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# NSA/CSS Requirements for Optical Destruction Devices



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## 1 Introduction

Optical destruction devices must pass an evaluation by meeting requirements set by the National Security Agency/Central Security Service (NSA/CSS) to sanitize classified optical storage devices. Secondly the operational, administrative, power, safety, environmental and mechanical areas will be evaluated to minimize the potential risk.

If the evaluation yields acceptable results, then the NSA/CSS will include the device in the next release of the "NSA/CSS Evaluated Products List for Optical Destruction Devices." The Evaluated Products List (EPL) is meant to serve as guidance; inclusion in this document is not an endorsement by the NSA/CSS or the U.S. Government. **All listed products on the EPL sanitize Top Secret/Sensitive Compartmented Information (TS/SCI) and below.**

## 2 Purpose and Use

This document should be used by a vendor of optical destruction device as a guide for the NSA/CSS evaluation. For a vendor's product to be included in the "NSA/CSS Evaluated Products List for Optical Destruction Device," it must satisfy all requirements in this document and go through an evaluation performed by the Center for Storage Device Sanitization Research (CSDSR). During an assessment, the optical destruction device will be evaluated against a random assortment of storage devices which the vendor claims it sanitizes.

## 3 Definitions

- **Center for Storage Device Sanitization Research (CSDSR):** The office that guides the sanitization of information system (I.S.) storage devices for the NSA/CSS.
- **Evaluated Products Lists (EPL):** A list managed by the CSDSR lists sanitization/destruction equipment that meets NSA/CSS specifications. These lists apply to all NSA/CSS elements and pertain to all I.S. storage devices utilized by NSA/CSS elements, contractors, and personnel.
- **Evaluator:** The destruction engineer performing the evaluation.
- **Impulse noise:** A category of (acoustic) noise that includes almost instantaneous sharp sounds.
- **Jam:** The instance of a device seizing or becoming stuck through an operation. The CSDSR considers a machine jammed when the operator must manually interfere with unjamming or resetting the device. Any automatic unjamming systems will be regarded as a part of the device's operation as long as the operator does not need any significant interference.
- **Operator:** The person using the hard disk drive destruction device to perform the destruction of the hard disk drive.
- **Optical Destruction Device:** A machine that will destroy an optical storage device so that no classified information can be extracted.
- **Optical Storage Media:** Optical storage Media store and read data using light, often recording information on an optical disk. The most common optical storage types are read and write C.D.s, DVDs, and Blu-ray discs.

## 4 General Requirements

### 4.1 Destruction

The optical destruction device must have the ability to sanitize optical storage media (through grinding, milling, cutting, disintegrating, or knurling) for:

- C.D.s to a maximum edge size of 5 millimeters or less
- DVDs and B.D.s to a maximum edge size of 2 millimeters or less

For more information (see [reference a](#)).

### 4.2 Operational Time

The optical destruction device must operate continuously for 1 hour while destroying at least 100 various optical storage devices made by multiple manufacturers. The optical storage device may jam up to 3 times during the hour; however, a jam must be cleared within 5 minutes.

### 4.3 Optical Device Types

An optical destruction device may be able to destroy all or some of these optical storage media:

- C.D.s
- DVDs
- Blu-ray Disks (B.D.)

## 5 Administrative Requirements

### 5.1 Labels

The optical destruction device must have a label that can be easily viewed and includes:

- Company Name
- Model Number
- Serial Number

### 5.2 Feature Claims

Vendors of optical destruction devices must clearly state in their documentation all media the machine is capable of destroying. The NSA/CSS will not test the device for capabilities unclaimed by the vendor, nor will NSA/CSS approve untested media destruction capabilities. Failure to claim a requirement may result in disqualification for evaluation.

### 5.3 User/Operator Guide

The optical destruction device must have an English version of the user/operator manual. The manual must include the following:

- An accurate description of the optical destruction device.
- A list of optical storage devices and any other media it will destroy.
- An accurate summary of all features and functions.
- List of specifications (i.e., power consumption, motor size, etc.)
- Operator allowed maintenance procedures that do not alter calibration:

- Changing Filters
- Removing a jam
- Lubrication
- Safety procedures

## 6 Power Requirements

### 6.1 Electronic Operation

The optical destruction device will only be approved for a power source that is evaluated in testing. Every power source for a unit must be individually tested to claim approval.

### 6.2 Manual Operation Force

A manually powered hard disk drive destruction device must take less than 30 Newtons of force by a human operator to destroy the media.

### 6.3 On/Off Mechanism

If the optical destruction device must have an on/off mechanism that an operator can use safely.

**NOTE:** If your device does not have an emergency stop mechanism, this on/ off mechanism must follow all the functions outlined in the [7.1 Emergency Off section](#).

### 6.4 Power Indication

The optical destruction device must have a power-on indication display that the operator can see.

**NOTE:** some devices that are not electrically powered may be excluded from this requirement.

### 6.5 Ready Indication

If the optical destruction device requires a warm-up period before the operation, it must have a ready indication display.

## 7 Safety and Environmental

### 7.1 Emergency Off

The optical destruction device must have an emergency stop mechanism that is identified. This stopping mechanism should be initiated in a single human action and override all other functions without hindering protective functions (see [reference f](#)). The stop mechanism must be within 0.5 meters from the location where the storage media is fed into the machine for sanitization. Disengaging the emergency stop mechanism should not start the machine. The emergency procedure must be documented, which should include directions on how to reset the device.

**NOTE:** some devices that are not electrically powered may be excluded from this requirement.

### 7.2 Operator Protection

The optical destruction device must protect the operator. The operator must not contact any moving parts or projectiles during the operation of the optical destruction device. The optical destruction device must be in an enclosed chamber

that will not allow the destruction mechanism to work until a door is closed, totally enclosing the optical destruction device.

### 7.3 Reverse

An optical destruction device with an automatic feeder for optical media must either automatically or manually allow the optical media to be reversed and extracted.

### 7.4 Debris Collection

The internal design of the optical destruction device must deposit the majority (95%) of the particles into the debris bin.

### 7.5 Debris Full

The optical destruction device must have a full debris indicator and must automatically shut off. This must be an actual measurement of the level of debris in the bin and not based on time or other criteria.

### 7.6 Debris Handling

The optical destruction device must have the ability for the operator to remove and empty the debris quickly.

### 7.7 Noise

Sound levels for the device must meet both the National Institute for Occupational Safety and Health (NIOSH) and the Occupational Safety and Health Administration (OSHA) standards ([reference b and c](#)). CSDSR requires the sound level of devices that create impulse noise to be less than 120 dB. Machines that make continuous noise must follow Table 1 - Permissible Noise Exposures. Since the operation time of devices varies among users, the CSDSR requires the sound level for these devices to be less than 85 dBA.

Table 1: Permissible Noise Exposures

| Duration per day, hours | Sound level dBA slow intervals |
|-------------------------|--------------------------------|
| 8                       | 90                             |
| 6                       | 92                             |
| 4                       | 95                             |
| 3                       | 97                             |
| 2                       | 100                            |
| 1 ½                     | 102                            |
| 1                       | 105                            |
| ½                       | 110                            |
| ¼ or less               | 115                            |

## 8 Mechanical

### 8.1 Fit and Finish

The optical destruction device should have a tight fit with no gaps greater than 2 millimeters between panels, loose panels, faulty doors, loose windows, or sharp edges that could cause safety or operational issues.

The optical destruction device must be a production unit, and all claimed features should be operational. Special features for service engineer diagnoses are allowed but should not be available to the operator.

## 8.2 Vibration

The effects of vibration can be severe. Unchecked vibration can accelerate rates of wear (e.g., reduce bearing life) and damage equipment. Vibrating machinery can create noise, cause safety problems and lead to degradation in plant working conditions.

The machine must not exhibit vibration velocity in the unsatisfactory or unacceptable range shown below in Table 2. The unsatisfactory or unacceptable ranges differ among the four different listed machine classes:

- Class A: small machines to 15 kW
- Class B: 15-75 kW on light foundations and 15-300 kW on heavy foundations
- Class C: above 300 kW on heavy and rigid foundations
- Class D: above 300 kW on flexible foundations (soft mount).

The measurements will be taken at locations around the device using a digital vibration instrument.

**Table 2: Vibration Severity**

| Vibration Severity                 |         |       |                |                |                |                |
|------------------------------------|---------|-------|----------------|----------------|----------------|----------------|
|                                    | Machine |       | Class A        | Class B        | Class C        | Class D        |
|                                    | in/s    | mm/s  |                |                |                |                |
| Vibration Velocity V <sub>ms</sub> | 0.01    | 0.28  | Good           | Good           | Good           | Good           |
|                                    | 0.02    | 0.45  | Good           | Good           | Good           | Good           |
|                                    | 0.03    | 0.71  | Good           | Good           | Good           | Good           |
|                                    | 0.04    | 1.12  | Satisfactory   | Good           | Good           | Good           |
|                                    | 0.07    | 1.80  | Satisfactory   | Satisfactory   | Good           | Good           |
|                                    | 0.11    | 2.80  | Unsatisfactory | Satisfactory   | Satisfactory   | Good           |
|                                    | 0.18    | 4.50  | Unsatisfactory | Unsatisfactory | Satisfactory   | Satisfactory   |
|                                    | 0.28    | 7.10  | Unacceptable   | Unsatisfactory | Unsatisfactory | Satisfactory   |
|                                    | 0.44    | 11.20 | Unacceptable   | Unacceptable   | Unsatisfactory | Unsatisfactory |
|                                    | 0.70    | 18.0  | Unacceptable   | Unacceptable   | Unacceptable   | Unsatisfactory |
|                                    | 0.71    | 28.0  | Unacceptable   | Unacceptable   | Unacceptable   | Unacceptable   |
|                                    | 1.10    | 45.0  | Unacceptable   | Unacceptable   | Unacceptable   | Unacceptable   |

| Key            |          |
|----------------|----------|
| Good           | Green    |
| Satisfactory   | Orange   |
| Unsatisfactory | Red      |
| Unacceptable   | Dark Red |

Note: Table 2 is based on the general guidelines from International Organization for Standardization (see [reference e](#)).

## 8.3 Heat Generation

ASTM C1055 (the Standard Guide for Heated System Surface Conditions that Produce Contact Burn Injuries) recommends that surface temperatures remain at or below 44°C (see [reference d](#) and Table 3 below).

**Table 3: Thermal Sensations and Associated Effects Throughout Range of Temperatures Compatible with Tissue Life**

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| Sensation      | Skin Color            | Tissue Temperature |        | Process             | Injury       |
|----------------|-----------------------|--------------------|--------|---------------------|--------------|
|                |                       | deg. C             | deg. F |                     |              |
| Numbness       | White                 | 72                 | 162    | Protein Coagulation | Irreversible |
|                | Mottled Red and White | 68                 | 140    |                     |              |
| Maximum Pain   |                       | Bright Red         |        | 64                  | 111          |
|                | 60                    |                    |        |                     |              |
| Severe Pain    | Light Red             | 56                 | 93     | Normal Metabolism   | None         |
| Threshold Pain |                       | 52                 |        |                     |              |
| Hot            | Flushed               | 48                 | 93     | Normal Metabolism   | None         |
| Warm           |                       | 44                 |        |                     |              |
|                |                       |                    | 40     |                     |              |
|                |                       | 36                 |        |                     |              |
|                |                       | 32                 |        |                     |              |

At that temperature, the average operator can touch a 44°C surface for up to six hours without causing damage to the skin. Heat measurements will be taken in various places on each side of the machine, and no measurement should be above 44°C. Measurements will be taken inside the machine in areas that the operator can access (e.g., to empty debris, perform maintenance, reset motors, etc.). Warning labels must be visible if the temperature in these locations can exceed 44°C. No temperature above 60°C in accessible areas will be allowed.

### 8.4 Calibration or Maintenance

Any machine will require calibration and maintenance during its lifetime. All calibration or maintenance tasks performed by the operator must be safe and easily accomplished. Some specific requirements:

- Unit jams must be cleared within 5 minutes.
- Filters must be changed within 5 minutes without using special tools.
- A thermally induced shutdown of a device operation must last no longer than 10 minutes to reset and permit regular operation.
- Lubricant should be able to be applied, refilled, or replaced within 5 minutes.

## 9 References

- a. [NSA/CSS Policy Statement 9-12](#), “NSA/CSS Storage Device Sanitization Manual”
- b. [OSHA 1910.95](#), “Occupational noise exposure.”
- c. [NIOSH Publication Number 98-126](#), “Occupational Noise Exposure”
- d. [ASTM C1055](#), “the Standard Guide for Heated System Surface Conditions that Produce Contact Burn Injuries”
- e. [ISO 20816](#), “ISO 20816 Mechanical vibration” — Measurement and evaluation of machine vibration
- f. [ISO 13850](#), Safety of machinery – Emergency Stop Function – Principles for design