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# Measurements & Testing Newsletter

THE BULLETIN OF INFORMATION OF THE MEASUREMENTS AND TESTING GENERIC ACTIVITY IN THE COMPETITIVE AND SUSTAINABLE GROWTH PROGRAMME

## FOREWORD

### *The fight against doping in sport*



Sport is an integral part of our culture and society. All of us have surely been inspired at some point in our lives by a sporting achievement, either experienced as a competitor or witnessed as a spectator. We find sport important and meaningful, perhaps as a metaphor for life itself, with its challenges, successes and failures. Unfortunately, the darker side of human nature is also reflected in sport in the form of the taking of illegal or banned performance-enhancing drugs, which is a particular way of cheating.

With the rapid evolution of doping techniques, fuelled by the growing financial resources available to athletes and the increasingly complex organisation of trafficking in substances, testing laboratories must constantly develop and re-assess their working methods and means. This ongoing process will require more frequent and closer co-operation between laboratories, the pharmaceutical industry and those involved in basic research.

European-funded research projects are supporting the efforts of the Olympic movement to fight doping in sport by, in particular, developing new and improved testing methods. These methods will help not only to close in on those who are cheating at the moment, but also to protect athletes from false accusations and to deter those who might be tempted to cheat in the future. We all hope that the Commission research programmes will continue with this support.

Dr. Jacques Rogge,  
President of the International Olympic Committee



COMPETITIVE AND  
SUSTAINABLE GROWTH

## NOTE FROM THE EDITOR

### *Nearing the end of the fifth framework programme*

The fifth, and last, dedicated call for proposals for the Measurements and Testing generic activity in the Growth programme was published on 16 October 2001. On page 5 of this issue, we give a full list of the topics for which proposals are invited.

The fight against crime and fraud is a continuing priority for the European Union. We look at how some current Measurements and Testing projects are helping law enforcement agencies and control laboratories to keep one step ahead of criminals and defrauders. We also publish a paper by the High Level Expert Group for Measurements and Testing that identifies research needs for the future.

Looking towards the development of a European infrastructure for measurements and testing in an enlarged European Union, we report on the plans of DG Research to organise an important conference on measurements and testing in Warsaw, Poland, 18-19 June 2002.

The Measurements and Testing Newsletter is the bulletin of information of the Measurements and Testing generic activity in the Competitive and Sustainable Growth programme of the European Union's fifth framework programme for research and technological development.

The Measurements and Testing generic activity is managed by the Measurement and Testing, Infrastructure unit of Directorate H of the Research Directorate General of the European Commission.

For questions or further information about the Competitive and Sustainable Growth programme please contact the Growth infodesk at [growth@cec.eu.int](mailto:growth@cec.eu.int) or visit the Growth internet web site:  
<http://europa.eu.int/comm/research/growth>

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The staff of the Measurement and Testing, Infrastructure unit wish you a happy New Year!

## How to subscribe to the Measurements and Testing Newsletter

The Measurements and Testing Newsletter is free of charge. If you wish to subscribe please send your name and address to the Growth infodesk: e-mail: [growth@cec.eu.int](mailto:growth@cec.eu.int) or fax: +32 2 295 80 72

This issue has been published in 4000 copies. It is also accessible on the CORDIS web site:  
<http://www.cordis.lu/growth/src/library.htm>



## NEWS

### *Measurements and testing conference to be held in Warsaw*

The Competitive and Sustainable Growth programme is organising a conference on measurements and testing that will be held in Warsaw, Poland, 18-19 June 2002.

The conference will discuss how European metrology research can best contribute to the implementation of the European Research Area (ERA) initiative and how an integrated European infrastructure for measurement and testing will form an essential part of this new vision for European research. Particular emphasis will be placed on how to ensure the full participation of the candidate Member States in this endeavour.

The conference will consist of an introductory political session, followed by plenary sessions around specific themes. There will also be a poster exhibition.

The target audience for the conference includes research institutes, universities, laboratories and industries developing or using measurement and testing techniques. The conference will also be of great interest to other stakeholders working with regulations, standardisation and quality control.

The registration form will be sent out with the provisional programme in early March 2002 and will be available on the Growth website.



Warsaw old city

### **"Towards an integrated infrastructure for measurements"**

*Warsaw, Poland, 18-19 June 2002*

#### **Draft Programme**

##### **Monday 17 June 2002**

- \* Opportunity for researchers to set up posters
- \* Registration and a welcome cocktail in the evening for all participants

##### **Tuesday 18 June 2002**

- \* Opening of the conference
- \* Measurements and testing for the needs of society (environment, health, food, and fight against fraud and crime)
- \* Measurements and testing for supporting trade and competitiveness

##### **Wednesday 19 June 2002**

- \* Towards an integrated metrology infrastructure in Europe
- \* Measurements and testing in the thematic priorities of the next framework programme
- \* New possibilities for the candidate Member States

The conference will be opened by Mr Philippe Busquin, Commissioner for Research.

*Full up-to-date information on the conference, including the call for posters and how to register, will be given on the GROWTH web site:  
<http://europa.eu.int/comm/research/growth>  
Topics for the poster exhibition should be submitted before 15 January 2002.*



## *Sixth framework programme (2002 - 2006): inter-institutional discussions continue*

As reported in the last issue of the newsletter, the European Commission presented its proposal for the sixth framework programme (FP) for research and development for the European Union on 21 February 2001. Subsequently, on 30 May 2001, the Commission put forward its proposal for the specific programmes as well as a communication concerning the application of Article 169 of the Treaty and the networking of national programmes. This was followed on 10 September 2001 by the Commission's proposal for the rules for participation and dissemination.



Central Audiovisual Library,  
European Commission

Research Commissioner  
Philippe Busquin

The proposed new FP, covering the period 2002 - 2006, will be a major tool to support the creation of the European Research Area (ERA). As such, it is a deliberate break with past FPs with regard to ambition, scope and instruments to be used in its implementation. The aim is to achieve greater focus on questions of European importance and a better integration of research efforts on the basis of an improved partnership between the various actors in the ERA.

Discussions are now continuing within the Council and the European Parliament with the perspective of the adoption of the FP during the course of the year 2002.

*For full up to date information on important developments in the formulation of future EU priorities for RTD see the following CORDIS web site: <http://www.cordis.lu/rtd2002/>*

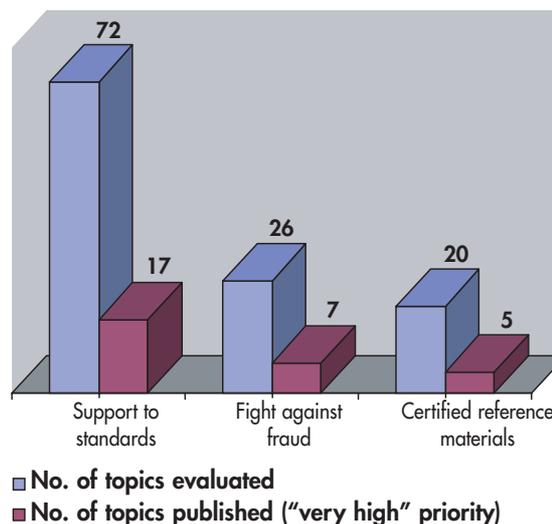
## UPDATE

### *Expressions of interest evaluated*

The call for expressions of interest for the Competitive and Sustainable Growth programme closed on 30 April 2001. The objective of the call was to enable any interested parties to suggest needs for projects in areas of the Measurements and Testing generic activity covered by the dedicated calls, as well as for all activities under Support for Research Infrastructures.

For Measurements and Testing, 118 expressions of interest received before the deadline were evaluated by independent experts in Brussels in June 2001. A large proportion of them were judged to be of "high" or "very high" priority. Because of budget restrictions, however, only topics that were judged to be of "very high" priority were recommended for inclusion in the fifth dedicated call (see below).

### **Results of the last evaluation of expressions on interest for Measurements and Testing**



### *Fifth dedicated call for proposals published*

The fifth, and last, dedicated call for proposals for the Measurements and Testing generic activity and for Support for Research Infrastructures was published in the Official Journal of the European Communities on 16 October 2001. For the Measurements and Testing generic activity, proposals are invited for 29 topics (see table).

For each of the topics, a supporting document has been produced that details precisely the objectives to be met and should be consulted before attempting to develop a proposal. The deadline for the receipt of proposals in Brussels is 15 February 2002 at 5 p.m. (Brussels local time).

Potential proposers are requested to take note that since this is the last dedicated call in the fifth framework programme, some proposals recommended for funding may be placed on a reserve list and only funded if the budget situation so allows.

*The full text of the fifth dedicated call, as well as the supporting documents for the various topics, can be downloaded from CORDIS: <http://www.cordis.lu/growth/calls/200103.htm>*



# TOPICS FOR THE FIFTH DEDICATED CALL

## I. MEASUREMENTS AND TESTING (INDICATIVE BUDGET 11 M€):

### (i) Methodologies to support standardisation and Community policies

#### *Machinery and electromagnetic compatibility:*

- \* Hand-held vibrating tools (topic V.1)
- \* Medium and large industrial machines - electromagnetic compatibility (topic V.2)
- \* Functional safety of integrated electronics in large mobile machines (topic V.3)
- \* Risk assessment methodology for incorporation into EN 1050 (topic V.4)

#### *Protective clothing and textiles:*

- \* Testing of performance of clothing and gloves against heat and fire (topic V.5)
- \* Assessment of thermal properties of protective clothing and their use (topic V.6)
- \* Organic flame retardant components on textile materials (topic V.7)
- \* Antibacterial and anti-fungi properties of textile materials (topic V.8)

#### *Building and construction:*

- \* Seismic behaviour of precast concrete structures with respect to Eurocode 8 (topic V.9)
- \* Freeze/thaw test for natural stones (topic V.10)
- \* Roadside barriers (topic V.11)
- \* Resistance of concrete to chloride ingress (topic V.12)

#### *Pre-normative topics:*

- \* Adhesion and fracture properties of coatings determined by tensile testing (topic V.13)
- \* Hydrotreating reactors and disbonding testing (topic V.14)
- \* Optical techniques for strain measurement (topic V.15)
- \* Supercritical fluids technology (topic V.16)
- \* Migration of Non-phthalate plasticisers in toys (topic V.17)

### (ii) Measurements and testing anti-fraud methodologies

#### *Forensic science and criminal prosecution:*

- \* Determination of the origin of illicit substances (topic V.18)
- \* Chemical discrimination of forensic automotive paint coating samples (topic V.19)
- \* Identification of persons based on the genetic analysis of single nucleotide polymorphism (topic V.20)

#### *Protecting European economic interests:*

- \* Infringement of patents or proprietary processes of fine chemicals and pharmaceuticals (topic V.21)

- \* Detection of animal species in raw material and cooked or heat-treated food products (topic V.22)

#### *Protecting the health and the safety of European citizens:*

- \* Anabolic substances and related compounds in cattle (topic V.23)
- \* Detection of the presence of specified risk material in processed meat products (topic V.24)

### (iii) Support to the development of certified reference materials (CRMs)

#### *Technical support for health and safety protection:*

- \* Determination of mineral oil hydrocarbons in water, soil and waste (topic V.25)
- \* Monitoring of mycotoxins in cereal, food and feed (topic V.26)
- \* Organic components in sludge (topic V.27)
- \* Polyaromatic hydrocarbons in urban dust (topic V.28)

#### *Protecting European economic interests:*

- \* Calibration of energy dispersive X-ray spectrometers (topic V.29)

## II. NEEDS IN SUPPORT OF RESEARCH INFRASTRUCTURES (INDICATIVE BUDGET 20 M€):

Note: Only topics particularly related to measurements and testing are given below. The complete list of topics is given in the call text.

### (v) Setting up of virtual institutes

- \* Reference Materials (topic V.33)
- \* Thermal metrology (topic V.35)
- \* Speciation measurements (topic V.38)

### (vii) Measurement and quality management infrastructures

#### *Measurement infrastructure:*

- \* Implementation of the EU Electromagnetic Compatibility Directive in the Single Market (topic V.41)
- \* Quality and comparability of European proficiency testing schemes (topic V.42)

#### *Support to laboratories in Newly Associated States:*

- \* Implementation of the Low Voltage Directive in the candidate Member States (topic V.43)
- \* Improving the infrastructure of metrology in chemistry in the candidate Member States (topic V.44)
- \* Testing of new chemical substances - adapting good laboratory practice in the candidate Member States (topic V.45)



## *Last periodic call for proposals closes*

The periodic call for proposals for the Measurements and Testing generic activity that was published on 1 June 2001 closed on 17 September 2001. The call was only open for thematic networks and concerted actions, and was the last periodic call for the Measurements and Testing generic activity. The eight thematic network proposals received were evaluated in Brussels in October 2001 by independent experts and 3 were recommended for funding.

## *CRAFT proposals evaluated*

An evaluation of proposals for SME specific measures (CRAFT) took place in Brussels from 15 to 18 October 2001. In total, 9 co-operative research projects in the area of Measurements and Testing were recommended for funding. Due to budget restrictions, some of the proposals may be put on a reserve list.

**Important note: The final deadline for the submission of co-operative research projects has been moved from 17 April 2002 to 28 February 2002.**

For more information about CRAFT see:  
<http://www.cordis.lu/sme/home.html>

## *New certified reference materials*

The BCR certified reference material review panel had its third and fourth meetings on 6-8 June and 7-9 November and agreed on the certification of 13 new materials (see box). The new materials will be available from the Institute for Reference Materials and Measurements (IRMM) or its authorised distributors in due course. Information about their availability will be given on the IRMM web site.



The catalogue for existing BCR certified reference materials is on the IRMM web site:  
<http://www.irmm.jrc.be>

## **Forthcoming certified reference materials**

- \* BCR-261T: Tantalum pentoxide
- \* BCR-322R, -323R, -324R and -325R: Unalloyed zinc
- \* BCR-411 and -412: Diethylstilboestrol DES in bovine muscle
- \* BCR-656 and -660: 13C and site specific 2H isotope ratio and the alcoholic grade of wine alcohol
- \* BCR-657: 13C isotope ratio of sugar
- \* BCR-658 and -659: 18O2 isotope ratio of water from wine
- \* BCR-614: Dioxin solutions
- \* BCR-615: Dioxins in fly ash
- \* BCR-677: Dioxins in sewage sludge
- \* BCR-686, -687 and -688: Trans fatty acids in edible oils
- \* BCR-718: Ortho PCBs in herring
- \* BCR-719: Non-ortho PCBs in chub
- \* BCR-723: Palladium, platinum and rhodium in road dust



Institute for Reference Materials and Measurements (IRMM)

New BCR certified reference materials for dioxins will be used to control the release of dioxins from industrial processes into the environment



## SUMMARY OF CALLS

Remaining calls for the Measurements and Testing generic activity in the Competitive and Sustainable Growth programme are summarised below. The information given is only indicative and may change. Potential proposers should always consult the full text of the relevant call.

### Dedicated calls for proposals

| Publication Date | Scope   | Deadline         |
|------------------|---|------------------|
| 16 October 2001  | RTD projects: restricted to specified topics for areas of Measurements and Testing that are implemented by the expression of interest / dedicated call mechanism<br><br>Thematic networks: restricted to specified topics for Support to Research Infrastructures | 15 February 2002 |

### Calls for proposals for SME specific measures (CRAFT)

| Publication Date                           | Scope                 | Deadline                                       |
|--|-----------------------|--|
| Continuously open until the final deadline | Co-operative research | 28 February 2002<br>(moved from 17 April 2002) |

### Calls for accompanying measures and Marie Curie fellowships

| Publication Date                            | Scope  | Deadline   |
|---|--|--|
| Continuously open until the final deadlines | Accompanying Measures<br><br>Marie Curie fellowships | 28 February 2002<br>(moved from 15 March 2002)<br>28 February 2002<br>(moved from 20 March 2002) |

Full, up-to-date information on all calls that have been published can be found on CORDIS at:  
<http://www.cordis.lu/growth/calls/calls2.htm#open>

## Measurements and Testing on CORDIS



CORDIS is the European Commission's on-line Community Research & Development Information Service. The CORDIS web site contains all the official information concerning the fifth Framework programme. It is the key site for existing and potential participants in the fifth framework programme and provides users with comprehensive up-to-date information on the various possibilities offered by the different programmes as well as information on existing projects.

The Competitive and Sustainable Growth programme is on CORDIS at:  
<http://www.cordis.lu/growth/>



# NEW PROJECTS

The titles of all new Measurements and Testing projects are listed below together with the contract number and the name and the e-mail address of the co-ordinator. More detailed information on all the projects listed below can be found on the CORDIS projects database: [http://dbs.cordis.lu/EN\\_PROJL\\_search.html](http://dbs.cordis.lu/EN_PROJL_search.html)

## *Support to standardisation*

### **Calibration of sensory testing of food contact materials - paper and board (CALIBSENSORY)**

G6RD-CT-2001-00514

Ms. Birgit AURELA  
Oy Keskuslaboratorio -  
Centrallaboratorium Ab  
birgit.aurela@kcl.fi

### **Test methods on wear resistance and long-term stability of furniture surfaces**

G6RD-CT-2001-00524

Mr. Rico EMMLER  
Institut Fuer Holztechnologie  
Dresden GmbH  
emmler@ihd-dresden.de

### **Seismic performance assessment and rehabilitation (SPEAR)**

G6RD-CT-2001-00525

Prof. Michael FARDIS  
University of Patras  
mnf@pat.forthnet.gr

### **Thermo-mechanical fatigue - the route to standardisation (TMF-Standard)**

G6RD-CT-2001-00526

Dr. Peter HÄHNER  
Joint Research Centre, Petten  
hahner@jrc.nl

### **Development and harmonisation of creep crack growth testing for industrial specimens**

G6RD-CT-2001-00527

Dr. Valerio BICEGO  
Centro Elettrotecnico Sperimentale Italiano  
bicego.valerio@cesi.it

### **Mechanical ignition hazards in potentially explosive gas and dust atmospheres**

G6RD-CT-2001-00553

Dr. Geoffrey LUNN  
Health and Safety Executive  
geoff.lunn@hsl.gov.uk

### **Measurement of properties of fresh self-compacting concrete (TESTING-SCC)**

G6RD-CT-2001-00580

Prof. Peter BARTOS  
University of Paisley  
peter.bartos@paisley.ac.uk

## *Methodologies for measurements and testing*

### **Network on energy and environmental tests and measurements for domestic appliances burning solid, liquid or gaseous fuels (LABNET)**

G6RT-CT2001-05046

Dr. Jean SCHWEITZER  
Dansk Gasteknisk Center A/S  
jsc@dgc.dk

## *Instrumentation*

### **3D deflectometry - a new 3D measurement technology for fast inspection of large slightly unflat surfaces**

G6RD-CT-2001-00547

Dr. Ingolf WEINGAERTNER  
Physikalisch Technische Bundesanstalt (PTB)  
ingolf.weingaertner@ptb.de

### **A portable Raman - X-ray instrument (PRAXIS)**

G6RD-CT2001-00502

Prof. Koen JANSSENS  
University of Antwerp (UIA)  
koen@uia.ua.ac.be

## *Fight against fraud*

### **Confirmation of the origin of farmed and wild salmon and other fish (COFAWS)**

G6RD-CT-2001-00512

Dr. Karine WIETZERBIN  
Eurofins Scientific  
karinewietzerbin@eurofins.com

### **Natural isotopes and trace elements in criminalistics and environmental forensics**

G6RT-CT2001-05025

Dr. Jurian HOOGEWERFF  
Institute of Food Research  
jurian.hoogewerff@bbsrc.ac.uk

### **Steroid glucuronides; development of liquid chromatography/mass spectrometric LC/MS analysis in the detection of doping in sport (SGLC/MS)**

G6RD-CT-2001-00513

Dr. Marjaana ELLFOLK  
United Laboratories Helsinki  
Marjaana.ellfolk@  
yhtyneetlaboratoriot.fi

### **Gas chromatography coupled to stable isotope ratio mass spectrometry (GC-IRMS) to check for food and beverage authentication (GC IRMS)**

G6RD-CT-2001-00515

Dr. Michèle LEES  
Eurofins Scientific  
michelelees@eurofins.com



**Dioxin analysis by using comprehensive gas chromatography (DIAC)**

G6RD-CT2001-00572  
Dr. Jacob DE BOER  
Netherlands Institute for Fisheries Research  
j.deboer@rivoex.dlo.nl

**Determination of the milk fat content of mixed spreadable fats (SPREADS)**

G6RD-CT2001-00589  
Prof. Franz ULBERTH  
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fulberth@edv1.boku.ac.at

***Certified reference materials***

**Certified reference materials for optical telecommunication wavelengths (CREW)**

G6RD-CT-2001-00425  
Dr. Uwe STERR  
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**Certified reference materials for the measurement of gaseous pollutants in ambient air (CERMATAIR)**

G6RD-CT-2001-00517  
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thafkenscheid@nmi.nl

**Biological reference materials for organic contaminants (BROC)**

G6RD-CT2001-00518  
Dr. Jacob DE BOER  
Netherlands Institute for Fisheries Research  
j.deboer@rivoex.dlo.nl

**Development of standardised blood and a reference procedure for determination of aggregation of blood cells (AGGREGATION STANDARD)**

G6RD-CT-2001-00522  
Dr. Hans BAEUMLER  
Medical Faculty Charité  
hans.baeumler@charite.de

**Quality in molecular genetic testing: development of certified reference materials (CRMGEN)**

G6RD-CT-2001-00581  
Dr. David Edward BARTON  
University College, Dublin  
david.barton@olhsc.ie

**Development of certified reference materials for allergenic products and validation of methods for their quantification (CREATE)**

G6RD-CT2001-00582  
Dr. Ronald VAN REE  
Central Laboratory of The Netherlands Red Cross Bloodtransfusion Service  
r\_van\_ree@clb.nl

**Feasibility to develop reference measurement systems for Thyrotropin (TSH) and for free Thyroxine (FT4), and validation of reference measurement systems (procedure and material) for Thyroxine (T4) and Triiodothyronine (T3) in human serum (IVD-NONSI-THYROID)**

G6RD-CT-2001-00587  
Dr. Rudolf M. LEQUIN  
Diagnostics Consultancy  
r.m.lequin@wxs.nl

***SME specific measures (CRAFT)***

**Continuous emission and process monitoring of VOC / PFK as individual and total organic compounds (CEMVOC)**

G6ST-CT-2001-50086  
Dr. Petri JAAKKOLA  
Temet Instruments Oy  
Petri.jaakkola@temet.fi

**Shear test for thermally sprayed coatings (SHEAR TEST)**

G6ST-CT-2001-50093  
Dr. Klaus NASSENSTEIN  
GTV Gesellschaft für Thermischen Verschleißschutz mbH  
k.nassenstein@gtv-mbh.de

**Design of a new forged banknote detector for testing the new European currency (EURODETECTOR)**

G6ST-CT-2001-50098  
Mr. Jean-Paul VACANDARE  
Contrôle et Traitement des Monnaies Sécurité S.A.  
Vacandare@ctms.fr

**High-Temperature Micromaterial Testing Technology (HiT)**

G6ST-CT-2001-50099  
Dr. Rolf KUEHNERT  
Image Instruments GmbH  
kuehnert@image-instruments.de

**Evaluation of the occupational health, environmental and process technology consequences of using UV curing printing technology (UVITECH)**

G6ST-CT-2001-50102  
Mr. Hans SPENNES  
Aug. Heinrigs Druck + Verpackung GmbH  
hspennes@aug-heinrigs.de

**Externally injected polyfrom sealant for gas pipes (EIPSFGP)**

G6ST-CT-2001-50103  
Mr. Michael WILD  
MW Polymer Products Ltd  
Mike@mwpolymers.co.uk

**Solid state sensors for CO and Nox measurements inside industrial and/or domestic flues (SENCOFLUE)**

G6ST-CT-2001-50109  
Mr. Sergio SOLMI  
ORION Srl  
Orion@asn.it

**Testing and measurement procedure for the validation of the cleaning behaviour of reusable surgical devices (CLEANTEST)**

G6ST-CT-2001-50121  
Mr. Klaus ROTH  
SMP GmbH  
Klaus.Roth@uni-tuebingen.de



# MEASUREMENTS AND TESTING IN RELATION TO THE FIGHT AGAINST CRIME AND FRAUD

## *High Level Expert Group for Measurements and Testing*

The High Level Expert Group is an advisory panel set up by the European Commission to provide advice on the implementation of the Measurements and Testing generic activity within the GROWTH programme. The group has sixteen members from twelve Member States and two Associated States and is chaired by Mr. Claes Bankvall of the Swedish National Testing and Research Institute. This short paper from the group looks at the fight against crime and fraud. It will be followed by another short paper that they are currently preparing on research needs related to emerging technologies (nanotechnologies). The views presented in this paper are entirely those of the group and do not reflect any official position of the Commission.



Astrid Voets

*European Union co-operation within the area of justice and home affairs (JHA; "third pillar") has taken rapid steps forward in line with the Maastricht and Amsterdam Treaties. The Member States are collaborating intensely in harmonising criminal and civil legislation. In various policy documents the EU has announced a series of measures aimed at combating crime and product counterfeiting.<sup>(1)</sup> The freedom of movement of persons, services, goods and capital within the EU is making it increasingly necessary to develop measures to fight crime and to block the manufacture, import and export of fraudulent products. The efficient production and exchange of data is essential, and calls for intensified co-operation to develop harmonised measurement and testing techniques for investigative and control purposes.*

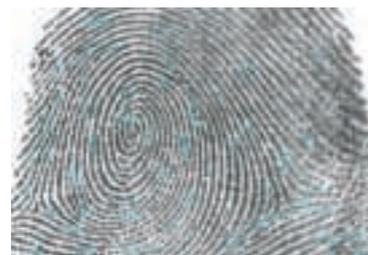
### *Scope*

This paper looks broadly at measurement and testing needs in relation to the fight against crime and fraud. Two main areas are considered:

- \* the prevention, investigation and prosecution of various kinds of crime,
- \* the fight against the manufacture, import, export and sale of fraudulent products.

The first area includes the entire spectrum of forensic science, which refers to the examination of scenes of crime, recovery of material evidence, laboratory examinations, interpretation of findings and presentation of the conclusions for intelligence and investigation purposes or as evidence in court. These fields of expertise can be listed, for example, according to ILAC <sup>(2)</sup> (these can in most cases be seen as widely accepted fields of expert knowledge where casework usually is the

responsibility of specialists whose competence is limited to one area only and separate from the others): controlled substances; toxicology; serology and DNA profiling; trace evidence (e.g. fire debris, glass, paint, gunshot residues); firearms and ballistics; handwriting and document examination; fingerprints; marks and impressions (e.g. toolmarks, shoe prints); audio, video and computer analysis; accident investigation; crime scene investigation; forensic pathology, entomology and odontology. Forensic science methods are applicable to fighting all kinds of crime ranging from everyday crime to organised crime activities and acts of terrorism.



Fingerprint with so-called minutiae

The second area, the fight against product fraud, is possibly even more diverse. The spectrum of products which can be the subject of fraud (or for which the origin has to be controlled) ranges from virgin olive oil containing refined oil and wine containing glycerol via gene-manipulated bovine meat to cheap jeans with designer logos. The illegal use of antibiotics and growth promoters in animals is one of the problems most visible to the public. The recent epidemics of animal diseases within the EU have led to a situation where it is attractive to give misleading information about the country of origin of foodstuffs. A new major issue is the vulnerability of information technology components such as software, database and communication systems and the increased difficulty to uncover the fraudulent penetration of data systems. Illegal software packages and recordings are commonly found in the market. Forged credit cards and frauds in e-commerce are new phenomena. These should be combated with co-operation between experts in law enforcement authorities and industry.

<sup>1</sup> e.g. Green paper on anti-counterfeiting, COM(2000)789

<sup>2</sup> ILAC Guidelines for Forensic Science Laboratories, Draft 1.7, February 2001.



## *Description of the current situation*

### **Increasing European Union co-operation**

European Union co-operation in the area of justice and home affairs (JHA; "third pillar") is increasing, a development initiated in the Maastricht Treaty and further emphasised after the Treaty of Amsterdam. This change is clearly visible in the activities of several working groups under the third pillar of the EU (such as Police Co-operation, Drugs and organised crime etc.) and Europol, and in the many contacts between the police forces of the EU Member States and, at the other end, Central Eastern European (CEE) applicant countries. The Member States are collaborating intensely in harmonising criminal and civil legislation. The freedom of movement of persons, services, goods and capital within the EU and, more specifically, the abolition of border control of persons in the Schengen Agreement countries is making it necessary to develop compensating measures to fight crime and to block the trade on fraudulent products.



Central Audiovisual Library, European Commission  
Co-ordination of an anti-smuggling operation with OLAF inspectors

The central eastern European (CEE) countries applying for membership in the EU need support in their efforts to conform to the particular requirements of judicial and home affairs area. The support should cover a wide spectrum of activities ranging from policy making and development of legislation to comprehensive technical support. In the anti-crime area these needs are exceptionally pronounced because they are not only caused by a technological backlog alone but also by the need to change the way of functioning of the judicial systems.

### **Forensic science and the fight against crime**

In Europe, tens of governmental forensic laboratories are routinely performing thousands of casework investigations in the field of forensic science every year. A major part of these are investigations where the essential results are achieved through use of instrumental analysis which produce unequivocal results controllable with commonly accepted quality assurance procedures. In these areas the standard metrological

approach is applicable. On the other hand in many fields of forensic science expertise such as handwriting, fingerprint or toolmark examinations the essential content of a laboratory report is in fact an examiner's subjective interpretation of direct observations, a so-called qualified opinion. With proper training, however, the outcomes between different forensic scientists should be consistent also in these fields. Thus, in forensic science the basic concept of measurement uncertainty is not always as straightforward as in many other fields. A lot of basic methods development, collaborative testing and harmonisation is still needed even in the most traditional areas of forensic science.

It is important not to accuse the innocent. A reflection of this is the search for faster and more efficient methods for crime investigation. There is a growing demand for rapid screening methods that could be used directly on site. Typical examples are test kits suitable for identifying suspect drug consignments or testing drivers suspected of driving under the influence of illicit drugs. The results obtained using these rapid techniques need not be acceptable in court as such but they would be utilised to diminish the number of "false positives"; the confirmation would be obtained using reliable laboratory methods.

### **The fight against fraud**

The diversity of the possibilities to manufacture and market fraudulent goods is a problem in itself. A wide spectrum of methodologies are needed, such as:

- \* techniques to be used to identify food adulterations
- \* tagging techniques to confirm product authenticity, ranging from simple visual markers to combinations of chemical or isotopic markers
- \* test tools for checking software authenticity
- \* cryptography techniques for prevention of non-permitted access to data systems and communications networks
- \* tracking devices to monitor transport of goods
- \* tamper-proof tagging of transported animals.

In general, the root of most anti-fraud methods lies in the design of the products and thus preventive methods to be used by the producers play an increasing role.

## *Measures required in the fight against crime and fraud.*

### *A suggestion for a work plan*

**Support to networking.** Crime and fraud are permanent problems and therefore "steady state" networks should be established. It should be noted that many aspects are global rather than only European and thus even technical issues should be treated in co-operation with third countries. Special emphasis should be put into networking between law enforcement authorities, industry, research institutions and policy makers.



### **Collaborative methods development and proficiency testing schemes in forensic science.**

Emphasis should be put on areas where international (especially EU) agreements on information exchange are being developed (such as DNA, drug intelligence data, etc.) and areas where the results of an investigation are particularly vulnerable because of the subjective nature of the expertise (fingerprints, impression evidence, handwriting, etc.).

**Benchmarking exercises.** Emphasis should be put into identifying factors, which have an impact on the quality and comparability of measurement and to solving problems, which could risk the reliability of results (e.g. confusion in defining measurement uncertainty; cf. above). Where possible, these exercises should be designed to complement activities of existing networks.

**Development of rapid screening techniques and on site systems.** These activities should be aiming at increasing the efficiency of field work of law enforcement authorities. A special concern is the fact that the techniques and instruments should only cause minimal harm to the target person or persons. Examples of the needs include routine checking of freight or personal ID documentation, screening for illicit drugs or explosives on a person or in a car, screening for drivers under the influence of drugs, checking of product batches or freights using X-rays, ultrasound or other techniques, etc.

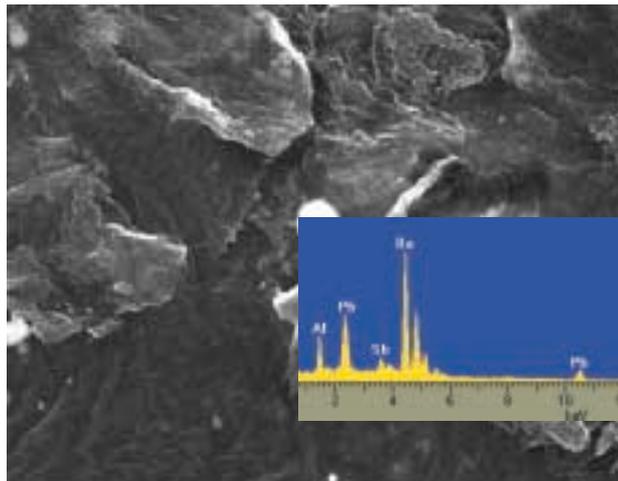
**Development of tagging techniques.** These techniques are needed for tagging genuine products and for easy detection of tagging (and thus for identifying counterfeit products).

**Creation of data banks, reference collections and reference materials.** Comparison data is needed to assist the examiner in authentication of products. The nature of the data and the data banks vary depending on the type of product.

**Support for transfer of technology.** Centres of excellence should be identified. These can be either individual research institutions or virtual institutes consisting of networks. These centres should provide a platform for technology transfer to smaller or less experienced laboratories in the EU and in the candidate countries.

**Development of improved and/or automated sample preparation and clean up techniques.** Drugs of abuse in biological samples and prohibited drug residues in food/feed are examples of areas where large numbers of samples should be monitored rapidly and efficiently. Thus, there is a continuous need for suitable methods for this purpose.

**European legislative issues.** Legal aspects in the fight against crime and fraud call for close interaction with several policy DGs. At present many initiatives related to the fight against crime and fraud are being drafted without a proper harmonised approach between policy makers and researchers.



Scanning electron microscope picture and X-ray fluorescence spectrum of a gunshot residue particle

## **Conclusions**

The development of today's Europe has made it necessary to improve international co-operation in the field of measurements and testing in support of the fight against crime and fraud, a research area which is important in terms of both social development, justice and technology. This is a particularly challenging field which cuts across an entire spectrum of scientific and technical disciplines.

A variety of fundamental research and development needs have been identified. These include new instrumentation, improvement of the quality of forensic investigations, improvement of the comparability of results and the development of the competence of practitioners. Special emphasis should be given to the harmonisation of methods and procedures between Member States and applicant countries.

Research and development related to the fight against crime and fraud has an exceptional role in responding to the needs of the society.

*This paper is on the Competitive and Sustainable Growth programme web site on EUROPA:*

*<http://europa.eu.int/comm/research/fp5/eag.html>*



# MEASUREMENTS AND TESTING PROJECTS

## FIGHTING FRAUD

### *Detecting the illegal addition of mammalian tissues in feedingstuffs for animals*



Since the outbreak of mad cow disease (BSE) in the early 1990s, successive Commission decisions (94/381/EC, 99/129/EC, 2000/766/EC ) have banned the inclusion of mammalian tissues in feedingstuffs intended for ruminants (cattle and sheep). Since 2000, the ban has covered all processed animal proteins; i.e. meat and bone meal, meat meal, bone meal, blood meal, dried plasma and other products.

The STRATFEED project brings together ten research centres, universities and a private company to improve the existing method of detection, to develop and validate new methods, and to set up a European sample bank of animal tissues, ingredients and feedingstuffs from a wide range of sources and countries.

Until now the main method of detection has been classical microscopy which is reliable but slow. The STRATFEED project is developing this method further by linking a conventional microscope with a near infra-red spectrometer. Used together, they enable the researcher to identify visually the particles in a feedingstuff and to determine the near-IR spectrum of each individual particle. Near-IR spectroscopy is also used to determine the composition of a mixture of particles in a sample of feedingstuff. If a sample of feedingstuff is 'spiked' with animal meal, this method can determine the concentration of animal meal.

Further investigations are developing the polymerase chain reaction (PCR) and DNA sequencing from a feedingstuff to determine whether it is plant or animal in origin, and even whether it is pork, beef or lamb. Project co-ordinator Pierre Dardenne says, "The 'golden method' would be PCR and DNA sequencing, as this could prove beyond doubt the complete nature of feedingstuff additives, which can stand up in a court of law."

Project G6RD-CT-2000-00414  
"Strategies and methods to detect and quantify mammalian tissues in feedingstuffs (STRATFEED)"  
Co-ordinator: Dr Pierre Dardenne, Agricultural Research Centre of Gembloux CRAGx, e-mail: [dptqual@cragx.fgov.be](mailto:dptqual@cragx.fgov.be)  
Web site: <http://stratfeed.cragx.fgov.be>

### *Confirming the origin of farmed and wild salmon*

At present there is no reliable method to distinguish a wild fish from a farmed fish, nor to tell its geographical origin. As wild salmon command a higher price than farmed salmon, there is therefore an incentive to mislabel farmed salmon as wild salmon. Also in some countries, salmon from some areas are seen as more desirable than from others. If the price of salmon from the preferred areas is higher, there is again scope for fraud. A further factor is that when a country produces a large quantity of any product, the price tends to fall, and anti-dumping duties are levied over a certain amount of the product exported or sold. Producers of large amounts of farmed fish can be tempted to mislabel their fish, to hide its origin and avoid anti-dumping duties. In an attempt to deal with this problem, the European Commission has published a new regulation (No. 2065/2001, 22 October 2001) on fish labelling, which requires that fish be labelled as to their origin starting on 1 January 2002.

Since September 2001, a consortium of five partners in France, Italy, the UK and Norway has been working to develop a validated method to enable official laboratories to determine exactly where fish come from, and whether or not they are wild. The partners under the



COFAWS project will examine a range of techniques: determining deuterium distribution in the fatty acids by nuclear magnetic resonance (NMR); oxygen and carbon isotope levels by isotope ratio mass spectrometry (IRMS); distribution of fatty acids in triglycerides and the composition of the fatty acid mixture by gas chromatography and  $^{13}\text{C}$  NMR.

According to Karine Wietzerbin of Eurofins Scientific "All the methods will be tested on salmon of known origin from the major European fisheries, and then a statistical analysis will show which parameters are most informative." The combination of methods chosen to distinguish wild from farmed fish may not be the same as the best combination to determine the geographic origin.

The research will help maintain the market for genuine wild salmon (without unfair competition) and will contribute to a quality labelling system for salmon which is organically farmed, or caught in a particular geographic region. It will also be an aid in the enforcement of the new EU regulations.



Project G6RD-CT-2001-00512  
 "Confirmation of the origin of farmed and wild salmon and other fish (COFAWS)"  
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## Detecting forged banknotes



With the imminent appearance of the euro on 1 January 2002, seven new banknotes and eight new coins are about to become part of everyday life for the citizens of the 12 countries of the euro area. A recent report by Europol, the Union's police co-ordination office, warns that the introduction of the euro could unleash an unprecedented crime wave as criminals take advantage of the abundance of cash and confusion likely to be created by the currency changeover. In 1999 and 2000, law enforcement agencies in the European Union seized more than 2 125 000 counterfeit notes with a total value of about €32 million. This figure is likely to rise significantly as the euro becomes the second most used currency in the world.

Counterfeiting has certain characteristics that make it different from other crimes. With new computer technologies and modern reproduction methods allowing us to make high-quality copies of almost any printed material, virtually any individual can potentially counterfeit banknotes from the comfort of his or her own home. A young student, for instance, proficient with computers, could start out by printing a few notes for a laugh and then easily move on to producing false notes for financial gain.

Although nothing can stop a determined counterfeiter from trying, a number of special security features have been incorporated into the design of the new euro, including special tactile properties, a distinctive watermark, a security thread, a foil hologram, and special inks. In addition, machine-readable features have been integrated into the banknotes, allowing cash handling machines to check each banknote's authenticity without human intervention, but for any of these measures to be effective, banknotes must be examined upon receipt.



The EURODETECTOR project is aimed at providing users with a foolproof system for detecting false euro banknotes. Partners are developing a new range of mechanisms, including manual, motorised, and high-cadence devices with integrated automation to eliminate the need for human judgement. The new system will be capable of carrying out counterfeiting detection simultaneously with counting and valorisation operations and will be reasonably priced for affordability for retailers as well as larger financial institutions.

"European-level co-operation is very important to this project," says Jean-Paul Vacandare of France's CTMS (Contrôle et Traitement des Monnaies Sécurité).

"Together with our partners we've been able to come up with and test new and different ideas, and the ability to produce this device on a large scale will mean we can keep the price low."

*Project G6ST-2001-50098 "Design of a new forged banknote detector for testing the new European currency (EURODETECTOR)"  
Co-ordinator, Mr Jean-Paul Vacandare,  
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## PAST EVENTS

### *Environment, health and safety: a challenge for measurements, Paris, France, 14-15 June 2001*

An international conference on metrology in support of environmental policies was held 14-15 June 2001 in Paris with the support of the Measurements and Testing generic activity. It was organised by the Institut National de l'Environnement Industriel et des Risques (INERIS). The main objective of the conference was to highlight the importance of measurement sciences for the monitoring of the environment and policy making in the domains of air, water and soil pollution.

Participants at the conference were treated to an impressive display of posters and two days of animated and sometimes heated discussion, ranging from environmental protection to food safety and public health.



Maryse Arditi,  
INERIS President

Maryse Arditi, INERIS President, welcomed over 200 participants, including researchers, business people, representatives of governmental organisations and the press, at an opening session which featured a rousing discussion focused on the European environment.

"The available resources for work on environmental research are very limited in comparison with other technological areas," said Arditi. "Efficient co-operation is therefore very important, if not indispensable, and this has to be recognised by all concerned. We are all looking forward to the upcoming sixth Framework programme and would like to see how far it goes in fostering this kind of co-operation."

With the intervention of European Member of Parliament Yves Piétrasanta, the discussion turned to society's expectations for a better-preserved and safer environment. "We face a difficult situation in metrology," he said. "It seems that the better we get at measuring and testing, the worse things look."

One of the 'buzz terms' heard repeatedly during the course of the conference was 'the precautionary principle', according to which we assume that there is a risk until we are sure otherwise. "We need more general standards," said Piétrasanta, "simplified monitoring systems and management procedures, and when we don't know for sure we shouldn't say there is no impact."

*A full report on the conference is on the  
GROWTH web site on EUROPA:  
[http://europa.eu.int/comm/research/growth/  
gcc/projects/metrology-conference.html](http://europa.eu.int/comm/research/growth/gcc/projects/metrology-conference.html)*



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