

# New NMS Materials Programmes An Overview

Presentation for IAGs

March 2003

# Background

- Funding for the Materials Measurement programme has transferred to the National Measurement System Directorate (NMSD)
- Best practice will be adopted from NMSD programme formulation and management.
- Re-alignment of programmes.
- NPL and DTI are formulating the first of these programmes now.

# What's Happening?

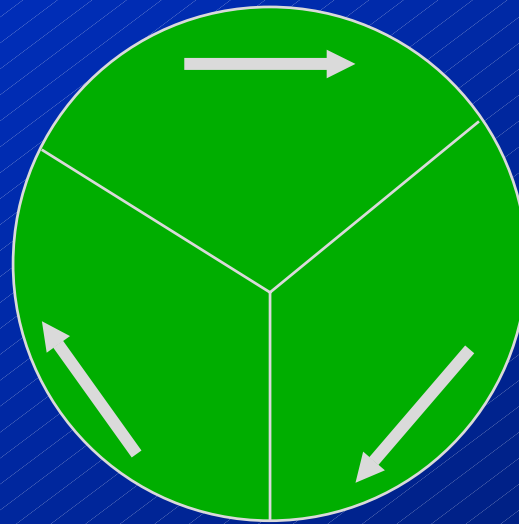
- **Move to 3 'lifecycle' based programmes.**
  - Materials Processing (properties during manufacture)
  - Materials Characterisation (at first use)
  - **Materials Performance (in service)**
- One programme will start each year
- Programmes will cover all material types
- Will be some degree of overlap between programmes
  - In effect a 'rolling' materials programme
- No more material specific programmes
  - **Materials Systems will not be renewed.**
- Funding is likely to be more stable – work may cross programmes

# Planned NMS Materials Metrology Programmes

## *Materials Life-Cycle – 3 Programmes of 3 year duration*

Measurements for  
**Materials Processing**  
manufacturing / fabrication / recycling

Formulate 2004,  
work 2005-2008



Measurements for  
**Materials Performance**  
service performance/ multi-point data  
Whole life costs

Formulate 2003,  
work 2004-2007

Measurements for  
**Materials Characterisation**  
microstructure / initial properties /  
single-point data

Formulate 2005,  
work 2006-2009

# Materials Projects & Industry

- Must be supported by industry during formulation
- Must attract Industrial Advisory Groups of industry experts
- Must gain material support from industry
- Must produce benefits to industry in the short and long term
- Knowledge transfer a key requirement

# Next Programme

## Measurements for Materials Performance

Formulate: 2003 – **happening now**

Work: April 2004 – April 2007

Re-Formulate: 2006

Work: April 2007 – April 2010

Etc.....

# Formulation Steps

## Where you can get involved

- **March/April: Consult with IAGS & key stakeholders to scope programme.**
- **April-June: Wider consultation with industry to rank project priorities.**
- **July: Formulation workshop to confirm priorities.**

**Please get involved.**

# “Measurements for Materials Performance” 2004-2007

**Scope and Aims:** “The Performance of Materials programme will develop measurement methodologies and models for the assessment, prediction and ongoing evaluation of the properties of materials in a service environment critical to maintaining fitness for purpose.

Knowledge and best practice will be promoted to users through new facilities, standardised test methods and access to experts.”

# Anticipated Themes – Correct?

- High temperature degradation
- Engineering integrity assessment
- Wear and abrasion
- Durability of electronic materials
- Assessment monitoring
- Aqueous corrosion
- Surface engineered solutions
- Performance of polymeric materials
- Accelerated ageing methodologies
- Construction materials

Formulation and Consultation now underway

Please let us know your views at :

[www.npl.co.uk/materials/formulation](http://www.npl.co.uk/materials/formulation)

# Ideas for Adhesives?

- Accelerated Ageing Protocols for Assessing environmentally Compliant Surface Treatments
- Permeability and chemical resistance of adhesive joints, barrier materials and polymer multi-layers
- Assessing the service performance of polymer interfaces
- Prediction of the life-time of adhesive joints under sustained loading
- Long-term performance of welded thermoplastic joints
- Accelerated Ageing Protocol For Service in Hostile Conditions
- Adhesives Toolkit – Durability Module?
- **Others.....?**


# Preferred Methods of Technology Transfer?

- Meetings/Seminars
- Reports/Scientific Papers
- Good Practice Guides
- Electronic/SMART Manuals/Web Toolkits
- Secondments
- Newsletters
- Case Studies
- Other mechanisms?

# What to do now?

- Please let us have your views
  - Make sure your needs are stated
- Complete the scoping questionnaire
  - Website:  
[www.npl.co.uk/materials/formulation](http://www.npl.co.uk/materials/formulation)
  - Consultation form
  - Text inputs on specific requirements and drivers are invaluable

# Electronic Consultation - [www.npl.co.uk/materials/formulation](http://www.npl.co.uk/materials/formulation)




**NPL**  
National Physical Laboratory

The UK's National Measurement Laboratory

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## Measurements for Materials Performance 2004-2007

The performance and lifetime of materials is critical to the success of organisations involved in any engineering field through the impact on costs, safety and the environment. A proposed new three year DTI Materials Metrology research programme, focussing on the performance of materials in service, is planned to start on 1st April 2004. Consultation on the scope and priorities for research will take place between March and June 2003.


The Performance of Materials programme will develop measurement methodologies and models for the assessment, prediction and ongoing evaluation of the properties of materials in a service environment critical to maintaining fitness for purpose. Knowledge and best practice will be promoted to users through new facilities, standardised test methods and access to experts.

Anticipated themes in the Materials Performance Programme will include:

High temperature degradation	Aqueous corrosion
Surface engineered solutions	Wear and abrasion
Durability of electronic materials	Construction materials
Engineering integrity assessment prediction under complex loading	Performance of polymeric materials
Assessment monitoring	Accelerated ageing methodologies


Please help us to formulate a programme to meet industry needs.

**Electronic feedback form** [click here](#)

**Download response form here**  183 kb

For further details please contact [Andrew.Dunlop@npl.co.uk](mailto:Andrew.Dunlop@npl.co.uk)

Office



Microsoft

# Contact Details

Materials (LPM)

Measurements for  
Materials Systems  
(MMS)

National Corrosion  
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access to experts.

Please help us formulate this programme to help meet your needs.

**All information will be treated in confidence**

Part A : Contact Details	
Your e-mail address	<input type="text"/>
Your name	<input type="text"/>
Position	<input type="text"/>
Organisation	<input type="text"/>
Address	<input type="text"/>
Town	<input type="text"/>
Postcode	<input type="text"/>
Telephone	<input type="text"/>
Would you like to be kept informed of the progress of this programme formulation?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Would you like to be kept informed of other programmes?	<input checked="" type="radio"/> Yes <input type="radio"/> No

Part B : Formulation input

Anticipated themes in Materials Measurement Programme

# Themes and Service Environments

- High temperature degradation
  - Accelerated ageing methodologies
  - Performance of polymeric/composite materials
  - Durability of electronic materials
  - Engineering integrity assessment /prediction of behaviour under complex loading
  - Aqueous corrosion and electrochemistry
  - Assessment monitoring
  - Surface engineered solutions
  - Wear and abrasion
  - Construction materials
- Other (please specify)

## Service environment

### Long term loads

- fatigue     creep     multiple impact
- overloads     acoustic fatigue

### Temperature environments

- thermal ageing     high temperature oxidation/corrosion
- thermal spiking     low temperatures

### Water

- moisture     immersion
- aqueous corrosion     electrochemistry
- corrosion inhibitors     electrolytes/salt solutions
- scale growth     steam

### Chemicals

- acids     alkalis

# Requirements, Company Info, Materials

Are there any new drivers likely to affect the use of materials in your company/industry ? <i>(e.g. EU directives, environmental legislation, technological changes)</i>	<input type="text"/>
Any comments not covered elsewhere <i>(e.g. are there areas appropriate).</i>	<input type="text"/>

## Part C : Background Information

Company employees	<input type="radio"/> 1 - 3	<input type="radio"/> 4 - 10
	<input type="radio"/> 11 - 20	<input type="radio"/> 21 - 50
	<input type="radio"/> 51 - 250	<input type="radio"/> 251 - 1000
	<input type="radio"/> 1000+	
Annual turnover (£ millions)	<input type="radio"/> < 0.3	<input type="radio"/> 0.3 - 1
	<input type="radio"/> 1 - 5	<input type="radio"/> 5 - 30
	<input type="radio"/> 30 - 250	<input type="radio"/> > 250

## Materials used

	<b>Metals</b>		
	<input type="checkbox"/> steel	<input type="checkbox"/> aluminium	<input type="checkbox"/> titanium

# Remember.....

- If you want more work in adhesive bonding then please **respond to the formulation consultation.**
- Work funded will be driven by what **industry supports during consultation.**
- **Make sure your views are heard.**
- **Please do so by 7 May 2003**