

DIN EN 15165:2015-01 (E)

Food processing machinery - Forming machines - Safety and hygiene requirements

Contents		Page
Foreword		5
Introduction		6
1	Scope	7
1.1	General	7
1.2	Machine description	7
1.3	Combinations of forming machines and auxiliary devices and/or interchangeable equipment	10
1.3.1	Definition	10
1.3.2	Example for combinations	11
2	Normative references	11
3	Terms and definitions	12
4	List of significant hazards	13
5	Safety and hygiene requirements and/or -protective measures	17
5.1	General	17
5.2	Mechanical hazards - General	17
5.2.1	Guard interlocking	17
5.2.2	Cutting hazards	17
5.3	Forming machines with feed intake hopper	17
5.3.1	Technical solutions for infeed area	17
5.3.2	Specific requirements for types of hoppers	18
5.3.3	Mould filling area in the feed intake hopper	23
5.3.4	Crushing points between the mould plate and other parts of the machine	23
5.3.5	Ejector mechanism	24
5.3.6	Plastic film/paper interleaver (where fitted)	24
5.3.7	Mechanism to insert sticks (where fitted)	24
5.3.8	Meat ball roller (where fitted)	24
5.3.9	Drives (e.g. vee-belts and pulleys; chains and sprockets; gears, drive shafts and clutches)	24
5.3.10	Discharge conveyor (where fitted)	25
5.3.11	Loading devices	25
5.3.12	Additional requirements for lift-tilt devices	25
5.4	Additional requirements for table top machines with tray	27
5.4.1	Infeed side	27
5.4.2	Outfeed side	29
5.5	Electrical hazards	30
5.5.1	General	30
5.5.2	Emergency stop-device	30
5.5.3	Protection against water ingress	30
5.5.4	On- and Off-switch	32
5.5.5	Safety requirements related to electromagnetic phenomena	32
5.6	Hydraulic and pneumatic hazards	32
5.7	Hazards from loss of stability	32
5.8	Noise reduction	32
5.9	Ergonomic requirements	32
5.10	Hygiene and cleaning	33

6	Verification of safety and hygiene requirements and/or protective measures	35
7	Information for use	37
7.1	General	37
7.2	Instruction handbook	37
7.3	Marking	39
	Annex A (normative) Noise test code for forming machines (grade 2)	40
A.1	Sound measurements	40
A.2	Installation and mounting conditions	42
A.3	Operating conditions	42
A.4	Measurement	42
A.5	Information to be recorded	42
A.6	Information to be reported	42
A.7	Declaration and verification of noise emission values	43
	Annex B (normative) Design principles to ensure the cleanability of forming machines	44
B.1	Terms and definitions	44
B.2	Materials of construction	45
B.3	Design	45
	Bibliography	51
	Figures Figure 1 -- Floor machines	9
	Figure 2 -- Table top machine with tray	10
	Figure 3 -- Example of combination	11
	Figure 4 -- Danger zones	16
	Figure 5 -- Forming machine with feed intake hopper and switch bar/light barrier - safety distances	20
	Figure 6 -- Forming machines with divided hopper - safety distances	21
	Figure 7 -- Forming machine with feed intake hopper -- Example: ladder - safety distances	22
	Figure 8 -- Forming machine with feed intake hopper -- Example: step, two-hand control	22
	Figure 9 -- Plough in feed intake hopper	23
	Figure 10 -- Safety device for container position	27
	Figure 11 -- Infeed and outfeed side of table top machines	29
	Figure 12 -- Outfeed side of table top machines	30
	Figure 13 -- On/Off switch with hood	31
	Figure 14 -- Hygiene areas of forming machines	34
	Figure 15 -- Hygiene areas of forming machines	35
	Figure A.1 -- Position of measuring point	41
	Figure B.1 -- Joined surfaces - food area	44
	Figure B.2 -- Corners and radii in food area	45
	Figure B.3 -- Angles in the food area	46

Figure B.4 -- Intersecting surfaces in the food area	47
Figure B.5 -- Acceptable joining elements - head profiles	48
Figure B.6 -- Castors - dimensions examples	49
Tables Table 1 -- List of significant hazards	14
Table 2 -- Verification list	36