

# Enhanced Requirements & Test Methods for Anti-Ligature Hardware

**DHF TS 001:2013**

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# Foreword

This standard is aimed at addressing the safety of people that may be at risk of self-harm whilst in special care environments.

It is primarily aimed at door hardware but can also include non-door mounted hardware such as coat hooks and curtain rails.

The aim is to provide personal freedom and quality of life but, at the same time, reduce the risk of self-harm by providing products where it is difficult to attach a ligature.

It must be recognised that this standard sets out to reduce the risk of self-harm and every effort has been made to take into account all possibilities but does not guarantee ligature - free hardware.

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## 1. Scope

This specification contains requirements and test methods for all door mounted hardware and other building products which are classified as anti-ligature devices, being designed to significantly reduce the risk of ligature attachment and subsequent self-harm.

Individual performance requirements are to be specified according to the application and tested separately to the appropriate criteria.

## 2. Normative references

No relevant normative references.

## 3. Definitions

For the purpose of this standard the following definitions apply:

### 3.1 Ligature

A device by which means can be used to inflict harm by restricting normal breathing or blood flow

### 3.2 Anti-ligature device

A device intended to reduce the risk of attachment of a ligature

### 3.3 Fixed hardware device

A product which performs a specific function that is fixed/ attached to a surface which has fixings that are either inaccessible or require special tools to release them

### 3.4 Load release hardware device

A product which is attached to a surface by a method which allows the products to be released from the surface when the load reaches a threshold value, below which the product performs a specific function

### 3.5 Associated mounting device

A plate, escutcheon or similar fixture by means of which the anti-ligature device is mounted and/or attached to a surface using fixings that are either inaccessible or require special tools to release them

A load releasing hardware device may often be designed to be detachable from any associated mounting device when is not load releasing

Associated mounting devices will normally be subject to the same safety tests as the fixed hardware devices

### 3.6 Test wire

A normally flexible device used to assess the anti-ligature characteristics of a device

## 4. Classification

Anti-ligature hardware shall be classified as follows:

- Test A** Fixed hardware devices and fixed mounting devices tested in multiple directions shall be classified **grades A1 to A4**
- Test B** Fixed hardware devices tested only in a downwards direction shall be classified **grades B1 to B4**
- Test C** Load release hardware devices (including fixed mounting devices which will also need to be classified against test B) shall be classified **grades C1 to C4**

## 5. Requirements

### 5.1 Fixed anti-ligature hardware

It shall not be possible to secure and hold a weight according to the relevant grade on any anti-ligature hardware when tested in accordance with clause 6.

### 5.2 Load release anti-ligature hardware

The load release anti-ligature device shall not be able to support a weight according to the relevant grade when tested in accordance with clause 6. It shall not be possible to secure and hold a weight according to the relevant grade on any associated mounting device following the removal of the load release device when tested in accordance with clause 6.

## 6. Test method

### 6.1 Hardware removal

The anti-ligature device, including any associated mounting device, shall be installed on a test block in an orientation representing its intended use (eg: for a hinge, the door shall be in the closed position). Attempts to unscrew the hardware shall be made using the following tools with a maximum torque of 6Nm applied: steel dining implements, a selection of flat blade screw drivers, Phillips and posi-head screw drivers, one set of metric and one set of imperial Allen keys, for a total of 10 minutes. All implements or tools used shall have a maximum length of 250 mm.

### 6.2 Safety

#### 6.2.1 Fixed hardware devices

The device shall be subjected to safety testing as shown in Table 1a.

##### 6.2.1.1 Test method A for multi directional devices

For fixed devices designed to resist multi directional abuse, the test wire shall be tied around the device as close as possible to the mounting fixture. For each test, starting with grade 1, the test wire (see Table 1b) will be tied in a slip knot. (See Annex A.) The required test load 'X' shall be applied by a weight, sequentially in five directions:

For vertically mounted devices: 1 - down, 2 - upward, 3 - horizontal left, 4 - horizontal right, 5 - perpendicular to the mounting surface.

For horizontally mounted devices, four tests to be carried out parallel to the mounting plane and at 90 degrees to each other and the fifth test perpendicular to the mounting face. The test shall be repeated for each grade in turn. If the wire remains attached to the anti-ligature device on any of the five directions, the test will be deemed unsuccessful at that grade and will default to the previous successful test.

##### 6.2.1.2 Test A shall be repeated using wetted cotton sterile dressing attached to the test specimen by tourniquet action.

The furniture is deemed to comply if it is not possible to attach the wetted cotton dressing to the device.

**6.2.1.3 Test method B for vertical direction devices**

For devices designed to resist abuse only in the vertical direction, the device is to be mounted in accordance with the manufacturer’s instructions, the test wire shall be tied around the device as close as possible to the mounting fixture. For each test, starting with grade 1, the test wire (see Table 1b) will be tied in a slip knot. (See Annex A.) The required test load ‘X’ shall be applied in a downward direction only. If the wire remains attached to the anti-ligature device, the test will be deemed unsuccessful at that grade and will default to the previous successful test.

6.2.1.4 Test B shall be repeated using wetted cotton sterile dressing attached to the test specimen by tourniquet action. The furniture is deemed to comply if it is not possible to attach the wetted cotton dressing to the device.

Classification	Test method	Figure
Grades A1 to A4	A: See clauses 6.2.1.1 and 6.2.1.2	Annex A part 1
Grades B1 to B4	B: See clauses 6.2.1.3 and 6.2.1.4	

**Table 1a**

	Grade 1	Grade 2	Grade 3	Grade 4
Test wire diameter	4mm	2mm	1mm	0.5mm
Test load ‘X’	0.475Kg (±0.025Kg)	0.475Kg (±0.025Kg)	0.475Kg (±0.025Kg)	0.475Kg (±0.025Kg)

**Table 1b**

**6.2.2 Load release hardware**

The device shall be subject to safety testing as show in Table 2a.

**6.2.2.1 Test method C for load release hardware**

**6.2.2.2 Vertically mounted devices**

For devices designed to be mounted on vertical surfaces, the test wire shall be tied around the device as close to the mounting fixture as is possible using a simple slip knot (see Annex A). For each test, starting with grade 1, the test load Y specified in Table 2b shall be applied by weight in one direction, being downward.

If the load release device remains attached the test will be deemed unsuccessful at that grade and will default to the previous successful test.

After the test on the load release hardware, test B shall be carried out on any associated mounting device in accordance with the relevant requirements of test method B, clause 6.2.1.

**6.2.2.3 Horizontally mounted devices**

For devices designed to be mounted on horizontal and all other non-vertical surfaces, the test wire shall be tied around the device as close to the mounting fixture as possible using a simple slip knot (see Annex A). For each test, starting with grade 1, the test load Y specified in Table 2b shall be applied by a force in a plane parallel to the mounting surface.

If the load release device remains attached, the test will be deemed unsuccessful at that grade and will default to the previous successful test.

After the test on the load release hardware, any associated mounting device shall be tested in accordance with the relevant requirements of test method B, clause 6.2.1.3

Classification	Test method	Figure
Grades C1 to C4	C: See clauses 6.2.2.2 or 6.2.2.3	Annex A part 2

**Table 2a**

	Grade 1	Grade 2	Grade 3	Grade 4
Test wire diameter	4mm	4mm	4mm	4mm
Test load 'X'	40Kg	30Kg	20Kg	10Kg

**Table 2b**

For test sequencing refer to Annex B

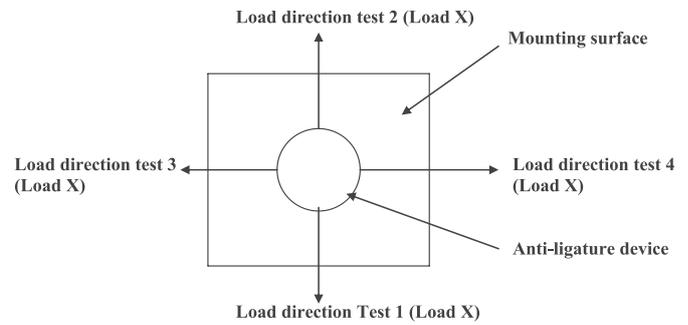
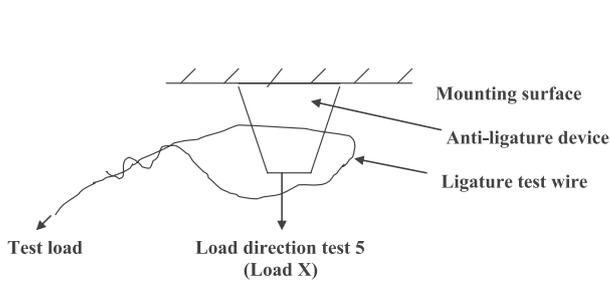
## 7. Marking

The following information shall be quoted on the labelling, packaging, literature or product:

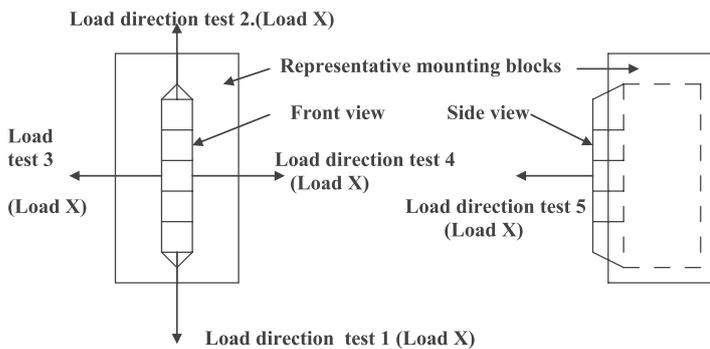
- Manufacturer's name or trademark, or other means of positive identification
- Clear product identification
- Classification according to clause 4 of this standard; in the case of load release hardware, the classifications based on the load release test C and the mounting device test B shall be declared separately
- Number and date of this standard
- Date or code relating to the date of manufacture

## ANNEX A (normative)

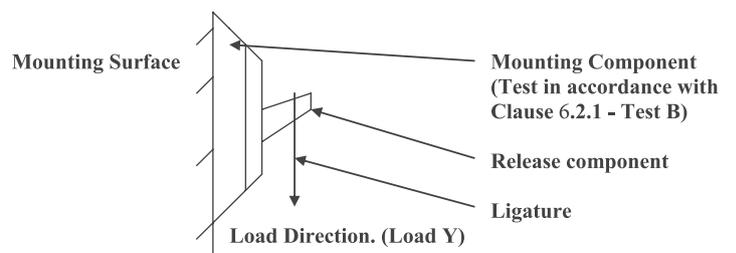
### Part 1 - Fixed Hardware Device



### Hinge test



### Part 2 - Load Release Hardware



## ANNEX B (normative)

### Test sampling and sequencing

#### Fixed hardware devices

Two test samples, (marked 1 & 2) shall be subjected to a sequence of tests as shown in the following table.

Test	Sample 1	Sample 1
1st Test	Hardware removal test as 6.1	-
2nd Test	-	Safety test as 6.2.1

#### Load release hardware devices

Three test samples, (marked 1, 2 & 3) shall be subjected to a sequence of tests as shown in the following table.

Test	Sample 1	Sample 2	Sample 3
1st Test	Hardware removal test as 6.1	-	-
2nd Test	-	Safety test as 6.2.2	-
3rd Test	-	-	Safety test as 6.2.1



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