



**BBC Studioworks**

# Water (Prop or Effect)



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## **1 Introduction**

BBC Studioworks values the Health & Safety of all staff, employees, customers, contractors, visitors and members of the public. The following policy outlines the responsibilities and sets the Health and Safety Policy objectives with regards to the use of Water as a prop or effect within BBC Studioworks.

## **2 Guidance**

In a studio, the use of water poses risks of contact with electricity and the potential slip hazards. Care should be taken to ensure the water source is free from contamination, including bacteriological contamination, e.g. legionella. Water treatment may be necessary if the water is retained (see separate policy and risk assessment on Legionella and water contamination).

Where water is to be used as a prop or effect, plans and a risk assessment must be provided by the person introducing the effect. This must include the type of prop or effect to be used, the competence of the operator, how this will be managed, and whether an audience will be present.

Wherever possible illusory effects will be utilised. For example, use of a liquid can be avoided by using safe substitutes such as artist painted PVC or gauze to create the illusion of a body of water.

If water is required, for example to create a pond, then consider using the absolute minimum water possible to produce the illusion; e.g. using black butyl rubber sheeting covered by no more than a couple of centimetres of water.

## **3 Rain effect**

When water is used as a rain effect the Designer must ensure that catchment facilities are sufficient to collect all the water and must also indicate their position on the floor plan. Adequate runaway provisions must be made and special precautions taken to protect electrical apparatus in the vicinity. Catchment facilities should have a capacity of at least 125% of the volume of water to be used.

## **4 Fully practical effects**

Where water is required for fully practical bathrooms, showers, kitchens etc. this must be shown on the floor plan. Such services must be installed by a suitably qualified contractor. All metal pipes must be electrically earthed. Adequate runaway facilities and precautions to protect nearby electrical fittings must be provided, thought should be given to the need for secondary catchment.

## **5 Tanks and water containers**

If it is planned to use a tank the arrangements must cover:

- Construction
- Materials to be used
- Weight
- Tank liners
- Catchment
- Testing
- Filling and emptying the tanks
- Setting
- Emergency arrangements

Any tanks built or used in a design must be adequately constructed, tested and certificated. Consideration should be given to the need for secondary catchment, e.g. the use of a 'bund' constructed of butyl rubber.

### **5.1 Floor Loadings**

Water is surprisingly heavy, for this reason the total floor loading and point loading expected should be calculated in advance so as to ensure the integrity of the studio floor (or any rostra). It is likely that any tank holding water to a depth of more than 900 mm will require a means of spreading the load. It is advisable to seek the opinion of a structural engineer in this matter

1 cubic metre of water = 1000 litres = 1 metric tonne

36 cubic feet of water weighs about 1 ton.

### **5.2 Ready Made Tanks**

Hired, ready-made tanks should be checked for suitability, adequately tested and safe for the purpose. Only prefabricated glass, plastic or metal tanks can be used, size will be limited by the weight capacity of the studio floor. All tanks must be tested for leakage prior to entering the studio.

### **5.3 Constructed Tanks**

When Designers wish to use specially constructed tanks they must ensure that the design is inherently safe (the use of glass should be avoided due to additional danger of broken glass in the case of failure) and that the weight is spread adequately. The tank must be constructed by a competent company with experience in building such tanks, and tested. The opinion of a structural engineer should be sought here.

## **5.4 Contractors**

Any reputable contractor may be employed, providing they have both engineering expertise and experience in water tank construction. Tanks must be constructed with full knowledge of the proposed production usage plus any transportation requirements. No variations should be allowed unless the whole design and usage is re-assessed.

## **5.5 Tank Liners**

Only approved reinforced butyl rubber sheeting may be used as tank liners or to create ponds. Seams and joints must be welded and the edges should be reinforced with fire-resistant material. Testing Tanks must be fully assessed in specific relation to:

- The construction itself (including any support materials)
- The quantity of water to be contained and the length of time involved
- The action required by the production.

When a tank has been tested against leakage, a signed Test Certificate must be attached to that tank. A copy of this certificate must be retained by the person conducting the test and must be available on demand.

Whenever possible testing should occur before taking the tank into the studio.

Although a tank may only be filled to within 90% of its capacity for a production item, testing for leakage must be undertaken with a full tank.

It should be the responsibility of the manufacturer or supplier to test the tank before delivery. If a tank is not certificated the Designer must ensure testing is carried out before the tank enters the studio.

A competent person can only test tank liners when in position in the studio. The process is slow and requires care. The designer must arrange for the test, bearing in mind the time required to do so safely. A signed test certificate should be attached or handed to the designer before use.

## **5.6 Secondary Catchment**

The Designer during the risk assessment process must assess the need for secondary catchment dependent on the risks of spillage or leakage. Assessment will be based on the degree of risk which will occur if a spillage or leakage occurs. Secondary catchment must be provided where there is:

- Risk of electrocution.
- The tank cannot be adequately tested before entry into a studio.

Secondary catchment should be in the form of a secondary tank or an inner liner (If an inner liner is used the tank should be tested first without it).

### **5.7 Setting**

The Designer must ensure testing occurs before any tank enters a studio, unless special arrangements have been made with the appropriate studio management.

All tanks must be set on waterproof sheeting, e.g. thick gauge PVC.

### **5.8 Filling and Emptying Tanks**

Where possible tanks should be filled as close to production as circumstances allow to reduce the risk of leakage. Tanks may only be filled to a maximum of 90% of their capacity for production use (this figure includes any displacement by items or people in the tank).

Tanks should not be left filled overnight. If they must remain filled overnight secondary catchment is advised. Alternatively, arrangements must be made with the appropriate studio management to ensure the tank is inspected regularly.

Tanks should be emptied before striking.

Be aware that filling and emptying tanks takes a long time.

### **5.9 People in tanks**

The risk assessment must address all risks to that person, including the need for removal in an emergency, e.g. by use of a harness and pulley.

## **6 Accidents**

If any accidental leakage should occur the source must be stopped immediately, the area kept clear, electrical equipment removed (or isolated) and the spillage mopped up without delay.

Any danger, caused by the leakage, must be eliminated before the production is permitted to continue. Accidental leakage is potentially hazardous and, even if there are no injuries to personnel, each incident must be regarded as a “near miss” and reported on an Accident/Incident (Near Miss)

Report Form

## APPENDIX 1: RISK ASSESSMENT WATER (PROP OR EFFECT)

The people that might be harmed: BBC Studioworks employees, contractors, public, artists

HAZARD	CONTROLS
<ul style="list-style-type: none"> <li>Electric shock due to the presence of electrical apparatus and the consequent danger to personnel as water is highly conductive</li> </ul>	<p>Secondary catchment will be in place when the risk of electrocution is present; this will be the form of an additional tank or liner</p> <p>If accidental leakage should occur the source will be stopped immediately, electrical equipment removed (or isolated)</p>
<ul style="list-style-type: none"> <li>Leakage on areas of painted floor produces an extremely slippery surface where water-based paint has been used</li> </ul>	<ul style="list-style-type: none"> <li>Precautions are taken to minimise the risk of accidental release.</li> <li>Water tanks or containers are effectively designed to ensure that they are suitable for the intended use and adequately tested for leakage prior to use.</li> <li>Secondary catchment in the form of an additional tank or liner</li> <li>All tanks will be set on waterproof sheeting, e.g. thick gauge PVC.</li> <li>Mopping apparatus will be available immediately in case of spillage</li> </ul>
<ul style="list-style-type: none"> <li>Vital technical facilities could be rendered unserviceable</li> </ul>	<ul style="list-style-type: none"> <li>Precautions are taken to minimise the risk of accidental release.</li> <li>Water tanks or containers are effectively designed to ensure that they are suitable for the intended use and adequately tested for leakage prior to use.</li> <li>Secondary catchment in the form of an additional tank or liner</li> <li>All tanks will be set on waterproof sheeting, e.g. thick gauge PVC.</li> <li>Mopping apparatus will be available immediately in case of spillage</li> </ul>

HAZARD	CONTROLS
	<ul style="list-style-type: none"> <li>If accidental leakage should occur the source will be stopped immediately, electrical equipment removed (or isolated)</li> </ul>
<ul style="list-style-type: none"> <li>Leakage could damage studio floors</li> </ul>	<ul style="list-style-type: none"> <li>Water tanks or containers are effectively designed to ensure that they are suitable for the intended use and adequately tested for leakage prior to use.</li> <li>Secondary catchment in the form of an additional tank or liner</li> <li>All tanks will be set on waterproof sheeting, e.g. thick gauge PVC.</li> </ul>
<ul style="list-style-type: none"> <li>The weight of the water may damage the studio floor</li> </ul>	<ul style="list-style-type: none"> <li>The tank will be constructed by a competent company with experience in building such tanks, and tested prior to delivery to the studio.</li> <li>The opinion of a structural engineer will be sought prior to use.</li> </ul>
<ul style="list-style-type: none"> <li>Poor design and construction of water tanks</li> </ul>	<ul style="list-style-type: none"> <li>The tank will be constructed by a competent company with experience in building such tanks, and tested prior to delivery to the studio.</li> </ul>



<b>HAZARD</b>	<b>CONTROLS</b>
<ul style="list-style-type: none"><li>• Endangerment of persons in the tank</li></ul>	<ul style="list-style-type: none"><li>• An additional risk assessment for that person will be undertaken and adequate measures will be in place to ensure their safety, including the removal in an emergency, e.g. by use of a harness and pulley.</li></ul>