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NSCG Newsletter

Title: Safety Film in Display Areas

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Source: Lampard, D. J. (1998). Safety Film in Display Areas. *NSCG Newsletter, Issue 8, The Ten Agents of Deterioration, 4. Theft and Vandalism, 7 - 11.*

URL: <http://www.natsca.org/article/1125>

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political or religious fervour. But our experience outlined here illustrates that objects can be damaged out of much less obvious motives - perhaps based on some personal conflict, insanity, anger at society in general, a simple demand for attention. Who knows? It is not even strictly speaking correct to term the above incidents acts of vandalism - the damage caused was obviously not wilful; nor were there attempts at theft; apparently just misguided attempts to achieve contact with a coveted item. We can not predict human behaviour in cases like this. But perhaps more openness and greater circulation of information around the museum world might give us some clues. Anyone feel like organising a conference?

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Safety Film in Display Areas

In 1992 new health and safety regulations concerning glazing came into force, which had an immediate effect on museums. The regulations affect public, stall areas and stores, and concern doors, barriers, display cases and windows.

The Ipswich Museum building in High Street contains a wide variety of cases, dating from the 1880's to the present. There is an enormous area of exposed glass. The glazing is a combination of spun (early cases), float, toughened and laminated glass, ranging from about

2.5mm to 7mm thick. The two largest areas are the "Jungle case" with an area of 22.7 m² and the Giraffe case (erected in 1909) with an area of 67.5 m². This is believed to be the largest single, glazed, mounted specimen in the UK.

Although there have been few acts of vandalism in recent years, there is still the risk of an accidental breakage of glass cases. In the most recent event two years ago a 2.5mm thick pane cracked in an 1881 wall case, when a visitor leant their head on it "to get a better view of the objects". However, all cases installed since 1992 are glazed in toughened glass, which is visibly marked to show that it conforms to BS6206.

The following is an extract from the 1992 Health Safety and Welfare regulations concerning glazing,

Windows, and transparent or translucent doors, gates and walls.

(1) Every window or other transparent or translucent surface in a wall or partition and every transparent surface in a door or gate, shall where necessary for reasons of health or safety -

(a) be of safety material or be protected against breakage of the transparent or translucent material; and...

(b) be appropriately marked or incorporate features so as, in either case, to make it apparent, with reasons. A risk assessment and survey of the museum divided the glass into three categories: high, medium and low. All glass has to show the safety mark.

147 Transparent or translucent surfaces in doors, gates and walls and partitions should be of safety material or be adequately protected against breakage in the following cases:

(a) in doors and gates, and door and gate side panels, where any part of the transparent or translucent surface is at shoulder level or below.

(b) in windows, walls or partitions, where any part of the transparent or translucent surface is at waist level or below, except in glass houses where people there will be aware of the presence of glazing and avoid contact. This paragraph does not apply to narrow panes up to 250mm wide measured between glazing beads.

148 'safety materials' are:

- (a) materials which are inherently robust, such as polycarbonates or glass blocks; or
- (b) glass which if it breaks, breaks safely; or
- (c) ordinary annealed glass which meets the thickness criteria in the following table

Nominal thickness	Maximum size
8mm	1.10m x 1.10m
10mm	2.25m x 2.25m
12mm	3.00m x 3.00m
15mm	any size

149 As an alternative to the use of safety materials, transparent or translucent surfaces may be adequately protected against breakage. This may be achieved by means of a screen or barrier which may prevent a person from coming into contact with the glass if he or she falls against it. If a person going through the glass would fall from a height, the screen or barrier should also be designed to be difficult to climb.

150 A transparent or translucent surface should be marked where necessary to make it apparent. The risk of collision is greatest in large uninterrupted surfaces where the floor is at a similar level at each side, so that people might reasonably think they can walk straight

through. If features such as mullions, transoms, rails, door frames, large pull or push handles, or heavy tinting make the surface apparent, marking is not essential. Where it is needed, marking may take any form (for example coloured lines or patterns), provided it is conspicuous and at a conspicuous height.

151 The term 'safety glass' is used in a British standard which is concerned with the breakage of flat glass or flat plastic sheet. Materials meeting that standard, for example laminated or toughened glass, will break in a way that does not result in large sharp pieces and will fulfil paragraph 148 (b) above. 'Safety materials' as used in these Regulations includes safety glass, but also other materials as described in paragraph 148 (a) and (c) above. There is also a British Standard which contains a code of practice for the glazing of buildings

152 Building regulations have similar requirements. Advice may be obtained from local authorities.

Since 1992 all new glazing has to be safety glass marked with the British Standard kite mark BS 2602.

A risk assessment survey in 1996 carried out on all Ipswich Borough Council buildings open to the public divided the glazed areas into to three categories; high, medium and low risk. High risk areas included exposed glass below shoulder height, medium risk glass that was touchable or covered a smaller areas, while low risk areas were those above shoulder height.

It would have been prohibitively expensive to re-glaze all the display cases, (and in the case of the Giraffe case an exceedingly interesting job) with safety glass, and impractical to place high barriers in front of them. The alternative was to cover the glass with a plastic safety film.

For financial reasons the treatment has been carried out over the last few months in three stages, high risk areas first followed by medium and low risk areas. All treated glass has a visible marker confirming that it conforms to BS6206 class B.

Two firms have been involved in applying film on the glass using plastic safety films produced by *Invicta* window films and *Armour-guard* film produced by MSC. The film is applied to the outside of the glass and the procedure is

fairly straightforward. The film is cut to size; the glass is thoroughly cleaned to remove dust, grease and fingerprints; it is sprayed with water and the film applied. Initially the film is attached by surface tension and can be slid into its final position, a roller is used to flatten out the film and move trapped air bubbles. Once the water has evaporated the film bonds to the glass and cures over several days.

The work took over two weeks to complete, and although there was minimal disruption, parts of galleries had to be closed while the work was in progress.

Conservators and keepers were not involved in briefing the companies who completed the work. It was therefore not possible to address in detail any display or conservation requirements of the film or its application. We have had little conservation information on the film, apart from learning that it combines safety protection and ultraviolet light filters, removing 95% of UV light. We have no information about its physical and chemical makeup nor its long-term properties (although it comes with a ten year guarantee). There is no information on: whether the film will discolour with age, become brittle or drop off; how easy it will

be to remove if it needs replacing; if it will react with human sweat or survive the wear and tear of people touching it. Even the best way of cleaning the surface without scratching or abrading the film is unknown, and ordinary glass cleaning fluids are no longer usable. However common sense suggests that abrasion may eventually wear the film away or alter its transparency.

When the film was applied to some older cased mounts, labels had to be removed from the outside of the glass. There is some debate over a suitable method of attaching new labels, i.e. if a label needs replacing again how can it be removed without damaging the film. One suggestion given was that only *blu-tack* could be used to attach labels, this is not an option.

The run off from excessive spraying of water has entered some cases at the glazing beads. This has caused some water streaks on the inside of glass, a temporary increase in internal humidity and a very slight staining of some background materials. Specimens were not removed from cases during the application, however there is no evidence that any have been damaged.

A more noticeable affect is obvious where the area of glass has required more than one sheet of film to cover it. Sheets of film have been applied with an overlap up to 5mm at the join. This has left a visible and distracting line at eye level on several cases.

While the work has improved the safety of the galleries, and brought us in line with health and safety regulations, more detailed consultations with staff directly concerned could have lead to a much more satisfactory outcome.

David J. Lampard
Keeper of Botany

Ipswich Museums and Galleries



Natural Science Conservation travelling lectures

The Natural Science Conservation Group is particularly concerned with educating institutions and individuals with its work. Natural science conservation is not a familiar discipline nor is it fully understood. One aim of the NSCG is to promote the work of the group through visiting schools, colleges and Universities. Through talks, lectures and slide shows the work of natural science conservators around Britain can be brought to the individual.

There are many more courses in conservation being established which is in relation to the rise in demand. However, natural science conservation courses are still poorly represented and so the NSCG felt it would be worthwhile to speak to students and lecturers alike to inform them of this particular area of conservation that they could enter into after qualifying. Once the awareness and interest is generated then the demand for more information and therefore training should follow.

The University of Derby has recently embarked upon a conservation science course that is linked to the chemistry department. It is in its first year and was instigated by Dr Trevor Brown, a conservation scientist. A member of the NSCG spoke to a group of students and lecturers from this discipline about the work of natural science conservators within the UK and the influence of NSCG on natural science collections. The lecture was well received with a good deal of feed back afterwards.

Through this communication the wide and varied work actually carried out by British natural science conservators is made easily accessible, and the NSCG can be represented first hand.

Vicky Purewal
NMGW

