

# DIN EN ISO 669:2016-07 (E)

## Resistance welding - Resistance welding equipment - Mechanical and electrical requirements (ISO 669:2016)

---

<b>Contents</b>		<b>Page</b>
European foreword .....		4
Foreword .....		5
<b>1</b>	<b>Scope .....</b>	<b>6</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>Mechanical parts of spot, projection, and seam welding equipment .....</b>	<b>7</b>
<b>3.2</b>	<b>Mechanical parts of upset and flash welding equipment .....</b>	<b>13</b>
<b>3.3</b>	<b>Static mechanical characteristics .....</b>	<b>16</b>
<b>3.4</b>	<b>Electrical and thermal characteristics .....</b>	<b>19</b>
<b>3.5</b>	<b>Pneumatic and hydraulic characteristics .....</b>	<b>21</b>
<b>4</b>	<b>Symbols and abbreviated terms .....</b>	<b>21</b>
<b>5</b>	<b>Physical environment and operating conditions .....</b>	<b>23</b>
<b>5.1</b>	<b>General .....</b>	<b>23</b>
<b>5.2</b>	<b>Ambient air temperature .....</b>	<b>23</b>
<b>5.3</b>	<b>Liquid cooling medium .....</b>	<b>23</b>
<b>5.4</b>	<b>Humidity .....</b>	<b>23</b>
<b>5.5</b>	<b>Altitude .....</b>	<b>24</b>
<b>5.6</b>	<b>Transportation and storage .....</b>	<b>24</b>
<b>6</b>	<b>Test conditions .....</b>	<b>24</b>
<b>6.1</b>	<b>General .....</b>	<b>24</b>
<b>6.2</b>	<b>Environmental conditions .....</b>	<b>24</b>
<b>6.3</b>	<b>Measuring instruments .....</b>	<b>24</b>
<b>7</b>	<b>Rated no load voltage at the output .....</b>	<b>25</b>
<b>7.1</b>	<b>General .....</b>	<b>25</b>
<b>7.2</b>	<b>a.c. no load voltage (U<sub>20</sub>) .....</b>	<b>25</b>
<b>7.3</b>	<b>d.c. no load voltage (U<sub>2d</sub>) .....</b>	<b>25</b>
<b>8</b>	<b>Maximum short circuit current .....</b>	<b>25</b>
<b>8.1</b>	<b>General .....</b>	<b>25</b>
<b>8.2</b>	<b>Spot and seam welding equipment .....</b>	<b>26</b>
<b>8.3</b>	<b>Projection welding equipment .....</b>	<b>26</b>
<b>8.4</b>	<b>Upset and flash welding equipment .....</b>	<b>27</b>
<b>9</b>	<b>Thermal rating .....</b>	<b>28</b>
<b>9.1</b>	<b>General .....</b>	<b>28</b>
<b>9.2</b>	<b>Thermal test .....</b>	<b>28</b>
<b>10</b>	<b>Cooling liquid circuit (liquid cooled welding equipment) .....</b>	<b>28</b>
<b>11</b>	<b>Static mechanical characteristics .....</b>	<b>29</b>
<b>11.1</b>	<b>General .....</b>	<b>29</b>
<b>11.2</b>	<b>Spot and projection welding equipment .....</b>	<b>29</b>
<b>11.2.1</b>	<b>General .....</b>	<b>29</b>

11.2.2	Eccentricity .....	30
11.2.3	Angular deflection .....	31
11.2.4	Radial deflection .....	31
11.2.5	Axial deflection .....	32
11.2.6	Machine stiffness .....	32
11.2.7	Parallelism of top and bottom platen .....	32
11.2.8	Perpendicularity in platen movement, 4 .....	33
11.3	Seam welding equipment .....	34
11.3.1	General .....	34
11.3.2	Eccentricity .....	34
11.3.3	Angular deflection .....	35
11.4	Upset welding equipment .....	35
11.4.1	General .....	35
11.4.2	Angular deflection .....	36
12	Rating plate .....	36
12.1	General .....	36
12.2	Description .....	37
12.3	Tolerances .....	39
13	Instruction manual .....	39
Annex A (informative) Examples of rating plates .....		41
Bibliography .....		43