SLOVENSKI STANDARD
SIST EN 17076:2021

01-april-2021

Stolpni žerjavi - Sistemi za preprečitev trka - Varnostne zahteve

Tower cranes - Anti-collision systems - Safety requirements

Turmdrehkrane - Antikollisionssysteme - Sicherheitstechnische Anforderungen

Grues à tour - Systèmes anti-collision - Prescriptions de sécurité

Ta slovenski standard je istoveten z: **EN 17076:2020**

ICS:

53.020.20	Dvigala	Cranes

SIST EN 17076:2021 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 17076

December 2020

ICS 53.020.20

English Version

Tower cranes - Anti-collision systems - Safety requirements

Grues à tour - Systèmes anti-collision - Prescriptions de sécurité

Turmdrehkrane - Antikollisionssysteme - Sicherheitstechnische Anforderungen

This European Standard was approved by CEN on 21 September 2020.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN 17076:2020 E

Contents

Page

European foreword

This document (EN 17076:2020) has been prepared by Technical Committee CEN/TC 147 “Cranes - Safety”, the secretariat of which is held by BSI.

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of an identical text or by endorsement, at the latest by June 2021 and conflicting national standards shall be withdrawn at the latest by June 2021.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

To select a suitable set of standards for a given application, see Annex A.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This document has been prepared to be a harmonized standard to provide one means for the mechanical design and theoretical verification of cranes to conform with the essential health and safety requirements of the Machinery Directive 2006/42/EC modified.

This document is a type C standard as stated in EN ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situations and events are covered are indicated in the scope of this standard.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standards, for machines that have been designed and built according to the provisions of this type C standard.

1 Scope

This document specifies the requirements of anti-collision devices and systems installed on tower cranes for construction work (as defined in EN 14439:2006+A2:2009) to avoid the risks of collision between several cranes in service, to avoid the risks of collision between a crane in use and fixed obstacles, and to avoid travelling over prohibited zones.

It also specifies the requirements for working range limiting devices.

Anti-collision devices and systems and working range limiting devices according to this document are safety components.

This document defines the safety characteristics and requirements of anti-collision devices and systems intended for installation on self-erecting tower cranes and tower cranes erected from parts.

In particular:

— performance level;

— information to be provided by the sensors installed on the crane;

— operation, particularly in the event of failure, override and free jib slewing states of a crane;

— type of communication between devices;

— information for the crane operator and outside indicator.

This document deals with all significant hazards, hazardous situations and events relevant to anti-collision devices and systems installed on tower cranes, when used as intended and under conditions foreseen by the manufacturer. This document specifies the appropriate technical measures to eliminate or reduce risks arising from the significant hazards (see Clause 4).

This document is not applicable to anti-collision devices and systems which are manufactured before the date of publication by CEN of this document.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 13557:2003+A2:2008, *Cranes — Controls and control stations*

EN 14439:2006+A2:2009, *Cranes — Safety — Tower cranes*

EN 60204-32:2008, *Safety of machinery — Electrical equipment of machines — Part 32: Requirements for hoisting machines (IEC 60204-32:2008)*

EN ISO 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction (ISO 12100:2010)*

EN ISO 13849-1:2015, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2015)*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp

3.1
stop function
interruption of the crane's movement preceded by a deceleration phase (slowing down) monitored by the anti-collision device

3.2
local fault
error related to the anti-collision device and/or the information coming from the crane on which it is installed

3.3
normal operation mode
operation without any of the following conditions: local fault detected by the anti-collision device or free jib slewing condition or overriding

3.4
working range limiting device
WRLD
set of components installed on the same crane whose combined actions enable management of prohibited zones only

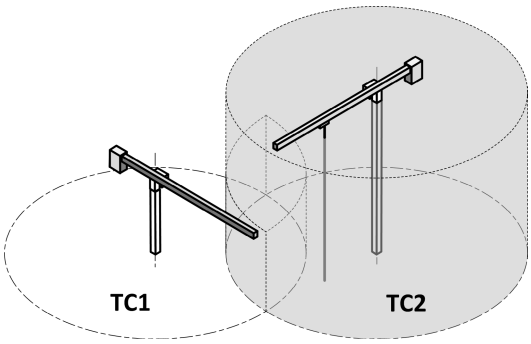
Note 1 to entry: Working range limiting device generally fulfils the same requirements as anti-collision device limited to one crane without communication with other anti-collision devices.

3.5
anti-collision device
ACD
set of components installed on the same crane whose combined actions enable management of interference zones and/or prohibited zones

3.6
anti-collision system
ACS
network of anti-collision devices that enable management of interference zones and/or prohibited zones, in which each anti-collision device is an input device for the other anti-collision devices within this network

3.7
working volume
<operating zone of the crane>
zone or volume swept over by the hook and/or the rotating upper works of the crane

Note 1 to entry: See Figures 1 to 3.

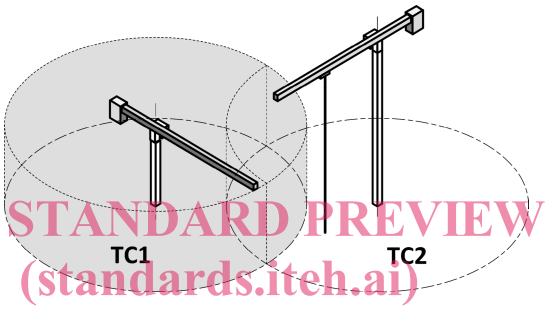


Key

TC1 tower crane 1

TC2 tower crane 2

Figure 1 — Case of fixed base higher crane: working volume of TC2 (grey area)

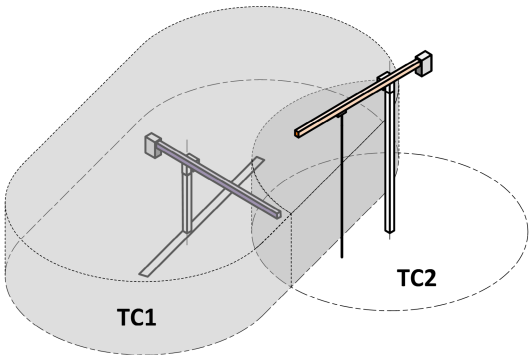


Key

TC1 tower crane 1

TC2 tower crane 2

Figure 2 — Case of fixed base lower crane: working volume of TC1 (grey area)



Key

TC1 tower crane 1

TC2 tower crane 2

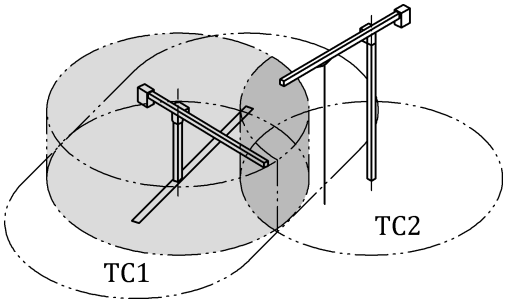
Figure 3 — Case of travelling lower crane: working volume of TC1 (grey area)

3.8
flyover volume
limited working volume for a tower crane opposite to a free slewing tower crane according to the following:

— for a lower crane the flyover volume is equivalent to the working volume, in a defined position in case of travelling crane;

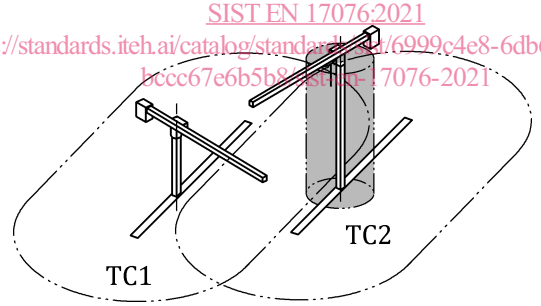
— for a higher crane the flyover volume is equivalent to the working volume limited to a radius equal to the trolley position

Note 1 to entry: See Figures 4 and 5.



Key
TC1 free slewing tower crane
TC2 in service tower crane

Figure 4 — Case of travelling lower crane (TC 1)



Key
TC1 in service tower crane
TC2 free slewing tower crane

Figure 5 — Case of travelling higher crane (TC 2)

3.9
prohibited volume
defined zone or volume in which the hook and/or the presence of a part of the rotating upper works of the crane is prohibited

Note 1 to entry: See Figures 6, 7 and 8.

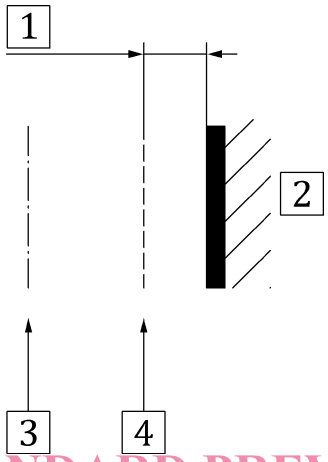
3.10
stop limit
limit at which all dangerous movements have to be stopped due to an action of the ACD

Note 1 to entry: See Figure 6.

3.11
approach limit
limit of the zone over-swept by the hook and/or the crane element at which it is necessary to slow down the movements of the crane in order to stop at or before the stop limit

Note 1 to entry: See Figure 6.

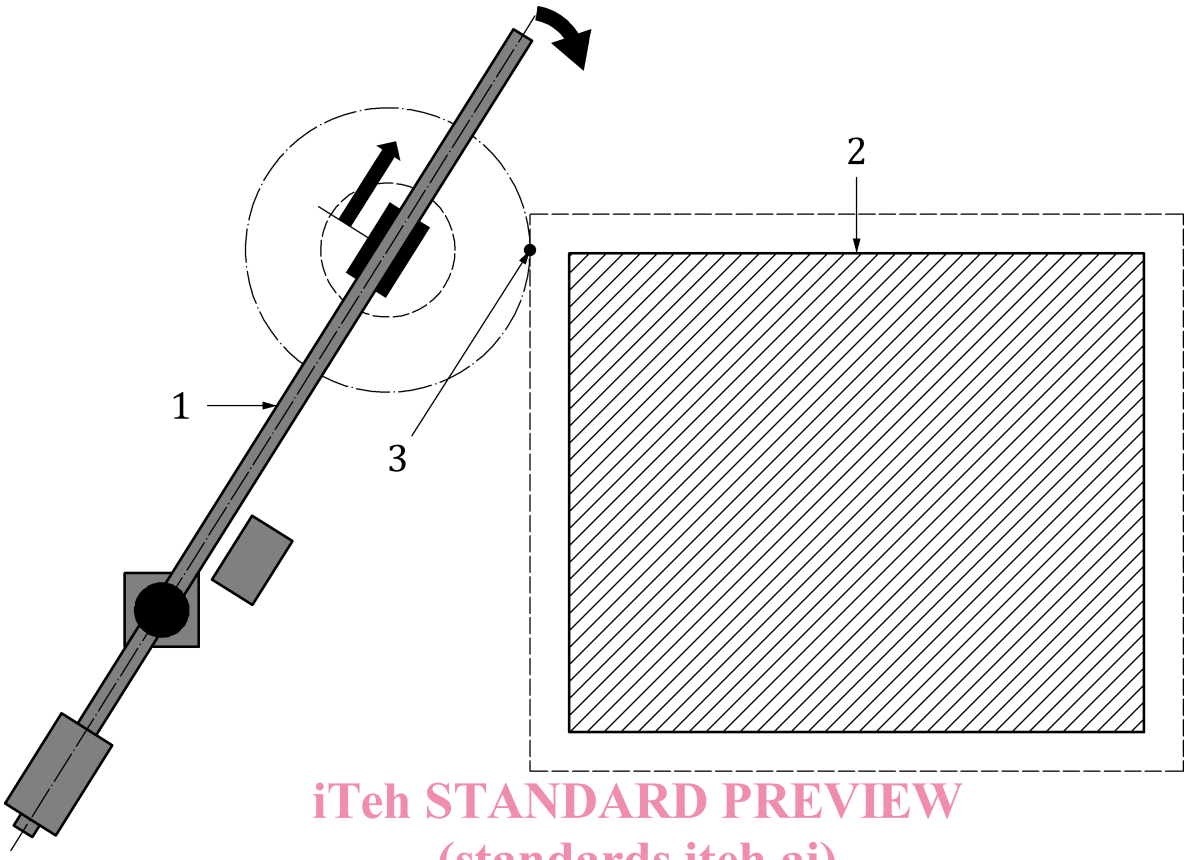
Note 2 to entry: The approach limit can vary according to the movement speeds. At the determination of the approach limit the braking characteristics of each tower crane has to be taken into account individually.



Key

1 safety distance
2 crane or prohibited zones
3 approach limit
4 stop limit

Figure 6 — Example of prohibited zone, stop limit and approach limit



Key

1	crane
2	prohibited zone
3	approach limit is reached
----------	stop limit
_ · _ · _ · _ · _	approach limit

Figure 7 — Example of approach limit between a crane and a prohibited zone

Note 3 to entry: Prohibited zone can be over-swept by the rotating upper works of the crane.