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# NSA/CSS Requirements for Punch Tape Disintegrators



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## 1 Introduction

Punch Tape Disintegrators must pass an evaluation by meeting the National Security Agency/Central Security Service (NSA/CSS) requirements to destroy punched (key) tape. The operational, administrative, power, safety, environmental and mechanical areas of the device will be evaluated by the NSA/CSS to minimize potential risk.

If the evaluation yields acceptable results, the NSA/CSS will include the device in the next release of the "NSA/CSS Evaluated Products List for Punch Tape Disintegrators." 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 sanitize on the EPL Top Secret/Sensitive Compartmented Information (TS/SCI) and below.**

## 2 Purpose and Use

A vendor should use this document as a guide for the NSA/CSS evaluation. For a vendor's product to be included in the "NSA/CSS Evaluated Products List for Punch Tape Disintegrations," 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 punch tape disintegration will be evaluated against a random assortment of storage media which the vendor claims it disintegrates.

## 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.
- **Impulse noise:** 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 viewed as a part of the device's operation as long as the operator does not need any significant interference.
- **Operator:** The person using the punch tape disintegrator to perform the destruction of punch tapes.
- **Paper:** Paper is a material manufactured in thin sheets from the pulp of wood or other fibrous substances, used for writing, drawing, printing on, or wrapping material. Paper is categorized by thickness, weight, and size.
- **Punch (Key) Tape Disintegrator:** Mechanical device that will reduce plastic and paper/plastic laminate punched tape to a small enough size so that classified data cannot be extracted.
- **Punched (key) tape:** Punched tape or perforated paper tape is a form of data storage consisting of a long strip of paper in which holes are punched. Now virtually obsolete, it was widely used during much of the 20th century by governments to store cryptographic keys.

## 4 General Requirements

### 4.1 Disintegration

The punch tape disintegrator must reduce plastic and paper/plastic laminate punched (key) tape materials to 2.5 millimeters by 0.5-millimeter edge size or less (see [reference a](#)).

### 4.2 Operational Time

The punch tape disintegrator must operate continuously for 1 hour while destroying at least 20 feet of punch (key) tape from various manufacturers. The punch tape disintegrator may jam up to 3 times during the hour; however, a jam must be cleared within 5 minutes.

## 5 Administrative Requirements

### 5.1 Labels

The punch tape disintegrator must have a label that can be easily viewed and includes:

- Company Name
- Model Number
- Serial Number

### 5.2 Feature Claims

Vendors of punch tape disintegrators must clearly state all media the disintegrator can destroy in their documentation. 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 punch tape disintegrator must have an English version of the user/operator manual. The manual must include the following:

- An accurate description of the punch tape disintegrator.
- A list of storage media that the device can disintegrate.
- 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 punch tape disintegrator will be approved for any power source evaluated during testing. Every available power source for a punch tape disintegrator must be individually tested to claim approval.

## 6.2 Manual Operation Force

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

## 6.3 On/Off Mechanism

The punch tape disintegrator must have an On/Off mechanism that an operator can use safely.

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

## 6.4 Power Indication

The punch tape disintegrator must have a power indicator that the operator can see.

## 6.5 Ready Indication

If the punch tape disintegrator requires a warm-up period before the operation, it must have a ready indication display.

# 7 Safety and Environmental

## 7.1 Emergency Off

The punch tape disintegrator 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 of where the storage media is fed into the machine for destruction. 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 punch tape disintegrator must protect the operator. The operator must not contact any moving parts or projectiles during the operation of the paper disintegrator. The punch tape disintegrator must be in an enclosed chamber that will not allow the destruction mechanism to work until a door is closed.

## 7.3 Reverse

A punch tape disintegrator that feeds the punched tape into an input chute must either automatically or manually allow the reverse operation.

## 7.4 Debris Collection

The internal design of the punch tape disintegrator must deposit the majority (99%) of the particles into the debris bin.

## 7.5 Debris Full

The punch tape disintegrator must have a full debris indicator and must automatically shut off. This must be an actual measurement of the bin's level of debris and not based on time or other criteria.

## 7.6 Debris Handling

The punch tape disintegrator operator must have the ability 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 (see [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 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 punch tape disintegrator should have a tight fit with no gaps (more significant than 2 millimeters) between panels, loose panels, faulty doors, loose windows, or sharp edges that could cause safety or operational issues.

The punch tape disintegrator should be a complete production unit, and all 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 (i.e., 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				

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Vibration Velocity Vms	in/s	mm/s	Class A	Class B	Class C	Class D
	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 4 below).

**Table 4: 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	140		
Maximum Pain		Bright Red		64	Thermal Inactivation of Tissue Contents
Severe Pain	Light Red	60			
Threshold Pain		56			
Hot	Flushed	52	111	Normal Metabolism	Reversible
		48			
Warm		44	93		None
		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 measurement 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 has access to (i.e., to empty debris, perform maintenance, resetting motors, etc.). Warning labels must be visible if the temperature in these locations can exceed 44°C. No temperature above 60°C inaccessible areas will be allowed.

## 8.4 Calibration or Maintenance

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

- Unit Jam must be cleared within 5 minutes.
- Filters must be changed within 5 minutes without using special tools.
- 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