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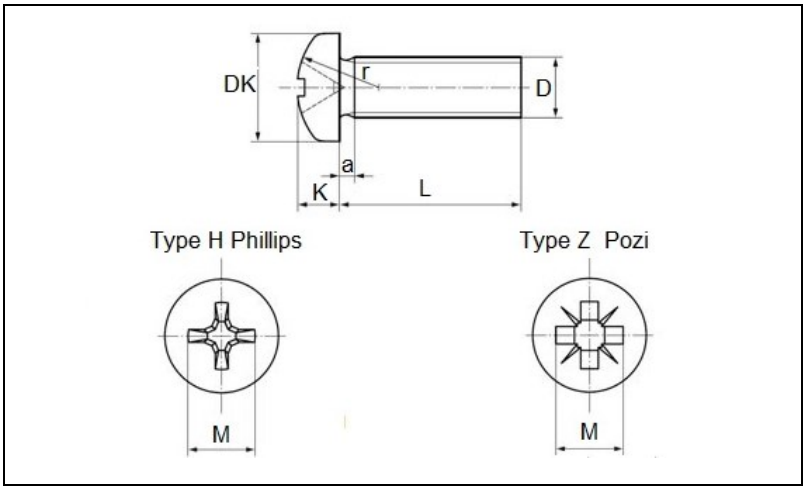
**Product Dimensions and Weights** **DIN 7985 / ISO 7045 Specifications**

# Metric DIN 7985 Cross Recessed (Phillips) Pan Head Machine Screws




| Thread D | | | M1.6 | M2 | M2.5 | M3 | (M3.5) | M4 | M5 | M6 | M8 | M10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **P** | | | 0.35 | 0.4 | 0.45 | 0.5 | 0.6 | 0.7 | 0.8 | 1 | 1.25 | 1.5 |
| **a** | | **max.** | 0.7 | 0.8 | 0.9 | 1 | 1.2 | 1.4 | 1.6 | 2 | 2.5 | 3 |
| **DK** | | **nominal max.** | 3.2 | 4 | 5 | 6 | 7 | 8 | 10 | 12 | 16 | 20 |
| | | **min.** | 2.9 | 3.7 | 4.7 | 5.7 | 6.64 | 7.64 | 9.64 | 11.57 | 15.57 | 19.48 |
| **K** | | **nominal** | 1.3 | 1.6 | 2 | 2.4 | 2.7 | 3.1 | 3.8 | 4.6 | 6 | 7.5 |
| | | **max.** | 1.42 | 1.72 | 2.12 | 2.52 | 2.82 | 3.25 | 3.95 | 4.75 | 6.15 | 7.68 |
| | | **min.** | 1.18 | 1.48 | 1.88 | 2.28 | 2.58 | 2.95 | 3.65 | 4.45 | 5.85 | 7.32 |
| **r** | | **min.** | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.25 | 0.4 | 0.4 |
| **rf** | | **approx.** | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 12 | 16 | 20 |
| **Cross Recess** | | **No.** | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 4 | 4 |
| **Type H** | **M** | **approx.** | 1.8 | 2.5 | 2.7 | 3.1 | 4.2 | 4.6 | 5.3 | 6.8 | 9 | 10.2 |
| | **penetration depth** | **min.** | 0.72 | 1.1 | 1.3 | 1.7 | 1.74 | 2.04 | 2.77 | 3.03 | 4.18 | 5.38 |
| | | **max.** | 1.02 | 1.4 | 1.6 | 2 | 2.24 | 2.54 | 3.27 | 3.53 | 4.68 | 5.88 |
| **Type Z** | **M** | **approx.** | 1.8 | 2.4 | 2.6 | 3 | 4 | 4.3 | 5 | 6.7 | 8.8 | 9.9 |
| | **penetration depth** | **min.** | 0.92 | 1.1 | 1.27 | 1.68 | 1.65 | 1.9 | 2.64 | 3.02 | 4.06 | 5.23 |
| | | **max.** | 1.17 | 1.35 | 1.52 | 1.93 | 2.11 | 2.36 | 3.1 | 3.48 | 4.52 | 5.69 |

All measurements are in mm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Metric DIN 7985 are cross recessed (Phillips) raised cheese head (Pan Head) machine screws. Machine screws are externally threaded fasteners designed to be mated with threaded nuts or tapped holes in the parts they are designed to hold together. DIN 7985 cross recessed (Phillips) raised cheese head (Pan Head) machine screws can be used for many applications. The pan head is cylindrical head with a slightly rounded top surface and a flat bearing surface underneath. This head style is ideal for most applications where a protruding head is acceptable These screws are available in steel as well as stainless steel A2 and A4. Aspen Fasteners offers over 500.000 unique fastener products from stock in inch and metric standard in a variety of materials and finishes. The following sizes of metric DIN 7985 cross recessed (Phillips) raised cheese head (Pan Head) machine screws are available for immediate shipping from stock: Diameters ranging from M1.6 to M10 up to 35mm long in steel and stainless steel A2 and A4. View parts by clicking on the following link: DIN 7985 cross recessed (Phillips) raised cheese head (Pan Head) machine screws

| Thread d | | | M1.6 | M2 | M2.5 | M3 | (M3.5) | M4 | M5 | M6 | M8 | M10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| L | | | Weight kg/1000pcs | | | | | | | | | |
| nominal | min. | max. | | | | | | | | | | |
| 2 | 1.8 | 2.2 | | | | | | | | | | |
| 3 | 2.8 | 3.2 | | | 0.34 | | | | | | | |
| 4 | 3.75 | 4.25 | | | 0.37 | 0.62 | | | | | | |
| 5 | 4.75 | 5.25 | | | 0.4 | 0.67 | 0.99 | 1.4 | | | | |
| 6 | 5.75 | 6.25 | | | 0.43 | 0.71 | 1.05 | 1.48 | 2.66 | | | |
| 8 | 7.7 | 8.3 | | | 0.49 | 0.8 | 1.17 | 1.63 | 2.91 | | | |
| 10 | 9.7 | 10.3 | | | 0.55 | 0.88 | 1.29 | 1.79 | 3.16 | 5.14 | 10.9 | |
| 12 | 11.65 | 12.35 | | | 0.61 | 0.95 | 1.42 | 1.94 | 3.41 | 5.49 | 11.5 | 21.2 |
| 14 | 13.65 | 14.35 | | | 0.67 | 1.03 | 1.54 | 2.1 | 3.66 | 5.84 | 12.2 | 22.2 |
| 16 | 15.65 | 16.35 | | | 0.73 | 1.11 | 1.67 | 2.25 | 3.91 | 6.29 | 12.8 | 23.2 |
| 18 | 17.65 | 18.35 | | | 0.79 | 1.19 | 1.8 | 2.41 | 4.16 | 6.64 | 13.5 | 24.2 |
| 20 | 19.6 | 20.4 | | | 0.85 | 1.27 | 1.92 | 2.56 | 4.41 | 7.00 | 14.2 | 25.2 |
| 22 | 21.6 | 22.4 | | | 0.91 | 1.35 | 2.05 | 2.72 | 4.66 | 7.35 | 14.8 | 26.2 |
| 25 | 24.6 | 25.4 | | | 1,00 | 1.47 | 2.25 | 2.94 | 5.03 | 7.87 | 15.8 | 27.7 |
| 28 | 27.6 | 28.4 | | | 1.09 | 1.59 | 2.5 | 3.24 | 5.4 | 8.4 | 16.8 | 29.2 |
| 30 | 29.6 | 30.4 | | | 1.18 | 1.71 | 2.63 | 3.44 | 5.7 | 8.75 | 17.5 | 30.2 |
| 35 | 34.5 | 35.5 | | | | | 3.4 | 3.94 | 6.5 | 9.6 | 19.1 | 32.7 |
| 40 | 39.5 | 40.5 | | | | | | 4.44 | 7.3 | 10.5 | 20.7 | 35.7 |
| 45 | 44.5 | 45.5 | | | | | | | 8 | 11.4 | 22.3 | 37.7 |
| 50 | 49.5 | 50.5 | | | | | | | 8.7 | 12.3 | 23.9 | 41.2 |
| 55 | 54 | 56 | | | | | | | | | 25.4 | 43.7 |
| 60 | 59 | 61 | | | | | | | | | 27 | 46.2 |

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DIN (**D**eutsches **I**nstitut für **N**ormung - German Institute for Standardization) standards are issued for a variety of components including industrial fasteners as metric DIN 464 raised knurled head thumb screws. The DIN standards remain common in Germany. Europe and globally even though the transition to ISO standards is taking place. DIN standards continue to be used for parts which do not have ISO equivalents or for which there is no need for standardization. The ISO equivalent for DIN 7985 cross recessed (Phillips) raised cheese head (Pan Head) machine screws is ISO 7045.

## 1) Mechanical properties of stainless steel for metric DIN 7985 cross recessed (Phillips) raised cheese head (Pan Head) machine screws

Stainless steels can be divided into three groups of steel - austenitic. ferritic and martensitic. Austenitic steel is by far the most common type (>90% of commercial fasteners). The steel groups and strength classes are designated by a four-digit sequence of letters and numbers (eg A2-70) as shown in the following table. DIN EN ISO 3506 governs screws and nuts made from stainless steel.

| Steel group | Steel grade | Strength class | Screws. Nuts and Bolts | | | |
|---|---|---|---|---|---|---|
| | | | Tensile strength $N/mm^2$ | Tensile strength PSI | Dia range | Nut Load $N/mm^2$ |
| Austenitic | A2 and A4 | 50 | 500 | 70.000 | <=M39 | 500 |
| | | 70 | 700 | 100.000 | <=M20 | 700 |
| | | 80 | 800 | 118.000 | <=M20 | 800 |

The tensile stress is calculated with reference to the tensile stress area (see DIN EN ISO 3506-1979). Nuts to be paired with same grade of stainless steel screws

| Steel group | Property Strength class | Made From | Characteristics |
|---|---|---|---|
| Austenitic | 50 | A1. A2 | Soft; cold worked. turned and soft pressed fasteners |
| | 70 | A2. A4 | Cold worked. normal strength formed fasteners |
| | 80 | A2. A4 | Extreme cold worked. high strength. special applications |

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**2) Chemical composition of stainless steel metric DIN 7985 cross recessed (Phillips) raised cheese head (Pan Head) machine screws**

| Grade | USA Grade | Material designation | Material no. | C % | Si ≤ % | Mn ≤ % | Cr % | Mo % | Ni % |
|---|---|---|---|---|---|---|---|---|---|
| **A 2** | **304** | X 5Cr Ni 1810 | 1.4301 | ≤ 0.07 | 1.0 | 2.0 | 17.5 to 19.5 | - | 8.0 to 10.5 |
| | | X 2 Cr Ni 1811 | 1.4306 | ≤ 0.03 | 1.0 | 2.0 | 18.0 to 20.0 | - | 10 to 12.0 |
| | | X 8 Cr Ni 19/10 | 1.4303 | ≤ 0.07 | 1.0 | 2.0 | 17.0 to 19.0 | - | 11.0 to 13.0 |
| **A 4** | **316** | X 5 Cr Ni Mo 1712 | 1.4401 | ≤ 0.07 | 1.0 | 2.0 | 16.5 to 18.5 | 2.0 to 2.5 | 10.0 to 13.0 |
| | | X 2 Cr Ni Mo 1712 | 1.4404 | ≤ 0.03 | 1.0 | 2.0 | 16.5 to 18.5 | 2.0 to 2.5 | 10 to 13 |

**3) Chemical composition of steel metric DIN 7985 cross recessed (Phillips) raised cheese head (Pan Head) machine screws**

| PROPERTY CLASS | MATERIAL AND TREATMENT | CHEMICAL COMPOSITION LIMITS % | | | | TEMPERING TEMP ºC MIN. |
|---|---|---|---|---|---|---|
| | | C | | P | S | |
| | | min. | max. | max. | max. | |
| 4.6. 4.8. 5.8. 6.8 | Low or medium carbon steel | - | 0.55 | 0.05 | 0.06 | - |
| 8.8 | Medium carbon steel quenched. tempered | 0.25 | 0.55 | 0.04 | 0.05 | 425 |
| 9.8 | Medium carbon steel quenched. tempered | 0.25 | 0.55 | 0.04 | 0.05 | 425 |
| 10.9 | Medium carbon steel additives e.g. boron. Mn. Cr or Alloy steel - quenched. tempered | 0.20 | 0.55 | 0.04 | 0.05 | 425 |
| 12.9 | Alloy steel - quenched. tempered | 0.20 | 0.50 | 0.035 | 0.035 | 380 |

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**4) Mechanical properties of steel for metric DIN 7985 cross recessed (Phillips) raised cheese head (Pan Head) machine screws**

| MECHANICAL PROPERTY | | PROPERTY CLASS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 8.8 | | | | |
| | | 4.8 | 5.6 | 5.8 | 6.8 | Up to M 16 | Over M 16 | 9.8 | 10.9 | 12.9 |
| Tensile Strength (Rm. N/mm²) | nom. | 400 | 500 | | 600 | 800 | | 900 | 1000 | 1200 |
| | min. | 420 | 500 | 520 | 600 | 800 | 830 | 900 | 1040 | 1220 |
| Vickers Hardness | min. | 130 | 155 | 160 | 190 | 250 | 255 | 290 | 320 | 385 |
| | max | 250 | | | | 320 | 336 | 360 | 380 | 435 |
| Brinell Hardness | min. | 124 | 147 | 152 | 181 | 319 | 242 | 266 | 295 | 353 |
| | max. | 238 | | | | 385 | 319 | 342 | 363 | 412 |
| Rockwell Hardness | min. HR | 71 | 79 | 82 | 89 | - | | | | |
| | HRC | - | - | - | - | 20 | 23 | 28 | 32 | 39 |
| | HR | 95 | | | 99 | - | | | | |
| | max. HRC | - | - | - | - | 32 | 34 | 37 | 39 | 44 |
| Yield Stress ReL. N/mm² | nom. | 320 | 300 | 400 | 480 | - | | | | |
| | min. | 340 | 300 | 420 | 480 | - | | | | |
| Stress at permanent set limit N/mm² | nom. | - | | | | 640 | | 720 | 900 | 1080 |
| | min. | - | | | | 640 | 660 | 720 | 940 | 1100 |

Disclaimer

Dimensional data and technical information for metric DIN 7985 cross recessed (Phillips) raised cheese head (Pan Head) machine screws was obtained from publicly available sources and not acquired through standards agencies. It has been completed and compiled for reference purposes only; where discrepancies are found they are subject to change without notice. Aspen Fasteners makes no warranties or representations regarding the accuracy and validity of the compiled information and data. Contact the relevant standards authorities for accurate and detailed information.