

2011-2012 TC-M Report to the General Assembly

Nieves Medina, TC-M Chair

CEM, Spain

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6th EURAMET General Assembly
22-23 May 2012, Lyngby

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General

- Many very different quantities, diversity of techniques
- Last TC-M contact persons meeting –Vienna, Austria, 29 February to 2 March 2012.
- No separate meetings, just technical sessions before the TC-CP meeting
- Including especial sessions for EMRP projects

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Sub-Committees

SC Density and Viscosity has been officially approved

New convenor of **SC Density and Viscosity**: *Dr Horst Bettin*

New convenor of **SC Mass**: *Dr Stuart Davidson*

SC Dynamic Measurements has been suggested

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Projects

- 141 overall
- 9 new since the last meeting (6 comparisons, 2 research, 1 traceability)
- 5 completed during last year (2 comparison, 2 research, 1 traceability)

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Projects

	Comparison	Research	Traceability	Consultation	Total
Proposed	3 (4)	2 (3)	1	-	6 (7)
Agreed	19 (14)	9(8)	2(3)	-	30 (25)
Completed	46 (45)	36 (34)	7 (6)	15 (15)	104 (100)
Total	69 (63)	47 (45)	10 (9)	15 (15)	141 (132)

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Project breakdown

	Proposed	Agreed	Completed	Total
Density	2 (0)	2 (2)	8 (8)	12
Force	0 (2)	6(7)	6 (5)	12
Hardness	-	-	1 (1)	1
Mass	1(0)	7(7)	40 (39)	48
Pressure	2 (5)	13 (6)	42 (40)	58
Torque	-	1 (1)	2 (2)	3
Viscosity	-	0 (1)	5 (4)	5
Gravimetry	-	1 (1)	1 (1)	2

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14 active projects (no comparisons)

Ref.	Title	Institute	Year	Collaboration
1215	Primary mercury columns using floats - exchange of experiences	CEM	2011	research
1214	Density measurement of viscous oils	VSL	2011	research
1210	Best practice for the dissemination of the kilogram	VSL	2011	traceability
1205	Review of EURAMET cg 18: Guidelines on the Calibration of Non-Automatic Weighing Instruments	CEM	2011	research
1125	Evaluation of cross-float measurements with pressure balances	LNE	2010	research
1121	Transferring of knowledge in the field of gas pressure balance calibration	EIM	2009	research
1110	Determination of magnetic properties of mass standards	PTB	2009	research
911	Study of standard leaks performance for different gas, in the transition regime	INRIM	2006	research
890	Dynamic Force Measurement	PTB	2006	research
803	FPG-type digital piston manometer – exchange of experiences	MIKES	2004	research
402	Mass measurement (Guide to the mass determination)	SMU	1997	research
351	Workshop on 'Secondary and Reference Mass Standard	LNE	1995	research
286	Traceability in force measurement at national laboratory level in range up to 2 MN	PTB	1993	traceability
285	Calibration of precision force measuring devices and transfer standards of the capacities up to 16,5 MN.	PTB	1993	traceability

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11 new projects since last GA

Ref.	Title	Institute	Collaboration
1222	Comparison of 10 kg Mass Standard For south East European Countries (SEE)	BEV	comparison
1215	Primary mercury columns using floats - exchange of experiences	CEM	research
1214	Density measurement of viscous oils	VSL	research
1210	Best practice for the dissemination of the kilogram	VSL	traceability
1207	Bilateral comparison to determine the effective area of the piston cylinder unit by cross floating	MIKES	comparison
1206	Bilateral comparison in the barometric absolute pressure range 800 to 1100 hPa	MIKES	comparison
1205	Review of EURAMET cg 18: Guidelines on the Calibration of Non-Automatic Weighing Instruments	CEM	research
1198	Bilateral comparison of 20 g, 500 g and 10 kg provided by EIM	EIM	comparison
1197	Bilateral comparison of pressure in the range of 0 MPa to 50 MPa	UME	comparison
1190	Calibration of hydrometers at several temperatures	INRIM	comparison
1186	Comparison of absolute gravimeters	METAS	comparison

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32 Key Comparisons

Comparison ID	Project no.	Title/Range	Subfield	Pilot	Status	Years
EUROMET.M.M-K1	215	Kilogram	Mass	NPL	Approved and published	1992-1999
EUROMET.M.M-K2	445	(Sub-)multiples	Mass	SP	Approved and published	2001-2003
EUROMET.M.M-K2.1	786	(Sub-)multiples	Mass	SP	Approved and published	2004-2008
EUROMET.M.M-K2.2	1120	(Sub-)multiples	Mass	BEV	Approved and published	2009-2010
EUROMET.M.M-K2.3	1198	(Sub-)multiples	Mass	EIM	Report in progress, Draft A	2011
EUROMET.M.M-K4	510	Kilogram	Mass	NPL	Approved and published	1999-2003
EUROMET.M.M-K4.1	1029	Kilogram	Mass	MIRS	Approved and published	2007-2008
EURAMET.M.M-K4.2	1120	Kilogram	Mass	BEV	Approved and published	2009-2010
EUROMET.M.D-K1	339	Solid (3 Si spheres)	Density	METAS	Provisional equivalence	1998-1999
EUROMET.M.D-K1.1	1031	Solid (3 ceramic sph.)	Density	PTB	In progress	2008-2010
EUROMET.M.D-K2	627	Liquid density	Density	PTB	Report in progress, Draft B	2001-2002
EURAMET.M.D-K2	1019	Liquid density	Density	BEV	In progress, Draft A	2007-
EUROMET.M.D-K4.Prev	236	Hydrometers	Density	IMGC	Provisional equivalence	1993-1994
EUROMET.M.D-K4	702	Hydrometers	Density	IMGC	Approved for equivalence	2003-2006
EUROMET.M.P-K1.a	442	0.1 Pa to 1000 Pa	Pressure	BNM-LNE	Approved and published	1999-2002
EUROMET.M.P-K1.b	442	0.3 mPa to 9 Pa	Pressure	BNM-LNE	Approved and published	2000-2002

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32 Key Comparisons (follows)

Comparison ID	Project no.	Title/Range	Subfield	Pilot	Status	Years
EUROMET.M.P-K1.c	1179	0.7 MPa to 7 MPa	Pressure	FORCE	In progress	2011-2013
EUROMET.M.P-K2	305	1 MPa to 4 MPa	Pressure	PTB	Approved and published	1994-1995
EUROMET.M.P-K3.a	439	0.05 MPa to 1 MPa	Pressure	LNE/NPL	Approved and published	1999-2001
EUROMET.M.P-K3.b	439	0.05 MPa to 1 MPa	Pressure	NPL	Approved and published	1999-2001
EUROMET.M.P-K4	389	10 MPa to 100 MPa	Pressure	NPL	Approved and published	1998-1999
EURAMET.M.P-K4 2010	1047	0.5 Pa to 15 kPa	Pressure	CMI	In progress	2007
EUROMET.M.P-K5	045	50 MPa to 500 MPa	Pressure	BNM-LNE	Provisional equivalence	1993-1995
EUROMET.M.P-K6	110	100 MPa - 1000 MPa	Pressure	BNM-LNE	Provisional equivalence	1992-1994
EURAMET.M.P-K7	881	50 MPa to 500 MPa	Pressure	MIKES	Report in progress, Draft B	2005-2007
EURAMET.M.P-K8	1041	25 kPa to 200 kPa	Pressure	METAS	In progress	2007-
EURAMET.M.P-K13	1091	50 MPa to 500 MPa	Pressure	UME	In progress	2009-
EUROMET.M.F-K1	535	5 kN to 10 kN	Force	MIKES	Report in progress, Draft B	2002-2004
EUROMET.M.F-K2	518	50 kN to 100 kN	Force	NPL	Rep. in progress, Draft B	2003-
EUROMET.M.F-K3	505	500 kN to 4 MN	Force	PTB	In progress	2005-2007
EURAMET.M.G-K1	1186	Free fall acceleration	Gravimetry	METAS	In progress	2011
SIM-EUROMET.M.P-BK3		3 mPa to 0.9 Pa	Pressure	PTB/CENAM	Approved and published	2001-2002
SIM-EUROMET.M.P-BK4		10 MPa to 100 MPa	Pressure	PTB/CENAM	Approved and Published	2002

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23 Supplementary Comparisons

Comparison ID	Project no.	Title/Range	Subfield	Pilot	Status	Years
EUROMET.M.V-S1	273	(0.989-4600) mm ² /s	Viscosity	PTB	Published	1992-1993
EUROMET.M.V-S2	303	(0.4- 67743 mm ² /s	Viscosity	PTB	Published	1993-1996
EUROMET.M.V-S3	415	(190- 774000 mm ² /s	Viscosity	PTB	Published	1997-2000
EUROMET.M.V-S4	415	(0.33-144000) mm ² /s	Viscosity	PTB	Published	1997
EURAMET.M.M-S1	461	500 kg	Mass	CMI	Report in progress, Draft B	2001-2005
EURAMET.M.M-S2	1054	0.1 mg to 100 g	Mass	NPL	Approved and Published	2008-
EURAMET.M.M-S3		100 mg to 50 kg	Mass	UME	In progress	2011-2012
EUROMET.M.P-S1	788	0.05 MPa to 1 MPa	Pressure	METAS	Approved and Published	2004-2006
EUROMET.M.P-S2	922	30 Pa to 7 kPa	Pressure	PTB	Approved and Published	2006-2007
EUROMET.M.P-S3	884	80 kPa to 110 kPa	Pressure	LNE	Approved and Published	2006-2008
EUROMET.M.P-S4	861	40 kPa to 1.75 MPa	Pressure	UME	Approved and Published	2005-2006
EURAMET.M.P-S5	931	50 MPa to 500 MPa	Pressure	PTB	Report in progress, Draft B	2007-2008
EURAMET.M.P-S6		1.5 kPa to 300 kPa	Pressure	PTB	Approved and Published	2007-2008
EURAMET.M.P-S7	1040	0.1 mPa to 1 Pa	Pressure	METAS	In progress	2007-
EURAMET.M.P-S8	1131	-100 kPa to +100 kPa	Pressure	MIKES	Approved and Published	2009-2010
EURAMET.M.P-S9	1170	-950 hPa to 0 hPa	Pressure	LNE	In progress	2011
EURAMET.M.P-S10		0.005 Pa to 100 Pa	Pressure	CEM	Approved and Published	2010-2011
EURAMET.M.P-S11		0 MPa to 50 MPa	Pressure	UME	Approved and Published	2011
EURAMET.M.T-S1	1055	1 N.m to 1000 N.m	Torque	PTB	Approved and Published	2008-2010
EURAMET.M.T-S2	1141	100 N m	Torque	PTB	Rep. in progress, Draft A	2008-
EURAMET.M.T-S3		10 N.m to 1 kN.m	Torque	CEM	Approved and Published	2010
EURAMET.M.G-S1	1093	Free fall acceleration	Gravimetry	METAS	Approved and Published	2008-2009
EURAMET.M.F-S1		5 kN to 5 MN	Force	NPL	Approved and Published	2005-2006

CMCs

4 new submissions or revisions from other RMOs reviewed

Submission	NMI	Field	CMCs	State
EURAMET.M.18.2010	EIM, Greece	mass	revision	published
EURAMET.M.22.2011	LNE, France	mass	new	published
EURAMET.M.23.2011	IMBIH, Bosnia and Herzegovina	mass	new	under revision
EURAMET.M.24.2011	CEM, Spain	torque	new	published
EURAMET.M.24.2011	CEM, Spain	mass	revision	published

EURAMET Calibration Guidance Documents

EURAMET Calibration Guide 18 “Guidelines on the Calibration of Non-Automatic Weighing Instruments”

Scope: It has being adopted also by other RMOs and broadly used by accreditation bodies as mandatory

New review under EURAMET project 1205 (17 NMIs participating)

First review with a direct collaboration of manufacturers

First draft is expected at the beginning of summer.

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EMRP 2010

Number	Short Name	Full Name
IND 03	HIGHpress	High Pressure Metrology for Industrial Applications
IND 09	Dynamic	Traceable Dynamic Measurement of Mechanical Quantities
IND 12	Vacuum	Vacuum metrology for production environments

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EMRP 2011

Number	Short Name	Full Name
SIB03	KNOW	Realisation of the awaited definition of the kilogram - resolving the discrepancies
SIB05	NewKILO	Developing a practical means of disseminating the new kilogram

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Roadmaps

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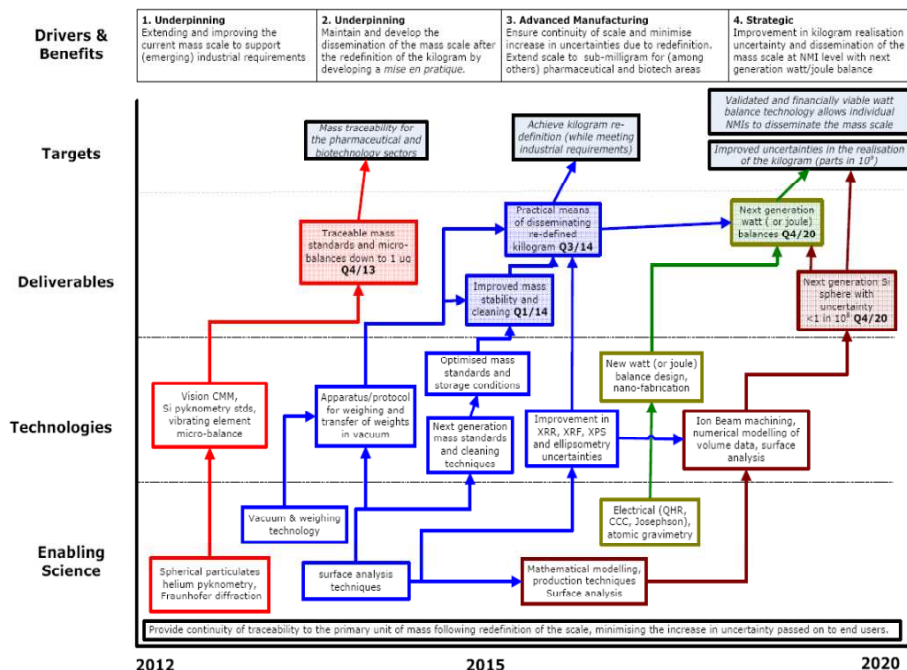
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EURAMET TC-M, Mass Area Roadmap



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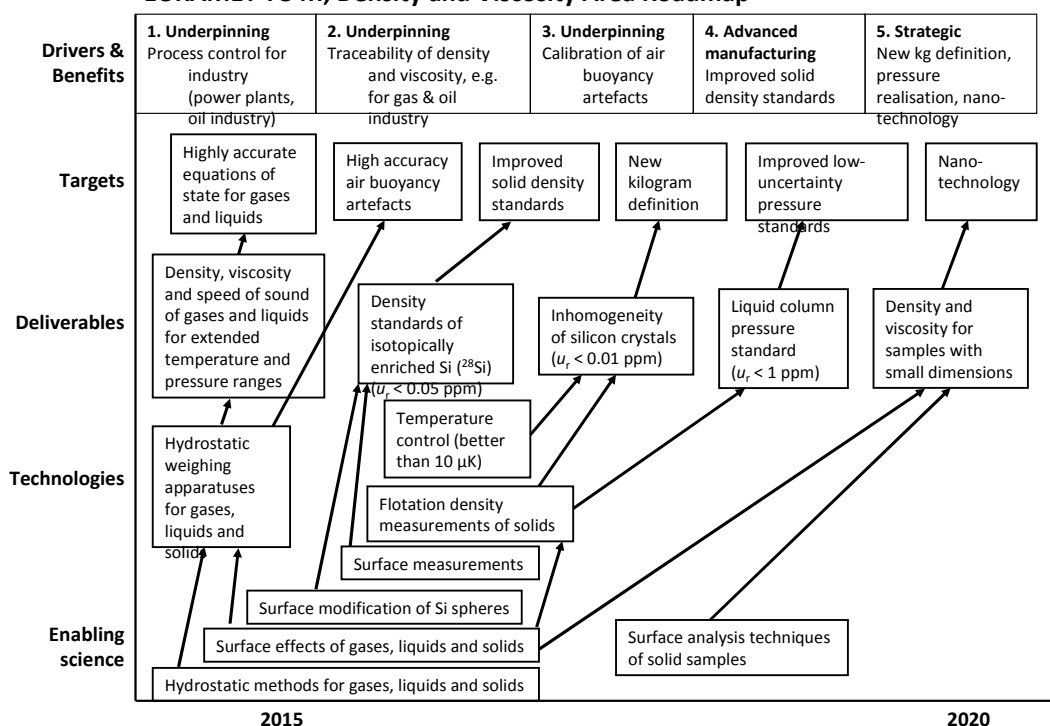
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EURAMET TC-M, Density and Viscosity Area Roadmap



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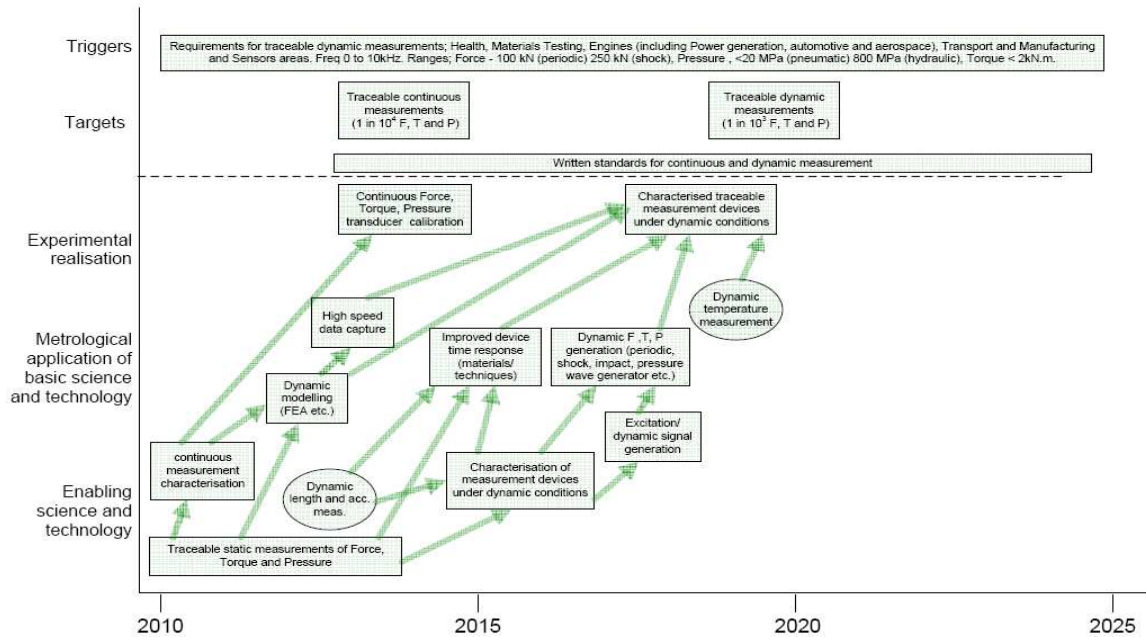
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EURAMET TC-M Force Area Roadmap



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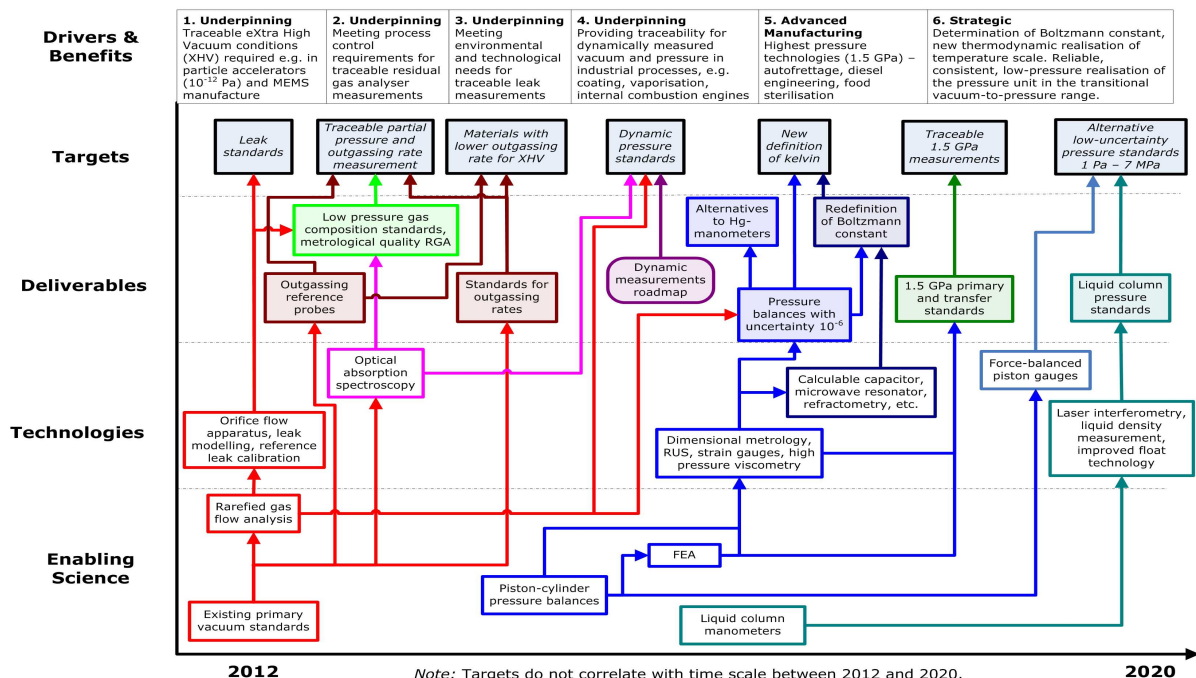
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EURAMET TC-M, Pressure Area Roadmap



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The End

Thank you for your attention