

STN	Tuhé biopalivá Bezpečná manipulácia a skladovanie peliet z tuhých biopalív na komerčné a priemyselné použitie (ISO 20024: 2020)	STN EN ISO 20024 65 7432
------------	--	--

Solid biofuels - Safe handling and storage of solid biofuel pellets in commercial and industrial applications (ISO 20024:2020)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 07/20

Obsahuje: EN ISO 20024:2020, ISO 20024:2020

130930

EUROPEAN STANDARD

EN ISO 20024

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2020

ICS 27.190; 75.160.40

English Version

Solid biofuels - Safe handling and storage of solid biofuel pellets in commercial and industrial applications (ISO 20024:2020)

Biocombustibles solides - Manipulation et stockage en toute sécurité des granulés de biocombustibles solides dans des applications commerciales et industrielles (ISO 20024:2020)

Biogene Festbrennstoffe - Sicherer Umgang und Lagerung von Pellets aus biogenen Festbrennstoffen in kommerziellen und industriellen Anwendungen (ISO 20024:2020)

This European Standard was approved by CEN on 9 February 2020.

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

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN ISO 20024:2020 (E)

Contents	Page
European foreword.....	3

European foreword

This document (EN ISO 20024:2020) has been prepared by Technical Committee ISO/TC 238 "Solid biofuels" in collaboration with Technical Committee CEN/TC 335 "Solid biofuels" the secretariat of which is held by SIS.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2020, and conflicting national standards shall be withdrawn at the latest by September 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 20024:2020 has been approved by CEN as EN ISO 20024:2020 without any modification.

INTERNATIONAL STANDARD

ISO 20024

First edition
2020-02

Solid biofuels — Safe handling and storage of solid biofuel pellets in commercial and industrial applications

*Biocombustibles solides — Manutention et stockage en toute sécurité
des granulés de biocombustibles solides dans des applications
commerciales et industrielles*



Reference number
ISO 20024:2020(E)

© ISO 2020

ISO 20024:2020(E)**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
3.1 General terms.....	1
3.2 Risk management.....	3
3.3 Storage, handling and operation.....	6
3.4 Extinguishing media, extinguishing systems and detection.....	9
4 Guidance on how to use this document	9
5 Risk management	10
5.1 General.....	10
5.2 Introduction to the risk management process.....	12
5.2.1 General.....	12
5.2.2 Definition of scope.....	12
5.2.3 Hazard identification.....	12
5.2.4 Risk estimation.....	12
5.2.5 Risk evaluation.....	13
5.2.6 Risk reduction/control.....	13
6 Requirements for design and construction	14
6.1 General.....	14
6.2 Specific risk considerations for handling of solid biofuel pellets.....	15
6.3 Risk areas.....	17
6.4 General requirements and recommendations for safe handling.....	17
7 Requirements for safe operation and maintenance	18
7.1 General.....	18
7.2 General requirement for operation, maintenance and manuals.....	18
7.3 Documentation of operation procedures.....	19
7.4 Safety during operation.....	20
7.4.1 Operation.....	20
7.4.2 Housekeeping.....	20
7.4.3 Maintenance.....	21
7.4.4 Guidelines for visitors/contractors.....	22
7.5 Pre-planning of emergency operations.....	23
7.6 Personnel risks.....	24
8 Conveyor system and transfer points	24
8.1 General.....	24
8.2 Detection.....	24
8.3 Preparatory measures.....	25
8.3.1 Fire protection.....	25
8.3.2 Explosion protection.....	26
8.4 Additional information, recommendation and requirements on design and protection of conveyor systems.....	27
8.4.1 General.....	27
8.4.2 Detection systems.....	27
8.4.3 Fire protection.....	27
8.4.4 Explosion protection.....	28
9 Silos	28
9.1 General.....	28
9.2 Detection and temperature and gas monitoring.....	29
9.3 Preparatory measures.....	29

ISO 20024:2020(E)

9.3.1	Fire protection	29
9.3.2	Explosion protection	30
9.4	Additional information, recommendation and requirements on design and protection of silos	31
9.4.1	General	31
9.4.2	Detection systems	31
9.4.3	Fire protection systems	31
9.4.4	Explosion protection	35
10	Large scale bunkers	35
10.1	General	35
10.2	Detection and temperature and gas monitoring in bunkers	36
10.3	Preparatory measures	37
10.3.1	Fire protection	37
10.3.2	Explosion protection	37
10.4	Additional information, recommendation and requirements on design and protection of bunkers	38
10.4.1	General	38
10.4.2	Detection systems	38
10.4.3	Fire protection systems	38
10.4.4	Explosion protection	40
11	Warehouse	41
11.1	General	41
11.2	Detection	41
11.3	Preparatory measures	42
11.3.1	Fire protection	42
11.3.2	Explosion protection	42
11.4	Additional information, recommendation and requirements on design and protection of warehouse	43
11.4.1	Detection systems	43
11.4.2	Fire protection	43
11.4.3	Explosion protection	44
Annex A (informative) Description of solid biofuel pellets supply chain and general safety guidelines for unit operations		45
Annex B (informative) Self-heating and off-gassing		60
Annex C (informative) Dust as a fire and explosion hazard and mitigation of risks		66
Annex D (informative) Safety aspects and guidance on handling various emergency situations		82
Annex E (informative) Ventilation for cooling of bulk material		97
Annex F (informative) Principle design of inert gas distribution system and inlet openings		98
Annex G (informative) Examples of arrangement of various sensors and detection systems relevant to the biofuel pellet industry		101
Annex H (informative) Example for the risk assessment in a commercial medium size wood pellet store		107
Bibliography		120

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 of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 238, *Solid biofuels*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

ISO 20024:2020(E)**Introduction**

There is a continuous global growth in production, storage, handling, bulk transport and use of solid biofuels especially in the form of pelletized biofuels.

The handling and storage of solid biofuels and their physical characteristics can lead to a risk for fire and/or explosion, but also health risks, for example intoxication due to exposure to carbon monoxide (CO), asphyxiation due to oxygen depletion, and allergic reactions.

There is a risk of injury or fatality associated with pellet storage so the implementation of safety measures is important. The possibility of fire and explosion incidents is a clear indicator that safety is to be prioritized, first of all for human safety but also because interruptions in energy supply will have significant consequences. The market confidence in solid biofuels as a reliable energy source will be jeopardized, and financial losses due to business interruptions could occur. Difficulty to obtain insurance coverage will also increase.

This document provides support, advice and guidance to facility owners, logistics providers, equipment suppliers/manufacturers, consultants, authorities and insurance providers to assess and mitigate risk when handling and storing solid biofuel pellets. General guidance is provided for personnel safety protection and personal precautions in accordance with generally accepted work safety requirements. As part of the determination and assessment of risks for solid biofuels, applicable quality standards and related test methods are discussed and recommendations for additional methodologies are indicated. As made of living materials, solid biofuels are subject to degradation such as ageing and moisture contamination causing variability in reactivity which requires margins in risks assessments. One shipment of solid biofuels may have substantially different physical and chemical characteristics in terms of self-heating and off-gassing than another, and therefore diligent monitoring, frequent testing and house-keeping are recommended.

Solid biofuels — Safe handling and storage of solid biofuel pellets in commercial and industrial applications

1 Scope

This document provides principles and requirements for safe handling and storage of solid biofuels pellets in commercial and industrial applications. This document is using a risk-based approach to determine what safety measures should be considered.

Facilities with a storage capacity <100 t are covered by ISO 20023. Generally, for end-user facilities with a storage capacity of <1 000 t, ISO 20023 could also be applicable if storage principle and facility complexity is in-line with the objectives of ISO 20023.

This document covers the handling and storage process of pellets in the following applications:

- at a pellet production plant from the outlet of the cooler unit until loaded for transportation;
- at a commercial distributor from the receiving station until loaded for transportation; and
- at an industrial end-user from the receiving station until fed into the fuel preparation or combustion process.

Although unloading and loading of e.g. vessels, trains or trucks are included in the operational envelopes defined above, the safety aspect of the transportation itself is beyond the scope of this document.

This document also gives specific guidance on detection and suppression systems and preparatory measures to enable safe and efficient firefighting operations. Guidance on the management of fire and explosion incidents is also specified.

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 12100, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN