

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE

**Powertrack systems –  
Part 22: Particular requirements for powertrack systems intended for on floor or  
under floor installation**

**Systemes de conducteurs préfabriqués –  
Partie 22: Exigences particulières pour les systèmes de conducteurs  
préfabriqués destinés au montage sur le sol ou sous le sol**



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Partie 22: Exigences particulières pour les systèmes de conducteurs  
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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

## POWERTRACK SYSTEMS –

**Part 22: Particular requirements for powertrack systems intended for on floor or under floor installation**

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International Standard IEC 61534-22 has been prepared by subcommittee 23A: Cable management systems, of IEC Technical Committee 23: Electrical accessories.

The text of this standard is based on the following documents:

FDIS	Report on voting
23A/580/FDIS	23A/590/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This standard is to be used in conjunction with IEC 61534-1:2003, Powertrack systems – Part 1: General requirements.

The clauses of the particular requirements of this Part 22 add to or modify the corresponding clauses in Part 1. Where the text of Part 22 indicates an "addition" or a "deletion" or a "replacement" of the relevant requirement, test specification or explanation of Part 1, these changes are made to the relevant text of Part 1, which then becomes part of the standard. Where no change is necessary, the words: "This clause of Part 1 is applicable" are used in Part 22.

Subclauses, tables and figures which are in addition to those in Part 1 are numbered starting with 101.

A list of all parts of IEC 61534 series, published under the general title *Powertrack systems*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

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Withhold

## POWERTRACK SYSTEMS –

### Part 22: Particular requirements for powertrack systems intended for on floor or under floor installation

#### 1 Scope

This clause of Part 1 is applicable except as follows:

This standard applies to PT systems which are intended to be mounted on, or under the floor level and floor service units which are mounted on the floor, under the floor or flush with the floor.

NOTE 1 Types and applications are shown in Figures AA.1a, AA.1b and AA.2.

NOTE 2 Flush floor PT systems, with the exception of flush floor service units, are not covered by this standard.

#### 2 Normative references

This clause of Part 1 is applicable.

#### 3 Terms and definitions

This clause of Part 1 is applicable except as follows:

*Additional terms and definitions:*

##### 3.101 under floor PT system

PT system whose components, except flush floor service units, are intended for installation beneath the finished floor and in normal use are not exposed to traffic loads

NOTE Examples are shown in Figures AA.1a and AA.1b

##### 3.102 on floor PT system

PT system whose components are mounted on the floor surface

NOTE An example is shown in Figure AA.2.

##### 3.103 finished floor

floor which carries the traffic load and which may be made of concrete, wood, or the like and which may or may not be completed with floor covering material such as carpet, tile, paint, parquet or similar means

##### 3.104 apparatus mounting device

system component to accommodate electrical apparatus, for example switches, socket outlets, circuit-breakers

**3.105**

**floor service unit**

apparatus mounting device used when installing a floor system

**3.106**

**flush floor service unit**

floor service unit when not in use is flush with the finished floor

**3.107**

**in-use floor service unit**

floor service unit which has cables and/or cords connected to external electrical appliances

**3.108**

**not in-use floor service unit**

floor service unit which has no cables and/or cords connected to external electrical appliances

**3.109**

**dry-treatment of floor**

process for cleaning and/or care by which the floor is treated without liquids or with only a small quantity of liquid. The required agents are applied and spread in such quantities that no pools are formed and soaking of the floor covering does not occur

NOTE Examples of dry treatment are: sweeping with a broom or carpet-sweeper, vacuum cleaning, brushing, cleaning with a dry cleaning powder, dry shampoo treatment, wet shampooing of carpets, treatment with cleaning litter (liquid chemical cleaning agent on a solid material used as carrier, for example soaked sawdust, damp cloth, etc.).

**3.110**

**wet-treatment of floor**

process for cleaning and/or care by which the floor is treated with liquid agents such that pools of liquid, or soaking of the floor covering for a brief period of time, cannot be excluded

NOTE Examples of wet treatment are: wet scrubbing, manual or mechanical wiping.

**4 General requirements**

This clause of Part 1 is applicable:

**5 General notes on tests**

This clause of Part 1 is applicable:

**6 Ratings**

This clause of Part 1 is applicable:

**7 Classification**

This clause of Part 1 is applicable except as follows:

*Replacement:*

**7.1 According to resistance to impact for installation and application**

- PT system for 5 J impact;
- PT system for 20 J impact.



*Additional subclauses:*

### **7.101 According to floor treatment**

**7.101.1** Dry-treatment of floor

**7.101.2** Wet-treatment of floor for not in-use floor service unit

**7.101.3** Wet-treatment of floor for in-use floor service unit

### **7.102 According to the intended location**

**7.102.1** Under floor PT system

**7.102.2** On floor PT system

### **7.103 According to resistance to traffic load applied to small surface area on a flush floor service unit**

**7.103.1** 750 N

**7.103.2** 1 000 N

**7.103.3** 1 500 N

**7.103.4** 2 000 N

**7.103.5** 2 500 N

**7.103.6** 3 000 N

### **7.104 Optional classification according to resistance to traffic load applied to large surface area on a flush floor service unit**

**7.104.1** 2 000 N

**7.104.2** 3 000 N

**7.104.3** 5 000 N

**7.104.4** 10 000 N

**7.104.5** 15 000 N

## **8 Marking and documentation**

This clause of Part 1 is applicable.

## **9 Construction**

This clause of Part 1 is applicable with the following additional subclauses:

**9.101** Under floor powertrack system components shall withstand external loads during transport and installation but are not subjected to traffic loads in normal use.

*Compliance is checked by the tests specified in 14.2.101.2.*

**9.102** On floor powertrack system components shall withstand external loads.

*Compliance is checked by the tests specified in 14.2.101.3.*

**9.103** Flush floor service units shall withstand traffic loads in accordance with 7.103 and 7.104.

*Compliance is checked by the tests specified in 14.2.101.4.*

**9.104** Lids of flush floor service units shall be so designed that in normal use they will close automatically and cannot be detached without an intentional action. Lids shall also resist movement or unintentional opening when subject to external load.

*Compliance is checked by inspection.*

**9.105** Blank

**9.106** Flush floor service units shall be so constructed that when installed with the lid closed there shall be no protrusion greater than 4 mm above the finished floor. When the service unit is in use this requirement does not apply.

*Compliance is checked by inspection.*

## **10 Clearances, creepage distances and solid insulation**

This clause of Part 1 is applicable

## **11 Protection against electric shock**

This clause of Part 1 is applicable except as follows:

### *Addition*

**11.1.101** The minimum IP rating for powertrack system components accessible to ordinary persons during normal use shall be IP 3XD. This requirement does not apply to accessories.

## **12 Terminals and terminations**

This clause of Part 1 is applicable

## **13 Screws, current-carrying parts and connections**

This clause of Part 1 is applicable

## **14 Mechanical strength**

This clause of Part 1 is applicable except as follows:

*Delete 14.2*

Add the following subclauses:

## **14.2.101 External mechanical load test**

### **14.2.101.1 General**

Under floor and on floor PT systems and PT flush floor service units, shall have sufficient mechanical strength against external mechanical loads likely to occur during normal use:

- under floor PT system components by the test of 14.2.101.2;
- on floor PT system components by the tests of 14.2.101.3;
- flush floor service units by the test of 14.2.101.4 and 14.2.101.5 as appropriate.

Any part for temporary use only during the installation phase does not need to comply with these tests but may be included for the test to allow compliance of other parts.

### **14.2.101.2 Load test for under floor powertrack system components**

NOTE This test simulates loads incurred during transport, storage and installation.

PT systems including tap-off units shall have sufficient mechanical strength against external loads likely to occur during installation and use.

#### **14.2.101.2.1 Powertrack**

*The test shall be performed on a sample consisting of two lengths of powertrack each with a minimum length of 0,5 m which are connected together with the necessary connectors and with a supply connector at each end of the sample.*

*The sample is positioned on a horizontal rigid support. A steel cube of 50 mm ± 0,5 mm with an edge radius of approximately 1 mm is placed centrally on the joint. In the case of multi-compartment powertrack whose partition walls provide support, the middle of the largest compartment is selected, see Figure 101.*

*A vertical force of 750 N ± 10 N is gradually applied over 60 s ± 1 s and maintained for a further 120 s ± 5 s centrally to the cube.*

*During the test, there shall be no deformation that impairs electrical safety.*

*In case of doubt, sample shall conform to Clause 10 and 11.1.1.1.*

*After the test, the sample shall show no signs of damage, nor any cracks visible to normal or corrected vision without additional magnification.*

*After removal of the external load, the continuity of the protective circuit shall remain unaffected.*

*A current of (25 ± 1) A a.c. having a frequency of 50 Hz to 60 Hz supplied by a source with a no-load voltage not exceeding 12 V shall be passed between the earthing terminals at each end of the sample. Measurement of the voltage drop shall be made within 120 s after the initiation of the current flow. The impedance per metre, calculated from the measurement of the voltage drop between the two supply connectors, shall not exceed the value declared by the manufacturer or 0,05 Ω/m whichever is the lower.*

#### **14.2.101.2.2 Tap-off units**

*A tap-off unit shall be centrally installed on a length of powertrack which has a minimum length of 0,5 m.*

The powertrack is positioned on a horizontal rigid support. A steel cube of  $50 \text{ mm} \pm 0,5 \text{ mm}$  with an edge radius of approximately  $1 \text{ mm}$  is placed centrally on the tap-off unit. If the profile of the tap-off unit is unable to accommodate the complete contact area of the cube then a suitably profiled intermediate piece may be inserted between the tap-off unit and the cube.

A vertical force of  $750 \text{ N} \pm 10 \text{ N}$  is gradually applied over  $60 \text{ s} \pm 1 \text{ s}$  and maintained for a further  $120 \text{ s} \pm 5 \text{ s}$  centrally to the cube.

During the test, there shall be no deformation that impairs electrical safety.

In case of doubt, the sample shall conform to Clause 10 and 11.1.1.1.

After the test, the sample shall show no signs of damage, nor any cracks visible to normal or corrected vision without additional magnification.

After removal of the external load, the continuity of the protective circuit shall remain unaffected.

A current of  $(25 \pm 1) \text{ A}$  a.c. having a frequency of  $50 \text{ Hz}$  to  $60 \text{ Hz}$  supplied by a source with a no-load voltage not exceeding  $12 \text{ V}$  shall be passed between the earthing terminal or contact of the tap-off unit and the nearest point on the protective earth busbar with the tap-off unit fully engaged as in normal use. Measurement of the voltage drop shall be made within  $120 \text{ s}$  after the initiation of the current flow. The impedance calculated from the measurement of the voltage drop between the two points stated shall not exceed the value declared by the manufacturer or  $0,05 \text{ } \Omega/\text{m}$  whichever is the lower.

#### 14.2.101.3 Load test for on floor PT system components

PT systems including tap-off units shall have sufficient mechanical strength against external loads likely to occur during installation and use.

##### 14.2.101.3.1 Powertrack

The test shall be performed on a sample consisting of two lengths of powertrack each with a minimum length of  $0,5 \text{ m}$  which are connected together with the necessary connectors and with a supply connector at each end of the sample.

The sample is positioned on a horizontal rigid support. A steel cube of  $50 \text{ mm} \pm 0,5 \text{ mm}$  with an edge radius of approximately  $1 \text{ mm}$  is placed centrally on the joint. In the case of multi-compartment powertrack whose partition walls provide support, the middle of the largest compartment is selected, see Figure 101.

A vertical force of  $1\,000 \text{ N} \pm 10 \text{ N}$  is gradually applied over  $60 \text{ s} \pm 1 \text{ s}$  and maintained for a further  $120 \text{ s} \pm 5 \text{ s}$  centrally to the cube.

During the test, there shall be no deformation that impairs electrical safety.

In case of doubt, the sample shall conform to Clause 10 and 11.1.1.1.

After the test, the sample shall show no signs of damage, nor any cracks visible to normal or corrected vision without additional magnification.

After removal of the external load, the continuity of the protective circuit shall remain unaffected.

A current of  $(25 \pm 1) \text{ A}$  a.c. having a frequency of  $50 \text{ Hz}$  to  $60 \text{ Hz}$  supplied by a source with a no-load voltage not exceeding  $12 \text{ V}$  shall be passed between the earthing terminals at each

end of the sample. Measurement of the voltage drop shall be made within 120 s after the initiation of the current flow. The impedance per metre, calculated from the measurement of the voltage drop between the two supply connectors, shall not exceed the value declared by the manufacturer or 0,05  $\Omega$ /m whichever is the lower.

#### 14.2.101.3.2 Tap-off units

A tap-off unit shall be centrally installed on a length of powertrack which has a minimum length of 0,5 m.

The powertrack is positioned on a horizontal rigid support. A steel cube of 50 mm  $\pm$  0,5 mm with an edge radius of approximately 1 mm is placed centrally on the tap-off unit. If the profile of the tap-off unit is unable to accommodate complete contact area of the cube then a suitably profiled intermediate piece may be inserted between the tap-off unit and the cube.

A vertical force of 1000 N  $\pm$  10 N is gradually applied over 60 s  $\pm$  1 s and maintained for a further 120 s  $\pm$  5 s centrally to the cube.

During the test, there shall be no deformation that impairs electrical safety.

In case of doubt, the sample shall conform to Clause 10 and 11.1.1.1

After the test, the sample shall show no signs of damage, nor any cracks visible to normal or corrected vision without additional magnification.

After removal of the external load, the continuity of the protective circuit shall remain unaffected.

A current of (25  $\pm$  1) A a.c. having a frequency of 50 Hz to 60 Hz supplied by a source with a no-load voltage not exceeding 12 V shall be passed between the earthing terminal or contact of the tap-off unit and the nearest point on the protective earth busbar with the tap-off unit fully engaged as in normal use. Measurement of the voltage drop shall be made within 120 s after the initiation of the current flow. The impedance calculated from the measurement of the voltage drop between the two points stated shall not exceed the value declared by the manufacturer or 0,05  $\Omega$ /m whichever is the lower.

#### 14.2.101.4 Traffic load test for flush floor service units as declared in 7.103

The test is carried out on an assembly prepared according to the manufacturer's instructions.

NOTE 1 Additional provision may be included to simulate the influence of the floor material on the sides of the product.

NOTE 2 Other system components may be included, if necessary, to prevent movement.

The surface of the sample which can be exposed to traffic is loaded with the force declared according to 7.103.

A vertical force is applied through a steel cylinder of 13,3 mm  $\pm$  0,1 mm diameter with an edge radius of 1 mm providing a contact surface of approximately 1 cm<sup>2</sup> with a minimum length of 30 mm as shown in Figure 102.

The cylinder is placed approximately in the middle of the length of the sample and in the most unfavourable position in the width of the sample. In the case of a multi-compartment floor service unit whose partition(s) provide support, the middle of the largest compartment is selected.