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

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Replacing GB/T 20051-2006

Specifications of amusement rides for flying trapeze

空中飞人通用技术条件

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1 Scope

This document specifies the technical requirements, inspection and test, accompanying documents, marking, packaging, transportation and storage of flying trapeze.

This document applies to the design, manufacture, installation, test and use of flying trapeze.

2 Normative References

GB/T 191

GB/T 5226.1

GB 5725

GB 8408

GB/T 8918

GB/T 8923

GB/T 9075

GB/T 9286-2021

GB/T 13384

GB/T 13912

GB/T 20050-2020

GB/T 20306

GB/T 34370.9

GB/T 34371

GB/T 39043

GB 50009

GB/T 50011

GB 50017

GB 50135

GB 50231

3 Terms and Definitions

The terms and definitions defined in GB/T 20306, and the following are applicable to this

document.

3.1 Flying trapeze

A large amusement ride that uses a lifting device to elevate (lower) passengers (the passenger- carrying device) to a certain height via steel cables or other ropes. Relying on their own potential energy, they swing back and forth around a suspension point, and the suspension structure is flexible.

NOTE 1.the main structural type of the flying trapeze refers to the type of lifting beam and suspension structure.

NOTE 2.a typical structural diagram of the flying trapeze is shown in Figure 1.

NOTE 3.large amusement rides without a lifting device, where passengers ride directly on a platform at a certain height and swing back and forth around a suspension point, and whose suspension structure is flexible, can also be considered flying trapezes.

3.2 Lifting device

A device that lifts (lowers) the suspension structure and passenger-carrying device to a certain height.

3.3 Separating device

A device that separates the lifting device from the passenger-carrying device.

4.1 Basic Requirements

4.1.1 In addition to meeting the requirements of this document, the flying trapeze shall also meet the requirements of GB 8408.

4.1.2 The number of people carried by a single suspension structure of the flying trapeze shall not exceed 3.

4.1.3 The maximum unilateral swing angle of the flying trapeze shall not exceed 90°.

4.1.4 A risk assessment for the flying trapeze shall be conducted in accordance with GB/T 34371 and GB/T 39043 during the design phase, and a risk assessment report shall be issued.

4.1.5 The operating organization or the design client shall provide written data on the geological, seismic, meteorological, and power supply conditions of the flying trapeze installation site.

4.1.6 The design and construction of the foundation or building (structure) shall be entrusted to organizations with corresponding qualifications and comply with relevant civil engineering or building (structure) design codes.

4.2.1 Loads and Operating condition analysis

4.2.1.1 The live load value for the flying trapeze shall not be lower than the maximum permissible passenger load value.

4.2.1.2 When calculating the ultimate wind load, a wind load with a 50-year recurrence interval for the location of use shall be selected. For coastal cities (see HY/T 094) and areas with an altitude exceeding 1,000 m, a wind load with a 100-year recurrence interval shall be selected.

The wind load values shall comply with the provisions of GB 50009.

4.2.1.3 During design, the seismic load value shall comply with the provisions of GB/T 50011.

4.2.1.4 During design, icing load calculation shall be performed, and the load values shall comply with the provisions of GB 50135.

4.2.1.5 Under separation conditions, the impact coefficient selected for the lifting towers

(frames) and separating devices shall not be less than 1.5.

4.2.1.6 The operating conditions of the flying trapeze include normal operating conditions,

abnormal operating conditions, and extreme state conditions. Normal operating conditions include lifting, separation, swinging, and maximum overturning moment, etc., and with consideration of no-load, eccentric load, and full load. Abnormal operating conditions include at least emergency stop, emergency rescue, and maintenance, etc. Extreme state conditions include at least ultimate wind speed, earthquake, and icing, etc.

4.2.1.7 Based on different operating condition analyses, the permanent loads borne by the flying trapeze structure shall be combined with other loads. Examples of combinations are shown in

4.2.2.1 The design calculations for the flying trapeze include static strength calculations, fatigue

strength calculations, stiffness calculations, stability calculations, and anti-overturning calculations, etc., which shall be selected in accordance with the specific structure and operating conditions.

4.2.2.2 At least static strength and fatigue strength calculations shall be performed on the lifting beams, suspension structures, passenger-carrying devices, and lifting towers (frames).