

CCL-GD4 Key comparison planning document

Version	Date	Comment
1.0	2009-07-13	Initial copy sent by RT to AL after CCL meeting and updates sent by S-L Tan
1.1	2009-09-01	Updated for latest info on APMP.L-K1.1, added NPL to EURAMET.L-K4.2004
1.2	2009-12-17	Added AU and JP to EURAMET.L-K3.2009
1.3	2010-02-02	Added EURAMET.L-K1.2
1.4	2010-04-27	Tidying up. Added EURAMET.L-K3.1
1.5	2010-05-21	INMETRO added as CCL member for SIM, latest KC info updated
1.6	2010-06-02	Minor edits post APMP report to WG-MRA, plus EURAMET.L-K3.1 is Final
1.7	2010-06-03	Minor edits post SIM report to WG-MRA
1.8	2010-06-28	Updates to participants of CCL-K1.2010
1.9	2011-09-07	Various updates prior to WG-MRA meeting 2011
1.10	2011-09-08	Change of status EURAMET.L-K5.2004.
1.11	2011-09-20	Updates to SIM KC
1.12	2011-09-30	APMP.L-K6 Final
1.13	2011-10-04	Updated after EURAMET TC-L meeting 2011, before WG-MRA meeting
1.14	2011-10-06	Updated during WG-MRA meeting 2011
1.15	2011-10-10	Added NPL to EURAMET.L-K6 list
1.16	2011-10-21	Added EURAMET K11 data and new K11-MeP sheet
1.17	2011-12-13	Added APMP.L-K1.1.2011, sim.L-K3 -> SIM.L-K3.2008
1.18	2012-02-10	Added EUROMET.L-K1.2011 final details
1.19	2012-04-13	Updated several comparisons
1.20	2012-08-28	All EURAMET TC-L member with CMCs added with their participation data; corrected CCL-S3 & EURAMET.L-S14 mix-up; added CMC column and calculation of years from last comparison for EURAMET TC-L members; some other smaller formulations /A. Lassila
1.201	2012-10-09	Added EUROMET.L-K4.2005 and EURAMET.L-K3.1 for Estonia, S11 participants corrected, GUM added to SIM.L-K3.2008, end year of EURAMET.L-k5 changed to 2007, updated CMCs from EURAMET.L.11.2012
1.202	2012-10-22	Added SMU to K3.2009
1.203	2012-11-8	Added DK to K4.2005
1.3	2013-10-03	Added EURAMET.L-K8.2013
1.31	2013-10-04	Added KC CMC from EURAMET.L.14.2013 (BG K3), checked EURAMET.L.13.2012 (no KC CMCs) and added KC CMCs from EURAMET.L.12.2012 (DFM K4); added EURAMET.L-K4.1.2013, Added UME for K11 2013
1.32	2014-09-10	Name of follow-up EURAMET.L-K4 was updated to EURAMET.L-K4.2005.1; updated VSL stopped the surface roughness; BG CCL-K11 2014 partic. added
1.33	2015-10-25	Status update of various comparisons; cross check with CCL WG-MRA list
1.34	2016-10-15	Status update of various comparisons; cross check with CCL WG-MRA list
1.34	2016-10-15	Corrections coming from the WGMRA list (participant withdrawal, or addition)
1.35	2017-10-14	Status update of various comparisons; cross check with CCL WG-MRA list
1.36	2018-10-14	Status update of various comparisons; cross check with CCL WG-MRA list (v1.43)
1.45	2019-10-09	Status update and cross-check with CCL WGMRA v1.45
1.46	2019-11-99	Updates after the WG-MRA meeting including new KCDB links
1.47	2020-08-28	Updates: EURAMET.L-K5.2016
1.48	2020-10-08	Updates prior to WG-MRA meeting
1.49	2020-10-13	Updated after EURAMET TC-L meeting 2020. Added countries to EURAMET: HA (Bosniz & Herzegovina, IMBiH), MD (Moldova, INM-MD), ME (Montenegro, MBM), MK (N Macedonia, BoM)
1.50	2020-11-11	Updated KCDB2.0 links for comparisons, updated new comparisons.
1.51	2020-12-17	Post WG-MRA updates to participation
1.52	2021-02-02	Added APMP.L-K5.2021
1.53	2021-10-04	Updated prior to WG-MRA meeting
1.54	2021-10-18	Updated after WG-MRA and prior to CCL
1.55	2021-11-18	Updated after EURAMET TC-L meeting
1.56	2022-02-23	NMIJ accepted into APMP.L-K5, no longer in EURAMET.L-K5.n01
1.57	2022-09-23	SMU no longer have interferometric gauge block CMC, some updates, full SC list
1.58	2022-09-26	Full update prior to TC-L and WG-MRA meetings
1.59	2022-09-28	Added NIS (EG) as CCL member, further updates e.g. K11
1.60	2022-10-19	Updated after EURAMET TC-L meeting
1.61	2022-11-26	Updated after WG-MRA 2022 meeting. Del A*STAR from APMP.L-K5.2021; add NIST o to APMP.L-K8.2021

	CMC X/since	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
APMP																			
AU (NMIA)	x												2	4					
CN (NIM)	x												2	4					
JP (NMIJ)	x													4					
KR (KRISS)	x													4					
SG (A*STAR)	x													4					
COOMET																			
VNIMM	x												2						
EURAMET																			
AT (BEV)	x																3		
CH (METAS)	x						1										3		
CZ (CMI)	x																3		
DE (PTB)	x						1						2				3		
ES (CEM)	x						1										3		
FI (MIKES)	x						1										3		
FR (LNE)	x																3		
IT (INRIM)	x						1						2				3		
NL (NMI VSL)	x						1										3		
SK (SMU)	x																3		
TR (UME)	x																3		
UK (NPL)	x						1						2				3		
AL (DPM)																			
BE (SMD)																			
BG (BIM)																			
DK (DANIAmet-DFM, DTU, DTI)																			
EE (Metrosert)																			
GR (EIM)																			
HA (IMBiH)																			
HR (HMI/FSB-LPMD)																			
HU (BFKH)																			
IE (NSAI NML)																			
LT (VMT/VMC)																			
LV (LATMB)																			
MD (INM-MD)																			
ME (MBM)																			
MK (BoM)																			
MT (MSA-NMS)																			
NO (JV)																			
PL (GUM)																			
PT (IPQ)																			
RO (INM)																			
RS (DMDM)																			
SE (RISE)																			
SI (MIRS/UM-FS/LTM)																			
AFRIMETS																			
EG (NIS)	x																		
SA (NMISA)	x												2						
SIM																			
BR (INMETRO)	x																		
CA (NRC)	x												2						
MX (CENAM)	x																		
USA (NIST)	x												2						

CCL-K2 long gauges joined with CCL-K1 for future comparisons, limited to L <= 500 mm

	start	stop	KCDB number & link	Status	Publication reference
1	1993	1995	EUROMET.L-K2.Prev		(Metrologia, 1996, 33, 485-491)
2	1999	2001	CCL-K2		(Metrologia, 2003, 40, Tech. Suppl. 04004)
3	2002	2005	EUROMET.L-K2		(Metrologia, 2006, 43, Tech. Suppl. 04003)
4	2000	2002	APMP.L-K2		(Metrologia, 2006, 43, Tech. Suppl. 04005)

	CMC	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Years from start of last comparison	
	X/since																																							
APMP																																								
AU (NMI/A)	x													2							4																		1	
CN (NIM)	x													2															8										11	7
JP (NMI/J)	x																				4																			
KR (KRISS)	x																				4																		1	
SG (A*STAR)	x													2							4																		1	
COOMET																																								
VNIIM	x													2																8										2
EURAMET																																								
AT (BEV)	x																			3									9										6	
CH (METAS)	x																				3								8										6	
CZ (CMI, VUGTK)	x									1					2						3																		6	
DE (PTB)	x									1					2						3																		6	
ES (CEM)	x									1											3									8									6	
FI (MIKES, FGI)	x									1											3																		6	
FR (LNE, LNE-INM)	x									1											3																		6	
IT (INRIM)	x									1					2						3																		6	
NL (NMI VSL)	x									1											3				7				8										6	
SK (SMU)	x																				3				7														6	
TR (UME)	x									1											3																		6	
UK (NPL)	x									1					2						3						7												9	
AL (DPM)	x																				3																		9	
BE (SMD)	x																				3						7												9	
BG (BIM)	x																				3																		6	
DK (DANIAmet-DFM, DTU, DTI)	2012																				3																	9		
EE (Metroserf)																					3																		6	
GR (EIM)																					3																		9	
HA (IBMIH)																					3																		6	
HR (HMI/FSB-LPMD)	x																				3																		6	
HU (BFKH)	x									1											3																		6	
IE (NSAI NML)	2012																				3																		6	
LT (VMT/VMC)																					3																		6	
LV (LATMB)																					3																		6	
MD (INM-MD)																																							6	
ME (MBM)																																							9	
MK (BoM)																																							6	
MT (MSA-NMS)																																							6	
NO (JV)																																							9	
PL (GUM)	x									1											3																		6	
PT (IPQ)																																							6	
RO (INM)	x																				3	5																6		
RS (DMDM)																																							6	
SE (RISE)	x									1											3																		6	
SI (MIRS/UM-FS/LTM)	x																				3						7												9	
AFRIMETS																																								
EG (NIS)																																							1	
SA (NMISA)	x														2																								11	
SIM																																								
BR (INMETRO)	x																				3																	7		
CA (NRC)																					3								8										7	
MX (CENAM)	x														2																								7	
USA (NIST)	x													2																									7	

	start	stop	KCDB number & link	Status	Publication reference
1	1996	1998	EUROMET.L-K4.Prev		(Metrologia, 2000, 37, 253-260)
2	2000	2002	CCL-K4a CCL-K4b		(Metrologia, 2000, 37, 253-260)
3	2005	2007	EUROMET.L-K4.2005		(Metrologia, 2010, 47, Tech. Suppl. 04001) , (Metrologia, 2010, 47, Tech. Suppl. 04003)
4	2008	2010	APMP.L-K4		(Metrologia, 2014, 51, Tech. Suppl. 04004)
5	2006	2008	COOMET.L-K4.b		Abandoned
6	2009	2010	SIM.L-K4.2009		(Metrologia, 2015, 52, Tech. Suppl. 04004)
7	2013	2014	EURAMET.L-K4.2005.1		(Metrologia, 2020, 57, Tech. Suppl. 04003)
8	2015	2017	CCL.K4.2015	Draft B with participants	
9	2016	2018	EURAMET.L-K4.2015		(Metrologia 2021 58 Tech. Suppl. 04004)
10	2020	2021	COOMET.L-K4.2021	Draft A with participants	
11	2021	2023	APMP.L-K4.n01	Running	

	CMC X/since	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Years from start of last comparison	
APMP																																								
AU (NMA)	x													2					3	4														8					1	
CN (NIM)	x													2						4										6				8					1	
JP (NMIJ)	x													2						4					5				6					8					1	
KR (KRISS)	x													2						4														8					1	
SG (A*STAR)	x													2						4										6					8				1	
COOMET																																								
VNIIM																			3																					
EURAMET																																								
AT (BEV)	x																												6											6
CH (METAS)	x																													6										6
CZ (CMI, VUGTK)	x																			3										6									6	
DE (PTB)																																								
ES (CEM)	x									1																														
FI (MIKES, FGI)	x																																							
FR (LNE, LNE-INM)	x																																							
IT (INRIM)	x																																							
NL (NMI VSL)	x																																							
SK (SMU)																																								
TR (UME)																																								
UK (NPL)	x																																							
AL (DPM)																																								
BE (SMD)																																								
BG (BIM)																																								
DK (DANIAmet-DFM, DTU, DTI)																																								
EE (Metroser)																																								
GR (EIM)																																								
HA (IMBiH)																																								
HR (HMI/FSB-LPMD)																																								
HU (BFKH)	x																																							
IE (NSAI NML)																																								
LT (VMT/VMC)																																								
LV (LATMB)																																								
MD (INM-MD)																																								
ME (MBM)																																								
MK (BoM)																																								
MT (MSA-NMS)																																								
NO (JV)																																								
PL (GUM)	x																																							
PT (IPQ)																																								
RO (INM)	x																																							
RS (DMDM)																																								
SE (RISE)	x																																							
SI (MIRS/UM-FS/LTM)																																								
AFRIMETS																																								
EG (NIS)																																								
SA (NMISA)	x																																							6
SIM																																								
BR (INMETRO)	x																																							
CA (NRC)																																								
MX (CENAM)	x																																							
USA (NIST)	x																																							

	start	stop	KCDB number & link
1	1996	1998	EUROMET.L-K5.Prev
2	1999	2002	CCL-K5
3	2004	2007	EUROMET.L-K5.2004
4	2006	2007	APMP.L-K5.2006
5	2012	2012	APMP.L-K5.2006.1
6	2016	2017	EURAMET.L-K5.2016
7	2014	2015	APMP.L-K5.2014
8	2021	2022	APMP.L-K5.2021
9	2022	2023	EURAMET.L-K5.n01

Status	Publication reference
Running	(PTB Report F-37, September 1999)
Starting	(Metrologia, 2006, 43, Tech. Suppl. 04006)
	(Metrologia, 2012, 49, Tech. Suppl. 04008)
	(Metrologia, 2012, 49, Tech. Suppl. 04007)
	(Metrologia, 2017, 54, Tech. Suppl. 05006)
	(Metrologia 2020, 57, Tech. Suppl. 04002)
	Abandoned

	CMC																						
	X/since		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	
APMP																							
AU (NMIA)	x								1							2						4	
CN (NIM)	x														2							4	
JP (NMIJ)	x														2							4	
KR (KRISS)	x																					4	
SG (A*STAR)	x																					4	
COOMET																							
VNIM															2								
EURAMET																							
AT (BEV)	x																						
CH (METAS)	x																	3					
CZ (CMI)	x								1						2			3					
DE (PTB)									1						2			3					
ES (CEM)	x																						
FI (MIKES)	x																					4	
FR (LNE)	x														2								
IT (INRIM)	x																					4	
NL (NMI VSL)	x														2			3					
SK (SMU)																							
TR (UME)																							
UK (NPL)	x														2			3					
AL (DPM)																							
BE (SMD)																							
BG (BIM)																							
DK (DANIAmet-DFM, DTU, DTI)																							
EE (Metrosert)																							
GR (EIM)																							
HA (IMBiH)																							
HR (HMI/FSB-LPMD)																							
HU (BFKH)																							
IE (NSAI NML)																							
LT (VMT/VMC)																							
LV (LATMB)																							
MD (INM-MD)																							
ME (MBM)																							
MK (BoM)																							
MT (MSA-NMS)																							
NO (JV)																							
PL (GUM)																							
PT (IPQ)																							
RO (INM)																							
RS (DMDM)																							
SE (RISE)																							
SI (MIRS/UM-FS/LTM)																							
AFRIMETS																							
EG (NIS)																							
SA (NMISA)	x								1													4	
SIM																							
BR (INMETRO)	x																					4	
CA (NRC)									1						2							4	
MX (CENAM)	x														2								
USA (NIST)	x														2								

CCL-K6 comparison series halted. DQ6 discussing new artefacts and comparisons

	start	stop	KCDB number & link	Status	Publication reference
2	2000	2003	CCL-K6		(Metrologia, 2009, 46, Tech. Suppl. 04003)
3	2004	2005	EUROMET-L-K6		(Metrologia, 2013, 50, Tech. Suppl. 04001)
1	1996	1996	SIM.L-K6.Prev.		(Proc. International Dimensional Workshop on "Metrology of the 21st Century", May 1999)
4	2008	2008	APMP.L-K6		(Metrologia, 2014, 51, Tech. Suppl. 04003)
5	2022	2024	APMP.L-S10	Being planned as supplementary comparison	

	CMC	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Years from start of last comparison		
	X/since																																								
APMP														2														5											7		
AU (NMIA)	x													2														5										8	7		
CN (NIM)	x															3				4																			1		
JP (NMIJ)	x															3																							7		
KR (KRISS)	x																																						7		
SG (A*STAR)	x																			4																			7		
COOMET																																									
VNIIM	x															3					4																			1	
EURAMET																																									
AT (BEV)	x																																							1	
CH (METAS)	x																																							1	
CZ (CMI, VUGTK)	x																																							1	
DE (PTB)	x																																							1	
ES (CEM)	x																																							1	
FI (MIKES, FGI)	x																																							1	
FR (LNE, LNE-INM)	x																																							1	
IT (INRIM)	x																																							6	
NL (NMI VSL)	x																																							1	
SK (SMU)	x																																							1	
TR (UME)																																								1	
UK (NPL)	x																																							1	
AL (DPM)																																								1	
BE (SMD)																																								1	
BG (BIM)	x																																							1	
DK (DANIAmet-DFM, DTU, DTI)																																								1	
EE (Metroserf)																																								1	
GR (EIM)																																								1	
HA (IMBiH)																																								1	
HR (HMI/FSB-LPMD)	x																																							1	
HU (BFKH)	x																																							1	
IE (NSAI NML)	2012																																							1	
LT (VMT/VMC)																																								1	
LV (LATMB)	x																																							1	
MD (INM-MD)																																								1	
ME (MBM)																																								1	
MK (BoM)																																								1	
MT (MSA-NMS)																																								1	
NO (JV)																																								1	
PL (GUM)	x																																							1	
PT (IPQ)																																								1	
RO (INM)	x																																							1	
RS (DMDM)																																								1	
SE (RISE)	x																																							7	
SI (MIRS/UM-FS/LTM)	x																																							1	
AFRIMETS																																									
EG (NIS)																																									7
SA (NMISA)	x																																								7
SIM																																									
BR (INMETRO)																																								1	
CA (NRC)																																								1	
MX (CENAM)	x																																							1	
USA (NIST)	x																																							1	

	start	stop	KCDB number & link
1	1992	1993	EUROMET.L-S1
2	2003	2004	EUROMET.L-S14
3	2000	2002	CCL-S3
4	2006	2008	EUROMET.L-K7.2006
5	2015	2016	APMP.L-K7
6	2014	2014	EURAMET.L-K7.2014
7	2016	2017	SIM.L-K7.2016
8	2021		EURAMET.L-K7.n01

Status	Publication reference
	(EUROMET Project 252, Final report, BNM-LNE Report, September 1995)
	(Metrologia, 2003, 40, Tech. Suppl. 04002)
	(EUROMET.L-S14 Final Report, 2004, 38 pages)
	(Metrologia, 2012, 49, Tech. Suppl. 04006)
	Met Tech. Supp MISSING
	(Metrologia, 2015, 52, Tech. Suppl. 04007)
Draft B with participants	
Draft Protocol (PTB pilot)	

	CMC X/since	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Years from start of last comparison		
APMP																																									
AU (NIA)	x																			3											6	7						1			
CN (NIM)	x																				3										6	7						1			
JP (NML)	x																				3										7							1			
KR (KRIS)	x																				3										7							1			
SG (A*STAR)	x																			3						5						7						1			
COOMET																																									
VNIIM	x																														6		7						2		
EURAMET																																									
AT (BEV)	x																									5					6								2		
CH (METAS)	x													2												5					6								2		
CZ (CMI, VUGTK)	x													2																	6								2		
DE (PTB)	x													2																	6								2		
ES (CEM)	x													2																	6								2		
FI (MIKES, FGI)	x													2																	6		6						9		
FR (LNE, LNE-INM)	x													2																									9		
IT (INRIM)	x													2																										9	
NL (NMI VSL)	x													2																										9	
SK (SMU)	x													2																										9	
TR (UME)	x													2																										9	
UK (NPL)	x													2																										2	
AL (DPM)																																									
BE (SMD)																																									
BG (BIM)																																									
DK (DANIAMET-DFM, DTU, DTI)	x													2																										9	
EE (Metroser)	x																																							13	
GR (EIM)																																									
HA (IMBHI)																																									
HR (HMJ/FSB-LPMD)	x																																							2	
HU (BPKH)																																									
IE (NSAI NML)																																									
LT (VMT/VMC)														2																											
LV (LATMB)																																									
MD (INM-MD)																																									
ME (MBM)																																									
MK (BoM)																																									
MT (MSA-NMS)																																									
NO (JV)																																									
PL (GUM)	x													2																										2	
PT (IPQ)	x													2																										9	
RO (INM)	x																																							2	
RS (DMDM)																																									
SE (RISE)	x													2																										9	
SJ (MIRSA/UM-FS/LTM)																																									
AFRIMETS																																									
EG (NIS)	x																																								13
SA (NMISA)	x																																								9
SIM																																									
BR (INMETRO)	x																																								9
CA (NRC)	x																																								
MX (CENAM)	x																																								
USA (NIST)	x																																								13

DFM had unsuccessful participation in 6

	start	stop	KCDB number & link	Status	Publication reference
1	2000	2001	SIM.L.S2	Running	(Metrologia, 2006, 43, Tech. Suppl. 04002)
2	2001	2002	EUROMET.L.S11	Running	(Metrologia, 2004, 41, Tech. Suppl. 04001)
3	2008	2010	APMP.L-K8	Running	(Metrologia, 2013, 50, Tech. Suppl. 04003)
4	2009	2011	EURAMET.L-K8	Running	(Metrologia, 2017, 54, Tech. Suppl. 04005)
5	2013	2015	EURAMET.L-K8.2013	Running	(Metrologia, 2015, 53, Tech. Suppl. 04001)
6	2020	2020	EURAMET.L-K8.2020	Running	
7	2021	2022	APMP.L-K8.2021	Running	

	CMC x/since YYYY	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	Years from last comparison			
APMP																																										
AU (NMIA)																																							R			
CN (NIM)	x																						4																R	12		
JP (NMIJ)	x																						4																R	Node		
KR (KRISS)	x																																						R			
SG (A*STAR)	x																						4																R	12		
COOMET																																										
VNIIM	x																																						R			
EURAMET																																										
AT (BEV)	x										0		1										3														14			2		
CH (METAS)	x		0			0																	4																15	1		
CZ (CMI, VUGTK)	x					0				0	0				1									4															15	1		
DE (PTB)			0			0						0																														
ES (CEM)	x					0							1					2						5																11		
FI (MIKES, FGI)	x				0					0	0				1																									Node		
FR (LNE, LNE-INM, CNAM)	x			0			0							1		2		2																					16	0		
IT (INRIM)	x											1				2		2																						16	0	
NL (NMI VSL)	x						0						1		2																								9	7		
SK (SMU)	x					0											2						4																R	16	0	
TR (UME)	x					0							1		1		2	2					3																	11	5	
UK (NPL)	x											1																												7	Node	
AL (DPM)																																										
BE (SMD)	x		0				0																																		9	
BG (BIM)	x											1																													8	
DK (DANIAmet-DFM, DTU, DTI)			0			0											2																									
EE (Metroserf)																																										
GR (EIM)	x																																							13	3	
HA (IMBiH)																																										
HR (HMI/FSB-LPMD)	x																							3																13		
HU (BFKH)	x					0					0														4																14	2
IE (NSAI NML)																																										
LT (VMT/MC)																																										
LV (LATMB)																																										
MD (INM-MD)																																										
ME (MBM)																																										
MK (BoM)																																										
MT (MSA-NMS)																																										
NO (JV)	x						0						1																												10	
PL (GUM)	x													1																											7	
PT (IPQ)	x					0	0										2		2																						6	
RO (INM)	x																	2																						9	6	
RS (DMDM)	x		0																																					5	1	
SE (RISE)	x		0	0			0										2		2																					6	10	
SI (MIRS/UM-FS/LTM)	x																																							3	12	4
AFRIMETS																																										
EG (NIS)	x																2		2																						5	11
SA (NMISA)	x																																								6	4
SIM																																										
BR (INMETRO)	x																																								3	13
CA (NRC)	x																																								3	Node
MX (CENAM)	x																																								3	13
USA (NIST)	x																																								6	10

	start	stop	KCDB number & link	Status	Publication reference
0	1991		BIPM.L-K10		Phys. Rev. Lett., 2000, 85, 18, 3797-3800 Appl. Phys. B, 2001, 72, 221-226 Proc. SPIE, 2001, 4269, 122-133
1	2000	2003	Calibration at BIPM		
2	2004	2006	BIPM.L-K11		(Metrologia, 2005, 42, Tech. Suppl. 04002)(Metrologia, 2005, 42, Tech. Suppl. 04003)(Metrologia, 2010, 47, Tech. Suppl. 04009) Metrologia, 2007, 44, Tech. Suppl., 04003 Metrologia, 2007, 44, Tech. Suppl., 04004
3	2007	2009	CCL-K11		
4	2010	2010		Report for 2007 - 2009	(Metrologia, 2010, 47, Tech. Suppl. 04009)
5	2011	2011		Report for 2010	(Metrologia, 2011, 48, Tech. Suppl. 04001)
6	2012	2012		Report for 2011	(Metrologia, 2012, 49, Tech. Suppl. 04009)
7	2013	2013		Report for 2012	(Metrologia, 2015, 52, Tech. Suppl. 04005)
8	2014	2014		Report for 2013	(Metrologia, 2015, 52, Tech. Suppl. 04006)
9	2015	2015		Report for 2014	(Metrologia, 2016, 53, Tech. Suppl. 04007)
10	2016	2016		Report for 2015	(Metrologia, 2017, 54, Tech. Suppl. 04001)
11	2017	2017		Report for 2016	(Metrologia, 2018, 55, Tech. Suppl. 04003)
12	2018	2018		Report for 2017	(Metrologia, 2018, 55, Tech. Suppl. 04004)
13	2019	2019		Report for 2018 - 2020	(Metrologia, 2022, 59, Tech. Suppl. 04001) R = requested but postponed due to COVID
14	2020	2020			
15	2021	2021		Report for 2021	(Metrologia, 2022, 59, Tech. Suppl. 04004)
16	2022	2022			
17	2023	2023			

APMP.L-K11 ITRI, MSL, NIM, NIMT, NMIJ, NMISA, SIRIM, SCL 2004
 PTB offers CMCs but take a different approach to K11 equivalency (see WGMRA-19-5.9-3_CCL-K11_TechnicalProtocol_v2.96.docx)

CCL members in bold

CCL observers in BOLD Italics

AFRIMETS		APMP		COOMET		GULFMET		SIM		EURAMET	
Botswana	BOBS	Australia	NMIA	Azerbaijan	AZSTAND	Kuwait	PAI	Canada	NRC	Albania	DPM
Mauritius	MSB	Bangladesh	NML-BSTI	Belarus	BELGIM	Belarus	OMAN	Mexico	CENAM	Austria	BEV
Namibia	NSI			Cuba	NC	Cuba	QATAR	USA	NIST	Belgium	SMD
Seychelles	SBS	China	NIM	Georgia	GEOSTM	Saudi Arabia	SASO	USA	JILA	Bosnia and Herzegovina	IMBIH
South Africa	NMISA	<i>Chinese Taipei</i>	<i>CMS/ITRI</i>	Kazakhstan	KazInMetr	UAE	ESMA	Antigua & Barbuda		Bulgaria	BIM
Tanzania	TBS	Hong Kong	SCL	Russia	VNIIM			Barbados		Croatia	DZM
Zambia	ZABS	India	NPLI	<i>Ukraine</i>	<i>NSC IM</i>			Dominica		Cyprus	MCIT
Zimbabwe	NMI-SIRDC	Indonesia	SNSU-BSN	Uzbekistan	UzNIM SE			Grenada		Czechia	CMI
		Japan	NMIJ					Guyana		Denmark	DFM
Kenya	KEBS	Korea R.O.	KRISS					Jamaica	JBS	Estonia	METROSEROT
		Malaysia	NMIM					Saint Kitts & Nevis		Finland	MIKES
Morocco	LPEE-LNM	Mongolia	MASM					Saint Lucia		France	LNE
Tunisia	ANM	New Zealand	MSL-IRL					St Vincent & the Grenadines		Germany	PTB
		Pakistan	NPSL					Suriname		Greece	EIM
Egypt	NIS	Philippines	ITDI					Trinidad & Tobago		Hungary	BFKH
Ethiopia	NMIA									Ireland	NSAI NML
Ghana	GSA	Singapore	A*STAR					Belize		Italy	INRIM
Sudan	SSMO	Sri Lanka	MUSSD					Costa Rica	LACOMET	Latvia	LATMB
		<i>Thailand</i>	<i>NIMT</i>					Panama	CENAMEP-AIP	Lithuania	FTMC
		Viet Nam	VMI							Luxembourg	ILNAS
								Bolivia	IBMETRO	Malta	MSA
								Colombia	INM (CO)	Moldova	NMI (MD)
								Ecuador	INEN	Montenegro	BMM
								Peru	INACAL	Netherlands	VSL
										North Macedonia	BOM
								Argentina	INTI	Norway	JV
								Brazil	INMETRO	Poland	GUM
								Chile	INM	Portugal	IPQ
								Paraguay	INTN	Romania	INM
								Uruguay	LATU	Serbia	DMDM
										Slovakia	SMU
										Slovenia	MIRS
										Spain	CEM
										Sweden	RISE
										Switzerland	METAS
										Turkey	UME
										United Kingdom	NPL

Updated A Lewis
07/09/2022

Number

CCL-S1
CCL-S2
CCL-S3
CCL-S4
AFRIMETS.L-S3
AFRIMETS.L-S4
AFRIMETS.L-S5
APMP.L-S1
APMP.L-S2
APMP.L-S3
APMP.L-S3.4.01
APMP.L-S4
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EUROMET.L-S5a
EUROMET.L-S5b
EUROMET.L-S6
EUROMET.L-S7
EUROMET.L-S8
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EUROMET.L-S10

EUROMET.L-S11
EURAMET.L-S12
EUROMET.L-S13
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EURAMET.L-S25
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EURAMET.L-S26.1
EURAMET.L-S27
EURAMET.L-S28
EURAMET.L-S29
EURAMET.L-S30
EURAMET.L-S31
GULFMET.L-S1
GULFMET.L-S2
SIM.L-S1
SIM.L-S1.PREV
SIM.L-S2
SIM.L-S3.PREV
SIM.L-S4.PREV
SIM.L-S5
SIM.L-S6
SIM.L-S7
SIM.L-S8

Title

Nanometrology: one-dimensional gratings
Nanometrology: step height standards
Nanometrology: line scale standards
Nanometrology: two-dimensional gratings
Calibration of gauge blocks by mechanical comparison
Calibration of gauge blocks by mechanical comparison
Mechanical determination of length
Thermal expansion coefficient of gauge blocks
Nanometric lateral scale
Gauge block by mechanical comparison
Angle gauge blocks
Geometrical roundness measurements using error separation
Nano particles measurements
Long gauge blocks by comparative method
Comparison of step height measurements
Flatness of optical flat measured by flatness interferometer
Thread
Calibration of coordinate measuring machine (CMM)
Nanometrology: One-Dimensional Gratings
Comparison of comparators with photoelectric microscopes
Comparison of high accuracy gauge block interferometers
Comparison of standard of evolvent surface
Comparison of standards of Length
Comparison of straightness and flatness national standards
Stabilized He-Ne/12lasers at wavelength 633 nm
Comparison of length standards for measuring gear parameters
Comparison of reference measuring instruments of surface parameters
Comparison of length standards in the range from 0.001 mm to 1 mm
Comparison of flatness standards
Comparison of standards in the field of surface density of coating measurements and coating thickness
Comparison of standards in the field of roundness measurements
Comparison of the determination of parameters linked to involute gears
Comparison of profiles of measuring bridges
Calibration of gauge blocks
Interference units for measurement of tapes up to 20 m
End standards
Comparison of precision range-finders
Comparisons of precise navigation systems GPS/GLONASS
Nanometer standards
Coordinates of one-dimensional standards
End standards
Supplementary comparisons of standards in the field of measurement of 3D parameters of surface texture
Calibration of gauge blocks by inteferometry on measurement standards of length
Involute gears using a complex standard
Linear scale
Calibration of long distance standards
Line scale measurement
Thermal expansion of gauge blocks
Depth setting standards
External diameter of wires
Roundness
Roundness profiles
Standards of thermal expansion
Flatness of surface plates
Nd:YAG lasers
Two dimensional grid
Squareness measurements

Surface texture measurements
Calibration of gauge blocks by mechanical comparison
Cylindrical artefacts
Steel tape measurements
Step height standards
Step height standards
Calibration of gauge blocks by comparison
Length intervals on a steel tape
Squareness measurements
Squareness measurements
Laser distance measuring instruments
Comparison of parallel thread gauges
Calibration of gauge blocks by mechanical comparison
High precision roundness measurement by error separation techniques
Involute gear standards
Distance measurements using pocket-type laser instruments (EDMs)
Depth of v-shaped grooves
Depth of v-shaped grooves
Length of stainless steel tapes
Flatness of surface plates
Measurement of a 1 mm stage micrometer
Determination of roundness in the equator of two alumina spheres
Transducer displacement error
Calibration of gauge blocks by mechanical comparison
Calibration of gauge blocks by interferometry
Gauge blocks by mechanical comparison
Short gauge blocks by mechanical comparison
Comparison of surface roughness and step height (depth) standards
Measurement of Rockwell hardness indenter geometry
Linewidth standards
Nanometrology: one-dimensional grating pitch calibration by optical diffraction
Gauge blocks by mechanical comparison
Calibration of central length and variation of 6 steel gauge blocks
Gauge blocks measured by mechanical and interferometric technique

Participants

METAS, ITRI, IMGCC, DFM, KRIS, NIM, NIST, NMIJ, NPL, PTB, VNIIM
PTB, CEM, ITRI, IMGCC, DFM, GUM, KRIS, METAS, NIM, NIST, NMIJ, VSL, NPL, VNIIM
PTB, LNE, ITRI, IMGCC, METAS, MIKES, NIM, NIST, NMIJ, NRC, RISE, VNIIM
DFM, CMI, ITRI, INRIM, KRIS, METAS, MIKES, NIM, NIST, NMIJ, NPL, PTB
NIS (EG), COSQ (Iraq), LCAE (Tunisia), NMISA (SA), NSCL (Syria)
LCAE (Tunisia), PTB
NIS (EG), BOBS (Botsw.), GSA (Ghana), KEBS (Kenya), LPEE-LNM (Morocco), MSB (Maurit.), NMIE (Ethio.), N
NMIJ, CENAM, CMI, INRIM, METAS, MIKES, PTB
NMIJ, PTB
KRIS, NIMT, NML-SIRIM, NPLI, NPSL (Pakistan), KIM-LIPI, VMI-STAMEQ (Viet Nam)
NIMT, EMI (UAE), A*STAR, NMIA, NMIM (Malaysia), SASO-NMCC, SE Ukremtrteststandard, SNSU-BSn (Indor
NIMT, ITRI, KRIS, NIM, A*STAR, NMIA, NMIJ, NMISA
ITRI, CENAM, DFM, INMETRO, INRIM, KRIS, LNE, METAS, NIM, NIMT, NMIA, NMIJ, PTB
NIMT, KRIS
NPLI, BEV, NIMT, A*STAR, MNIJ
NIMT, MSL, NIM, A*STAR, NMIJ, NMISA, NPLI
NIM, NIMT, A*STAR, PTB
NMIJ
NIM, KRIS, NIMT, A*STAR, NMIA, NMIJ
NSC, KazInMetr, VNIIM
NSC, KazStandard
NSC, VNIIMS
BelGIM (Belarus), GUM, KazStandard, NSC, SE Ukrmetrteststandard (Ukraine), SMU
UNIIM (Ru), BelGIM (Belarus), KazStandard
VNIIM, BelGIM, KazStandard, NSC
BelGIM, VNIIMS
NSC, VNIIMS
NSC, KazStandard
NSC, BelGIM, VNIIMS
PTB, UNIM (Ru)
NSC, BelGIM, VNIIMS
NSC, PTB, VNIIMS
BelGIM, KazStandard
NMI (MD), INM (RO), PTB, VMC
VNIIM, BelGIM, KazStandard
NSC, GEOSTM (Georgia)
NSC, NIM
NSC, BelGIM, NIM
NSC, PTB
NSC, BelGIM, VNIIMS
NSC, BelGIM, FTMC (Lithuania), GEOSTM (Georgia), KazStandard, UzNIM (Uzbekistan)
VNIIMS, BelGIM, KazInMetr
BelGIM, KazStandard, NSC, PTB, SE Ukrmetteststandard, VNIIM
VNIIMS, BelGIM
BelGIM, KazStandard, NSC, SE Ukrmetrteststandard, VNIIM
BelGIM, SE Ukrmetteststandard, VNIIFTRI, VNIIM
BIPM, LNE, MIKES, INRIM, METAS, NMI-VSL, NPL, PTB, RISE
METAS, INRIM, NMI-VSL, NPL, PTB
TUE (NL), CEM, INRIM, METAS, NIST, VSL, PTB, RISE, MIKES
LNE, METAS, NPL, PTB
RISE, LNE, INRIM, DTH (DK), METAS, VSL, PTB
TUE (NL), INRIM, METAS, VSL, PTB, RISE
PTB, NMI-VSL, NPL
PTB, VSL, NPL, MIKES
INRIM, PTB
NPL, PTB
SMU, LNE, CEM, GUM, IPQ, METAS, MIKES, VSL, BFKH, PTB, SMIS, RISE

PTB, BEV, CEM, CMI, INRIM, DFM, GUM, IPQ, METAS, MIKES, VSL, NPL, SMU, RISE, UME, VMT
NML(IE), BEV, CMI, EIM, GUM, MIKES, MIRS, BIM (BG), NPL, BFKH, UME, VMT/VMC
PTB, LNE, IMRIM, METAS, NIST, VSL, RISE
METAS, BEV, CEM, CMI, GUM, INM, JV, LATMB, MIKES, MIRS, BIM, NMIA (Australia), BFKH, PTB, SMD, RIS
PTB, CMI, INRIM, METAS, VSL
PTB, CMI, INRIM, MIKES, A*STAR, VSL
NPL, FSB, INM, JV, LATMB, METROSERT, MSA, NML (IE), SMD
METAS, METROSERT, UME
SMU, MIKES
SMU, GUM
GUM, METROSERT, BEV, CEM, CMI, INM, INRIM, JV, METAS, MIKES, PTB, SMU, RISE
FSBm METROSERT, BEV, INRIM, LNE, METAS, MIKES, MIRS, BFKH, UME
DTI (DK), METROSERT, BEV, BMM (Montenegro), CEM, DFM, LATMB, MCCA-SMI (Malta), MIRS, NPL, NSA
CEM, DTI, INRIM, IPQ, LNE, SMD, VSL
PTB, NGML, NIM, NIMT, NMIJ, NSC
CEM, BEV, VSL
PTB, BEV, CEM, GUM, INRIM, MIKES, NMISA, SP, UME, VNIIMS
MIKES, CEM, PTB, UME
PTB, METROSERT, BEV, BFKH, BIM, BMM, CEM, CMS, GUM, INTI (Arge.), IPQ, JV, LATMB, MASM (Mong.),
PTB, NIM, NMIJ, VNIIMS
BEV, CEM, DMDM, GUM, INM, INMETRO, INRIM, INTI, NIM, NIMT, NMISA, RISE, UME
CEM, DTI, INRIM, LNE, VSL
MIRS, BEV, CEM, DFM, DTI, JV, METAS, MIKES, VSL
EMI (UAE), DGSM (Oman), DPM (Albania), NMIM (Malasia), PAI (Kuwait), SASA (SA), UME
UME, SASO
NRC, CEM, INDECOPI (Peru), INMETRO, INTI, LCPN-DICTU (Chile), LPMP-UTP (Panama), NIST, SIC (Colombia)
CEM, CCCM (Colombia), CERTI (Brazil), CI-UNAM (MX), CIDESI (MX), INDECOPI (Peru), INMETRO, INTI, PT
NRC, CENAM, INMETRO, INTI, NIST
NIST, INRIM, MPA-NRW (DE), NIM, NMIJ, UM (IT)
NIST, NPL
NRC, ITRI, METAS, PTB
CENAM, BSJ (Jam.), CENAMEP AIP (Pana.), CMI, DICTUC (Chile), IBMETRO (Boliv.), INDECOPI, INEN (Ecuæ
INTI, BSJ, CENAM, CANAMEP AIP, DICTUC, IBMETRO, INACAL (Peru), INEN, INM (Colombia), INMETRO, L/
INTI, CENAM, DICTUC, INACAL, INM (Colombia), INMETRO, NIST, NRC

ι), INMETRO, INTI, LACOMET (Costa R.), LATU (Urug.), NIST, NPLI, SIC (Colom.), TTBS (CARICOM,

(Trin Tob.)