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--- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ГОСТ 8509-93****МЕЖГОСУДАРСТВЕННЫЙ СТАНДАРТ****УГОЛКИ СТАЛЬНЫЕ ГОРЯЧЕКАТАНЫЕ РАВНОПОЛОЧНЫЕ****СОРТАМЕНТ****МЕЖГОСУДАРСТВЕННЫЙ СОВЕТ ПО СТАНДАРТИЗАЦИИ, МЕТРОЛОГИИ И СЕРТИФИКАЦИИ**МинскПредисловие1 РАЗРАБОТАН Украинским научно-исследовательским институтом металловВНЕСЕН Госстандартом Украины2 ПРИНЯТ Межгосударственным Советом по стандартизации, метрологии и сертификации (протокол № 3от 17.02.93)За принятие проголосовали:

| Наименование государства | Наименование национального органа по стандартизации |
| --- | --- |
| Республика Армения | Армгосстандарт |
| Республика Белоруссия | Белстандарт |
| Республика Казахстан | Госстандарт Республики Казахстан |
| Республика Молдова | Молдовастандарт |
| Российская Федерация | Госстандарт России |
| Туркменистан | Туркменглавгосинспекция |
| Республика Узбекистан | Узгосстандарт |
| Украина | Госстандарт Украины |

3 Постановлением Комитета Российской Федерации по стандартизации, метрологии и сертификации от 20.02.96 № 85 межгосударственный стандарт ГОСТ 8509-93 введен в действие непосредственно в качестве государственного стандарта Российской Федерации с 1 января 1997 г.4 ВЗАМЕН ГОСТ 8509-86**МЕЖГОСУДАРСТВЕННЫЙ СТАНДАРТ**

|  |  |
| --- | --- |
| **УГОЛКИ СТАЛЬНЫЕ ГОРЯЧЕКАТАНЫЕ РАВНОПОЛОЧНЫЕ****Сортамент**Hot-rolled steel equal-leg angles. Dimensions | **ГОСТ 8509-93** |

**Дата введения 1997-01-01**1 Настоящий стандарт распространяется на уголки стальные горячекатаные равнополочные.2 Размеры уголков, площадь поперечного сечения, справочные величины для осей и масса 1 м уголков должны соответствовать указанным на [рисунке 1](http://www.docload.ru/Basesdoc/3/3969/index.htm#i18716) и в [таблице 1](http://www.docload.ru/Basesdoc/3/3969/index.htm#i22968), а при поставках на экспорт - рекомендуемым [приложениям А](http://www.docload.ru/Basesdoc/3/3969/index.htm#i52038) и [Б](http://www.docload.ru/Basesdoc/3/3969/index.htm#i71691).Untitled-1Рисунок 1Таблица 1

| Номер уголка | *b* | *t* | *R* | *r* | *F*, см2 | Справочные значения величин для осей | Масса 1 м, кг |
| --- | --- | --- | --- | --- | --- | --- | --- |
| *х - х* | *x*0 *- x*0 | *у*0 *- у*0 | *Ixy*, см4 | *x*0*,* см |
| мм | *Ix,* см4 | *Wx,* см3 | *ix,* см | *Ix*0 *max,* см4 | *iх*0 *max,* см | *Iy*0 *min,* см4 | *Wy*0*,* см3 | *iy*0 *min,* см |
| 2 | 20 | 3 | 3,5 | 1,2 | 1,13 | 0,40 | 0,28 | 0,59 | 0,63 | 0,75 | 0,17 | 0,20 | 0,39 | 0,23 | 0,60 | 0,89 |
| 4 | 3,5 | 1,2 | 1,46 | 0,50 | 0,37 | 0,58 | 0,78 | 0,73 | 0,22 | 0,24 | 0,38 | 0,28 | 0,64 | 1,15 |
| 2,5 | 25 | 3 | 3,5 | 1,2 | 1,43 | 0,81 | 0,46 | 0,75 | 1,29 | 0,95 | 0,34 | 0,33 | 0,49 | 0,47 | 0,73 | 1,12 |
| 4 | 3,5 | 1,2 | 1,86 | 1,03 | 0,59 | 0,74 | 1,62 | 0,93 | 0,44 | 0,41 | 0,48 | 0,59 | 0,76 | 1,46 |
| 2,8 | 28 | 3 | 4,0 | 1,3 | 1,62 | 1,16 | 0,58 | 0,85 | 1,84 | 1,07 | 0,48 | 0,42 | 0,55 | 0,68 | 0,80 | 1,27 |
| 3 | 30 | 3 | 4,0 | 1,3 | 1,74 | 1,45 | 0,67 | 0,91 | 2,30 | 1,15 | 0,60 | 0,53 | 0,59 | 0,85 | 0,85 | 1,36 |
| 4 | 4,0 | 1,3 | 2,27 | 1,84 | 0,87 | 0,90 | 2,92 | 1,13 | 0,77 | 0,61 | 0,58 | 1,08 | 0,89 | 1,78 |
| 3,2 | 32 | 3 | 4,5 | 1,5 | 1,86 | 1,77 | 0,77 | 0,97 | 2,80 | 1,23 | 0,74 | 0,59 | 0,63 | 1,03 | 0,89 | 1,46 |
| 4 | 4,5 | 1,5 | 2,43 | 2,26 | 1,00 | 0,96 | 3,58 | 1,21 | 0,94 | 0,71 | 0,62 | 1,32 | 0,94 | 1,91 |
| 3,5 | 35 | 3 | 4,5 | 1,5 | 2,04 | 2,35 | 0,93 | 1,07 | 3,72 | 1,35 | 0,97 | 0,71 | 0,69 | 1,37 | 0,97 | 1,60 |
| 4 | 4,5 | 1,5 | 2,67 | 3,01 | 1,21 | 1,06 | 4,76 | 1,33 | 1,25 | 0,88 | 0,68 | 1,75 | 1,01 | 2,10 |
| 5 | 4,5 | 1,5 | 3,28 | 3,61 | 1,47 | 1,05 | 5,71 | 1,32 | 1,52 | 1,02 | 0,68 | 2,10 | 1,05 | 2,58 |
| 4 | 40 | 3 | 5,0 | 1,7 | 2,35 | 3,55 | 1,22 | 1,23 | 5,63 | 1,55 | 1,47 | 0,95 | 0,79 | 2,08 | 1,09 | 1,85 |
| 4 | 5,0 | 1,7 | 3,08 | 4,58 | 1,60 | 1,22 | 7,26 | 1,53 | 1,90 | 1,19 | 0,78 | 2,68 | 1,13 | 2,42 |
| 5 | 5,0 | 1,7 | 3,79 | 5,53 | 1,95 | 1,21 | 8,75 | 1,52 | 2,30 | 1,39 | 0,78 | 3,22 | 1,17 | 2,98 |
| 4,5 | 45 | 3 | 5,0 | 1,7 | 2,65 | 5,13 | 1,56 | 1,39 | 8,13 | 1,75 | 2,12 | 1,24 | 0,89 | 3,00 | 1,21 | 2,08 |
| 4 | 5,0 | 1,7 | 3,48 | 6,63 | 2,04 | 1,38 | 10,52 | 1,74 | 2,74 | 1,54 | 0,89 | 3,89 | 1,26 | 2,73 |
| 5 | 5,0 | 1,7 | 4,29 | 8,03 | 2,51 | 1,37 | 12,74 | 1,72 | 3,33 | 1,81 | 0,88 | 4,71 | 1,30 | 3,37 |
| 5 | 50 | 3 | 5,5 | 1,8 | 2,96 | 7,11 | 1,94 | 1,55 | 11,27 | 1,95 | 2,95 | 1,57 | 1,00 | 4,16 | 1,33 | 2,32 |
| 4 | 5,5 | 1,8 | 3,89 | 9,21 | 2,54 | 1,54 | 14,63 | 1,94 | 3,80 | 1,95 | 0,99 | 5,42 | 1,38 | 3,05 |
| 5 | 5,5 | 1,8 | 4,80 | 11,20 | 3,13 | 1,53 | 17,77 | 1,92 | 4,63 | 2,30 | 0,98 | 6,57 | 1,42 | 3,77 |
| 6 | 5,5 | 1,8 | 5,69 | 13,07 | 3,69 | 1,52 | 20,72 | 1,91 | 5,43 | 2,63 | 0,98 | 7,65 | 1,46 | 4,47 |
| 5,6 | 56 | 4 | 6,0 | 2,0 | 4,38 | 13,10 | 3,21 | 1,73 | 20,79 | 2,18 | 5,41 | 2,52 | 1,11 | 7,69 | 1,52 | 3,44 |
| 5 | 6,0 | 2,0 | 5,41 | 15,97 | 3,96 | 1,72 | 25,36 | 2,16 | 6,59 | 2,97 | 1,10 | 9,41 | 1,57 | 4,25 |
| 6,3 | 63 | 4 | 7,0 | 2,3 | 4,96 | 18,86 | 4,09 | 1,95 | 29,90 | 2,45 | 7,81 | 3,26 | 1,25 | 11,00 | 1,69 | 3,90 |
| 5 | 7,0 | 2,3 | 6,13 | 23,10 | 5,05 | 1,94 | 36,80 | 2,44 | 9,52 | 3,87 | 1,25 | 13,70 | 1,74 | 4,81 |
| 6 | 7,0 | 2,3 | 7,28 | 27,06 | 5,98 | 1,93 | 42,91 | 2,43 | 11,18 | 4,44 | 1,24 | 15,90 | 1,78 | 5,72 |
| 7 | 70 | 4,5 | 8,0 | 2,7 | 6,20 | 29,04 | 5,67 | 2,16 | 46,03 | 2,72 | 12,04 | 4,53 | 1,39 | 17,00 | 1,88 | 4,87 |
| 5 | 8,0 | 2,7 | 6,86 | 31,94 | 6,27 | 2,16 | 50,67 | 2,72 | 13,22 | 4,92 | 1,39 | 18,70 | 1,90 | 5,38 |
| 6 | 8,0 | 2,7 | 8,15 | 37,58 | 7,43 | 2,15 | 59,64 | 2,71 | 15,52 | 5,66 | 1,38 | 22,10 | 1,94 | 6,39 |
| 7 | 8,0 | 2,7 | 9,42 | 42,98 | 8,57 | 2,14 | 68,19 | 2,69 | 17,77 | 6,31 | 1,37 | 25,20 | 1,99 | 7,39 |
| 8 | 8,0 | 2,7 | 10,67 | 48,16 | 9,68 | 2,12 | 76,35 | 2,68 | 19,97 | 6,99 | 1,37 | 28,20 | 2,02 | 8,37 |
| 7,5 | 75 | 5 | 9,0 | 3,0 | 7,39 | 39,53 | 7,21 | 2,31 | 62,65 | 7,91 | 16,41 | 5,74 | 1,49 | 23,10 | 2,02 | 5,80 |
| 6 | 9,0 | 3,0 | 8,78 | 46,57 | 8,57 | 2,30 | 73,87 | 2,90 | 19,28 | 6,62 | 1,48 | 27,30 | 2,06 | 6,89 |
| 7 | 9,0 | 3,0 | 10,15 | 53,34 | 9,89 | 2,29 | 84,61 | 2,89 | 22,07 | 7,43 | 1,47 | 31,20 | 2,10 | 7,96 |
| 8 | 9,0 | 3,0 | 11,50 | 59,84 | 11,18 | 2,28 | 94,89 | 2,87 | 24,80 | 8,16 | 1,47 | 35,00 | 2,15 | 9,02 |
| 9 | 9,0 | 3,0 | 12,83 | 66,10 | 12,43 | 2,27 | 104,72 | 2,86 | 27,48 | 8,91 | 1,46 | 38,60 | 2,18 | 10,07 |
| 8 | 80 | 5,5 | 9,0 | 3,0 | 8,63 | 52,68 | 9,03 | 2,47 | 83,56 | 3,11 | 21,80 | 7,10 | 1,59 | 30,90 | 2,17 | 6,78 |
| 6 | 9,0 | 3,0 | 9,38 | 56,97 | 9,80 | 2,47 | 90,40 | 3,11 | 23,54 | 7,60 | 1,58 | 33,40 | 2,19 | 7,36 |
| 7 | 9,0 | 3,0 | 10,85 | 65,31 | 11,32 | 2,45 | 103,60 | 3,09 | 26,97 | 8,55 | 1,58 | 38,30 | 2,23 | 8,51 |
| 8 | 9,0 | 3,0 | 12,30 | 73,36 | 12,80 | 2,44 | 116,39 | 3,08 | 30,32 | 9,44 | 1,57 | 43,00 | 2,27 | 9,65 |
| 9 | 90 | 6 | 10,0 | 3,3 | 10,61 | 82,10 | 12,49 | 2,78 | 130,00 | 3,50 | 33,97 | 9,88 | 1,79 | 48,10 | 2,43 | 8,33 |
| 7 | 10,0 | 3,3 | 12,28 | 94,30 | 14,45 | 2,77 | 149,67 | 3,49 | 38,94 | 11,15 | 1,78 | 55,40 | 2,47 | 9,64 |
| 8 | 10,0 | 3,3 | 13,93 | 106,11 | 16,36 | 2,76 | 168,42 | 3,48 | 43,80 | 12,34 | 1,77 | 62,30 | 2,51 | 10,93 |
| 9 | 10,0 | 3,3 | 15,60 | 118,00 | 18,29 | 2,75 | 186,00 | 3,46 | 48,60 | 13,48 | 1,77 | 68,00 | 2,55 | 12,20 |
| 10 | 100 | 6,5 | 12,0 | 4,0 | 12,82 | 122,10 | 16,69 | 3,09 | 193,46 | 3,89 | 50,73 | 13,38 | 1,99 | 71,40 | 2,68 | 10,06 |
| 7 | 12,0 | 4,0 | 13,75 | 130,59 | 17,90 | 3,08 | 207,01 | 3,88 | 54,16 | 14,13 | 1,98 | 76,40 | 2,71 | 10,79 |
| 8 | 12,0 | 4,0 | 15,60 | 147,19 | 20,30 | 3,07 | 233,46 | 3,87 | 60,92 | 15,66 | 1,98 | 86,30 | 2,75 | 12,25 |
| 10 | 12,0 | 4,0 | 19,24 | 178,95 | 24,97 | 3,05 | 283,83 | 3,84 | 74,08 | 18,51 | 1,96 | 110,00 | 2,83 | 15,10 |
| 12 | 12,0 | 4,0 | 22,80 | 208,90 | 29,47 | 3,03 | 330,95 | 3,81 | 86,84 | 21,10 | 1,95 | 122,00 | 2,91 | 17,90 |
| 14 | 12,0 | 4,0 | 26,28 | 237,15 | 33,83 | 3,00 | 374,98 | 3,78 | 99,32 | 23,49 | 1,94 | 138,00 | 2,99 | 20,63 |
| 16 | 12,0 | 4,0 | 29,68 | 263,82 | 38,04 | 2,98 | 416,04 | 3,74 | 111,61 | 25,79 | 1,94 | 152,00 | 3,06 | 23,30 |
| 11 | 110 | 7 | 12,0 | 4,0 | 15,15 | 175,61 | 21,83 | 3,40 | 278,54 | 4,29 | 72,68 | 17,36 | 2,19 | 106,00 | 2,96 | 11,89 |
| 8 | 12,0 | 4,0 | 17,20 | 198,17 | 24,77 | 3,39 | 314,51 | 4,28 | 81,83 | 19,29 | 2,18 | 116,00 | 3,00 | 13,50 |
| 12,5 | 125 | 8 | 14,0 | 4,6 | 19,69 | 294,36 | 32,20 | 3,87 | 466,76 | 4,87 | 121,98 | 25,67 | 2,49 | 172,00 | 3,36 | 15,46 |
| 9 | 14,0 | 4,6 | 22,00 | 327,48 | 36,00 | 3,86 | 520,00 | 4,86 | 135,88 | 28,26 | 2,48 | 192,00 | 3,40 | 17,30 |
| 10 | 14,0 | 4,6 | 24,33 | 359,82 | 39,74 | 3,85 | 571,04 | 4,84 | 148,59 | 30,45 | 2,47 | 211,00 | 3,45 | 19,10 |
| 12 | 14,0 | 4,6 | 28,89 | 422,23 | 47,06 | 3,82 | 670,02 | 4,82 | 174,43 | 34,94 | 2,46 | 248,00 | 3,53 | 22,68 |
| 14 | 14,0 | 4,6 | 33,37 | 481,76 | 54,17 | 3,80 | 763,90 | 4,78 | 199,62 | 39,10 | 2,45 | 282,00 | 3,61 | 26,20 |
| 16 | 14,0 | 4,6 | 37,77 | 538,56 | 61,09 | 3,78 | 852,84 | 4,75 | 224,29 | 43,10 | 2,44 | 315,00 | 3,68 | 29,65 |
| 14 | 140 | 9 | 14,0 | 4,6 | 24,72 | 465,72 | 45,55 | 4,34 | 739,42 | 5,47 | 192,03 | 35,92 | 2,79 | 274,00 | 3,76 | 19,41 |
| 10 | 14,0 | 4,6 | 27,33 | 512,29 | 50,32 | 4,33 | 813,62 | 5,46 | 210,96 | 39,05 | 2,78 | 301,00 | 3,82 | 21,45 |
| 12 | 14,0 | 4,6 | 32,49 | 602,49 | 59,66 | 4,31 | 956,98 | 5,43 | 248,01 | 44,97 | 2,76 | 354,00 | 3,90 | 25,50 |
| 16 | 160 | 10 | 16,0 | 5,3 | 31,43 | 774,24 | 66,19 | 4,96 | 1229,10 | 6,25 | 319,33 | 52,52 | 3,19 | 455,00 | 4,30 | 24,67 |
| 11 | 16,0 | 5,3 | 34,42 | 844,21 | 72,44 | 4,95 | 1340,06 | 6,24 | 347,77 | 56,53 | 3,18 | 496,00 | 4,35 | 27,02 |
| 12 | 16,0 | 5,3 | 37,39 | 912,89 | 78,62 | 4,94 | 1450,00 | 6,23 | 375,78 | 60,53 | 3,17 | 537,00 | 4,39 | 29,35 |
| 14 | 16,0 | 5,3 | 43,57 | 1046,47 | 90,77 | 4,92 | 1662,13 | 6,20 | 430,81 | 68,15 | 3,16 | 615,00 | 4,47 | 34,20 |
| 16 | 16,0 | 5,3 | 49,07 | 1175,19 | 102,64 | 4,89 | 1865,73 | 6,17 | 484,64 | 75,92 | 3,14 | 690,00 | 4,55 | 38,52 |
| 18 | 16,0 | 5,3 | 54,79 | 1290,24 | 114,24 | 4,87 | 2061,03 | 6,13 | 537,46 | 82,08 | 3,13 | 771,00 | 4,63 | 43,01 |
| 20 | 16,0 | 5,3 | 60,40 | 1418,85 | 125,60 | 4,85 | 2248,26 | 6,10 | 589,43 | 90,02 | 3,12 | 830,00 | 4,70 | 47,41 |
| 18 | 180 | 11 | 16,0 | 5,3 | 38,80 | 1216,44 | 92,47 | 5,60 | 1933,10 | 7,06 | 499,78 | 72,86 | 3,59 | 716,00 | 4,85 | 30,47 |
| 12 | 16,0 | 5,3 | 42,19 | 1316,62 | 100,41 | 5,59 | 2092,78 | 7,04 | 540,45 | 78,15 | 3,58 | 776,00 | 4,89 | 33,12 |
| 20 | 200 | 12 | 18,0 | 6,0 | 47,10 | 1822,78 | 124,61 | 6,22 | 2896,16 | 7,84 | 749,40 | 98,68 | 3,99 | 1073,00 | 5,37 | 36,97 |
| 13 | 18,0 | 6,0 | 50,85 | 1960,77 | 134,44 | 6,21 | 3116,18 | 7,83 | 805,35 | 105,07 | 3,98 | 1156,00 | 5,42 | 39,92 |
| 14 | 18,0 | 6,0 | 54,60 | 2097,00 | 144,17 | 6,20 | 3333,00 | 7,81 | 861,00 | 111,50 | 3,97 | 1236,00 | 5,46 | 42,80 |
| 16 | 18,0 | 6,0 | 61,98 | 2362,57 | 163,37 | 6,17 | 3755,39 | 7,78 | 969,74 | 123,77 | 3,96 | 1393,00 | 5,54 | 48,65 |
| 20 | 18,0 | 6,0 | 76,54 | 2871,47 | 200,37 | 6,12 | 4860,42 | 7,72 | 1181,92 | 146,62 | 3,93 | 1689,00 | 5,70 | 60,08 |
| 25 | 18,0 | 6,0 | 94,29 | 3466,21 | 245,59 | 6,06 | 5494,04 | 7,63 | 1438,38 | 172,68 | 3,91 | 2028,00 | 5,89 | 74,02 |
| 30 | 18,0 | 6,0 | 111,54 | 4019,60 | 288,57 | 6,00 | 6351,05 | 7,55 | 1698,16 | 193,06 | 3,89 | 2332,00 | 6,07 | 87,56 |
| 22 | 220 | 14 | 21,0 | 7,0 | 60,38 | 2814,36 | 175,18 | 6,83 | 4470,15 | 8,60 | 1158,56 | 138,62 | 4,38 | 1655,00 | 5,91 | 47,40 |
| 16 | 21,0 | 7,0 | 68,58 | 3175,44 | 198,71 | 6,80 | 5045,37 | 8,58 | 1305,52 | 153,34 | 4,36 | 1869,00 | 6,02 | 53,83 |
| 25 | 250 | 16 | 24,0 | 8,0 | 78,40 | 4717,10 | 258,43 | 7,76 | 7492,10 | 9,78 | 1942,09 | 203,45 | 4,98 | 2775,00 | 6,75 | 61,55 |
| 18 | 24,0 | 8,0 | 87,72 | 5247,24 | 288,82 | 7,73 | 8336,69 | 9,75 | 2157,78 | 223,39 | 4,96 | 3089,00 | 6,83 | 68,86 |
| 20 | 24,0 | 8,0 | 96,96 | 5764,87 | 318,76 | 7,71 | 9159,73 | 9,72 | 2370,01 | 242,52 | 4,94 | 3395,00 | 6,91 | 76,11 |
| 22 | 24,0 | 8,0 | 106,12 | 6270,32 | 348,26 | 7,69 | 9961,30 | 9,69 | 2579,04 | 260,52 | 4,93 | 3691,00 | 7,00 | 83,31 |
| 25 | 24,0 | 8,0 | 119,71 | 7006,39 | 391,72 | 7,65 | 11125,52 | 9,64 | 2887,26 | 287,14 | 4,91 | 4119,00 | 7,11 | 93,97 |
| 28 | 24,0 | 8,0 | 133,12 | 7716,86 | 434,25 | 7,61 | 12243,84 | 9,59 | 3189,89 | 311,98 | 4,90 | 4527,00 | 7,23 | 104,50 |
| 30 | 24,0 | 8,0 | 141,96 | 8176,82 | 462,11 | 7,59 | 12964,66 | 9,56 | 3388,98 | 327,82 | 4,89 | 4788,00 | 7,31 | 111,44 |
| 35 | 24,0 | 8,0 | 163,71 | 9281,05 | 530,11 | 7,53 | 14682,73 | 9,47 | 3879,37 | 366,13 | 4,87 | 5401,68 | 7,53 | 128,51 |

Примечания:1 Площадь поперечного сечения и справочные величины вычислены по номинальным размерам. Плотность стали - 7,85 г/см3.2 Радиусы закругления, указанные на [рисунке 1](http://www.docload.ru/Basesdoc/3/3969/index.htm#i18716) и в [таблице 1](http://www.docload.ru/Basesdoc/3/3969/index.htm#i22968), даны для построения калибра и на профиле не контролируются.Условные обозначения к [рисунку 1](http://www.docload.ru/Basesdoc/3/3969/index.htm#i18716) и [таблице 1](http://www.docload.ru/Basesdoc/3/3969/index.htm#i22968):*b -* ширина полки;*t* - толщина полки;*R -* радиус внутреннего закругления;*r -* радиус закругления полок;*F-* площадь поперечного сечения;*I* - момент инерции;*x*0 *-* расстояние от центра тяжести до наружной грани полки;*Ixy* - центробежный момент инерции;*i -* радиус инерции.3 По точности прокатки уголки изготавливают:А - высокой точности;В - обычной точности.4 Предельные отклонения по размерам уголков не должны превышать указанных в [таблице 2](http://www.docload.ru/Basesdoc/3/3969/index.htm#i31663).Таблица 2

| Номер уголка | Предельные отклонения, мм |
| --- | --- |
| по ширине полки | по толщине полки |
| до 6 включ. | от 6,5 до 9 включ. | свыше 9 |
| А | В | А | В | А | В |
| От 2 до 4,5 | ±1,0 | +0,2 | +0,3 | - | - | - | - |
| -0,3 | -0,4 |
| » 5 » 9 | ±1,5 | +0,2 | +0,3 | +0,2 | +0,3 | +0,3 | +0,4 |
| -0,4 | -0,5 | -0,5 | -0,6 | -0,5 | -0,6 |
| » 10 » 15 | ±2,0 | - | - | +0,3 | +0,4 | +0,3 | +0,4 |
| -0,5 | -0,6 | -0,6 | -0,7 |
| » 16 » 20 | ±3,0 | - | - | - | - | +0,4 | +0,5 |
| -0,7 | -0,8 |
| » 22 » 25 | ±4,0 | - | - | - | - | +0,4 | +0,5 |
| -0,8 | -0,9 |

5 По согласованию изготовителя с потребителем допускается изготовление уголков со смещением предельных отклонений по толщине полки в пределах допускаемых отклонений соответствующей точности.6 По согласованию с потребителем отклонения по толщине полки допускается заменять предельными отклонениями по массе в соответствии с [таблицей 3](http://www.docload.ru/Basesdoc/3/3969/index.htm#i43918).Таблица 3

| Номер уголка | Предельные отклонения по массе, % |
| --- | --- |
| 1 класс | II класс |
| От 2 до 7,5 включ. | +3 | +3-5 |
| -5 |
| Свыше 7,5 | ±2,5 |

7 Отклонение от прямого угла при вершине не должно превышать 35′.По согласованию изготовителя с потребителем отклонение от прямого угла при вершине не должно превышать:1,0 мм - для уголков с шириной полки до 50 мм включительно;2,0 мм - для уголков с шириной полки свыше 50 до 100 мм включительно;3,0 мм - для уголков с шириной полки свыше 100 до 200 мм.8 Притупление внешних углов (в том числе и угла при вершине) не контролируется.По требованию потребителя притупление внешних углов (в том числе и угла при вершине) не должно превышать:0,3 толщины полки - для уголков толщиной до 10 мм включительно;3,0 мм - для уголков толщиной свыше 10 до 16 мм включительно;5,0 мм - для уголков толщиной свыше 16 мм.9 Уголки изготавливают длиной от 4 до 12 м:мерной длины;мерной длины с немерной в количестве не более 5 % массы партии;кратной мерной длины,кратной мерной длины с немерной в количестве не более 5 % массы партии;немерной длины;ограниченной длины в пределах немерной.9.1 По согласованию изготовителя с потребителем уголки изготавливают мерной и кратной мерной длины с немерными длинами более 5 % массы партии.9.2 Допускается изготовление уголков длиной не менее 3 м и свыше 12 м.10 Предельные отклонения по длине уголков мерной длины или кратной мерной не должны превышать:+ 30 мм - при длине до 4 м включительно;+ 50 мм - при длине свыше 4 до 6 м включительно;+ 70 мм - при длине свыше 6 м.По требованию потребителя для уголков длиной свыше 4 до 7 м предельные отклонения длины не должны превышать + 40 мм, более 7 м - + 5 мм на каждый следующий метр.11 Кривизна уголков не должна превышать 0,4 % длины. По требованию потребителя изготавливают уголки, кривизна которых не превышает 0,2 % длины. Для уголков от № 2 до 4,5 включительно кривизну проверяют на длине 1 м.12 Размеры поперечного сечения уголков, притупление углов измеряют на расстоянии не менее 500 мм от торца штанги.*ПРИЛОЖЕНИЕ А**(рекомендуемое)***ПРОФИЛИ СТАЛЬНЫЕ ГОРЯЧЕКАТАНЫЕ****ЧАСТЬ 1. УГОЛКИ РАВНОПОЛОЧНЫЕ. РАЗМЕРЫ (ИСО 657-1-89)****1 Область распространения**Эта часть ИСО 657 включает размеры горячекатаных равнополочных уголков.2 Настоящий стандарт содержит условия данной части ИСО 657. По состоянию на время публикации данное издание являлось действующим.Все стандарты пересматриваются, поэтому необходимо использовать стандарты наиболее позднего издания.Страны-члены МЭК и ИСО должны обеспечиваться действующими международными стандартами.ИСО 657-5-76. Горячекатаные стальные профили, часть 5. Равнополочные и неравнополочные уголки, предельные отклонения в метрической и дюймовой сериях.**3 Размеры**3.1 Предпочтительные размеры выделены полужирным шрифтом.3.2 Радиусы внутреннего закругления даны для информации и приведены в [таблице А.1](http://www.docload.ru/Basesdoc/3/3969/index.htm#i65316).3.3 Радиус закругления полок не определен, но при необходимости может быть рассчитан.**4 Свойства профиля**Масса, площадь поперечного сечения и справочные значения величин равнополочных уголков приведены для информации в [таблице A.1](http://www.docload.ru/Basesdoc/3/3969/index.htm#i65316) и рассчитаны при условии, что радиус закругления полок имеет 1/2 значения радиуса внутреннего закругления.**5 Допуски**Допускаемые отклонения на размеры приведены в [таблице Б.1 приложения Б](http://www.docload.ru/Basesdoc/3/3969/index.htm#i88579).Untitled-1Таблица А.1

| Размер | Масса кг/м | *S*, см2 | Величины | Расстояние от центра тяжести | Справочные значения величин для осей |
| --- | --- | --- | --- | --- | --- |
| *х-х=у-у* | *u-u* | *v-v* |
| *А*, мм | *t*, мм | *rroot*, мм | *Cx=Cy*, см | *Cu*, см | *Cv*, см | *Ix=Iy*, см4 | *rx=ry*, см3 | *Zx=Zy*, см | *Iu*, см4 | *ru*, см | *Iv*, см4 | *rv*, см | *Zv*, см3 |
| 20×20×3 | 0,88 | 1,12 | 20 | 3 | 3,5 | 0,598 | 1,41 | 0,846 | 0,392 | 0,590 | 0,279 | 0,618 | 0,742 | 0,165 | 0,383 | 0,195 |
| 25×25×3 | 1,12 | 1,42 | 25 | 3 | 3,5 | 0,723 | 1,77 | 1,02 | 0,803 | 0,751 | 0,452 | 1,27 | 0,945 | 0,334 | 0,484 | 0,326 |
| 25×25×4 | 1,45 | 1,85 | 25 | 4 | 3,5 | 0,762 | 1,77 | 1,08 | 1,02 | 0,741 | 0,586 | 1,61 | 0,931 | 0,430 | 0,482 | 0,399 |
| 30×30×3 | 1,36 | 1,74 | 30 | 3 | 5 | 0,835 | 2,12 | 1,18 | 1,40 | 0,899 | 0,649 | 2,22 | 1,13 | 0,585 | 0,581 | 0,496 |
| 30×30×4 | 1,78 | 2,27 | 30 | 4 | 5 | 0,878 | 2,12 | 1,24 | 1,80 | 0,892 | 0,850 | 2,85 | 1,12 | 0,754 | 0,577 | 0,607 |
| 35×35×4 | 2,09 | 2,67 | 35 | 4 | 5 | 1,00 | 2,47 | 1,42 | 2,95 | 1,05 | 1,18 | 4,68 | 1,32 | 1,23 | 0,678 | 0,865 |
| 35×35×5 | 2,57 | 3,28 | 35 | 5 | 5 | 1,04 | 2,47 | 1,48 | 3,56 | 1,04 | 1,45 | 5,64 | 1,31 | 1,49 | 0,675 | 1,01 |
| 40×40×3 | 1,84 | 2,35 | 40 | 3 | 6 | 1,07 | 2,83 | 1,52 | 3,45 | 1,21 | 1,18 | 5,45 | 1,52 | 1,44 | 0,783 | 0,949 |
| 40×40×4 | 2,42 | 3,08 | 40 | 4 | 6 | 1,12 | 2,83 | 1,58 | 4,47 | 1,21 | 1,55 | 7,09 | 1,52 | 1,86 | 0,777 | 1,17 |
| 40×40×5 | 2,97 | 3,79 | 40 | 5 | 6 | 1,16 | 2,83 | 1,64 | 5,43 | 1,20 | 1,91 | 8,60 | 1,51 | 2,26 | 0,773 | 1,38 |
| 45×45×4 | 2,74 | 3,49 | 45 | 4 | 7 | 1,23 | 3,18 | 1,75 | 6,43 | 1,36 | 1,97 | 10,2 | 1,71 | 2,68 | 0,876 | 1,53 |
| 45×45×5 | 3,38 | 4,30 | 45 | 5 | 7 | 1,28 | 3,18 | 1,81 | 7,84 | 1,35 | 2,43 | 12,4 | 1,70 | 3,26 | 0,871 | 1,80 |
| 50×50×4 | 3,06 | 3,89 | 50 | 4 | 7 | 1,36 | 3,54 | 1,92 | 8,97 | 1,52 | 2,46 | 14,2 | 1,91 | 3,73 | 0,979 | 1,94 |
| 50×50×5 | 3,77 | 4,80 | 50 | 5 | 7 | 1,40 | 3,54 | 1,99 | 11,0 | 1,51 | 3,05 | 17,4 | 1,90 | 4,55 | 0,973 | 2,29 |
| 50×50×6 | 4,47 | 5,69 | 50 | 6 | 7 | 1,45 | 3,54 | 2,04 | 12,8 | 1,50 | 3,61 | 20,3 | 1,89 | 5,34 | 0,968 | 2,61 |
| 60×60×5 | 4,57 | 5,82 | 60 | 5 | 8 | 1,64 | 4,24 | 2,32 | 19,4 | 1,82 | 4,45 | 30,7 | 2,30 | 8,03 | 1,17 | 3,46 |
| 60×60×6 | 5,42 | 6,91 | 60 | 6 | 8 | 1,69 | 4,24 | 2,39 | 22,8 | 1,82 | 5,29 | 36,1 | 2,29 | 9,44 | 1,17 | 3,96 |
| 60×60×8 | 7,09 | 9,03 | 60 | 8 | 8 | 1,77 | 4,24 | 2,50 | 29,2 | 1,80 | 6,89 | 46,1 | 2,26 | 12,2 | 1,16 | 4,86 |
| 65×65×6 | 5,91 | 7,53 | 65 | 6 | 9 | 1,80 | 4,60 | 2,55 | 29,2 | 1,97 | 6,21 | 46,3 | 2,48 | 12,1 | 1,27 | 4,74 |
| 65×65×8 | 7,73 | 9,85 | 65 | 8 | 9 | 1,89 | 4,60 | 2,67 | 37,5 | 1,95 | 8,13 | 59,4 | 2,46 | 15,6 | 1,26 | 5,84 |
| 70×70×6 | 6,38 | 8,13 | 70 | 6 | 9 | 1,93 | 4,95 | 2,73 | 36,9 | 2,13 | 7,27 | 58,5 | 2,68 | 15,3 | 1,37 | 5,60 |
| 70×70×7 | 7,38 | 9,40 | 70 | 7 | 9 | 1,97 | 4,95 | 2,79 | 42,3 | 2,12 | 8,41 | 67,1 | 2,67 | 17,5 | 1,36 | 6,28 |
| 75×75×6 | 6,85 | 8,73 | 75 | 6 | 9 | 2,05 | 5,30 | 2,90 | 45,8 | 2,29 | 8,41 | 72,7 | 2,89 | 18,9 | 1,47 | 6,53 |
| 75×75×8 | 8,99 | 11,4 | 75 | 8 | 9 | 2,14 | 5,30 | 3,02 | 59,1 | 2,27 | 11,0 | 93,8 | 2,86 | 24,5 | 1,46 | 8,09 |
| 80×80×6 | 7,34 | 9,35 | 80 | 6 | 10 | 2,17 | 5,66 | 3,07 | 55,8 | 2,44 | 9,57 | 88,5 | 3,08 | 23,1 | 1,57 | 7,55 |
| 80×80×8 | 9,63 | 12,3 | 80 | 8 | 10 | 2,26 | 5,66 | 3,19 | 72,2 | 2,43 | 176 | 115 | 3,06 | 29,9 | 1,56 | 9,37 |
| 80×80×10 | 11,9 | 15,1 | 80 | 10 | 10 | 2,34 | 5,66 | 3,30 | 87,5 | 2,41 | 15,4 | 139 | 3,03 | 36,4 | 1,55 | 11,0 |
| 90×90×7 | 9,61 | 12,2 | 90 | 7 | 11 | 2,45 | 6,36 | 3,47 | 92,5 | 2,75 | 14,1 | 147 | 3,46 | 38,3 | 1,77 | 11,0 |
| 90×90×8 | 10,9 | 13,9 | 90 | 8 | 11 | 2,50 | 6,36 | 3,53 | 104 | 2,74 | 16,1 | 166 | 3,45 | 43,1 | 1,76 | 12,2 |
| 90×90×9 | 12,2 | 15,5 | 90 | 9 | 11 | 2,54 | 6,36 | 3,59 | 116 | 2,73 | 17,9 | 184 | 3,44 | 47,9 | 1,76 | 13,3 |
| 90×90×10 | 15,0 | 17,1 | 90 | 10 | 11 | 2,58 | 6,36 | 3,65 | 127 | 2,72 | 19,8 | 201 | 3,42 | 52,6 | 1,75 | 14,4 |
| 100×100×8 | 12,2 | 15,5 | 100 | 8 | 12 | 2,74 | 7,07 | 3,87 | 145 | 3,06 | 19,9 | 230 | 3,85 | 59,9 | 1,96 | 15,5 |
| 100×100×10 | 15,0 | 19,2 | 100 | 10 | 12 | 2,82 | 7,07 | 3,99 | 177 | 3,04 | 24,6 | 280 | 3,83 | 73,0 | 1,95 | 18,3 |
| 100×100×12 | 17,8 | 22,7 | 100 | 12 | 12 | 2,90 | 7,07 | 4,11 | 207 | 3,02 | 29,1 | 328 | 3,80 | 85,7 | 1,94 | 20,9 |
| 120×120×8 | 14,7 | 18,7 | 120 | 8 | 13 | 3,23 | 8,49 | 4,56 | 255 | 3,69 | 29,1 | 405 | 4,65 | 105 | 2,37 | 23,1 |
| 120×120×10 | 18,2 | 23,2 | 120 | 10 | 13 | 3,31 | 8,49 | 4,69 | 313 | 3,67 | 36,0 | 497 | 4,63 | 129 | 2,36 | 27,5 |
| 120×120×12 | 21,6 | 27,5 | 120 | 12 | 13 | 3,40 | 8,49 | 4,80 | 368 | 3,65 | 42,7 | 584 | 4,60 | 152 | 2,35 | 31,6 |
| 125×125×8 | 15,3 | 19,5 | 125 | 8 | 13 | 3,35 | 8,84 | 4,74 | 290 | 3,85 | 31,7 | 461 | 4,85 | 120 | 2,47 | 25,3 |
| 125×125×10 | 19,0 | 24,2 | 125 | 10 | 13 | 3,44 | 8,84 | 4,86 | 356 | 3,84 | 39,3 | 565 | 4,83 | 146 | 2,46 | 30,1 |
| 125×125×12 | 22,6 | 28,7 | 125 | 12 | 13 | 3,52 | 8,84 | 4,98 | 418 | 3,81 | 46,6 | 664 | 4,81 | 172 | 2,45 | 34,6 |
| 150×150×10 | 23,0 | 29,3 | 150 | 10 | 16 | 4,03 | 10,6 | 5,71 | 624 | 4,62 | 56,9 | 990 | 5,82 | 258 | 2,97 | 45,1 |
| 150×150×12 | 27,3 | 34,8 | 150 | 12 | 16 | 4,12 | 10,6 | 5,83 | 737 | 4,60 | 67,7 | 1170 | 5,80 | 303 | 2,95 | 52,0 |
| 150×150×15 | 33,8 | 43,0 | 150 | 15 | 16 | 4,25 | 10,6 | 6,01 | 898 | 4,57 | 83,5 | 1430 | 5,76 | 370 | 2,93 | 61,6 |
| 180×180×15 | 40,9 | 52,1 | 180 | 15 | 18 | 4,98 | 12,7 | 7,05 | 1590 | 5,52 | 122 | 2520 | 6,96 | 653 | 3,54 | 92,7 |
| 180×180×18 | 48,6 | 61,9 | 180 | 18 | 18 | 5,10 | 17,7 | 7,22 | 1870 | 5,49 | 145 | 2960 | 6,92 | 768 | 3,52 | 106 |
| 200×200×16 | 48,5 | 61,8 | 200 | 16 | 18 | 5,52 | 14,1 | 7,81 | 2340 | 6,16 | 162 | 3720 | 7,76 | 960 | 3,94 | 123 |
| 200×200×20 | 59,9 | 76,3 | 200 | 20 | 18 | 5,68 | 14,1 | 8,04 | 2850 | 6,11 | 199 | 4530 | 7,70 | 1170 | 3,92 | 146 |
| 200×200×24 | 71,1 | 90,6 | 200 | 24 | 18 | 5,84 | 14,1 | 8,26 | 3330 | 6,06 | 235 | 5280 | 7,64 | 1380 | 3,90 | 167 |
| 250×250×28 | 104 | 133 | 250 | 28 | 18 | 7,24 | 17,7 | 10,2 | 7700 | 7,62 | 433 | 1220 | 9,61 | 3170 | 4,89 | 309 |
| 250×250×35 | 128 | 163 | 250 | 35 | 18 | 7,50 | 17,7 | 10,6 | 9260 | 7,54 | 529 | 1470 | 9,48 | 3860 | 4,87 | 364 |

Примечания1 Страны-члены ИСО могут включать в национальные стандарты требуемые им размеры уголков.Из приведенного в таблице сортамента на равнополочные уголки в национальный стандарт могут быть включены те размеры уголков, которые обеспечиваются на прокатных станах.2 Площадь поперечного сечения вычисляют по формуле,где *S -* площадь поперечного сечения, см2;*t* - толщина, мм;*rroot -* радиус внутреннего закругления, мм;*rtoс -* радиус закругления полок, мм;*А -* ширина полки, мм.3 При вычислении массы 1 м плотность стали принята 7,85 кг/дм3.*ПРИЛОЖЕНИЕ Б**(рекомендуемое)***ПРОФИЛИ СТАЛЬНЫЕ ГОРЯЧЕКАТАНЫЕ****ЧАСТЬ 5. УГОЛКИ РАВНОПОЛОЧНЫЕ И НЕРАВНОПОЛОЧНЫЕ В МЕТРИЧЕСКОЙ И ДЮЙМОВОЙ СЕРИЯХ. ДОПУСКИ****(ИСО 657-5-76)****1 Предмет стандарта и область применения**Настоящий международный стандарт регламентирует предельные отклонения размеров горячекатаных стальных равнополочных и неравнополочных уголков в метрической и дюймовой сериях. Размеры уголков в метрической серии должны соответствовать ИСО 657-1 и ИСО 657-2, в дюймовой - ИСО 657-3 и ИСО 657-4.**2 Предельные отклонения по ширине полки**Предельные отклонения по ширине полки должны соответствовать приведенным в [таблице Б.1](http://www.docload.ru/Basesdoc/3/3969/index.htm#i88579).Таблица Б.1 Предельные отклонения по ширине

| Метрическая серия, мм | Дюймовая серия, дюйм |
| --- | --- |
| Ширина полки 1 | Предельные отклонения | Ширина полки 1 | Предельные отклонения |
| Свыше | От и до включ. | Свыше | От и до включ. |
| - | 50 | ±1,0 | - | 2 | ±0,04 |
| 50 | 100 | ±1,5 | 2 | 4 | ±0,06 |
| 100 | 150 | ±2,0 | 4 | 6 | ±0,08 |
| 150 | 200 | ±3,0 | 6 | 8 | ±0,12 |
| 1 Для неравнополочных уголков как базовая берется ширина большей полки. |

**3 Предельные отклонения по толщине полки**Предельные отклонения по толщине равнополочных и неравнополочных уголков должны соответствовать приведенным в [таблице Б.2](http://www.docload.ru/Basesdoc/3/3969/index.htm#i97967).Таблица Б.2 Предельные отклонения по толщине

|  |  |
| --- | --- |
| Метрическая серия, мм | Дюймовая серия, дюйм |
| Ширина полки 1 | Предельные отклонения | Ширина полки 1 | Предельные отклонения |
| Свыше | От и до включ. | Свыше | От и до включ. |
| - | 50 | ±0,5 | - | 2 | ±0,02 |
| 50 | 100 | ±0,8 | 2 | 4 | ±0,03 |
| 100 | 150 | ±1,0 | 4 | 6 | ±0,04 |
| 150 | 200 | ±1,2 | 6 | 8 | ±0,05 |
| 1 Для неравнополочных уголков как базовая берется ширина большей полки. |
| Примечание - Для уголков с длиной полки свыше 75 мм предельные отклонения по массе составляют ± 2,5 % на единицу длины и могут быть заменены предельными отклонениями по толщине. Масса единицы длины уголков приведена в приложении А. |

**4 Предельные отклонения при порезке на длины**Предельные отклонения по длине при порезке на нормальные и точные длины равнополочных и неравнополочных уголков должны соответствовать приведенным в [таблицах Б.3](http://www.docload.ru/Basesdoc/3/3969/index.htm#i101375) и [Б.4](http://www.docload.ru/Basesdoc/3/3969/index.htm#i117249) соответственно.Таблица Б.3 Предельные отклонения для нормальных длин

| Метрическая серия | Дюймовая серия |
| --- | --- |
| Длина | Предельные отклонения | Длина | Предельные отклонения |
| Все длины | ± 100 мм | Все длины | ± 4 дюйма |

Таблица Б.4 Предельные отклонения для точных длин

| Метрическая серия | Дюймовая серия |
| --- | --- |
| Длина, м | Предельные отклонения, мм | Длина, фут | Предельные отклонения, дюйм |
| Свыше | От и до включ. | Свыше | От и до включ. |
| - | 12 | +75 | - | 40 | +3 |
| 0 | 0 |
| 12 | - | +100 | 40 | - | +4 |
| 0 |

**5 Кривизна**5.1 Максимально допустимая кривизна для равнополочных и неравнополочных уголков должна соответствовать приведенной в [таблице Б.5](http://www.docload.ru/Basesdoc/3/3969/index.htm#i128903).Таблица Б.5

| Метрическая серия, мм | Дюймовая серия, дюйм |
| --- | --- |
| Ширина полки 1 | Кривизна | Ширина полки 1 | Кривизна |
| Свыше | От и до включ. | Свыше | От и до включ. |
| 50 | 150 | 0,4 % длины | 2 | 6 | 0,4 % длины |
| 150 | 200 | 0,25 % длины | 6 | 8 | 0,25 % длины |
| 1 Для неравнополочных уголков как базовая берется ширина большей полки. |

5.2 Кривизна должна быть измерена как показано на [рисунке Б.1](http://www.docload.ru/Basesdoc/3/3969/index.htm#i145778).**6 Неперпендикулярность (непараллельность, отклонение от прямого угла)**6.1 Полки должны быть перпендикулярными относительно друг друга в пределах отклонений концов согласно [таблице Б.6](http://www.docload.ru/Basesdoc/3/3969/index.htm#i131385).Таблица Б.6 Отклонение от прямого угла

| Метрическая серия, мм | Дюймовая серия, дюйм |
| --- | --- |
| Ширина полки 1 | Отклонение | Ширина полки 1 | Отклонение |
| Свыше | От и до включ. | Свыше | От и до включ. |
| - | 50 | 1,0 | - | 2 | 0,04 |
| 50 | 100 | 2,0 | 2 | 4 | 0,08 |
| 100 | 200 | 3,0 | 4 | 8 | 0,12 |
| 1 Для неравнополочных уголков как базовая берется ширина большей полки. |

Untitled-1Рисунок Б.16.2 Отклонение от прямого угла измеряется на концах полок уголков ([рисунок Б.2](http://www.docload.ru/Basesdoc/3/3969/index.htm#i158582)).Untitled-1Рисунок Б.2**7 Предельные отклонения по массе**Имеющиеся предельные отклонения по массе на единицу длины являются контрольными предельными отклонениями и предварительно должны быть включены в соответствующие национальные стандарты. |