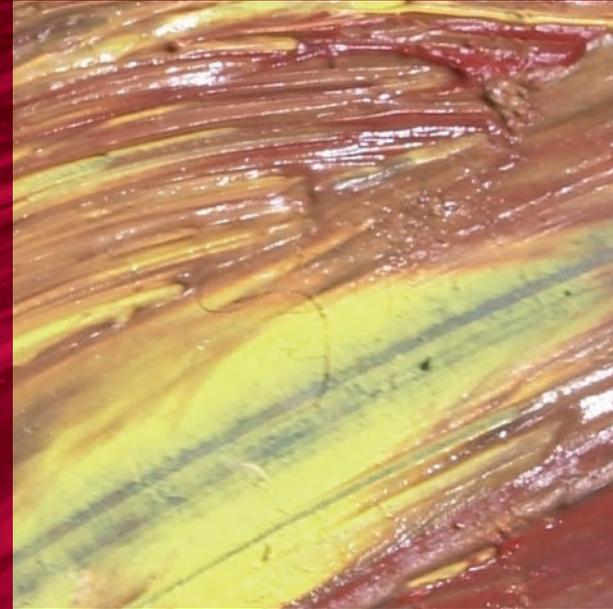




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AXA Art and the Tate Gallery Caring for Acrylics: Modern and Contemporary Paintings



**CARING FOR ACRYLICS:
MODERN AND CONTEMPORARY PAINTINGS**

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INTRODUCTION

This is the second AXA Art publication dealing with the conservation of modern materials, the first being *Plastic Art – A Precarious Success Story*. *Caring For Acrylics* is a manual for collectors of modern and contemporary works of art written by specialist conservators and conservation scientists, and reflects their knowledge and experience gained from working on a daily basis with modern paints.

For many years AXA Art has been involved in several international projects dealing with art conservation techniques. In 2003, we initiated the AXA Art Research Grant, first awarded to the Vitra Design Museum in Weil am Rheine in Germany to fund the study of modern plastic materials used in contemporary furniture. Now, AXA Art is very pleased to be sponsoring the Tate AXA Art Modern Paints Project (TAAMPP), offering collectors and conservators further insight into modern materials used in art, this time: modern paints.

Acrylic paints and primers account for approximately 50% of artists' paint sales over the last thirty years. They are far more stable than traditional oils, and we are much less likely to see them turn yellow or develop cracks. However, as with most new materials used in works of art, conservators are uncertain as to how best to restore acrylic paintings when they become dirty or damaged, partly due to a lack of knowledge on the possible long-term effects of conservation treatments. Given that modern and contemporary art is currently one of the most highly sought-after segments of the art market, it is clearly important that conservators have access to this information.

In this publication we highlight the main precautions that any collector of acrylic paintings should take in order to reduce the chances of their works needing remedial conservation. These include considering appropriate framing and/or temporary protection during high-risk situations; choosing the safest hanging site with the least damaging lighting; and ensuring that appropriate materials and methods are used for moving, handling, wrapping, and packing acrylic works of art. This, along with AXA Art's knowledge of and international contacts in shipping, packing and conservation - available to all who insure with us - will help ensure that acrylic painting collections are kept in the best condition possible.

It is crucial to have the right insurance cover in place for all of your works of art. We hope that the readers of this publication will feel the way that we did when we began some twenty years ago to occupy ourselves intensely with the preservation of all of the objects entrusted to us for insurance. We believe you can only insure a work of art if you understand how it can be best protected from damage and deterioration, and moreover, how it can be preserved and conserved.

AXA Art's initiation of the Research Grant was in keeping with the company's mission to protect cultural heritage for future generations and, in light of it, we have been praised by collectors, artists, designers, museums, conservators and restoration experts alike. This grant has previously been awarded to globally renowned art institutions such as MoMA, the Guggenheim, Jacquemart André, Triennale di Milano, Museo Borgogna, and the Vitra Design Museum.

Through the TAAMPP, we are facilitating ground-breaking research into acrylic paints by looking into their fundamental properties, their long-term behaviour and the effects of conservation treatments such as surface cleaning. The results also indicate how these paints are affected by incorrect storage; packing; transit and display conditions. Both Tate and AXA Art are aware that, although many well cared-for acrylic paintings still look 'new', they are, like all works of art, vulnerable to deterioration, whether the causes are man-made, inherent or environmental.

The results of the TAAMPP are already feeding directly into conservation practice and will better equip conservators to handle and advise collectors on how best to avoid damage to acrylic paintings. It is our hope that, as a result of this publication, synthetic paints will be further incorporated as an important area of study for students preparing for a career in conservation, and that this publication becomes a standard reference for conservation training programs; contributing to the growing need for specific information on the conservation of modern paints, and particularly acrylics.

I would like to thank the primary author, Dr. Bronwyn Ormsby, for her commitment as the *AXA Art Research Fellow* at Tate and all members of the team for their contributions. AXA Art is delighted that Bronwyn has now taken over the post of Senior Conservation Scientist at Tate, previously held by Dr. Thomas Learner. Dr. Learner, who is now at the Getty Conservation Institute and my colleague, Thomas Wessel initiated the Tate AXA Art Modern Paints Project, and with Dr. Ormsby's persistence, the project is now known worldwide. As we go to print, the new *AXA Art Research Fellow*, Dr. Elina Kampasakali is continuing this high profile research at Tate under Bronwyn's direction, which also includes the treatment of five paintings in Tate's collection in collaboration with the paintings conservation department.

Thanks also to the commitment of our colleagues at AXA Art; Frances Fogel, Marketing and TAAMPP Co-ordinator, London, and Benedetta Brandi, Group Marketing Co-ordinator, Milano, whose combined efforts have made this publication possible.

In addition, I hope that this publication - about a previously unexplored subject - will be enjoyed and useful to any reader with an interest in art.

Ulrich Guntram

Chairman of the Management Board of AXA Art Insurance

Cologne, October 2007

FOREWORD

AXA Art Insurance has supported several research projects on the conservation of modern and contemporary art in Europe and the United States and we were therefore delighted when AXA Art agreed to become a partner of Tate in 2006, to further the groundbreaking research we have been carrying out on acrylic emulsion paints since 2002.

The need to explore conservation issues surrounding acrylic paints has recently become more pressing as early acrylic works are now approaching fifty years old. Despite the frequent occurrence of acrylic paint in collections, conservators have access to very little information on how acrylic emulsion paints might alter with age, or how they are affected by conservation treatments such as surface cleaning.

Tate has long recognised the need to better understand these painting materials to ensure that the methods adopted to preserve these modern masterpieces are appropriate. Tate has led much of the research into this area over the past decade, and since 2006, our partnership with AXA Art has enabled this crucial research to progress.

To understand these paints and their preservation and conservation, considerable research effort is required. For this I'd like to thank former and current senior conservation scientists Tom Learner and Bronwyn Ormsby, who have been the driving force behind this research, in collaboration with Patricia Smithen in paintings conservation.

This publication is a joint effort between Tate conservation science and paintings conservation staff and AXA Art, and marks an important milestone in the collaboration. It is hoped that its contents will help to disseminate the key features of our current understanding on how best to preserve acrylic paintings to other private, corporate and institutional collections.

Nicholas Serota
Director, Tate

London, October 2007



WHAT ARE ACRYLIC PAINTS?

Although the term 'acrylic' paint would – strictly speaking – encompass two distinct types of synthetic paint, acrylic emulsion paint is by far the more commonly encountered type in post 1950s paintings. The other type – acrylic solution paint – is certainly historically important: sold under the brand name Magna, it was the first acrylic paint to be developed specifically for artists' use, and was used by a number of influential artists such as Roy Lichtenstein, Morris Louis and Kenneth Noland during the 1960s. However, it has not been widely used since then, perhaps as a result of the need to use white spirit or turpentine to thin it for application or dissolve it during brush clean up. On the other hand, acrylic emulsion paint – the water-borne and thinnable version of this stable synthetic polymer – has continued to remain extremely popular since the early 1960s. It has been used by artists such as Patrick Caulfield, Helen Frankenthaler, David Hockney, Bridget Riley, and Andy Warhol. Today it is manufactured throughout the world and sales compare favourably with traditional oils. This booklet focuses on the care of paintings executed in acrylic emulsion paints.

Artists' acrylic emulsion paints were introduced in 1956 by the artists' paint manufacturer Liquitex (which was also the name used for the paint brand), and by the mid 1960s were causing much excitement among artists, not least because they embodied the characteristics that many painters had been searching for at that time; affording a means of expression that was distinct from oil painting and its associated history and traditions. British artist John Hoyland recalled his sudden switch from oil paint to acrylic emulsion paints in 1963, stating that acrylic paints '... seemed exciting in the way people would get excited about the use of plastics, aluminium ... and other industrial materials.'

Acrylic paints produce films of great clarity, they are easy to manipulate and hold many advantages over oil: they can be painted directly onto a variety of supports, such as canvas, wood, metal or glass; they are water-thinnable – so no turpentine or white spirits is required to thin them; they dry very quickly - usually in a couple of hours; they are a very stable class of polymer – so are resistant to deterioration from light and ultraviolet radiation, and yellow far less over time; and they form relatively flexible films that are less prone to cracking and other problems associated with stiffer paint films.



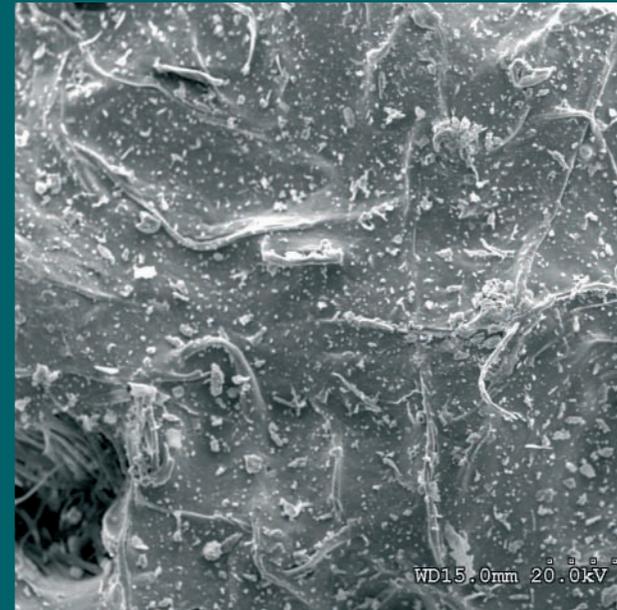
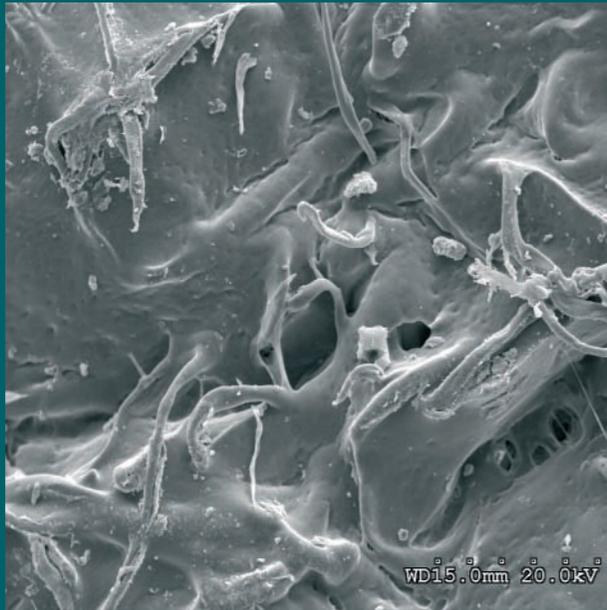
PROBLEMS WITH ACRYLIC PAINTINGS

In spite of the outstanding mechanical and ageing properties of acrylic paints, once applied to a support, the resulting painting can suffer damage in much the same way that all works of art can, i.e. from factors such as: accidents, vandalism, the accumulation of surface dirt, nicotine and grime, scuff marks, fingerprints, inherent deterioration, as well as inappropriate packing methods and uncontrolled environmental conditions.

Acrylic paints differ from oil paints in two important ways. Firstly, their relationship with temperature: acrylics are flexible at room temperature (around 20°C, 68°F), whereas oil paints are harder and stiffer. While this flexibility significantly reduces the likelihood of cracks forming, the associated softness makes acrylic paint films more vulnerable to surface damage from impacts, knocks, handling, inquisitive hands and packing materials. Dirt or dust remaining on the paint surface can even become embedded in the paint film if it is not removed early enough, as shown in the figures on pages 12 and 13; thereby altering its colour and surface texture permanently. If conditions become warmer, acrylic paints will soften further and become even more vulnerable to dirt retention, deformation and the effects of inappropriate packing. Conversely, if the temperature drops much below 10°C (50°F), acrylic paint films will stiffen and harden considerably, making them far more liable to crack. It is now known that the effect of temperature is more pronounced for acrylics than oils, and the latest information on these effects are summarised in this booklet.

Secondly, unlike oil paints, acrylic paints have not been the subject of prolonged research within the conservation profession. Until recently there has been little information available on how to best preserve and conserve these paintings. Acrylic emulsion paints are actually very complicated formulations and often contain around ten components in addition to the acrylic polymer, water, pigments and extenders. These 'additives' are often required to render the paints more stable and/or easier to handle. However, it has now been shown that at least one of these materials – a surfactant that is added to stabilise the paint in the tube – can migrate to the surface, leading to the formation of a greyish surface film that increases the stickiness of the surface. Although this material can usually be removed by a professional conservator, if done incorrectly the result can cause streaking and disruption to the delicate surface of these paintings (See *Do's and Don'ts*).

While research into best conservation practice for acrylic paintings is ongoing, it is clear that one of the most important ways to care for them is to prevent the surface from becoming soiled or damaged. Therefore 'preventive conservation' measures are paramount to the long-term preservation of acrylic paintings; and many of the necessary measures can be easily accommodated by collectors/owners/caretakers.



DISPLAY

Protection: can be provided to the front, sides and back of a painting by glazing, framing and attaching a backboard respectively. Although glazing (see below) will usually have a significant effect on the appearance of the work, a backboard will not and hence should be considered for all paintings. A conservator can assist in choosing the appropriate material for this, but often light-weight foam boards are used. The board is cut to just under the size of the painting and screwed into the back of the stretcher (the wooden construction to which the canvas is attached – visible from the back of the painting), and will provide a high level of protection from knocks to the back of the painting. If your painting is on a wood or another type of solid panel however, a backboard is not always necessary.

Framing your painting will also provide much protection. Often very minimal L-section frames can be used that do not interfere significantly with the overall aesthetic of the image and prevents most instances of fingers touching the paint surface during handling (see *Moving Acrylic Paintings*).

If your painting is framed it can usually be adapted so that the front surface is protected by glass (glazing). The glass is fitted into the frame rebate and separated from the painting by a wooden slip (2 to 4 mm thick depending on the painting dimensions) or by battens attached to the stretcher tacking edges. The frame needs to support the additional weight of the glazing material, and if the frame is not rigid, it can be strengthened at the corners by adding a build-up on the reverse. If this is not possible, do not glaze the work since flexing of the frame may cause the glazing to break. Equally, glazing becomes essentially impossible for very large paintings due to the enormous increase in weight that a large sheet of glass/Perspex can add. If you do not wish to frame and/or glaze your painting, temporary protection during high risk situations can be useful, for example during a drinks party or when small children are visiting. For this, a Perspex box can be made to fit over the painting.

The chosen hanging site: should be evenly lit, free from obstructions and distracting light sources. Avoid light from south facing windows since sunlight can be more than one hundred times as bright and damaging as the levels required for good viewing. Artists' acrylic paints do not usually contain particularly light-sensitive pigments, and in museums 200 lux or 20 foot candles is a suitable standard light level. However, if you have any reason to believe there are light-sensitive components such as paper, textiles (e.g. exposed canvas) and fading pigments present then the painting should be hung in the darkest part of the room and you should also consider not displaying it continuously, as the damaging effects of light are cumulative.

Acrylic paintings with large areas of flat colour or interesting surfaces are best appreciated in ambient light. If spotlights need to be used they should be placed well away from the painting to avoid heating effects and to provide a good spread of light (it is difficult to light larger paintings evenly in this way). The lights should be attached to the ceiling and point down at a steep angle to avoid glare from the painting surface, which can be difficult to achieve with tall paintings.

Hanging fixtures: most paintings in the home are hung with two screw-hooks and wire over a single screw-hook in the wall. However, if any component fails in this system (for example, the wire might fracture after some years), there is no back-up, and the painting may be damaged if it falls. Failures usually occur when the wood or wall-plaster detach from around the screw, either because the screw was too short or under compression because the hole was incorrectly predrilled. Hanging a large or heavy painting is best done with more than one fixing. Remember that screws can quickly loosen if a fitting is removed and then re-attached repeatedly. Any attachment to the back of the painting frame or stretcher, such as a backboard, hanging fixture or alarm needs to be firm but care should be taken not to use screws too long for the depth of the painting.

Environment: it is not a good idea to hang paintings over radiators or fireplaces and with unglazed acrylic paintings, this is of particular concern. Intermittent heating is an obvious problem for all works of art but more importantly, in these areas dirt deposition is likely to be heavy and uneven as a result of rising air currents and therefore more apparent. Acrylic paint is very similar to decorators' emulsion paint and in a few years the painting surface will develop the same dust deposits as the rest of the walls in the room. Most visible dust in domestic houses consists of abraded textile fibres from clothing and soft furnishings along side small amounts of hair and skin that is stirred up and distributed by human activity. This cannot be prevented however it is important to avoid unnecessary dirt deposition from the regular dusting of nearby objects or building work.

Paintings should not be hung on poorly insulated walls. In modern, heated buildings this is unlikely to be a serious problem, but if an outside wall is damp and cold, high humidity can build up behind a painting, possibly leading to mould growth which can be difficult to remove. A well-sealed backboard will prevent this in most circumstances. Mould will usually grow on the backboard first, so regular monitoring will provide a warning that the painting is in danger. Mould cannot occur in a well-sealed glazed and backboarded frame unless it is in direct contact with water from rising damp or a leaking roof. Other hanging positions to avoid for similar reasons are kitchens and bathrooms, above sinks and near swimming pools.

MOVING ACRYLIC PAINTINGS

All paintings are most at risk when they are being moved. Damages such as: scratches, scuffs, handling marks, dents and even tears and holes can easily occur if paintings are handled carelessly. Acrylic paintings can be particularly susceptible to casual damage because the soft paint can be easily marked; in addition, large or unframed works can present specific handling challenges.

Moving paintings can be divided into two typical situations: moving a painting around one environment (a gallery or home, for example) and the transportation of paintings between two or more sites. It is always best practice to call in professionals for advice however the guidelines below may assist on those occasions when this is not practical. In every case however, the key to safe movement of an artwork is *planning*.

Moving within one environment



Preparation: consider where the painting will be located at each stage of the move. If it is going to be leant against a wall, make sure there are no nearby objects that can come into contact with the front or back surfaces. It is always a good idea to walk the route first, visualising the size of the painting and watching out for potential hazards or difficult areas, such as doorways or corners.

Always clear the path and ensure that you have a safe place to rest the painting (on cushions or foam blocks) at the beginning and end of the move. The chances of damaging the painting are much reduced if an extra person is present to look out for hazards, and of course additional help will be required if the work is large, heavy or an awkward shape.

Handling the painting: if the work is framed and well secured within its frame, it makes sense to handle the painting by the frame. However, if the work is not glazed or framed and there is a danger of your hands touching the painted surface, it is imperative that you wear clean gloves (cotton or vinyl), to protect the surface from the transfer of hand grease and dirt. Even if your hands are washed thoroughly and dried prior to handling, touching the paint surface is very likely to result in finger grease being deposited on the painting, as shown in the figure on page 10. While this is not immediately apparent, dirt will soon start to adhere preferentially to these areas and disfiguring fingermarks will soon appear. Unfortunately, removing fingermarks from acrylic emulsion paintings is an extremely difficult, occasionally impossible, and sometimes costly procedure.

If one person can comfortably lift and carry the painting, face the paint surface, place your hands along the outer edges and apply slight pressure inwards, as shown in the figures on pages 16 and 17.





Remember to remove all jewellery and any other loose or bulky items that might scratch/contact the painting surface before starting the move. As your fingers grasp the edges, be careful that neither your fingertips nor palms are putting pressure on the front or reverse face of the canvas and hold the painting away from your body. If there are visible stretcher bars at the reverse of the canvas, the central bars can also be used as handling points as shown in the figure on page 21. However care must be taken as it is very easy to touch and put pressure on the canvas.

For larger paintings, where two or more people are required for lifting and carrying, it is always safest to consult professional art movers. However, if you choose to move the painting yourself, each person should place their hands along the side edges, with one hand close to the bottom as shown in the figure, (the location of your lower hand is dictated by the size of the painting). It is also advisable to lift the painting slightly to get a feel for its weight before you lift it together, as shown in the figure on page 18. Again, make sure your fingers are not pressing into the canvas on the front or reverse faces. Communicate your movements to your fellow handlers/helpers and try to keep the painting as vertical as possible. As you move, be particularly cautious of the top edge which is vulnerable to knocks from ceiling lamps, fans and doorways. When you reach the final destination, place the painting down on blocks or cushions against a wall before hanging it, as you may need to adjust your hand positions.

Transportation between sites

If you intend to transport a painting from one venue/site to another, then it is strongly recommended that professional art transporting agents are used - your insurance policy might even demand it. You may also want to engage a conservator for advice on the condition of your painting to ensure it is fit to travel.

The way an acrylic painting is wrapped and packaged for transport is very important. Nothing should come into contact with the paint, as packing materials can adhere to the surface and leave permanent impressions in the paint. If the surrounding temperature rises (for example if the case containing your painting has to stand in a hot warehouse during the summer) acrylic emulsion paint films quickly become softer and tackier, significantly increasing the risk of materials adhering to the surface. If the painting is likely to experience low temperatures, say below 10°C (50°F), acrylic paint becomes more brittle and prone to impact damage (see *Environmental Considerations*). This is why museums and galleries use well-insulated packing cases and commission temperature-controlled vehicles when transporting acrylic paintings.

Transit frames: one useful method that is widely employed to avoid touching paintings during handling is to have a 'transit' or 'carrying' frame made for each painting, as shown in the figure on page 22. This usually consists of a simple L-section wooden frame, into which the painting is secured for extra protection – see Tate's website *Transit Frame Specifications* – with well-secured carrying handles on the sides. The edges of the transit frame project out in front of the painting (and frame if present), and there is a gap on all four sides so the painting can be secured into the frame. This is most beneficial for paintings without display frames and is very effective at reducing wear and tear. In addition, the whole transit frame can be wrapped in polyethylene sheeting

which, when overlapped and taped to itself, provides a stable atmosphere around the painting for storage (see *Storage and Access*). The only risk with wrapping works of art in polyethylene comes if the painting itself has been located in a damp environment. In this situation, the high moisture content in the framed painting will make the trapped air humid and mould can appear in a short time (days to weeks). In this case, the painting should be moved to a less humid environment for a few days before being wrapped.

If it is not possible to use a transit frame for an unframed painting: it should be carefully wrapped to avoid damaging the paint. For smaller paintings (1.5 x 1.5 m or less) it is possible to make a three-sided box out of fluted polythene (Cor-X or Cor-O-Plast), foam board, or stiff card board (preferably acid-free). The box should be 5 cm larger than the painting along all edges, and deeper than any part by at least 3 cm. The painting can be screwed into the box on the reverse of the stretcher (the wooden construction that the canvas is attached to - ensuring the screws are shorter than the depth of the stretcher) to secure it (this should be done by a conservator). Cotton tape should then be wrapped tautly around the box in two directions to prevent the subsequent wrapping (polythene film) from touching the surface of the painting. For larger paintings, the likelihood of packing materials adhering to the paint surface can be reduced by choosing conservation-grade, silicone release paper as the wrapping material. Tissue paper is frequently used, but it is far more likely to adhere, particularly in high humidity or temperature conditions. Never allow bubble wrap to touch the painting directly: it usually contains significant quantities of plasticiser that can transfer to the paint surface and leave a disfiguring circular pattern.

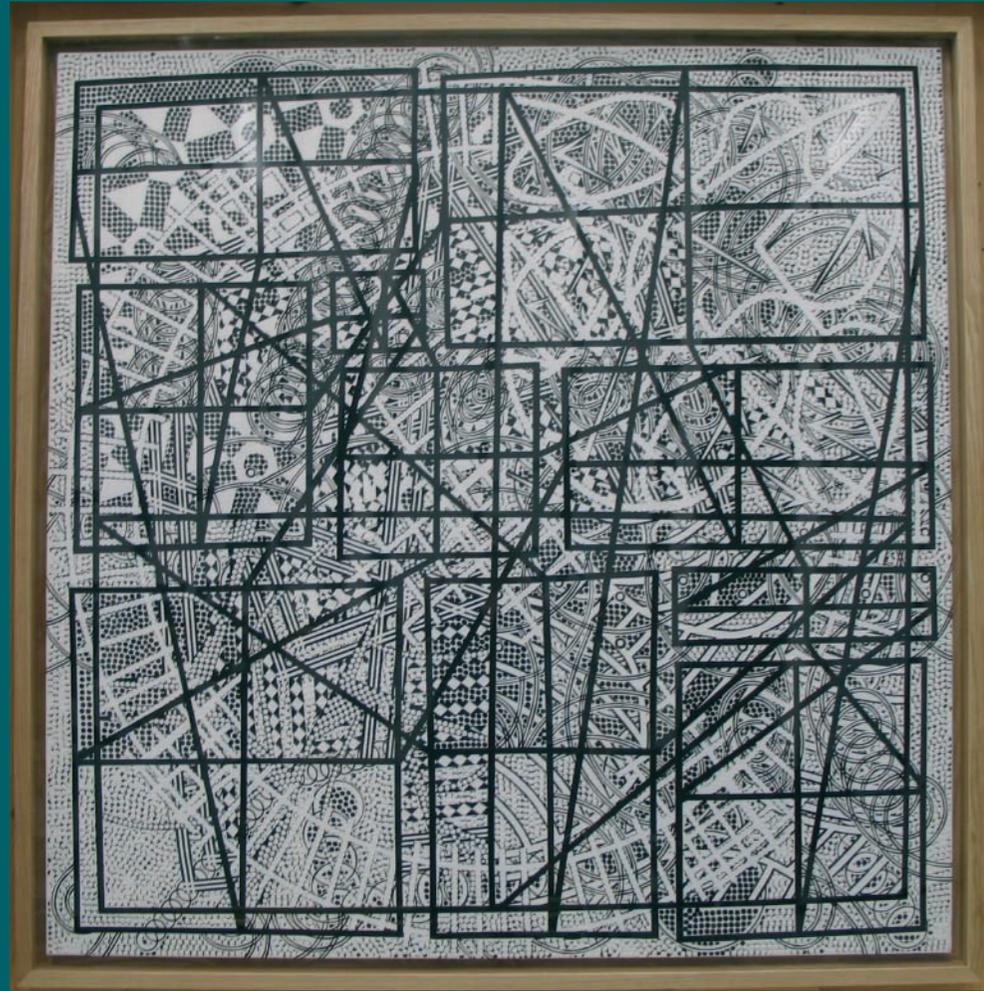
A framed painting with incorporated glazing can be minimally wrapped for short journeys, as long as the frame is structurally sound and the painting has a backboard. One quick protection method for this situation is to use four pieces of foam sheeting – each folded into triangular envelopes - that slide over the corners of the glazed frame. The painting can then be wrapped in polythene sheeting and taped securely prior to transport.

International transportation

If you want to transport an acrylic painting internationally, it is essential (and probably an insurance requirement) to consult a conservator for advice on the condition and packing of the painting(s) prior to travel. For all international transportation, it is also vital to control environmental conditions as much as possible. As far as temperature control is concerned the allowable journey time depends on the weather outside, the way the work of art is wrapped and packed, and whether the transport is climate controlled.

For road transport, temperature-controlled vehicles set at an temperature between 18-20°C (64.5-68°F) are ideal, although a stable temperature between the range of 15-25°C (59-77°F) may be acceptable for shorter journeys. If road transportation is frequently required, it may be advantageous to include a temperature data logger within the packing case, which can be fitted by conservators/professional art shippers. An overnight lorry journey requires the air conditioning or heating to be kept running overnight or at the very least, the lorry to be parked in a secure enclosed space.





A transit frame may be adequate protection for short road journeys using climate controlled vehicles where the painting is handled by qualified art handlers. When a painting is completely wrapped in polyethylene and sealed with tape, the moisture content within the polythene will control the relative humidity for a time. If a mixed load of paintings in transit frames and packing cases is planned, then a plywood cover attached to the carrying frame (front and back) provides useful additional protection when a full case is not possible.

When transporting paintings by air, the risks associated with handling at airports make a packing case with a robust plywood outer shell essential. In unheated cargo handling areas maintaining temperatures above 10°C (50°F) can prove difficult. Consequently thermal insulation should be included in the packing case, which is often conveniently provided by the cushioning material primarily included to reduce shock. Full specifications for packing cases are available at Tate's website *Specifications for a Single Painting*.

Bear in mind that thermal insulation will only be effective for limited time periods – for example the 10cm foam insulation used in Tate's packing cases will only maintain a stable temperature for a few hours in extreme conditions - so if a shipped painting is held up by unforeseen circumstances (such as industrial action) the painting will become susceptible to high/low temperatures. A common misconception is that the hold of a plane is unheated - in reality, the flight engineer simply sets the temperature. Packing cases over a specific height (around 1.6m) may need to travel on freight planes (rather than passenger planes) and the nature of other cargo will often determine the hold temperature. In this case, request that your painting(s) travel within the appropriate temperature range: 15-25°C (59-77°F) and ideally 18-20°C (64.5-68°F); and not at the low temperatures required by some perishables. In addition, it is also a good idea to ask the agent in charge of shipping to ensure that the paintings are in a good position so that they are unlikely to be moved around if other freight is being picked up/dropped off along the route.

If a painting is to be stored in an isolated packing case in an airport overnight it should be kept in a heated warehouse, with a minimum temperature of 15°C. The next day, the case will need to be transferred to the heated cargo hold of the plane within a few hours - if the outside temperature is close to freezing, the painting will drop to 8°C in 4 hours and 4°C within in 8 hours!

AXA Art is able to provide further advice about shipping and packing, and can direct clients to a range of art service providers to meet every transport need.

STORAGE AND ACCESS

Storage should never be considered without also considering access: a stored painting needs to be accessible without disturbing other stored objects; otherwise one or more of them may be damaged. Ideally you should not disturb objects in storage but you must expect that maintenance and access will need to occur, leading to some risk. Long term storage also requires that the packed object is appropriately labeled for future reference.

Location and environment: if you need to store an acrylic painting, choose a place that is fit for human habitation. A consistent temperature is important, ideally between 15-22°C (59-71.5°F), and an intact roof to keep out the rain and insulated walls to prevent condensation. Other possible sources of water to be avoided include downpipes, sprinkler systems and rising damp. Also consider fire risks; the condition of any electrical circuits, other inflammable materials, as well as any conflicting uses of the site and nearby buildings. The storage area should be enclosed for security and to eliminate sunlight. To keep the painting clean, it should be wrapped in polythene sheeting that does not touch the surface and the painting should have a backboard if possible.

Protection: for storage of acrylic paintings and unframed works, also consider providing a transit frame (see *Moving Acrylic Paintings*), that projects far enough beyond the front of the painting to allow the frame to be wrapped in polythene without touching the paint surface. If this is not feasible, and the painting is wrapped with tissue paper or silicone release paper under polythene sheeting, it is imperative that the painting be kept cool (not cold) and out of direct sunlight. For framed paintings and those in a transit frame, cotton tape should be wrapped tautly around the frame in two directions, to prevent the subsequent polythene wrapping from touching the surface of the work. If a group of paintings need to be stacked together (leaning against a wall for example) it is best to keep them from touching each other. Insert a sheet of stiff, acid-free card or foam board between each work, ensuring that the sheets are larger than each painting and that they are carefully positioned to avoid touching paint surfaces.

SUMMARY OF ENVIRONMENTAL CONSIDERATIONS FOR ACRYLICS

Paintings contain a number of different materials (canvas, priming, paint layers, wood etc), each of which will respond differently to temperature and humidity fluctuations. This can lead to physical stress and eventually cracking and/or flaking paint and paint loss. The first priority, therefore, is to keep conditions as stable as possible. Rapid fluctuations in environmental conditions can lead to more damage than if a painting remains in a steady environment, even when close to the extremes of the ranges provided below.

Temperature: acrylic paint is much more flexible than dried oil paint at normal temperatures and therefore far less likely to crack/flake. However as discussed, acrylic paint is softer and more vulnerable to dirt retention than most other paints. At high temperatures (certainly above 30°C, 86°F) acrylics are more likely to absorb dirt present on the surface into the body of the paint. At low temperatures (below 10°C, 50°F) the paint starts to become increasingly brittle and therefore more prone to cracking, shearing off (delamination) and impact damage. Precautions should therefore be taken to avoid areas where extreme conditions most often occur: near fireplaces, kitchens, furnaces, boilers and intense lighting. In cold climates, do not hang paintings on exterior walls where the temperature is lower and moisture can condense behind the painting, as this can lead to mould growth.

Relative humidity (RH): acrylic paint is best kept in the middle range (~ 50%RH) avoiding the extremes of both humid and dry conditions, and certainly within the range of 40–60% RH. Dryness is not as much of a problem for acrylic emulsion paints as it is for other materials such as natural glues and wood, which become brittle and may crack. Moderately humid conditions are generally acceptable if kept stable. However at high humidity (>65%) components within the acrylic film attract water to the surface, which readily diffuses through the film causing it to expand excessively, become softer and therefore more prone to mould growth, surface damage and dirt retention.

Dust and pollution: any dust or small particulates are problematic since they can stick to the paint surface and cause discoloration, sometimes unevenly, and potentially permanently. External dust can be excluded by keeping windows closed but internal dust, fluff, pet hairs, and other small particles will inevitably reach the painting. There is no acceptable threshold (see *Dusting Acrylic Paintings*).

Light: high light levels can cause the rapid fading of pigments, so as a general rule paintings should be kept under 200 lux, where most artists' pigments are reasonably stable. Direct sunlight is extremely intense, and will also contain a significant proportion of high energy ultraviolet rays, even through window glass, which is very damaging to works of art and should therefore be avoided at all costs. Direct sunlight also contains infrared radiation that can heat and soften acrylic paint surfaces. Spot-lights also contain infrared radiation and should therefore not be placed too close to the painting surface.

DUSTING ACRYLIC PAINTINGS

Keeping loose dust and dirt off acrylic paintings will help preserve their fresh appearance and minimise the chances of particles becoming permanently embedded in paint films. While dusting paintings can be risky, those responsible for the care of collections should be able to undertake this task using the following guidelines. Please note that these instructions are for well-bound, intact acrylic paint films only. If you are at all unsure about the condition of your painting, or it contains collage elements, powdery paint or other loosely bound media/parts, such as charcoal or pastel, then seek advice from a professional conservator before commencing dusting. Alternatively, it may be advantageous to employ a conservator to dust your painting collection on a regular basis.

How often: dusting once or twice per year is usually adequate. If dust builds up particularly quickly, or more frequent dusting is necessary, consider relocating the painting or fitting it into a frame with glazing.

Tools: the best tool for dusting a painting is a soft artists' paint brush as shown in the figure on page 27. It should be approximately 5-8 cm (2-3 inches) wide, with 5 cm (2 inch) long hairs and flat. The brush hairs should be soft and springy; goat's hair or soft synthetic brushes work well. A good test for the suitability of the brush is to try it on the inside of your wrist: you should not feel any individual bristles and the action should not be too floppy or too stiff. If the brush has a metal ferrule at the base of the hairs, then wrap the metal section in several layers of masking tape to blunt the sharp edge, in case of contact with the painting. It is also useful to have a vacuum cleaner with a long hose attachment to capture the dust from a safe distance. Cover the nozzle of the pipe with a piece of fine netting or cheesecloth and tape it securely into place.

Before dusting: examine the surface of the painting thoroughly with a strong light. This can be done while the painting is on the wall, or it can be lowered onto blocks for better access. Hold the light to one side, allowing it to play across the surface from the edge – this will show up the surface texture and any loose/raised fragments of paint. Look closely across the entire surface. If you see any raised fragments or any areas that look powdery/loose, do NOT dust the painting as brushing could damage these sections. If everything looks intact however, you can proceed with caution.

Environment: dust the painting on a relatively cool day. On warm days, acrylic paint films will be softer and more susceptible to abrasion from the brush. Prepare the space by bringing in a ladder (if needed) and a bright light that can be moved around to spotlight the painting. Remove any dangling jewellery, scarves or ties, loose belts, or sharp rings and watches. Take your time and take a break if needed; some paintings are very large so a team of two people can be useful.

Dusting procedure: when ready, set up the light to illuminate the initial working area clearly. Turn on the vacuum cleaner and hold it approximately 30 centimetres (1 foot) away from the surface with one hand. Grasp the brush in your other hand, holding it around the base of the bristles. This may feel odd, but it will help to keep this hard part of the brush from scratching the paint. Starting at the top, lightly draw the brush along the top edge of the painting if the picture is



unframed (this is often the dirtiest part), brushing lightly outward from the painting and towards the vacuum nozzle. Then, on the front surface of the painting, brush in short strokes: down first then across, down and across, until that section of the painting is completed. Reposition your light and ladder if necessary and continue. If any paint flakes or materials do come loose, they should be trapped on the screen over the vacuum nozzle. Save these in a safe place (a plastic resealable sandwich bag is a good choice!) and contact a conservator as soon as possible. If you are in any doubt about the condition of the painting, stop dusting and contact a conservator for advice.



WHAT IF I HAVE A DAMAGED ACRYLIC PAINTING?

Damage and emergencies: it is not feasible to provide specific instructions to cover every possible emergency/damage scenario. However in the event of damage, it is advisable to call your insurance company as soon as possible and take photographs of the situation. If you can safely do so, try to remove the source of damage. In some cases it may be possible/advantageous to carefully move the painting to another location if, for example, water from a leaking roof is dripping onto it. In any case, avoid touching the surface of the painting and contact a conservator as soon as possible.

Aside from damage and emergencies, the following list outlines many other reasons to consult a conservator about a specific painting or the general care of your works of art.

A conservator can:

- Assess the condition of your painting(s) and provide a written condition report in preparation for loan/exhibition/transport.
- Recommend and carry out preventive measures, such as dusting, attaching backboards, improving framing, etc.
- Provide advice on the lighting and hanging of paintings.
- Assess the environmental conditions in which your paintings are displayed/stored.
- Provide advice on preparing paintings for transportation and purchasing conservation grade storage materials.
- Carry out technical examination of your painting to inform historical research or conservation treatments.
- Carry out conservation treatments such as surface cleaning, tear repair, reattachment of flaking paint and varnish removal.

Finding a conservator: most countries have their own professional associations for conservators (also known as restorers) that can provide details of professionals in your area - see the links section at the end of this booklet for lists of conservation associations that may be of use. If you are unable to locate conservators in your area, try contacting the conservation department of your national art institution as they may be able to help.

It is important that you let your insurance company know about any damage, as they will need to approve of the conservator and estimate of the work to be done. As an AXA Art client, you will be able to get advice about the best person for the job.

IMPORTANT DO'S AND DON'TS

DO

- Make sure you are adequately insured with a specialist insurer, such as AXA Art, who will be able to help in the unfortunate event of an accident, damage or theft. AXA Art insure on an agreed-value basis, so call one of AXA Art's Risk Surveyors for advice about handling and security.
- Consult a conservator if you are unsure about any aspect of the care of your acrylic paintings – including condition, storage, display, environment, transport, dusting/cleaning.
- Ensure that you display the painting with adequate hanging support and that it is located away from danger zones such as thoroughfares, and away from direct/extreme heat or moisture sources.
- Remember that acrylic paints are softer than other paints and therefore more vulnerable to surface damage, heat from lighting, materials touching the surface and dirt accumulation. Be particularly aware when you pack/wrap paintings for any purpose.
- Put in place key preventive measures such as regular inspections of the environment including lighting, temperature and relative humidity (RH), as well as a regular dusting regime (see *Dusting Acrylic Paintings*).
- Have condition reports of your paintings prepared by conservators as this will help ensure your acrylic painting collection remains in sound condition. This may be required if you transport your painting(s) between sites.
- Try to keep the environment (storage, display, transportation) as stable as possible, ideally within the extremes of 15–25°C (59–77°F) and 40–60% RH. Also be aware that rapid changes in temperature and RH can be as damaging as extreme values.
- Employ adequate alarm systems, Object ID labeling systems and photographically document your collection where possible.
- Make one employee responsible for the care of a painting whilst on display as part of a corporate collection. This person needs to ensure that cleaners or others who may come into close contact are aware of the paintings vulnerability.
- Ensure that the works are protected (see *Protection and Display*) and that nothing comes into contact with the surface if you are hosting social occasions in rooms where acrylic paintings (or other works of art) are displayed.

DON'T

- Use wet cloths/impregnated cloths for dusting the painting – as the surfaces of acrylic paintings are delicate and can be irreversibly damaged by well-intentioned individuals.
- Apply any domestic or proprietary cleaning/coating materials to the surface of acrylic emulsion paintings as this may result in permanent damage.
- Use the types of solvents used to clean oil paintings on acrylics as this can lead to permanent damage.
- Handle unframed acrylic paintings with bare hands – use cotton/vinyl or even smooth leather gloves and keep any contact with the paint surface to a minimum.
- Allow packing/storage materials to touch the surface of acrylic emulsion paintings as this poses a serious risk to the surface.
- Attach picture lights to frames as this leads to localised heating – take advice from a conservator on the best lighting for your space.
- Display/store acrylic paintings in rooms with high dust levels unless they have been protected by glazing/wrapping in polythene (storage).
- Employ a conservator or transport company without prior consent or advice from your insurance company.
- Display/store paintings in positions where they are vulnerable to damage or theft. In a corporate collection, this includes entrances/lobbies, or near open doors or windows.

AUTHORS, LINKS AND CONTACTS

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Web links

TAAMPP: http://www.tate.org.uk/research/tateresearch/majorprojects/conservation_modernpaints.htm

Modern Paints: <http://www.tate.org.uk/research/tateresearch/majorprojects/conservation.htm>

Tate Conservation: <http://www.tate.org.uk/conservation/>

Tate Transit Frame Specifications: <http://www.tate.org.uk/conservation/faqs/#7>

Tate Packing Case Guidelines – single painting: <http://www.tate.org.uk/conservation/faqs/#7>

AXA Art: www.axa-art.co.uk

AXA Art TAAMPP: <http://www.axa-art.co.uk/sps/sps019.asp>

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Links of interest

www.iiconservation.org	International Institute for Conservation (IIC)
www.incca.org	International Network for the Conservation of Contemporary Art (INCCA)
www.ecco-eu.info	European Confederation of Conservator-Restorers' Organisations (ECCO)
www.iccrom.org	International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM)
www.icon.org.uk	Institute of Conservation (ICON), UK
www.bapcr.org.uk	British Association for Picture Conservator-Restorers (BAPCR)
www.aic.stanford.edu	American Institute for Conservation (AIC)
www.cci-icc.gc.ca	Canadian Conservation Institute (CCI)
www.restauratoren.de	Verband der Restauratoren (VDR), Germany
www.sbmkn.nl	Foundation for the Conservation of Contemporary Art (SBMK), Holland

PICTURES

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Inside cover An assortment of acrylic paints, detail. Image: Joanna Fernandes © Tate 2007.

page 3 Detail of 25.4.69 by John Hoyland, acrylic emulsion on canvas, 1969. Image: Tate 2007 © John Hoyland.

page 7 Detail of Untitled 2/72 by Jeremy Moon, acrylic emulsion on canvas, 1972. Image: Tate 2007 © Estate of Jeremy Moon, courtesy Rocket Gallery, London.

page 8 Detail of 25.4.69 by John Hoyland, acrylic emulsion on canvas, 1969. Image: Tate 2007 © John Hoyland.

page 10 Fingerprints along the edges of acrylic paintings – especially on exposed priming – can easily occur if gloves are not worn when handling, and can be extremely hard to remove without affecting the paint. © Tate 2006

page 12 A magnified image of a clean section of an acrylic emulsion paint film using a Scanning Electron Microscope (SEM). Image: Joyce Townsend © Tate 2006.

page 13 A magnified image of a correspondingly dirty section of the same paint film - it is possible to see dust and dirt particles becoming embedded in the soft acrylic paint film. Image: Joyce Townsend © Tate 2006.

page 16 Carrying a small painting: wear gloves and make sure the paint surface is facing you at a safe distance away from your body and clothing. © Tate 2007.

page 17 Carrying a small painting: powder-free latex gloves are a good choice for handling paintings. Apply slight pressure to the sides of the painting with the palm of your hands and be aware of the placement of your fingertips at the back of the painting. © Tate 2007.

page 18 Carrying a large painting requires at least two people at either end, a well-planned route and some resting blocks. © Tate 2007.

page 21 Careful placement of one hand on the central stretcher bar on the reverse of the painting (if visible) can be a helpful handling position for carrying paintings, but be careful not to let your fingers touch the back of the canvas. © Tate 2007.

page 22 Out There by Bernard Cohen, acrylic emulsion on canvas, 1994-95. This painting has been fitted into a wooden travelling frame for safe transport and storage; helping to minimise the effects of handling. Image: Tate 2007 © Bernard Cohen.

page 27 Regular dusting of acrylic paintings is important. This image shows the soft-haired brush and the covered vacuum cleaner hose typically used to clean loose dust from the surface of acrylic paint. © Tate 2007.

page 28 Dr. Bronwyn Ormsby (front) and Patricia Smithen of Tate's conservation department examining Jeremy Moon's painting Untitled 2/72. Image: Tate 2007 © Estate of Jeremy Moon, courtesy Rocket Gallery, London.