

SGT NEWS



TELEVISION TUBE MANUFACTURE

Glass makes up 80% of the weight of a colour television. It provides a stable, clear screen which maintains structural integrity while holding a high vacuum. Finishing and production engineering manager Martin King related Sony's manufacturing methods at the company's South Wales plants to the Midlands Section.

Sony has been making the Trinitron range of televisions in Bridgend for more than 18 years. What started as assembly work in 1974 has now been expanded to take in the production of the vacuum tubes. A new site at Pencoed opened in August 1992, solely for their manufacture. The new facility has a capacity for up to 1.5 million 21in, 25in and 29in consumer cathode ray tubes, not only for South Wales but also Germany, Spain, Malaysia and Singapore.

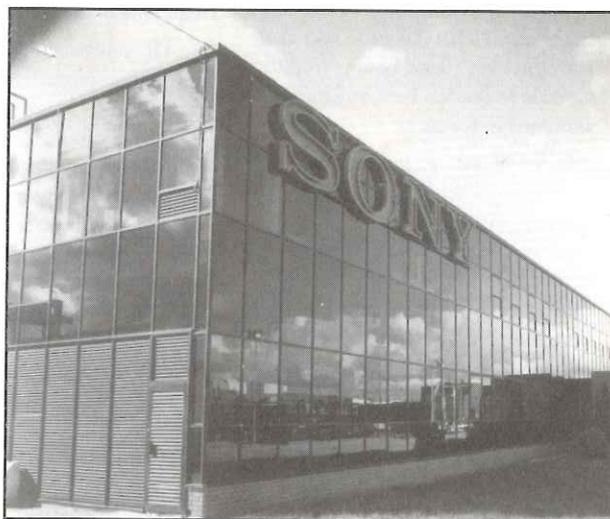
The tube is made up from six glass components. The panel holds the picture, the funnel provides the structural framework for the vacuum, the neck and bead holds the electron gun, the stem connects the electronics and the tubulator is used to exhaust and seal the tube. The glass for each component is specially formulated to absorb x-rays, have a low coefficient of thermal expansion, high dielectric discharge resistance and chemical resistance to the acid and alkali processing chemicals. Frit of similar properties is used in the joining of the panel and funnel but it also must be able to break

down fairly easily in order to help salvage the two joined halves if misaligned.

After manual inspection and loading of the panels, the process is automated.

The metal grille is matched with the panel and the phosphor stripes are built up by a photo-lithographic process which fixes first the green stripes, then the blue and finally the red. The funnel is frit sealed to the panel and the integrity of the fit is tested by a mallet and microphone system. The neck, electron gun, bead glass, stem and tubulator are then fitted in turn onto the funnel and placed onto exhausting carts.

The tube is then pumped down to 10 Torr, sealed and a barium getter is flashed off to absorb any remaining gases and improve the vacuum. A steel rim band is heat shrunk around the panel/funnel



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interface to counteract the inward bending forces and protect against implosion. The set is then checked by running a test card and given a jolt to knock off any dust and prevent arcing.

Losses occur through either frit and gun seal failure or implosion. Implosion is very dangerous and happens to 0.05% of the tubes produced. The main causes are panel/funnel misalignment, frit contamination acting as a stress concentrator, badly positioned pins and exhausting.

LOCAL SECTION CONTACTS

For details of forthcoming local section events in your area, contact the appropriate Honorary Secretary. All SGT members and non-members welcome.

London

– Mr M C Brew, United Glass Ltd, Porters Wood, St Albans, Herts AL3 6NY. Tel 0727 59261.

Midlands

– Dr G R Mattocks, 'Whitemead', 18 Blakebrook, Kidderminster, West Midlands DY11 6AP. Tel 0562 824153.

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 L40 5UF. 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.

APRIL DIARY DATES

LONDON

A young speakers' evening has been arranged for Tuesday April 20.

MIDLANDS

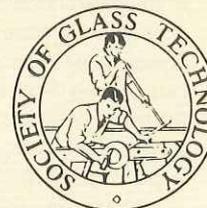
On Monday April 5, the AGM will be followed by a presentation entitled 'Windows' and given by Professor Michael Cable, University of Sheffield.

NORTH WEST

The section's annual dinner and dance takes place on Friday April 16.

YORKSHIRE

'Further developments in oxy-fuel melting' is the theme of a presentation from BOC Ltd, to be given on Thursday April 1.



KEEPING STANDARDS IN PERSPECTIVE

Once attained, BS5750 has to be maintained with the same zeal as its introduction. John Lomax told the Yorkshire Section how to keep the standard in focus.

Taking stock of any achievement can highlight the changes that have occurred in getting there; the benefits and the misconceptions. BS5750 certification instils a company-wide motivation for greater quality, not just on the shop floor but in the administrative support and sales areas. Working practices are formalised with written procedures, dubious areas have been analysed and integrated. Greater attention is paid to details; putting a signature to a report means it has been read.

Implementation of a standard breaks down barriers and improves inter-departmental communications. Employees are made aware of the effects of their actions on the rest of the company. Attention to detail means that the results can be monitored and help with auditing. Although there is no real competitive advantage if the rest of the sector is adopting the same standards, quality does communicate to the customer. Because BS5750 is assessed independently, it acts as a useful benchmark against competitors' performance.

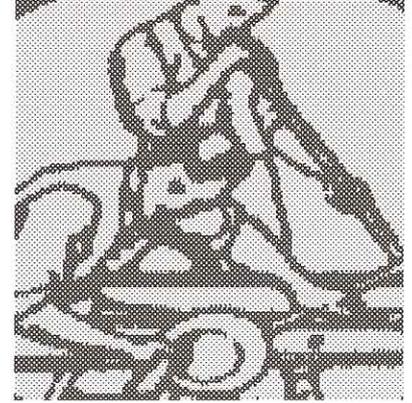
A popular misconception of a new registration holder is that complaints can be dismissed. Mistakes still happen though and no one is perfect. Customer audits will not disappear either. In fact, they are a thing of the present and future. The 'due diligence' of the 1982 Food Act will ensure that they will increase. Documentation should not mushroom. It should only be required to appropriate levels and kept as simple as possible; the same should be said of questionnaire information, which is currently too detailed and may be following a different agenda to merely quality. Some customers in Europe and USA think BS5750 is a legal requirement; this is not so but in a competitive world, it may be a

requirement of survival.

The equivalent of the seven year itch in marriage comes five years after registration. Complacency can set in and attention drifts. This can be seen by an increase in surveillance comments, documents are passed unsigned, alterations in pencil or by unauthorised personnel appear, work instructions are not updated or are ignored. There is a serious lack of awareness or there is inertia ("do we really need to...") and calibration of instruments becomes irregular.

The answer to drift is to stay vigilant, never stop improvements and always raise fresh challenges for the future. As well as unpredictable audits from BSI, always have an annual audit, periodic reviews of each line and promote good housekeeping. Training new starters from day one to appreciate quality is very important. Discipline is instilled and the level of awareness is not reduced because of changes in personnel.

Once achieved, BS5750 registration should be protected by the same effort it has attained. Measurement, training and surveillance keep the quality in perspective.



AUTOMATED GLASS QUALITY INSPECTION

Discrimination and assessment of the functionality of a defect is needed from the next generation of automatic inspection equipment. Stones have to be rejected, blisters above a critical size also have to be discarded, except where they are not big enough to affect the performance of the product. The type of defect also needs to be evaluated in order to feed information back to the production line and help diagnose faults.

The Furnace Committee's clinic on quality brought together manufacturers and inspection equipment suppliers to discuss the potential for improving machinery and procedures.

The continuing need to improve product quality is driven by the consumer and the measures needed to protect them. Similar or more sophisticated automatic inspection equipment has been adopted for container filling lines. This creates a second filter for defective containers and puts more pressure on the glass industry to source less rejects.

Vision technology, combining three cameras with sophisticated analysing software using fuzzy logic or neural networks will soon be capable of differentiating between stones and blisters, going some of the way to providing a qualitative assessment of defects.

The tolerances set by the inspection equipment needs to be matched by an overall improvement in processing, otherwise the number of rejects will increase and profitability will decrease. Fixing the tolerances between a good and bad product will optimise the commercial product. Standardising material, working patterns, runs and procedures will help maintain an environment conducive to high quality.

BADGE

In the fourth issue of *SGT News*, there was a note about the Society's badge and the new version was inadvertently reproduced instead of the old one. We now reproduce the earlier badge below.



The Old Badge.



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