

## Standard L6: Materials Science Technologist

### UOS reference number

ST0675

### Trailblazer reference number

TB0253

### Title of occupation

Materials Science Technologist

### Trailblazer name

Materials Science

### Core and options

No

### Resubmission

No

### Level of occupation

Level 6

### Route

Engineering and Manufacturing

### Typical duration of apprenticeship

4 years

### Target date for approval

31 January 2019

## Occupational profile

### Summary

The Materials Science Technologist occupation is at the forefront materials innovation in the Petrochemical, Pharmaceutical, Engineering, Construction, and Manufacturing industries across numerous sectors including automotive, aerospace, healthcare, defence, and energy, mechanical, civil and chemical engineering, material failure, rheology, adhesives, polymers, traditional and advanced ceramics.

The broad purpose of the occupation is to ensure materials used in those industries are fit for purpose in terms of product innovation, performance, failure diagnosis, operational management, process and manufacturing, and the positive advancement of materials science, thus enhancing economic and social value today and in the future.

In their daily work, materials technologists will engage in high level activities such as materials testing, novel product development, solving manufacturing issues, laboratory management, team leadership, technological sales, and client management, depending on which of the

variety of related businesses their employer is in.

Work involves testing materials used by clients through activities such as investigation, gathering physical evidence, critical analyses, drawing conclusions, and recommending courses of action. Depending on context, technologists may be involved in designing new materials or production processes, combining materials, or additive manufacturing. In addition, they may need to provide technical leadership in the design and development of new material products by choosing correct materials and applications through data derived from analysis in the field or lab for: e.g. body armour for defence, materials for engine parts for aerospace, commercial vehicles or high performance cars, materials for new developments in battery design/manufacture, or coatings and additives for healthcare applications such as dental work, or materials for replacement bones or prosthetics.

This employee will participate in internal/external project teams, provide management and leadership of direct report personnel as well as cross-functional teams in addition to liaising with clients in a sales role or providing technical consultancy, proof of concept, or scale-up initiatives. Work will be on projects in the lab, office, onsite, or in the field in local, regional, national or global contexts.

In addition they may be expected to acquire and develop new business and manage an existing client base comprising of individuals, SMEs, larger national companies, government agencies, and multinational organisations.

### Typical job titles

Typical job titles include: R&D; Technologist, Graduate Material Scientist, Development Engineer, Technical Service Specialist, Materials Tester, Quality assurance/Quality Control, Graduate Sales Exec.

Duty	Criteria for measuring performance	Knowledge	Skills	Behaviours
Provide materials science advice utilising advanced practical, conceptual and technological expertise to key departments such as, but not limited to, innovation, production, and engineering design teams.	Accuracy; comprehensive consideration of risk factors; on budget; on time; consistency; rigor; attention to detail; flexibility of approach according to physical context; attentive to health & safety and data security; clear and succinct communication.	<ul style="list-style-type: none"> <li>• K1: Contemporaneous practical and technological knowledge of chemical and physical properties of materials including: metals, ceramics, polymers, adhesives, glass, construction materials, composites, and new future materials and their key performance properties.</li> <li>• K2: Up-to-date conceptual and practical underpinning knowledge of chemical and physical properties of materials and how these react to testing and synthesis including the chemical composition of a range of materials such as advanced ceramics, metals, glass, polymers, and their structural manipulation and transformation and problems and advances that may arise during change at a microstructural level.</li> </ul>	<ul style="list-style-type: none"> <li>• S1: Utilise cognitive and practical skills in conjunction with adaptability and versatility in technical support both in-house and to clients to improve manufacturing processes, problem solving, innovation, and scale up formulations.</li> <li>• S2: Determine and use industry standard and emerging digital technologies and data analysis tools to complete work activities and address problems that are ill defined or involve numerous interacting factors.</li> <li>• S3: Critically evaluate actions, methodologies, and results and their implications in analysing materials against parameters in product specifications.</li> </ul>	<ul style="list-style-type: none"> <li>• B1: Self-starter ☑ confidence to work autonomously and use initiative to lead. Ability to take responsibility for actions that underpin, enhance, or develop employer or client.</li> <li>• B2: Clear and concise communicator ☑ influence with integrity and exercise judgement.</li> <li>• B3: Anticipate and respond to others☑ feelings with emotional intelligence and take responsibility, where relevant or appropriate, for the work and roles of others.</li> <li>• B5: Results orientated ☑ thoughtful and methodical planner, ensuring goals and targets are achieved to deliver successful outcomes utilising and incorporating results in future activities.</li> <li>• B7: Collaborative ☑ comfortable team player as well as being able to team-lead when called upon.</li> </ul>

Duty	Criteria for measuring performance	Knowledge	Skills	Behaviours
		<ul style="list-style-type: none"> <li>• K3: Systems and processes such as, but not limited to, CRM systems, client handling, profit and loss, and planning, in project management, business improvement, proof of concept, and scale up.</li> <li>• K4: Current design and production knowledge of composite materials and additive manufacturing with the ability to engage with and evaluate complex theories and processes.</li> <li>• K5: Bonding technologies utilising, for example, metals, ceramics, polymers, rubbers and glasses and full understanding of positive and negative interactions between materials.</li> <li>• K6: Required understanding of material component forming methods and how these contribute to effective production methods, problem solving innovations, and novel product development.</li> </ul>	<ul style="list-style-type: none"> <li>• S4: Conduct and interpret failure analysis of engineering components using relevant methodologies and systems such as but not limited to, for example, microscopy, macroscopy, and chemical analysis.</li> <li>• S5: Write clear and succinct technical and analytical reports.</li> </ul>	<ul style="list-style-type: none"> <li>• B9: Display expert demeanour across an organisation with confidence and ability to initiate and lead tasks, allocate time and resources, and to challenge constructively.</li> <li>• B10: Health and safety conscious at all times and adheres to regulations and incorporates underpinning knowledge of same into planning.</li> <li>• B11: Data hygienic and security sensitive when handling employer or client data.</li> </ul>

Duty	Criteria for measuring performance	Knowledge	Skills	Behaviours
		<ul style="list-style-type: none"> <li>• K7: Practical, conceptual, and technological knowledge of thermodynamics; structural chemistry; solid state chemistry; rheology; micro structures; analytical chemistry; organic chemistry; inorganic chemistry.</li> <li>• K8: Intellectual property rights issues and the implications and importance of patent, non-disclosure issues, and GDPR regulations.</li> <li>• K9: Contemporary research and developments in the materials science community in terms of understanding different perspectives, methodologies, and schools of thought as well as the theoretical stances that underpin them.</li> <li>• K10: Materials applications including theories, techniques and relevant calculations to understand related disciplines and be able to work in a collaborative or cross-functional environment in more than one materials context.</li> <li>• K11: Comprehensive understanding of how engineering materials are manufactured and processed including understanding of UK and international materials standards, procedures and specifications across a range of operations and contexts.</li> </ul>		

Duty	Criteria for measuring performance	Knowledge	Skills	Behaviours
		<ul style="list-style-type: none"> <li>• K12: How materials fail in terms of fatigue, wear, impairment, corrosion, stresses, cracking, embrittlement, abrasion and cavitation erosion, including risk and mitigation factors. Understanding and ability to conduct failure testing using, for example, microscopy, macroscopy, and chemical analysis.</li> <li>• K13: Systematic approaches to cost benefit analysis, including contextual financial understanding using industry standard metrics. Awareness of marketplace dynamics.</li> <li>• K14: How IT and emerging digital technologies such as 3D printing can be applied to enhance materials science work practices.</li> <li>• K15: Report writing techniques, including how to synthesise information and write concisely using a formal or neutral language register and vocabulary appropriate to the target reader.</li> </ul>		
<p>Research, design, and optimise innovative processes to reduce costs and environmental impact as well as iterating novel products for new market opportunities and societal demands and needs.</p>	<p>Attention to detail; thorough research methodologies; comprehensive understanding of key markets; high level verbal and written communication attributes: able to converse clearly and fluently; able to undertake presentations; able to write concisely and accurately.</p>	<ul style="list-style-type: none"> <li>• K1</li> <li>• K2</li> <li>• K4</li> <li>• K5</li> <li>• K6</li> <li>• K7</li> <li>• K8</li> <li>• K9</li> <li>• K10</li> <li>• K11</li> <li>• K13</li> <li>• K15</li> </ul>	<ul style="list-style-type: none"> <li>• S2</li> <li>• S5</li> <li>• S6: Research, adapt and test new technologies through materials characterisation feedback.</li> <li>• S8: Maintain a working knowledge of a range of project management and financial management techniques to complete projects relevant to their discipline.</li> </ul>	<ul style="list-style-type: none"> <li>• B1</li> <li>• B4: Customer focus ☑ promotes, and works to achieve, excellent customer service to internal and external customers alike exercising broad autonomy and refined judgement.</li> <li>• B5</li> <li>• B7</li> <li>• B8: Combine commercial and technical sensibility to assist employer and/or clients to capitalise on opportunities.</li> </ul>

Duty	Criteria for measuring performance	Knowledge	Skills	Behaviours
Innovate and/or translate materials science R&D; into the production of new products and analyse and evaluate suitability of design concepts for production.	Generates multiple new ideas and novel practices; objective; skilled in praxis; shows successful collaborative mind-set; target driven.	<ul style="list-style-type: none"> <li>• K1</li> <li>• K4</li> <li>• K5</li> <li>• K6</li> <li>• K7</li> <li>• K9</li> <li>• K10</li> <li>• K11</li> <li>• K12</li> <li>• K14</li> <li>• K15:</li> </ul>	<ul style="list-style-type: none"> <li>• S1</li> <li>• S2</li> <li>• S3</li> <li>• S5</li> <li>• S6</li> <li>• S7: Interpret, develop and implement UK and international materials standards, procedures and specifications across a range of operations and contexts.</li> <li>• S8: Maintain a working knowledge of a range of project management and financial management techniques to complete projects relevant to their discipline.</li> </ul>	<ul style="list-style-type: none"> <li>• B2</li> <li>• B3</li> <li>• B4</li> <li>• B6: Anticipate situations and problems, finds appropriate contemporaneous solutions and grasps opportunities.</li> <li>• B7</li> <li>• B8</li> <li>• B9</li> <li>• B10</li> <li>• B11</li> </ul>
Conduct rigorous analyses and report on materials failure in engineering components from test or in the field.	Attention to detail; thorough research methodologies; accuracy; dedication; rigour; clear and precise accounting of work.	<ul style="list-style-type: none"> <li>• K1</li> <li>• K10</li> <li>• K11</li> <li>• K12</li> <li>• K14</li> <li>• K15:</li> </ul>	<ul style="list-style-type: none"> <li>• S2</li> <li>• S3</li> <li>• S4</li> <li>• S5</li> <li>• S7</li> </ul>	<ul style="list-style-type: none"> <li>• B1</li> <li>• B2</li> <li>• B3</li> <li>• B4</li> <li>• B5</li> <li>• B6</li> <li>• B7</li> <li>• B8</li> <li>• B9</li> <li>• B10</li> <li>• B11</li> </ul>
Solve internal and external materials production problems utilising experiential or innovative solutions.	High level verbal and written communication skills; tenacity; consistency; accuracy; collaborative mind-set; customer focus.	<ul style="list-style-type: none"> <li>• K1</li> <li>• K2</li> <li>• K4</li> <li>• K5</li> <li>• K6</li> <li>• K7</li> <li>• K10</li> <li>• K11</li> <li>• K12</li> <li>• K14</li> </ul>	<ul style="list-style-type: none"> <li>• S1</li> <li>• S2</li> <li>• S3</li> <li>• S4</li> <li>• S7</li> </ul>	<ul style="list-style-type: none"> <li>• B1</li> <li>• B2</li> <li>• B3</li> <li>• B4</li> <li>• B5</li> <li>• B6</li> <li>• B7</li> <li>• B8</li> <li>• B9</li> <li>• B10</li> <li>• B11</li> </ul>

Duty	Criteria for measuring performance	Knowledge	Skills	Behaviours
Develop strategic national and international partnerships with key materials supply chains, HEIs, Government Agencies, and commercial clients.	High level of written and verbal communication skills; emotional intelligence; collaborative mind-set; comprehensive understanding of market forces and of profit margins.	<ul style="list-style-type: none"> <li>• K1</li> <li>• K3</li> <li>• K8</li> <li>• K9</li> <li>• K13</li> <li>• K16: Management techniques and theories, including problem solving methodologies, effective decision making, delegation and planning methods, time management, organisational awareness, motivational techniques, and conflict resolution.</li> </ul>	<ul style="list-style-type: none"> <li>• S7</li> <li>• S8</li> <li>• S9: Utilise emotional intelligence and identify a range of supervisory, management, and leadership skills in developing the ability to mentor, direct or lead teams or individuals.</li> </ul>	<ul style="list-style-type: none"> <li>• B1</li> <li>• B2</li> <li>• B3</li> <li>• B4</li> <li>• B7</li> <li>• B8</li> <li>• B11</li> </ul>
Utilise detailed product formulations and characterisations in production process and maintain formulation and costing databases.	Attention to detail; accuracy; on budget; on time; high level IT attributes such as data analysis and illustrated report writing and costing.	<ul style="list-style-type: none"> <li>• K1</li> <li>• K2</li> <li>• K3</li> <li>• K7</li> <li>• K9</li> <li>• K10</li> <li>• K11</li> </ul>	<ul style="list-style-type: none"> <li>• S1</li> <li>• S2</li> <li>• S3</li> <li>• S6</li> <li>• S7</li> </ul>	<ul style="list-style-type: none"> <li>• B5</li> <li>• B7</li> <li>• B8</li> <li>• B11</li> </ul>
Seek out and discourse with customers, acquiring new sales by understanding their requirements and advising on appropriate solutions and products based on technical performance specifications related to material performance.	Customer focus; acquisition of multiple new sales; written and verbal communication skills; comprehensive understanding of market forces; understanding of profit and loss.	<ul style="list-style-type: none"> <li>• K1</li> <li>• K2</li> <li>• K3</li> <li>• K4</li> <li>• K5</li> <li>• K6</li> <li>• K7</li> <li>• K8</li> <li>• K9</li> <li>• K11</li> <li>• K12</li> <li>• K13</li> <li>• K14</li> <li>• K15:</li> </ul>	<ul style="list-style-type: none"> <li>• S1</li> <li>• S3</li> <li>• S5</li> <li>• S7</li> <li>• S8</li> </ul>	<ul style="list-style-type: none"> <li>• B1</li> <li>• B2</li> <li>• B3</li> <li>• B4</li> <li>• B5</li> <li>• B6</li> <li>• B8</li> <li>• B11</li> </ul>

Duty	Criteria for measuring performance	Knowledge	Skills	Behaviours
Design testing regimes for materials performance evaluations of new and existing products and be responsible for maintaining development of materials, products and manufacturing infrastructures and resources within their area of responsibility.	Full cognisance in contemporary research and testing methodologies; accuracy; attention to detail; methodical; iteration of more than one new product.	<ul style="list-style-type: none"> <li>• K1</li> <li>• K2</li> <li>• K4</li> <li>• K5</li> <li>• K6</li> <li>• K7</li> <li>• K9</li> <li>• K10</li> <li>• K11</li> <li>• K12</li> <li>• K14</li> <li>• K15:</li> </ul>	<ul style="list-style-type: none"> <li>• S2</li> <li>• S3</li> <li>• S4</li> <li>• S5</li> <li>• S6</li> <li>• S7</li> </ul>	<ul style="list-style-type: none"> <li>• B1</li> <li>• B5</li> <li>• B6</li> <li>• B7</li> <li>• B8</li> <li>• B10</li> <li>• B11</li> </ul>
Manage and motivate personnel and maintain efficient administration, effective lab practices, and address Health & Safety procedures at all times.	Emotionally intelligent; attentive to detail; rigorous; high level written and verbal communication; safety record at least equal to standard company levels.	<ul style="list-style-type: none"> <li>• K3</li> <li>• K13</li> <li>• K15:</li> <li>• K16:</li> </ul>	<ul style="list-style-type: none"> <li>• S2</li> <li>• S5</li> <li>• S9</li> </ul>	<ul style="list-style-type: none"> <li>• B1</li> <li>• B2</li> <li>• B3</li> <li>• B4</li> <li>• B5</li> <li>• B6</li> <li>• B7</li> <li>• B9</li> <li>• B10</li> <li>• B11</li> </ul>
Analyse and utilise data to create accurate reports whilst maintaining data hygiene, security, and being mindful of GDPR.	Accurate; attention to detail; precise; responsible; methodical; compliance with company targets.	<ul style="list-style-type: none"> <li>• K3</li> <li>• K7</li> <li>• K8</li> <li>• K9</li> <li>• K13</li> <li>• K15:</li> </ul>	<ul style="list-style-type: none"> <li>• S2</li> <li>• S3</li> <li>• S5</li> <li>• S7</li> </ul>	<ul style="list-style-type: none"> <li>• B2</li> <li>• B8</li> <li>• B11</li> </ul>



Duty	Criteria for measuring performance	Knowledge	Skills	Behaviours
Consistently progress projects to completion on time and on budget.	Accurate; attention to detail; precise; responsible; methodical; drive; tenacity; on time; on budget; target driven; .	<ul style="list-style-type: none"> <li>• K1</li> <li>• K2</li> <li>• K3</li> <li>• K4</li> <li>• K5</li> <li>• K6</li> <li>• K7</li> <li>• K8</li> <li>• K9</li> <li>• K11</li> <li>• K12</li> <li>• K13</li> <li>• K14</li> <li>• K15:</li> <li>• K16:</li> </ul>	<ul style="list-style-type: none"> <li>• S1</li> <li>• S2</li> <li>• S3</li> <li>• S4</li> <li>• S5</li> <li>• S7</li> <li>• S8</li> <li>• S9</li> </ul>	<ul style="list-style-type: none"> <li>• B1.</li> <li>• B2</li> <li>• B3</li> <li>• B4</li> <li>• B5</li> <li>• B6</li> <li>• B7</li> <li>• B8</li> <li>• B9</li> <li>• B10</li> <li>• B11</li> </ul>

## Example training specification

Duty	Training requirement	Method of delivery	Provider type	OTJ days
Provide materials science advice utilising advanced practical, conceptual and technological expertise to key departments such as, but not limited to, innovation, production, and engineering design teams.	—			0
Research, design, and optimise innovative processes to reduce costs and environmental impact as well as iterating novel products for new market opportunities and societal demands and needs.	—			0
Innovate and/or translate materials science R&D; into the production of new products and analyse and evaluate suitability of design concepts for production.	—			0
Conduct rigorous analyses and report on materials failure in engineering components from test or in the field.	—			0
Solve internal and external materials production problems utilising experiential or innovative solutions.	—			0
Develop strategic national and international partnerships with key materials supply chains, HEIs, Government Agencies, and commercial clients.	—			0
Utilise detailed product formulations and characterisations in production process and maintain formulation and costing databases.	—			0
Seek out and discourse with customers, acquiring new sales by understanding their requirements and advising on appropriate solutions and products based on technical performance specifications related to material performance.	—			0
Design testing regimes for materials performance evaluations of new and existing products and be responsible for maintaining development of materials, products and manufacturing infrastructures and resources within their area of responsibility.	—			0

## Example training specification (continued)

Duty	Training requirement	Method of delivery	Provider type	OTJ days
Manage and motivate personnel and maintain efficient administration, effective lab practices, and address Health & Safety procedures at all times.	—			0
Analyse and utilise data to create accurate reports whilst maintaining data hygiene, security, and being mindful of GDPR.	—			0
Consistently progress projects to completion on time and on budget.	—			0

Qualification	Basis for mandation
<p><b>Materials Science &amp; Engineering BSc x 3 years (University of Manchester); Materials Science &amp; Engineering BEng x 3 years (University of Birmingham); Materials Science &amp; Engineering BEng x 3 years (Imperial College London); Materials Science &amp; Engineering/Materials Science &amp; Engineering (Year in Industry) BEng x 3 &amp; 4 years respectively (University of Sheffield); Natural Sciences (Materials Science BA Hons x 3 or 4 years (Cambridge University)</b></p> <p>Level: 6 (non-integrated degree)                      Type: Type 2 off-the-job qualification                      Ofqual regulated: No                      Awarding bodies</p> <ul style="list-style-type: none"> <li>• Staffordshire University</li> <li>• Manchester Metropolitan University</li> <li>• University of Derby</li> <li>• University Centre Peterborough</li> </ul>	<p><b>Hard sift</b></p> <p>—</p> <p>Materials Science Technologist Degree Apprenticeship Standard: Mandatory Qualification <a href="#">?</a>                      Greater Breadth and Depth.</p> <p>There are clear advantages to combining cutting edge scientific research and contemporary industrial practice by undertaking the degree apprenticeship in Materials Science and thus having the benefit of two key learning contexts: that of a practical work-based apprenticeship in addition to the academic experience of a degree.</p> <p>—</p>
<p>Level:                      Type:                      Ofqual regulated:                      Awarding bodies</p>	<p>This level of praxis will not only engender a highly connected pathway in its combination of apprenticeship and off-the-job study of a mandatory degree but is also, as we have found through consultation with employers in and beyond our Trailblazer group, an essential requirement for the attainment of the KSBs needed to fulfil a professional role in a contemporary materials science career.</p>
<p>Level:                      Type:                      Ofqual regulated:                      Awarding bodies</p>	<p>In terms of materials science work, employers will, in most cases, be involved in the development, deployment, and/or manufacture of products or solutions that utilise more than one material and those employers involved in the development of the degree apprenticeship in materials science have sought to ensure that the apprenticeship programme includes study of a wide range of traditional and contemporary materials.</p>
<p>Level:                      Type:                      Ofqual regulated:                      Awarding bodies</p>	<p>The justification for this stance is drawn from the contemporaneous experiences brought to the development of the programme by a wide range of materials employers in manufacturing, innovation, scale-up, and testing, who now see their businesses increasingly being driven by the need for expertise in multi-materials. Employers are now seeing materials technology develop rapidly and demand in commensurate markets moving quickly to a context that increasingly utilises the combining of materials and/or additive manufacturing.</p>
<p>Level:                      Type:                      Ofqual regulated:                      Awarding bodies</p>	<p>For example, Bostik market their smart adhesive technologies throughout the globe and are not only involved in the home consumer markets but also in construction, automotive, aeronautics, and railways. Engine manufacturers such as Caterpillar, will no doubt benefit from apprenticeship candidates that are undertaking research at their host university into alternatives to metal components using materials such as advanced ceramics. Manufacturers dealing with material failures will definitely have their work enhanced by apprentices doing contemporary research in a university context and, by the same token, the apprentices will benefit from having their industrial experience as a platform to use as real-world examples in their studies.</p>

Qualification	Basis for mandation
Level: Type: Ofqual regulated: Awarding bodies	An exciting example of how research and practice will be mutually beneficial is the proposed National Advanced Sintering Centre (NASC). This will bring together a substantial number of HEIs as partners to share expertise and research in the area of field enhanced sintering technology. Many of the ten HEIs that have signed on to the NASC initiative thus far are already running materials science degrees in the form of BEng or BSc pathways. In this context alone, the Materials Science Technologist Degree Apprenticeship would be a perfect fit and would benefit from the broadening capacity of the mandated qualification.
Level: Type: Ofqual regulated: Awarding bodies	All the attached job descriptions require candidates to have attained both academic knowledge and understanding drawn from a <i>degree</i> , <i>BSc</i> , <i>relevant degree</i> or <i>related degree</i> in materials in addition to practical abilities and experience. The Materials Science Technologist Degree Apprenticeship with mandatory qualification offers the breadth and depth not always associated with the attainment derived from a typical or traditional degree pathway and our development work has shown that this apprenticeship is exactly what employers need now and moving forward.

### Entry requirements

No entry requirements specified

### Professional recognition

Professional body	Level
The Institute of Materials, Minerals, and Mining (IOM3)	Associate Member with Incorporated Engineer registration (IEng AIMMM)

### Trailblazer membership details

#### Chair

Dr Chris Stevens (NGF Europe)

#### Facilitator

Cathryn Hickey (AMRICC)

#### Employer members

Name	Employer
Andrew Clark (L)	Mantec Technical Ceramics Ltd
Andrew Crabtree (L)	Bostik Ltd
Andrew Scott (L)	Bostik UK
Andy Bason (L)	Bostik Ltd
Andy Hayling (L)	MAGDEV Ltd
Angela Edwards (L)	Johnson Matthey
Angela Ellmore (L)	Knowles (UK) Limited
Anna Dobrowolska (L)	Keeling & Walker; Ltd
Anne Polding (L)	Steelite International Ltd
Brian Norton (S)	Indestructible Paint Ltd
Bridie Warner-Adsetts (L)	Naylor Industries plc
Carolyn Small (L)	Arconic Manufacturing (GB) Ltd
Charles Marsden (L)	Coorstek Crewe Limited
Charles Truelove (S)	Prince Minerals Limited
Chris Bradshaw (L)	Trelleborg AVS
Colin Kirkham (L)	Johnson Tiles
David Clarke (L)	Steelite International
David Goddard (S)	Wade Ceramics
David Slinn (L)	Global Ceramic Materials Limited
Dr Paul Hunt (L)	Victrex PLC
Dr Paul Shelton (L)	Cape Plc
Dr Philip Frampton (L)	Prince Minerals Limited
Ed Haslam (L)	Forterra
Gareth Hughes (L)	F P McCann Ltd
Harry Hodgson (L)	Coorstek Crewe Limited

## Additional information (continued)

Name	Employer
James Smith (L)	Caterpillar
Jeremy Leslie (S)	Norcros Adhesives
Joe Hallett (L)	Fenner Precision
John Longmore (S)	James Kent Group
Joy Delaney (L)	Fairey Industrial Ceramics Ltd
Ken Berry (L)	Synthomer Plc
Kevin Ward (L)	Gates Power Transmission
Kevin Young (L)	Dupre Minerals
Liz Meehan (L)	AstraZeneca
Mark Cumberlidge (S)	Furlong Mills Ltd
Mark Nutting (S)	Furlong Mills Ltd
Matt Bunker (L)	AstraZeneca
Melvin Wingfield (S)	A&M; EDM Limited
Michael McMullan (S)	TA Instruments
Nicola Walker (L)	Bostik Ltd
Paula Wardle (L)	Ibstock PLC
Paul LeGood (L)	Imerys Fused Minerals Hull Limited
Pete Cunningham (S)	Chemquip Ltd
Peter Coverley (L)	Pilkington UK Ltd (NSG Group)
Phil Dent (L)	Exova
Richard Gruning (S)	Furlong Mills Ltd
Sean Sutton (L)	Steelite International
Shane Duffy (L)	Lagan Brick
Simon Grant (S)	Denby Pottery Co Ltd
Simon Nash (S)	James Kent Group
Steve Brown (L)	Dudson Ltd
Stuart McQuillan (L)	Forterra
Timothy Birch (L)	Foseco International Ltd
Xu Cao (S)	James Kent Group
Yvonne Mills (L)	MAGDEV Ltd

### Other members

## Additional information (continued)

<b>Name</b>	<b>Employer</b>
Chris McDonald	Materials Processing Institute
Dr Robin Jacob	Institute of Corrosion
Gilmar Queiros	Staffordshire University
Jo Carney	Manchester Metropolitan University
John Fletcher	Institute of Corrosion
Jonathan Steel	National Composites Centre
Katie McAllister	University Centre Peterborough
Phil Bather	Cogent Skills
Professor Angela Dean	University of Derby
Prof James Busfield,	Queen Mary University London
Sarah Tudor	Staffordshire University
Tom Nadin	Staffordshire Chambers of Commerce
Tom Reynolds	British Ceramic Confederation