

# DIN EN 13605:2013-09 (E)

## Copper and copper alloys - Copper profiles and profiled wire for electrical purposes

---

<b>Contents</b>		<b>Page</b>
Foreword .....		4
1	Scope .....	6
2	Normative references .....	6
3	Terms and definitions .....	6
4	Designations .....	7
4.1	Material .....	7
4.2	Material condition .....	7
4.3	Product .....	7
5	Ordering information .....	8
6	Requirements .....	10
6.1	Composition .....	10
6.2	Mechanical properties .....	10
6.3	Electrical properties .....	10
6.4	Freedom from hydrogen embrittlement .....	10
6.5	Drawings .....	10
6.6	Dimensions and tolerances .....	10
6.7	Form of delivery of profiled wire .....	14
6.8	Mass tolerances .....	14
6.9	Surface condition .....	14
7	Sampling .....	15
7.1	General .....	15
7.2	Analysis .....	15
7.3	Mechanical, electrical and hydrogen embrittlement tests .....	15
8	Test methods .....	15
8.1	Analysis .....	15
8.2	Tensile test .....	15
8.3	Hardness test .....	15
8.4	Electrical test .....	16
8.5	Hydrogen embrittlement test .....	16
8.6	Retests .....	16
8.7	Rounding of results .....	16
9	Declaration of conformity and inspection documentation .....	17
9.1	Declaration of conformity .....	17
9.2	Inspection documentation .....	17
10	Marking, packaging, labelling .....	17
Annex A (informative)	Characteristics of coppers for electrical purposes .....	25
Bibliography .....		27
Figures	Figure 1 -- Profile within a circumscribing circle .....	11

<b>Figure 2 -- Cross-sectional dimensions .....</b>	<b>11</b>
<b>Figure 3 -- Twist of a profile .....</b>	<b>12</b>
<b>Figure 4 -- Indication of flatness on a U-Profile .....</b>	<b>13</b>
<b>Figure 5 -- Indication of flatness on a H-Profile .....</b>	<b>13</b>
<b>Figure 6 -- Indication of angularity .....</b>	<b>13</b>
<b>Figure 7 -- Indication of perpendicularity .....</b>	<b>13</b>
<b>Figure 8 -- Indication of straightness tolerances .....</b>	<b>14</b>
<b>Tables Table 1 -- Composition of unalloyed copper grades .....</b>	<b>18</b>
<b>Table 2 -- Composition of copper grades .....</b>	<b>19</b>
<b>Table 3 -- Mechanical properties .....</b>	<b>20</b>
<b>Table 4 -- Electrical properties (at 20 °C) .....</b>	<b>21</b>
<b>Table 5 -- Tolerances for dimensions b and h, ratio bmax. or hmax. to smin. &lt; 20 : 1 .....</b>	<b>21</b>
<b>Table 6 -- Tolerances for dimensions b and h, ratio bmax. or hmax. to smin. 20 : 1 .....</b>	<b>22</b>
<b>Table 7 -- Thickness tolerances .....</b>	<b>22</b>
<b>Table 8 -- Radius tolerances .....</b>	<b>22</b>
<b>Table 9 -- Maximum radii of sharp corners .....</b>	<b>22</b>
<b>Table 10 -- Twist tolerances -- coefficient f .....</b>	<b>23</b>
<b>Table 11 -- Straightness tolerances for profiles .....</b>	<b>23</b>
<b>Table 12 -- Tolerances on "as manufactured" lengths .....</b>	<b>23</b>
<b>Table 13 -- Tolerances on "fixed" lengths .....</b>	<b>24</b>
<b>Table 14 -- Sampling rate .....</b>	<b>24</b>
<b>Table A.1 -- Particular characteristics of coppers for electrical purposes .....</b>	<b>26</b>