

Данный файл представлен исключительно в ознакомительных целях.

Уважаемый читатель!

Если вы скопируете данный файл,  
Вы должны незамедлительно удалить его сразу после ознакомления с содержанием.  
Копируя и сохраняя его Вы принимаете на себя всю ответственность, согласно действующему международному законодательству .  
Все авторские права на данный файл сохраняются за правообладателем.  
Любое коммерческое и иное использование кроме предварительного ознакомления запрещено.

Публикация данного документа не преследует никакой коммерческой выгоды. Но такие документы способствуют быстрейшему профессиональному и духовному росту читателей и являются рекламой бумажных изданий таких документов.

**Шпильки ГОСТ 9066-75 для фланцев спп ГОСТ 12820-80 ( $P_y \leq 25$  кгс/см<sup>2</sup>) и спв ГОСТ 12821-80 ( $P_y \leq 200$  кгс/см<sup>2</sup>)**

| Фланец<br>Ду, мм | Фланец $P_y$ , кгс/см <sup>2</sup> (ряд 2) |          |    |          |    |          |    |          |    |          |    |          |    |          |     |          |
|------------------|--------------------------------------------|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|-----|----------|
|                  | 1 и 2,5                                    |          | 6  |          | 10 |          | 16 |          | 25 |          | 40 |          | 63 |          | 100 |          |
|                  | ко                                         | обознач. | ко | обознач. | ко | обознач. | ко | обознач. | ко | обознач. | ко | обознач. | ко | обознач. | ко  | обознач. |
| 10               | 4                                          | M10x50   | 4  | M10x50   | 4  | M12x60   | 4  | M12x60   | 4  | M12x60   | 4  | M12x70   | 4  | M12x80   | 4   | M12x100  |
| 15               | 4                                          | M10x50   | 4  | M10x50   | 4  | M12x60   | 4  | M12x60   | 4  | M12x60   | 4  | M12x70   | 4  | M12x80   | 4   | M12x100  |
| 20               | 4                                          | M10x50   | 4  | M10x55   | 4  | M12x60   | 4  | M12x70   | 4  | M12x70   | 4  | M12x70   | 4  | M16x90   | 4   | M16x110  |
| 25               | 4                                          | M10x50   | 4  | M10x55   | 4  | M12x60   | 4  | M12x70   | 4  | M12x70   | 4  | M12x70   | 4  | M16x90   | 4   | M16x110  |
| 32               | 4                                          | M12x60   | 4  | M12x60   | 4  | M16x70   | 4  | M16x80   | 4  | M16x80   | 4  | M16x90   | 4  | M20x110  | 4   | M20x130  |
| 40               | 4                                          | M12x60   | 4  | M12x60   | 4  | M16x80   | 4  | M16x80   | 4  | M16x80   | 4  | M16x90   | 4  | M20x110  | 4   | M20x130  |
| 50               | 4                                          | M12x60   | 4  | M12x60   | 4  | M16x80   | 4  | M16x80   | 4  | M16x80   | 4  | M16x90   | 4  | M20x110  | 4   | M24x130  |
| 65               | 4                                          | M12x60   | 4  | M12x60   | 4  | M16x80   | 4  | M16x80   | 8  | M16x90   | 8  | M16x90   | 8  | M20x120  | 8   | M24x130  |
| 80               | 4                                          | M16x70   | 4  | M16x70   | 4  | M16x80   | 4  | M16x90   | 8  | M16x90   | 8  | M16x100  | 8  | M20x120  | 8   | M24x130  |
| 100              | 4                                          | M16x70   | 4  | M16x70   | 8  | M16x80   | 8  | M16x90   | 8  | M20x100  | 8  | M20x110  | 8  | M24x130  | 8   | M27x150  |
| (125)            | 8                                          | M16x70   | 8  | M16x80   | 8  | M16x90   | 8  | M16x90   | 8  | M24x110  | 8  | M24x120  | 8  | M27x150  | 8   | M30x160  |
| 150              | 8                                          | M16x70   | 8  | M16x80   | 8  | M20x100  | 8  | M20x100  | 8  | M24x110  | 8  | M24x120  | 8  | M30x160  | 12  | M30x170  |
| (175)            | 8                                          | M16x80   | 8  | M16x80   | 8  | M20x100  | 8  | M20x100  | 12 | M24x120  | 12 | M27x150  | 12 | M30x170  | 12  | M30x180  |
| 200              | 8                                          | M16x80   | 8  | M16x80   | 8  | M20x100  | 12 | M20x110  | 12 | M27x120  | 12 | M27x150  | 12 | M30x170  | 12  | M36x200  |
| (225)            | 8                                          | M16x80   | 8  | M16x80   | 8  | M20x100  | 12 | M20x110  | 12 | M27x130  | 12 | M30x170  | 12 | M30x180  | 12  | M36x200  |
| 250              | 12                                         | M16x80   | 12 | M16x80   | 12 | M20x100  | 12 | M24x120  | 12 | M27x130  | 12 | M30x170  | 12 | M36x200  | 12  | M36x210  |
| 300              | 12                                         | M20x90   | 12 | M20x90   | 12 | M20x100  | 12 | M24x120  | 16 | M27x140  | 16 | M30x180  | 16 | M36x210  | 16  | M42x240  |
| 350              | 12                                         | M20x90   | 12 | M20x100  | 16 | M20x100  | 16 | M24x120  | 16 | M30x150  | 16 | M30x190  | 16 | M36x220  | 16  | M48x240  |
| 400              | 16                                         | M20x90   | 16 | M20x100  | 16 | M24x110  | 16 | M27x130  | 16 | M30x160  | 16 | M36x220  | 16 | M42x240  | 16  | M48x240  |
| (450)            | 16                                         | M20x100  | 16 | M20x100  | 20 | M24x110  | 20 | M27x140  | 20 | M30x160  | 20 | M36x220  |    |          |     |          |

|      |    |         |    |         |    |         |    |         |    |         |    |         |    |  |  |  |
|------|----|---------|----|---------|----|---------|----|---------|----|---------|----|---------|----|--|--|--|
| 500  | 16 | M20x100 | 20 | M20x100 | 20 | M24x120 | 20 | M30x160 | 20 | M36x180 | 20 | M42x240 | 20 |  |  |  |
| 600  | 20 | M24x110 | 20 | M24x110 | 20 | M27x130 | 20 | M36x170 | 20 | M36x190 | 4  | M48x240 | 20 |  |  |  |
| 700  | 24 | M24x110 | 24 | M24x110 | 24 | M27x130 | 24 | M36x180 | 24 | M42x210 | 4  | M48x    | 24 |  |  |  |
| 800  | 24 | M27x120 | 24 | M27x120 | 24 | M30x150 | 24 | M36x180 | 24 | M42x220 | 4  | M52x    | 24 |  |  |  |
| 900  | 24 | M27x120 | 24 | M27x140 | 28 | M30x150 | 28 | M36x180 | 28 | M48x230 | 28 | M52x    | 28 |  |  |  |
| 1000 | 28 | M27x120 | 28 | M27x140 | 28 | M30x160 | 28 | M42x200 | 28 | M52x240 | 28 | M52x    | 28 |  |  |  |
| 1200 | 32 | M27x120 | 32 | M30x140 | 32 | M36x180 | 32 | M48x210 | 32 | M52x    | 32 | M56x    | 32 |  |  |  |
| 1400 | 36 | M27x120 | 36 | M30x150 | 36 | M42x210 | 36 | M48x    | 36 | M56x    |    |         |    |  |  |  |
| 1600 | 40 | M27x120 | 40 | M30x    | 40 | M48x230 | 40 | M52x    |    |         |    |         |    |  |  |  |
| 1800 | 44 | M27x120 | 44 | M36x    | 44 | M48x    |    |         |    |         |    |         |    |  |  |  |
| 2000 | 48 | M27x120 | 48 | M42x    | 48 | M48x    |    |         |    |         |    |         |    |  |  |  |
| 2200 | 52 | M30x130 | 52 | M42x    |    |         |    |         |    |         |    |         |    |  |  |  |
| 2400 | 56 | M30x130 | 56 | M42x    |    |         |    |         |    |         |    |         |    |  |  |  |
| 2600 | 60 | M30x    |    |         |    |         |    |         |    |         |    |         |    |  |  |  |
| 2800 | 64 | M36x    |    |         |    |         |    |         |    |         |    |         |    |  |  |  |
| 3000 | 68 | M36x    |    |         |    |         |    |         |    |         |    |         |    |  |  |  |

**Болты ГОСТ 7798-70 для фланцев спп ГОСТ 12820-80 и спв ГОСТ 12821-80**

| Фланец<br>Ду, мм | Фланц Ру, кгс/см <sup>2</sup> (ряд 2) |          |    |          |    |          |    |          |    |          |
|------------------|---------------------------------------|----------|----|----------|----|----------|----|----------|----|----------|
|                  | 1 и 2,5                               |          | 6  |          | 10 |          | 16 |          | 25 |          |
|                  | ко                                    | обознач. | ко | обознач. | ко | обознач. | ко | обознач. | ко | обознач. |
| 10               | 4                                     | M10x35   | 4  | M10x40   | 4  | M12x40   | 4  | M12x45   | 4  | M12x50   |
| 15               | 4                                     | M10x35   | 4  | M10x40   | 4  | M12x45   | 4  | M12x45   | 4  | M12x50   |
| 20               | 4                                     | M10x40   | 4  | M10x45   | 4  | M12x50   | 4  | M12x50   | 4  | M12x55   |
| 25               | 4                                     | M10x40   | 4  | M10x45   | 4  | M12x50   | 4  | M12x50   | 4  | M12x55   |
| 32               | 4                                     | M12x45   | 4  | M12x50   | 4  | M16x55   | 4  | M16x60   | 4  | M16x60   |

|       |    |         |    |         |    |         |    |         |    |         |
|-------|----|---------|----|---------|----|---------|----|---------|----|---------|
| 40    | 4  | M12x45  | 4  | M12x50  | 4  | M16x55  | 4  | M16x60  | 4  | M16x65  |
| 50    | 4  | M12x45  | 4  | M12x50  | 4  | M16x55  | 4  | M16x65  | 4  | M16x70  |
| 65    | 4  | M12x45  | 4  | M12x50  | 4  | M16x60  | 4  | M16x65  | 8  | M16x70  |
| 80    | 4  | M16x50  | 4  | M16x55  | 4  | M16x60  | 4  | M16x65  | 8  | M16x70  |
| 100   | 4  | M16x50  | 4  | M16x55  | 8  | M16x65  | 8  | M16x70  | 8  | M20x80  |
| (125) | 8  | M16x55  | 8  | M16x60  | 8  | M16x70  | 8  | M16x70  | 8  | M24x90  |
| 150   | 8  | M16x55  | 8  | M16x60  | 8  | M20x70  | 8  | M20x80  | 8  | M24x90  |
| (175) | 8  | M16x60  | 8  | M16x65  | 8  | M20x75  | 8  | M20x80  | 12 | M24x90  |
| 200   | 8  | M16x60  | 8  | M16x65  | 8  | M20x75  | 12 | M20x80  | 12 | M27x100 |
| (225) | 8  | M16x60  | 8  | M16x65  | 8  | M20x75  | 12 | M20x80  | 12 | M27x100 |
| 250   | 12 | M16x65  | 12 | M16x70  | 12 | M20x75  | 12 | M24x90  | 12 | M27X100 |
| 300   | 12 | M20x70  | 12 | M20x75  | 12 | M20x80  | 12 | M24x90  | 16 | M27X100 |
| 350   | 12 | M20x70  | 12 | M20x75  | 16 | M20x80  | 16 | M24x100 | 16 | M30X120 |
| 400   | 16 | M20x75  | 16 | M20x80  | 16 | M24x90  | 16 | M27x110 | 16 | M30x130 |
| (450) | 16 | M20x75  | 16 | M20x80  | 20 | M24x90  | 20 | M27x120 | 20 | M30x130 |
| 500   | 16 | M20x75  | 20 | M20x80  | 20 | M24x90  | 20 | M30130  | 20 | M36X140 |
| 600   | 20 | M24x80  | 20 | M24x90  | 20 | M27x110 | 20 | M36x140 | 20 | M36X150 |
| 700   | 24 | M24x80  | 24 | M24x90  | 24 | M27x110 | 24 | M36x140 | 24 | M42x160 |
| 800   | 24 | M27x90  | 24 | M27x100 | 24 | M30X120 | 24 | M36x140 | 24 | M42x170 |
| 900   | 24 | M27x90  | 24 | M27x100 | 28 | M30x120 | 28 | M36x140 | 28 | M48x180 |
| 1000  | 28 | M27x90  | 28 | M27x100 | 28 | M30x130 | 28 | M42x150 | 28 | M52x190 |
| 1200  | 32 | M27x90  | 32 | M30x110 | 32 | M36x150 | 32 | M48x160 | 32 | M52x    |
| 1400  | 36 | M27x90  | 36 | M30x120 | 36 | M42x170 | 36 | M48x    | 36 | M56x    |
| 1600  | 40 | M27x100 | 40 | M30x    | 40 | M48x180 | 40 | M52x    |    |         |
| 1800  | 44 | M27x100 | 44 | M36x    | 44 | M48x    |    |         |    |         |

|      |    |         |    |      |    |      |  |  |  |  |
|------|----|---------|----|------|----|------|--|--|--|--|
| 2000 | 48 | M27x100 | 48 | M42x | 48 | M48x |  |  |  |  |
| 2200 | 52 | M30x100 | 52 | M42x |    |      |  |  |  |  |
| 2400 | 56 | M30x110 | 56 | M42x |    |      |  |  |  |  |
| 2600 | 60 | M30x    |    |      |    |      |  |  |  |  |
| 2800 | 64 | M36x    |    |      |    |      |  |  |  |  |
| 3000 | 68 | M36x    |    |      |    |      |  |  |  |  |

## Масса стальных болтов (исполнение 1) с крупным шагом резьбы

| Длина<br>болта | Теоретическая масса 1000 шт. болтов, кг≈, при номинальном диаметре резьбы $d$ , мм |        |       |       |       |        |        |       |       |       |       |       |       |    |    |
|----------------|------------------------------------------------------------------------------------|--------|-------|-------|-------|--------|--------|-------|-------|-------|-------|-------|-------|----|----|
| $l$ , мм       | 6                                                                                  | 8      | 10    | 12    | 14    | 16     | 18     | 20    | 22    | 24    | 27    | 30    | 36    | 42 | 48 |
| 8              | 4,306                                                                              | 8,668  | -     | -     | -     | -      | -      | -     | -     | -     | -     | -     | -     | -  | -  |
| 10             | 4,712                                                                              | 9,394  | 16,68 | -     | -     | -      | -      | -     | -     | -     | -     | -     | -     | -  | -  |
| 12             | 5,118                                                                              | 10,120 | 17,82 | -     | -     | -      | -      | -     | -     | -     | -     | -     | -     | -  | -  |
| 14             | 5,524                                                                              | 10,850 | 18,96 | 27,89 | -     | -      | -      | -     | -     | -     | -     | -     | -     | -  | -  |
| 16             | 5,930                                                                              | 11,570 | 20,10 | 29,48 | 43,98 | -      | -      | -     | -     | -     | -     | -     | -     | -  | -  |
| 18             | 6,336                                                                              | 12,300 | 21,23 | 31,12 | 46,21 | 65,54  | -      | -     | -     | -     | -     | -     | -     | -  | -  |
| 20             | 6,742                                                                              | 13,020 | 22,37 | 32,76 | 48,45 | 68,49  | 95,81  | -     | -     | -     | -     | -     | -     | -  | -  |
| 22             | 7,204                                                                              | 13,520 | 23,51 | 34,40 | 50,69 | 71,44  | 99,52  | -     | -     | -     | -     | -     | -     | -  | -  |
| 25             | 7,871                                                                              | 14,840 | 25,22 | 36,86 | 54,05 | 75,87  | 105,10 | 133,3 | -     | -     | -     | -     | -     | -  | -  |
| 28             | 8,537                                                                              | 16,330 | 26,92 | 39,32 | 57,40 | 80,29  | 110,60 | 140,2 | -     | -     | -     | -     | -     | -  | -  |
| 30             | 8,981                                                                              | 17,120 | 28,52 | 40,96 | 59,64 | 83,24  | 114,30 | 144,8 | 193,0 | -     | -     | -     | -     | -  | -  |
| 32             | 9,426                                                                              | 17,910 | 29,43 | 42,59 | 61,87 | 86,19  | 118,00 | 149,4 | 198,6 | 237,0 | -     | -     | -     | -  | -  |
| 35             | 10,090                                                                             | 19,090 | 31,28 | 45,34 | 65,24 | 90,62  | 123,60 | 156,3 | 207,0 | 246,9 | 340,6 | -     | -     | -  | -  |
| 38             | 10,760                                                                             | 20,280 | 33,18 | 48,00 | 68,59 | 95,04  | 129,20 | 163,2 | 215,4 | 256,9 | 353,3 | -     | -     | -  | -  |
| 40             | 11,200                                                                             | 21,070 | 34,36 | 49,78 | 71,25 | 97,99  | 132,90 | 167,8 | 221,0 | 263,5 | 361,8 | 474,8 | -     | -  | -  |
| 45             | 12,310                                                                             | 23,040 | 37,45 | 54,22 | 77,30 | 105,70 | 142,10 | 179,4 | 235,0 | 280,1 | 373,0 | 500,9 | -     | -  | -  |
| 50             | 13,420                                                                             | 25,020 | 40,53 | 58,67 | 83,35 | 113,60 | 152,40 | 190,9 | 249,0 | 296,7 | 404,1 | 526,9 | 834,5 | -  | -  |

|             |                                                                                    |        |        |        |        |        |        |       |       |        |        |        |        |      |      |
|-------------|------------------------------------------------------------------------------------|--------|--------|--------|--------|--------|--------|-------|-------|--------|--------|--------|--------|------|------|
| 55          | 14,530                                                                             | 26,990 | 43,62  | 63,11  | 89,39  | 121,50 | 162,40 | 203,7 | 263,1 | 313,3  | 425,3  | 553,0  | 872,1  | 1304 | -    |
| 60          | 15,640                                                                             | 28,970 | 46,70  | 67,55  | 95,44  | 129,40 | 172,40 | 216,0 | 278,9 | 329,9  | 446,5  | 579,0  | 909,8  | 1356 | -    |
| 65          | 16,760                                                                             | 30,940 | 49,79  | 71,99  | 101,50 | 137,30 | 182,40 | 228,4 | 293,8 | 348,8  | 467,7  | 605,1  | 947,4  | 1407 | 2009 |
| 70          | 17,870                                                                             | 32,910 | 52,87  | 76,44  | 107,50 | 145,20 | 192,40 | 240,7 | 308,8 | 366,5  | 491,1  | 631,1  | 985,0  | 1458 | 2076 |
| 75          | 18,980                                                                             | 34,890 | 55,96  | 80,88  | 113,60 | 153,10 | 202,40 | 253,0 | 323,7 | 384,3  | 513,6  | 659,7  | 1023,0 | 1509 | 2143 |
| 80          | 20,090                                                                             | 36,860 | 59,04  | 85,33  | 119,60 | 161,00 | 212,40 | 265,0 | 338,6 | 402,1  | 536,1  | 687,5  | 1061,0 | 1561 | 2211 |
| 85          | 21,200                                                                             | 38,840 | 62,13  | 89,77  | 125,70 | 168,90 | 222,40 | 277,7 | 353,6 | 419,8  | 558,6  | 715,2  | 1098,0 | 1612 | 2278 |
| 90          | 22,310                                                                             | 40,810 | 65,21  | 94,20  | 131,70 | 176,80 | 232,40 | 290,1 | 368,5 | 437,6  | 581,0  | 743,0  | 1141,0 | 1663 | 2345 |
| 95          | -                                                                                  | 42,790 | 68,30  | 98,64  | 137,80 | 184,70 | 242,40 | 302,4 | 383,4 | 455,4  | 603,5  | 770,8  | 1181,0 | 1715 | 2412 |
| Длина болта | Теоретическая масса 1000 шт. болтов, кг≈, при номинальном диаметре резьбы $d$ , мм |        |        |        |        |        |        |       |       |        |        |        |        |      |      |
| $l$ , мм    | 6                                                                                  | 8      | 10     | 12     | 14     | 16     | 18     | 20    | 22    | 24     | 27     | 30     | 36     | 42   | 48   |
| 100         | -                                                                                  | 44,760 | 71,38  | 103,10 | 143,80 | 192,60 | 252,40 | 314,7 | 398,3 | 473,2  | 626,0  | 798,5  | 1221,0 | 1766 | 2479 |
| 105         | -                                                                                  | -      | 74,47  | 107,50 | 149,90 | 200,50 | 262,40 | 327,1 | 413,3 | 490,9  | 648,5  | 826,3  | 1261,0 | 1826 | 2546 |
| 110         | -                                                                                  | -      | 77,55  | 112,00 | 155,90 | 208,40 | 272,30 | 339,4 | 428,2 | 508,7  | 671,0  | 854,1  | 1301,0 | 1880 | 2614 |
| 115         | -                                                                                  | -      | 80,63  | 116,40 | 162,00 | 216,30 | 282,30 | 351,8 | 443,1 | 526,5  | 693,5  | 881,8  | 1341,0 | 1934 | 2690 |
| 120         | -                                                                                  | -      | 83,72  | 120,90 | 168,00 | 224,20 | 292,30 | 364,1 | 458,1 | 544,2  | 716,0  | 909,6  | 1381,0 | 1989 | 2760 |
| 125         | -                                                                                  | -      | 86,80  | 125,30 | 174,00 | 232,10 | 302,30 | 376,4 | 473,0 | 562,0  | 738,5  | 937,4  | 1421,0 | 2043 | 2831 |
| 130         | -                                                                                  | -      | 89,89  | 129,70 | 180,10 | 240,00 | 312,30 | 388,8 | 487,9 | 579,8  | 761,0  | 965,2  | 1461,0 | 2098 | 2903 |
| 140         | -                                                                                  | -      | 96,06  | 138,60 | 192,20 | 255,80 | 332,30 | 413,5 | 517,8 | 615,3  | 806,0  | 1021,0 | 1541,0 | 2207 | 3045 |
| 150         | -                                                                                  | -      | 102,18 | 147,50 | 204,30 | 271,60 | 352,30 | 438,1 | 547,6 | 650,8  | 850,1  | 1076,0 | 1621,0 | 2315 | 3187 |
| 160         | -                                                                                  | -      | 108,38 | 156,40 | 216,40 | 287,40 | 372,30 | 462,8 | 577,5 | 686,4  | 895,9  | 1132,0 | 1701,0 | 2424 | 3329 |
| 170         | -                                                                                  | -      | 114,58 | 165,30 | 228,50 | 303,20 | 392,30 | 487,5 | 607,4 | 721,9  | 940,9  | 1188,0 | 1780,0 | 2533 | 3471 |
| 180         | -                                                                                  | -      | 120,68 | 174,20 | 240,60 | 319,00 | 412,30 | 512,2 | 637,2 | 757,5  | 985,9  | 1243,0 | 1860,0 | 2642 | 3614 |
| 190         | -                                                                                  | -      | 126,88 | 183,10 | 252,70 | 333,80 | 432,30 | 536,9 | 667,1 | 793,0  | 1031,0 | 1299,0 | 1940,0 | 2751 | 3756 |
| 200         | -                                                                                  | -      | 133,08 | 191,90 | 264,70 | 350,60 | 452,20 | 561,5 | 697,0 | 828,6  | 1076,0 | 1354,0 | 2020,0 | 2860 | 3898 |
| 220         | -                                                                                  | -      | -      | 209,70 | 228,90 | 382,20 | 492,20 | 610,9 | 756,7 | 899,6  | 1166,0 | 1465,0 | 2180,0 | 3077 | 4182 |
| 240         | -                                                                                  | -      | -      | 227,50 | 313,10 | 413,80 | 532,20 | 660,3 | 816,4 | 970,8  | 1256,0 | 1576,0 | 2340,0 | 3295 | 4466 |
| 260         | -                                                                                  | -      | -      | 245,20 | 337,60 | 445,40 | 572,20 | 709,6 | 876,1 | 1042,0 | 1346,0 | 1687,0 | 2500,0 | 3513 | 4751 |
| 280         | -                                                                                  | -      | -      | -      | 361,50 | 476,90 | 612,20 | 759,0 | 935,9 | 1113,0 | 1436,0 | 1798,0 | 2660,0 | 3730 | 5035 |
| 300         | -                                                                                  | -      | -      | -      | 385,70 | 508,50 | 652,20 | 808,3 | 995,6 | 1184,0 | 1526,0 | 1910,0 | 2820,0 | 3948 | 5319 |

## Масса стальных шпилек типа А

| Длина шпильки L, мм | Теоретическая масса шпильки типа А исполнений 1 и 2, кг ≈, при номинальном диаметре резьбы $d$ , мм |       |       |       |       |       |       |       |       |       |       |       |
|---------------------|-----------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                     | 10                                                                                                  | 12    | 16    | 20    | (22)  | 24    | (27)  | 30    | 36    | 42    | 48    | (52)  |
| 45                  | 0,028                                                                                               |       |       |       |       |       |       |       |       |       |       |       |
| 50                  | 0,031                                                                                               |       |       |       |       |       |       |       |       |       |       |       |
| 55                  | 0,034                                                                                               | 0,041 |       |       |       |       |       |       |       |       |       |       |
| 60                  | 0,037                                                                                               | 0,045 |       |       |       |       |       |       |       |       |       |       |
| 65                  | 0,040                                                                                               | 0,049 |       |       |       |       |       |       |       |       |       |       |
| 70                  | 0,043                                                                                               | 0,054 | 0,094 |       |       |       |       |       |       |       |       |       |
| 75                  | 0,046                                                                                               | 0,058 | 0,102 |       |       |       |       |       |       |       |       |       |
| 80                  | 0,049                                                                                               | 0,063 | 0,110 |       |       |       |       |       |       |       |       |       |
| 85                  | 0,052                                                                                               | 0,067 | 0,118 | 0,178 |       |       |       |       |       |       |       |       |
| 90                  | 0,055                                                                                               | 0,072 | 0,126 | 0,191 |       |       |       |       |       |       |       |       |
| 95                  | 0,058                                                                                               | 0,076 | 0,134 | 0,203 | 0,246 |       |       |       |       |       |       |       |
| 100                 | 0,061                                                                                               | 0,081 | 0,142 | 0,216 | 0,261 |       |       |       |       |       |       |       |
| 110                 | 0,064                                                                                               | 0,090 | 0,158 | 0,241 | 0,291 | 0,336 |       |       |       |       |       |       |
| 120                 | 0,067                                                                                               | 0,099 | 0,173 | 0,266 | 0,321 | 0,371 | 0,469 |       |       |       |       |       |
| 130                 | 0,070                                                                                               | 0,108 | 0,189 | 0,290 | 0,350 | 0,407 | 0,514 | 0,623 |       |       |       |       |
| 140                 | 0,073                                                                                               | 0,117 | 0,205 | 0,315 | 0,380 | 0,442 | 0,559 | 0,679 |       |       |       |       |
| 150                 | 0,076                                                                                               | 0,126 | 0,221 | 0,340 | 0,410 | 0,477 | 0,603 | 0,734 | 1,042 |       |       |       |
| 160                 |                                                                                                     | 0,135 | 0,236 | 0,364 | 0,440 | 0,513 | 0,648 | 0,750 | 1,122 | 1,520 |       |       |
| 170                 |                                                                                                     | 0,144 | 0,252 | 0,389 | 0,470 | 0,548 | 0,694 | 0,845 | 1,202 | 1,628 |       |       |
| 180                 |                                                                                                     | 0,153 | 0,268 | 0,413 | 0,499 | 0,584 | 0,738 | 0,901 | 1,282 | 1,737 |       |       |
| 190                 |                                                                                                     | 0,162 | 0,283 | 0,438 | 0,529 | 0,620 | 0,784 | 0,456 | 1,362 | 1,845 |       |       |
| 200                 | -                                                                                                   | 0,171 | 0,300 | 0,463 | 0,559 | 0,655 | 0,827 | 1,012 | 1,443 | 1,953 | 2,504 |       |
| 210                 | -                                                                                                   | -     | 0,316 | 0,488 | 0,589 | 0,691 | 0,873 | 1,067 | 1,523 | 2,062 | 2,645 |       |
| 220                 | -                                                                                                   | -     | 0,332 | 0,513 | 0,619 | 0,726 | 0,919 | 1,123 | 1,603 | 2,171 | 2,787 | 3,280 |

| Длина шпильки L, мм | Теоретическая масса шпильки типа А исполнений 1 и 2, кг ≈, при номинальном диаметре резьбы d, мм |    |       |       |       |       |       |       |       |       |       |       |
|---------------------|--------------------------------------------------------------------------------------------------|----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                     | 10                                                                                               | 12 | 16    | 20    | (22)  | 24    | (27)  | 30    | 36    | 42    | 48    | (52)  |
| 230                 | -                                                                                                | -  | 0,348 | 0,538 | 0,648 | 0,761 | 0,964 | 1,178 | 1,683 | 2,279 | 2,929 | 3,446 |
| 240                 | -                                                                                                | -  | -     | -     | -     | 0,797 | 1,009 | 1,234 | 1,763 | 2,387 | 3,071 | 3,612 |
| 250                 | -                                                                                                | -  | -     | -     | -     | 0,833 | 1,053 | 1,289 | 1,843 | 2,494 | 3,214 | 3,778 |
| 260                 | -                                                                                                | -  | -     | -     | -     | -     | 1,098 | 1,345 | 1,923 | 2,602 | 3,358 | 3,945 |
| 270                 | -                                                                                                | -  | -     | -     | -     | -     | 1,141 | 1,400 | 2,003 | 2,712 | 3,499 | 4,112 |
| 280                 | -                                                                                                | -  | -     | -     | -     | -     | -     | 1,455 | 2,083 | 2,822 | 3,640 | 4,280 |
| 290                 | -                                                                                                | -  | -     | -     | -     | -     | -     | 1,511 | 2,164 | 2,927 | 3,782 | 4,445 |
| 300                 | -                                                                                                | -  | -     | -     | -     | -     | -     | 1,567 | 2,245 | 3,032 | 3,925 | 4,610 |
| 310                 | -                                                                                                | -  | -     | -     | -     | -     | -     | 1,622 | 2,323 | 3,142 | 4,067 | 4,777 |
| 320                 | -                                                                                                | -  | -     | -     | -     | -     | -     | 1,678 | 2,402 | 3,252 | 4,210 | 4,945 |
| 330                 | -                                                                                                | -  | -     | -     | -     | -     | -     | 1,733 | 2,482 | 3,362 | 4,350 | 5,112 |
| 340                 | -                                                                                                | -  | -     | -     | -     | -     | -     | 1,788 | 2,563 | 3,472 | 4,490 | 5,280 |
| 350                 | -                                                                                                | -  | -     | -     | -     | -     | -     | -     | 2,642 | 3,582 | 4,635 | 5,445 |
| 360                 | -                                                                                                | -  | -     | -     | -     | -     | -     | -     | 2,722 | 3,692 | 4,780 | 5,610 |
| 370                 | -                                                                                                | -  | -     | -     | -     | -     | -     | -     | 2,804 | 3,799 | 4,920 | 5,777 |
| 380                 | -                                                                                                | -  | -     | -     | -     | -     | -     | -     | 2,887 | 3,907 | 5,060 | 5,945 |
| 390                 | -                                                                                                | -  | -     | -     | -     | -     | -     | -     | 2,964 | 4,019 | 5,202 | 6,107 |
| 400                 | -                                                                                                | -  | -     | -     | -     | -     | -     | -     | 3,442 | 4,132 | 5,345 | 6,270 |
| 410                 | -                                                                                                | -  | -     | -     | -     | -     | -     | -     | -     | 4,232 | 5,487 | 6,435 |
| 420                 | -                                                                                                | -  | -     | -     | -     | -     | -     | -     | -     | -     | 5,630 | 6,600 |
| 430                 | -                                                                                                | -  | -     | -     | -     | -     | -     | -     | -     | -     | 5,775 | 6,770 |
| 440                 | -                                                                                                | -  | -     | -     | -     | -     | -     | -     | -     | -     | 5,920 | 6,940 |
| 450                 | -                                                                                                | -  | -     | -     | -     | -     | -     | -     | -     | -     | -     | 7,110 |
| 460                 | -                                                                                                | -  | -     | -     | -     | -     | -     | -     | -     | -     | -     | 7,280 |
| 470                 | -                                                                                                | -  | -     | -     | -     | -     | -     | -     | -     | -     | -     | 7,440 |
| 480                 |                                                                                                  |    |       |       |       |       |       |       |       |       |       | 7,600 |
| 490                 |                                                                                                  |    |       |       |       |       |       |       |       |       |       | 7,770 |
| 500                 |                                                                                                  |    |       |       |       |       |       |       |       |       |       | 7,940 |

| Длина шпильки L, мм | Теоретическая масса шпильки типа А исполнений 1 и 2, кг ≈, при номинальном диаметре резьбы d, мм |       |    |      |    |      |    |    |     |     |       |     |     |     |
|---------------------|--------------------------------------------------------------------------------------------------|-------|----|------|----|------|----|----|-----|-----|-------|-----|-----|-----|
|                     | 56                                                                                               | (60)  | 64 | (68) | 72 | (76) | 80 | 90 | 100 | 110 | (120) | 125 | 140 | 160 |
| 250                 | 4,332                                                                                            |       |    |      |    |      |    |    |     |     |       |     |     |     |
| 260                 | 4,525                                                                                            |       |    |      |    |      |    |    |     |     |       |     |     |     |
| 270                 | 4,717                                                                                            |       |    |      |    |      |    |    |     |     |       |     |     |     |
| 280                 | 4,910                                                                                            | 5,620 |    |      |    |      |    |    |     |     |       |     |     |     |
| 290                 | 5,105                                                                                            | 5,842 |    |      |    |      |    |    |     |     |       |     |     |     |
| 300                 | 5,300                                                                                            | 6,065 |    |      |    |      |    |    |     |     |       |     |     |     |

| Длина шпильки L, мм | Теоретическая масса шпильки типа А исполнений 1 и 2, кг ≈, при номинальном диаметре резьбы d, мм |        |        |        |        |        |        |        |        |        |        |        |        |         |
|---------------------|--------------------------------------------------------------------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
|                     | 56                                                                                               | (60)   | 64     | (68)   | 72     | (76)   | 80     | 90     | 100    | 110    | (120)  | 125    | 140    | 160     |
| 310                 | 5,492                                                                                            | 6,287  | 7,120  |        |        |        |        |        |        |        |        |        |        |         |
| 320                 | 5,685                                                                                            | 6,510  | 7,370  |        |        |        |        |        |        |        |        |        |        |         |
| 330                 | 5,877                                                                                            | 6,730  | 7,625  | 8,620  |        |        |        |        |        |        |        |        |        |         |
| 340                 | 6,070                                                                                            | 6,950  | 7,880  | 8,910  | 9,960  | 12,097 |        |        |        |        |        |        |        |         |
| 350                 | 6,262                                                                                            | 7,175  | 8,130  | 9,190  | 10,270 | 12,453 | 13,811 |        |        |        |        |        |        |         |
| 360                 | 6,455                                                                                            | 7,400  | 8,380  | 9,470  | 10,580 | 12,809 | 14,206 | 17,978 |        |        |        |        |        |         |
| 370                 | 6,647                                                                                            | 7,620  | 8,635  | 9,760  | 10,900 | 13,165 | 14,600 | 18,478 |        |        |        |        |        |         |
| 380                 | 6,840                                                                                            | 7,840  | 8,890  | 10,050 | 11,220 | 13,520 | 14,995 | 18,978 |        |        |        |        |        |         |
| 390                 | 7,035                                                                                            | 8,065  | 9,140  | 10,330 | 11,540 | 13,876 | 15,389 | 19,478 |        |        |        |        |        |         |
| 400                 | 7,230                                                                                            | 8,290  | 9,390  | 10,610 | 11,870 | 14,232 | 15,784 | 19,977 |        |        |        |        |        |         |
| 410                 | 7,420                                                                                            | 8,510  | 9,645  | 10,900 | 12,080 | 14,588 | 16,177 | 20,475 |        |        |        |        |        |         |
| 420                 | 7,610                                                                                            | 8,730  | 9,900  | 11,190 | 12,300 | 14,944 | 16,573 | 20,975 |        |        |        |        |        |         |
| 430                 | 7,810                                                                                            | 8,950  | 10,150 | 11,470 | 12,720 | 15,299 | 16,968 | 21,471 |        |        |        |        |        |         |
| 440                 | 8,010                                                                                            | 9,170  | 10,410 | 11,750 | 13,140 | 15,655 | 17,362 | 21,974 |        |        |        |        |        |         |
| 450                 | 8,200                                                                                            | 9,390  | 10,660 | 12,040 | 13,460 | 16,011 | 17,757 | 22,473 | 27,742 |        |        |        |        |         |
| 460                 | 8,390                                                                                            | 9,610  | 10,910 | 12,330 | 13,780 | 16,367 | 18,152 | 22,972 | 28,359 | 34,316 |        |        |        |         |
| 470                 | 8,580                                                                                            | 10,060 | 11,160 | 12,600 | 14,100 | 16,723 | 18,546 | 23,472 | 28,976 | 35,062 |        |        |        |         |
| 480                 | 8,770                                                                                            | 10,280 | 11,420 | 12,880 | 14,420 | 17,078 | 18,941 | 23,971 | 29,592 | 35,808 |        |        |        |         |
| 490                 | 8,965                                                                                            | 10,510 | 11,670 | 13,170 | 14,740 | 17,434 | 19,335 | 24,471 | 30,208 | 36,554 |        |        |        |         |
| 500                 | 9,160                                                                                            | 10,730 | 11,930 | 13,460 | 15,060 | 17,790 | 19,730 | 24,970 | 30,825 | 37,300 | 44,390 |        |        |         |
| 510                 | 9,350                                                                                            | 10,960 | 12,170 | 13,750 | 15,380 | 18,146 | 20,125 | 25,469 | 31,442 | 38,046 | 45,278 |        |        |         |
| 520                 | 9,540                                                                                            | 11,180 | 12,420 | 14,040 | 15,700 | 18,502 | 20,519 | 25,969 | 32,058 | 38,792 | 46,166 |        |        |         |
| 530                 | -                                                                                                | 11,410 | 12,680 | 14,320 | 16,010 | 18,857 | 20,914 | 26,468 | 32,674 | 39,538 | 47,053 |        |        |         |
| 540                 | -                                                                                                | 11,610 | 12,940 | 14,600 | 16,320 | 19,213 | 21,308 | 26,968 | 33,291 | 40,286 | 47,941 |        |        |         |
| 550                 | -                                                                                                | -      | 13,190 | 14,890 | 16,650 | 19,509 | 21,703 | 27,467 | 33,907 | 41,030 | 48,829 |        |        |         |
| 560                 | -                                                                                                | -      | 13,450 | 15,180 | 16,980 | 19,925 | 22,098 | 27,966 | 34,524 | 41,776 | 49,717 |        |        |         |
| 570                 |                                                                                                  |        | 13,700 | 15,460 | 17,290 | 20,281 | 22,492 | 28,466 | 35,141 | 42,552 | 50,605 |        |        |         |
| 580                 |                                                                                                  |        | 13,950 | 15,740 | 17,610 | 20,636 | 22,887 | 28,965 | 35,757 | 43,268 | 51,492 |        |        |         |
| 590                 |                                                                                                  |        | 14,200 | 16,020 | 17,910 | 20,992 | 23,281 | 29,465 | 36,374 | 44,014 | 52,380 |        |        |         |
| 600                 |                                                                                                  |        | 14,450 | 16,310 | 18,210 | 21,348 | 23,676 | 29,964 | 36,990 | 44,760 | 53,288 | 57,798 | 72,480 | 94,680  |
| 610                 |                                                                                                  |        | -      | 16,600 | 18,530 | 21,704 | 24,071 | 30,463 | 37,606 | 45,506 | 54,156 | 57,761 | 93,688 | 96,258  |
| 620                 |                                                                                                  |        | -      | 16,890 | 18,860 | 22,060 | 24,466 | 30,963 | 38,223 | 46,252 | 55,044 | 59,725 | 74,896 | 97,836  |
| 630                 |                                                                                                  |        | -      | 17,160 | 19,180 | 22,415 | 24,860 | 31,462 | 38,840 | 46,998 | 55,931 | 60,688 | 76,104 | 99,414  |
| 640                 |                                                                                                  |        |        | 17,440 | 19,510 | 22,771 | 25,254 | 31,962 | 39,456 | 47,774 | 56,819 | 61,651 | 77,312 | 100,992 |
| 650                 |                                                                                                  |        | -      | 17,740 | 19,830 | 23,127 | 25,649 | 32,461 | 40,072 | 48,490 | 57,707 | 62,614 | 78,520 | 102,570 |
| 660                 |                                                                                                  |        | -      | -      | 20,160 | 23,483 | 26,044 | 32,960 | 40,689 | 49,236 | 58,595 | 63,578 | 79,728 | 104,148 |
| 670                 |                                                                                                  |        | -      | -      | 20,480 | 23,839 | 26,438 | 33,460 | 41,306 | 49,982 | 59,483 | 64,541 | 80,936 | 105,728 |
| 680                 |                                                                                                  |        | -      | -      | 20,810 | 24,194 | 26,833 | 33,959 | 41,922 | 50,728 | 60,370 | 65,504 | 82,144 | 10,304  |

| Длина шпильки L, мм | Теоретическая масса шпильки типа А исполнений 1 и 2, кг ≈, при номинальном диаметре резьбы $d$ , мм |      |    |      |    |        |        |        |        |        |        |        |        |         |
|---------------------|-----------------------------------------------------------------------------------------------------|------|----|------|----|--------|--------|--------|--------|--------|--------|--------|--------|---------|
|                     | 56                                                                                                  | (60) | 64 | (68) | 72 | (76)   | 80     | 90     | 100    | 110    | (120)  | 125    | 140    | 160     |
| 690                 |                                                                                                     |      | -  | -    | -  | 24,560 | 27,227 | 34,459 | 42,538 | 51,474 | 61,258 | 66,468 | 83,359 | 108,882 |
| 700                 |                                                                                                     |      | -  | -    | -  | 24,906 | 27,622 | 34,958 | 43,155 | 52,220 | 62,146 | 67,431 | 84,560 | 110,460 |
| 710                 |                                                                                                     |      | -  | -    | -  | -      | -      | 35,457 | 43,772 | 52,966 | 63,034 | 68,394 | 85,768 | 112,038 |
| 720                 |                                                                                                     |      | -  | -    | -  | -      | -      | 35,957 | 44,388 | 53,712 | 63,922 | 69,358 | 86,976 | 113,616 |
| 730                 |                                                                                                     |      | -  | -    | -  | -      | -      | 36,456 | 45,004 | 54,458 | 64,809 | 70,321 | 88,184 | 115,194 |
| 740                 |                                                                                                     |      | -  | -    | -  | -      | -      | 36,956 | 45,621 | 55,204 | 65,697 | 71,284 | 89,392 | 116,772 |
| 750                 |                                                                                                     |      | -  | -    | -  | -      | -      | 37,455 | 46,238 | 55,950 | 66,585 | 72,248 | 90,600 | 118,350 |

## Масса стальных шпилек типа Б

| Длина шпильки L, мм | Теоретическая масса шпильки типа Б исполнения 1, кг ≈, при номинальном диаметре резьбы d, мм |       |       |       |       |       |       |       |       |       |       |       |
|---------------------|----------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|                     | 10                                                                                           | 12    | 16    | 20    | (22)  | 24    | (27)  | 30    | 36    | 42    | 48    | (52)  |
| 45                  | 0,028                                                                                        | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     |
| 50                  | 0,030                                                                                        | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     |
| 55                  | 0,031                                                                                        | 0,040 | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     |
| 60                  | 0,033                                                                                        | 0,044 | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     |
| 65                  | 0,036                                                                                        | 0,048 | -     | -     | -     | -     | -     | -     | -     | -     | -     | -     |
| 70                  | 0,038                                                                                        | 0,052 | 0,097 | -     | -     | -     | -     | -     | -     | -     | -     | -     |
| 75                  | 0,040                                                                                        | 0,056 | 0,104 | -     | -     | -     | -     | -     | -     | -     | -     | -     |
| 80                  | 0,041                                                                                        | 0,059 | 0,111 | -     | -     | -     | -     | -     | -     | -     | -     | -     |
| 85                  | 0,043                                                                                        | 0,063 | 0,118 | 0,170 | -     | -     | -     | -     | -     | -     | -     | -     |
| 90                  | 0,045                                                                                        | 0,067 | 0,125 | 0,180 | -     | -     | -     | -     | -     | -     | -     | -     |
| 95                  | 0,047                                                                                        | 0,071 | 0,132 | 0,190 | 0,222 | -     | -     | -     | -     | -     | -     | -     |
| 100                 | 0,049                                                                                        | 0,075 | 0,139 | 0,200 | 0,247 | -     | -     | -     | -     | -     | -     | -     |
| 110                 | 0,053                                                                                        | 0,082 | 0,153 | 0,220 | 0,271 | 0,328 | -     | -     | -     | -     | -     | -     |
| 120                 | 0,054                                                                                        | 0,090 | 0,166 | 0,240 | 0,296 | 0,358 | 0,462 | -     | -     | -     | -     | -     |
| 130                 | 0,055                                                                                        | 0,098 | 0,180 | 0,260 | 0,321 | 0,388 | 0,501 | 0,628 | -     | -     | -     | -     |
| 140                 | 0,056                                                                                        | 0,115 | 0,194 | 0,280 | 0,345 | 0,418 | 0,539 | 0,677 | -     | -     | -     | -     |
| 150                 | 0,057                                                                                        | 0,123 | 0,208 | 0,300 | 0,370 | 0,448 | 0,578 | 0,725 | 1,007 | -     | -     | -     |
| 160                 | -                                                                                            | 0,130 | 0,222 | 0,320 | 0,395 | 0,477 | 0,616 | 0,773 | 1,074 | 1,500 | -     | -     |
| 170                 | -                                                                                            | 0,138 | 0,236 | 0,340 | 0,419 | 0,507 | 0,655 | 0,822 | 1,141 | 1,594 | -     | -     |
| 180                 | -                                                                                            | 0,145 | 0,250 | 0,360 | 0,444 | 0,537 | 0,694 | 0,870 | 1,209 | 1,688 | -     | -     |
| 190                 | -                                                                                            | 0,153 | 0,264 | 0,380 | 0,469 | 0,567 | 0,732 | 0,918 | 1,276 | 1,782 | -     | -     |
| 200                 | -                                                                                            | 0,160 | 0,277 | 0,400 | 0,493 | 0,597 | 0,771 | 0,967 | 1,343 | 1,876 | 2,497 | -     |
| 210                 | -                                                                                            | -     | 0,291 | 0,420 | 0,518 | 0,627 | 0,809 | 1,015 | 1,410 | 1,969 | 2,622 | -     |
| 220                 | -                                                                                            | -     | 0,305 | 0,440 | 0,543 | 0,656 | 0,848 | 1,063 | 1,477 | 1,063 | 2,747 | 3,257 |
| 230                 |                                                                                              |       | 0,319 | 0,460 | 0,567 | 0,686 | 0,886 | 1,112 | 1,544 | 2,157 | 2,872 | 3,405 |
| 240                 |                                                                                              |       |       |       |       | 0,716 | 0,925 | 1,160 | 1,611 | 2,251 | 2,996 | 3,553 |
| 250                 |                                                                                              |       |       |       |       | 0,746 | 0,963 | 1,209 | 1,679 | 2,345 | 3,121 | 3,701 |
| 260                 |                                                                                              |       |       |       |       |       | 1,002 | 1,257 | 1,746 | 2,438 | 3,246 | 3,849 |
| 270                 |                                                                                              |       |       |       |       |       | 1,040 | 1,305 | 1,813 | 2,532 | 3,371 | 3,997 |
| 280                 |                                                                                              |       | -     | -     | -     | -     | -     | 1,354 | 1,880 | 2,626 | 3,496 | 4,145 |
| 290                 |                                                                                              |       |       |       |       |       |       | 1,402 | 1,947 | 2,720 | 3,621 | 4,293 |
| 300                 |                                                                                              |       |       |       |       |       |       | 1,450 | 2,014 | 2,813 | 3,746 | 4,441 |
| 310                 |                                                                                              |       |       |       |       |       |       | 1,499 | 2,081 | 2,907 | 3,870 | 4,589 |

| Длина шпильки L, мм | Теоретическая масса шпильки типа Б исполнения 1, кг ≈, при номинальном диаметре резьбы d, мм |    |    |    |      |    |      |       |       |       |       |       |
|---------------------|----------------------------------------------------------------------------------------------|----|----|----|------|----|------|-------|-------|-------|-------|-------|
|                     | 10                                                                                           | 12 | 16 | 20 | (22) | 24 | (27) | 30    | 36    | 42    | 48    | (52)  |
| 320                 |                                                                                              |    |    |    |      |    |      | 1,547 | 2,148 | 3,001 | 3,995 | 4,737 |
| 330                 |                                                                                              |    |    |    |      |    |      | 1,595 | 2,216 | 3,095 | 4,120 | 4,885 |
| 340                 |                                                                                              |    |    |    |      |    |      | 1,644 | 2,283 | 3,189 | 3,245 | 5,033 |
| 350                 |                                                                                              |    |    |    |      |    |      |       | 2,350 | 3,282 | 4,370 | 5,181 |
| 360                 |                                                                                              |    |    |    |      |    |      |       | 2,417 | 3,376 | 4,495 | 5,329 |
| 370                 |                                                                                              |    |    |    |      |    |      |       | 2,484 | 3,470 | 4,619 | 5,477 |
| 380                 |                                                                                              |    |    |    |      |    |      |       | 2,551 | 3,564 | 4,744 | 5,626 |
| 390                 |                                                                                              |    |    |    |      |    |      |       | 2,618 | 3,657 | 4,869 | 5,773 |
| 400                 |                                                                                              |    |    |    |      |    |      |       | 2,686 | 3,751 | 4,994 | 5,921 |
| 410                 |                                                                                              |    |    |    |      |    |      |       |       | 3,845 | 5,119 | 6,069 |
| 420                 |                                                                                              |    |    |    |      |    |      |       |       |       | 5,244 | 6,217 |
| 430                 |                                                                                              |    |    |    |      |    |      |       |       |       | 5,369 | 5,365 |
| 440                 |                                                                                              |    |    |    |      |    |      |       |       |       | 5,493 | 6,513 |
| 450                 |                                                                                              |    |    |    |      |    |      |       |       |       |       | 6,661 |
| 460                 |                                                                                              |    |    |    |      |    |      |       |       |       |       | 6,809 |
| 470                 |                                                                                              |    |    |    |      |    |      |       |       |       |       | 6,957 |
| 480                 |                                                                                              |    |    |    |      |    |      |       |       |       |       | 7,105 |
| 490                 |                                                                                              |    |    |    |      |    |      |       |       |       |       | 7,253 |
| 500                 |                                                                                              |    |    |    |      |    |      |       |       |       |       | 7,402 |

| Длина шпильки L, мм | Теоретическая масса шпильки типа Б исполнения 1, кг ≈, при номинальном диаметре резьбы d, мм |       |       |       |        |        |        |        |     |     |       |     |     |     |
|---------------------|----------------------------------------------------------------------------------------------|-------|-------|-------|--------|--------|--------|--------|-----|-----|-------|-----|-----|-----|
|                     | 56                                                                                           | (60)  | 64    | (68)  | 72     | (76)   | 80     | 90     | 100 | 110 | (120) | 125 | 140 | 160 |
| 250                 | 4,168                                                                                        |       |       |       |        |        |        |        |     |     |       |     |     |     |
| 260                 | 4,334                                                                                        |       |       |       |        |        |        |        |     |     |       |     |     |     |
| 270                 | 4,501                                                                                        |       |       |       |        |        |        |        |     |     |       |     |     |     |
| 280                 | 4,668                                                                                        | 5,414 |       |       |        |        |        |        |     |     |       |     |     |     |
| 290                 | 4,293                                                                                        | 5,607 |       |       |        |        |        |        |     |     |       |     |     |     |
| 300                 | 5,001                                                                                        | 5,800 |       |       |        |        |        |        |     |     |       |     |     |     |
| 310                 | 5,168                                                                                        | 5,994 | 6,880 |       |        |        |        |        |     |     |       |     |     |     |
| 320                 | 5,335                                                                                        | 6,187 | 7,102 |       |        |        |        |        |     |     |       |     |     |     |
| 330                 | 5,501                                                                                        | 6,381 | 7,324 | 8,333 |        |        |        |        |     |     |       |     |     |     |
| 340                 | 5,668                                                                                        | 6,574 | 7,546 | 8,586 | 9,980  | 11,710 |        |        |     |     |       |     |     |     |
| 350                 | 5,835                                                                                        | 6,767 | 7,768 | 8,839 | 10,270 | 12,023 | 13,351 |        |     |     |       |     |     |     |
| 360                 | 6,002                                                                                        | 6,961 | 7,990 | 9,091 | 10,560 | 12,319 | 13,686 | 17,528 |     |     |       |     |     |     |
| 370                 | 6,168                                                                                        | 7,154 | 8,212 | 9,314 | 10,860 | 12,625 | 14,030 | 17,958 |     |     |       |     |     |     |
| 380                 | 6,335                                                                                        | 7,347 | 8,434 | 9,596 | 11,150 | 12,920 | 14,365 | 18,398 |     |     |       |     |     |     |
| 390                 | 6,507                                                                                        | 7,541 | 8,656 | 9,849 | 11,440 | 13,226 | 14,699 | 18,828 |     |     |       |     |     |     |

| Длина шпильки L, мм | Теоретическая масса шпильки типа Б исполнения 1, кг ≈, при номинальном диаметре резьбы d, мм |        |        |        |        |        |        |        |        |        |        |        |        |         |
|---------------------|----------------------------------------------------------------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
|                     | 56                                                                                           | (60)   | 64     | (68)   | 72     | (76)   | 80     | 90     | 100    | 110    | (120)  | 125    | 140    | 160     |
| 400                 | 6,668                                                                                        | 7,734  | 8,878  | 10,100 | 11,740 | 13,522 | 15,044 | 19,267 |        |        |        |        |        |         |
| 410                 | 6,835                                                                                        | 7,927  | 9,100  | 10,350 | 12,030 | 13,822 | 15,377 | 19,695 |        |        |        |        |        |         |
| 420                 | 7,002                                                                                        | 8,121  | 9,322  | 10,600 | 12,320 | 14,134 | 15,713 | 20,135 |        |        |        |        |        |         |
| 430                 | 7,169                                                                                        | 8,314  | 9,544  | 10,850 | 12,620 | 14,429 | 16,048 | 20,564 |        |        |        |        |        |         |
| 440                 | 7,335                                                                                        | 8,507  | 9,766  | 11,110 | 12,910 | 14,735 | 16,392 | 21,004 |        |        |        |        |        |         |
| 450                 | 7,502                                                                                        | 8,701  | 9,988  | 11,360 | 13,200 | 15,031 | 16,727 | 21,433 | 26,592 |        |        |        |        |         |
| 460                 | 7,669                                                                                        | 8,894  | 10,210 | 11,610 | 13,500 | 15,337 | 17,062 | 21,872 | 27,129 | 32,966 |        |        |        |         |
| 470                 | 7,835                                                                                        | 9,087  | 10,430 | 11,860 | 12,790 | 15,633 | 17,406 | 22,312 | 27,676 | 33,632 | -      | -      | -      | -       |
| 480                 | 8,002                                                                                        | 9,281  | 10,650 | 12,120 | 14,080 | 15,938 | 17,741 | 22,741 | 28,222 | 34,298 |        |        |        |         |
| 490                 | 8,169                                                                                        | 9,474  | 10,870 | 12,370 | 14,380 | 16,244 | 18,075 | 23,181 | 28,768 | 34,964 |        |        |        |         |
| 500                 | 8,336                                                                                        | 9,668  | 11,090 | 12,620 | 14,670 | 16,540 | 18,410 | 23,610 | 29,305 | 35,631 | 43,090 | 46,805 |        |         |
| 510                 | 8,502                                                                                        | 9,861  | 11,310 | 12,870 | 14,970 | 16,846 | 18,755 | 24,049 | 29,852 | 36,296 | 43,888 | 47,775 |        |         |
| 520                 | 8,669                                                                                        | 10,050 | 11,510 | 13,130 | 15,260 | 17,142 | 19,089 | 24,479 | 30,398 | 36,962 | 44,686 | 48,552 |        |         |
| 530                 |                                                                                              | 10,250 | 11,760 | 13,380 | 15,550 | 17,447 | 19,424 | 24,918 | 30,944 | 37,628 | 45,483 | 49,425 |        |         |
| 540                 |                                                                                              | 10,440 | 11,980 | 13,630 | 15,850 | 17,743 | 19,758 | 25,348 | 31,491 | 38,294 | 46,291 | 50,298 |        |         |
| 550                 |                                                                                              | 10,630 | 12,200 | 13,880 | 16,140 | 18,049 | 20,103 | 25,787 | 32,027 | 38,960 | 47,089 | 51,162 |        |         |
| 560                 |                                                                                              |        | 12,420 | 14,140 | 16,430 | 18,345 | 20,438 | 26,216 | 32,574 | 39,626 | 47,877 | 52,035 |        |         |
| 570                 |                                                                                              |        | 12,650 | 14,390 | 16,730 | 18,651 | 20,772 | 26,656 | 33,121 | 40,292 | 48,685 | 52,908 |        |         |
| 580                 |                                                                                              |        | 12,870 | 14,640 | 17,020 | 18,456 | 21,107 | 27,065 | 33,667 | 40,958 | 49,492 | 53,781 |        |         |
| 590                 |                                                                                              |        | 13,030 | 14,890 | 17,310 | 19,472 | 21,681 | 27,525 | 34,214 | 41,624 | 50,290 | 54,655 |        |         |
| 600                 |                                                                                              |        | 13,310 | 15,150 | 17,610 | 19,768 | 22,016 | 28,214 | 35,040 | 42,290 | 51,108 | 55,528 | 70,650 | 93,370  |
| 610                 |                                                                                              |        |        | 15,400 | 17,900 | 20,074 | 22,351 | 28,653 | 35,786 | 43,276 | 51,896 | 56,401 | 71,748 | 94,838  |
| 620                 |                                                                                              |        |        | 15,650 | 18,190 | 20,380 | 22,685 | 29,083 | 36,133 | 43,942 | 51,694 | 57,275 | 72,856 | 96,306  |
| 630                 |                                                                                              |        |        | 15,900 | 18,490 | 20,675 | 22,930 | 29,522 | 36,680 | 44,608 | 53,491 | 58,148 | 74,064 | 97,974  |
| 640                 |                                                                                              |        |        | 16,160 | 18,780 | 20,981 | 23,364 | 29,952 | 37,216 | 45,271 | 54,299 | 59,021 | 75,07? | 99,242  |
| 650                 |                                                                                              |        |        | 16,410 | 19,070 | 21,277 | 23,699 | 30,391 | 37,762 | 45,940 | 55,097 | 59,894 | 76,180 | 100,710 |
| 660                 |                                                                                              |        |        |        | 19,370 | 21,583 | 24,044 | 30,820 | 38,309 | 46,606 | 55,895 | 60,768 | 77,278 | 102,178 |
| 670                 |                                                                                              |        |        |        | 19,660 | 21,879 | 24,378 | 31,260 | 38,956 | 47,272 | 56,703 | 61,641 | 78,386 | 103,646 |
| 680                 |                                                                                              |        |        |        | 19,960 | 22,184 | 24,713 | 31,699 | 39,402 | 47,938 | 57,500 | 62,504 | 79,494 | 105,144 |
| 690                 |                                                                                              |        |        |        | 20,250 | 22,490 | 25,047 | 32,129 | 39,939 | 48,614 | 58,298 | 63,376 | 80,609 | 106,582 |
| 700                 |                                                                                              |        |        |        | 20,540 | 22,786 | 25,392 | 32,568 | 40,485 | 49,280 | 59,096 | 64,251 | 81,710 | 108,050 |
| 710                 |                                                                                              |        |        |        |        |        |        | 32,997 | 41,032 | 49,946 | 59,984 | 65,124 | 82,808 | 109,518 |
| 720                 |                                                                                              |        |        |        |        |        |        | 33,437 | 41,578 | 50,612 | 60,792 | 65,998 | 83,916 | 110,796 |
| 730                 |                                                                                              |        |        |        |        |        |        | 33,866 | 42,114 | 51,278 | 61,589 | 66,871 | 85,024 | 111,464 |
| 740                 |                                                                                              |        |        |        |        |        |        | 34,306 | 42,661 | 51,944 | 62,387 | 67,741 | 86,132 | 113,932 |
| 750                 |                                                                                              |        |        |        |        |        |        | 34,735 | 43,208 | 52,610 | 63,195 | 68,618 | 86,960 | 115,400 |

| Длина шпильки L, мм | Теоретическая масса шпильки типа Б исполнения 2, кг ≈, при номинальном диаметре резьбы d, мм |
|---------------------|----------------------------------------------------------------------------------------------|
|---------------------|----------------------------------------------------------------------------------------------|

|     | 10    | 12    | 16    | 20    | (22)  | 24    | (27)  | 30    | 36    | 42    | 48    | (52)  |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 45  | 0,021 |       |       |       |       |       |       |       |       |       |       |       |
| 50  | 0,023 |       |       |       |       |       |       |       |       |       |       |       |
| 55  | 0,025 | 0,038 |       |       |       |       |       |       |       |       |       |       |
| 60  | 0,027 | 0,041 |       |       |       |       |       |       |       |       |       |       |
| 65  | 0,029 | 0,043 |       |       |       |       |       |       |       |       |       |       |
| 70  | 0,031 | 0,046 | 0,089 |       |       |       |       |       |       |       |       |       |
| 75  | 0,033 | 0,019 | 0,095 |       |       |       |       |       |       |       |       |       |
| 80  | 0,035 | 0,052 | 0,100 |       |       |       |       |       |       |       |       |       |
| 85  | 0,037 | 0,055 | 0,105 | 0,170 |       |       |       |       |       |       |       |       |
| 90  | 0,039 | 0,058 | 0,110 | 0,178 |       |       |       |       |       |       |       |       |
| 95  | 0,041 | 0,061 | 0,115 | 0,186 | 0,223 |       |       |       |       |       |       |       |
| 100 | 0,043 | 0,064 | 0,121 | 0,195 | 0,243 |       |       |       |       |       |       |       |
| 110 | 0,047 | 0,070 | 0,131 | 0,211 | 0,263 | 0,313 |       |       |       |       |       |       |
| 120 | 0,051 | 0,075 | 0,141 | 0,228 | 0,283 | 0,336 | 0,443 |       |       |       |       |       |
| 130 | 0,055 | 0,081 | 0,152 | 0,244 | 0,303 | 0,360 | 0,473 | 0,581 |       |       |       |       |
| 140 | 0,058 | 0,086 | 0,162 | 0,261 | 0,323 | 0,383 | 0,503 | 0,629 |       |       |       |       |
| 150 | 0,062 | 0,092 | 0,173 | 0,277 | 0,344 | 0,406 | 0,533 | 0,667 | 1,016 |       |       |       |
| 160 | -     | 0,098 | 0,183 | 0,294 | 0,364 | 0,430 | 0,562 | 0,705 | 1,087 | 1,543 |       |       |
| 170 | -     | 0,103 | 0,193 | 0,311 | 0,384 | 0,453 | 0,592 | 0,743 | 1,143 | 1,620 |       |       |
| 180 | -     | 0,109 | 0,204 | 0,327 | 0,404 | 0,477 | 0,622 | 0,781 | 1,198 | 1,695 |       |       |
| 190 | -     | 0,114 | 0,214 | 0,344 | 0,428 | 0,500 | 0,652 | 0,819 | 1,254 | 1,772 |       |       |
| 200 | -     | 0,120 | 0,225 | 0,360 | 0,448 | 0,524 | 0,681 | 0,857 | 1,309 | 1,849 | 2,486 |       |
| 210 | -     | -     | 0,235 | 0,377 | 0,468 | 0,547 | 0,711 | 0,895 | 1,365 | 1,925 | 2,587 |       |
| 220 | -     | -     | 0,245 | 0,393 | 0,488 | 0,570 | 0,741 | 0,933 | 1,420 | 2,001 | 2,689 | 3,243 |
| 230 | -     | -     | 0,256 | 0,410 | 0,508 | 0,594 | 0,771 | 0,970 | 1,476 | 2,078 | 2,780 | 3,3b4 |
| 240 | -     | -     | -     | -     | -     | 0,617 | 0,801 | 1,008 | 1,531 | 2,154 | 2,891 | 3,484 |
| 250 |       |       |       |       |       | 0,641 | 0,831 | 1,038 | 1,587 | 2,230 | 2,992 | 3,604 |
| 260 |       |       |       |       |       |       | 0,860 | 1,084 | 1,642 | 2,307 | 3,093 | 3,725 |
| 270 |       |       |       |       |       |       | 0,890 | 1,122 | 1,697 | 2,383 | 3,194 | 3,845 |
| 280 |       |       |       |       |       |       |       | 1,160 | 1,753 | 2,460 | 3,295 | 3,966 |
| 290 |       |       |       |       |       |       |       | 1,198 | 1,808 | 2,536 | 3,396 | 4,085 |
| 300 |       |       |       |       |       |       |       | 1,236 | 1,854 | 2,612 | 3,497 | 4,206 |
| 310 |       |       |       |       |       |       |       | 1,274 | 1,909 | 2,687 | 3,598 | 4,326 |
| 320 |       |       |       |       |       |       |       | 1,312 | 1,975 | 2,765 | 3,699 | 4,447 |
| 330 |       |       |       |       |       |       |       | 1,350 | 2,019 | 2,841 | 3,800 | 4,567 |
| 340 |       |       |       |       |       |       |       | 1,387 | 2,086 | 2,918 | 3,901 | 4,688 |
| 350 |       |       |       |       |       |       |       | -     | 2,139 | 2,993 | 4,002 | 4,708 |
| 360 |       |       |       |       |       |       |       | -     | 2,197 | 3,070 | 4,104 | 4,929 |
| 370 |       |       |       |       |       |       |       |       | 2,249 | 3,146 | 4,206 | 5,049 |

| Длина шпильки L, мм | Теоретическая масса шпильки типа Б исполнения 2, кг ≈, при номинальном диаметре резьбы d, мм |    |    |    |      |    |      |    |       |       |       |       |
|---------------------|----------------------------------------------------------------------------------------------|----|----|----|------|----|------|----|-------|-------|-------|-------|
|                     | 10                                                                                           | 12 | 16 | 20 | (22) | 24 | (27) | 30 | 36    | 42    | 48    | (52)  |
| 380                 |                                                                                              |    |    |    |      |    |      |    | 2,308 | 3,223 | 4,305 | 5,170 |
| 390                 |                                                                                              |    |    |    |      |    |      |    | 2,359 | 3,298 | 4,406 | 5,290 |
| 400                 |                                                                                              |    |    |    |      |    |      |    | 2,419 | 3,376 | 4,508 | 5,410 |
| 410                 |                                                                                              |    |    |    |      |    |      |    | -     | 3,451 | 4,610 | 5,530 |
| 420                 |                                                                                              |    |    |    |      |    |      |    | -     | -     | 4,710 | 5,651 |
| 430                 |                                                                                              |    |    |    |      |    |      |    |       | -     | 4,811 | 5,772 |
| 440                 |                                                                                              |    |    |    |      |    |      |    |       | -     | 4,912 | 5,892 |
| 450                 |                                                                                              |    |    |    |      |    |      |    |       |       | -     | 6,012 |
| 460                 |                                                                                              |    |    |    |      |    |      |    |       |       |       | 6,133 |
| 470                 |                                                                                              |    |    |    |      |    |      |    |       |       |       | 6,253 |
| 480                 |                                                                                              |    |    |    |      |    |      |    |       |       |       | 6,373 |
| 490                 |                                                                                              |    |    |    |      |    |      |    |       |       |       | 6,493 |
| 500                 |                                                                                              |    |    |    |      |    |      |    |       |       |       | 6,614 |

| Длина шпильки L, мм | Теоретическая масса шпильки типа Б исполнения 2, кг ≈, при номинальном диаметре резьбы d, мм |       |       |        |       |       |       |       |       |     |       |     |     |     |
|---------------------|----------------------------------------------------------------------------------------------|-------|-------|--------|-------|-------|-------|-------|-------|-----|-------|-----|-----|-----|
|                     | 56                                                                                           | (60)  | 64    | (68)   | 72    | (76)  | 80    | 90    | 100   | 110 | (120) | 125 | 140 | 160 |
| 250                 | 4,157                                                                                        | 5,420 | 5,655 |        |       |       |       |       |       |     |       |     |     |     |
| 260                 | 4,299                                                                                        | 5,591 | 5,848 |        |       |       |       |       |       |     |       |     |     |     |
| 270                 | 4,441                                                                                        | 5,763 | 6,140 |        |       |       |       |       |       |     |       |     |     |     |
| 280                 | 4,583                                                                                        | 5,934 | 6,333 |        |       |       |       |       |       |     |       |     |     |     |
| 290                 | 4,733                                                                                        | 6,107 | 6,525 |        |       |       |       |       |       |     |       |     |     |     |
| 300                 | 4,867                                                                                        | 6,288 | 6,618 |        |       |       |       |       |       |     |       |     |     |     |
| 310                 | 5,009                                                                                        | 6,450 | 6,811 |        |       |       |       |       |       |     |       |     |     |     |
| 320                 | 5,151                                                                                        | 6,621 | 7,005 |        |       |       |       |       |       |     |       |     |     |     |
| 330                 | 5,293                                                                                        | 6,794 | 7,197 | 8,196  |       |       |       |       |       |     |       |     |     |     |
| 340                 | 5,435                                                                                        | 6,965 | 7,391 | 8,418  | 9,76  | 11,08 |       |       |       |     |       |     |     |     |
| 350                 | 5,577                                                                                        | 7,138 | 7,584 | 8,699  | 10,02 | 11,39 | 12,70 |       |       |     |       |     |     |     |
| 360                 | 5,719                                                                                        | 7,309 | 7,778 | 8,862  | 10,29 | 11,69 | 13,02 | 16,72 |       |     |       |     |     |     |
| 370                 | 5,861                                                                                        | 7,481 | 7,971 | 9,083  | 10,56 | 12,00 | 13,37 | 17,16 |       |     |       |     |     |     |
| 380                 | 6,003                                                                                        | 7,552 | 8,165 | 9,306  | 10,83 | 12,30 | 13,69 | 17,59 |       |     |       |     |     |     |
| 390                 | 6,145                                                                                        | 7,825 | 8,357 | 9,528  | 11,09 | 12,61 | 14,04 | 18,03 |       |     |       |     |     |     |
| 400                 | 6,287                                                                                        | 7,996 | 8,551 | 9,749  | 11,36 | 12,83 | 14,36 | 18,46 |       |     |       |     |     |     |
| 410                 | 6,429                                                                                        | 8,168 | 8,744 | 9,971  | 11,62 | 13,22 | 14,71 | 18,90 |       |     |       |     |     |     |
| 420                 | 6,571                                                                                        | 8,339 | 8,938 | 10,194 | 11,89 | 13,52 | 15,03 | 19,33 |       |     |       |     |     |     |
| 430                 | 6,713                                                                                        | 8,512 | 9,130 | 10,416 | 12,16 | 13,83 | 15,38 | 19,77 |       |     |       |     |     |     |
| 440                 | 6,855                                                                                        | 8,683 | 9,324 | 10,638 | 12,42 | 14,13 | 15,70 | 20,20 |       |     |       |     |     |     |
| 450                 | 6,997                                                                                        | 8,856 | 9,517 | 10,860 | 12,69 | 14,44 | 16,03 | 20,64 | 25,64 |     |       |     |     |     |

| Длина шпильки<br>L, мм | Теоретическая масса шпильки типа Б исполнения 2, кг ≈, при номинальном диаметре резьбы d, мм |        |        |        |       |       |       |       |       |       |       |       |       |        |
|------------------------|----------------------------------------------------------------------------------------------|--------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
|                        | 56                                                                                           | (60)   | 64     | (68)   | 72    | (76)  | 80    | 90    | 100   | 110   | (120) | 125   | 140   | 160    |
| 460                    | 7,139                                                                                        | 9,027  | 9,711  | 11,081 | 12,95 | 14,74 | 16,37 | 21,06 | 26,18 | 32,05 |       |       |       |        |
| 470                    | 7,281                                                                                        | 9,199  | 10,097 | 11,303 | 13,22 | 14,97 | 16,76 | 21,50 | 26,73 | 32,72 |       |       |       |        |
| 480                    | 7,421                                                                                        | 9,370  | 10,290 | 11,525 | 13,49 | 15,35 | 17,04 | 21,93 | 27,27 | 33,38 |       |       |       |        |
| 490                    | 7,561                                                                                        | 9,543  | 10,484 | 11,747 | 13,75 | 15,56 | 17,39 | 22,37 | 27,82 | 34,05 |       |       |       |        |
| 500                    | 7,706                                                                                        | 9,714  | 10,677 | 11,969 | 14,02 | 15,96 | 17,71 | 22,80 | 28,36 | 34,71 | 41,97 | 45,53 |       |        |
| 510                    | 7,848                                                                                        | 9,886  | 10,870 | 12,190 | 14,29 | 16,26 | 18,05 | 23,23 | 28,95 | 35,37 | 42,78 | 46,40 |       |        |
| 520                    | 7,991                                                                                        | 10,057 | 11,063 | 12,412 | 14,55 | 16,57 | 18,38 | 23,67 | 29,45 | 36,04 | 43,58 | 47,28 |       |        |
| 530                    | -                                                                                            | 10,230 | 11,257 | 12,633 | 14,82 | 16,87 | 18,72 | 24,10 | 29,99 | 36,70 | 44,39 | 48,15 |       |        |
| 540                    |                                                                                              | 10,401 | 11,450 | 12,866 | 15,08 | 17,18 | 19,05 | 24,54 | 30,54 | 37,37 | 45,19 | 49,03 |       |        |
| 550                    |                                                                                              | 10,572 | 11,643 | 13,078 | 15,34 | 17,48 | 19,39 | 24,97 | 31,08 | 38,03 | 46,01 | 49,91 |       |        |
| 560                    |                                                                                              | -      | 11,836 | 13,300 | 15,62 | 17,79 | 19,72 | 25,41 | 31,63 | 38,70 | 46,80 | 50,78 |       |        |
| 570                    |                                                                                              |        | 12,030 | 13,521 | 15,88 | 18,09 | 20,06 | 25,84 | 32,17 | 39,36 | 47,62 | 51,66 |       |        |
| 580                    |                                                                                              |        | 12,223 | 13,743 | 16,15 | 18,75 | 20,39 | 26,28 | 32,72 | 40,03 | 48,41 | 52,53 |       |        |
| 590                    |                                                                                              |        | 12,416 | 13,964 | 16,48 | 19,05 | 20,81 | 26,71 | 33,26 | 40,69 | 49,23 | 53,41 |       |        |
| 600                    |                                                                                              |        | 12,609 | 14,187 | 16,74 | 19,36 | 21,14 | 27,24 | 33,89 | 41,36 | 50,03 | 54,29 | 68,96 | 91,18  |
| 610                    |                                                                                              |        | -      | 14,409 | 17,01 | 19,66 | 21,48 | 27,67 | 34,43 | 42,12 | 50,84 | 55,26 | 70,07 | 92,64  |
| 620                    |                                                                                              |        | -      | 14,631 | 17,27 | 19,97 | 21,87 | 27,11 | 34,98 | 42,79 | 51,64 | 56,04 | 71,19 | 94,11  |
| 630                    |                                                                                              |        |        | 14,853 | 17,54 | 20,27 | 22,15 | 28,54 | 35,52 | 43,45 | 52,45 | 56,91 | 72,30 | 95,57  |
| 640                    |                                                                                              |        |        | 14,966 | 17,81 | 20,58 | 22,48 | 28,98 | 36,07 | 44,12 | 53,25 | 57,79 | 73,42 | 97,04  |
| 650                    |                                                                                              |        |        | 15,188 | 18,07 | 20,88 | 22,82 | 29,41 | 36,61 | 44,78 | 54,07 | 58,67 | 74,54 | 98,51  |
| 660                    |                                                                                              |        |        | -      | 18,34 | 21,19 | 23,15 | 29,85 | 37,16 | 45,45 | 54,86 | 59,54 | 75,65 | 99,97  |
| 670                    |                                                                                              |        |        | -      | 18,61 | 21,49 | 23,44 | 30,28 | 37,70 | 46,11 | 55,68 | 60,42 | 76,77 | 101,44 |
| 680                    |                                                                                              |        |        |        | 18,81 | 21,80 | 23,82 | 30,72 | 38,25 | 46,78 | 56,47 | 61,29 | 77,88 | 102,90 |
| 690                    |                                                                                              |        |        |        | 19,14 | 22,10 | 24,16 | 31,15 | 38,79 | 47,44 | 57,29 | 62,17 | 79,00 | 104,37 |
| 700                    |                                                                                              |        |        |        | 19,40 | 22,41 | 24,49 | 31,59 | 39,34 | 48,11 | 58,09 | 63,05 | 80,12 | 105,84 |
| 710                    |                                                                                              |        |        |        | -     | -     | -     | 32,02 | 39,88 | 48,77 | 58,90 | 63,92 | 81,23 | 107,36 |
| 720                    |                                                                                              |        |        |        | -     | -     | -     | 32,42 | 40,42 | 49,43 | 59,70 | 64,80 | 82,35 | 108,77 |
| 730                    |                                                                                              |        |        |        |       |       |       | 32,89 | 40,97 | 50,10 | 60,51 | 65,67 | 83,46 | 110,23 |
| 740                    |                                                                                              |        |        |        |       |       |       | 33,33 | 41,52 | 50,77 | 61,31 | 66,55 | 84,58 | 111,70 |
| 750                    |                                                                                              |        |        |        |       |       |       | 33,76 | 42,06 | 51,43 | 62,13 | 67,43 | 85,70 | 113,17 |

Масса стальных гаек

| Номинальный диаметр резьбы <i>d</i> , мм | Масса, кг, в гайк типов |              |              |              |
|------------------------------------------|-------------------------|--------------|--------------|--------------|
|                                          | А                       | Б            |              |              |
|                                          |                         | Исполнение 1 | Исполнение 2 | исполнение 3 |
| 10                                       | 0,014                   | -            | -            | -            |
| 12                                       | 0,019                   | 0,083        | -            | -            |
| 16                                       | 0,039                   | 0,118        | -            | -            |
| 20                                       | 0,077                   | 0,203        | 0,21         | -            |
| (22)                                     | 0,093                   | 0,290        | 0,31         | -            |
| 24                                       | 0,133                   | 0,412        | 0,43         | -            |
| (27)                                     | 0,194                   | 0,670        | -            | -            |
| 30                                       | 0,277                   | 0,680        | 0,72         | -            |
| 36                                       | 0,446                   | 0,960        | 0,92         | -            |
| 42                                       | 0,777                   | 1,610        | 1,48         | 1,66         |
| 48                                       | 1,197                   | 2,380        | 2,25         | 2,44         |
| (52)                                     | 1,420                   | 2,940        | 2,84         | 3,01         |
| 56                                       | 1,668                   | 3,374        | 2,95         | 3,29         |
| (60)                                     | 2,080                   | 3,929        | 4,15         | 4,67         |
| 64                                       | 2,310                   | 4,591        | 4,17         | 4,81         |
| (68)                                     | 2,740                   | 5,318        | -            | -            |
| 72                                       | 3,005                   | 8,166        | 7,41         | 8,11         |
| (76)                                     | 3,53                    | 8,741        | 7,38         | 7,88         |
| 80                                       | 4,02                    | 8,546        | 7,20         | 7,72         |
| 90                                       | 5,82                    | 12,551       | 11,60        | 12,92        |
| 100                                      | 8,09                    | 16,960       | 15,20        | 17,46        |
| 110                                      | 9,71                    | 22,359       | 20,39        | 22,96        |
| (120)                                    | 13,42                   | 27,503       | 25,69        | 28,46        |
| 125                                      | 15,42                   | 29,545       | -            | -            |
| 140                                      | 21,06                   | 44,147       | 40,11        | 45,11        |
| 160                                      | 29,66                   | 52,773       | 55,83        | 61,43        |
|                                          |                         |              |              |              |

Масса стальных шайб

| Номинальный диаметр резьбы<br>шпильки, мм | Теоретическая масса 1000 шт<br>шайб, кг | Теоретическая масса одной<br>шайбы, кг | Номинальный диаметр резьбы<br>шпильки, мм | Теоретическая масса 1000 шт<br>шайб, кг | Теоретическая масса одной<br>шайбы, кг |
|-------------------------------------------|-----------------------------------------|----------------------------------------|-------------------------------------------|-----------------------------------------|----------------------------------------|
| 10                                        | 4,20                                    | 0,004                                  | 60                                        | 508,57                                  | 0,509                                  |
| 12                                        | 6,27                                    | 0,006                                  | 64                                        | 546,35                                  | 0,546                                  |
| 16                                        | 9,41                                    | 0,009                                  | 68                                        | 585,20                                  | 0,585                                  |
| 20                                        | 22,87                                   | 0,023                                  | 72                                        | 640,64                                  | 0,640                                  |
| 22                                        | 24,44                                   | 0,024                                  | 76                                        | 838,25                                  | 0,838                                  |
| 24                                        | 32,30                                   | 0,032                                  | во                                        | 910,69                                  | 0,911                                  |
| 27                                        | 52,85                                   | 0,053                                  | 90                                        | 1177,18                                 | 1,177                                  |
| 30                                        | 66,99                                   | 0,067                                  | 100                                       | 1713,76                                 | 1,713                                  |
| 36                                        | 110,40                                  | 0,110                                  | 110                                       | 2031,47                                 | 2,031                                  |
| 42                                        | 156,52                                  | 0,157                                  | 120                                       | 2447,49                                 | 2,447                                  |
| 48                                        | 344,96                                  | 0,345                                  | 125                                       | 2595,48                                 | 2,595                                  |
| 52                                        | 376,31                                  | 0,376                                  | 140                                       | 3784,70                                 | 3,784                                  |
| 56                                        | 408,79                                  | 0,409                                  | 160                                       | 4921,30                                 | 4,921                                  |

