

---

---

**Counterbalanced trucks handling freight  
containers of 6 m (20 ft) length and  
above — Additional stability tests**

*Chariots élévateurs travaillant en porte-à-faux manutentionnant des  
conteneurs pour le transport de marchandises de longueur égale ou  
supérieure à 6 m (20 ft) — Essais de stabilité supplémentaires*

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

ISO 10525:1997

<https://standards.iteh.ai/catalog/standards/sist/fc941988-2d73-4c10-8cf0-0fa8fff8e2c8/iso-10525-1997>



Contents	Page
1 Scope.....	1
2 Normative references .....	1
3 Test requirements.....	2
4 Test procedure.....	8
5 Schedule of tests .....	8
6 Marking.....	9

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[ISO 10525:1997](https://standards.iteh.ai/catalog/standards/sist/fc941988-2d73-4c10-8cf0-0fa8fff8e2c8/iso-10525-1997)  
<https://standards.iteh.ai/catalog/standards/sist/fc941988-2d73-4c10-8cf0-0fa8fff8e2c8/iso-10525-1997>

© ISO 1997

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Organization for Standardization  
Case postale 56 • CH-1211 Genève 20 • Switzerland  
Internet central@iso.ch  
X.400 c=ch; a=400net; p=iso; o=isocs; s=central

Printed in Switzerland

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

iTeh STANDARD PREVIEW

International Standard ISO 10525 was prepared by Technical Committee ISO/TC 110, *Industrial trucks*, Subcommittee SC 2, *Safety of powered industrial trucks*.

[ISO 10525:1997](https://standards.iteh.ai/catalog/standards/sist/fc941988-2d73-4c10-8cf0-0fa8fff8e2c8/iso-10525-1997)

<https://standards.iteh.ai/catalog/standards/sist/fc941988-2d73-4c10-8cf0-0fa8fff8e2c8/iso-10525-1997>

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

ISO 10525:1997

<https://standards.iteh.ai/catalog/standards/sist/fc941988-2d73-4c10-8cf0-0fa8fff8e2c8/iso-10525-1997>

## 1 Scope

This International Standard specifies additional tests to verify the stability of counterbalanced lift trucks when handling freight containers of 6 m (20 ft) length and above.

This International Standard specifies tests in addition to those specified in ISO 1074.

The stability tests contained in this International Standard ensure that counterbalanced trucks handling freight containers have satisfactory stability when reasonably and appropriately used under the following conditions.

- a) The truck (travelling with the freight container at normal travelling height and stacking) is operating under conditions where the wind speed is up to 12,2 m/s (Beaufort Scale Force 6).
- b) Alternative ratings for use in higher wind speeds shall be developed by use of higher values for wind speed, in equations (1) and (2) in 3.5.3.
- c) The truck is travelling forward with the freight container leading, elevated so that the base is not higher than 1 m above the point of maximum depression of the seat cushion under the operator and the mast is fully tilted back.

NOTE — The elevated load permits an operator to see underneath the freight container.

Stability tests to cover conditions stated in a) or b) are applicable to all trucks.

Stability tests to cover conditions stated in c) are only applicable to a truck which will operate with a partially elevated container.

This International Standard does not apply to trucks when

- 1) handling suspended loads which may swing freely,
- 2) handling a container which has a mobile centre of gravity (see ISO 3874).

## 2 Normative references

The following standards contain provisions, which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 1074:1991, *Counterbalanced fork-lift trucks — Stability tests*.

ISO 1496-2:1996, *Series 1 freight containers — Specification and testing — Part 2: Thermal containers*.

ISO 3691:1980, *Powered industrial trucks — Safety code*.

ISO 3691:1980/Amd.1:1983, *Amendment 1 to ISO 3691:1980*.

ISO 3874:—<sup>1)</sup>, *Series 1 freight containers — Handling and securing*.

### 3 Test requirements

The stability of the trucks shall be verified by means of the test methods described below. Any of the methods is an acceptable verification procedure.

#### 3.1 Verification procedure

##### 3.1.1 Tilting platform

A test platform which can be tilted about one side shall be used.

Place the truck under test on the platform, which is initially in the horizontal plane, sequentially in the positions described in table 3. For each of the truck positions, the platform shall be tilted slowly and smoothly to the slope indicated in table 3.

##### 3.1.2 Fixed slope

Fixed slopes with inclinations equivalent to the specified test slope shall be used. The slope surface shall be smooth and capable of supporting the truck weight without deformation likely to affect the test results.

Drive the truck under test onto the fixed slope with the mast lowered and position it according to table 3. For each of the laden truck positions, the load shall be elevated slowly and smoothly to the height indicated in table 3.

<https://standards.iteh.ai/catalog/standards/sist/fc941988-2d73-4c10-8cf0-0fa8fff8e2c8/iso-10525-1997>

##### 3.1.3 Calculation

Compliance with the specified values may be determined by calculation.

Such calculated capacities must allow for manufacturing tolerances, possible deflections of the mast, tyres, etc.

##### 3.1.4 Completion of test

The truck is considered stable if it passes all required tests without overturning (see clause 4). For tests Nos. 1, 2 and 3, the overturning value of the test slope is that which, if increased, would produce complete overturning of the truck. For test No. 4, the overturning value is reached when a wheel loses contact with the test slope.

#### 3.2 Test conditions

Prevailing winds shall not have any significant effect on the test results. For test No. 3, it is permissible for the load wheels on one side of the truck to lose contact with the slope and for parts of the structure or other designed features to make contact with the test slope.

##### 3.2.1 Condition of the truck

The tests shall be carried out with the truck ready for use without an operator. Fuel tanks of engined trucks shall be full if stability is thereby reduced; all other tanks shall be filled to their correct operating levels. The load-carrying means shall be fully equipped with any protective or supplementary lifting apparatus as included in the rating. The mast or fork arms, if adjustable for tilt, shall be positioned in accordance with table 3. Where applicable, tyres shall be inflated to the pressure specified by the manufacturer, and where tyre ballast is permitted it shall be used in accordance with the manufacturer's instructions.

1) To be published. (Revision of ISO 3874:1988)

### 3.2.2 Verification of verticality of the lift of the load-engaging means

Before proceeding with test No.1, the verticality of the lift of load-engaging means shall be verified by means of a plumb-line or other suitable equipment.

Elevate the load-engaging means and the specified test load to approximately 300 mm (12 in) above the test platform. Establish a point E (see figure 1) on the load-engaging means. This point E shall be used to provide a reference datum, F, on the test platform (see figure 1). When the mast is elevated, a new point  $F_1$  on the test platform occurs (see figure 2). By the adjustments described below this new point  $F_1$  can be returned to the original location of F (see figure 3).

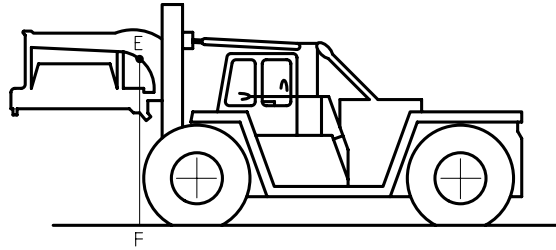


Figure 1

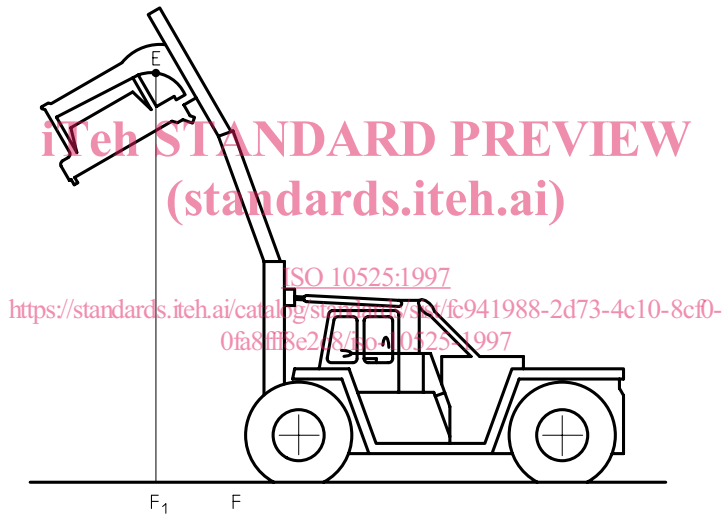


Figure 2

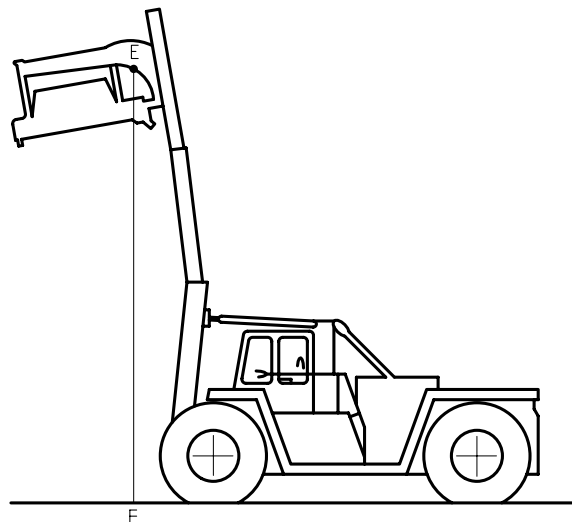


Figure 3

For trucks with tiltable masts, changes in the location of  $F_1$  shall be corrected by varying the tilt of the mast within the limits of the truck design.

For trucks with fixed masts, adjustments in the load-engaging means or fork carrier tilt (where provided) may be used to correct for changes in location of point  $F_1$  within the limits of the truck design.

This procedure does not apply to trucks where the design does not allow such corrections.

### 3.2.3 Lift height for tests simulating travelling with the freight container substantially elevated

For tests simulating travel, the centre of gravity of the test load shall be positioned 2 300 mm above the point of maximum depression of the operator's seat cushion. These tests shall not apply where it is not necessary to elevate the container to obtain adequate visibility in the direction of travel [e.g. high-level operator position or driving in reverse (freight container trailing)].

## 3.3 Effect of the operator's mass on stability

The operator on rider-controlled trucks shall be represented by a weight of mass 90 kg if the stability during a test is thereby decreased. The weight shall be secured with its centre of gravity 250 mm above the operator's seat when in the compressed condition.

# iTeh STANDARD PREVIEW (standards.iteh.ai)

The specified position of the truck on the test slope shall be maintained during each test. Wheel rotation shall be prevented by application of the parking brake or service brakes, which may be secured in the "on" position. Additionally, the wheels may be wedged against the truck frame but in such a way that any axle/frame articulation is not affected.

Blocks (chocks) having a maximum height of 80 mm may be used, if necessary, to maintain the initial position of the truck on the test platform. Blocks (chocks), if used, shall not artificially improve stability.

## 3.5 Test load

### 3.5.1 General

The test load shall consist of a basic load corresponding to the mass of the freight container, and a load or force simulating the effect of wind on the container.

### 3.5.2 Basic load

The basic test load shall be equivalent to a 2,590 m (8 ft 6 in) high container (which conforms to ISO 3874 and ISO 1496-2) in either the laden or unladen condition with its centre of gravity,  $G$ , acting at its centroid (see figures 4 and 5).

## 3.4 Location of the truck on the test slope



Dimensions in metres

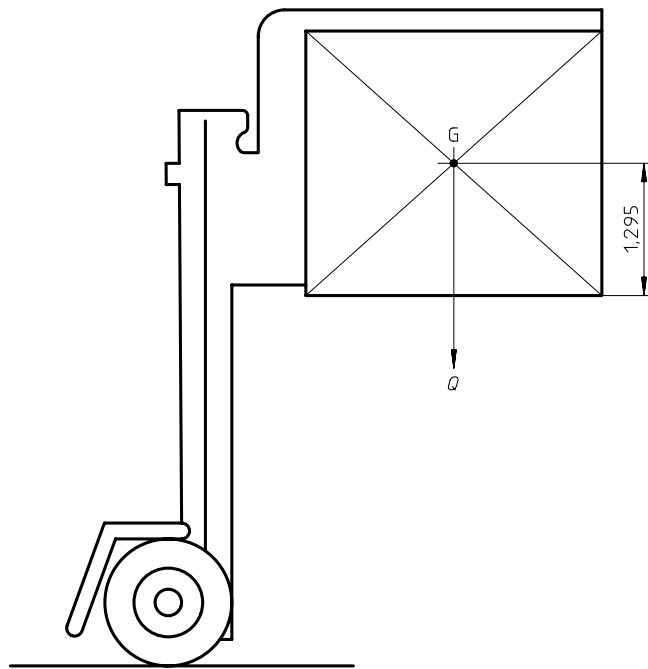


Figure 4

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

ISO 10525:1997

<https://standards.iteh.ai/catalog/standards/sist/c941988-2d73-4c19-8cf0-0fa8fff8e2c8/iso-10525-1997>

Dimensions in metres

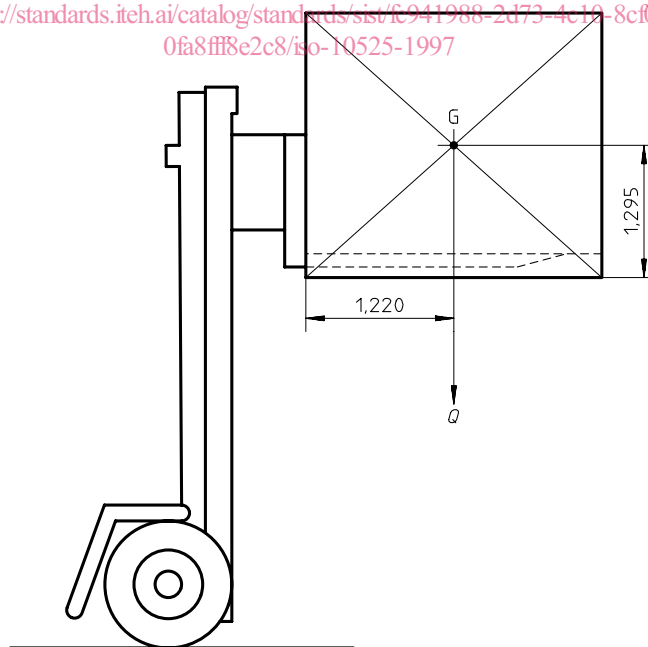


Figure 5