Welcome to our fourth Sustainable Materials Group newsletter. We hope you enjoy the articles and features chosen for this edition. We encourage contributions from our members, so please contact us so that we can share your latest news and achievements.

**Our vision** for The Sustainable Materials Group is to bring together key players across the rubber industry into one community, with the goal of accelerating the development and adoption of ‘green’ alternatives. With ARTIS as the elastomer experts at the group’s core, we believe that together we can promote and incentivise the use of these unique materials. For more details on the group and how to join, see reverse.

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**The road towards a sustainable rubber industry continues**

Murfitts is the largest tyre recycling operation in the UK, currently handling volumes circa 90,000 tonnes per annum. Murfitts recently launched a new infill product, PRO-gran, which they describe as having literally ‘changed the game’ in high-performance infill for artificial sports pitches.

RUBBER CONVERSION produces devulcanised rubber compounds from end of life rubber products and offcuts. Rubber Conversion is an exclusive licensee of the LEVGUM patented technology developed in Israel. Rubber Conversion is a young thriving Italian company listed in the official Register of the Innovative Startups.
Annual SMG Seminar—Broadening Horizons

at

The Institute of Materials, Minerals and Mining

297 Euston Road, London, NW1 3AD

Wed, January 17, 2018

9:30 AM—4:30 PM GMT

We take great pleasure in inviting you to our second annual Sustainable Materials Group (SMG) seminar. The event on January 17th will mark the first anniversary of the SMG and we would like to take the opportunity to share with you some of the activities we have been undertaking to support rubber sustainability. We're pleased that the topic of recovered carbon black is already receiving additional attention. Now, we want to use the SMG to 'broaden horizons' to see what else we can do as a group to develop and support other renewable materials in order to make industry more responsible.

Please see overleaf for the schedule.

Go to Eventbrite to book tickets

SMG members, please contact ARTIS directly to obtain your free tickets.
# Annual SMG Seminar—Broadening Horizons

The Institute of Materials, Minerals and Mining  
297 Euston Road, London, NW1 3AD

Wed, January 17, 2018

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<tr>
<th>Start</th>
<th>Topic</th>
<th>Speaker</th>
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<tr>
<td>9:00</td>
<td>Registration Opens &amp; Coffee</td>
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| 09:45 | Opening Remarks Broadening Horizons | Martyn Bennett | artis  
The Sustainable Materials Group |
| 10:15 | SMG Member Company Introductions | SMG Members | |
| 10:45 | Funding Opportunities | Dr Sally Beken | Innovate UK |
| 11:10 | Life Cycle Assessment of New Materials | Dr Ian German | CompositesUK  
*gnosys*  
*Silent Sensors* |
| 11:35 | Composite Recycling | Stella Job | |
| 12:00 | The Role of Passive or Active Sensors in Tyre Management | Marcus Taylor | SILENT SENSORS |
| **12:30** | Lunch – To be Served in The Mine | | |
| 13:45 | Tyre Sustainability | Katharina Herzog | Continental |
| 14:15 | rCB Surface Activation | Prof Bob Bradley | MatSurf Ltd.  
*Haydale*  
*InterPuls*  
*Artis*  
*Silent Sensors* |
| 14:40 | Plasma Treatment of rCB | Dr Matthew Thornton | |
| **14:55** | Coffee | | |
| 15:15 | Sustainable Compounding – Case Studies | Dr Chris Norris | artis  
The Sustainable Materials Group |
| 15:40 | Our Sustainable Materials Journey | Mary Jo Cabanes-Book | milkrite  
*InterPuls*  
*Artis*  
*Silent Sensors* |
| 16:00 | Future SMG Projects | Dr Chris Norris | |
| **16:10** | Discussion Session – What Next for the SMG? | | |

[Go to Eventbrite to book tickets](#)
Welcome to our colleagues at milkrite|InterPuls. With a long history of manufacturing rubber liners and tubing for the dairy industry, we have become the leading innovator and designer for products and services right at the heart of milking. The acquisition of InterPuls in 2015, a specialist in electro-mechanical milking components, such as pulsators, milk meters, automatic cluster removers and milking clusters, has added significantly to our product range, making us the complete milking point solutions provider, improving every farm we touch.

Founded 1923 by Carl Wilhelm Brabender, Brabender® GmbH & Co. KG, as the leading supplier, develops, produces and sells instruments and equipment for determination of material quality and physical properties in all ranges of research, development and industrial production in the chemical- and food industry world-wide. As well as offering rubber processing equipment (internal mixers and extruders), raw materials testing such as oil absorption and void volume meters are also available for characterising fillers such as carbon black.

Established in 2008, the Centre for Sustainable Chemical Technologies (CSCT) brings together academic expertise from the University of Bath with international industrial, academic and stakeholder partners to carry out research, training and outreach in sustainable chemical technologies. The centre has rapidly become an important hub for sustainable chemistry in the UK. ARTIS and the CSCT recently announced collaboration to develop new sustainable additives for rubber products using renewable feedstock’s such as agricultural and industrial wastes.
Extra-Large Tyre Recycling Plant Planned

Construction of the world’s first extra-large tyre recycling plant is due to commence in Perth, Western Australia. The venture is a collaboration between the Tytec Group and Green Distillation Technologies, who have jointly established Perth based Tytec Recycling Pty Ltd to undertake economic green recycling of off the road (OTR) tyres which are classified as those with rim sizes ranging from 25 to 63 inches.

The plant will recycle whole tyres without the requirement for size reduction into shreds or crumb. Up to 5,000 tonnes of OTR tyres will be processed each year, yielding over 2 million litres of oil, approximately 2,000 tonnes of carbon and 1,000 tones of steel.

It is estimated that 155,000 tonnes of end-of-life OTR tyres are generated in Australia each year and currently there is no means of recycling, with the usual method of disposal being to bury them in a dumping area on mine sites, or in an EPA nominated dumping area. GDT’s Chief Operating Officer Trevor Bayley said “our process will turn a very large and difficult to handle environmental waste problem into high value commodities, which is a result consistent with the highest aspirations of the circular economy”.


IRC2019 Coming to London

One of the biggest global rubber conferences and exhibitions is coming to London. IRC2019 Innovations in Elastomer Materials & Products will be held 10-12 September 2019 at the Kia Oval, London, UK. Original papers will be invited to be presented that reflect current research and technology within the rubber industry in sectors / disciplines such as defence, civil engineering, minerals extraction, biomedical, sustainability, adhesives, sport & leisure, robotics, transportation, oil & gas. Other topics for discussion include environmental and sustainability issues in the industry as well as innovations in polymer production, the use of fillers and other additives in compounds and developments in vulcanization technology.

ARTIS have agreed to organise and chair the session on sustainability ensuring the Sustainable Materials Group will have a significant contribution to the event.

Learn more [here](#).
Haydale, ARTIS and Trelleborg Antivibration Solutions Set to Collaborate on New R&D Project

Haydale, ARTIS, and Trelleborg Antivibration Solutions are pleased to announce that they are to embark on a two-year research and development project. This highly innovative project will investigate the use of Haydale’s patented plasma functionalisation for the enhancement of recovered carbon materials that are produced from the recycling of waste tyres so that these materials have the desired properties to enable them to be reused in engineering applications of rubber.

The project will also use plasma functionalised graphene, either alone or in combination with the newly developed recovered black materials as a hybrid system, to develop novel multifunctional elastomeric materials and products that can find a wide variety of applications across several different industry sectors.

This two-year project is co-funded by the UK’s innovation agency, Innovate UK and has a total project budget in excess of £750,000.

Commenting, Dr Matthew Thornton, Senior Manager at Haydale, said: “We recognise the strength of our partners in this project to be able to take the solutions that will be developed to market on a global level. We believe our expertise in functionalisation will ensure that we can design and deliver the desired type and degree of functionality to recovered carbon black materials and that these, in combination with functionalised graphene and other nanomaterials, will subsequently find applications across the elastomer industry, primarily through the market sectors served by the partners in this project consortium”.

Martyn Bennett, Chief Scientist at ARTIS, said: “We are very excited at this opportunity and have worked with the other partners in the past so that we are very familiar with their capabilities. We fully believe that this technology can enhance the opportunities for graphene and other nanomaterials and offers scope to grow our technology offerings to the recovered carbon industry through functionalisation and deliver this to the key players at the heart of the rCB industry”.

Bill Mortel, Head of Materials at Trelleborg Antivibration Solutions, commented “Trelleborg are keen to support this project to enable the use of recycled materials having good engineering properties. The use of plasma treatments and graphene additives within our formulations, with the goal of performance improvements, is of great interest to us for potential adoption as a production process”.
Meet our experts…

Stephen Millington

Steve joined ARTIS as a Development Scientist in 2011 and has over 35 years’ experience of working with a broad range of materials, including adhesives, sealants, textiles, rubbers, paper and board, fibre reinforcements, and composite materials. He began his career with the Ministry of Defence at Woolwich Arsenal before moving to DERA at Farnborough and, eventually, to QinetiQ. At ARTIS Steve has responsibility for customers within the defence sector and also for developing and managing ARTIS’ involvement in customer and public-funded R+D projects. In addition he is responsible for ARTIS’ quality management system and its compliance to ISO 9001.

Steve has presented papers at a number of adhesive-related conferences and is currently Vice-Chairman of the Society for Adhesion and Adhesives (a technical committee within the Institute of Materials, Minerals and Mining). He is also a member of the NPL Industrial Advisory Group for composites, adhesives and polymers.

We asked Steve

What are your hopes for The Sustainable Materials Group?

To facilitate dialogue and collaboration between all sectors of the rubber industry from suppliers to end-users in order to develop efficient recycling processes and the increased use of recovered materials and chemicals from sustainable sources.

What is the best bit about your job?

The variety of work we undertake and engaging with clients from multi-nationals to SMEs across a range of industry sectors. Also, as someone with little prior knowledge of rubber before joining ARTIS, working with some of the best rubber technologists in the world. Every day presents fresh challenges and I’m always learning something new (today it was don’t whistle with a mouth full of blancmange).
ARTIS recently purchased a Retsch PM100 planetary ball mill to complement our laboratory-scale pyrolysis equipment. Planetary ball mills are used wherever the highest degree of fineness are required. The extremely high centrifugal forces of a planetary ball mill result in very high pulverization energy and therefore short grinding times.

The ball mill will provide the means for preparing small samples of milled rCB suitable for rubber compounding using our 60cc Brabender internal mixer. Achieving the maximum particle size of 10µm will allow us to fully research the effects of variables such as feedstock composition and pyrolysis temperature profile on the in-rubber performance of the resultant rCB, without poor dispersion dominating the results.

The mill will also support our clients who require the refinement of char samples to investigate the potential performance of their rCB. This may negate the need for expensive and long lead-time jet mill trials until the quality of the material has been verified.
The new official soccer ball of the World Cup 2018 contains the bio-based EPDM rubber Keltan Eco from ARLANXEO, one of the world’s leading suppliers of synthetic rubber. The EPDM rubber (ethylene-propylene-diene monomer) Keltan Eco 6950 is the rubber basis for a sponge rubber layer directly underneath the “Telstar 18” ball’s outer cover. It serves as a moldable cushion for the ball and supports optimal bounce characteristics during games. Materials that are used in this layer must meet strict requirements in properties such as density, hardness and weight, and they must also demonstrate good processability. The most important performance characteristic, however, is the elasticity and resilience of the layer.

“For us, ecological sustainability was a fundamental criterion in the selection of products for the World Cup soccer ball,” says Stefan Bichler, project manager of Football Operations at adidas AG. “We wanted to create the new soccer ball using high-tech materials that have impressive performance characteristics and are also sustainable.”

Keltan Eco is claimed to be the world’s first EPDM rubber made from ethylene extracted from sugarcane. Depending on ethylene-content, the proportion of bio-based material ranges between 50-70%.

Source: [http://arlanxeo.com](http://arlanxeo.com)

Sustainable Rubber to Feature in 2018 World Cup Football
Independent Rubber Consultants

Established in 2007, ARTIS provides research and development capabilities in a wide range of rubbers and polymers. We offer compound analysis, material testing and solution validation, as well as sour gas ageing facilities. Our aim is to help worldwide industries better understand how materials perform in real applications and manufacturing processes.

Our polymer failure analysis service is supported by compounding and manufacturing facilities; physical testing to measure property performance, and thermal, environmental, and sour gas ageing capabilities for elastomers and other polymer materials, such as plastics, composites and adhesives.

Visit [www.artis.uk.com](http://www.artis.uk.com) for more details on our services and how to get in touch.