

# SGT NEWS



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## YOUNG SPEAKERS ON GLASS

Coverage of different aspects of glass and its production is reflected throughout the Society's local section lectures. Academic, industrial and historical subjects can all be represented and the benefit of multi-disciplinary audiences always proves educational. The London Section most recently hosted an evening where two young speakers gave talks on such differing subjects as the deterioration of Venetian glass and greening of the glass industry. Tom Ensor of United Glass reports.

*A study of the deterioration of Venetian glass in a museum environment by using ion mass spectrometry, by Jason Ryan of Imperial College.*

The talk covered work being carried out at Imperial College, studying the decay of Venetian glass and the problems and experiences encountered in conservation. Slides were shown giving examples of the way in which the glassware crizzled. Studies had shown that the 10% of deteriorated ware found in the Victoria and Albert Museum in London had also been experienced worldwide.

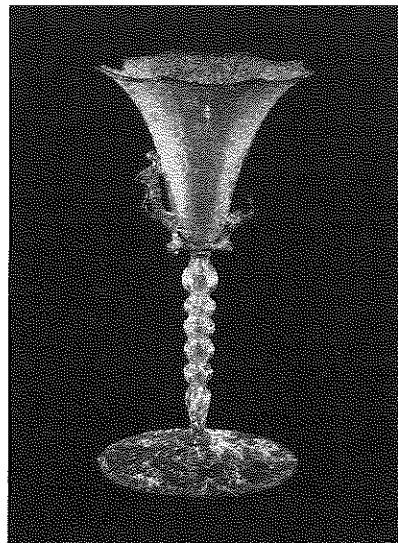
The decay, which is irreversible, was due to an ion exchange reaction between the alkali ions in the glass and hydrogen or hydroxide ions from atmospheric water. The process initially results in microcracks forming, referred to as crizzling and with continued drying of the object the cracks enlarge, resulting in pieces of glass spalling away. At this stage the surface adopts a dull appearance.

The author listed factors involved in the durability of the glass and compared recent and ancient glassware, particularly in considering the effect of raw materials used in the melting process. Initial results using SIMS analysis indicated a depletion in the sodium profile towards the surface. Further results will be obtained.

In describing the experimental work being conducted at the college, the author gave examples of techniques used. Essentially accelerated experiments were the only way in which to determine the manner of deterioration of the glassware. In particular, hydration and dehydration techniques had been used, notably in considering the effect of atmospheric humidity.

In conclusion, the author considered the work would lead to a better understanding of the way in which the deterioration occurred and indicate safer storage conditions to use to prevent the decay. The future work would aim to obtain a deeper understanding of the thermodynamics and kinetics of the

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## IN PRINT

The October 1993 issue of *Glass Technology* features the first papers from the Society's Spring Meeting. The keynote lecture on glass melting furnaces presented by Dr J L Barton is joined by presentations on high zirconia refractories, designs for reduced NO<sub>x</sub> and SO<sub>x</sub> and furnace repair.

The Papers Section has results from the International Congress/Technical Committee 2 'Chemical durability and analysis' report on the determination of impurities in glassmaking sands. The two other papers are on silane treatment of porous glass and the effects of particle size and addition of sodium sulphate and nitrates on the reaction in soda lime silicate glass batches.

*Physics and Chemistry of Glass* has a review of the average coordination number concept in multi-component chalcogenide glasses by Professor Varshnaya of Alfred University. Other papers in the October 1993 issue feature work on nickel in quenched oxide glasses, predictive modelling of liquids spreading on solid surfaces, a structural study of borosilicate glasses, optical basicity studies of carboxylate glasses and electrical resistivity in the Ge-Se system.

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decay process, as well as the effect of environmental pollutants.

*Greening the glass industry: Is an environmental audit enough? by John Holt of United Glass Ltd*

Initially, the author described the issues involved in carrying out auditing of environmental issues. It was now necessary to consider all aspects including consumers, customers and users.

There had been a big increase in interest in environmental issues, particularly brought about by the global nature of the problems. Developments and trends in the subject were listed and in particular, one of these was 'Our common future' (sustainable development), which fuelled the debate on the subject.

In considering environmental management, total commitment to the

problem was essential. The author went on to describe the tools available for managing environmental systems and gave examples of environmental audits and the different types of audits being used by companies. It was essential in carrying out an audit to consider the impact of what was done. The current best practices for the key stages of an audit programme were outlined.

Examples of the benefits gained by carrying out environmental audits were given and glass was viewed in a very good light in that it had many advantages compared with other packaging materials.

The new British Standard BS 7750 covering environmental management systems provides the context for auditing. It was emphasised that whatever a company stated in its policy becomes binding.

## WINNING PAPER

Dr Diane Holland, FSGT, has been awarded the best oral presentation prize for her paper 'In Silicate Glasses' delivered to the Second ESG meeting in Venice last June. The prize, administered by USCV, a founding member of the ESG, is for 30,000 Belgian Francs.

In conclusion, John Holt considered that in the future, integrated management systems would be implemented and there would be continued pressure from stakeholders to improve environmental performance. He suggested that greening would be a balance between corporate objectives or a deleterious environmental quality; environmental auditing is one of the tools available to achieve company objectives.

# IS MACHINE EVOLUTION CONTINUES



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**The domination of the container market by the IS machine has made the development of a replacement very difficult. To invest in alternative machinery would lead to the tying up of capital in incompatible spare parts and variable equipment. Until significant improvements in production rates, efficiency and quality tip the scales in favour of change, manufacturers such as Maul Technology must introduce improvements to the established population of over 20,000 sections. Barry Johnson explained his company's latest developments to the Yorkshire Section.**

Maul Technology has targeted resources into machine control systems, gob delivery, ware handling, mechanisms and variables, plus mould heat transfer. A five year development programme, initiated in 1989, has seen improvements in retrofit modifications and an expansion of the company's product range to include single bed 12-section and two piece bed 16-section machines.

Developments in micro-electronics have been the driving force behind the M2000 timing system, with its touchscreen operator interface. The software does not require prior knowledge

of computing, it has an on-line help facility, local area networking, reporting facilities for management improving production analysis and trend formulation. A diagnostics and alarm message package helps to reduce downtime and simplify troubleshooting.

Job editing without a production interruption is available through an on/off-line facility and for security, definable access levels prevent unauthorised production alterations. The system is expandable up to 72 programmable outputs per section and a master controller can be used to monitor up to 20 lines, each with its own controller.

With the advent of the 12-section machine, gob delivery has moved away from the cam-operated distributor to the use of servomotors. A patented linkage to drive the scoop heads has improved the accuracy in angular alignment and an operating speed of 220 cuts/min is designated.

Productivity improvements have led to power rating upgrades of drive modules for ware handling to provide an increase in motor torque. The acceleration cam profile for pushers is held on its own memory chip oreprom. Alternatively, it can be fully integrated with the M2000

timing system. The eprom holds four cam profiles, the M2000 has many more and the operating settings can be filed against the job reference for quick set-up on job changes. The transfer of containers from the deadplate and conveyor belt can be stabilised by vertically adjustable wind boxes.

Electronic timing directly controlling solenoids in the valve block has enabled the rationalisation of some components and pipework. This provides cleaner lines, improves access for maintenance crews and speeds up job changes. Electrical overrides can be positioned in the most accessible position and overall safety is improved by removal of speed adjustment from the proximity of moving equipment.

A new blowhead design has been introduced to solve alignment and maintenance problems. Hydraulic blank and mould closing was investigated but the fire risks associated with fluid loss were too high.

Maul has been working with PLM Redfearn on internal mould cooling which is suitable for both blank and blow side use. Computer-aided design is helping to develop cooling hole patterns before any metal is cut.

The IS machine has remained dominant because its design is loose enough to accommodate new technologies. It will continue in this mode until a successor provides the leap in productivity that will drive change.