

DIN EN 12013:2018-03 (E)

Plastics and rubber machines - Internal mixers - Safety requirements

Contents		Page
European foreword		4
Introduction		5
1	Scope	6
2	Normative references	6
3	Terms and definitions	8
4	Safety requirements and/or protective/risk reduction measures	11
4.1	General	11
4.2	Start, stop and restart functions	11
4.2.1	Start function	11
4.2.2	Stop function	11
4.2.3	Restart function	11
4.3	Safety related parts of the control system	11
4.4	Emergency stop	12
4.5	Emergency stop devices	12
4.6	Mechanical hazards	12
4.6.1	General	12
4.6.2	Safeguarding and risk reduction measures	12
4.6.3	Guidance for interpreting subclauses 4.6.4 to 4.6.7	13
4.6.4	Safety requirements and/or protective/risk reduction measures preventing mechanical hazards in the feeding area	14
4.6.5	Safety requirements and/or protective / risk reduction measures preventing mechanical hazards in the transition chute area of the tandem mixer	28
4.6.6	Safety requirements and/or protective / risk reduction measures preventing mechanical hazards in the discharge area	31
4.6.7	Safety requirements and/or protective /risk reduction measures preventing mechanical hazards for movement of the rotor drive elements	33
4.7	Hazards due to the hose assemblies of the hydraulic/pneumatic/heating and cooling systems	35
4.8	Additional hazards during major cleaning operation, maintenance and repair	35
4.8.1	Conditions for major cleaning operation, maintenance and repair at internal mixers and laboratory internal mixers	35
4.8.2	Additional conditions for major cleaning operations, maintenance and repair at laboratory internal mixers	36
4.9	Hazards due to electrical energy	36
4.9.1	General	36
4.9.2	Protection against direct contact	36
4.9.3	Protection against indirect contact	36
4.9.4	Protection against ingress of solids and liquids	36
4.9.5	Electric shock or fire due to electrostatic discharge	36
4.10	Thermal hazards	36
4.11	Hazards generated by noise	37
4.12	Hazards resulting from substances hazardous to health	37
4.13	Fire hazards	38
4.14	Slip, trip and fall hazards	38
4.14.1	Slippage due to leakage from dust seals	38

4.14.2	Slipping, tripping and falling from permanent means of access	38
4.15	Ergonomics	38
5	Verification of the safety requirements and/or protective/risk reduction measures	38
6	Information for use	45
6.1	General	45
6.2	Instruction handbook	45
6.2.1	General	45
6.2.2	Installation	45
6.2.3	Operation	46
6.2.4	Cleaning and maintenance	46
6.2.5	Noise	47
6.2.6	Information on fire hazard emergency procedure	47
6.3	Marking	47
6.4	Warning signals and warning signs	47
Annex A	(informative) List of significant hazards	48
A.1	General	48
A.2	Design versions of internal mixers and their working levels	48
A.3	Hazards, hazardous situations and events	49
Annex B	(normative) Noise test code for laboratory internal mixers	62
B.1	Introduction	62
B.2	Determination of the A-weighted emission sound pressure level at the workstation	62
B.2.1	Basic standards and measurement procedure	62
B.2.2	Measurement uncertainty	63
B.3	Determination of the A-weighted sound power level	63
B.3.1	Basic standards and measurement procedure	63
B.3.2	Measurement uncertainty	64
B.4	Mounting and operating conditions	64
B.5	Information to be recorded and reported	65
B.5.1	General	65
B.5.2	General data	65
B.5.3	Mounting and operating conditions	65
B.5.4	Standards	65
B.5.5	Noise data	65
B.6	Declaration and verification of noise emission values	65
Annex C	(informative) Examples of possible technical measures to prevent fire hazards due to exothermically reacting compounds	68
Annex ZA	(informative) Relationship between this European Standard and the essential requirements of EU Directive 2006/42/EC aimed to be covered	69
Bibliography	70