International Standard

ISO 1813

# Belt drives — Electrical conductivity of antistatic belts: Characteristics and test methods

*Transmissions par courroies — Conductibilité électrique des courroies anti-électrostatiques: Caractéristiques et méthodes d'essai*

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

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# Foreword

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This document was prepared by Technical Committee ISO/TC 41, *Pulleys and belts (including veebelts)*, Subcommittee SC 1, *Friction*.

This fifth edition cancels and replaces the fourth edition (ISO 1813:2014), which has been technically revised.

The main changes are as follows:

— addition of terms in Clause 3;

— revision of the unit of surface resistivity of the dried film from Ω·m to Ω (see 9.2).

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# Belt drives — Electrical conductivity of antistatic belts: Characteristics and test methods

## 1 Scope

This document specifies the maximum electrical resistance of the following:

— antistatic endless V-ribbed belts;

— joined V-belts;

— single V-belts, including wide section belts and hexagonal belts.

This document also specifies the corresponding production control and individual proof methods of measurements.

This document applies to new belts intended to be used in an explosive atmosphere or in situations where there is a fire risk. The test is intended to ensure that the belt is sufficiently conductive to dissipate charges of electricity which can form on it in service.

## 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.

ISO 1604, *Belt drives — Endless wide V-belts for industrial speed-changers and groove profiles for corresponding pulleys*

ISO 2790, *Belt drives — V-belts for the automotive industry and corresponding pulleys — Dimensions*

ISO 3410, *Agricultural machinery — Endless variable-speed V-belts and groove sections of corresponding pulleys*

ISO 4183, *Belt drives — Classical and narrow V-belts — Grooved pulleys (system based on datum width)*

ISO 4184, *Belt drives — Classical and narrow V-belts — Lengths in datum system*

ISO 5289, *Agricultural machinery — Endless hexagonal belts and groove sections of corresponding pulleys*

ISO 5290, *Belt drives — Grooved pulleys for joined narrow V-belts — Groove sections 9N/J, 15N/J and 25N/J (effective system)*

ISO 5291, *Belt drives — Grooved pulleys for joined classical V-belts — Groove sections AJ, BJ, CJ and DJ (effective system)*

ISO 9981, *Belt drives — Pulleys and V-ribbed belts for the automotive industry — PK profile: Dimensions*

ISO 9982, *Belt drives — Pulleys and V-ribbed belts for industrial applications — PH, PJ, PK, PL and PM profiles: dimensions*

ISO 23529, *Rubber — General procedures for preparing and conditioning test pieces for physical test methods*

## 3 Terms and definitions

No terms and definitions are listed in this document.

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

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

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

## 4 Electrical conductivity characteristics

The electrical conductivity of an individual belt, when tested by the production control test method (factory test) in accordance with Clause 8, shall have an electrical resistance not greater than that given by the applicable limit value specified in Table 1, Table 2, or Table 3.

The electrical conductivity of an individual belt, when proof-tested in accordance with Clause 9, shall have an electrical resistance not greater than that given by Formula (1).

## 5 Principle

The electrical resistance along a fixed length of belt is measured by an insulation tester under specified conditions. The belt(s) shall be accepted as suitable for antistatic duties if the electrical conductivity is sufficiently high that a specified level of electrical resistance is not exceeded.

## 6 Test apparatus and material

**6.1 Insulation tester**, with a nominal open-circuit voltage of 500 V d.c. capable of applying a voltage of not less than 40 V with a power of not more than 3 W in the belt section under test and capable of measuring the electrical resistance with an accuracy of ±5 %.

The voltage shall be applied no longer than is necessary to carry out the test, in order to reduce the risk of overheating the test piece.

For values of resistance above $10^6$ Ω, an instrument with a nominal open-circuit voltage of 1 000 V may be used.

### 6.2 Metal electrodes

**6.2.1 Two metal electrodes**, of low electrical resistance, preferably brass, having contact surfaces of minimum width of 25 mm, arranged in a nominal distance of 100 mm apart on an electrically insulated base (see Figure 1).

**6.2.2 Electrodes for testing single V-belts (driving surfaces)**. The dimensions of the V-groove of the fixed electrodes shall be as specified for the pulley groove profile associated with the belt. The groove angle shall be specified by the manufacturer according to the design and type of belt being tested (see Figure 3).

In order to maintain continuity with previous editions of this document, the movable electrodes applicable to classical and narrow V-belts are retained as alternatives to the fixed electrodes. These electrodes have contact surfaces which are free to rotate around an axis parallel to the drive side surfaces of the belt (see Figure 5, Figure 6 and Table A.1).

These types of electrodes are not applicable to V-ribbed belts or joined V-belts.

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