# Inhalt

<table>
<thead>
<tr>
<th>Europäisches Vorwort</th>
<th>Seite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vorwort</td>
<td>5</td>
</tr>
<tr>
<td>Einleitung</td>
<td>6</td>
</tr>
<tr>
<td>1 Anwendungsbereich</td>
<td>8</td>
</tr>
<tr>
<td>2 Normative Verweisungen</td>
<td>8</td>
</tr>
<tr>
<td>3 Begriffe</td>
<td>9</td>
</tr>
<tr>
<td>3.1 Allgemeine Begriffe</td>
<td>9</td>
</tr>
<tr>
<td>3.2 Risikomanagement</td>
<td>10</td>
</tr>
<tr>
<td>3.3 Lagerung, Handhabung und Betrieb</td>
<td>13</td>
</tr>
<tr>
<td>3.4 Löschmittel, Löschsysteme und Erkennung</td>
<td>16</td>
</tr>
<tr>
<td>4 Einführung in die Anwendung dieses Dokuments</td>
<td>17</td>
</tr>
<tr>
<td>4.1 Allgemeine Informationen</td>
<td>17</td>
</tr>
<tr>
<td>4.2 Anwendbarkeit dieses Dokuments</td>
<td>17</td>
</tr>
<tr>
<td>5 Risikomanagement</td>
<td>18</td>
</tr>
<tr>
<td>5.1 Allgemeines</td>
<td>18</td>
</tr>
<tr>
<td>5.2 Einführung in den Risikomanagementprozess</td>
<td>20</td>
</tr>
<tr>
<td>5.2.1 Allgemeines</td>
<td>20</td>
</tr>
<tr>
<td>5.2.2 Festlegung des Umfangs</td>
<td>20</td>
</tr>
<tr>
<td>5.2.3 Ermittlung von Gefährdungen</td>
<td>20</td>
</tr>
<tr>
<td>5.2.4 Risikoeinschätzung</td>
<td>21</td>
</tr>
<tr>
<td>5.2.5 Risikobewertung</td>
<td>21</td>
</tr>
<tr>
<td>5.2.6 Risikominderung/-beherrschung</td>
<td>21</td>
</tr>
<tr>
<td>6 Anforderungen an Planung und (konstruktive) Ausführung</td>
<td>23</td>
</tr>
<tr>
<td>6.1 Allgemeines</td>
<td>23</td>
</tr>
<tr>
<td>6.2 Spezifische Risikobetrachtungen hinsichtlich der Handhabung von Pellets aus biogenen Festbrennstoffen</td>
<td>23</td>
</tr>
<tr>
<td>6.3 Risikobereiche</td>
<td>25</td>
</tr>
<tr>
<td>6.4 Allgemeine Anforderungen an und Empfehlungen für eine sichere Handhabung</td>
<td>26</td>
</tr>
<tr>
<td>7 Anforderungen an den sicheren Betrieb und die sichere Wartung</td>
<td>27</td>
</tr>
<tr>
<td>7.1 Allgemeines</td>
<td>27</td>
</tr>
<tr>
<td>7.2 Allgemeine Anforderungen an Betrieb, Wartung und Handbücher</td>
<td>27</td>
</tr>
<tr>
<td>7.3 Dokumentation von Betriebsanweisungen</td>
<td>28</td>
</tr>
<tr>
<td>7.4 Sicherheit während des Betriebs</td>
<td>29</td>
</tr>
<tr>
<td>7.4.1 Betrieb</td>
<td>29</td>
</tr>
<tr>
<td>7.4.2 Einrichtungspflege</td>
<td>30</td>
</tr>
<tr>
<td>7.4.3 Wartung</td>
<td>31</td>
</tr>
<tr>
<td>7.4.4 Leitlinien für Besucher/Auftragnehmer</td>
<td>32</td>
</tr>
<tr>
<td>Nummer</td>
<td>Abschnitt</td>
</tr>
<tr>
<td>--------</td>
<td>-----------</td>
</tr>
<tr>
<td>7.5</td>
<td></td>
</tr>
<tr>
<td>7.6</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
</tr>
<tr>
<td>8.1</td>
<td></td>
</tr>
<tr>
<td>8.2</td>
<td></td>
</tr>
<tr>
<td>8.3</td>
<td></td>
</tr>
<tr>
<td>8.3.1</td>
<td></td>
</tr>
<tr>
<td>8.3.2</td>
<td></td>
</tr>
<tr>
<td>8.4</td>
<td></td>
</tr>
<tr>
<td>8.4.1</td>
<td></td>
</tr>
<tr>
<td>8.4.2</td>
<td></td>
</tr>
<tr>
<td>8.4.3</td>
<td></td>
</tr>
<tr>
<td>8.4.4</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
</tr>
<tr>
<td>9.1</td>
<td></td>
</tr>
<tr>
<td>9.2</td>
<td></td>
</tr>
<tr>
<td>9.3</td>
<td></td>
</tr>
<tr>
<td>9.3.1</td>
<td></td>
</tr>
<tr>
<td>9.3.2</td>
<td></td>
</tr>
<tr>
<td>9.4</td>
<td></td>
</tr>
<tr>
<td>9.4.1</td>
<td></td>
</tr>
<tr>
<td>9.4.2</td>
<td></td>
</tr>
<tr>
<td>9.4.3</td>
<td></td>
</tr>
<tr>
<td>9.4.4</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
<tr>
<td>10.1</td>
<td></td>
</tr>
<tr>
<td>10.2</td>
<td></td>
</tr>
<tr>
<td>10.3</td>
<td></td>
</tr>
<tr>
<td>10.3.1</td>
<td></td>
</tr>
<tr>
<td>10.3.2</td>
<td></td>
</tr>
<tr>
<td>10.4</td>
<td></td>
</tr>
<tr>
<td>10.4.1</td>
<td></td>
</tr>
<tr>
<td>10.4.2</td>
<td></td>
</tr>
<tr>
<td>10.4.3</td>
<td></td>
</tr>
<tr>
<td>10.4.4</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
</tr>
<tr>
<td>11.1</td>
<td></td>
</tr>
<tr>
<td>11.2</td>
<td></td>
</tr>
<tr>
<td>11.3</td>
<td></td>
</tr>
<tr>
<td>11.3.1</td>
<td></td>
</tr>
<tr>
<td>11.3.2</td>
<td></td>
</tr>
<tr>
<td>11.4</td>
<td></td>
</tr>
<tr>
<td>11.4.1</td>
<td></td>
</tr>
<tr>
<td>11.4.2</td>
<td></td>
</tr>
<tr>
<td>11.4.3</td>
<td></td>
</tr>
<tr>
<td>Anhang A (informativ)</td>
<td>Beschreibung der Lieferkette von Pellets aus biogenen Festbrennstoffen und allgemeine Sicherheitsrichtlinien für Grundoperationen</td>
</tr>
<tr>
<td>Anhang B (informativ)</td>
<td>Selbsterhitzung und Ausgasung</td>
</tr>
<tr>
<td>Anhang C (informativ)</td>
<td>Staub als eine Brand- und Explosionsgefahr sowie Risikominderung</td>
</tr>
</tbody>
</table>
Contents

Foreword .............................................................................................................................................. 7

Introduction .......................................................................................................................................... 8

1 Scope .................................................................................................................................................. 9

2 Normative references .......................................................................................................................... 9

3 Terms and definitions .......................................................................................................................... 9

  3.1 General terms ..................................................................................................................................... 9
  3.2 Risk management ............................................................................................................................. 10
  3.3 Storage, handling and operation ........................................................................................................ 13
  3.4 Extinguishing media, extinguishing systems and detection .............................................................. 15

4 Introduction to the use of this document ........................................................................................... 16

  4.1 General information .......................................................................................................................... 16
  4.2 Applicability of this document ........................................................................................................ 17

5 Risk management ................................................................................................................................... 18

  5.1 General .............................................................................................................................................. 18
  5.2 Introduction to the risk management process .................................................................................... 19

6 Requirements for design and construction ......................................................................................... 23

  6.1 General .............................................................................................................................................. 23
  6.2 Specific risk considerations for handling of solid biofuel pellets ................................................... 23
  6.3 Risk areas ......................................................................................................................................... 25
  6.4 General requirements and recommendations for safe handling ..................................................... 26

7 Requirements for safe operation and maintenance .............................................................................. 27

  7.1 General .............................................................................................................................................. 27
  7.2 General requirement for operation, maintenance and manuals ....................................................... 27
  7.3 Documentation of operation procedures ........................................................................................... 28
  7.4 Safety during operation .................................................................................................................... 29
8 Conveyor system and transfer points

8.1 General

8.2 Detection

8.3 Preparatory measures

8.4 Additional information, recommendation and requirements on design and protection of conveyor systems

9 Silos

9.1 General

9.2 Detection and temperature and gas monitoring

9.3 Preparatory measures

9.4 Additional information, recommendation and requirements on design and protection of silos

10 Large scale bunkers

10.1 General

10.2 Detection and temperature and gas monitoring in bunkers

10.3 Preparatory measures

10.4 Additional information, recommendation and requirements on design and protection of bunkers

11 Warehouse

11.1 General

11.2 Detection

11.3 Preparatory measures

11.4 Additional information, recommendation and requirements on design and protection of warehouse

Annex A (informative) Description of solid biofuel pellets supply chain and general safety guidelines for unit operations
Annex B (informative) Self-heating and off-gassing ................................................................. 75
Annex C (informative) Dust as a fire and explosion hazard and mitigation of risks.................. 82
Annex D (informative) Safety aspects and guidance on handling various emergency situations ........................................................................................................................................ 102
Annex E (informative) Ventilation for cooling of bulk material.................................................. 119
Annex F (informative) Principle design of inert gas distribution system and inlet openings..... 121
Annex G (informative) Examples of arrangement of various sensors and detection systems relevant to the biofuel pellet industry ........................................................................................................ 124
Annex H (informative) Example for the risk assessment in a commercial medium size wood pellet store........................................................................................................................................... 131
Bibliography ........................................................................................................................................... 141