100 | C13-L-100 | CAL113_32198 | GIBITRE INSTRUMENTS | 02/09/25 | 02/09/2026 | 0,01 | mm |
| Thickness Block | Gibitre Instruments srl | C13-L-150 | C13-L-150 | CAL113_32198 | GIBITRE INSTRUMENTS | 02/09/25 | 02/09/2026 | 0,01 | mm |
| Digital Calliper | Mitutoyo | B18012619 | C13-CL-200 | CAL113_32198 | GIBITRE INSTRUMENTS | 02/09/25 | 02/09/2026 | 0,01 | mm |
| Thickness Block | Gibitre Instruments srl | C13-L-6.1 | C13-L-6.1 | CAL113_32198 | GIBITRE INSTRUMENTS | 02/09/25 | 02/09/2026 | 0,01 | mm |
| Thickness Block | Gibitre Instruments srl | C13-L-6.7 | C13-L-6.7 | CAL113_32198 | GIBITRE INSTRUMENTS | 02/09/25 | 02/09/2026 | 0,01 | mm |
| PT100 Thermoresistance + Calibrator | Gibitre Instruments srl | C13-T-PTA | C13-GB3-CAL-1 + C13-T-PTA(T<0°C) | CAL113_19653 | GIBITRE INSTRUMENTS | 24/09/24 | 24/09/2025 | 0,05 | °C |
| Quick-entry time readers | Gibitre Instruments srl | C13-QI-1 | C13-GB3-CAL-1 + C13-QI-1 | CAL113_32198 | GIBITRE INSTRUMENTS | 02/09/25 | 02/09/2026 | 0,00 | s |

ENVIRONMENTAL CONDITIONS

| | |
|---|---|
| Room Temperature | (23 ± 2) °C |
| Relative Humidity | (50 ± 10) % |

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# Calibration Report n° LTCXXXXXX_65432

Calibration of: **Temperature Measuring Device**
Sensor Type: **Thermoresistance**
Resolution: 0,1 °C

Procedure: The temperature of the bath is set at different values. The reading of the instrument is recorded in the first column. The readings of the reference thermometer (see page 2) are reported in the table below

Standard Reference: ISO 2921 - Annex A - Table A1 - Line 1
ISO 812 - Annex B - Table B1- Line 8

Reference Instruments:
**C13-GB3-CAL-1 + C13-T-PTA(T<0°C)** Uncertanty: 0,0500 °C Deviation 0,50 °C

| Instrument Reading °C | Minimum Allowed °C | Maximum Allowed °C | Reference Reading 1 °C | Reference Reading 2 °C | Reference Reading 3 °C | Mean °C | Error °C | Uncertanty U_ext_95% °C | Outcome |
|---|---|---|---|---|---|---|---|---|---|
| 0 | -0,5 | 0,5 | -0,03 | -0,05 | -0,02 | 0,0 | 0,0 | 0,1 | ok |
| -5 | -5,5 | -4,5 | -5,07 | -5,09 | -5,05 | -5,1 | -0,1 | 0,1 | ok |
| -35 | -35,5 | -34,5 | -35,07 | -35,05 | -35,05 | -35,1 | -0,1 | 0,1 | ok |
| -70 | -70,5 | -69,5 | -70,05 | -70,02 | -70,02 | -70,0 | 0,0 | 0,1 | ok |

Calibration of: **Heating of heat-transfer medium**

Sensor Type: **Thermoresistance**
Resolution: 0,1 °C

Procedure: After the start of the test, the temperature reading of the instrument is recorded with 10 minutes interval (time recoded using instrument clock). The temperature variation must be 10 ± 2 °C

Reference Standard: ISO 2921 - Annex A - Table A1 - Line 4

Reference Instruments:
**C13-GB3-CAL-1 + C13-T-PTA(T<0°C)** Uncertanty: 0,0500 °C Deviation 0,50 °C

| Instrument Reading °C/10 min | Minimum Allowed °C/10 min | Maximum Allowed °C/10 min | Reference Reading 1 °C/10 min | Reference Reading 2 °C/10 min | Reference Reading 3 °C/10 min | Mean °C/10 min | Error °C/10 min | Uncertanty U_ext_95% °C/10 min | Outcome |
|---|---|---|---|---|---|---|---|---|---|
| 10 | 8 | 12 | 10 | 10 | 10 | 10,0 | 0,0 | 0,1 | ok |

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# Calibration Report n° LTCXXXXXX_65432

Calibration of: **Time mesuring device of the system**

Sensor Type: **PC Clock**
Resolution: 0,01 s

Procedure: After the start of the test, the time reading of the instrument is compared after 60 seconds with the reading of the reference chronometer (see page 2).

Reference Standard: ISO 2921 - Annex A - Table A1 - Line 5

Reference Instruments:
**C13-GB3-CAL-1 + C13-CH-1** Uncertanty: 0,1618 s Deviation 0,00 s

| Instrument Reading s | Minimum allowed s | Mazimum Allowed s | Reference Reading 1 s | Reference Reading 2 s | Reference Reading 3 s | Mean s | Error s | Uncertanty U_ext_95% s | Outcome |
|---|---|---|---|---|---|---|---|---|---|
| 60 | 59 | 61 | 60,00 | 60,00 | 60,00 | 60,00 | 0,00 | 0,16 | ok |

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# Calibration Report n° LTCXXXXXX_65432

Calibration of: **Rack with test piece holders - Tension on the sample between 10 and 20 kPa**

Procedure: When the locking system is not active, each sample holder should move upwards when a force below 10 kPa is applied and should not move upwards when a force higher then 20 kPa is applied

Reference Standard: ISO 2921 - Annex A - Table A1 - Line 6

Reference Instruments:

| | | | | | | |
|---|---|---|---|---|---|---|
| **C13-WT-LT1** | Uncertanty: | 0,0017 | g | Deviation | 0,01 | g |
| **C13-WT-LT2** | Uncertanty: | 0,0017 | g | Deviation | 0,00 | g |

| Sample Holder | Force applied kPa | test 1 | Test 2 | Test 3 |
|---|---|---|---|---|
| 1 | <10 | ok | ok | ok |
| 2 | <10 | ok | ok | ok |
| 3 | <10 | ok | ok | ok |
| 4 | <10 | ok | ok | ok |
| 5 | <10 | ok | ok | ok |
| 6 | <10 | ok | ok | ok |

| Sample Holder | Force applied kPa | test 1 | Test 2 | Test 3 |
|---|---|---|---|---|
| 1 | >20 | ok | ok | ok |
| 2 | >20 | ok | ok | ok |
| 3 | >20 | ok | ok | ok |
| 4 | >20 | ok | ok | ok |
| 5 | >20 | ok | ok | ok |
| 6 | >20 | ok | ok | ok |

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# Calibration Report n° LTCXXXXXX_65432

Calibration of: **Retraction measuring devices - Accurate within ± 0,25 mm**

Sensor Type: **Encoder**
Resolution: 0,16 mm

Procedure: Each sample holder is displaced by 100 mm using reference templetes. The reading of the instrument is recorded in the table

Reference Standard: **ISO 2921 - Annex A - Table A1 - Line 7**

Reference Instruments:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **C13-L-50** | Nom.Length: | 50 mm | Uncertanty | 0,0136 | mm | Deviation | 0,00 | mm |
| **C13-L-100** | Nom.Length: | 100 mm | Uncertanty | 0,0136 | mm | Deviation | 0,00 | mm |
| **C13-L-150** | Nom.Length: | 150 mm | Uncertanty | 0,0136 | mm | Deviation | 0,00 | mm |

| Sample Holder | Set Displacem. mm | Minimum Allowed mm | Maximum Allowed mm | Instrument Reading 1 mm | Instrument Reading 2 mm | Instrument Reading 3 mm | Mean mm | Deviation mm | Uncertanty U_ext_95% mm | Outcome |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 50 | 49,75 | 50,25 | 50,04 | 50,13 | 50,04 | 50,07 | 0,07 | 0,11 | ok |
| 2 | 50 | 49,75 | 50,25 | 50,00 | 50,00 | 50,09 | 50,03 | 0,03 | 0,11 | ok |
| 3 | 50 | 49,75 | 50,25 | 50,04 | 49,96 | 49,96 | 49,99 | -0,01 | 0,11 | ok |
| 4 | 50 | 49,75 | 50,25 | 49,91 | 50,00 | 50,00 | 49,97 | -0,03 | 0,11 | ok |
| 5 | 50 | 49,75 | 50,25 | 50,03 | 50,05 | 50,10 | 50,06 | 0,06 | 0,10 | ok |
| 6 | 50 | 49,75 | 50,25 | 49,98 | 50,00 | 50,02 | 50,00 | 0,00 | 0,10 | ok |
| 1 | 100 | 99,75 | 100,25 | 100,00 | 100,00 | 100,09 | 100,03 | 0,03 | 0,11 | ok |
| 2 | 100 | 99,75 | 100,25 | 100,00 | 100,00 | 100,00 | 100,00 | 0,00 | 0,09 | ok |
| 3 | 100 | 99,75 | 100,25 | 100,00 | 100,00 | 100,00 | 100,00 | 0,00 | 0,09 | ok |
| 4 | 100 | 99,75 | 100,25 | 99,91 | 100,00 | 100,00 | 99,97 | -0,03 | 0,11 | ok |
| 5 | 100 | 99,75 | 100,25 | 100,06 | 100,06 | 100,02 | 100,05 | 0,05 | 0,10 | ok |
| 6 | 100 | 99,75 | 100,25 | 100,00 | 100,02 | 100,04 | 100,02 | 0,02 | 0,10 | ok |

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# Calibration Report n° LTCXXXXXX_65432

Calibration of: **Linear speed of striking edge for Brittleness point test**

Sensor Type: Limit Switches and internal timer
Resolution: 0,01 m/s

Procedure: Speed is measured by reading the time needed for the striker to move between the two measurement switches. The calibration is made by measuring the distance of the switches and the time needed for the displacement

Reference Standard: ISO 812 - Annex B - Table B1- Line 3

Reference Instruments:
**C13-CL-200** Uncertanty: 0,0148 mm Deviation 0,01 mm

| Expected Distance of switches | Instrument Reading 1 | Instrument Reading 2 | Instrument Reading 3 | Mean | Uncertanty U_ext_95% |
|---|---|---|---|---|---|
| m | m | m | m | m | m |
| 0,150 | 0,150 | 0,150 | 0,150 | 0,150 | 0,0000 |

Reference Instruments:
**C13-GB3-CAL-1 + C13-QI-1** Uncertanty: 0,0006 s Deviation 0,08 s

| Expected Time Read. | Instrument Reading 1 | Instrument Reading 2 | Instrument Reading 3 | Mean | Uncertanty U_ext_95% |
|---|---|---|---|---|---|
| s | s | s | s | s | s |
| 0,0753 | 0,0751 | 0,0751 | 0,0751 | 0,0751 | 0,0000 |

| Instrument Speed Reading | Minimum Allowed | Maximum Allowed | Measured Distance switches | Measured Displacem. Time | Measured Reference Speed | Accuracy | Uncertanty U_ext_95% |
|---|---|---|---|---|---|---|---|
| m/s | m/s | m/s | m | s | m/s | m/s | m/s |
| 2,0 | 1,8 | 2,2 | 0,150 | 0,0751 | 1,997 | -0,003 | 0,0029 |

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## Calibration Report n° LTCXXXXXX_65432

Calibration of: **Clearance between striker and clamp at impact**

Procedure: The distance is measured using certified templates

Reference Standard: ISO 812 - Annex B - Table B1- Line 6

Reference Instruments:

| | | | | | | |
|---|---|---|---|---|---|---|
| **C13-L-6.1** | Uncertanty: | 0,0136 | mm | Deviation | 0,00 | mm |
| **C13-L-6.7** | Uncertanty: | 0,0136 | mm | Deviation | 0,00 | mm |

| Radius mm | Minimum Allowed mm | Maximum Allowed mm | Test BRDIST01 (>6.1 mm) | Test BRDIST02 (<6.7 mm) | Outcome |
|---|---|---|---|---|---|
| 6,4 | 6,1 | 6,7 | ok | ok | ok |