

DIN EN ISO 16092-1:2019-08 (E)

Machine tools safety - Presses - Part 1: General safety requirements (ISO 16092-1:2017)

Contents		Page
European foreword		4
Annex ZA (informative) Relationship between this European standard and the essential requirements of EU Directive 2006/42/EC aimed to be covered		5
Foreword		6
Introduction		7
1	Scope	8
2	Normative references	9
3	Terms and definitions	10
4	List of significant hazards	18
5	Safety requirements and/or measures	19
5.1	General	19
5.2	Basic design considerations	19
5.2.1	Hydraulic and pneumatic systems -- Common features	19
5.2.2	Pneumatic systems	20
5.2.3	Hydraulic systems	20
5.2.4	Electric systems	20
5.3	Mechanical hazards in the tools area	21
5.3.1	General	21
5.3.2	Safeguarding measures	21
5.3.3	Other safety requirements	25
5.3.4	Release of trapped persons between the tools	25
5.3.5	Release of persons trapped inside enclosed areas	25
5.3.6	Prevention of gravity fall during maintenance or repair	25
5.4	Control and monitoring system	26
5.4.1	Control and monitoring functions	26
5.4.2	Muting	28
5.4.3	Selection devices	28
5.4.4	Position sensors	29
5.4.5	Control devices	29
5.4.6	Valves	30
5.4.7	Performance level of safety functions	30
5.5	Tool-setting, trial strokes, maintenance and lubrication	30
5.6	Mechanical hazards -- Other	31
5.7	Slips, trips and falls	31
5.8	Protection against other hazards	31
5.8.1	Electrical hazards	31
5.8.2	Thermal hazards	31
5.8.3	High pressure fluid ejection hazards	32
5.8.4	Hazards generated by noise	32
5.8.5	Hazards generated by vibration	32
5.8.6	Hazards generated by materials and substances	32
5.8.7	Hazards generated by neglecting ergonomic principles	32

6	Verification of the safety requirements and/or measures	33
7	Information for use	38
7.1	General	38
7.2	Marking	38
7.3	Warnings	39
7.4	Instructions handbook	39
	Annex A (informative) Significant hazards, hazardous situations and protective measures	41
	Annex B (informative) Closed tools	44
	Annex C (informative) Electro-sensitive protective equipment (ESPE) using active opto-electronic protective devices (AOPDs)	45
	Annex D (normative) Calculation of minimum distances	46
D.1	General	46
D.2	Interlocking guards without guard locking, control guards without guard locking and early opening interlocking guards without guard locking	46
D.3	ESPE using vertically arranged AOPDs and AOPDDRs	46
7.5	ESPE using horizontally arranged AOPDs when used as the sole means of safeguarding	47
7.6	Two-hand control devices	47
	Annex E (informative) Slide operation mode	48
	Annex F (normative) Noise test code	50
F.1	General	50
F.2	Determination of A-weighted emission sound pressure levels and C-weighted peak instantaneous sound pressure level at work stations	50
F.3	Determination of A-weighted sound power levels	50
F.4	Mounting and operating conditions	51
F.5	Information to be recorded and reported	51
F.6	Noise declaration in instruction manuals and technical sales literature	52
	Bibliography	53