

Translated English of Chinese Standard: GB28265-2012

www.ChineseStandard.net

Sales@ChineseStandard.net

GB

NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA

ICS 97.200.40

Y 57

GB 28265-2012

Safeguard Specification of Amusement Rides

GB 28265-2012 How to BUY & immediately GET a full-copy of this standard?

1. www.ChineseStandard.net;
2. Search --> Add to Cart --> Checkout (3-steps);
3. No action is required - Full-copy of this standard will be automatically & immediately delivered to your EMAIL address in 0~25 minutes.
4. Support: Sales@ChineseStandard.net. Wayne, Sales manager

Issued on: May 11, 2012

Implemented on: March 1, 2013

Issued by: General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China;

Standardization Administration of the People's Republic of China.

Table of Contents

Foreword.....	3
1 Scope	4
2 Normative references	4
3 Terms and definitions	5
4 Technical Requirements	6
5 Test methods	9
6 Sampling principles	13

Safeguard Specifications of Amusement Rides

1 Scope

This Standard specifies the technical requirements, test methods and sampling principles of safeguard of amusement rides.

This Standard is applicable to safeguard devices such as over-speed limit devices, limit devices, emergency brake devices, anti-kickback device, safety belts, safety pressure bar and cushioning devices of amusement rides.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this Standard.

GB/T 2423.1 Environmental testing for electric and electronic products - Part 1: Test methods - Test A: Hypothermia

GB/T 2423.2 Environmental testing for electric and electronic products - Part 2: Test methods - Test B: Mega-thermal

GB/T 2423.3 Environmental testing for electric and electronic products - Part 3: Test methods - Test Cab: Damp heat test

GB/T 2423.37 Environmental testing for electric and electronic products - Part 37: Test methods - Test L: Dust Test

GB/T 2423.38 Environmental testing for electric and electronic products - Part 38: Test methods - Test R: Water test method and guidance

GB 4208 Enclosure protection class (IP code)

GB 5226.1 Electrical safety of machinery - Electrical equipment - Part 1: General requirements

GB 8408-2008 Amusement rides safety specifications

GB 14166-2003 Vehicle safety belt and restraint system for occupant adult

GB/T 20051-2006 Technical specifications of no power class amusement rides

GB/T 20438 Function safety of electrical / electronic / programmable electronic safety-related systems – Part 2: Requirements of electrical / electronic / programmable electronic safety-related systems

GB 50150-2006 Electrical installations and electrical devices handover test standard

3 Terms and definitions

The following terms and definitions are applicable to this document.

3.1 Safeguard

In safety functions, the guards or protection devices that protect people from existing harm or imminent harm.

3.2 Electric devices

The devices that achieve specified safety functions through coordinating mechanical devices, electronics and electrical components.

3.3 Mechanical devices

The devices that achieve specified safety functions through mechanical devices.

3.4 Fault

The status of a characteristic that can not perform a specified function.

3.5 Trigger threshold

The physical quantity to trigger the safeguard.

3.6 Display error

The value difference between measurement value and safeguard's display value.

3.7 Action error

When safeguard triggers, the value difference between its actual physical quantity and trigger threshold.

3.8 Dangerous directions

When amusement rides are running and reaching to safeguards' trigger conditions, the amusement rides or the safeguards are not running to expected direction.

$$\text{Display error} = (\text{Display value} - \text{Measured value}) / \text{Found} \times 100\% \dots\dots\dots (1)$$

4.5.2 When testing under the laboratory condition, the action error of electric devices shall not exceed $\pm 3\%$; the action error of mechanical devices shall not exceed $\pm 5\%$. When using whole amusement rides to conduct the test, the action error of electric devices shall not exceed $\pm 6\%$, the action error of mechanical devices shall not exceed $\pm 10\%$.

4.6 Flexible restraining devices

4.6.1 The safety belt (containing components such as lock) shall meet the requirements in 7.6.7 of GB 8408-2008, and shall pass the test specified by 5.2.3.

4.6.2 The elastic ropes which protect personal safety directly, shall specify the restriction of the breaking force, usage count and failure time; the elastic ropes for bungee shall meet the requirements specified in Part 4 of GB/T 20051-2006 at the same time, and shall be able to pass the tests specified by 5.2.4 and 5.3.3.

4.7 Safety pressure bar

The safety pressure bar shall meet the requirements in 7.6.8 specified by GB 8408-2008, and shall be able to pass the test specified by 5.2.2 and 5.3.2.

4.8 Anti-kickback devices

The anti-kickback devices shall be able to act quickly under emergency situations to prevent amusement rides from running to dangerous direction; it shall meet the requirements in 7.4 of GB 8408-2008; and it shall be able to pass the test specified by 5.4.

4.9 Emergency brake

The emergency brake shall be able to act quickly under emergency situations to prevent amusement rides running to dangerous direction; it shall be adjustable, and shall be able to pass the test specified by 5.4 and 5.5.

4.10 Cushioning devices

The cushioning devices shall be able to act quickly, under emergency situations, to prevent amusement rides running to dangerous direction, and shall be able to pass the test specified by 5.4.

4.11 Over-speed limiting devices

The over-speed limiting devices shall be able to act quickly, under emergency situations, to prevent amusement rides from running to dangerous direction, and shall be able to pass the test specified by 5.6.

P -- the load that is born by specimen in normal operation, Newtons (N);

k -- load coefficient, $k = 2$.

5.2.3 Tensile strength test for safety belt

According to the method specified in 5.4 and 5.5 of GB 14166-2003, conduct the strength tensile test for safety belt; if the tensile breaking strength of safety belt is not less than $6 \times 10^3 \text{N}$, then it is judged as qualified.

5.2.4 Tensile strength test for elastic rope

Simulate the actual working conditions; use testing machine, under 100mm/min ~ 500mm/min tensile speed, apply loading at action point of force; stretch elastic rope specimens to 2.5 times and 4 times of their original length respectively. WHEN the specimen is stretched to 2.5 times of the length, its tensile load is greater than the design load, AND WHEN it is stretched to 4 times of the length, the corresponding tensile load is less than the maximum dynamic load design, THEN it is judged as qualified.

5.3 Fatigue strength test

5.3.1 Fatigue test method

Simulate the actual working conditions; use fatigue test machine to apply rated load repeatedly at action point of force of specimen.

5.3.2 Fatigue test for safety pressure bar

Use test machine to apply rated load at action point of force; test for 6×10^4 times. After testing, if the safety pressure bar does not fail, then it is judged as qualified.

5.3.3 Fatigue test for elastic rope

The fatigue test for elastic rope shall meet following conditions:

- a) Attach elastic rope specimen to test machine; stretch for 50 times; after the specimen is confirmed without abnormality, conduct fatigue test;
- b) Set stretching times to 1000; conduct equal-amplitude tensile fatigue test; if the maximum of force-decreasing amplitude of elastic rope is not greater than 20%, then it is judged as qualified.

5.4 Impact strength test

Simulate actual working conditions; use test machine or whole amusement rides to conduct field test; conduct impact test by applying rated load at action point of force. Repeat the test for 1000 times; after the completion of test, if safeguard does not fail, then it is judged as qualified.

safeguard is not in energized state.

Table 2 Impact acceleration test requirements (half sine wave)

Impact Acceleration / (m/s ²)	Impact time / h	Up-down Vibration Times	Front-back vibration times	Left-right vibration times
147	< 18	3	3	3

After the impact test, the components shall not be loose, fall-off or damages; the wires shall not be disconnected. After the test, conduct the test specified in 5.8.

5.9.3 Protection level test

The test methods and conformity assessment shall meet the corresponding requirements specified by GB/T 2423.37 and GB/T 2423.38. During the test, the safeguard is not in energized state. After this test, conduct the test specified in 5.8.

5.9.4 Temperature Test

5.9.4.1 The high temperature test methods is in accordance with the specification of GB/T 2423.2. During the test, the safeguard is not in energized state. Test temperature is 60°C, last for 16 h. After the recovery, complete test specified in 5.8 within 30 min.

5.9.4.2 The low temperature test methods are in accordance with the specification of GB/T 2423.1. During the test, the safeguard is not in energized state. Test temperature is -15°C, last for 16 h. After the recovery, complete test specified in 5.8 within 30 min.

5.9.5 Steady damp-heat test of devices

Before the test, the safeguard shall pass the test in 5.12 and 5.13. The test method are according to the specifications of GB/T 2423.3; test time is 48 h. After the recovery, conduct the tests specified in 5.8, 5.12 and 5.13.

5.10 Voltage fluctuation test

When it is under the AC power supply, apply 110% of rated voltage for 60 min AND 85% of rated voltage for 10 min, respectively; when it is under the battery power supply, apply 135% of rated voltage for 60 min AND 85% of rated voltage 10 min, respectively. In the later stage of the test, conduct the test according to 5.8.

5.11 Power immunity test

On the power supply of electric device, superimpose a spike voltage that has the following parameters:

- Pulse amplitude: 1000V;
- Pulse width: 0.1μs ~ 2μs;

This is an excerpt of the PDF (Some pages are marked off intentionally)

Full-copy PDF can be purchased from 1 of 2 websites:

1. <https://www.ChineseStandard.us>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Select your country (currency), for example: USA (USD); Germany (Euro).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Tax invoice can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with download links).

2. <https://www.ChineseStandard.net>

- SEARCH the standard ID, such as GB 4943.1-2022.
- Add to cart. Only accept USD (other currencies - <https://www.ChineseStandard.us>).
- Full-copy of PDF (text-editable, true-PDF) can be downloaded in 9 seconds.
- Receiving emails in 9 seconds (with PDFs attached, invoice and download links).

Translated by: Field Test Asia Pte. Ltd. (Incorporated & taxed in Singapore. Tax ID: 201302277C)

About Us (Goodwill, Policies, Fair Trading...): <https://www.chinesestandard.net/AboutUs.aspx>

Contact: Wayne Zheng, Sales@ChineseStandard.net

Linkin: <https://www.linkedin.com/in/waynezhengwenrui/>

----- The End -----