
Conveyor belts — Drum friction testing

Courroies transporteuses — Essais de frottement au tambour

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html. (standards.iteh.ai)

This document was prepared by Technical Committee ISO/TC 41, *Pulleys and belts (including veebelts)*, Subcommittee SC 3, *Conveyor belts*.

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Introduction

The purpose of this document is to provide a method of testing that will assist conveyor belt users in assessing the degree of risk which can be anticipated from the hazard caused when a conveyor belt stalls and the drive mechanism of the conveyor system continues to operate, causing localized heating of the conveyor belt through contact with the driving drum or other frictional heat source.

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Conveyor belts — Drum friction testing

1 Scope

This document specifies a method of testing to determine the propensity of a conveyor belt to generate heat flame or glow when held stationary, under a given tension, in surface contact around a rotating driven steel drum.

It describes means of varying the conveyor belt tension.

NOTE For conveyor belts containing steel reinforcement, it may not be possible to conduct this test in full due to the inability of the conveyor belt to comply with the requirements of 7.2. In this case, premature termination according to 7.3 can be necessary.

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 65, *Carbon steel tubes suitable for screwing in accordance with ISO 7-1*

ISO 7590, *Steel cord conveyor belts — Methods for the determination of total thickness and cover thickness*

ISO 9329-1, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 1: Unalloyed steels with specified room temperature properties*

ISO 9330-1, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 1: Unalloyed steel tubes with specified room temperature properties*

EN 60584-1, *Thermocouples — Part 1: EMF specifications and tolerances*

3 Terms and definitions

No terms and definitions are listed in this document.

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

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

4 Principle

A test piece of conveyor belt, suitably mounted and tensioned, is wrapped halfway around a rotating steel drum, simulating a stalled belt. The test is continued at specified tensions for a given time period, or until the belt parts or breaks. The presence, or absence, of flame or glow is noted and reported and the maximum temperature of the drum is recorded. The test is conducted in still air and/or in moving air. Two options on arc of contact are given. The reduced arc of contact test (135° of contact) with increased initial load is considered equivalent to the 180° arc of contact test.

5 Apparatus

5.1 Steel drum, of external diameter (210 ± 1) mm mounted on a horizontal axis and capable of being rotated under all load conditions at (200 ± 5) r/min throughout the test. The outer shell of the drum shall be manufactured from tube complying with ISO 9329-1 or ISO 9330-1. The surface roughness, R_a , of the drum surface shall be a maximum of $1,6 \mu\text{m}$.

NOTE Experience has shown that motors of between 7,5 kW and 15 kW have proven suitable for maintaining these conditions, although for smaller motors, a “soft start” can be necessary.

Basic dimensions of the drum, shown in [Figure 3](#), are given in order to standardize its thermal characteristics. The variation in diameter along the length of the drum shall not exceed 1 mm.

Notwithstanding the dimensions and tolerances on the drum diameter and shell thickness shown in [Figure 3](#), the effect of wear down to a minimum shell thickness of 6 mm is permissible, but the overall diameter of the drum shall not become less than 209 mm.

5.2 Mineral-insulated stainless steel sheathed thermocouple, having a maximum outside diameter of 2 mm and complying with EN 60584-1. It shall be used to determine the drum temperature. The tip of the thermocouple shall be set not more than 0,5 mm below the surface of the drum, midway along its length.

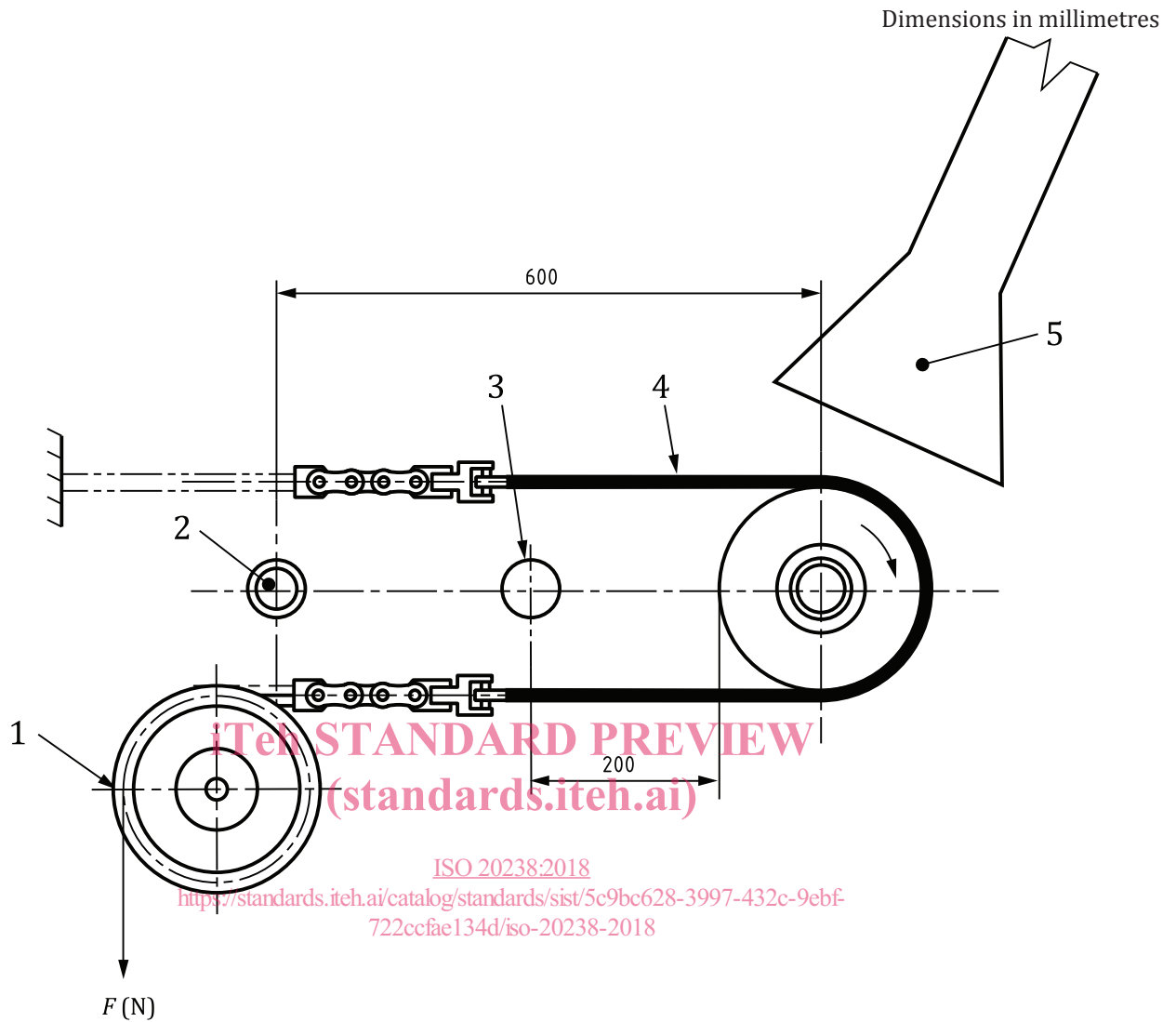
More than one thermocouple may be fitted in order to provide back-up in the event of failure.

Take care to see that the effective “cold junction” temperature is compensated for or, alternatively, is measured and the appropriate correction made.

The functioning of the rotating contacts shall be checked periodically by observing that there is no change in the recorded temperature when the apparatus is run without a test piece.

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Key

- 1 guide pulley
- 2 perforated air supply pipe
- 3 anemometer
- 4 test piece
- 5 fume extraction hood

Figure 1 — Schematic arrangement of drum friction apparatus (standard arc of contact)