VSL	INM	PTB	INRIM
Netherlands	Romania	Germany	Italy

Executive Report of EURAMET.EM-S26

Supplementary Comparison

Inductance measurements of 100 mH at 1 kHz

EURAMET project 816

Editor: Erik Dierikx

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VSL, Dutch Metrology Institute
P.O. Box 654
NL-2600 AR, Delft
The Netherlands

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1. SMD, Belgium

We, SMD, confirm that our CMC claims are in agreement with the results of this comparison (EURAMET.EM-S26).

Jacques NICOLAS
FPS Economy, DG Quality and Safety, Metrology(SMD) - National Standards
17 November 2011

2. DANIAmet-MI-Trescal, Denmark

We, DANIAmet-MI-Trescal (DANIAmet DPLE at the time of the measurements), have compared our results reported for this comparison (EURAMET.EM-S26) against our CMC capability entries and, with our comment given in the final draft B report in mind, found that they are consistent.

Torsten Lippert
DANIAmet-MI-Trescal
13 October 2011

3. PTB, Germany

We, PTB, have compared our results reported for this comparison (EURAMET.EM-S26) against our CMC capability entries and found that they are consistent.

Axel Kölling
PTB
21 October 2011

4. MKEH, Hungary

We, MKEH, checked our results against the CMC claims, and we have found that they do not support the claims in the database.
We attempted to clarify the reasons for the differences, but we were not able to reconstruct all the important circumstances because there was in the Office a lots of changes. In the meanwhile, the person who made the measurements has passed away, his fields were taken over by a new person, the laboratory for inductance measurements had to move in another building, and our institute bought new device for inductance measurements.
That is why we intend to make soon a bilateral comparison with one of the laboratories participated in EM-S26 comparison successful.

Miklós Telepy
responsible for inductance measurments
Hungarian Trade Licensing Office
Budapest
6 December 2011

5. NSAI NML, Ireland

Impact of EUROMET Supplementary Comparison EUROMET.EM-S26 on the calibration and measurement capabilities (CMCs) of NSAI NML

Participant	CMC claims supported or not supported	Comments (including measures to be taken to remove inconsistency, if applicable)
	100 mH, 1kHz	
NSAI NML	supported	NSAI NML's published CMC value for inductance measurements at 100 mH and 1 kHz (Service Identifier: 125) is 0.02 mH. The results of comparison EUROMET.EM-S26 for measurements carried out on the mean date 2 Oct 2007 showed a difference of +0.0078 mH between the value reported by NSAI NML and the reference value. The expanded uncertainty, given with 95% coverage probability, associated with this difference was 0.023 mH. This result supports NSAI NML's CMC for this quantity.

Oliver Power
NSAI NML
30 September 2011

6. IAI SL, Israel

IAI SL, currently, has no published CMC entries in the field of inductance measurements.

7. VSL, The Netherlands

We, VSL, have checked our results in this comparison, EURAMET.EM-S26, and found that the reported results are in agreement with the reference values.

The uncertainties reported by VSL in this comparison are significantly lower than our CMC entries. The measurements in this comparison were meant to demonstrate our improved uncertainties. With these results, the uncertainties in the CMC list for inductance calibrations can be reduced.

Erik Dierikx
VSL
5 October 2011

8. GUM, Poland

The results of "EURAMET.EM-S26 Inductance comparison" have improved our best measurement capability of 100 mH. This was included in the tables of CMC 2010 and accepted in 2011.

Robert Rzepakowski
GUM
26 October 2011

9. IPQ, Portugal

IPQ, currently, has no published CMC entries in the field of inductance measurements.

10. INM, Romania

We, INM, state that the results from this comparison support our current CMC of 200 ppm. However, the disagreement with respect to the reference value is quite large. We have to thoroughly check the substitution method implemented for a systematic source which produces the disagreement.

Anca Nestor
INM
12 December 2011

11. SIQ, Slovenia

We, MIRS/SIQ/Metrology, have compared our results reported for this comparison (EURAMET.EM-S26) against our CMC capability entries and found that they are consistent.

Mag. Matjaž Lindič, Assistant to TMT Director for Metrology
SIQ, Testing & Measuring Technologies
11 November 2011

12. NMISA, South Africa

The comparison results were checked against NMISA CMC claims, and they support the NMISA CMC claims.

Alexander Matlejoane
NMISA
28 September 2011

13. METAS, Switzerland

The CMC claims of METAS (NMI Service Identifier 38, 39, 40 and 41) are supported by the results of the EURAMET.EM-S26 comparison !

Frédéric Overney
Federal Office of Metrology METAS
11 November 2011

14. UME, Turkey

REPORT FOR RELATIONSHİP BETWEEN CMC CLAIMS OF UME (TURKEY) AND THE RESULT OF EURAMET.EM-S26 INDUCTANCE COMPARISON AT 100 mH

CMC claims of UME for inductance calibration are given in the following tables:

Calibration or Measurement Services			Measurand Level or Range			Measurement Conditions/Independent variables		Expanded Uncertainty							
Quantity	**Instrument or artifact**	**Instrument Type or Method**	**Minimum value**	**Maximum value**	**units**	**Parameter**	**Specifications**	**Value**	**Units**	**Coverage Factor**	**Level of Confidence**	**Is the expanded uncertainty a relative one?**	**Uncertainty matrix**	**Comments**	**NMI Service Identifier**
Inductance: self inductance, intermediate values	Fixed inductor	Maxwell-Wien bridge	0.001	1	H	Frequency	60 Hz to 10 kHz	60 to 250	µH/H	2	95%	Yes	Inductance_Matrix	Approved on 17 August 2011	57.2

Inductance Matrix

	60 Hz	100 Hz	200 Hz	400 Hz	1 kHz	4 kHz	10 kHz
100 µH	-	260	200	200	130	-	260
1 mH	-	100	100	80	80	-	150
10 mH	-	60	60	60	-	100	250
100 mH	-	80	70	70	170	80	200
1 H	120	80	80	80	60	-	-
10 H	150	100	100	100	200	-	-

EURAMET.EM-S26 Inductance Comparison result of UME is given in the following table.

Laboratory	$D_{i,1}$ sn.13975 mH	$U(D_{i,1})$ mH	$D_{i,2}$ sn. 18197 mH	$U(D_{i,2})$ mH	D_i mH	$U(D_i)$ mH	E_n
UME	0.00106	0.00172	0.00117	0.00185	0.00112	0.00179	0.6

RESULT : According to abovementioned results, CMC claims of UME for inductance calibration are supported by EURAMET.EM-S26 Inductance Comparison results.

Gülay GÜLMEZ
TÜBİTAK UME
5 October 2011

15. UMTS, Ukraine

The UMTS declare that they have checked their results against their CMC claims which are supported by their results.

Oleh Velychko
UMTS, Ukraine, Kyiv
29 September 2011

16. NPL, United Kingdom

The results of NPL in this comparison are consistent with the CMC capability entries. However the reported uncertainties are slightly lower than the CMC entries due to the entries being estimated values for typical commercial devices. In the case of this comparison the inductors were modified and temperature controlled resulting in better accuracy and measurement repeatability.

Janet Belliss
National Physical Laboratory, UK
29 September 2011