

# The Work At Height Safety Association

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## Technical Guidance Note 8

### **“Guidance on the selection, use, maintenance and inspection of anchor devices”**

A series of informative notes for all industries involved with work at height or rescue.

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# WAHSA technical guidance note no. 8

## Guidance on the selection, use, maintenance and inspection of anchor devices

### Introduction

This guidance note gives guidance on the selection, use, maintenance and inspection of anchor devices for work at height that meet the requirement for PPE to be subjected to a prescribed assessment procedure and CE marked as contained in the Council Directive 89/686/EEC (The Personal Protective Equipment Directive) which was enacted in UK law by The Personal Protective equipment Regulations (the PPE regulations).

While some EU countries have interpreted publications from Brussels to suggest that classes 'A', 'C' and 'D' anchor devices to EN795 are no longer considered to be PPE, DTI (now BIS - Department for Business, Innovation and Skills) have confirmed that in the UK, these devices are still considered to be PPE, and therefore still require CE marking and appropriate Category III PPE compliance, obtained through independent third party certification by a notified body.

However the European Commission take the view that anchor classes A, C & D are not considered personal protective equipment and as such do not require to be CE marked. Therefore there can be legitimate anchors used in the UK which have no CE marking.

The current BS EN 795: 2012 is for single-user anchors devices and CEN Technical Specification PD CEN/TS 16415 : 2013 is for anchors intended for use by more than one person simultaneously.

### 1.0 What is an anchor device?

A BS EN 795 or PD CEN/TS 16415 anchor device is designed to be used in a fall from height of one person (BS EN 795 anchor device) and more than one person (PD CEN/TS 16415) and any equipment carried. An anchor device can be re-used. BS EN 795 and PD CEN/TS 16415 do not cover anchor devices that are permanently fixed. A simple definition of 'fixed' is if the anchor cannot be unbolted as it is permanently fixed by rivets, studs, welds or resin bonding or cast into concrete.

A BS EN 795 or PD CEN/TS 16415 anchor device is designed to be part of a fall protection system in a fall from height and must be capable of sustaining the maximum dynamic force generated in a fall from height of one person and any equipment carried. An anchor device is designed to be removed from the structure without damaging the structure or the anchor device so that the anchor device can be reused. BS EN 795 and PD CEN/TS 16415 do not cover anchor devices that are permanently fixed. A simple definition of 'fixed' is if the anchor cannot be unbolted as it is permanently fixed by rivets, studs, welds or resin bonding or cast into concrete.

BS EN 795: 2012 and PD CEN/TS 16415 : 2013 define an anchor device and divides the anchor points into five types.

Examples of different types of anchor:

Type A - eyebolts

Type B - Tripods, Davits, Slings, Beam anchors.

Type C - Flexible horizontal anchor line.

Type D - Rigid horizontal anchor line.

Type E - Deadweight anchor for flat roofs.

The anchor device may be manufactured from metal, synthetics or be fibre rope or webbing slings. In line with other standards the thread used for sewing must be of a contrasting shade or colour to help visual inspection. Elements of the anchor device should not be able to be unintentionally detached. If the anchor device has adjustment the design must ensure that the adjustment cannot appear to be locked together when incorrectly assembled or adjusted.

The anchor device must not exceed 25kg in weight so that it can be transported by one person. Or it should break down into elements that weigh no more than 25kg.

## 2.0 When should an anchor device be used?

Anchor devices for single person or multiple person use should ideally be positioned above or level with the user. The user may then work within a prescribed area, as defined within the user instructions. Anchor devices are used for restraint, work positioning and fall arrest. Anchor devices may be used with fall arrest blocks, lanyards, man riding winches and rope access equipment. When used as part of a fall arrest system elements that reduce the dynamic force of a falling person to 6kN or less on a single user anchor point. This will be more for an anchor serving more than one person.

An anchor device tested to BS EN 795 or PD CEN/TS 16415 which may, or may not, be CE marked should always be used for fall arrest systems. If a sling is being used ensure that it is attached to fixed point of sufficient strength to hold a 12kN load. Large steel beams in good condition and secured properly are obvious points to use. If in doubt as to the strength of a structural component the user should test the strength by applying a static load of 12kN or measure the structural component and obtain engineering calculations as to the strength, multi-user anchors must be sufficiently strong to hold a static load of 12kN + 1kN for each other user.

**Note:** Handrails do not have sufficient strength to be used as an anchor point for a fall arrest system.

## 3.0 Safety Issues

Several safety issues have been raised with respect to these products. They are:

- clearance distance below anchor device
- position of anchor device
- use where the lifeline may pass over an edge during arrest
- users weight exceeding 100kg
- use of fall arrest blocks with a flexible anchor line.
- markings and labelling
- information supplied by the manufacturer

### 3.1 Clearance distance below anchor points

It is essential that enough clearance is allowed below the anchor point to allow for the full extension of the energy absorbing lanyard to arrest a fall.

The following calculation may be used as a guide to a suitable clearance distance in such situations:

$$\text{User height} + \text{lanyard length} + \text{energy absorber extension} = \text{safety margin} = \text{clearance distance}$$

$$\text{E.g: } 2\text{m} + 2\text{m} + 1.75\text{m} + 1\text{m} = 6.75\text{m}$$

### 3.2 Position of the anchor device

The preferred position of an anchor device (type A & B) in a fall arrest system is above the user or level with the users shoulders. This reduces the fall distance and therefore the dynamic force applied to the user and the fall arrest system. If the anchor device is positioned at foot level then

the user will only be arrested when the user falls past the anchor device and the element linking the users harness to the anchor device is activated. This 'free fall' of the user may damage or cause to fail elements of the fall arrest system and injure the user. Before considering this type of anchor position consult the manufacturers of all the fall arrest system elements to check on their suitability.

Some anchor devices (types C, D and E) are to be used at a position below the users' centre of gravity. Ensure all manufacturer's instructions are followed. If there is any doubt as to the position or installation of the system contact the manufacturer for clarification.

If possible use an anchor device with an offset (davit) to allow the lifeline to be vertical and to prevent the lifeline contacting an edge.

### **3.3 Use where the lifeline may pass over an edge during arrest**

The Work at Height Regulations 2005 state, "*A fall arrest system shall not be used in a manner which involves the risk of a line being cut*" (Schedule 5, Part 3). There is a risk of the lifeline snapping or cutting when it runs along (a 'pendulum fall') or over an edge and the load from a fall arrest is applied. Performance of the lifeline when used over an edge will vary dependant on the construction and material of the lifeline and the nature of the edge. For example, steel edges cause more damage to the lifeline than concrete edges and on comparable diameters of lifelines, a stainless steel lifeline is weaker when used over edges than a galvanised steel lifeline.

**Note:** Ferrules on stainless steel lifelines are copper in colour, which can assist in identification.

**The user should be aware of these hazards and must take steps to eliminate this risk.**

### **3.4 Users weight exceeds 100kg**

Testing in Europe is based upon a 100kg solid steel mass. For situations where the user and the equipment they carry is in excess of 100kg, contact the manufacturer for further advice.

### **3.5 Use of fall arrest blocks with a flexible anchor line**

Fall arrest blocks should not be anchored to a horizontal flexible anchor line unless the particular block has been proven by the manufacturer to be suitable for use with the particular type of horizontal flexible anchor line

### **3.6 Marking and labelling**

Marking of the anchor device should conform to BS EN365.

It is recommended that the anchor device is marked with the date of the next and last inspection.

### **3.7 Information supplied by the manufacturer**

The manufacturer should supply comprehensive information on the use of an anchor device. This includes details maximum loads, maximum values of deflection and displacement. Guidance for anchor devices intended to deform during deployment. For type B devices advice on the need for stability and how to achieve it. For type C devices a statement to indicate whether the anchor device can be used with a fall arrest block and maximum angles of the anchor line to intermediate anchors. For type E details on the surface permitted, distance from the edge potential hazards and combinations of equipment.

### **3.8 Information on installation**

The manufacturer should supply comprehensive information on the installation of an anchor device and guidance to be supplied after the installation. The installation documentation provides evidence that the installation has been carried out properly and is the basis of future inspection. After the installation the user should receive copies of the installation documentation that should be retained for future examinations.

The installer should provide a signed declaration to the user. It is recommended that photographs of the anchor device are provided especially where fixings are no longer visible after completing the installation.

## **4.0 Using anchor devices**

It is very important that users always read the manufacturer's instructions to ensure that the product is suitable for its intended purpose. The following critical safety measures must be addressed prior to use:

- a suitable pre-use check has been carried out
- the element which links to the users harness is suitable for the type of anchorage
- a suitable anchor is being used (strength and type of connection)
- the position of the anchor is appropriate
- sharp edges that can act on the lifeline are being avoided
- sufficient clear fall distance has been allowed
- area of fall is free from obstruction
- connector between the lifeline and the harness is fully closed and secured
- connector is secured to a suitable fall arrest attachment point on the user's harness

## 5.0 Inspections and checks

For general information about inspecting fall protection equipment see WAHSA TGN03. This indicates several types of inspection, such as pre-use checks (carried out by the user), detailed inspection (sometimes referred to as 'periodic examination') and, where required, interim inspection (see also INDG367 – HSE).

### 5.1 Pre-use checks

Before an anchor device is used carry out a full visual inspection

- the anchor device should show no signs of deformation (10mm permanent deformation is not acceptable).
- no corrosion of the base material (tarnishing and white scaling is acceptable)
- if using steel wire then it should be galvanised in accordance with ISO2232
- thread used for sewing should be a contrasting shade or colour.
- if the anchor device is equipped with a fall indicator check that it has not been activated. if the indicator has been activated quarantine the anchor device and consult the manufacturer.
- before use ensure that the anchor point is positioned correctly and adjusted correctly and is stable.
- check that the anchor point is within its inspection or service interval.

#### 5.1.1 Fibre rope, webbing and wire rope checks

Anchor strops made of wire rope, rope or webbing may be approved to EN795. The following lists the principal causes of deterioration in fibre rope, webbing and wire ropes. The anchor should be immediately withdrawn from use should any of these be evident.

##### Fibre rope

- crushing – flattened or bent section of fibre rope
- abrasion – localised wear

##### Webbing

- abrasion – localised wear
- chemical attack
- contamination
- nicks and cuts
- damaged stitching
- UV degradation (e.g. fading)

##### Wire rope

- crushing - flattened or bent section of wire rope

- cutting - damaged strands and broken wires
- abrasion - localised wear; where outer strands appear flattened and with brighter appearance
- strand core protrusion (“bird-caging”) - the central core showing with the outer strands swelling out
- kinking - deformation of wire rope
- corrosion - roughness and pitting with broken wire propagating from cracks or pitting
- electric arcing or heat damage - bluing of surface, fusion of the wire, weld spatters
- damaged thimbles and ferrules - check secure and free from damage
- damaged connector - worn, distorted, cracked, burred, dented and has sharp edges

### **5.2 Pre use checks**

These checks are essential and should be carried out each time, before the product is used. Pre-use checks should be tactile and visual and the whole item should be subject to the check. A visual check should be undertaken in good light and will normally take a few minutes.

### **5.3 Detailed Inspection**

These are the same as the pre-use checks. They must be carried out by a competent person at a set period (WAHSA recommends every 3 months). These checks must be documented and the documents kept.

### **5.4 Interim Inspection**

These are additional detailed inspections. The need for and frequency of interim inspections will depend on the use and the environment. Examples of situations where they may be appropriate include: arduous working environments involving paints, chemicals, grit blasting operations and acidic or alkaline environments. The results of interim inspections should be recorded and kept.

### **5.5 Servicing**

Some types of anchor devices (tripods, davits etc) must be serviced, inspected and re-certified by the manufacturer or an approved service company (as specified by the manufacturer) at least every 12 months, or less if deemed necessary.

**Note:** Ensure that a service company is approved by contacting the manufacturer.

## **6.0 Longevity and obsolescence of fall arrest blocks**

Advice on obsolescence will be contained within the manufacturer’s user instructions. The frequency and conditions of use together with the quality of cleaning and storage will determine the safe and effective working life of personal protection equipment (PPE).

## **7.0 Cleaning and maintenance**

When necessary, wash webbing with a mild soap solution (maximum temperature 40°C) and remove excess moisture with a clean cloth. Wiping with a mild solution of sterile disinfectant may disinfect the webbing. Allow to dry naturally.

Clean metallic items when required, with a non-caustic solution.

## **8.0 Storage**

Store the anchor device in a dry, ventilated area.

## 9.0 Rescue

A rescue plan should be formulated for the rescue of a person with the required equipment and trained personnel to carry it out. (See WAHSA TGN05).

## 10.0 Training

Users should be trained in the proper use and practical / physical limitations of an anchor device. This includes pre use checks and compatibility with other items of PPE. (See WAHSA TGN01).

## 11.0 Useful References

*The Work at Height Regulations 2005*

*BS 8437: 2005 +A1 2012 Code of practice for selection, use and maintenance of personal fall protection systems and equipment for use in the workplace*

*BS EN 360: 2002 Personal protective equipment against falls from a height - Retractable type fall arresters*

*BS EN 362: 2004 Personal protective equipment against falls from a height - Connectors*

*BS EN 364: 1993 Personal protective equipment against falls from a height - Test methods*

*BS EN 365: 2004 Personal protective equipment against falls from a height - General requirements for instructions for use, maintenance, periodic examination, repair marking and packaging*

*HSE INDG 367 Inspecting fall arrest equipment made from webbing or rope (HSE)*