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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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Paper machinery - Safety requirements

造纸机械 安全要求

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1 Scope

This document defines the terms and definitions related to paper machinery. It specifies safety requirements, measures, and usage information. A hazard list and explanations are provided. Appropriate safety verification methods are described.

This document applies to the design, manufacture, use, disposal, and verification of paper

machinery.

2 Normative references

GB/T 150

GB/T 1251.1

GB 2893

GB 2894

GB/T 3766

GB/T 3836.1

GB 4053

GB/T 4208-2017

GB 5083-2023

GB/T 5226.1-2019

GB/T 7247.1

GB/T 23821-2022

GB/T 25078.1

GB/T 25285.1

GB/T 28386

GB 28526-2012

GB/T 30174

GB/T 31104

GB/T 33579

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB/T 30174 and QB/T 1693, as well as the followings apply.

3.1 Paper machinery

A series of mechanical equipment systems that use wood, straw, and other materials as raw materials to produce pulp and paper products.

NOTE. This includes pulping, papermaking, and finishing machinery.

3.2 Crawl speed

The minimum operating speed of the machine.

NOTE. The crawling speed varies between different machines, but is generally no greater than 0.25 m/s (15 m/min).

3.3 Hold-to-run control device

A control device that can only be triggered and maintain machine function when the manual controller (actuator) is activated.

[Source. GB/T 15706-2012, 3.28.3]

3.4 Inrunning nip

Dangerous points formed by the clamping of rotating rollers, drying cylinders, or other cylindrical objects that could trap a person, body part, or clothing.

NOTE. The following situations where a sufficient safe distance cannot be maintained may have inrunning nip.

- a) Between parts that rotate in opposite directions;
- b) Between rotating parts and fixed, adjustable parts;
- c) Between parts that rotate in the same direction but have different linear velocities and/or surface properties.

See Figure 1 for the inrunning nip.

3.7 Perimeter fence

A protective device to prevent entry into dangerous areas.

NOTE. Where space permits, the minimum height is 1.4 m, and the maximum clearance between the ground and the lower edge is 0.4 m. This definition does not cover fall protection.

4 List of hazards

The list of hazards covered in this document is provided in Annex A. The hazards in Table A.1 are determined according to the risk assessment in GB/T 15706-2012, and measures are taken to reduce the risks.

5.1.1.1 Protective devices and safety devices shall comply with GB/T 15706-2012.

design or selection of protective devices shall comply with GB/T 8196. Interlocking protective devices shall comply with GB/T 18831. Electrically sensitive protective devices shall comply with GB/T 19436.1. Pressure-sensitive pads shall comply with GB/T 17454.1. The color of protective devices shall not be used as signal color.

5.1.1.2 The requirements for movable protective devices shall comply with the provisions of 6.3.3.2.3 in GB/T 15706-2012.

5.1.1.3 When locked personnel need to leave the danger zone, perimeter fences with

interlocked doors shall be able to be opened from the inside of the fence at any time.

5.1.1.4 Appropriate safety measures shall be taken for parts that may cause injury to personnel or the equipment itself. Anti-loosening devices shall be installed for parts that may come loose during operation. Holes, openings, pits, and trenches in the workplace shall be equipped with covers and perimeter fences.

5.1.2 Protective devices for power transmission components

Hazardous points of power transmission components shall be protected by fixed protective devices, interlocking protective devices with or without protective locks.

Protective devices shall be installed as close as possible to the hazardous point. If this is not possible, a perimeter fence shall be installed, and the safe distance between the perimeter fence and the hazardous point shall comply with GB/T 23821-2022. The selection of protective devices for power transmission components shall comply with the provisions of Table 1.

5.1.3 Anti-crushing measures

The minimum distance between fixed and moving parts, or between moving parts, shall meet the requirements of Table 1 in GB/T 12265-2021. Alternatively, the crushing hazard can be avoided by reducing the crushing force at the danger point, thereby allowing the crushing movement to be artificially stopped.

NOTE. In the absence of relevant standards for reference, if the impact motion is low and the contact surface is flat or padded, a force of no more than 150 N is generally considered not to cause harm.

5.1.4 Wrapping hazards with drying cylinders, rollers, blankets, wire mesh, and paper

guide ropes, and trapping hazards with sinking into the end face of the roll