ISO 20024:2020-02 (E)

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

Contents

Page

Foreword v

Introduction vi

1 Scope 1

2 Normative references 1

3 Termsanddefinitions 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
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)Dustasafireandexplosionhazardandmitigationofrisks ... 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)Examplefortheriskassessmentinacommercialmediumsizewood pellet store .107

Bibliography 120