

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 |