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**Prevailing torque type steel nuts —  
Mechanical and performance properties**

*Écrous autofreinés en acier — Caractéristiques mécaniques et performances*

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 2320 was prepared by Technical Committee ISO/TC 2, *Fasteners*, Subcommittee SC 1, *Mechanical properties of fasteners*.

This fourth edition cancels and replaces the third edition (ISO 2320:1997), which has been technically revised. It also incorporates the Technical Corrigendum ISO 2320:1997/Cor.1:2006.

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# Prevailing torque type steel nuts — Mechanical and performance properties

## 1 Scope

This International Standard specifies the mechanical and performance properties for prevailing torque type steel nuts when tested at an ambient temperature range of +10 °C to +35 °C. It includes a single test to determine the prevailing torque properties (performance properties) and/or the torque/clamp force properties.

This International Standard applies to prevailing torque all metal type nuts and prevailing torque non-metallic insert type nuts:

- a) with triangular ISO thread according to ISO 68-1;
- b) with diameter/pitch combination according to ISO 261 and ISO 262;
- c) with coarse pitch thread M3 to M39 and mechanical properties according to ISO 898-2;
- d) with fine pitch thread M8×1 to M39×3 and mechanical properties according to ISO 898-6;
- e) within the temperature range of –50 °C to +150 °C for prevailing torque all metal type nuts;

NOTE 1 See Clause 7, paragraph 3.

- f) within the temperature range of –50 °C to +120 °C for prevailing torque non-metallic insert type nuts.

NOTE 2 See Clause 7, paragraph 4.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 273:1979, *Fasteners — Clearance holes for bolts and screws*

ISO 898-1, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs*

ISO 898-2, *Mechanical properties of fasteners — Part 2: Nuts with specified proof load values — Coarse thread*

ISO 898-6, *Mechanical properties of fasteners — Part 6: Nuts with specified proof load values — Fine pitch thread*

ISO 965-2, *ISO general purpose metric screw threads — Tolerances — Part 2: Limits of sizes for general purpose external and internal screw threads — Medium quality*

ISO 16047, *Fasteners — Torque/clamp force testing*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 16047 and the following apply.

- 3.1 prevailing torque type nut**  
nut which is not free-running on a mating thread by virtue of a self-contained prevailing torque feature, and which provides a degree of resistance to rotation independent of clamping or compression forces
- 3.2 prevailing torque developed by the nut**  
torque necessary to rotate the nut on its mating externally threaded component and with no axial force in the mating component
- 3.3 prevailing-on torque**  
torque to rotate the nut on its mating externally threaded component with the torque measured while the nut is in motion and with no clamp force
- 3.4 prevailing-off torque**  
torque to rotate after backing off the nut until the removal of the clamp force in the externally threaded component in the following 360° rotation of the nut
- 3.5 prevailing torque all metal type nut**  
nut which has a one piece or a multiple piece metal construction, and derives its prevailing torque characteristics from a controlled distortion of the nut thread and/or body or from metallic insert(s)
- 3.6 prevailing torque non-metallic insert type nut**  
nut which has a multiple piece construction and derives its prevailing torque characteristics from insert(s) of non-metallic material located and retained in the nut
- 3.7 seating point**  
point in the tightening process where clamp force first appears

### 4 Symbols

For the purpose of this International Standard, the following symbols apply together with those defined in ISO 16047.

#### Symbol Designation

|          |   |
|----------|---|
| $d$      | nominal diameter  |
| $d_4$    | diameter of the hole of the fixture   |
| $F_P$    | proof load  |
| $F_{65}$ | lower load limit for the evaluation of the coefficient of total friction at 65 % of $F_P$ |
| $F_{75}$ | upper load limit for the evaluation of the coefficient of total friction at 75 % of $F_P$ |
| $F_{80}$ | test clamp force (shut-down force for the tightening process) at 80 % of $F_P$            |
| $P$      | pitch of the thread   |
| $T_{FV}$ | prevailing-on torque, in newton metres  |

|             |   |
|-------------|---|
| $T_{Fd}$    | prevailing-off torque, in newton metres   |
| $T_{65}$    | lower torque limit for the evaluation of the coefficient of total friction at $F_{65}$    |
| $T_{75}$    | upper torque limit for the evaluation of the coefficient of total friction at $F_{75}$    |
| $T_{80}$    | test torque corresponding to 80 % of the proof load, in newton metres (see Tables 1 to 8) |
| $\mu_{tot}$ | coefficient of total friction   |

## 5 Thread

Threads for prevailing torque type nuts shall be in accordance with ISO 965-2 except for the prevailing torque feature:

- for prevailing torque non-metallic insert type nuts, the GO gauge shall be suitable for free installation (by hand) until it is seated against the prevailing torque feature;
- for prevailing torque all metal type nuts, the GO gauge shall be suitable for free installation (by hand) to one pitch at least.

## 6 Lubrication

At the option of the manufacturer a lubricant may be applied to the manufacturing lot to fulfil the performance requirements.

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## 7 Mechanical properties of prevailing torque type nuts

The mechanical properties of prevailing torque type nuts shall conform to ISO 898-2 or ISO 898-6.

With regard to proof load, the test method specified in 9.2 shall apply.

For prevailing torque all metal type nuts, users should consult an experienced fastener materials expert for temperatures outside the range of  $-50\text{ °C}$  to  $+150\text{ °C}$  to determine appropriate choices for a given application.

For prevailing torque non-metallic insert type nuts, use at or near the temperature limits of  $-50\text{ °C}$  and  $+120\text{ °C}$  may reduce the prevailing torque capability and may require the use of an adequate non-metallic material. Users should consult an experienced fastener materials expert for temperatures outside the range of  $-50\text{ °C}$  to  $+120\text{ °C}$  to determine appropriate choices for a given application.

## 8 Performance requirements for prevailing torque properties

The prevailing-on torque shall not exceed the value specified for the applicable nut in Tables 1 to 8.

The prevailing-off torque shall exceed the value specified for the applicable nut in Tables 1 to 8.

For delivery inspection, the 1st installation/removal test applies, unless otherwise agreed.

For initial type testing and in case of dispute, a 5th removal test shall also be applied unless otherwise agreed.

Prevailing torque performance decreases as a function of the number of reuses; the consumer should take into consideration the consequences of the decreased performance before any reuse of the nut.

By request of the customer, a temperature resistance test for prevailing torque non-metallic insert type nuts as given in Annex A may be carried out.

Paragraphs 3 and 4 of Clause 7 also apply to performance requirements.

Table 1 — Test clamp force and prevailing torques for prevailing torque type nuts of property class 04

| Thread<br><i>d P</i> | Test clamp force<br>$F_{80}^a$<br>N | Clamp force for evaluation of total friction coefficient |                                | Prevailing torque                  |                               |                               |
|----------------------|-------------------------------------|--|--------------------------------|------------------------------------|-------------------------------|-------------------------------|
|                      |                                     | $\mu_{tot}^b$  |                                | N·m                                |                               |                               |
|                      |                                     | Upper limit<br>$F_{75}^c$<br>N                           | Lower limit<br>$F_{65}^d$<br>N | 1st installation<br>$T_{Fv,max}^e$ | 1st removal<br>$T_{Fd,min}^f$ | 5th removal<br>$T_{Fd,min}^f$ |
| M3                   | 1 528                               | 1 433  | 1 242                          | 0,43                               | 0,12                          | 0,08                          |
| M4                   | 2 672                               | 2 505  | 2 171                          | 0,9                                | 0,18                          | 0,12                          |
| M5                   | 4 320                               | 4 050  | 3 510                          | 1,6                                | 0,29                          | 0,2                           |
| M6                   | 6 112                               | 5 730  | 4 966                          | 3                                  | 0,45                          | 0,3                           |
| M7                   | 8 800                               | 8 250  | 7 150                          | 4,5                                | 0,65                          | 0,45                          |
| M8                   | 11 120                              | 10 425   | 9 035                          | 6                                  | 0,85                          | 0,6                           |
| M8×1                 | 11 920                              | 11 175   | 9 685                          |                                    |                               |                               |
| M10                  | 17 600                              | 16 500   | 14 300                         | 10,5                               | 1,5                           | 1                             |
| M10×1,25             | 18 640                              | 17 475   | 15 145                         |                                    |                               |                               |
| M10×1                | 19 600                              | 18 375   | 15 925                         |                                    |                               |                               |
| M12                  | 25 600                              | 24 000   | 20 800                         | 15,5                               | 2,3                           | 1,6                           |
| M12×1,5              | 26 800                              | 25 125   | 21 775                         |                                    |                               |                               |
| M12×1,25             | 28 000                              | 26 250   | 22 750                         |                                    |                               |                               |
| M14                  | 34 960                              | 32 775   | 28 405                         | 24                                 | 3,3                           | 2,3                           |
| M14×1,5              | 38 000                              | 35 625   | 30 875                         |                                    |                               |                               |
| M16                  | 47 760                              | 44 775   | 38 805                         | 32                                 | 4,5                           | 3                             |
| M16×1,5              | 50 800                              | 47 625   | 41 275                         |                                    |                               |                               |
| M18                  | 58 400                              | 54 750   | 47 450                         | 42                                 | 6                             | 4,2                           |
| M18×1,5              | 65 360                              | 61 275   | 53 105                         |                                    |                               |                               |
| M20                  | 74 480                              | 69 825   | 60 515                         | 54                                 | 7,5                           | 5,3                           |
| M20×1,5              | 82 720                              | 77 550   | 67 210                         |                                    |                               |                               |
| M22                  | 92 080                              | 86 325   | 74 815                         | 68                                 | 9,5                           | 6,5                           |
| M22×1,5              | 101 200                             | 94 875   | 82 225                         |                                    |                               |                               |
| M24                  | 107 280                             | 100 575  | 87 165                         | 80                                 | 11,5                          | 8                             |
| M24×2                | 116 720                             | 109 425  | 94 835                         |                                    |                               |                               |
| M27                  | 139 520                             | 130 800  | 113 360                        | 94                                 | 13,5                          | 10                            |
| M27×2                | 150 800                             | 141 375  | 122 525                        |                                    |                               |                               |
| M30                  | 170 560                             | 159 900  | 138 580                        | 108                                | 16                            | 12                            |
| M30×2                | 188 800                             | 177 000  | 153 400                        |                                    |                               |                               |
| M33                  | 210 960                             | 197 775  | 171 405                        | 122                                | 18                            | 14                            |
| M33×2                | 231 360                             | 216 900  | 187 980                        |                                    |                               |                               |
| M36                  | 248 400                             | 232 875  | 201 825                        | 136                                | 21                            | 16                            |
| M36×3                | 262 960                             | 246 525  | 213 655                        |                                    |                               |                               |
| M39                  | 296 720                             | 278 175  | 241 085                        | 150                                | 23                            | 18                            |
| M39×3                | 313 120                             | 293 550  | 254 410                        |                                    |                               |                               |

NOTE The evaluation of results from the prevailing torque test by statistical process control methods (SPC) has no statistical relevance.

<sup>a</sup> The clamp force for property class 04 nuts is equal to 80 % of the proof load of property class 04 nuts for 3 mm ≤ *d* ≤ 39 mm. Proof loads for nuts are given in ISO 898-2 and ISO 898-6.

<sup>b</sup> See Annex B.

<sup>c</sup> The value of the upper limit of the clamp force is equal to 75 % of the proof load, see Annex B.

<sup>d</sup> The value of the lower limit of the clamp force is equal to 65 % of the proof load, see Annex B.

<sup>e</sup> The prevailing torques for first assembly apply for all metal type nuts only. For prevailing torque non-metallic insert type nuts, the maximum torques shall be 50 % of the values.

<sup>f</sup> Values in this table are required for testing performed under laboratory acceptance test conditions. Utilization of this type of fastener is application dependent and performance for parts may vary in normal use. It is recommended that additional testing of complete joints, using production components, be performed when there are questions of product performance.



Table 2 — Test clamp force and prevailing torques for prevailing torque type nuts of property class 05

| Thread<br><i>d P</i> | Test clamp force<br>$F_{80}^a$<br>N | Clamp force for evaluation of total friction coefficient |                                | Prevailing torque<br>N·m           |                               |                               |
|----------------------|-------------------------------------|--|--------------------------------|------------------------------------|-------------------------------|-------------------------------|
|                      |                                     | $\mu_{tot}^b$  |                                | 1st installation<br>$T_{Fv,max}^e$ | 1st removal<br>$T_{Fd,min}^f$ | 5th removal<br>$T_{Fd,min}^f$ |
|                      |                                     | Upper limit<br>$F_{75}^c$<br>N                           | Lower limit<br>$F_{65}^d$<br>N |                                    |                               |                               |
| M3                   | 2 000                               | 1 875  | 1 625                          | 0,6                                | 0,15                          | 0,1                           |
| M4                   | 3 520                               | 3 300  | 2 860                          | 1,2                                | 0,22                          | 0,15                          |
| M5                   | 5 680                               | 5 325  | 4 615                          | 2,1                                | 0,35                          | 0,24                          |
| M6                   | 8 000                               | 7 500  | 6 500                          | 4                                  | 0,55                          | 0,4                           |
| M7                   | 11 600                              | 10 875   | 9 425                          | 6                                  | 0,85                          | 0,6                           |
| M8                   | 14 640                              | 13 725   | 11 895                         | 8                                  | 1,15                          | 0,8                           |
| M8×1                 | 15 680                              | 14 700   | 12 740                         |                                    |                               |                               |
| M10                  | 23 200                              | 21 750   | 18 850                         | 14                                 | 2                             | 1,4                           |
| M10×1,25             | 24 480                              | 22 950   | 19 890                         |                                    |                               |                               |
| M10×1                | 25 760                              | 24 150   | 20 930                         |                                    |                               |                               |
| M12                  | 33 760                              | 31 650   | 27 430                         | 21                                 | 3,1                           | 2,1                           |
| M12×1,5              | 35 200                              | 33 000   | 28 600                         |                                    |                               |                               |
| M12×1,25             | 36 800                              | 34 500   | 29 900                         |                                    |                               |                               |
| M14                  | 46 000                              | 43 125   | 37 375                         | 31                                 | 4,4                           | 3                             |
| M14×1,5              | 50 000                              | 46 875   | 40 625                         |                                    |                               |                               |
| M16                  | 62 800                              | 58 875   | 51 025                         | 42                                 | 6                             | 4,2                           |
| M16×1,5              | 66 800                              | 62 625   | 54 275                         |                                    |                               |                               |
| M18                  | 76 800                              | 72 000   | 62 400                         | 56                                 | 8                             | 5,5                           |
| M18×1,5              | 86 000                              | 80 625   | 69 875                         |                                    |                               |                               |
| M20                  | 98 000                              | 91 875   | 79 625                         | 72                                 | 10,5                          | 7                             |
| M20×1,5              | 108 800                             | 102 000  | 88 400                         |                                    |                               |                               |
| M22                  | 121 200                             | 113 625  | 98 475                         |                                    |                               |                               |
| M22×1,5              | 133 200                             | 124 875  | 108 225                        | 90                                 | 13                            | 9                             |
| M24                  | 141 200                             | 132 375  | 114 725                        |                                    |                               |                               |
| M24×2                | 153 600                             | 144 000  | 124 800                        | 106                                | 15                            | 10,5                          |
| M27                  | 183 600                             | 172 125  | 149 175                        |                                    |                               |                               |
| M27×2                | 198 400                             | 186 000  | 161 200                        | 123                                | 17                            | 12                            |
| M30                  | 224 400                             | 210 375  | 182 325                        |                                    |                               |                               |
| M30×2                | 248 400                             | 232 875  | 201 825                        | 140                                | 19                            | 14                            |
| M33                  | 277 600                             | 260 250  | 225 550                        |                                    |                               |                               |
| M33×2                | 304 400                             | 285 375  | 247 325                        | 160                                | 21,5                          | 15,5                          |
| M36                  | 326 800                             | 306 375  | 265 525                        |                                    |                               |                               |
| M36×3                | 346 000                             | 324 375  | 281 125                        | 180                                | 24                            | 17,5                          |
| M39                  | 390 400                             | 366 000  | 317 200                        |                                    |                               |                               |
| M39×3                | 412 000                             | 386 250  | 334 750                        | 200                                | 26,5                          | 19,5                          |

NOTE The evaluation of results from the prevailing torque test by statistical process control methods (SPC) has no statistical relevance.

<sup>a</sup> The clamp force for property class 05 nuts is equal to 80 % of the proof load of property class 05 nuts for 3 mm ≤ *d* ≤ 39 mm. Proof loads for nuts are given in ISO 898-2 and ISO 898-6.

<sup>b</sup> See Annex B.

<sup>c</sup> The value of the upper limit of the clamp force is equal to 75 % of the proof load, see Annex B.

<sup>d</sup> The value of the lower limit of the clamp force is equal to 65 % of the proof load, see Annex B.

<sup>e</sup> The prevailing torques for first assembly apply for all metal type nuts only. For prevailing torque non-metallic insert type nuts, the maximum torques shall be 50 % of the values.

<sup>f</sup> Values in this table are required for testing performed under laboratory acceptance test conditions. Utilization of this type of fastener is application dependent and performance for parts may vary in normal use. It is recommended that additional testing of complete joints, using production components, be performed when there are questions of product performance.

Table 3 — Test clamp force and prevailing torques for prevailing torque type nuts of property class 5

| Thread<br><i>d P</i> | Test clamp force<br>$F_{80}^a$<br>N | Clamp force for evaluation of total friction coefficient |                                | Prevailing torque<br>N·m           |                               |                               |
|----------------------|-------------------------------------|--|--------------------------------|------------------------------------|-------------------------------|-------------------------------|
|                      |                                     | $\mu_{tot}^b$  |                                | 1st installation<br>$T_{Fv,max}^e$ | 1st removal<br>$T_{Fd,min}^f$ | 5th removal<br>$T_{Fd,min}^f$ |
|                      |                                     | Upper limit<br>$F_{75}^c$<br>N                           | Lower limit<br>$F_{65}^d$<br>N |                                    |                               |                               |
| M3                   | 1 528                               | 1 433  | 1 242                          | 0,43                               | 0,12                          | 0,08                          |
| M4                   | 2 672                               | 2 505  | 2 171                          | 0,9                                | 0,18                          | 0,12                          |
| M5                   | 4 320                               | 4 050  | 3 510                          | 1,6                                | 0,29                          | 0,2                           |
| M6                   | 6 112                               | 5 730  | 4 966                          | 3                                  | 0,45                          | 0,3                           |
| M7                   | 8 800                               | 8 250  | 7 150                          | 4,5                                | 0,65                          | 0,45                          |
| M8                   | 11 120                              | 10 425   | 9 035                          | 6                                  | 0,85                          | 0,6                           |
| M8×1                 | 11 920                              | 11 175   | 9 685                          |                                    |                               |                               |
| M10                  | 17 600                              | 16 500   | 14 300                         | 10,5                               | 1,5                           | 1                             |
| M10×1,25             | 18 640                              | 17 475   | 15 145                         |                                    |                               |                               |
| M10×1                | 19 600                              | 18 375   | 15 925                         |                                    |                               |                               |
| M12                  | 25 600                              | 24 000   | 20 800                         | 15,5                               | 2,3                           | 1,6                           |
| M12×1,5              | 26 800                              | 25 125   | 21 775                         |                                    |                               |                               |
| M12×1,25             | 28 000                              | 26 250   | 22 750                         |                                    |                               |                               |
| M14                  | 34 960                              | 32 775   | 28 405                         | 24                                 | 3,3                           | 2,3                           |
| M14×1,5              | 38 000                              | 35 625   | 30 875                         |                                    |                               |                               |
| M16                  | 47 760                              | 44 775   | 38 805                         | 32                                 | 4,5                           | 3                             |
| M16×1,5              | 50 800                              | 47 625   | 41 275                         |                                    |                               |                               |
| M18                  | 58 400                              | 54 750   | 47 450                         | 42                                 | 6                             | 4,2                           |
| M18×1,5              | 65 680                              | 61 575   | 53 365                         |                                    |                               |                               |
| M20                  | 74 480                              | 69 825   | 60 515                         | 54                                 | 7,5                           | 5,3                           |
| M20×1,5              | 82 400                              | 77 250   | 66 950                         |                                    |                               |                               |
| M22                  | 92 000                              | 86 250   | 74 750                         |                                    |                               |                               |
| M22×1,5              | 100 800                             | 94 500   | 81 900                         | 68                                 | 9,5                           | 6,5                           |
| M24                  | 107 200                             | 100 500  | 87 100                         |                                    |                               |                               |
| M24×2                | 116 800                             | 109 500  | 94 900                         | 80                                 | 11,5                          | 8                             |
| M27                  | 113 600                             | 106 500  | 92 300                         |                                    |                               |                               |
| M27×2                | 123 200                             | 115 500  | 100 100                        |                                    |                               |                               |
| M30                  | 139 200                             | 130 500  | 113 100                        | 94                                 | 13,5                          | 10                            |
| M30×2                | 153 600                             | 144 000  | 124 800                        |                                    |                               |                               |
| M33                  | 172 000                             | 161 250  | 139 750                        | 108                                | 16                            | 12                            |
| M33×2                | 188 800                             | 177 000  | 153 400                        |                                    |                               |                               |
| M36                  | 202 400                             | 189 750  | 164 450                        |                                    |                               |                               |
| M36×3                | 214 400                             | 201 000  | 174 200                        | 136                                | 21                            | 16                            |
| M39                  | 242 400                             | 227 250  | 196 950                        |                                    |                               |                               |
| M39×3                | 255 200                             | 239 250  | 207 350                        | 150                                | 23                            | 18                            |

NOTE The evaluation of results from the prevailing torque test by statistical process control methods (SPC) has no statistical relevance.

a The clamp force for property class 5 nuts is equal to 80 % of the proof load of property class 5.8 bolts for  $3 \text{ mm} \leq d \leq 24 \text{ mm}$ , and 80 % of the proof load of property class 4.8 bolts for  $d > 24 \text{ mm}$ . Proof loads for bolts are given in ISO 898-1.

b See Annex B.

c The value of the upper limit of the clamp force is equal to 75 % of the proof load, see Annex B.

d The value of the lower limit of the clamp force is equal to 65 % of the proof load, see Annex B.

e The prevailing torques for first assembly apply for all metal type nuts only. For prevailing torque non-metallic insert type nuts, the maximum torques shall be 50 % of the values.

f Values in this table are required for testing performed under laboratory acceptance test conditions. Utilization of this type of fastener is application dependent and performance for parts may vary in normal use. It is recommended that additional testing of complete joints, using production components, be performed when there are questions of product performance.

Table 4 — Test clamp force and prevailing torques for prevailing torque type nuts of property class 6

| Thread<br><i>d P</i> | Test clamp force<br>$F_{80}^a$<br>N | Clamp force for evaluation<br>of total friction coefficient<br>$\mu_{tot}^b$ |                                | Prevailing torque<br>N·m           |                               |                               |
|----------------------|-------------------------------------|--|--------------------------------|------------------------------------|-------------------------------|-------------------------------|
|                      |                                     | Upper limit<br>$F_{75}^c$<br>N   | Lower limit<br>$F_{65}^d$<br>N | 1st installation<br>$T_{Fv,max}^e$ | 1st removal<br>$T_{Fd,min}^f$ | 5th removal<br>$T_{Fd,min}^f$ |
|                      |                                     |  |                                |                                    |                               |                               |
| M3                   | 1 768                               | 1 658  | 1 437                          | 0,43                               | 0,12                          | 0,08                          |
| M4                   | 3 088                               | 2 895  | 2 509                          | 0,9                                | 0,18                          | 0,12                          |
| M5                   | 5 000                               | 4 688  | 4 063                          | 1,6                                | 0,29                          | 0,2                           |
| M6                   | 7 072                               | 6 630  | 5 746                          | 3                                  | 0,45                          | 0,3                           |
| M7                   | 10 160                              | 9 525  | 8 255                          | 4,5                                | 0,65                          | 0,45                          |
| M8                   | 12 880                              | 12 075   | 10 465                         | 6                                  | 0,85                          | 0,6                           |
| M8×1                 | 13 760                              | 12 900   | 11 180                         |                                    |                               |                               |
| M10                  | 20 400                              | 19 125   | 16 575                         | 10,5                               | 1,5                           | 1                             |
| M10×1,25             | 21 520                              | 20 175   | 17 485                         |                                    |                               |                               |
| M10×1                | 22 720                              | 21 300   | 18 460                         |                                    |                               |                               |
| M12                  | 29 680                              | 27 825   | 24 115                         | 15,5                               | 2,3                           | 1,6                           |
| M12×1,5              | 31 040                              | 29 100   | 25 220                         |                                    |                               |                               |
| M12×1,25             | 32 400                              | 30 375   | 26 325                         |                                    |                               |                               |
| M14                  | 40 480                              | 37 950   | 32 890                         | 24                                 | 3,3                           | 2,3                           |
| M14×1,5              | 44 000                              | 41 250   | 35 750                         |                                    |                               |                               |
| M16                  | 55 280                              | 51 825   | 44 915                         | 32                                 | 4,5                           | 3                             |
| M16×1,5              | 58 800                              | 55 125   | 47 775                         |                                    |                               |                               |
| M18                  | 67 600                              | 63 375   | 54 925                         | 42                                 | 6                             | 4,2                           |
| M18×1,5              | 76 000                              | 71 250   | 61 750                         |                                    |                               |                               |
| M20                  | 86 400                              | 81 000   | 70 200                         | 54                                 | 7,5                           | 5,3                           |
| M20×1,5              | 96 000                              | 90 000   | 78 000                         |                                    |                               |                               |
| M22                  | 106 400                             | 99 750   | 86 450                         | 68                                 | 9,5                           | 6,5                           |
| M22×1,5              | 116 800                             | 109 500  | 94 900                         |                                    |                               |                               |
| M24                  | 124 000                             | 116 250  | 100 750                        | 80                                 | 11,5                          | 8                             |
| M24×2                | 135 200                             | 126 750  | 109 850                        |                                    |                               |                               |
| M27                  | 161 600                             | 151 500  | 131 300                        | 94                                 | 13,5                          | 10                            |
| M27×2                | 174 400                             | 163 500  | 141 700                        |                                    |                               |                               |
| M30                  | 197 600                             | 185 250  | 160 550                        | 108                                | 16                            | 12                            |
| M30×2                | 218 400                             | 204 750  | 177 450                        |                                    |                               |                               |
| M33                  | 244 000                             | 228 750  | 198 250                        | 122                                | 18                            | 14                            |
| M33×2                | 268 000                             | 251 250  | 217 750                        |                                    |                               |                               |
| M36                  | 287 200                             | 269 250  | 233 350                        | 136                                | 21                            | 16                            |
| M36×3                | 304 800                             | 285 750  | 247 650                        |                                    |                               |                               |
| M39                  | 343 200                             | 321 750  | 278 850                        | 150                                | 23                            | 18                            |
| M39×3                | 362 400                             | 339 750  | 294 450                        |                                    |                               |                               |

NOTE The evaluation of results from the prevailing torque test by statistical process control methods (SPC) has no statistical relevance.

a The clamp force for property class 6 nuts is equal to 80 % of the proof load of property class 6.8 bolts. Proof loads for bolts are given in ISO 898-1.

b See Annex B.

c The value of the upper limit of the clamp force is equal to 75 % of the proof load, see Annex B.

d The value of the lower limit of the clamp force is equal to 65 % of the proof load, see Annex B.

e The prevailing torques for first assembly apply for all metal type nuts only. For prevailing torque non-metallic insert type nuts, the maximum torques shall be 50 % of the values.

f Values in this table are required for testing performed under laboratory acceptance test conditions. Utilization of this type of fastener is application dependent and performance for parts may vary in normal use. It is recommended that additional testing of complete joints, using production components, be performed when there are questions of product performance.