

# Your AV installation - is it safe?

We look at AV installations and consider the only authoritative document, the Public Available Specification (PAS 122), published by the British Standards Institution.

This paper gives an over view of AV installations, concentrating on mounting options and taking into consideration some of the elements in the PAS 122 published in 2009.

The information contained in this paper is for guidance only and should not be used in any official capacity or as a substitute for the PAS 122, which can be obtained from the British Standards Institution: [www.bsigroup.com](http://www.bsigroup.com).

## SITE SURVEY

Before the installation takes place a Site Survey should be carried out by a competent AV company who will be carrying out the work.

## RISK ASSESSMENT

Before any work commences, a risk assessment shall be carried out in accordance with HSE Risk Assessment guidelines.

This shall include safe working practices, by the AV Company, and any risks highlighted by the customer. In any reasonably foreseeable circumstance the installation should be safe and take into consideration the following:

- Possibility of accidental pull-down force being applied to the projector or screen assembly during installation.
- The miscreant behaviour by anyone that would result in a pull-down force being applied to the projector or screen assembly during normal use.
- The risk of looking directly into the beam of a projector during or after installation.

## INSTALLATION

### Health and Safety

The AV Company carrying out the installation shall have a documented health and safety policy used as a basis



from which the implementation of safe systems of work develops.

### Structural Considerations

When mounting AV equipment it is essential to consider not only the loads being supported but any extraneous loads or forces which could be imposed. Therefore, when considering perpendicular loads a Safety Factor of 5 should be applied.

### 5:1 rule

5 multiplied by the combined mass of - complete mounting assembly + AV equipment including any peripherals being supported. Any peak loads identified in the risk assessment, such as the miscreant behaviour of someone hanging from projector or screen, should be taken into account when choosing the fixings and mounting system.

If the installer has any concerns about the integrity of the structure, the AV equipment is being mounted to, he should not continue work in that area and inform the customer in writing. In this circumstance the customer should seek advice from a structural engineer.

### Fixings and brackets

A fixing system appropriate to the

building structure shall be selected by a qualified person to ensure safe installation.

AV Equipment is generally floor/surface, wall or ceiling mounted.

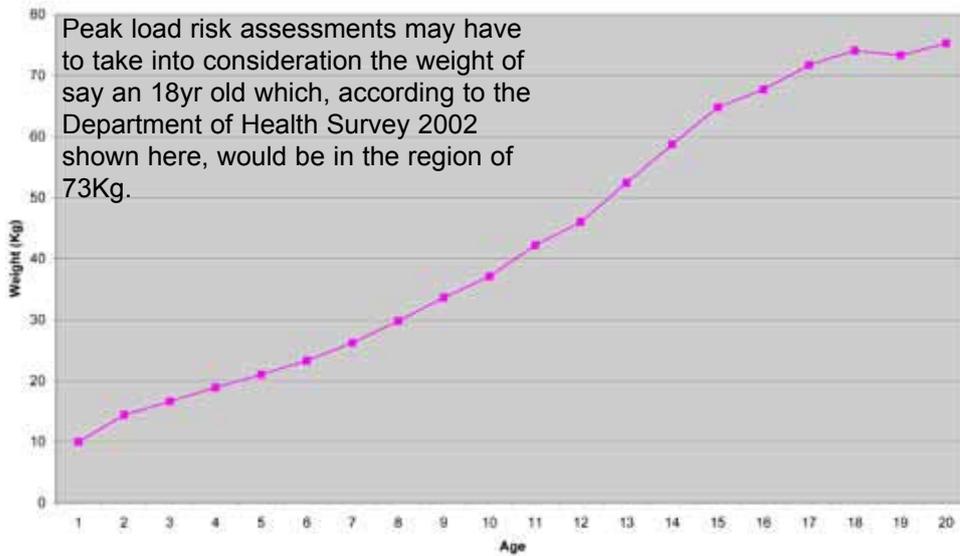
- Floor/Surface Mounted. Generally equipment is mounted on a wheeled trolley (cart) or static stand, which may be fixed to the floor structure. There are circumstances where floor and ceiling is used in combination i.e. fixed to floor



and fixed to ceiling as a continuous mounting assembly. AV equipment can also be mounted on desks or tables.

Freestanding stands or trolleys must be able to support the loads they are intended for and be able to resist horizontal forces without toppling over. Manufacturers shall have carried out a recognised static balance test.

If floor fixed stands are installed in places which are subject to overcrowding the structure and fixings should be capable of withstanding horizontal crowd loading.



Peak load risk assessments may have to take into consideration the weight of say an 18yr old which, according to the Department of Health Survey 2002 shown here, would be in the region of 73Kg.

**- Wall Mounted.** Equipment can be direct wall mounted or via an adapter bracket or one designed to stand the equipment off the wall for any specific purpose.

Careful thought must be given to ensure that the wall structure is strong enough to support the load. If the wall structure is deemed incapable of supporting the Safety Factor load imposed upon it consideration should be given to strengthening and/or stabilising the wall or adopting an alternative method of mounting, i.e. floor or ceiling suspension.

If the equipment is mounted away from the wall on an arm or extended bracket, the increased forces imposed on the fixings and wall must be taken into account. Where the length of arm extends beyond this, secondary support or bracing must be provided.



**- Ceiling Mounted.** Equipment can be mounted to the ceiling structure using an adapter bracket, or to Beams or other load bearing structures using appropriate bracketry. In high ceiling installations a suspension column is normally employed to suspend the equipment at the correct height.

Careful consideration must be given to ensure that any structure i.e. concrete ceilings, Beams, Purlins etc. are capable of supporting the Safety Factor load imposed. Structural beams should never be drilled and a clamping mount used instead.

False ceilings should not be relied upon for direct fixing unless the product has been specifically designed for that purpose i.e. small speakers or a secondary mechanism has been installed to take the load.

Where suspension columns or other means are employed to bring the equipment to the required installation height (generally 2.4M to the underside of the equipment) there are circumstances, especially with large screens, where airflow or other forces can impose horizontal loads on suspended equipment to the detriment of the fixings into the ceiling structure. The correct choice of ceiling mount and/or use of secondary bracing should be considered.



### UNICOL COMPLIANCE

UNICOL prides itself with manufacturing mounts that have always complied with stringent safety limits with no known catastrophic failure of any of its equipment in over 45 years. Much of this is due to the strength built into equipment at the design stage and the testing procedures carried out thereafter. That is why we guarantee our equipment for life against mechanical failure. The materials we use offer a gradual resilience to overloading and will collapse slowly rather than shattering as cast materials are prone to do. We rigorously test our equipment on purpose made test rigs but there is nothing like a real test by teenagers to prove it won't break, shown above. The installation remained sound even with 300 kg applied.

### CONCLUSION

We have taken a look at AV Installations concentrating on mounting options and safety issues. The new PAS 122 covers the Specification of AV Installations in a much wider sense and should be referred to by all AV Installers. We believe this specification will be a huge benefit and hopefully a stepping stone to galvanise the AV industry to set up a regulatory body to uphold the professional way we go about our business.