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SGT NEWS

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SPRING MEETING, 1994

The Society's Spring Meeting was hosted by the Yorkshire Section and held at the Grange Park Hotel, Willerby on the outskirts of Hull from Wednesday 11th to Friday 13th May. The conference followed the theme 'From Stacker to Packer' and looked at the processes and disciplines of the production line after the glass is formed. Separate sessions on hot end handling, inspection, cold end handling, afterhandling and waste disposal were used to illustrate the latest improvements in producing quality glass products.

The keynote lecture which began the conference was presented by Sir Robin Nicholson of Pilkington. The title of his paper, 'Forging a better future through research and development' explored the three areas of technological change (trends, foresight and organisation) which maximise the competitive advantage and minimise the disadvantages in producing an innovative product. This theme was mirrored by all the following papers in the conference. The linear model of product development has been replaced by a network model which constantly assesses progress through the involvement of all business functions within the company, maximising the chances of success.

Mr H-G Seidel of Heye Glas began the session on hot end handling with an assessment of the high speed production line in the container glass industry. The number of parameters which influence bottle position on the conveyor need to be understood to realise the full potential that computer control offers. The response to the increasing numbers of bottles approaching the lehr was explored by Mr H Holt of Stein Atkinson Stordy. The straight answer is that lehrs have become wider, belts are currently 5m wide and could be 6m in the near future.

As much importance though is the cleanliness of the facilities, whether it is for container lines or TV tubes. Dr N Cowan of United Glass presented an account of the application of surface treatments of glass containers; hot coatings and cold coatings, their application and the demands that lightweighting is placing on the process.

Information technology is impacting on all aspects of industry. Local area networks can link everything in a factory to provide fast, accurate information on demand to the relevant decision makers. Mr T Beiswinger described Emhart Powers' PowerNET process management system, which gives glass plant management a window onto the entire process.

A new vision system for automatic inspection at the hot end was previewed by Mr J P Chan of Image Automation. Using the infrared self luminance of the glass as the initial basis, the system can inspect any colour and does not require additional lighting sources.

Mr D D Ross of Pilkington Glass reviewed the available technology for float glass inspection which has to spot point defects of 0.1mm-0.2mm size in ribbons of glass travelling at 300m/h-1500 m/h.

The inspection of tubing for fluorescent lamps was detailed by Mr A L Cave of GB Glass Lighting

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PRESIDENTIAL ADDRESS

Following the end of the technical sessions and lunch on Friday May 13th, Dr D Martlew gave his address to an audience of members and conference delegates. His chosen title, 'Glass and the Management of Transparency' reinforced the message begun by Sir Robin's keynote lecture, using the history of the Society and figures from medieval times as examples of the use of glass as a medium for communication and change.

Suget, the Abbé of St Denis, pioneered the introduction of stained glass windows in religious buildings. He wanted wide windows with coloured glass and used the emerging technology of leading as a means toward this goal. The trend he began led to the birth of the flat glass industry and was the beginning of production line techniques. The revival of the use of stained glass in Victorian times provided business for Pilkington Brothers and fuelled the company's growth. The demand for purely flat glass led to the development of the float process and the many new opportunities for glass products this has provided.

The Society of Glass Technology's foundation was to satisfy a need to establish better standards in production and break down the barriers between competitors, providing a means for communication that was needed at that time and which still exists today. The diversity in disciplines of the original membership is still present, another example of a network for the realisation of development... and progress.

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and Mr J Laessoe of Jorgen Laessoe Engineering.

Mr P Goossens of Adept Scientific presented a computer-based package for modelling process plants. The VISSIM package takes in the operating parameters of a system, then models the operating plant at variable parameters so bottlenecks or points where there is potential weakness can be predicted before they are built.

Cold end handling line considerations were detailed by Mr P Firth of Beatson Clark, in particular the line control panel which provides the necessary protection of the electrical services required.

The disciplines of television tube assembly were given by Mr G Kelly of Sony Manufacturing. The movement and control, flexibility and versatility of the Bridgend facility were all described.

The first paper on afterhandling provided a contrast to the automated container facilities that had been previously detailed. Mr G Thompson of Dema International described the use of mainly hand decoration techniques for the company's glass tableware ranges. Industrial robots are only as good as the design of the production line they are part of, but if there is some understanding of the limitations of the system they are part of then the easier it is to integrate them according to Mr K Branton of NIS.

Palletising and pallet handling systems for round and out-of-round containers were explained by Mr E G Venema of Rosario Productie. The many trade-offs in automation were described, with particular detail of the problems associated with dividers.

The latest products and an update on new developments and legislation of the ceramic coatings industry was provided by Mr E Cardall of Degussa. The continuing development of lead- and cadmium-free products and organic inks were the main features.

Disposal of waste concluded the conference, with two contributions from British Glass. The first by Mr K Kannah discussed factory waste, with particular attention being paid to furnace demolition and disposal.

Secondly, Dr W G A Cook gave an update on the position of glass recycling targets and the programmes being adopted throughout Europe to dispose of packaging waste. Offsetting the cost is the major stumbling block, with the UK government determined to get recycling targets achieved by voluntary measures alone. Before the end of 1994 a new organisation for the recycling of packaging waste will be set up.

GLASS OPPORTUNITIES - 1995 SPRING MEETING

The date of the Spring Meeting has been brought forward to March 30th-31st as part of the agreement made within the European Society of Glass Science and Technology to hold annual meetings of member organisations at some distance from the third ESG Conference, which is to be held in Wurzburg on May 22nd-23rd, 1995.

The Society's meeting will be held at the Prince of Wales Hotel, Southport and will be linked with the North West Section and its Annual Dinner and Dance.

The meeting will begin on the Thursday afternoon and end at 4 pm on the Friday.

The Society's Annual General Meeting will be held on Saturday April 1st at 9.30 am.

Society of Glass Technology, 20 Hallam Gate Road, Sheffield S10 5BT. Tel 0742 663168. Fax 0742 665252.

AGM HIGHLIGHTS

At the Society's 77th Annual General Meeting, three new Fellows were introduced and presented with certificates: John Andrews, head of procurement, Pilkington Glass; Bill Brookes, senior lecturer, Sunderland University Business School; and Dr David Grossman, senior research associate, Corning.

Larry Penberthy, inventor and major developer of electric glass melting using molybdenum rod electrodes and founder of Penelectro Ltd, plus Dr Alexis Clare, associate professor at Alfred University, had both been elected to the Fellowship but could not attend the AGM.

Acting President, Dr David Martlew, proposed the President Elect nominated by Council, Roy Nickels be elected President for the year 1994-1995. This was seconded by Neil McDonnell and carried unanimously.

The 1993 AGM had given permission to the Officers to continue discussions on how to form links with the Institute of Materials, while retaining Society autonomy. These discussions had proved very successful, with joint membership of both bodies being offered at a reduced rate, thus opening the route to Chartered Status to Society members.

Mr McDonnell was to continue to attend the Institute of Materials Council meetings and the Society had been asked to nominate two members to attend the Council meetings of the Institute of Materials Ceramics Industry Division. In return, the same invitation had been extended to the Ceramics Division to send two people as observers to the Society's Council meetings.

QUALITY INSPECTION SYSTEMS

The Engineering Committee of the Society of Glass Technology will hold a one day conference on the latest developments in inspection systems at Keresforth Hall, Barnsley, on October 19th. Further details are available from Jill Costello at the Society head office.

IN PRINT

The October issue of *Glass Technology* features the hot end handling and inspection papers from the 1994 Spring Meeting, a review of the exhibitors and the second in Glass Training's regular contributions on training and skills development. Other papers address the effects of cullet level on the quality of amber glass bottle manufacture, spectrophotometric characterisation of homogeneous and inhomogeneous thin films for architectural glazing applications and evaluation of tin oxide coatings on glass containers using the hot end coating meter and electron probe microanalysis.

***Physics and Chemistry of Glasses* has a selection of papers covering the comparison of x-ray and infrared methods for determining the degree of crystallinity of silicates, ionic conductivities of mixed halide glasses, diffusion of sodium and iron isotopes in magnesium sialon glasses, the structure of vanadium phosphate glasses containing lithium oxide, the density of lithium silicate glasses over an extended alkali composition range, the effect of halogen content on the spectral window of chalcogenide-halide glasses, properties and structures of lead-zinc borates and optical absorption studies of Pr3+ in fluoride glasses.**

SGT NEWS

GLASS FORMATION FROM GELS

Low temperature routes to glasses via the sol-gel process may never reach the levels of bulk production of the high temperature route. However, the value of the novel glasses produced cannot be ignored. The latest developments were presented at the Basic Science Committee's half day technical session for the Institute of Materials 1994 Ceramic Industry Convention.

The structural development during the sol-gel process has been examined by Dr Diane Holland of Warwick University using nuclear magnetic resonance. A comparison was made between glasses made by the high and low temperature routes. The structure of the gel produced glass was found to be influenced by the first reactions.

Carole Harrison of Nottingham Trent University is using spectroscopic techniques to study the molecular interactions of a silica gel-glass with a range of physically absorbed dopants including cobalt, neodymium, Rhodamine and polymethylmethacrylates. The effects seen on each dopant gives some indication of the co-ordination environment within the glass, changes in fluorescent characteristics and porosity.

Xiaochun Li of the University of Manchester has studied the interaction between organic molecules and the silica xerogel. These range from dyes with no mutual chemical bonds to ormosils with fully formed chemical bonds between the silica and organic polymer.

The advantages of using the sol-gel process to produce alumina-silica gels for composite materials was investigated by J Wu of the University of Sheffield. High temperature sintering was still used but with a much more homogeneous mix. Carbon fibre composites were found to have flexural strengths of up to 766 Mpa and did not fail by brittle fracture.

The fabrication of tough and durable coating through the combination of organic and inorganic compounds by sol-gel processing was described by Carol Bagnall of Ceramic Developments. The coatings have found many applications already and the company is developing the curing system with the introduction of photo initiated catalysts. So ultraviolet light can be used instead of heating.

Integrated optics is a major area for research, backed by the European Union and major telecommunications companies. Semiconductor doped silica can be used as an optical switch but current commercial fabrication techniques rely on deposition techniques which have thickness restrictions. E M Yeatman of Imperial College, London is looking at a sol-gel route which overcomes the thickness problems and eliminates stresses. Progress towards devices and the fabrication issues involved were presented. ■

A WELCOME TO VISITORS TO INDIA

Eminent scientists, technologists and industrialists visiting India or nearby states are invited to contact the Honorary Secretary of the Society's Indian Section so that seminars and discussions can be organised with them.
Dr J Mukerji, with additional support from the All India Glass Manufacturers' Federation, is able to arrange local hospitality. His contact address is Central Glass & Ceramic Research Institute, Jadavpur, Calcutta-700 032, India. Tel +473 3469.

GLASS SELLERS AWARD 1994 - ART AND CRAFT

For the first time the Glass Sellers offered a £500 Student Award, as well as their usual £1000 Glass Sellers Award and the response to both was excellent.
Fifty-two entries were received in all and the12 shortlisted candidates were invited to exhibit their work on the Worshipful Company of Glass Sellers' stand at the Livery Company Exhibition held at the Guild Hall, London, 12-14 July.
All 12 items, ranging from a candelabra to bowls and sculpture, were admired and discussed by the many visitors to the stand, where there were also demonstrations of hand engraving on lead crystal glasses and decanters.
The final candidates for the main Award were Galia Amsel, Keith Brocklehurst, Clare Henshaw, Michael Hunter, Keiko Mukaide, David Reekie and K T Rothe, and for the Student Award Angela Bruce, James Carcass, Simon Hoffman, Matthew Pollard and Jenny Shufflebotham.
The winners were Keiko Mukaide for an unusual wavy bowl and Angela Bruce for her large fused crystal plate. Both will be presented with their cheques and inscribed trophies by the Lord Mayor of London at the Glass Sellers' Banquet on 25 October 1994.
In 1995 the Awards will be offered for Science and Technology but art and craft will be on the agenda once again in 1996.

LOCAL SECTION CONTACTS
For details of forthcoming local section events in your area, contact the following. All SGT members and non-members welcome.

London
– Mr T Ensor, United Glass Ltd, Porters Wood, St Albans, Herts AL3 6NY. Tel 0727 59261

Midlands
– Mr R W Fisher, Sismey and Linforth, Unit 94, Heming Rd, Reddich, Worcester B98 0AE. Tel 0527 529810.

North East
– Mr J Henderson, 44 Woodside Ave, Throckley, Newcastle upon Tyne NE15 9BE. Tel 091 264 4775.

North West
– Dr D Martlew, Pilkington Technology Centre, Hall Lane, Lathom, Ormskirk, Lancs. Tel 0695 54210.

Scottish
– Mr D A Rennie, United Glass Ltd, Glasshouse Loan, Alloa FK20 1PD. Tel 0259 218822.

Yorkshire
– Miss R M Sales, 20 Blackbrook Drive, Sheffield S10 4LS. Tel 0742 306179.

NORTH AMERICANS MEET WITH SUCCESS

The first annual meeting of the North American Section proved to be a great success with a much larger number of delegates than initially expected. The event was held on 3 June 1994 at PPG Headquarters, Pittsburgh with the help of Sue Corbett and Lowell Swartz. Invited speakers gave papers in the morning session, followed by lunch at PPG and a trip to Kopp Glass, just outside the city's downtown area. ALIX CLARE reports.

The topic for the morning session was 'Glassmaking for a clean environment', with talks on environmental regulations in the flat, fibre and lead glass industries. There were also presentations on products from recycled glass waste and the problems of using cullet. One talk covered a possible solution—oxy-fuel firing.

Many interesting points were raised, both in the presentations and in the subsequent discussions; how increased legislation will affect the various components of the glass industry both in melting and disposal of waste, for example and how the industry might band together to probe possible solutions.

The visit to Kopp Glass was extremely interesting. Kopp manufactures much of the coloured glass used for electrically illuminated signals, road, rail and air traffic. We found that the FAA, the controlling body of air traffic, has strict demands regarding the colour of the aircraft and runway lights. Interestingly all the lights for the airplanes and runways are formed by hand, not on a production line.

Following the visit to Kopp, there was a little free time when participants were able to wander around the Three Rivers Art Festival before dinner at the Hilton Hotel. Twenty-one people attended the banquet, which was deemed successful by all. It is hoped to hold the 1995 meeting at about the same time at a different host company. Our thanks go to PPG, particularly Lowell Swartz and Marlene Wightman of the New York State College of Ceramics, whose organisational capacity is without equal. ■

COLOUR IN GLASS

The practical aspects of introducing colour into glass were presented to the North West Section recently by Roy Wright, former head of glass technology at Rockware.

Colour is needed in glass in order to satisfy many particular customer demands: Protect from ultraviolet, maintain a particular colour style or for fashion. Colour is introduced into glass in two ways, either in the furnace or the forehearth.

Furnace colouring is achieved by a combination of batch, combustion and temperature. The entire campaign of a furnace may be devoted to a particular colour or range within this colour type. Economics are thus set accordingly. Changes in colour have to be achieved in the most efficient way, as it typically takes more than twice the deadweight of the furnace.

Forehearth colours are introduced by specific additions to a clear glass. The process may only be suitable for short production runs as a break point in the costs versus furnace colours can be reached. Offware produced by this method cannot usually be reused.

The colours available to the manufacturer stretch across the whole spectrum from red to blue. Multivalent metallic ions are the basis for the entire range. The balance between two species of ions presents the glass technologist with the opportunity to control the final colour of the glass.

Violet can be produced using manganese as a forehearth colouring compound. Attention has to be paid to the firing conditions to prevent a shift in the oxidation state. Blue or cobalt blue is an easy colour to work with and there are no practical problems; it is generally a mix of cobalt and copper.

Green, from blue-green to green-green, uses a combination of the various valencies of chromium and iron, Cr for yellow dominance, Fe for less yellow. Never start off with too much Fe. Antique green is a balance between amber and green. Amber itself uses reducing conditions with carbon and sulphur additions.

Forehearth amber is more brown, using oxidised species of iron and selenium, iron and manganese can combine to make amber. Reds use copper ruby, a colloidal metallic form. Black uses intense colours with high iron and manganese contents.

To take colour away, use selenium, cobalt, arsenic and neodymium. ■

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