

**Bolted connections  
made from hot-dip galvanized  
fittings M72x6  
in conformity with  
DASt - Directive 021**

|                                    |                            |           |
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## Scope of Application

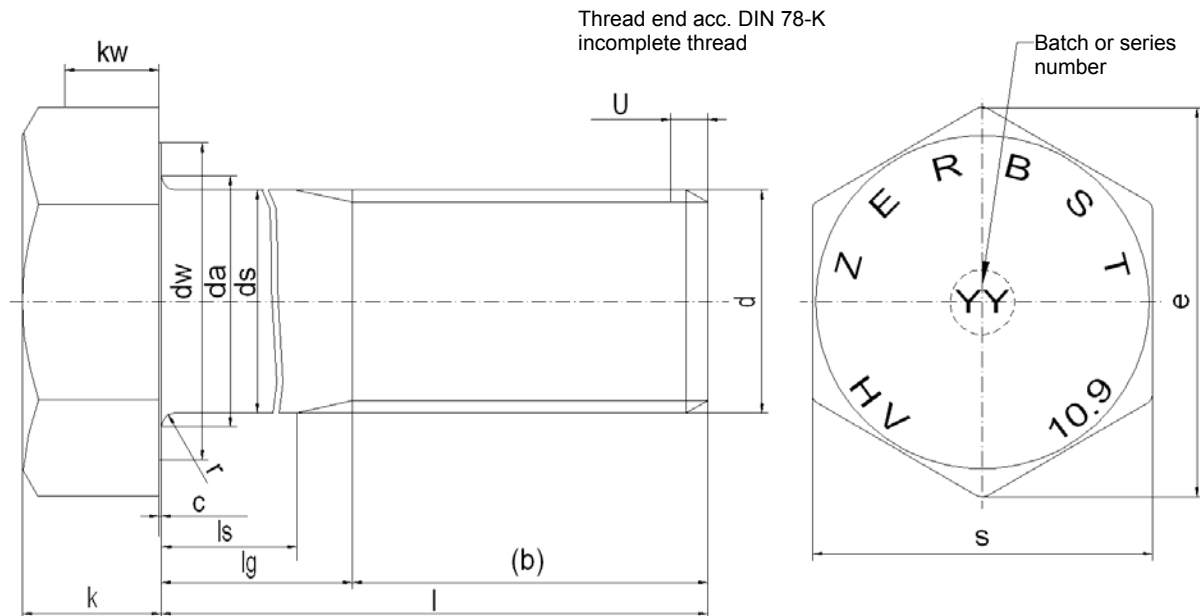
This works standard refers to the fastening system „HT-bolt fittings for steel construction“ as expansion of the DAST Directive 021 by the nominal size M72x6.

The application of the M72x6 HT-bolt fittings is in accordance with DIN 18800-1 and DIN 18800-7.

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## Geometry of the fastening elements

### Dimensions of the bolts <sup>1)</sup>



| d  | M72x6                 |        |
|--|-----------------------|--------|
| P <sup>2)</sup>                                    |                       | 6      |
| b  | (reference dimension) | 126    |
| c  | min.                  | 0.5    |
|  | max.                  | 1      |
| da   | max.                  | 82.2   |
| ds   | nom                   | 72     |
|  | min.                  | 70.8   |
|  | max.                  | 73.2   |
| dw <sup>3)</sup>                                   | min.                  | 102.41 |
| e  | min.                  | 121.8  |
| k  | nom.                  | 45     |
|  | min.                  | 43.75  |
|  | max.                  | 46.25  |
| kw   | min.                  | 30.63  |
| r  | min.                  | 4.5    |
| s  | max. = nom.           | 110    |
|  | min.                  | 107.8  |
| <sup>1)</sup> Dimensions in mm                     |                       |        |
| <sup>2)</sup> P = thread pitch (fine-pitch thread) |                       |        |
| <sup>3)</sup> $d_{wmax} = s_{actual}$              |                       |        |

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## Bolt Lengths

The lengths are graded in 20mm steps.

| M72x6 |        |        |      |      |
|-------|--------|--------|------|------|
| l     | l      | l      | ls   | lg   |
| nom.  | min.   | max.   | min. | max. |
| 180   | 178    | 182    | 36   | 54   |
| 200   | 197.7  | 202.3  | 56   | 74   |
| 220   | 217.7  | 222.3  | 76   | 94   |
| 240   | 237.7  | 242.3  | 96   | 114  |
| 260   | 257.4  | 262.6  | 116  | 134  |
| 280   | 277.4  | 282.6  | 136  | 154  |
| 300   | 297.4  | 302.6  | 156  | 174  |
| 320   | 317.15 | 322.85 | 176  | 194  |
| 340   | 337.15 | 342.85 | 196  | 214  |
| 360   | 357.15 | 362.85 | 216  | 234  |
| 380   | 377.15 | 382.85 | 236  | 254  |
| 400   | 397.15 | 402.85 | 256  | 274  |
| 420   | 416.85 | 423.15 | 276  | 294  |
| 440   | 436.85 | 443.15 | 296  | 314  |
| 460   | 456.85 | 463.15 | 316  | 334  |
| 480   | 476.85 | 483.15 | 336  | 354  |
| 500   | 496.85 | 503.15 | 356  | 374  |

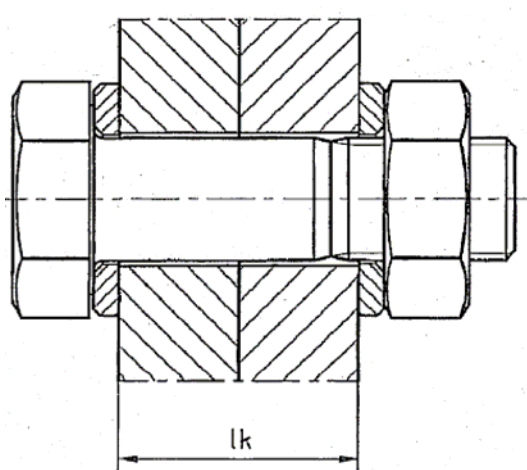
## Technical Delivery Conditions for Bolts

|  |  |                          |
|--|--|--------------------------|
| Material   | Steel  |                          |
| General Requirements                                 | DIN ISO 8992   |                          |
| Thread   | Tolerance  | 6g                       |
|  | Standard   | DIN ISO 261, DIN ISO 965 |
| Mechanical Properties                                | Strength Class                                       | 10.9                     |
|  | Standard   | DIN EN ISO 898-1         |
| Limit Dimensions,<br>Shape and Positional Tolerances | Product Class  | C <sup>1)</sup>          |
|  | Standard   | DIN EN ISO 4759-1        |
| Surface  | hot-dip galvanized acc.<br>DIN EN ISO 10684          |                          |
| Acceptance Inspection                                | DIN ISO 3269 applicable for<br>acceptance inspection |                          |

<sup>1)</sup> Exception tolerance for nominal length (=js17)

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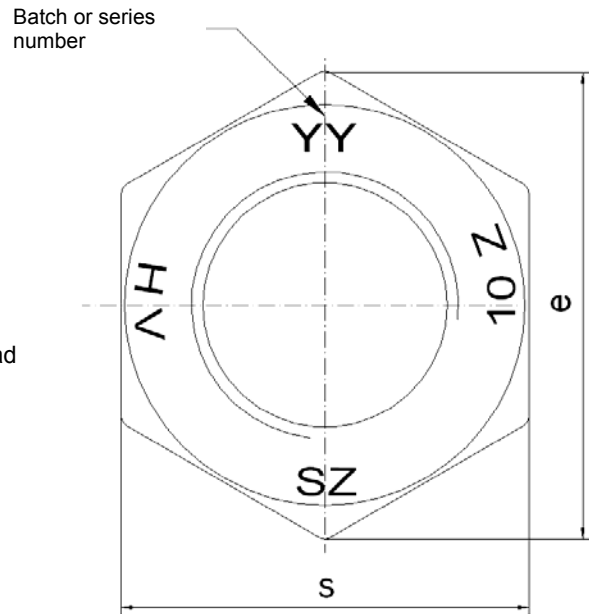
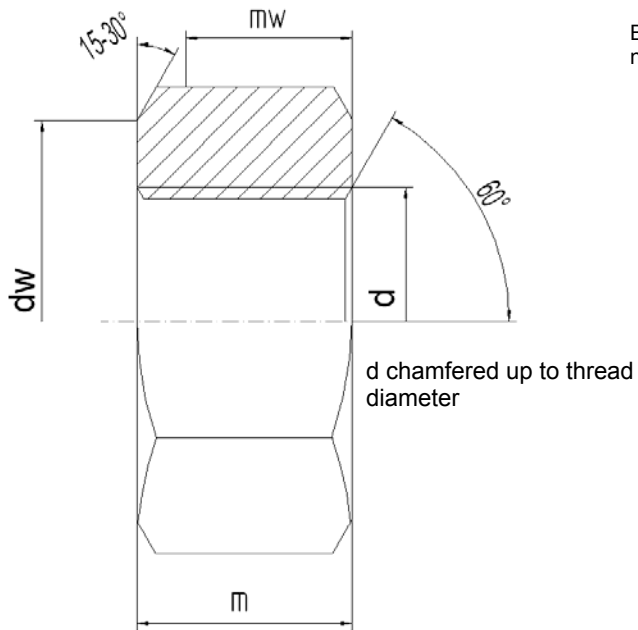
### Grip Length of Bolts



| M72x6 |      |      |
|-------|------|------|
| l     | lk   |      |
|       | min. | max. |
| 180   | 60   | 90   |
| 200   | 80   | 110  |
| 220   | 100  | 130  |
| 240   | 120  | 150  |
| 260   | 140  | 170  |
| 280   | 160  | 190  |
| 300   | 180  | 210  |
| 320   | 200  | 230  |
| 340   | 220  | 250  |
| 360   | 240  | 270  |
| 380   | 260  | 290  |
| 400   | 280  | 310  |
| 420   | 300  | 330  |
| 440   | 320  | 350  |
| 460   | 340  | 370  |
| 480   | 360  | 390  |
| 500   | 380  | 410  |

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Dimensions of the Nuts <sup>1)</sup>



|   |             |        |
|---|-------------|--------|
| d   | M72x6       |        |
| P <sup>2)</sup>   |             | 6      |
| d <sub>w</sub> <sup>3)</sup>  | min.        | 102.41 |
| e   | min.        | 121.8  |
| m   | max. = nom. | 58     |
|   | min.        | 56.1   |
| m <sub>w</sub>  |             | 44.88  |
| s   | max. = nom. | 110    |
|   | min.        | 107.8  |
| <sup>1)</sup> Dimensions in mm<br><sup>2)</sup> P = thread pitch (fine-pitch thread)<br><sup>3)</sup> d <sub>wmax</sub> = s <sub>actual</sub> |             |        |

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### Technical Delivery Conditions for Nuts

|  |                |  |
|--|----------------|--|
| Material   |                | Steel  |
| General Requirements                                 |                | DIN ISO 8992   |
| Thread   | Tolerance      | 6AZ <sup>1)</sup>                                    |
|  | Standard       | DIN ISO 261, DIN ISO 965                             |
| Mechanical Properties                                | Strength Class | 10   |
|  | Standard       | DIN EN ISO 898-6 <sup>2)</sup>                       |
| Limit Dimensions,<br>Shape and Positional Tolerances | Product Class  | B  |
|  | Standard       | DIN EN ISO 4759-1                                    |
| Surface  |                | hot-dip galvanized acc.<br>DIN EN ISO 10684          |
| Acceptance Inspection                                |                | DIN ISO 3269 applicable for<br>acceptance inspection |

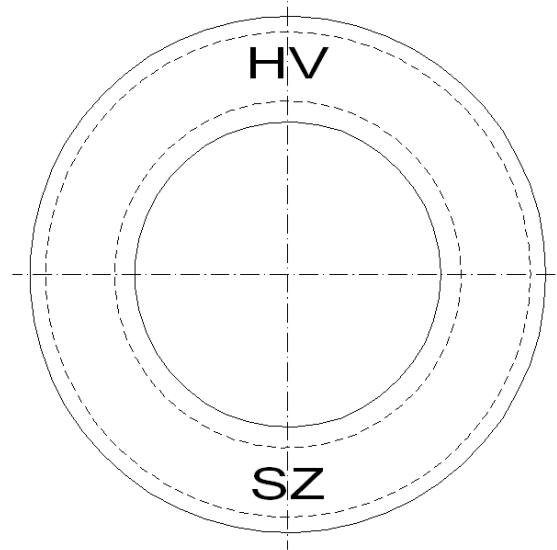
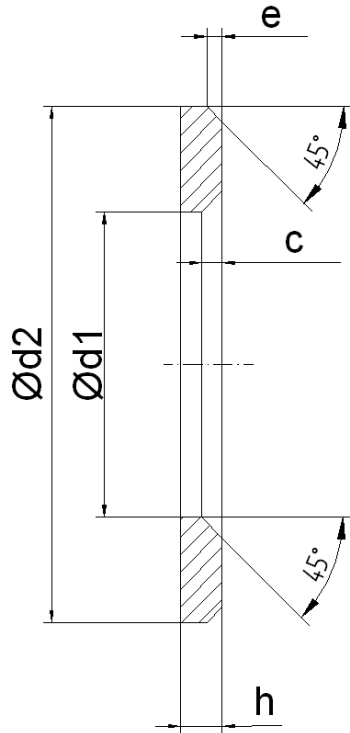
<sup>1)</sup> 6AZ modified: Outside Diameter D and Effective Diameter D<sub>2</sub>  
Core Diameter D<sub>1</sub>

6AZ  
6H

<sup>2)</sup> A test strain of Sp = 1090N/mm<sup>2</sup> is taken as a basis

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Dimensions of the Washers <sup>1)</sup>



| Nominal Size 72<br>for M72x6 |                      |                   |
|------------------------------|----------------------|-------------------|
| d <sub>1</sub>               | min. = nom.<br>max.  | 74<br>74.74       |
| d <sub>2</sub>               | min.<br>max. = nom.  | 123.4<br>125      |
| h                            | nom.<br>min.<br>max. | 10<br>8.8<br>11.2 |
| c                            | min. = nom.<br>max.  | 5<br>5.5          |
| e                            | min.<br>max.         | 2.5<br>5          |
| ) Dimensions in mm           |                      |                   |

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### Technical Delivery Conditions for Washers

|  |               |  |
|--|---------------|--|
| Mechanical Properties                                | Material      | Steel <sup>1)</sup> , heat-treated                   |
|  | Hardness      | 300-370HV  |
| Limit Dimensions,<br>Shape and Positional Tolerances | Product Class | A  |
|  | Standard      | DIN EN ISO 4759-3                                    |
| Surface  |               | hot-dip galvanized acc.<br>DIN EN ISO 10684          |
| Acceptance Inspection                                |               | DIN ISO 3269 applicable for<br>acceptance inspection |
| <sup>1)</sup> Acc. to choice of the manufacturer     |               |  |

### Values for Dimensioning and Planned Prestressing

The standard prestressing forces  $F_V$  according to DIN 18800-7:2008-11, Element (830).  
Applicable for the tightening according to the torque prestressing method are the tightening torques  $M_A$  for tightening by turning the nuts.

| M72x6   |        |
|---|--------|
| Shaft cross-section<br>$A_{sh}$ in mm <sup>2</sup>                      | 4071.5 |
| Stressed cross-section<br>$A_{sp}$ in mm <sup>2</sup>                   | 3463   |
| Force at the minimum 0.2% elongation limit<br>$F(R_{p0.2min})$<br>in kN | 3255   |
| Minimum breaking strength<br>$F(R_m \text{ min})$<br>in kN              | 3601   |
| Standard prestressing force<br>$F_V$ in kN                              | 2180   |
| Tightening torque<br>$M_A$ - hot-dip galvanized, nut lubricated in Nm   | 22000* |
| * Value is still to be verified in friction value trials                |        |

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## Change History

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|---------------|---------------------------|-----------|---------|
| -             | Creation                  | 5/27/2009 | Masurek |
| a             | Page 7 - Comment 1) added | 6/24/2009 | Masurek |
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