

# DIN EN 692:2006-02 (E)

## Machine tools - Mechanical presses - Safety

---

<b>Contents</b>		<b>Page</b>
<b>1</b>	<b>Scope</b> .....	<b>5</b>
<b>2</b>	<b>Normative references</b> .....	<b>6</b>
<b>3</b>	<b>Terms and definitions</b> .....	<b>7</b>
<b>3.1</b>	<b>Terms and definitions</b> .....	<b>7</b>
<b>3.2</b>	<b>Abbreviations</b> .....	<b>10</b>
<b>4</b>	<b>List of significant hazards</b> .....	<b>11</b>
<b>5</b>	<b>Safety requirements and/or measures</b> .....	<b>14</b>
<b>5.1</b>	<b>Introduction</b> .....	<b>14</b>
<b>5.2</b>	<b>Basic design considerations</b> .....	<b>14</b>
<b>5.2.1</b>	<b>Brakes and clutches</b> .....	<b>14</b>
<b>5.2.2</b>	<b>Presses with part revolution clutches (friction clutches)</b> .....	<b>15</b>
<b>5.2.3</b>	<b>Hydraulic and pneumatic systems - Common features</b> .....	<b>15</b>
<b>5.2.4</b>	<b>Pneumatic systems</b> .....	<b>16</b>
<b>5.2.5</b>	<b>Hydraulic systems</b> .....	<b>16</b>
<b>5.2.6</b>	<b>Slide adjustment and stroke adjustment</b> .....	<b>16</b>
<b>5.3</b>	<b>Mechanical hazards in the tools area</b> .....	<b>17</b>
<b>5.4</b>	<b>The control and monitoring system</b> .....	<b>21</b>
<b>5.4.1</b>	<b>Control and monitoring functions</b> .....	<b>21</b>
<b>5.4.2</b>	<b>Part revolution clutch presses: redundancy and monitoring of clutch/brake control systems, and overrun monitoring for single cycle use (see Tables 2, 3 and 4)</b> .....	<b>22</b>
<b>5.4.3</b>	<b>Muting</b> .....	<b>24</b>
<b>5.4.4</b>	<b>Programmable electronic systems (PES), programmable pneumatic systems (PPS) and safety related functions</b> .....	<b>24</b>
<b>5.4.5</b>	<b>Selector switches</b> .....	<b>24</b>
<b>5.4.6</b>	<b>Isolation switch</b> .....	<b>25</b>
<b>5.4.7</b>	<b>Position switches (see 10.1.4 of EN 60204-1:1997)</b> .....	<b>25</b>
<b>5.4.8</b>	<b>Control devices</b> .....	<b>25</b>
<b>5.4.9</b>	<b>Valves</b> .....	<b>25</b>
<b>5.5</b>	<b>Tool-setting, trial strokes, maintenance and lubrication</b> .....	<b>26</b>
<b>5.6</b>	<b>Mechanical hazards - other</b> .....	<b>27</b>
<b>5.7</b>	<b>Slips, trips and falls</b> .....	<b>27</b>
<b>5.8</b>	<b>Protection against other hazards</b> .....	<b>27</b>
<b>5.8.1</b>	<b>Electrical hazards</b> .....	<b>27</b>
<b>5.8.2</b>	<b>Thermal hazards</b> .....	<b>28</b>
<b>5.8.3</b>	<b>High pressure fluid ejection hazards</b> .....	<b>28</b>
<b>5.8.4</b>	<b>Hazards generated by noise</b> .....	<b>28</b>
<b>5.8.5</b>	<b>Hazards generated by vibration</b> .....	<b>29</b>
<b>5.8.6</b>	<b>Hazards generated by materials and substances</b> .....	<b>29</b>
<b>5.8.7</b>	<b>Hazards generated by neglecting ergonomic principles</b> .....	<b>30</b>
<b>6</b>	<b>Verification of the safety requirements and/or measures</b> .....	<b>39</b>
<b>7</b>	<b>Information for use</b> .....	<b>47</b>
<b>7.1</b>	<b>Marking</b> .....	<b>47</b>
<b>7.2</b>	<b>Instruction handbook</b> .....	<b>48</b>
	<b>Annex A (normative) Interlocking guards</b> .....	<b>50</b>

<b>A.1</b>	<b>Presses with part revolution clutches .....</b>	<b>50</b>
<b>Annex B (normative)</b>	<b>Calculation of minimum safety distances .....</b>	<b>53</b>
<b>Annex C (informative)</b>	<b>Electro-sensitive protective equipment (ESPE) using active opto-electronic protective devices (AOPDs) .....</b>	<b>55</b>
<b>Annex D (informative)</b>	<b>Closed tools .....</b>	<b>56</b>
<b>Annex E (informative)</b>	<b>The setting of the rotary cam arrangement .....</b>	<b>57</b>
<b>E.1</b>	<b>Basic features of the eccentric adjustment and rotary cam arrangement .....</b>	<b>57</b>
<b>E.2</b>	<b>Determination of the position where muting begins .....</b>	<b>63</b>
<b>Annex F (informative)</b>	<b>Determination of the overall response time T .....</b>	<b>66</b>
<b>Annex G (normative)</b>	<b>Conditions for noise measurement of mechanical presses .....</b>	<b>70</b>
<b>Annex ZA (informative)</b>	<b>Relationship between this European Standard and the Essential Requirements of EU Directive 98/37/EC, amended by Directive 98/79 EC .....</b>	<b>72</b>
<b>Bibliography</b>	<b>.....</b>	<b>70</b>