

Loss Prevention Standard

Specification for testing and classifying asset marking systems

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December 1999**

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FOREWORD

This standard identifies evaluation and testing practices for the certification and listing of asset marking systems by The Loss Prevention Certification Board.

Certification is based on the following criteria:

- a) Satisfactory performance of the marking system, in accordance with the requirements of The Loss Prevention Certification Board (LPCB) and the manufacturer's specifications.
- b) Verification by the LPCB of the establishment and maintenance of the manufacturer's quality management systems in accordance with BS EN ISO 9001:1994 quality systems or BS EN ISO 9002:1994 quality systems, as appropriate.
- c) Satisfactory product service experience.
- d) The asset marking system being linked to a secure database register certificated to LPS 1224.

PARTICIPATING ORGANISATIONS

Association of British Insurers / Lloyd's
Association of Chief Police Officers
Cabinet Office
The Loss Prevention Council

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1. SCOPE

This standard specifies requirements for the composition and performance of an asset marking system such that, when used according to the manufacturer's instructions, the asset marking device may:

- i) Enable the marked asset to be traced to the legal owner via a secure database register linked to the marking system employed.
- ii) Act as a theft deterrent in the first instance by virtue of known existence.

The standard does not specify any one particular design of marking system.

It is assumed that the part of the asset to which the asset marking device is applied is at least equal in resistance to removal from the asset as the asset marking device employed.

The two-part classification designation indicates the resistance of the product to eradication of ownership traceability and resistance to complete removal of marking without leaving evidence of previous existence. This gives the end-user the option of selecting a product to suit the required application. Complete removal of the marking and restoration of the asset gives maximum resale value to the stolen asset, however, the standard does not take into account replication or replacement of components as part of asset restoration.

Long term durability of the system and associated components are beyond the scope of this standard, as are the performance requirements of any covert marking technology incorporated in the system.

Although this standard specifies that the product instructions shall include hazard data, confirmation of the authenticity of such data is not addressed.

Requirements relating to the database register which the marking system shall be linked are described in LPS 1224.

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2. DEFINITIONS

2.1 Asset marking device

A method of securely marking or tagging an asset so as to provide visible information uniquely linking the asset, via a nominated secure database register, to the legal owner of the asset.

2.2 Asset marking system

Coalition of marking devices (either overt or overt and covert) and a secure database register used to provide traceability of a marked asset to the legal owner.

2.3 Asset identification code

Series of at least four alphabetic and/or numeric characters incorporated on an overt marking device.

2.4 Covert asset marking device

This a method of uniquely identifying legal ownership of an asset via a nominated secure database register, that when applied to an asset, it is:

- i) Secure and hidden from direct view.
- ii) Cannot be read with the unaided eye, assuming normal vision and average lighting conditions.

2.5 Fully cured state

Where an adhesive or chemical is used to attach or mark an asset, this is the state when the mark is fully cured, that is, a maximum bond / permanent mark has been achieved.

2.6 Manual intervention attack test

A manual attempt at preventing the effectiveness of the marking device.

2.7 Maximum test duration

The maximum duration of a manual intervention attack test which is the sum of the accrued working time, rest time of an operative for well being and safety reasons, time to change tools or exchange defective expendable tool elements and any inspection time.

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2.8 Maximum working time

The aggregate time of a manual intervention attack test.

Note: This includes the working time of any treatments applied during the tests in an attempt to remove or damage the integrity of the asset marking device.

2.9 Overt asset marking device

This is a method of uniquely identifying legal ownership of an asset via a nominated secure database, that when applied to an asset, it is:

- i) Secure.
- ii) Visible.
- iii) Can be read with the unaided eye, assuming average lighting conditions.
- iv) Links the asset to the legal owner.

2.10 Resistance rating

Indication of the degree of resistance of an asset marking device to manual intervention.

2.11 Secure database register

A system of recording the legal ownership of an asset using the unique asset identification code present on the marking device that is applied to the asset.

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3. DESIGN REQUIREMENTS

3.1 General

The marking system shall incorporate at least one form of overt marking device.

When installed in accordance with the manufacturer's product instructions, the overt marking device shall be secure, visible and identify the owner of a marked asset via a nominated database. The marking device shall be linked to a secure database register which shall be either:

- i) A database that meets the requirements of LPS 1224.
- ii) The DVLA register.

Note: Linking to the latter register will only be permissible providing a) the asset is a vehicle, b) the unique identification code used is the vehicle identity number (VIN) and c) the DVLA operates the register and remains a government agency.

The asset identification code shall uniquely identify the marked asset and be capable of being transferred should the owner relocate, sell or cancel ownership of the asset.

Where possible, asset marking devices shall incorporate security elements to minimize the possibility of their replication and/or substitution.

Product instructions shall be supplied with the asset marking system together with documentation relating to registration of an asset and change of details / ownership.

3.2 Overt asset marking devices

At least one overt asset marking device shall be placed in a clearly visible location so as to act as a deterrent to a potential thief.

3.3 Covert asset marking devices

If a covert asset marking device is employed within the asset marking system then the device shall be:

- i) Securely fastened to the asset.
- ii) Identify the legal owner of the asset via a nominated database using specific detection equipment.

The covert device in use shall be identifiable via the database to which the overt device is linked.

Note: The full requirements for the design and performance of covert asset marking devices are the subject of a future Loss Prevention Standard, and as such, assessment of their performance is beyond the scope of LPS 1225.

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3.4 Information to be displayed on an overt asset marking device

Information contained on an overt asset marking device shall be clearly readable with the unaided eye, assuming normal vision and average lighting conditions. All characters shall be at least 2 mm high.

The asset identification code shall be at least equal in resistance to removal as the marking device / asset on which it is printed.

Information to be present on each overt asset marking device:

- i) The asset identification code.
- ii) The LPCB certificate number and telephone number of the database that the marking device is registered on. Where this is not practical, a separate warning label or labels shall be supplied with the marking system and shall include this information. Advice regarding application of any warning label shall be included in the instructions supplied with the asset marking system.
- iii) A code to identify any covert marking device incorporated in the asset marking system.
- iv) The LPCB certificate number of the overt marking device. Where this is not practical, this information shall be displayed on any warning label as described in ii).

3.5 Information to be included on product instructions

The following information shall be included in the instructions that are supplied with the asset marking device:

- i) Limitations and recommendations for compatible substrates.
- ii) Instructions for affixing the marking device to such substrates.
- iii) Applicable resistance rating, and the scope of that rating.
- iv) Time taken for the mark to reach the fully cured state following application onto the asset and how the treated area / asset shall be protected so as to assure the performance of the marking device.
- v) Locations to which the asset marking device and any warning labels should be applied in order to act as a potential deterrent.
- vi) Procedure to be followed by the owner of a marked asset when registering, transferring or cancelling ownership of the asset.
- vii) The LPCB certification number of the asset marking device and of the secure database register(s) to which the asset marking device is linked.
- viii) Recommendations for recording and safe storage of the record of the asset marking device's unique code.
- ix) Procedure to follow in the case of theft or loss of the marked asset.
- x) Appropriate hazard data that meets COSHH requirements.

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4. INFORMATION TO BE SUPPLIED BY THE APPLICANT

4.1 General

Prior to examination and testing, an applicant shall furnish the LPCB with comprehensive information about the product for their consideration. All documents shall be dated and given a reference number and issue description. If the applicant is not the manufacturer then an application must be accompanied by written permission from the manufacturer for testing to be undertaken.

4.2 Data

The applicant shall supply the following detailed information relating to the product and hardware to be tested.

- a) Manufacturing responsibilities:
 - i) Name of manufacturer.
 - ii) Place of manufacture.
 - iii) Relationship of applicant to manufacturer.
 - iv) Company responsible for design and quality assurance.
- b) Specifications and drawings accurately detailing the asset marking device(s) incorporated in the system, including:
 - i) Data sheets for any adhesives, etching, curing or other chemical agents that affect the performance of the asset marking device.
 - ii) Material specifications for any tags, plates or stickers incorporated in the system.
 - iii) Appropriate material hazard data sheets.
- c) Instructions and specification for secure and effective installation / use of the asset marking device(s) incorporated in the system.
- d) Whether the product and hardware to be tested are prototypes or in series production.
- e) Details regarding the secure database register to which the marking device is linked:
 - i) Name of the operator.
 - ii) The LPS 1224 certificate number or application for certification of the secure database register.
 - iii) Asset registration and "change of detail" forms.
 - iv) Relationship of the applicant to the database management company.
 - v) Copy of agreement between the applicant and the database management company with respect to the device to be tested.

5. SPECIMENS TO BE SUPPLIED FOR TESTING

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Subsequent to the LPCB's acceptance of an application for certification, the following shall be observed:

- a) The applicant shall supply the agreed number of specimens.
- b) If a prototype marking device is supplied for testing, certification will not be given until the drawings for subsequent series production have been examined and confirmed that they accord with the tested prototype or that any changes will not effect the resistance rating.
- c) Additional components of some products may be requested for testing purposes.
- d) When the product incorporates advances or changes in technology, then additional specimens or components may be requested for evaluation prior to the supply of the agreed specimens.
- e) The number of specimens to be supplied for testing shall be specified by the laboratory and shall be dependent on the range and scope of application of the devices.
- f) All specimens shall be supplied complete with any associated accessories and instructions.

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6. EXAMINATION

6.1 Data

All information and drawings supplied will be reviewed to ensure suitability for test, certification and end-user purposes.

6.2 Conformity between specimen and documentation

Prior to testing, the test specimen(s) shall be visually examined for conformity with the details supplied by the applicant. A lack of conformity identified at this stage or during testing will, unless promptly corrected, prevent the granting of certification.

6.3 Design requirements

The specimens, product instructions and other information supplied by the applicant shall be reviewed against the requirements laid down in this standard in order to assess general compliance with design requirements and potential weaknesses of the system that may be exploited.

7. TESTING PROTOCOL

General laboratory procedures, confidential handling of specimens and information supplied by the applicant, event record requirements and presentation of the test report shall be in accordance with the requirements specified in EN 45001.

8. TEST OBJECTIVE AND REQUIREMENTS

8.1 General

The overall objective is to confirm the resistance rating classification of the overt asset marking device for the scope of application stipulated in the product instructions that are supplied with the asset marking device. This is achieved by conducting a series of manual intervention attack tests in order to determine both the resistance to erasure of any marking that provides traceability, with or without damage to the asset, and resistance to complete removal of the marking without evidence of previous existence.

The requirements for both phases and each resistance rating classification are given in Table 1.

8.2 Manual intervention attack testing

Using equipment from the list appropriate to the resistance rating classification expected, see Table 1, attempts are made to:

- i) Deface the overt marking device, such that the asset is no longer traceable to the legal owner, i.e. the asset identification code and any code identifying covert devices are no longer legible.
- ii) Remove the marking device and, where applicable, refurbish the asset such that there is no evidence of the asset having been marked.

Classification is determined in the fully cured state.

Table 1 Resistance rating requirements for manual intervention attack testing

Resistance rating classification	Equipment category	Maximum working time min	Maximum test duration min
1	A	0.5	0.5
2	B	1	1
3	B	3	3
4	C	5	5
5	C	10	20
6	D	15	30
7	D	30	60
8	E	60	120

8.3 Resistance rating classification

The overall classification designation achieved is given by two numerals separated by a plus sign. The first numeral represents the resistance rating to erasure of tracability and the second numeral to complete removal / asset restoration, e.g. 2+6.

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9. ATTACK EQUIPMENT

The equipment manifest for the manual intervention attack tests and the ascribed equipment category is as follows.

Equipment Category A

Manual dexterity without the aid of any tool.

Opportunist erasure of traceability or removal of an asset marking device prior to the asset being taken from a public area equipped with CCTV and with security staff in the vicinity, e.g. a busy retail premises during trading hours.

Equipment Category B

Equipment category A plus:

- Abrasive paper / cloth (various grades)
- Adhesive tape
- Axe (350mm long/1.5kg)
- Blowtorch
- Bolt cutters (500 mm long)
- Bottle opener
- Brick bolster (250mm/75mm wide)
- Camping gas stove and spare canister
- Can opener
- Claw hammer (350mm long/0.7kg)
- Cold chisel (250mm long/25mm wide)
- Cotton wool buds
- Corkscrew
- Craft / trimming knives
- Craftsman's smoothing plane
- Crowbar (700mm/2.5kg)
- Dishcloth
- Drill bits (HSS and carbide)
- Flask of hot or cold water (1.5 litre)
- Flexible plastic coupon
- Glass cutter
- Glass polishing kit
- Grinding paste
- Hacksaw and blades (HSS)
- Hammer (400mm long/1.5kg)
- Hand drill and drill bits (HSS)
- Hexagonal wrenches
- Key blanks (standard household types)
- Knives (blade 125mm x 3mm thick)
- Lighter (variable flame)
- Mallet (1kg)
- Matches
- Metal files
- Metal polish
- Padsaw
- Palette knife spatula (150mm)
- Picnic hamper style ice packs (six)
- Pincers
- Pipette
- Plate shears (300mm long)
- Pliers
- Punch
- Razor blades (single or double edged)
- Sanding block
- Scalpel
- Scouring powder
- Scissors
- Screwdrivers (range of sizes)
- Scriber
- Sewing needle and thread
- Sharpening / pumice stones
- Solder
- Spanners (range of sizes)
- Stitch cutter

Note: Equipment Category B continues.

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- String
- Spoke shave
- "Surform"
- "Superglue"
- Tweezers
- Wire
- Wire brush
- Wire wool / "Brillo" pads
- WD40
- Wood chisels (250mm x 25mm wide)
- Wood polish
- Household / trade chemicals
- (typical common quantities) such as:
 - bleach
 - cream cleaner
 - turpentine
 - white spirit
 - fluorocarbon based freeze spray

This tool kit comprises easily concealed common household or do-it-yourself items that may be employed by an opportunist in order to erase tracability or remove an asset marking device within three minutes prior to the asset being taken from a public area. The tool kit may also be employed in an attempt to remove an asset marking device prior to taking the asset from either:

- i) A manned environment such as a shop, warehouse or factory during working hours.*
- ii) Unmanned premises whose structure and building components offer a lower level of physical security than that required by security rating classification 2 of LPS 1175.*

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Equipment Category C

Equipment category B plus:

- 12Vdc cordless drill*
- 12Vdc cordless grinder*
- 12Vdc cordless jigsaw*
- 12Vdc cordless sander*
- 12Vdc cordless screwdriver*
- CO₂ extinguisher (2kg)
- Gas soldering kit
- Range of solvents including**:
- alcohol
- chlorinated hydrocarbons
- ethers
- esters
- aliphatic and aromatic hydrocarbons
- ketones

* *Each complete with a spare power pack.*

** *The minimum requirements:*

*acetone
diethyl ether
ethanol
hexane
"Methoklone"
methyl iso butyl ketone
"Shellsol" D40 (mixture of aliphatic and aromatic hydrocarbons)
toluene
111 trichloroethane*

This tool kit comprises portable items that may be employed in an attempt to remove an asset marking device from an asset prior to or after removing the asset from either:

- i) A sparsely-manned environment such as an automated warehouse or factory during working hours.*
- ii) Premises whose structure and building components offer a lower level of physical security than that required by security rating classification 4 of LPS 1175.*

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Equipment Category D

Equipment category C plus:

- Circular saw (200mm ϕ /1100W)
- Disk grinder (125mm ϕ /1100W)
- Hot air gun (1500W)
- Portable welding equipment (350A)
- Power drill (500W)
- Power planer (1000W)
- Power sander (170W)
- Reciprocating saw (500W)
- Soldering gun
- Soldering iron
- Sheet metal nibblers
- Steam generator (5litre / 2300W)

This tool kit provides a professional means of removal of an asset marking device from an asset generally following removal of the asset from a location offering a lower level of physical security than that required by security rating classification 5 of LPS 1175.

Equipment Category E

Equipment category D plus:

- Arc-air (750 litre/min STP oxygen consumption)
- Oxyacetylene welding equipment (250 litre/min STP oxygen consumption)

This tool kit is an enhancement of equipment category D.

Note: All dimensions are maximum unless otherwise specified.

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10. MANUAL INTERVENTION ATTACK TESTING

10.1 Test laboratory

The test laboratory shall be nominated by the LPCB in agreement with the applicant.

10.2 Test facility

The apparatus for the manual intervention attack tests shall consist of:

- i) A representative asset or a sample of substrate material simulating the surface of an asset in accordance with that specified by the applicant as being compatible with the marking device. Either shall be securely mounted to a suitable sub-structure in order to prevent excessive movement during testing.
- ii) Attack equipment of the appropriate category as specified in Clause 9.

10.3 Test method

Apply the asset marking device under test to the representative asset or simulated surface in accordance with the manufacturer's installation instructions and mount as described in Clause 10.2, with the mark confronting the test operative.

A series of attack tests using equipment of the appropriate category relative to the resistance rating expectation shall then be undertaken. For each attack only one test operative may be used.

Each individual attack test shall be continued until one of the following occurs:

- (i) The objective of the attack test is achieved.
- (ii) The maximum test duration is exceeded.
- (iii) It is decided to abandon the test owing to ineffectiveness for classification purposes.

Attack tests shall only be aimed at specimens which have not been damaged by a previous test to the same target area.

During each individual attack test the timing device used to measure test duration shall remain activated. The resolution of this device shall be at least 1 second. The timing device(s) used to record working time shall have a resolution of at least 0.01 second. At the conclusion of the test the aggregate working time shall be rounded to the next full second.

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12. PUBLICATIONS REFERRED TO:

BS EN ISO 9001:1994	Quality systems Model for quality assurance in design, development, production, installation and servicing.
BS EN ISO 9002:1994	Quality systems Model for quality assurance in production, installation and servicing.
EN 45001	General criteria for the operation of testing laboratories.
LPS 1224	Requirements for secure database management for use in asset marking systems.
LPS 1175	Specification for testing and classifying the burglary resistance of building components, strong points and security enclosures.

For undated references the latest edition of the publication referred to applies.