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**Industrial trucks - Verification of stability - Part 12:
Industrial variable-reach trucks handling freight containers
of 6 m length and longer**

工业车辆 稳定性验证 第 12 部分：搬运 6m 及其以上长度货运集装箱的伸缩臂式叉车
(ISO 22915-12:2015, IDT)

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Industrial trucks - Verification of stability - Part 12:

Industrial variable-reach trucks handling freight containers

of 6 m length and longer

1 Scope

This document specifies test methods for verifying the stability of industrial variable-reach trucks handling empty or fully loaded freight containers of 6 m length and longer.

This document applies to industrial variable-reach trucks, which are equipped with spreaders (top lift and side lift), used for interchangeable carriages, semi-trailers or other carrying device, for handling of container.

This document does not specify requirements for industrial variable-reach trucks (see ISO 22915-11) and off-road industrial variable-reach trucks (see ISO 22915-14).

This document does not apply to forklifts handling containers, which have a movable center of gravity (see ISO 3874).

This document does not apply to counterbalanced forklifts, which have gantry, for handling freight containers (see ISO 22915-9).

2 Normative references

The contents of the following documents constitute essential provisions of this document through normative references in the text. 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) is applicable to this standard.

GB/T 10827.2-2021 Industrial trucks - Safety requirements and verification - Part 2: Self-propelled variable-reach trucks (ISO 3691-2:2016, IDT)

ISO 1496-2 Series 1 freight containers - Specification and testing - Part 2: Thermal containers

Note: GB/T 7392-1998 Series 1 thermal containers - Specification and testing (idt ISO 1496-2:1996)

ISO 3874 Series 1 freight containers - Handling and securing

Note: GB/T 17382-2008 Series 1 freight containers - Handling and securing (ISO 3874:1997, IDT)

ISO 5353 Earth-moving machinery, and tractors and machinery for agriculture and forestry - Seat index point

Note: GB/T 6236-2008 Tractors and machinery for agricultural and forestry - Seat index point (ISO 5353:1995, MOD)

ISO 22915-1 Industrial trucks - Verification of stability - Part 1: General

Note: GB/T 26949.1-2020 Industrial trucks - Verification of stability - Part 1: General (ISO 22915-1:2016, IDT)

ISO 22915-10 Industrial trucks - Verification of stability - Part 10: Additional stability tests for trucks operating in the special conditions of stacking with load laterally displaced by powered devices

Note: GB/T 26949.10-2011 Industrial trucks - Verification of stability - Part 10: Additional stability tests for trucks operating in the special conditions of stacking with load laterally displaced by power (ISO 22915-10:2008, IDT)

ISO 22915-20 Industrial trucks - Verification of stability - Part 20: Additional stability test for trucks operating in the special condition of offset load, offset by utilization

Note: GB/T 26949.20-2016 Industrial trucks - Verification of stability - Part 20: Additional stability test for trucks operating in the special condition of offset load, offset by utilization (ISO 22915-20:2008, IDT)

3 Terms and definitions

The terms and definitions, which are defined in ISO 22915-1, as well as the following terms and definitions, apply to this document.

3.1

Industrial variable-reach truck for handling freight containers

A counterbalanced forklift, which is equipped with a telescopic or non-telescopic, non-slewing articulated arm, as defined in 4.13.2.2.2 of ISO 5053:1987, AND specially used for handling freight containers of 6 m length and longer.

Note 1: The handling device is directly installed on the lifting mechanism; the lifting mechanism cannot be slewed OR the slewing angle on either side of the longitudinal axis of the vehicle is not greater than 5°.

Note 2: The industrial variable-reach truck for handling freight containers is expected to be used on a firm, flat, level and paved site.

Note 3: According to the definition in GB/T 10827.2-2021, the industrial variable-reach truck for handling freight container can be equipped with stabilizers, axle locking devices or frame lateral leveling devices.

4 Operating conditions

4.1 General

In addition to the conditions specified in ISO 22915-1, it shall also meet the following conditions:

- Operate the forklift in a wind speed not exceeding 12.2 m/s (freight containers run and stack at normal operating height).

4.2 Partial lifting of containers

Before running, lift the container, so that the bottom of the container is not higher than 900 mm, above the seat index point (SIP) as defined in ISO 5353; meanwhile, the boom is fully retracted.

Note: A lifted container allows an operator, who is at lower position on the vehicle, to see the bottom of the container.

5 Test conditions

5.1 General

See ISO 22915-1.

During the test, it shall consider the eccentric load of the container, which is specified in ISO 3874.

When handling an empty reefer container, which has an integrated refrigeration unit (refrigerator) as specified in ISO 1496-2, it shall consider the offset load, in accordance with the requirements of ISO 22915-20.

5.2 Prevailing wind

The test shall not be carried out in prevailing wind; otherwise, the test results will be greatly affected.

5.3 Wind force

5.5.1 General

The test load shall consist of a base load, which is commensurate with the mass of the container, AND a load or force, which simulates the wind acting on the container.

5.5.2 Basic load

The test load shall be equivalent to a 2.90 m (9 ft 6 in) high ISO standard container, the mass of which is equivalent to the rated lifting weight, which is specified by the manufacturer; it acts on the center of mass.

When using a top lifting, side lifting or other load handling device, the position of the center of mass shall be determined by its connection point with the test load, such as the connection point, where the twist lock enters the corner piece.

If the load handling device has a lateral adjustment function, as relative to the longitudinal centerline of the vehicle, it shall comply with the provisions of ISO 22915-10.

If the load handling device has a position adjustment function, in the direction of the longitudinal centerline of the vehicle, in addition to the extension of the boom, the test shall be carried out, at both extreme positions within the adjustment range.

5.5.3 Wind force

The effects of wind force can be simulated in the test, by one of the following methods:

- Apply the force to the center of mass of the load, at the same vertical angle (parallel to the surface of the tilting platform) as the tilting platform, which is specified in Table 1, in a direction perpendicular to the tipping axis of the forklift;
- When the inclination angle of the tilting platform reaches the inclination angle, which is specified in Table 1, in addition to the test load, apply another vertical load, whose moment is equivalent to the wind action.

5.6 Lifting height

5.6.1 Lifting height when simulating stacking test

When simulating the stacking test, the test load shall be in the combination state of lifting and extending, that is most unfavorable to the stability of the vehicle, as specified by the manufacturer.

During test 5 (see Table 1), the boom shall be at the maximum lifting angle, AND at the maximum and minimum extension states, respectively.

5.6.2 Lifting height when simulating the running test with containers

When simulating the running test 2 and test 4 (see Table 1) with container, the boom shall be fully retracted AND the center of mass of the test load shall be located 2350 mm, above the seat index point (SIP), which is defined in ISO 5353.

This lifting height is not suitable for vehicles, that have sufficient visibility in the running direction without lifting the container, such as the operator in a high position or running backwards (with the container behind). In these cases, the load shall be at the actual position, which is specified by the manufacturer.

5.6.3 Lifting height in simulated running test without container

When simulating the running test without a container, the bottom of the load handling device shall be located 900 mm above the seat index point (SIP), which is defined in ISO 5353; the boom is fully retracted.

6 Verification of stability

The stability of the vehicle shall be verified, according to Table 1.

When conducting test 4 and test 5, the wheels shall not lose contact with the tilting platform or any structural component; any part of the vehicle shall not contact the tilting platform.

7 Markings

The actual lifting weight of the container handling, which is determined by the stability test, shall be marked on the signboard, in accordance with the provisions of 6.3 in GB/T 10827.2-2021.

The additional lifting capacity (see 5.4), which is determined by the stability test with stabilizers and/or axle locking devices, shall be indicated on the signboard.

When the wind speed, which is used for calculation, in accordance with 5.3, is greater than the rated wind speed of 12.2 m/s, it shall mark the actual wind speed used for the calculation.

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