eMech

IMechE West Cumbria e-Newsletter
Edition 4, February 2003

I MECH E
West Cumbria

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EDITORIAL

Falkirk Wheel + AGM Coming Up!

Just a reminder for our next event, which combines an exciting presentation on another successful Millennium Project, The Falkirk Wheel, with our Annual General Meeting. To be held in the palatial surroundings of Hundith Hill Hotel, Lorton Road, Cockermouth on Wednesday, March 19th commencing at 7.30pm, the evening is essential for all interested in the future of engineering in West Cumbria – We need your **HELP**!! Not just your **IDEAS** but also a small amount of your time – why not join our Committee, help us organise our events and set up the best communication support network in the country?

We will also be able to share some of the exciting ideas already in place for next Season, but you will only find out if you come along. It's **free** AND there will be **refreshments**, so you have **NO excuse**!

CONGRATULATIONS to YM Chair Andy Williams who has become a father for the first time. However, Andy and his wife are shortly returning to their roots in the North-East, so we are seeking **VOLUNTEERS** to take on the opportunity and excitement of being a young voice amongst the old 'fxxts' who currently populate the committee (young David Williamson excepted..) PLEASE come forward and talk to ANY Committee member NOW to get involved

Please don't forget - feel free to forward **eMech** to anyone else (with their permission!) or get them to drop their email address to me so we can keep in touch. Also… if you find you do NOT want to be emailed with **eMech**, then please email the Editor with **Unsubscribe** as the subject and we will happily remove you from the mailing list.

CHEERS!!

Editor: Chris George, Publicity Officer, IMechE West Cumbria
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1. QUICKSILVER

Just a quick note to acknowledge the awesome Quicksilver project, in which leader Nigel Macknight is aiming to become the fastest man on water, spearheading a project team that is shortly to take to Coniston Water. The IMechE is getting involved in sponsorship and support, and IMechE West Cumbria aim to organise an opportunity to become involved in the very near future – come to our **AGM** to find out **MORE**!!!! For more details of the project, please head to http://www.quicksilver-wsr.co.uk/. See also our Bluebird presentation on May 14th!

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2. UCB Recipe for Success

Outstanding Process Engineering Produces Precision Product

Please. Don't try this at home: Take some sheets of wood pulp. Chop up, mix and steep in caustic soda for a few hours. Dry off to form 'crumbs'. Mix with carbon disulphide and more caustic soda to produce an orange 'goo' called viscose. Filter, blend, de-aerate and then pour into sulphuric acid to coagulate. By extruding through a slot into the bath of sulphuric acid, a film is produced that can then be passed through various baths to bleach, soften and make in to the crystal clear precision film that every one of us takes for granted, whether buying sweets, food or luxury goods such as perfume.

No, really, that's the unlikely chemical process by which the transparent film known as cellophane is produced.

The amazing ingenuity needed to turn this into a feasible, high quality production operation was clearly visible during the recent visit by IMechE West to UCB Films at Wigton.

The first commercial production of cellophane took place in 1913. The Wigton site, built originally in 1915 to produce jam, began cellulose film manufacture in 1933 under the competitive brand name 'Rayophane', and now represents one of only 4 plants in the western world still producing the product. All plants are now owned by UCB – 'Union Chimique Belge', and UCB Wigton produces some 14,000 tonnes of film per year of which 70% is exported. It can be slit and coated to customer requirements, to provide a surface for printing, for example.

Produced on a continuous 5 shift system, the route through the old buildings provided an illuminating insight into the controls and tolerances needed to make a profit from such an intricate process. Whilst the early stages are somewhat hidden in large vats, the eventual extrusion of the viscose into the sulphuric acid bath and the speed of the subsequent film through the multi-bath processing was highly impressive – running at 80 metres/minute, producing film of 300 microns thick to a 2% thickness tolerance is no mean feat! Five

casting lines produce the total volume of film and allow for different specifications to be run.

One highly impressive feature was the continued investment by Wigton into a range of apprenticeships covering disciplines such as mechanical & electrical engineering, and also laboratory technician and IT. An active partner in the Gen2 project, UCB puts apprentices through an extensive 4 year programme and clearly sees the need for the continued replenishment and development of its workforce.

The visit was excellently handled by Rob Hunter and Barry Carruthers from the UCB Wigton Training Department – many thanks to them.

Rob Hunter and Barry Carruthers from UCB admire the sartorial elegance of our Chairman, Adrian Norendal…

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3. Pirelli Calender Turns Heads

Pirelli Power & Control in Rubber & Steel

How many times do we pay attention to the tyres on our cars? Such is the reliability and durability of the modern tyre that the first time could be when a helpful warden reminds us of the legal tread depth limit… (Ed: Please note – you should check your tyres and pressures on a weekly basis, minimum!)

It is another indication of the phenomenal progress made in the automotive industry – to make such a safety-critical part of the operation of our cars so routine, almost mundane. Yet the tyre represents the most crucial element of safety, enabling power transmission and steering control, providing feedback as well as contributing to the comfort of travel.

Pirelli are one of the world's leading tyre makers and West Cumbria can proudly boast another manufacturing beacon of excellence in their factory in Carlisle. Built by Pirelli in 1969, it is one of the world's most advanced tyre factories, producing tyres for 'Ultra High Performance' cars and more recently, the 4x4 'Sports Utility' recreational market. A staggering 13,500 are produced per DAY.

The complexity of building a tyre was evident in an absorbing and highly informative tour around the works by IMechE West Cumbria. After a brief but enjoyable film highlighting the essence of Pirelli (speed and sex, apparently…), the tour followed the route of the tyre, from sheets of uncured rubber to the final work of art.

Approximately 17 components have to be made to build a tyre, from the obvious tread rubber to the careful cutting and orientation of the fabric and steel reinforced belts and beading that are so essential to providing the required characteristics for the particular tyre type.

The process begins in a giant mixer that blends the raw rubber and other materials. This is then extruded through a die to produce sheets of basic material. A key element is the CALENDER, which is a melded sheet of rubber and fabric ply. This process was developed in as long ago as 1836 and allows rubber to be applied directly to fabric without the use of solvents.

A high degree of automation is used to ensure absolute consistency, and there are several quality checks made during the process of manufacturing the components, which then go forward into the process of tyre building. Here, the components are loaded, folded and formed to make the basic carcass, using a fascinating sequence of rhythmic automation. This then goes forward for the most impressive process – vulcanisation

Super-heated bladders are inserted into the raw tyre assembly and inflated to push the construction into the tyre mould which forms the required tread pattern and embosses the elegant Pirelli name plus all the necessary performance and traceability data. The time at temperature vulcanises the rubber to produce the high performance product that we all take for granted, and there are a number of further finishing and quality checks to make sure that the whole process has produced a successful end product to the highest standards.

Pirelli are justifiably proud of the progress they have made in embracing and implementing a total planned maintenance (TPM) regime, plus other initiatives, in which the duty and pride for the maintenance and performance of each machine is invested in the operators within each manufacturing 'cell'.

Using modern visual management communication techniques (where would we be without PowerPoint & Excel?), there were graphs and posters everywhere that charted the progress made and the performance achieved, and a very real sense of total involvement by the workforce in the factory success.

Particularly impressive were the 'before' and 'after' pictures of certain areas where rubber blending takes place. In former times, these were left to accumulate a pervasive film of carbon black and rubber swarf that coated every surface, including the operators. Now, with the implementation of disciplined management and investment in extraction and other techniques, the whole factory was impressively clean at every stage. And if any company wanted a working example of payback for introducing TPM, some of the striking graphs amply demonstrated the twin benefits of lower maintenance time and increased productivity.

A recent order to supply Porsche with a very special tyre that combines off road performance with ultra-high speed is a testament to the skills and esteem that the Carlisle factory is held, and this has resulted in further investment to provide better capability of bulk supply to such prestigious OEMs.

Many thanks are due to Toni Forshaw, PA to the Industrial Director, and her team of volunteer guides who stayed well beyond the call of duty to answer all our questions, and whose enthusiasm and pride in their company and its products was amply demonstrated.

Toni Forshaw and her team receive an IMechE West Cumbria Pit Tankie from event organiser Alastair Billson as thanks for a highly enjoyable tour

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4. Coming Up – Florence Mine & Bluebird

Tuesday, April 8th – FLORENCE MINE 7.00pm Museum Open, 7.30 Mine Tour Begins

The visit to Florence Mine, Egremont has now been extended by the kind assistance of volunteers who will open the Museum half an hour before the Tour begins.

IMPORTANT: Numbers are limited, so we must have confirmation **AND PAYMENT** before the event. At only £3.50 per head, it's a snip. Whilst PPE will be issued you are strongly advised to be reasonably fit and to wear warm outdoor clothing and boots that you don't mind getting mucky. 1 in 4 gradients are promised… Question – can we squeeze Adrian inside..?? Can we get him out again..??

CONTACT: **CHRIS GEORGE** (01946 811771) or

email cgeorge@capalex.com to confirm **NOW**.

Wednesday, May 14th – BLUEBIRD 7.30pm, The Barn, Rosehill

Another excellent presentation on a subject very dear to all engineers committed to the beauty and tragedy of the Lake District. **DON'T MISS IT!!**

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DIARY

March	April	May
Committee Meeting Date : Wed 05/03/03 Time : 19:30 hrs Venue : Travellers Rest, Workington	***Committee Meeting*** Date : Wed 23/04/03 Time : 19:30 hrs Venue : Lakes College, Workington	***Committee Meeting*** Date : Wed 07/05/03 Time : 19:30 hrs Venue : Swan Pub, Cockermouth
LECTURE/AGM: **The Falkirk Wheel** Date : Wed **19/03/03** Time : 19:30 hrs Venue : Hundith Hill, Cockermouth Booking Req'd: No Refreshments : Yes Organiser : Mike Edie Tel : 019467 84304	**VISIT:** **Florence Mine** Date : Wed 08/04/03 Time : 19:30 hrs Venue : Florence Mine, Egremont Numbers : Limited Booking Req'd: Yes Cost: £3.50 per head, **payable in advance** Organiser : Chris George Tel : 01946 811771	**LECTURE:** **The Bluebird Project** Date : Wed 14/05/02 Time : 19:30 hrs Venue : The Barn, Rose Hill Numbers : < 100 Booking Req'd: No Refreshments : Yes Organiser : Andy Cumber Tel : 019467 77431

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