SLOVENSKI STANDARD

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september 2004

Vozički za delo na nadzemnih vodih

Conductor cars

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EUROPEAN STANDARD **EN 50374**

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ICS 43.120

English version

Conductor cars

Nacelles suspendues Leitungsfahrzeuge

This European Standard was approved by CENELEC on 2004-02-01. CENELEC 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.

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Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

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CENELEC
European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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Foreword

This European Standard was prepared by CENELEC BTWG 93-1, Conductors cars. The text of the draft was submitted to formal vote and was approved by CENELEC as EN 50374 on 2004-02-01.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2005-02-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2007-02-01

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1 Scope

This European Standard applies to conductor cars which are used for driving (travelling) on conductors, shield wires or shield wires with integrated communication systems of overhead transmission lines.

2 Normative references

The following referenced documents are indispensable for the application 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 292-2 Safety of machinery – Basic concepts, general principles for design
Part 2: Technical principles (ISO 12100-2)

EN 354 Personal protective equipment against falls from a height - Lanyards

EN 1011-1 Welding – recommendations for welding of metallic materials
Part 1: General guidance for arc welding

EN 1011-2 Welding – Recommendations for welding of metallic materials
Part 2: Arc welding of ferritic steels

EN 1011-3 Welding – Recommendations for welding of metallic materials
Part 3: Welding of stainless steels

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EN 1011-4 Welding – Recommendations for welding of metallic materials
Part 4: Arc welding of aluminium and aluminium alloys

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EN 1050 Safety of machinery - Principles of risk assessment (ISO 14121)

EN 1708-1 Welding – Basic weld joint details in steel - Part 1: Pressurised components

EN 1712 Non-destructive examination of welds - Ultrasonic examination of welded joints - Acceptance levels

EN 30042 Arc-welded joints in aluminium and its weldable alloys – guidance on quality levels for imperfections

EN 60204-1 Safety of machinery - Electrical equipment of machines
Part 1: General requirements (IEC 60204-1)

Conductor cars are covered by the Directive 98/37/EC of the European Parliament and the Council of 22 June 1998 on the approximation of the laws of the Member States relating to machinery. In the case of conductor cars which are also used for lifting persons, the cars are devices covered by Annex IV of the Directive.

Every manufacturer or his authorised representative established in the Community shall prove by a conformity assessment procedure, that his conductor car complies with the requirements of the Directive. Where this standard covers one or more of the essential safety requirements of the Directive, conductor cars constructed in accordance with this standard shall be presumed to comply with the relevant essential requirements.

3 Definitions

3.1
conductor cars
conductor cars covered by this standard are devices designed to be used as moveable workplaces on overhead lines suspended by conductors or shield wires and which are moved manually, by pulling ropes or built-in-traction.

In addition conductor cars may be designed to incorporate the raising of persons to the work position

3.2
brake
the brake is used for slowing down the conductor car to a standstill

3.3
locking device
the locking device is used for fixing the conductor car at a position on the conductor or shield wire

3.4
conductors (IEC 466-01-15)
a wire or combination of wires not insulated from one another, suitable for carrying an electric current.

The conductors are strung between two supports of overhead lines. They may be arranged as a single conductor only or as a conductor bundle

3.5 Tests

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3.5.1
type test (IEC 151-16-16)
conformity test made on one or more items representative of the production

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3.5.2
routine test (IEC 151-16-17)
a periodical test defined by the manufacturer to which each individual device is subjected after manufacture by the user to ascertain that it complies with certain criteria

3.6
permissible load
the permissible load is the maximum load defined by the designer with which the conductor car may be loaded. The permissible load does not include the weight of the car

4 Requirements

4.1 Mechanical requirements

If conductor cars are designed to raise or lower persons a suitable safety factor shall be assigned, this is usually double.

4.1.1 Frame

Frameparts which are relevant for safety shall have a calculated safety factor of at least three times the stresses which may occur during the most unfavourable using condition with permissible load.

All materials have unique physical properties and will behave in different ways depending on the conditions to which they are exposed. Therefore consideration should be given to raising of the safety factor for special materials.

In case of emergency, i. e. if conductor car wheels inadvertently become detached from conductor, the safety factor may be different than under normal using conditions.

The welding shall be carried out regarding the following European Standards e. g. EN 1011-1, EN 1011-2, EN 1011-3 and EN 1011-4.

The welding shall at least meet the evaluation category BS-AL in accordance with EN 30042, Arc-welded joints in aluminium and its weldable alloys - Guidance on quality levels for imperfections.

Other materials may be used if they fulfil the above mentioned requirements.

4.1.2 Chassis

The chassis must be equipped with a device which protects the car from unintended tilting or falling under all operating and emergency conditions.

Conductor cars with built-in-traction shall be designed for a maximum speed of 6 km/h.

4.1.3 Brakes and locking device

4.1.3.1 Conductor cars shall be equipped with a brake and two locking devices independent from each other. The brake can also work as a locking device. The brake and the locking device shall be rated in accordance with 5.6.

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4.1.3.2 The locking device shall fasten the conductor car directly to the conductor under all conditions. In case of failure of the brake the locking device shall take over the function of the brake.

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Locking devices of conductor cars shall affect at least two axles independent from each other.

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4.1.3.3 For horizontally arranged conductors the brake shall have an effect on both conductors equally.

4.1.3.4 The locking devices shall be designed and arranged in such a way that their effect on at least one axle is always ensured, especially during the overtravelling of suspension sets and spacers.

4.1.3.5 Brakes and locking devices shall be designed such that there is no damage to the conductors under normal operating conditions.

4.1.4 Personnel protection

The conductor car shall be designed to allow rescue of an incapacitate operator.

The conductor car shall be designed to facilitate protection against the fall of persons.

In the case of conductor cars without flank protection in which the operator is sitting, there shall be a device to secure the operator to the seat.

In the case of conductor cars in which the operator is standing, the conductor cars shall be equipped with fall protection. The fall protection shall consist of

– a spar at a height of (1,00 ± 0,01) m,

– other design elements which ensure that persons shall not fall through and

– a border with a height of (0,1 ± 0,01) m at the floor.

In the case of conductor cars which are used on bundle conductors where the operator is positioned between the bundle, subconductors may replace the function of the upper flank protections.

In the case of conductor cars which are used on bundle conductors and the operator is positioned outside the bundle, chains or other elements may replace the function of the upper flank protections.

4.1.5 Operator environment

The conductor car shall be designed such that there are no sharp edges.

4.1.6 Car floor

The floor shall be slip resistant.

4.1.7 Mounting attachments

Conductor cars shall be provided with clearly marked mounting attachments for

– transporting (shifting to conductors or trailer, etc.),

– external traction (with pulling rope, etc.),

– equipotential bond,

– personal protective equipment against falls from a height.

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If it is not requested by the customer, the conductor car may be constructed without a mounting attachment for personal protective equipment. An alternative attachment for personal protective equipment may be directly to the conductors.

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4.1.8 Operating devices

Operating devices must be designed and arranged in such a way, that they can be reached and operated easily without confusion. They shall be protected against unintentional operation and they shall be marked durably.

4.1.9 Drives

Drives comprising of gears, chains and cone belts shall be completely covered.

Conductor car wheels shall be designed such that there are no risks to the operators hands. Conductor cars shall be designed such that there is no damage to the conductors under normal operating conditions.

4.1.10 Cables and hydraulic hoses

Cables and hoses shall be protected against mechanical damage.

4.1.11 Break down of built-in-traction

Conductor cars with built-in-traction shall be able to be moved manually or by means of a pulling rope, if the built-in-traction fails.