



# SLOVENSKI STANDARD

## SIST EN 15878:2010

01-september-2010

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### Stabilni jekleni sistemi za skladiščenje - Izrazi in definicije

Steel static storage systems - Terms and definitions

Ortsfeste Regale aus Stahl - Begriffe

Systèmes de stockage statiques en acier - Termes et définitions

Ta slovenski standard je istoveten z: **EN 15878:2010**

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53.080	Skladiščna oprema	Storage equipment

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EUROPEAN STANDARD

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## Steel static storage systems - Terms and definitions

Système de stockage statiques en acier - Termes et  
définitions

Ortsfeste Regale aus Stahl - Begriffe

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## Foreword

This document (EN 15878:2010) has been prepared by Technical Committee CEN/TC 344 “Steel static storage systems”, the secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2011, and conflicting national standards shall be withdrawn at the latest by January 2011.

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**EN 15878:2010 (E)**

## **Introduction**

This European Standard has been developed in order to rationalize the position which has been built up over the years resulting in a multiplicity of terms used by manufacturers and users, varying geographically and even across organizations.

This standard will clarify this position and result in a positive identification of the various items of storage equipment.

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## 1 Scope

This European Standard specifies terms and definitions for steel storage systems, as listed in Table 1, and their basic components and accessories.

NOTE Terms and definitions for mechanical handling equipment and load make-up accessories are included in informative annexes.

## 2 Normative references

Not applicable.

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

### 3.1 Storage system

#### 3.1.1

##### **storage system**

steel racking or shelving structure designed to store unit loads in a safe and organized way

NOTE Table 1 shows the types of storage systems.

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Table 1 — Types of storage systems

Section	Type of Unit Load	Section	Storage System
5.1	Palletized Goods	5.1.1	Adjustable pallet racking
		5.1.2	Drive-in and drive-through pallet racking
		5.1.3	S/R machine pallet racking
		5.1.4	Open face pallet racking
5.2	Small Parts Mechanically Handled	5.2.1	Open face miniload racking
		5.2.2	Multi-location miniload racking
5.3	Small Parts Hand Loaded	5.3.1	Shelving
		5.3.2	Multi-tier shelving
		5.3.3	Cantilever shelving - Gondola
5.4	Long Unit Loads	5.4.1	Cantilever racking
		5.4.2	Cassette racking
5.5	Dynamic Storage Palletized Goods	5.5.1	Mobile racking
		5.5.2	Pallet live storage
		5.5.3	Shuttle racking
5.6	Dynamic Storage Small Parts	5.6.1	Mobile shelving
		5.6.2	Carton live storage
		5.6.3	Carousels
		5.6.4	Storage lifts
5.7	Various	5.7.1	Mezzanine floor
		5.7.2	Raised floor
		5.7.3	Rack-clad

## 3.2 General definitions for any type of storage system

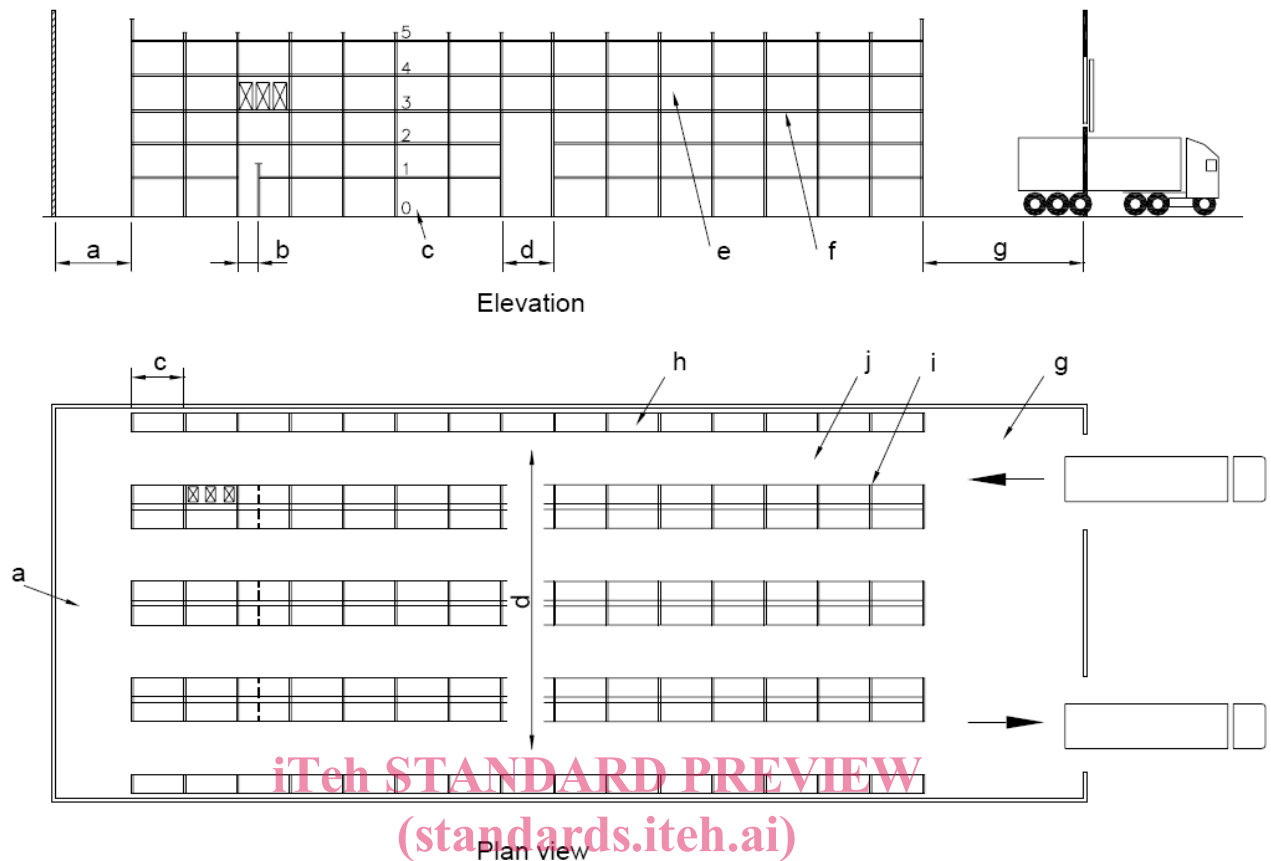
### 3.2.1

#### general arrangement

plan view and elevation of the installation

NOTE See Figure 1.



**Key**

- a gangway
- b pedestrian passageway
- c bay
- d passageway
- e compartment
- f storage level
- g marshalling area
- h single entry run
- i double entry run
- j operating aisle

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**Figure 1 — Example of racking general arrangement****3.2.2****unit load**

individual item which can be placed or retrieved in one operation, e.g. a pallet or a container with goods in a racking system or an individual box or a package in a shelving system

NOTE 1 See Figure 2.

NOTE 2 More than one unit load may be handled in one operation.

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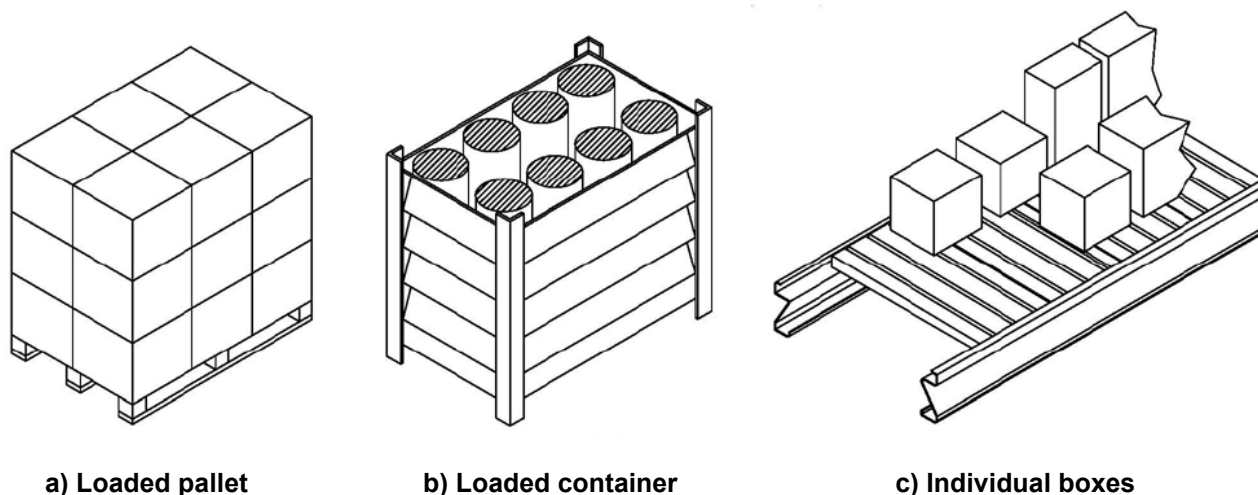


Figure 2 — Examples of unit loads

## 3.2.3

**bay**

module between uprights or upright frames

## 3.2.4

**run**

series of connected bays

## 3.2.5

**warehouse**

building for storing and handling unit loads

## 3.2.6

**compartment**

volume limited by adjacent frames down-aisle and adjacent storage levels in height

## 3.2.7

**storage level**

area or set of components intended to support the stored unit loads at a particular height

## 3.2.8

**compartment load**

load which can be stored in one compartment

## 3.2.9

**bay load**

total allowable weight of all the unit loads in a bay not including unit loads which might be stored on the floor of the bay

## 3.2.10

**single entry rack**

run of racking or shelving accessible from one operating aisle only

## 3.2.11

**double entry rack**

run of racking or shelving accessible from two operating aisles

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**3.2.12****single deep racking**

racking in which unit loads can be stored one deep from one operating aisle

**3.2.13****double deep racking**

racking in which unit loads can be stored two deep from one operating aisle

**3.2.14****down-aisle direction**

direction parallel to a run

**3.2.15****cross-aisle direction**

direction perpendicular to a run

**3.2.16****clearance**

nominal dimension between items to ensure safe operation related to a tolerance-free, undeformed system

**3.2.17****operating aisle**

space giving direct access to picking and loading faces

**3.2.18****operating aisle width**

minimum dimension across the aisle at any level between either unit loads located in their nominal position or between the rack structure components

**3.2.19****gangway**

space for movement or transport but not giving direct access to picking or loading faces

**3.2.20****passageway**

gangway resulting from eliminating one or more levels so the MHE can pass under the remaining levels

**3.2.21****pedestrian passageway**

space for pedestrian use only

**3.2.22****escape route**

space giving pedestrians access to emergency exits

**3.2.23****marshalling area**

area to receive or collate unit load

**3.3 Components****3.3.1****upright**

vertical component (often perforated) on which beams, arms, supports, etc. are fixed, supporting the loads transmitted by them

NOTE See Figure 4.

**EN 15878:2010 (E)****3.3.2****base plate**

structural component connected to an upright to spread the load on the floor and to allow fixing to the floor

NOTE See Figure 4.

**3.3.3****upright frame**

two or more upright sections linked together by means of a lattice or battens and fitted with base plates, intended to support the storage levels

NOTE See Figure 4.

**3.3.4****anchor bolt**

device that connects the base plate to the floor

NOTE See Figure 4.

**3.3.5****shim**

component located beneath the base plate to level the storage system

NOTE See Figure 4.

**3.3.6****non-shrink grout**

special mortar placed on site under the base plate to level the storage system

**3.3.7****upright protector**

free standing component to protect the lower part of uprights against accidental impact from MHE

NOTE See Figure 4.

**3.3.8****frame barrier**

free standing component(s) to protect the lower part of upright frames at the ends of runs and at passageways against accidental impact from MHE

NOTE See Figure 4.

**3.3.9****beam**

horizontal load carrying member linking adjacent frames, parallel to the operating aisle

NOTE See Figure 4.

**3.3.10****beam end connector**

component welded to or otherwise formed as an integral part of the beams which has hooks or other devices which engage in holes or slots in the upright

NOTE See Figure 4.

**3.3.11****beam connector lock**

device, independent or built into the connector, to reduce the risk of accidental vertical dislodgement of the beam

NOTE See Figure 4.

### 3.3.12

#### **shelf**

load carrying surface, supported by uprights or beams

### 3.3.13

#### **pick up and deposit station**

#### **P&D station**

structure at the end of an operating aisle used as an interface between different types of mechanical handling equipment

NOTE The P&D station can also be used to accurately fix the location of the unit load relative to the racking. This is often used by trucks or S/R machines having a fixed length of fork stroke and ensures accuracy in the down and cross-aisle directions when placing the unit load onto the rack beams.

### 3.3.14

#### **run spacer**

component connecting and spacing two upright frames back to back

NOTE See Figure 4.

### 3.3.15

#### **deck**

load carrying surface, supported by beams or arms

NOTE It might consist of shelves, steel panels, chipboard, mesh, etc.

### 3.3.16

#### **deck support**

structural component spanning between ~~beams cross-aisle~~ to increase the load carrying capacity of the deck

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### 3.3.17

#### **plan bracing**

horizontal structure in the run at load levels which, together with the spine bracing, provides stability to the storage system

NOTE See Figure 3.

### 3.3.18

#### **top plan bracing**

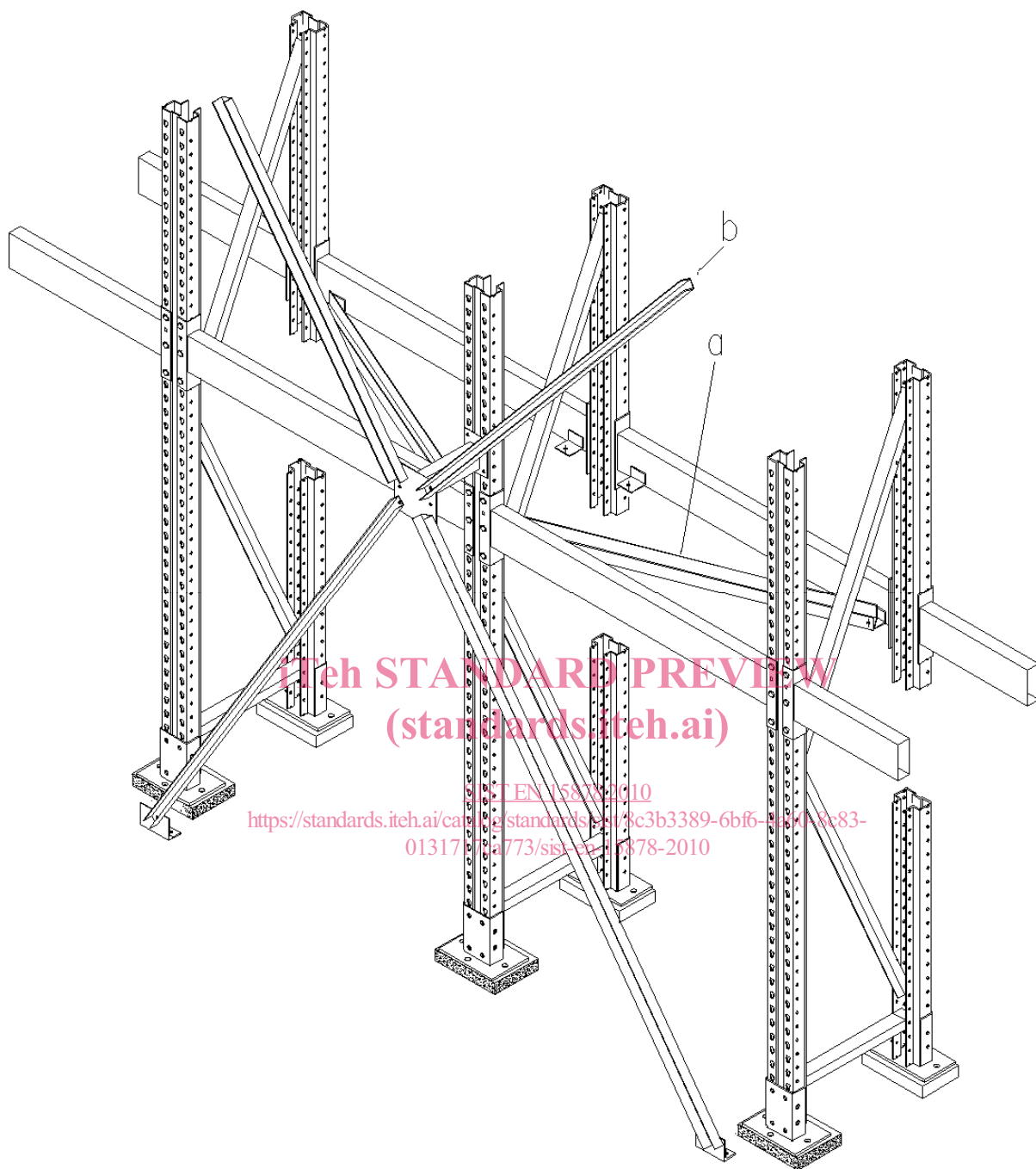
top horizontal structure which, together with the spine bracing, provides stability to the storage system

### 3.3.19

#### **spine bracing**

set of components in the vertical plane which, together with the plan and/or top plan bracing, provides stability to the storage system in the down aisle direction

NOTE See Figure 3.

**Key**

- a plan bracing
- b spine bracing

**Figure 3 — Plan and spine bracing****3.3.20 tie beam**

horizontal structural component which does not support unit loads and is generally part of the plan bracing system

**3.3.21****portal tie beam**

horizontal structural component which may support the upper guide rail and transmit the forces imposed by S/R machines

**3.3.22****arm**

load bearing component fixed to uprights

**3.3.23****beam rail**

horizontal component perpendicular to the operating aisle, directly supporting the unit loads at each storage level

**3.3.24****fork spacer**

component supported by the beams to provide a fork entry beneath the unit load

NOTE These may sometimes be referred as top-hats.

**3.3.25****pallet support bar**

structural component spanning between beams in the cross-aisle direction for the safe support of the pallet on the compartment

NOTE See Figure 4.

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**3.3.26****stop**

component intended to retain unit loads, restricting their sliding or rolling when stored

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**3.3.27****safety back stop**

component used to prevent accidental collision of a moving object with other unit loads or equipment when the unit load is placed or removed from its storage location

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NOTE In EN 528 safety back stops are used to prevent unintentional unit load movement.

**3.3.28****buffer back stop**

component used as an aid for MHE to deposit the unit load in the correct position in the racking

**3.3.29****upper guide rail**

structural component, fixed to the portal tie beams of the storage system, used to provide horizontal support and guidance to the S/R machine

**3.3.30****bottom rail**

structural component to support and guide the base of the S/R machine or other handling equipment

**3.3.31****busbar support**

structural component mounted on the floor or storage system to support the power supply to the S/R machine

**3.3.32****S/R machine run-outs**

top structure located at one or both ends of the operating aisle extending the upper guide rail to facilitate the S/R machine operations