

# DIN EN 1672-1:2014-12 (E)

## Food processing machinery - Basic concepts - Part 1: Safety requirements

---

<b>Contents</b>		<b>Page</b>
Foreword .....		5
Introduction .....		6
<b>1</b>	<b>Scope .....</b>	<b>7</b>
<b>2</b>	<b>Normative references .....</b>	<b>7</b>
<b>3</b>	<b>Terms and definitions .....</b>	<b>9</b>
<b>4</b>	<b>List of significant hazards .....</b>	<b>10</b>
4.1	General .....	10
4.2	Mechanical hazards .....	11
4.2.1	Moving parts .....	11
4.2.2	Hazards caused by high pressure fluids .....	12
4.2.3	Stored energy .....	13
4.2.4	Slip, trip and fall hazards resulting from the design of the machine .....	13
4.2.5	Loss of stability .....	13
4.3	Electrical Hazards .....	13
4.3.1	Electrical equipment .....	13
4.3.2	Electrostatic phenomena .....	14
4.4	Thermal hazards .....	14
4.5	Noise .....	14
4.6	Hazards generated by vibration .....	14
4.7	Hazards generated by radiation .....	14
4.8	Hazards generated by materials and substances .....	15
4.8.1	Food products .....	15
4.8.2	Hazards from cleaning media .....	15
4.8.3	Hazards from operating machines in potentially explosive atmospheres .....	16
4.9	Hazards generated by neglecting ergonomic principles in machine design .....	16
4.9.1	General .....	16
4.9.2	Human error .....	17
4.10	Hazards due to position, identification and operation of controls .....	17
4.10.1	General .....	17
4.10.2	Inability to stop movement .....	17
4.10.3	Failure to isolate .....	17
4.11	Hazards caused by failures on the machine .....	17
4.12	Hazards due to missing or wrongly adjusted guards and protective devices .....	18
4.13	Hazards due to the linking of machines and processes .....	18
4.14	Hazards created by common mechanisms on food processing machines .....	18
4.14.1	Feed hoppers .....	18
4.14.2	Cutting devices .....	19
4.14.3	Conveyors .....	19
<b>5</b>	<b>Safety requirements and protective measures .....</b>	<b>20</b>
5.1	General .....	20
5.2	Requirements to eliminate mechanical hazards .....	20
5.2.1	Safeguarding of moving parts .....	20
5.2.2	Safety requirements for hygienic design features .....	21
5.2.3	Safety requirements for high pressure fluids .....	23
5.2.4	Stored energy .....	23
5.2.5	Requirements to prevent slip, trip and falling hazards .....	23

5.2.6	Stability of machines .....	24
5.3	Requirements to prevent electrical hazards .....	25
5.3.1	Electrical equipment .....	25
5.3.2	Electrostatic phenomena .....	27
5.4	Thermal hazards .....	27
5.5	Noise reduction .....	27
5.6	Vibration .....	28
5.7	Radiation .....	28
5.8	Food products, materials and substances .....	28
5.8.1	Food products .....	28
5.8.2	Cleaning media .....	29
5.8.3	Requirements for machines used in potentially explosive atmospheres .....	29
5.9	Ergonomic design principles .....	30
5.9.1	General .....	30
5.9.2	Operating the machine .....	30
5.9.3	Loading product into the feed hopper .....	30
5.9.4	Cleaning the machine .....	30
5.9.5	Maintenance .....	30
5.9.6	Moving the machine .....	30
5.10	Controls .....	30
5.10.1	General .....	30
5.10.2	Stop Function .....	30
5.10.3	Emergency stop devices on large machines .....	31
5.10.4	Means of isolation of energy supplies .....	31
5.11	Requirements to prevent failures .....	31
5.12	Requirements to prevent hazards due to missing or wrongly adjusted guards and protective devices .....	32
5.13	Requirements for machines and processes that are linked together .....	33
5.14	Requirements for common mechanisms on food processing machines .....	33
5.14.1	Safety requirements for feed hoppers .....	33
5.14.2	Cutting devices .....	38
5.14.3	Conveyors .....	38
6	Verification .....	39
6.1	Introduction .....	39
6.2	Visual inspections .....	40
6.2.1	Mechanical parts .....	40
6.2.2	Guards .....	40
6.3	Functional tests .....	40
6.3.1	Interlocking and protective devices .....	40
6.3.2	Stopping functions .....	40
6.4	Measurements .....	40
6.4.1	Measurements with machine stopped .....	40
6.4.2	Measurements with machine running .....	41
6.5	Design verification .....	41
6.5.1	Guards .....	41
6.5.2	Pneumatic systems .....	41
6.5.3	Hydraulic systems .....	41
6.5.4	Electrical equipment .....	41
6.6	Hazardous-product- and cleaning-media-related requirements .....	41
7	Information for use .....	41
7.1	General .....	41
7.2	Signal and warning devices .....	41
7.3	Accompanying documents .....	42
7.4	Marking .....	43
Annex A (normative)	Noise measurement .....	45
A.1	Scope .....	45
A.2	Terms and definitions .....	45
A.3	Determination of emission sound pressure level .....	45

<b>A.4</b>	<b>Sound power level determination .....</b>	<b>45</b>
<b>A.5</b>	<b>Installation and mounting conditions .....</b>	<b>46</b>
<b>A.6</b>	<b>Operating conditions .....</b>	<b>46</b>
<b>A.7</b>	<b>Measurement uncertainties .....</b>	<b>46</b>
<b>A.8</b>	<b>Information to be recorded .....</b>	<b>47</b>
<b>A.9</b>	<b>Information to be reported .....</b>	<b>47</b>
<b>A.10</b>	<b>Declaration and verification of noise emission values .....</b>	<b>47</b>
<b>Annex B (normative) Alternative methods of safeguarding medium-sized openings in guards .....</b>		<b>49</b>
<b>Annex C (normative) Relationship to machine-specific food processing machine standards .....</b>		<b>50</b>
<b>Bibliography .....</b>		<b>52</b>