



EUROMET Length, Annual report 2001/2002

1 General aspects

1.1 Summary of activities

After the completion of the EUROMET review of the second part of the length CMCs, their acceptance by the other regions and the publication of these CMCs in the Key Comparison and Calibration database (KCDB) of the BIPM, the EUROMET Length TC could focus its activities again on more scientific and technical aspects. This is illustrated by an increasing number of active and proposed projects of all categories, i.e. co-operation in research, comparisons and consultations. In particular, the workshop on uncertainty in dimensional metrology, the EUROMET Initiative on Nanometrology and several regional Key and Supplementary Comparisons for the benefit of the MRA can be reported. It is also worth mentioning, that “post Key Comparisons” are starting, i.e. comparisons carried out by laboratories with unsatisfactory results in completed Key Comparisons or laboratories which were not yet able to participate in the Key Comparisons, both seeking for recognition of their declared CMCs.

1.2 Interregional contacts

At the occasion of a scientific conference held in Munich in June 2001, a meeting has been organized where numerous experts of all major regional Length TCs were present. At this meeting, the EUROMET Length TC chairman had the opportunity to present the EUROMET procedure for the regional CMC review. The confidence gained by the other regions in the EUROMET process was the basis for the inter-regional acceptance of the EUROMET Length CMCs, which was decided by all regional representatives at the CCL Dimensional Metrology Working Group meeting held in September 2001 in Paris.

1.3 Web site

The EUROMET Length web site (<http://www.npl.co.uk/euromet/length/>), hosted at NPL and maintained by Andrew Lewis (NPL) has proven to be a very useful source of information. The site provides information about points of contact, documents, projects and meetings. All recent project reports (EUROMET forms and extended reports), but also working papers, meeting minutes or workshop presentations can be downloaded, partly under restricted access.

1.4 EUROMET initiative on Nanometrology

Following a proposal of the EUROMET Intmet TC, the Length TC has started an initiative on dimensional metrology related to the needs of nanotechnology. In a first step, an inventory of the activities at EUROMET NMIs has been made. The project has tight connections to *euspen*, the European Society of Precision Engineering, and shall involve industry. A workshop is planned for the end of this year, possibly in conjunction with a larger event on a similar subject and funded by the EC.

2 Meetings

The annual contact persons meeting was held in Budapest on 15. - 16. October 2001, perfectly organised by OMH. It was attended by 31 participants from 25 countries and the BIPM. The status of all active projects was reviewed. From two active and three completed projects intermediate or final reports were presented.

Several new activities were proposed, with an increasing proportion in co-operation in research. The reason for this might be, that, firstly, after an intensive period of comparisons for the MRA, again more time is available for other types of co-operation, and, secondly, several projects which would have been classified in former years under the heading of comparisons, are today classified as co-operation in research, because they are not intended to support the MRA.

Further topics of the meeting were the participation and contribution of EUROMET to the MRA key comparisons as well as the successful review of the CMCs. These subjects will be discussed separately in this report. Directly after the meeting, a one-day workshop on *Uncertainty in Dimensional Measurements* was held with the participation of all contact persons and some additional guests. This kind of workshop was found to be very valuable and the wish was expressed to foresee similar events in the future.

The next contact persons meeting will be held on October 14-15, 2002, in Maribor, Slovenia.

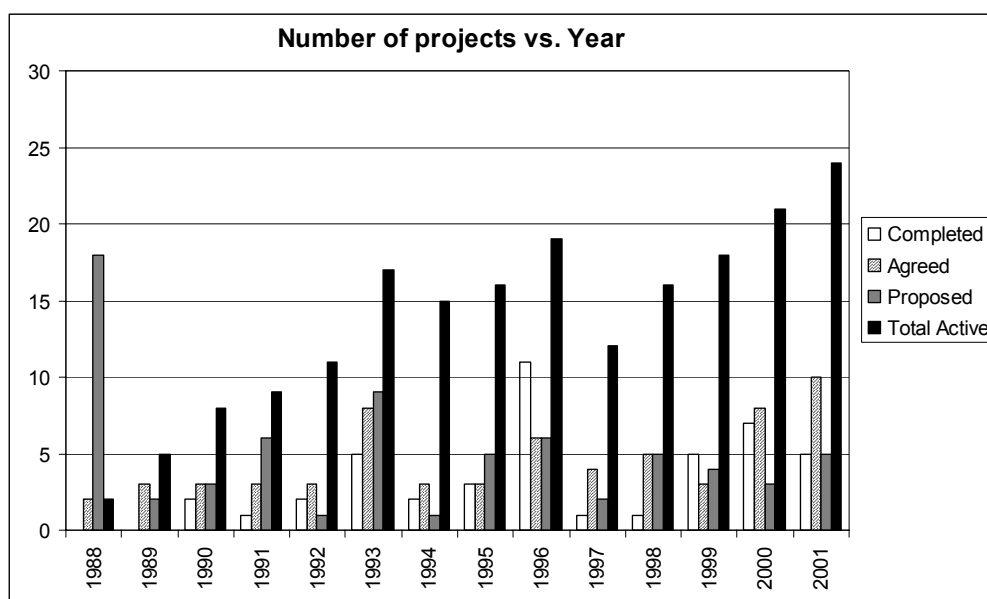
3 Projects

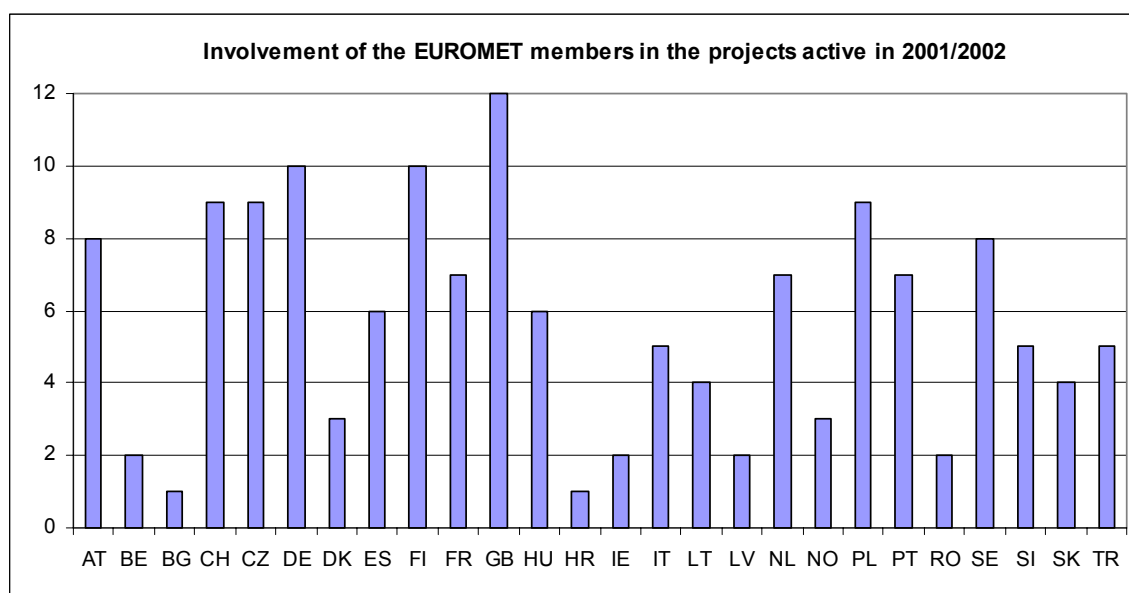
For the following, all information is adjourned on the 1 April 2002 on the basis of the actual status of the active projects rather than on the formal status of the EUROMET project forms.

In the reporting period, 24 projects involving 147 participations from EUROMET NMIs, corresponding members and the BIPM were active. Four of these projects are on-going traceability agreements, two consultations, nine co-operations in research and nine comparisons. Five projects have been completed while nine new projects were proposed and mostly agreed during this period.

Six of the projects are related to the MRA: two active projects are EUROMET key comparisons, three projects are supplementary comparisons and one proposed project is a follow-up to a completed key comparison.

Active projects in 2001		Project No.	Type of Co-operation
On-going:	4	7, 135, 137, 142	traceability agreements
Current:	20 (+3)	456, 471, 533, 561, 570, 588, 600, 601, 602, 610, 618, 622, 630, 639, 640, 643, 647, 649, 652, 654	2 consultations 9 co-operations in research 9 comparisons
Total active:	24 (+3)		





4 Mutual Recognition Arrangement

4.1 CIPM Key Comparisons

KC	Pilot	Status	EUROMET participants	EUROMET meas. date
CCL-K1	CH	completed	CH GB FR	1999
CCL-K2	GB	completed	GB IT DE	1999
CCL-K3	ZA	almost completed	FR IT CH DE	2001
CCL-K4	USA	almost completed	CH DE GB IT	2000/2001
CCL-K5	DE	almost completed	ES IT CH DE	2000/2001
CCL-K6	MX	running	FR CZ NL GB DE	2001/2002

4.2 EUROMET Key Comparisons

KC	Pilot	Project #	Status	No. of part.	Meas. date
EUROMET.L-K1	FR	471	completed	17	1999/2000
EUROMET.L-K1bis	NO	643	agreed	6	2002
EUROMET.L-K2	GB	602	running	23	2002/2003
EUROMET.L-K3	DE	371	completed	13	1996 - 1999
EUROMET.L-K4	CH	384	completed	15	1996 - 1998
EUROMET.L-K5	DE	372	completed	7	1996 - 1998
EUROMET.L-K6	DK/CZ	-	proposed	(13)	not yet defined

4.3 EUROMET Supplementary Comparisons

A list of past comparisons has been entered in the BIPM key comparison database. Only the new running supplementary comparisons are listed below.

Subject	Pilot	Project #	Status	No. of part.	Meas. date
Squareness	SK	570	running	10	2000 - 2002
Surface texture	DE	600	running	15	2001/2002
Gauge blocks by comparison	IE	601	running	11	2001/2002

4.4 CMCs

- All EUROMET Length CMCs have been reviewed by the EUROMET review committee and were accepted after the inter-regional review by the other RMOs. Meanwhile they are published on the KCDB.
- EUROMET Length has performed the inter-regional review of the 1st set of Length CMCs of SIM, APMP and SADCMET. These are published on the KCDB.
- EUROMET Length has been asked to perform the inter-regional review of the 2nd set of the SADCMET CMCs. This has been refused because of lacking evidence of a detailed intra-regional review. These CMCs were then submitted to the APMP review committee to perform the detailed review, as it has already been done for the 1st set.
- No further CMCs from other regions have been submitted to EUROMET Length for inter-regional review.
- A few additional CMCs (modified and new CMCs) from two EUROMET members were submitted to the TC chairman. They are actually in the EUROMET review process and will soon be submitted to the JCRB.
- Lithuania has recently submitted CMCs to EUROMET Length. No action has been taken so far in the review process.

Overview on the project activities of EUROMET Length

#	Subject	Type	Partners	Status
7	Calibration of gear standards	Trac	DE GB	ongoing
135	Calibration service for line standards from 0 to 3000 mm	Trac	FR GB	ongoing
137	Certification of API gauges	Trac	GB DE FR	ongoing, latest progress report Aug.2000
142	Calibration of polarimeters & saccharimeters	Trac	DE GB	ongoing
456	Comparison of angle gauges	Comp	PL CH PT	final report received Aug 01
471	Short gauge blocks measured by interferometry	Comp	FR AT BE CH CZ DE DK ES FI GB HU IT NL NO PT SE SK	draft A report received Sep 01
533	High precision roundness	Comp	FI CH DE GB SE	final report received April 2001
561	Measurement of long gauge blocks	Coop	SE ES NL NRC	final report received Sep 01
570	Comparison of squareness standards	Comp	SK CH CZ DE FI FR HU NL PL PT SE SI	Comparison near completion
588	Traceability of surveying and geodetic instruments	Coop	ES	First intermediate report presented Oct 01
600	Comparison of surface texture standards	Comp	DE AT CH CZ DK ES FI GB IT LT NL PL PT SE SK TR	Started Mai 2001
601	Mechanical comparison of gauge blocks	Comp	IE AT CZ FI GB HU LT NO PL SI TR	Comparison running on schedule
602	Calibration of long gauge blocks, EUROMET.L-K2	Comp	GB AT BE BG CH CZ DE ES FI FR HU IE IT LT LV NL PL PT RO SE SI SK TR	Comparison started Feb 2002
610	Comparison of reference laser interferometer systems	Comp	CZ AT HU	Proposed March 2001
618	Interferometric and mechanical measurements of gauge blocks	Cons	PL AT	final report received June 01
622	Workshop on uncertainty in length measurements	Coop	CH	Workshop hold in Oct 2001 in Budapest
630	EUROMET Initiative on Nanometrology	Coop	CH CZ DE DK ES FI FR GB IT NL PL PT SE SI TR	Proposed July 2001; first report Oct 01
639	Mechanical calibration of gauge blocks	Coop	FI LT LV SE EE	Proposed Oct 2001
640	Error separation algorithms in high precision roundness	Coop	FI GB	Proposed Oct 2001
643	Short gauge blocks measured by interferometry	Comp	NO CZ PL PT RO TR	Proposed Oct 2001
647	Investigation of techniques for absolute laser frequency measurements using an optical femtosecond comb laser	Coop	AT CZ	Proposed Feb 2002
649	Sensitivity transfer standards for form measuring instruments	Coop	DE CH FI FR GB IT NL	Proposed Feb 2002
652	Calibration of short steel gauge blocks by mechanical comparison	Coop	SI AT HU HR	Agreed Feb 2002
654	Exchange of experience in gauge blocks and material measures of length measurements	Cons	PL IE	Agreed Mar 2002