DIN EN 415-6:2013-09 (E)

Safety of packaging machines - Part 6: Pallet wrapping machines

Contents

Page

Foreword 5

Introduction 6

1 Scope 7

2 Normative references 8

3 Terms and definitions 10
3.1 Definition of terms 10
3.2 Description of pallet wrapping machines 11

4 List of hazards on pallet wrapping machines 25
4.1 General 25
4.2 General pallet wrapping machine hazards 26
4.3 Specific hazards on pallet wrapping machines excluding shrinking systems and auxiliary machines 30
4.4 Specific hazards on pallet shrinking systems 34
4.5 Auxiliary machines 36

5 Safety requirements and measures for pallet wrapping machines 37
5.1 General 37
5.2 General requirements for pallet wrapping machines 37
5.3 Safety requirements for pallet wrapping machines 51
5.4 Safety requirements for shrinking systems 56
5.5 Auxiliary machines 61

6 Verification of safety requirements and measures 61
6.1 General 61
6.2 Visual inspections with the machine stopped 62
6.3 Measurements with the machine stopped 62
6.4 Visual inspections with the machine running 62
6.5 Measurements with the machine running 63
6.6 Verification procedures 63

7 Information for use 65
7.1 Marking 65
7.2 Signals and warning signs 66
7.3 Instruction handbook 66

Annex A (normative) Noise test code for pallet wrapping machines - grade of accuracy 2 and 3 68

Annex B (normative) Methods of safeguarding large apertures 69

B.1 Interlocked guards with guard locking 69
B.2 Fixed and interlocked guards with ESPE 69
B.3 Positioning of ESPE 72

Annex C (normative) ESPE-Muting 74

Annex D (informative) List of possibly helpful standards for gas equipment 76

Annex E (informative) Significant technical changes between this European Standard and the Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2006/42/EC 78

Bibliography 79

Figures Figure 1 -- Principle of rotary table machine 12

Figure 2 -- Manual rotary table machine 12

Figure 3 -- Automatic rotary table machine 12

Figure 4 -- Semiautomatic rotary arm machine 13

Figure 5 -- Fully automatic rotary arm machine 14

Figure 6 -- Ring machine - Principle of operation 15

Figure 7 -- Semi automatic self driving pallet stretch wrapping machine 15

Figure 8 -- Mobile pallet stretch wrapping machine 16

Figure 9 -- Curtain stretching machine - Principle of operation 16

Figure 10 -- Hood stretching machine 17

Figure 11 -- Spiral pallet wrapping machine 19

Figure 12 -- Vertical hood application machine 20

Figure 13 -- Parachute hood application machine 20

Figure 14 -- Shrinking frame 21

Figure 15 -- Chamber shrinking oven with electric heating device 22

Figure 16 -- Continuous shrinking oven using thermal combustion heating 23

Figure 17 -- Shrinking column using thermal combustion 24

Figure 18 -- Product centralizing machine 25

Figure 19 -- Semiautomatic or manual rotary table machines: crushing, shearing and drawing-in hazard location 31

Figure 20 -- Warning sign "Caution, hot surface" 44

Figure 21 -- Semiautomatic or manual rotary table machines with apertures in the table 52

Figure 22 -- Methods for safeguarding of film rollers 53

Figure B.1 -- Interlocked guards with guard locking 69

Figure B.2 -- Example of a combination of fixed and interlocked guards and ESPE 70

Figure B.3 -- Dynamic cell positioning 72

Figure B.4 -- Positioning of ESPE 73

Figure C.1 -- Positioning of muting ESPE 75

Tables Table 1 --Degree of protection for dusty environments 42

Table 2 -- Degree of protection for different cleaning methods using water 42

Table 3 -- Verification procedures for safety requirements identified in 5.2 and 5.3 64

Table 3 (continued) 65