Estates Directorate

Technical Standards

TESTING SPECIFICATION:

Testing process for fixed furniture intended for use in cells (including Safer Cells).

Standard Number: STD/X/PT/063

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ISSUE NO.	PURPOSE	DATE
001	First draft	Sept 2013
002	Initial issue	Oct 2013
003	Updated to reflect organisational changes	Mar 2017
004	Additions and amendments to cover fire resistance, water resistance and additional physical strength tests – all changes and additions shown in red text	Mar 2019
005	All changes and additions to this Issue shown in red text.	Nov 2019

Contents

FOREWORD

This Standard has been prepared by Estates Directorate (ED) Technical Standards. It does not purport to include all the necessary provisions of a contract.

SAFETY STATEMENT

Persons using this document should be familiar with normal laboratory practice, if applicable. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate health and safety practices and to ensure compliance with any regulatory conditions.

Estates Directorate will accept no liability for accidents resulting in damage or personnel injury occurring as a result of any test detailed within this document.

1. Scope

This testing process covers the testing procedure, and method of testing for fixed furniture intended for use in cells (including safer cells) only. For the testing of other products items such as sanitary ware, radiant panels, luminaires etc. please refer to the relevant testing standards.

This testing process should be used to demonstrate that the furniture tested meets the minimum requirements for locations requiring furniture which can withstand the type of wear and tear expected within the custodial environment. Domestic furniture standards are not sufficient to demonstrate that the product will meet the requirements of the custodial environment. A certain amount of deliberate abuse is expected.

It must be noted that no product should be considered as indestructible and compliance with this standard should not be taken as a guarantee of indestructibility.

Products which have been tested and deemed to meet the requirements of Estates Directorate will be added to a compliant products list. The inclusion of a product on the compliant products list does not form any kind of contract and does not guaranteed that any products will be purchased.

2. Prerequisites

Where the product to be tested is capable of achieving a CE mark it is a prerequisite that the product should have achieved a CE Mark.

Unless otherwise agreed with Estates Directorate, each product must be indelibly marked with an identifier that gives the name of the manufacturer, date of manufacture and/or a batch code or serial number that can be traced to a date and place of manufacture. Where there is a legal requirement for said product to be uniquely marked that may satisfy this requirement. The marking shall be positioned as unobtrusively as possible. It may be located within products where those products incorporate covers that are intended to be removable for routine maintenance, otherwise they shall be external.

Whilst it is not anticipated that any fixed furniture for use in cells will be upholstered, any such relevant furniture must comply with the current Furniture and Furnishings (Fire) (Safety) Regulations.

All construction materials used within offered furniture must be rated for reaction to fire as Class B to BS EN 13501.

Prior to any testing taking place, the manufacturer must have provided both the Test House and MoJ Technical Standards with all relevant product construction drawings, materials specifications and installation instructions.

Testing must be carried out by any appropriately accredited UKAS testing house in compliance with the document titled **MODEL AGREEMENT: Manufacturer / certified testing body agreement for type testing of new products** (STD/Z/PT/057).

3. Testing Approval Process

Please see the Model Agreement (STD/Z/PT057) for further details of the testing approval process.

The results of the test shall be sent to ED Technical Standards and the decision of pass/ fail will rest with them. Documentation to be included:

- Written test reports as described later in this document.
- Photographs of the testing procedure and the damage to the material/ product
- Video of the product testing

4. Testing

4.1 Testing Sections

The testing procedures fall into two categories; Material testing and Product testing. Where items of furniture are made from the same material or material assembly then the materials testing section will be deemed to comply across the range. Where the thicknesses of material differ between products then they should not be considered to be the same material or assembly and must undergo separate materials testing. Should clarification of this point be required please contact ED Technical Standards for further advice.

4.2 Ability to have remedial repairs.

Under normal conditions of use, solid surface materials may sometimes need to be renewed by sanding or polishing in cases when scratches, gouges, chips or stains have marred the surface. In every case where any of the tests in this procedure results in the need for the test specimen to be sanded or polished to return it to its original finish, then the procedure recommended by the manufacturer shall be followed. The results of the renewal treatment shall be included in the appropriate test report.

4.3 Cleaning of the Test Specimen.

If the product supplied for testing has any dirt or grease on the surface then it should be cleaned before testing.

5. MATERIAL TESTING.

Introduction.

This standard is not material specific; products which meet the requirements of this testing standard will be compliant regardless of the material that the product is manufactured from.

Material testing is to be carried out on a test sample of the material or material assembly. The size of the sample should be sufficient to conduct the tests described in the following subsections.

5.1 TEST 1. Gouging/ Abrasion Test.

Equipment.
Stanley knife with a new blade, scriber and ruler.

Test Method.

a) Using a ruler as a guide run both a Stanley knife and scriber blades over the surface of the material 10 times in the same place.
b) Using wire wool, the surface should be abraded for a period of 5 minutes.

Photographs of all results should be taken and added to the test report.

Indicative Pass/ Fail criteria.
The surface of the material must be capable of being cleaned or refinished to a serviceable quality. Any gouging marks where dirt could accumulate or would provide a sharp edge would be considered a fail.

5.2 TEST 2. Blow Lamp.

Equipment.
Table mounted blow lamp.

Test Method.
Position the blow lamp so the hottest part of the flame is on the product surface for a period of 5 minutes plus or minus 30 seconds. Remove the blow lamp any combustion apparent on the material must self extinguish within 15 seconds.

Indicative Pass/ Fail criteria.

- The material must not be capable of sustaining combustion once the blow lamp has been removed.
- The surface of the material must be capable of being cleaned or refinished to a serviceable quality.
- Any pitting, roughness or discolouration still apparent following any cosmetic reworking would be considered a fail.

Photographs should be taken of the test and added to the test report.

5.3 Test 3. Water Saturation.

3a) The first part of this test is to be carried out in conjunction with the blow lamp test and is to simulate the inundation of the cell in case of a fire.

Once the material has self extinguished, or if the material does not self extinguish after 15 seconds then water should be poured directly onto the heated surface. The material or assembly should then be checked for cracking, splitting or delamination. Other damage should be noted within the test report.

3b) A material sample representing a complete edge detail and full length of component that will normally be in contact with the floor and of a minimum of 300mm high shall be used. The test house must inspect and be satisfied that the offered sample, especially the edge detail and treatment, is representative of those of the products being offered for test. The sample shall then be placed into a waterproof tray or container of sufficient size such that the entire edge normally in contact with the floor is fully immersed in approximately 10mm of standing water. After 24 hours the sample shall be removed, dried externally with a clean cloth, and then immediately cut into a minimum of three cross-sections to assess whether any moisture has been absorbed or any delamination of materials or degradation of adhesives has occurred. The results shall be noted within the test report.

Photographs should be taken of the both parts of the test and added to the test report.

5.4 TEST 4. Cigarette Burns. (Test method derived from BS ISO 19712-3).

Equipment.
Cigarettes.

Test Method.
Ignite a cigarette and let it burn until a reasonable amount of exposed burning tobacco is available. Position burning cigarette in full contact with the product surface for a period of 5 minutes plus or minus 30 seconds. Remove the burning cigarette, any combustion apparent on the material must self extinguish within 15 seconds. It is acceptable to use the equivalent BS detailed testing equipment if it is not deemed suitable to use real cigarettes.

Indicative pass/ fail criteria.

- The surface of the material must be capable of being cleaned or refinished to a serviceable quality.
- Any pitting, roughness or discolouration still apparent following any cosmetic reworking would be considered a fail.
- The material must not be capable of sustaining combustion once the cigarette has been removed.

Photographs should be taken of the test and added to the test report.

The Materials Test Report

The test report shall contain at a minimum, the following information:

- Name and address of the test laboratory.
- Date of the test.
- Operator(s) conducting test.
- Complete description of tested materials to include chemical composition. If the material is an assembly then all parts must be detailed including the details of any adhesives or fixings used in creating composite materials.
- Complete description of any changes in the described standard test method.
- Statement of overall results which will not include any inference of a pass/ fail.
- Post-test photograph of all test specimens.

The Materials Test report may be combined into the Product Test Report if conducted concurrently by the same UKAS accredited test authority.

6. PRODUCT TESTING.

6.1 Test Rig.

The product to be tested must be mounted within the 18mm plywood test rig as shown in Appendix A for the relevant product or fixed direct to suitable solid masonry or concrete.

The product to be tested must be mounted to the manufactures installation instructions including anti pick mastic. The manufacturer should be offered the opportunity to install their product for test, but that must be overseen by the test authority to ensure that the materials, fixings and jointing details do not differ from those of the specified product and manufacturer's installation instructions.

Due to the size and nature of the testing it is expected that the plywood test rig will need to be placed against a wall, in the corner of a room or bolted to the floor to prevent the product and test rig from moving while the testing is in progress.

6.2 Stage 1 testing

These tests are to demonstrate that the furniture can withstand a low level of anticipated misuse.

Photographs should be taken of the test and added to the test report.

a. Repetitive nuisance.

Impact to simulate kicking will be done for a period of 5 minutes. This can be done using a sledgehammer swung as a pendulum, through the legs to impact the surface. Test points of appropriate height for this test can be seen in the drawings in Appendix A.

b. Static Load testing.

A mass equal to 100kg will be placed on top of the desk and the cupboards to simulate someone sitting on it. In the case of the desk this should be applied at mid span.

A uniformly distributed load of 225kg will be applied to all beds to simulate 3 people sitting on the bed.

c. Leg-press testing

In the case of bunk-beds and desks a further test should be performed to assess the ability of the base of the upper bunk or the desk top to resist attempts by prisoners to `leg-press' those components from the underside.

This shall be demonstrated and confirmed in the following manner:

- Install the desk or bunk bed in the intended manner as per manufacturer's installation instructions.
- Create a test rig around the installed prototype desk or bunk bed that can measure any deflection or upwards movement in the desk-top / upper bed base as pressure is applied from below.
- Where necessary reinforce the top of lower bunks to ensure no deflection.
- Apply pressure from below to the underside of the desk/upper bunk using a single hydraulic ram (which can be manually operated or powered) and measure the load being applied using an electronic load-cell gauge with clear digital display
- For desks, apply the pressure 200mm in from the front edge of the desk-top and 75mm inboard of a support side panel or leg. For upper bunks, apply the pressure to the centre of the bed-base. The point of contact should be spread over a block measuring 300mm x 120mm.
- Increase the pressure in increments up to and beyond 500kg.
- The expected result is for no deflection, movement or failure of desk or desk tops at any load up to 500kg. For upper bunks there should be no failure or dislodgement of the upper bunk bed base up to a load of 500kg.

6.3 Stage 2 testing.

Photographs should be taken of the test and added to the test report.

a. Minor attack testing

A standard claw hammer with metal shaft will be used to strike the most vulnerable parts of the furniture including leading edges and corners of tops, shelves and side panels. The drawings in Appendix A show some indicative test points for the following types of furniture:

- Bunk Bed
- Bed with Storage
- Bed no storage
- Single Desk
- Desk with Storage
- Desk no storage
- Wardrobe

Impacts should be applied 10 times to each item in each selected impact location in the following manner. The hammer should be held by the grip in one hand and raised so that the hammer-head is no higher than shoulder-height of the test operative and brought down onto the test item with low to moderate force using the face of the hammer head only to impact the surface. Force equivalent to initial driving-in of a nail after `starting'.

b. Minor impact testing

A sledgehammer and a crow bar will be dropped onto the surface of the furniture at the indicated points five times from heights of 1m, 2m and 3m.

6.4 Stage 3 testing

Major physical force

The furniture will be subject to an uninterrupted attack of five minutes duration with a club hammer. The club-hammer should be held in one hand. For impacts in a downwards direction onto horizontal surfaces the hammer should be raised so that the hammer-head is no higher than head-height of the test operative and be brought down onto the item with moderate force. For horizontal impacts onto vertical faces at low level the hammer should be raised so that the hammer head is no higher than waist height of the operative and/or their arm does not rise above horizontal before applying the impact with moderate force. A similar mode of attack should be used for vertical faces at higher level, such as for wall-mounted units. `Moderate force' being akin to fully `driving-home' a nail with care. The same operative must complete the entirety of this test with no relaying of fresh operatives. This test assumes that there is a full suite of furniture consisting of at least three items and that the attack time will be spread reasonably evenly amongst those items. Where fewer items are being tested the total time may be reduced on a pro-rata basis to 1 minute 40 seconds per item. The points of impact should move across the surfaces of the furniture and be applied in a continuous manner at a rate of approximately 3 impacts per 5 seconds.

At the end of the Stage 2 and Stage 3 testing there should be no sharp material produced that could be weaponised or used for self-harm and no failure of the furniture that could be used as an anchor-point for ligature attachment.

6.5 Destruction Test.

This test is not applicable to vitreous china products. A sledge hammer or other no less effective device to be used. This test is to ascertain what types of implements can be created from complete destruction of the furniture in the event of concerted indiscipline. ED Technical Standards will consider factors such as;

- Sharp shards which could be used as weapons
- Flammable substrate which could be used to propagate fire
- Large pieces of material which can be used as weapons

It is not considered that the product should be able to withstand a prolonged and concerted attack. Photographs and description of failure mode required.

7.0 Tests for ligature attachment on products

7.1 Prior to commencement of the Product Testing and throughout those tests the ability to create viable ligature attachments must be assessed taking the following clauses into account.

7.2 Prisoners who are intent on committing suicide will often attempt to do so by creating a ligature which they can anchor to the building fabric or fixed equipment within their cell. MoJ / HMPPS aims to reduce the opportunities for ligature attachment as far as is possible and in particular has done so by development of the `Safer Cell' concept.

7.3 Whilst it is important to avoid opportunities at high level for attaching ligatures, it should also be noted that an anchor point does not necessarily need to support the full body weight of a person in order to prove fatal. It merely needs to be secure enough to allow the person to self-tourniquet by continuously twisting and thereby tightening the ligature around their neck. It follows that an anchor point does not necessarily need to be at a level that will leave a person suspended clear of the floor.

7.4 Anchors may be created by forcing items into gaps and notches that are pre-existing, or apertures created by impact, burning/melting, or abrasion of an object. In some cases, the ability to create more than one anchor point, say on either side of an object, may in combination create a secure anchor although individually those anchor points might not be sufficiently secure. Anchors may also be more simply created by opportune use of features of an item or by wedging other items within or between the equipment and other building surfaces or equipment.

7.5 Clearly an object that prior to, or following, attack allows the ligature material to be tied or wrapped around it securely will fail to meet the anti-ligature criteria.

7.6 Lighter materials such as cotton/thin string, although not in themselves sufficiently strong to form a ligature, may be used to thread or feed those stronger materials around components.

7.7 Longitudinal gaps that at first glance, due to orientation or depth, do not appear to offer an opportunity to create an anchor may in fact be viable by forcing-in a knotted end of string / shoe lace and pulling it sideways in order to wedge it within that gap.

7.8 Materials used to form a ligature can include:

- **7.8.1** Strips of bed-sheet
- **7.8.2** Clothing
- **7.8.3** Wire stripped from electrical flex, etc.
- **7.8.4** Shoe laces,
- **7.8.5** String / draw string.

7.9 Items used to assist in the creation of an anchor point may include:

- **7.9.1** Paper clips / large paper clips (the ends of which may be flattened or sharpened),
- **7.9.2** Woodscrews,
- **7.9.3** Pop-rivets (stolen from workshops)
- **7.9.4** Plastic cutlery / toothbrushes

7.10 Whilst the methods and materials mentioned in this section may not be exhaustive, they should be considered as adequate for assessing whether equipment is suitably anti-ligature during tests on equipment intended for use in cells, including safer-cells.

8.0 The Product Test Report

All testing should be video recorded with audio and the video files sent to Technical Standards to ensure that the tests are fairly assessed. Photographs of the completed tests should be included within the test report.

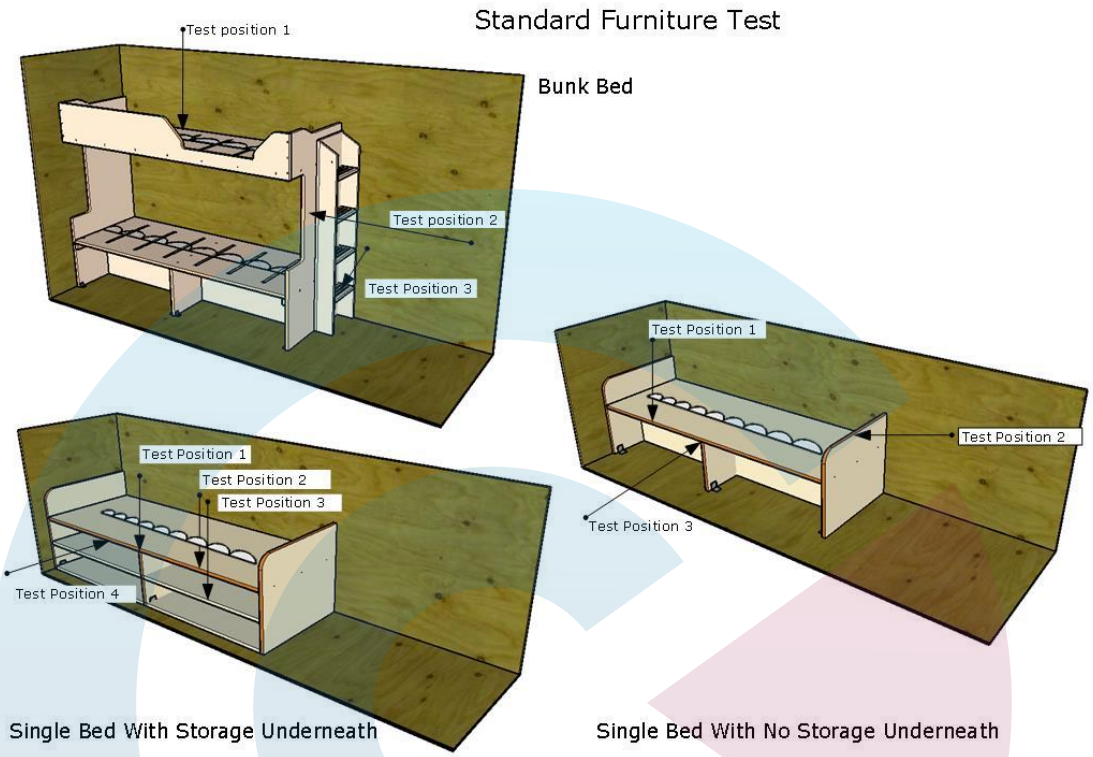
The product test report shall contain at a minimum, the following information:

- Name and address of the test laboratory.
- Date of the test.
- Operator(s) conducting test.
- Complete description of test materials.
- Complete description of the tested products, including the details of any adhesives or fixings used in the construction.
- Complete description of any changes in the described standard test method.
- Statement of overall Pass/Fail results.
- Post-test photograph of all test specimens.

The Product Test Report may incorporate the Materials Test Report if conducted concurrently by the same UKAS accredited test authority.

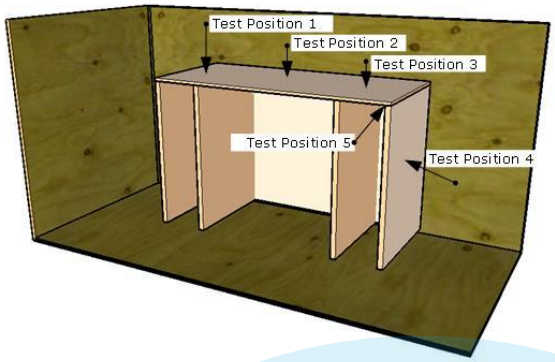
Appendix A

Furniture test points.



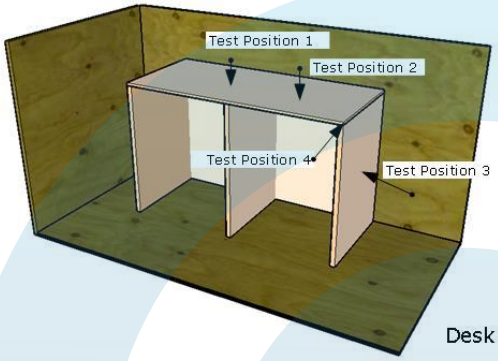
NB Test point 1 on the bunk bed is to simulate someone attempting to kick the arrester panel off and should be carried out as if the force is coming from someone on the bed.

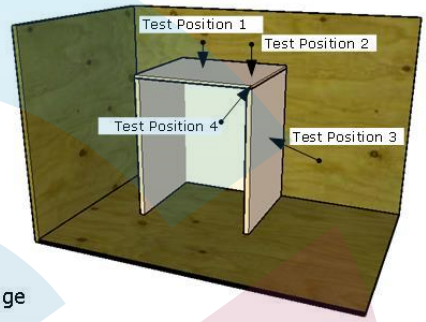
Standard Furniture Test



Desk With Storage

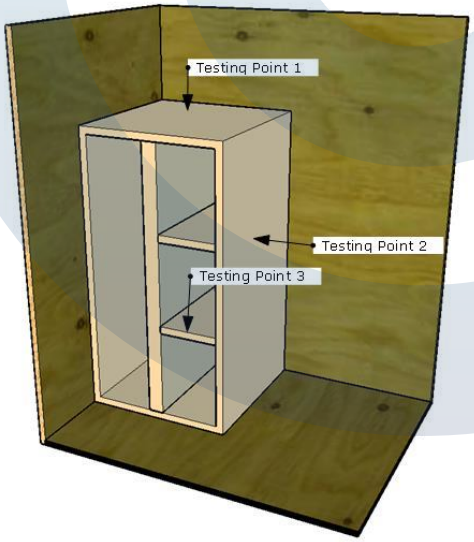
Single Desk





Desk No Storage

Standard Furniture Testing



Wardrobe with no doors