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NSA/CSS Requirements for Hard Disk Drive Destruction Devices



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1 Introduction

Hard disk drive destruction devices must pass an evaluation by meeting requirements set by the National Security Agency/Central Security Service (NSA/CSS) to destroy classified hard disk drives. Note, when used on their own, hard disk drive destruction devices do not sanitize magnetic storage devices. Secondly the operational, administrative, power, safety, environmental and mechanical areas will be evaluated to minimize 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 Hard Disk Drive Destruction Devices." The Evaluated Products List (EPL) 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 hard disk drive destruction devices as a guide for the NSA/CSS evaluation.. For a vendor's product to be included in the "NSA/CSS Evaluated Products List for Hard Disk Drive Destruction Devices," 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 evaluation, the hard disk drive destruction device will be evaluated against a random assortment of storage devices which the vendor claims it destroys.

3 Definitions

- **Center for Storage Device Sanitization Research (CSDSR):** The office that guides the sanitization of information system (IS) storage devices for the NSA/CSS.
 - **Evaluated Products Lists (EPL):** A list managed by the CSDSR that identifies sanitization/destruction equipment that meets NSA/CSS specifications. These lists apply to all NSA/CSS elements and pertain to all IS storage devices utilized by NSA/CSS elements, contractors, and personnel.
 - **Evaluator:** The destruction engineer performing the evaluation.
 - **Hard Disk Drive Destruction Device:** A device that can deform the platter(s) of a hard disk drive so classified data cannot be extracted without an exceptional effort.
 - **Hard Disk Drive:** A hard disk drive (sometimes abbreviated as a hard drive, HD, or HDD) is a sealed non-volatile magnetic storage device containing one or more disks (sometimes referred to as platters) coated with magnetic material. Data is stored in the magnetic coating in the form of magnetic patterns, which are written and read by magnetic heads which move rapidly over the spinning disks. Disk drives come in many physical shapes, known as form factors. Currently, the typical hard disk drive form factors are:
 - 3.5" form factor used in desktop computers and data centers
 - 2.5" form factor used in laptop computers and other portable applications, and some data centers
- NOTE:** For this document, the hard disk drive definition does not include electronic storage devices or solid-state storage devices commonly known as SSDs.
- **Impulse noise:** A category of (acoustic) noise that includes almost instantaneous sharp sounds.
 - **Jam:** The instance of a device seizing or becoming stuck through the 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 viewed as a part of the device's operation as long as the operator does not need any significant interference.

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- **Magnetic storage device:** Generalized device containing a magnetic medium on which information is stored in magnetic patterns.
- **Operator:** The person using the hard disk drive destruction device to perform the destruction of a hard disk drive.

4 General Requirements

4.1 Destruction

A hard disk drive destruction device has the ability to deform the platter(s) of a hard disk drive in 30 seconds or less by bending, punching, or waffling. For more information (see [reference a](#)).

4.2 Operational Time

The hard disk drive destruction device must operate continuously for one hour while destroying at least 100 hard disk drives made by various manufacturers. The disk drive destruction device may jam up to 3 times during the hour; however, a jam must be cleared within 5 minutes.

4.3 Hard Drive Types

A hard disk drive destruction device needs to be at least able to destroy these hard disk drive:

- 3.5" form factor used in desktop computers and data centers
- 2.5" form factor used in laptop computers and other portable applications, and some data centers

5 Administrative Requirements

5.1 Labels

The hard disk drive 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 hard drive 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 media unclaimed by the vendor, nor will NSA/CSS approve untested media destruction capabilities. Failure to claim a requirement in the documentation may result in disqualification for evaluation.

5.3 User/Operator Guide

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

- An accurate description of the hard disk drive destruction device
- List of hard disk drives and other media it will destroy
- An accurate summary of each feature and function
- List of specifications (i.e., power consumption, motor size, etc.)
- Operator allowed maintenance procedures that do not alter calibration:

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

6 Power Requirements

6.1 Electronic Operation

The hard disk drive destruction device will only be approved for a power source evaluated in testing. Every power source for a hard disk drive destruction device must be individually tested to claim approval.

6.2 Manual Operation Force

A manually powered hard disk drive destruction device must take less than 300 Newtons of force by a human operator to destroy the media.

6.3 On/Off Mechanism

The hard drive destruction product 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 hard disk drive destruction device must have a power-on indication display visible to the operator.

6.5 Ready Indication

If the hard disk drive 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 hard drive 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 operations (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 hard disk drive destruction device must protect the operator. The operator must not come into contact with any moving parts or projectiles during the operation of the device. The destruction mechanism must be in an enclosed chamber that will not allow the destruction operation to function until the section is sealed.

7.3 Deformed Hard Drive Handling

The operator must have the ability to remove the deformed hard disk drive easily.

7.4 Debris Collection

Any debris that is created during the deformation process must be collected in a bin.

7.5 Debris Handling

The operator must have the ability to remove and empty the debris quickly.

7.6 Noise

Sound levels for the device must meet both the National Institute for Occupational and Health (NIOSH) and the Occupational Safety and Health Administration (OSHA) standards (see [references 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 operation time varies among users, the CSDSR requires the sound level of 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 Requirements

8.1 Fit and Finish

The hard disk drive 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 hard disk drive destruction device should be a complete 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 inadequate or inappropriate 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).

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

Table 2: Vibrations Severity

Vibration Severity						
Vibration Velocity V _{ms}	Machine		Class A	Class B	Class C	Class D
	in/s	mm/s				
	0.01	0.28				
	0.02	0.45				
	0.03	0.71				
	0.04	1.12				
	0.07	1.80				
	0.11	2.80				
	0.18	4.50				
	0.28	7.10				
	0.44	11.20				
	0.70	18.0				
	0.71	28.0				
	1.10	45.0				

Key	
Good	
Satisfactory	
Unsatisfactory	
Unacceptable	

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

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

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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 required calibration or maintenance tasks performed by the operator must be safe and easy to perform. Some specific requirements:

- Unit jams must be cleared within 5 minutes.
- The machine must be able to reset within 10 minutes after a thermally induced shutdown.

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