

CERTIFIKAT O KALIBRACIJI / CALIBRATION CERTIFICATE

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Št. certifikata / Certificate no. 13673-LTM-24

Naročnik
Applicant 5Labs d.o.o.
Legen 112
2380 SLOVENJ GRADEC

Instrument
Instrument Črtno merilo
Proizvajalec
Manufacturer MITUTOYO
Tip
Type (0-300/0,5) mm
Serijska številka
Serial no. 25580

Kalibracijska metoda
Calibration method Primerjava izmerjene vrednosti z dolžinskim etalonom - SOP 21

Pogoji okolja
Environmental conditions Temperatura ($20 \pm 0,1$) °C

Čas in mesto kalibracije
Calibration period Od 19. 11. 2024 do 19. 11. 2024 LTM Maribor

Rezultati
Results Rezultati kalibracije so podani na strani 2

Negotovost
Uncertainty Razširjena negotovost meritve je podana kot standardna negotovost pomnožena s faktorjem $k = 2$, ki ustreza intervalu zaupanja 95 %.
The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k = 2$, which corresponds to coverage probability approximately 95 %.
Pri meritvah so bili uporabljeni etaloni, ki so sledljivi na primarni etalon za dolžino.
The measurements have been executed using standards, which are traceable to primary standard of length.

Izvedel / Performed by

Odobril / Approved by

Datum / Date

22. 11. 2024

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Merilni rezultati

Measurement results

Zap. št.	Nazivna dolžina / Nominal length L_n v mm	Razbirek na etalonu / Reference value L_e v mm	Razbirek na merilu / Instrument indication R v mm	Odstopanje / Deviation o v μm
1	0	0,00000	0	0,00
2	10	10,00038	10	-0,38
3	20	20,00071	20	-0,71
4	50	50,00175	50	-1,75
5	80	80,00257	80	-2,57
6	100	99,99968	100	0,32
7	140	139,99905	140	0,95
8	180	179,99964	180	0,36
9	200	199,99693	200	3,07
10	250	249,99795	250	2,05
11	300	299,99607	300	3,93

Izmerjene dolžine veljajo za temperaturo 20 °C in za stanje merila med kalibracijo. Za korekcijo merilnih rezultatov na temperaturo 20 °C je bila uporabljena temperaturna razteznost $\alpha = 6 \cdot 10^{-6} \text{ K}^{-1}$.

Measured lengths are valid for temperature 20 °C and for condition of gauge as it was during calibration. For the correction of the results to temp. 20 °C a temperature expansion coefficient $\alpha = 6 \cdot 10^{-6} \text{ K}^{-1}$ was used.

Razlaga rezultata

Results explanation

$$o = R - L_e$$

o – odstopanje / deviation

R – razbirek na merilu / instrument indication

L_e – razbirek na etalonu / reference value

Merilna negotovost

Uncertainty of measurement

$$U = 0,15 \mu\text{m} + 1,1 \cdot 10^{-6} \cdot L_n$$

Uporabljeni etaloni in merilna oprema

Applied standards and measurement equipment

Etalon Standard	Proizvajalec Manufacturer	Tip Type	Oznaka Identification	Št. kalibracije Calibration No.
Laserski interferometer	HP	5528A	2532A02451	13555-LTM-24
Merilnik temperature	JENAer Meßtech.	TEMP 14	300430	LMK07231856-860

Opomba

Remark