INTERNATIONAL STANDARD

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Film for wrapping rubber bales —

Part 1: Butadiene rubber (BR) and styrene-butadiene rubber (SBR)

Emballage des balles en caoutchouc —

Partie 1: Caoutchouc butadiène (BR) et caoutchouc styrène-butadiène (SBR)

Reference number
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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).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 3, *Raw materials (including latex) for use in the rubber industry*.

This second edition cancels and replaces the first edition (ISO 20299-1:2006), of which it constitutes a minor revision to update the normative references, in Clause 2 and in the text. It also incorporates the Technical Corrigendum ISO 20299-1:2006/Cor.1:2008.

ISO 20299 consists of the following parts, under the general title *Film for wrapping rubber bales*:

— *Part 1: Butadiene rubber (BR) and styrene-butadiene rubber (SBR)*

— *Part 2: Natural rubber*

— *Part 3: Ethylene-propylene-diene rubber (EPDM), acrylonitrile-butadiene rubber (NBR), hydrogenated nitrile-butadiene rubber (HNBR), acrylic-ethylene rubber (AEM) and acrylic rubber (ACM)*

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Introduction

Considerable quantities of general-purpose synthetic rubber are prepared in crumb form. The crumbs are dried and then pressed into bales while still warm, at approximately 60 °C. The bales are then wrapped in a film and packed, often automatically, into crates.

The wrapping film should be strong enough to withstand the stresses encountered during the wrapping and packaging operations. It should not adhere to the film on the other bales under the combined effects of the heat from the rubber and the weight of the bales. During storage, the rubber will flow and the film should be able to withstand the stresses generated. Any failure of the film will cause rubber-to-rubber adhesion, which in a 30-bale crate leads to a “one-tonne bale”.

The prime purpose of the film is to keep the bales separate at all times so that they may be easily removed from their packaging for use. However, because it is difficult and uneconomic to strip the film from each bale, an essential feature is that the film should disperse in the rubber compound during mixing. This means that its melting point has to be lower than the temperatures attained in internal mixing cycles, typically 120 °C to 160 °C.

Unfortunately, there is no acceptable or reproducible dispersal test available to measure this important property directly.

Mixes carried out on a two-roll mill or in a single-stage internal mixer cycle might not reach the required temperature for dispersion. If this happens, then an option would be to strip the film from the bales or to use a lower melting point film if this is practical.

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Film for wrapping rubber bales —

Part 1:
Butadiene rubber (BR) and styrene-butadiene rubber (SBR)

WARNING — Persons using this part of ISO 20299 should be familiar with normal laboratory practice. This part of ISO 20299 does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

1 Scope

This part of ISO 20299 specifies the material and physical property requirements for non-strippable film for wrapping general-purpose synthetic rubber bales, intended to keep the bales separate during storage, for example for wrapping:

— styrene-butadiene rubber (SBR);

— butadiene rubber (BR).

Certain applications or processing methods require the removal of the film. This part of ISO 20299 does not deal with strippable films.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 306:2013, *Plastics — Thermoplastic materials — Determination of Vicat softening temperature (VST)*

ISO 4591, *Plastics — Film and sheeting — Determination of average thickness of a sample, and average thickness and yield of a roll, by gravimetric techniques (gravimetric thickness)*

ISO 11357-3, *Plastics — Differential scanning calorimetry (DSC) — Part 3: Determination of temperature and enthalpy of melting and crystallization*

3 Material

The film shall be manufactured from one of the following:

a) low-density polyethylene (polyethene) (PE-LD);

b) low-density polyethylene blended with ethylene/vinyl acetate copolymer (EVAC);

c) an appropriate grade of EVAC copolymer.

NOTE Antioxidants, slip agents, and anti-blocking agents may be present.

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