

Overview of ISO TC 238 Safety Standards

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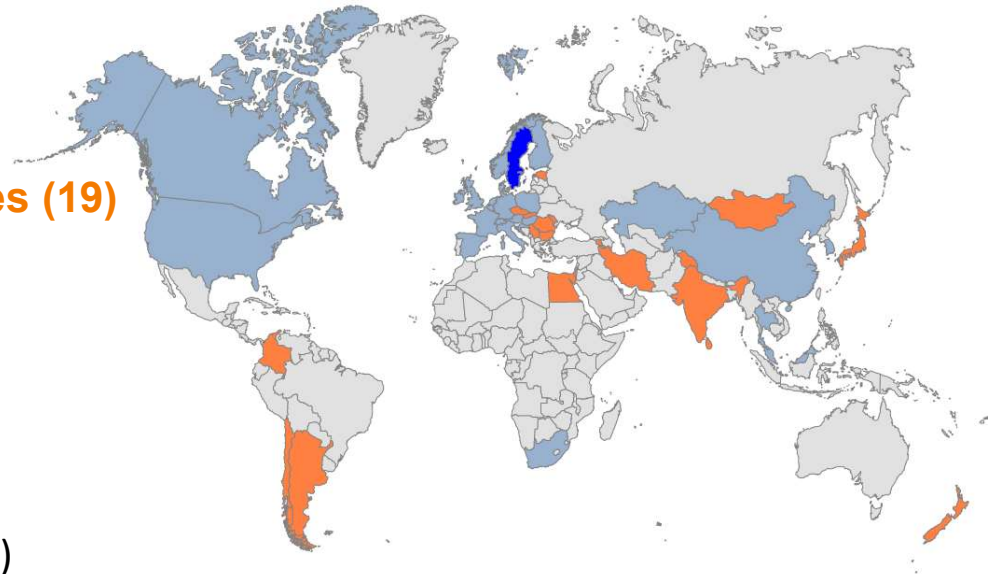
World of ISO TC 238 (Solid Biofuels)

Participating Countries (24)

Austria (ASI)
Belgium (NBN)
Canada (SCC)
China (SAC)
Croatia (HZN)
Denmark (DS)
Finland (SFS)
France (AFNOR)
Germany (DIN)
Hungary (MSZT)
Ireland (NSAI)
Italy (UNI)
Korea, Republic of (KATS)
Malaysia (DSM)
Netherlands (NEN)
Norway (SN)
Poland (PKN)
South Africa (SABS)
Spain (AENOR)
Sweden (SIS)
Switzerland (SNV)
Thailand (TISI)
United Kingdom (BSI)
United States (ANSI)

Observing Countries (19)

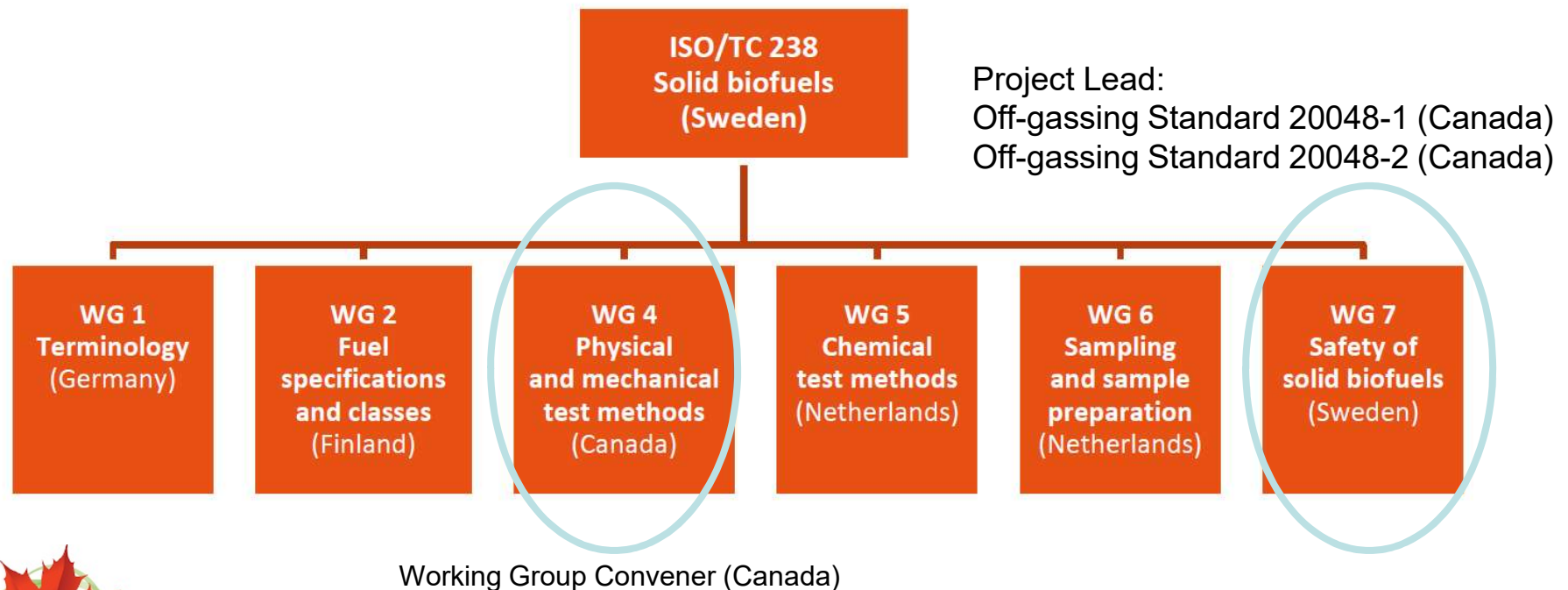
Argentina (IRAM)
Armenia (SARM)
Barbados (BNSI)
Bulgaria (BDS)
Chile (INN)
Colombia (ICONTEC)
Czech Republic (UNMZ)
Egypt (EOS)
Estonia (EVS)
India (BIS)
Iran, Islamic Republic of (ISIRI)
Israel (SII)
Japan (JISC)
Moldova, Republic of (ISM)
Mongolia (MASM)
Romania (ASRO)
Serbia (ISS)
Slovakia (SOSMT)
Sri Lanka (SLSI)



P-members (participating members) participate actively in the work, with an obligation to vote on all questions formally submitted for voting within the TC or SC, on NWI, DIS and FDIS, and to contribute to meetings. **O-members** (observers) follow the work as an observer, and therefore receive committee documents and have the right to submit comments and to attend meetings.

Scope of ISO TC 238 Committee Structure

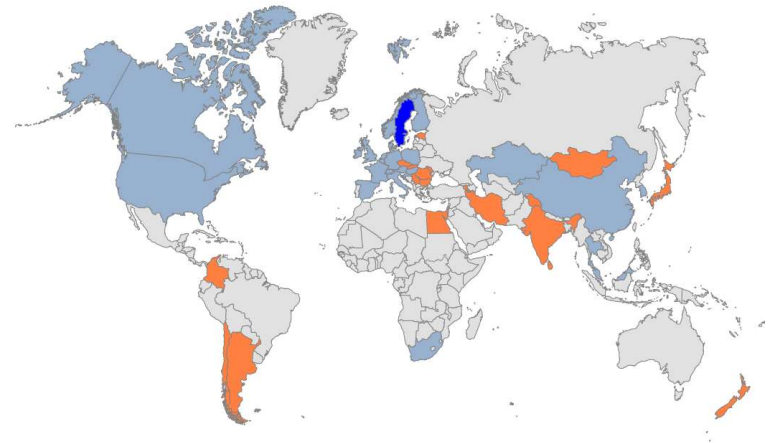
Standardization of terminology, specifications and classes, quality assurance, sampling and sample preparation, test methods and safety aspects in the field of raw and processed materials originating from arboriculture, agriculture, aquaculture, horticulture and forestry to be used as a source for solid biofuels.



Standardization within ISO/TC238

Working Group 7, ISO/TC238 Safety of solid biofuels

- Created at TC238 meeting in Stockholm 2014
- 1st meeting held in Vienna January 2015
- 11th (most recent) meeting held in Seoul, Korea, May 2019
- **Next meeting (2020) will be in Vancouver**
- 24 Participating countries
- 19 Observing countries



Active projects in ISO/TC238/WG7

- **ISO 20023:** Safe handling and storage of wood pellets in residential and other small-scale applications (published October/December 2018)
- **DIS 20024:** Safe handling and storage of solid biofuel pellets in commercial and industrial applications (out for public consultation)
- **WD 20048-1:** Determination of off-gassing and oxygen depletion characteristics – Part 1: Laboratory method for the determination of off-gassing and oxygen depletion
- **CD 20048-2:** Determination of off-gassing and oxygen depletion characteristics – Part 2: Operational method for screening of carbon monoxide off-gassing
- **CD 20049:** Determination of self-heating of pelletized biofuels

ISO 20023: Safe handling and storage of wood pellets in residential and other small-scale applications

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Reference number of working document: **ISO/TC 238/WG 7 N 70055**

Date: 2015-05-11

Reference number of document: **ISO/WD 20023**

Committee identification: ISO/TC 238/WG 7

Secretariat: SIS

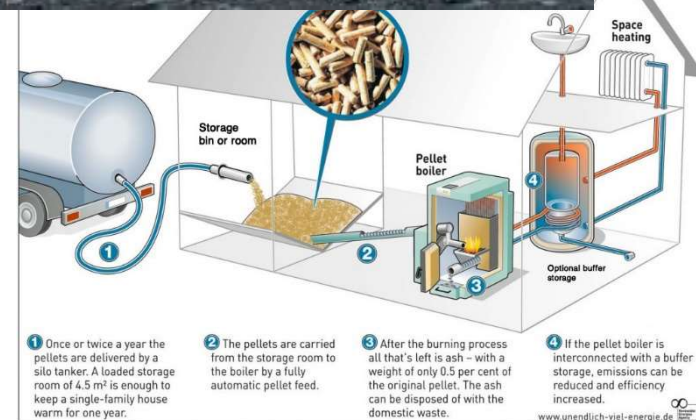
Solid biofuels – Safety of solid biofuel pellets – Safe handling and storage of wood pellets in residential and other small-scale applications

Élément introductif — Élément principal — Partie n: Titre de la partie

Warning

This document is not an ISO International Standard. It is distributed for review and comment. It is subject to change without notice and may not be referred to as an International Standard.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.



ISO 20023: Safe handling and storage of wood pellets in residential and other small-scale applications

- This International Standard provides principles and requirements for safe handling and storage of wood pellets in residential and other small-scale applications.
- It covers the supply chain from the final loading point of the bulk transport to the end-user storage and specific requirements for the bulk transport. It also covers the design and construction of pellet storage systems. This standard addresses risks of fires, dust explosions, off-gassing and other health risks.
- Facilities at end users with a storage capacity < 100 t are covered by ISO 20023 and larger stores are covered by ISO/CD 20024

ISO 20023: Safe handling and storage of wood pellets in residential and other small-scale applications

The hazards associated with pellet storage in small-scale applications can be summarized, but are not limited to :

- a) intoxication or oxygen depletion caused by volatile components that may accumulate through biological degradation or originate from backflow of flue gases
- b) risk of explosions and fire due to accumulation of dust and fines as a result of physical stress and decomposition
- c) risk of fire and smouldering due to self-ignition processes
- d) damage to storage structures and buildings due to swelling of pellets caused by water.

ISO 20023: Safe handling and storage of wood pellets in residential and other small-scale applications

- Requirements for storage and handling of pellets: Dust and fines, CO emission, humidity and moisture, contamination
- Requirements for safe transport and delivery of pellets: bulk pellets, trucks, tippers or walking floor trucks, big bags, small bags
- Requirements for bulk storage systems: Location of pellet store, Quality control of installation, Construction requirements, Measures to reduce the accumulation of fines, Protection against moisture and water, Prevention of dust movement, Fire and explosion protection, ventilation, access to storage

ISO 20024 :Safe handling and storage of solid biofuel pellets in commercial and industrial applications

Draft ISO/DIS 20024

version 2018-07-04

ISO TC 238/WG 7 N 70275

Secretariat: SIS

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

Draft DIS stage

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ISO 20024 :Safe handling and storage of solid biofuel pellets in commercial and industrial applications

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
- At an industrial end-user from the receiving station until fed into the fuel preparation or combustion process

ISO 20024 :Safe handling and storage of solid biofuel pellets in commercial and industrial applications

The purpose of this document is to help designers, purchasers of handling systems, and operators along the pellet supply chains to ensure that safety hazards and adverse effects to the quality of the pellets that can influence safety are avoided.

A risk based approach is used to determine what safety measures should be considered.

The requirements stated in this document as mandatory are additional wood pellet specific requirement that shall be included in the company's existing safety management system. The basic safety management shall, in addition to the requirements of this document, always comply with all national and regional (worker) safety laws and rules.

ISO 20024 :Safe handling and storage of solid biofuel pellets in commercial and industrial applications

- Requirements for design and construction: Specific risk considerations for handling of solid biofuel pellets: combustible or potentially explosive dust, self-heating, danger of dust emission to the environment and exposure of workers and, exposure of operators to asphyxiation or intoxication, avalanche, machinery, moving vehicles, fire hazard
- Documentation of operation procedures: Safety during operations, Pre-planning of emergency operations, Personnel risks, Conveyor system and transfer points , silos, bunkers, warehouse

WD 20048-1: Determination of off-gassing and oxygen depletion characteristics — Part 1: Laboratory method for the determination of off-gassing and oxygen depletion using closed containers

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ISO/TC 238 N 769

ISO /TS 20048-1:2019

ISO TC 238/WG 7

Secretariat: SIS

Solid biofuels — Determination of off-gassing and oxygen depletion characteristics — Part 1: Laboratory method for the determination of off-gassing and oxygen depletion using closed containers



WD stage

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WD 20048-1: Determination of off-gassing and oxygen depletion characteristics — Part 1: Laboratory method for the determination of off-gassing and oxygen depletion using closed containers

- This document defines a method for determination of off-gassing and oxygen depletion from woody as well as non-woody biomass, including densified materials such as pellets and briquettes, as well as nondensified materials such as chips.
- The method is also applicable for thermally treated materials, including torrefied and carbonized materials.
- The emission and depletion factor and emission and depletion rate for various gas species emitted from sample within a closed test container is determined by means of gas chromatography.

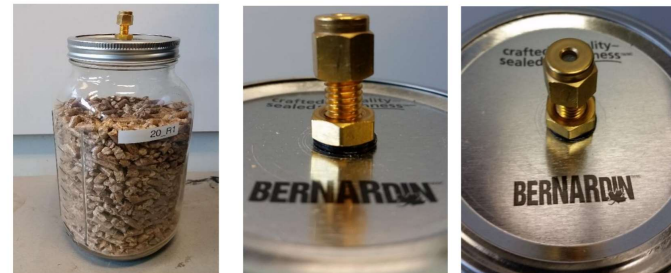


Figure 1 Example of test container of glass with sampling port

WD 20048-1: Determination of off-gassing and oxygen depletion characteristics — Part 1: Laboratory method for the determination of off-gassing and oxygen depletion using closed containers

- Test sample size
- Leakage testing of test containers
- Determination of void in biomass test sample
- Filling of test containers
- Test container arrangement and gas sampling volume
- Gas sampling procedure
- Gas analysis

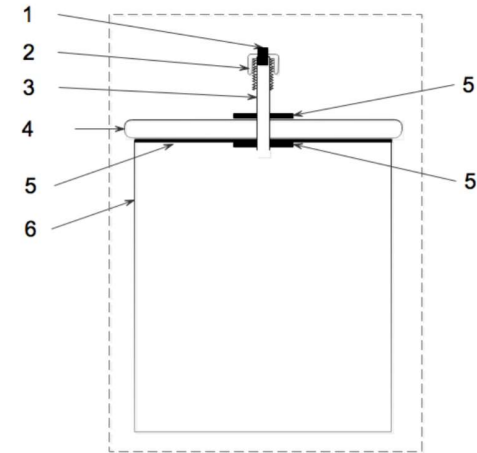


Figure 2 Schematic of test container with sampling port

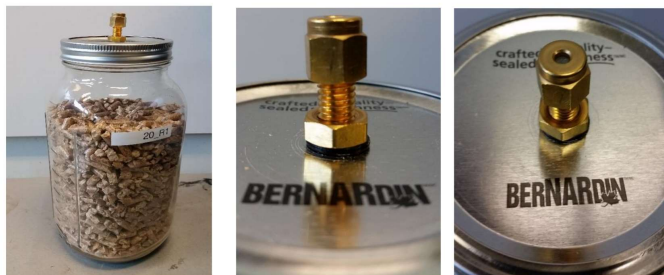


Figure 1 Example of test container of glass with sampling port



CD 20048-2: Determination of off-gassing and oxygen depletion characteristics — Part 2: Operational method for screening of carbon monoxide off-gassing

2019-02-25

draftISO/DIS 20048-2

ISO/TC 238 N70313

Secretariat: SIS

Solid biofuels — Determination of off-gassing and oxygen depletion characteristics — Part 2: Operational method for screening of carbon monoxide off-gassing

Draft DIS stage

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Figure A.1 — Insertion of logger into the pellet bulk

CD 20048-2 : Determination of off-gassing and oxygen depletion characteristics — Part 2: Operational method for screening of carbon monoxide off-gassing

- This document specifies an operational method for screening of off-gassing from solid biofuel pellets. It establishes special procedures for sampling and sample handling of solid biofuel pellets prior to the analysis of off-gassing.
- This document specifies the applicability and use of the method. Guidance on the applicability and use of the data is given.
- Test sample size, CO logger, Sampling and Sample transport and storage, filling of test containers and testing



CD 20049: Determination of self-heating of pelletized biofuels — Part 1: Isothermal calorimetry

Draft ISO/DIS 20024

version 2018-07-04

ISO TC 238/WG 7 N 70275

Secretariat: SIS

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



Draft DIS stage

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CD 20049: Determination of self-heating of pelletized biofuels — Part 1: Isothermal calorimetry

- This document specifies a general test procedure for quantification of the spontaneous heat generation from solid biofuel pellets using isothermal calorimetry.
- The document specifies a screening test procedure for wood pellets using an instrument at temperature of 60 °C
- The test procedure given in this document quantifies the thermal power (heat flow) of the sample during the test, it does not identify the source of self-heating in the test portion analyzed.
- Data on spontaneous heat generation determined using this document is only associated with the specific quality and age of the sample material.

CD 20049: Determination of self-heating of pelletized biofuels — Part 1: Isothermal calorimetry

- Isothermal calorimeter
- Sampling and Sample transport and storage
- Temperature stabilization
- Sample vial preparatio
- Heat development mea

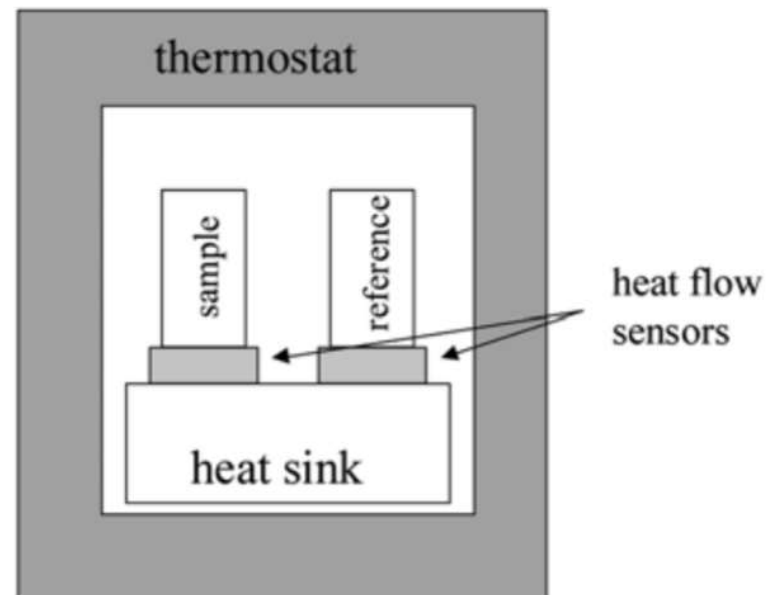


Figure 1 - Schematic drawing of an isothermal calorimeter

Thank You!

Questions?

