SCERAM
Advanced Ceramics

# PAN HEAD SCREWS DIMENSIONS (in mm)

**Our screws are available in two different materials:**
**high purity ALUMINA (99,7%) and ZIRCONIA OXIDE (Y2O3 PSZ)**

Alumina, or Aluminium Oxide (Al2O3), is one of the most widely used advanced ceramic in the industry. It is a good electric insulator, has a very good wear resistance, and is chemically inert and stable at high temperature (no degassing).
Alumina can resist to temperature up to 1600°C.
It should however not be used in case of high thermal shocks or big temperature gradient.

Zirconia Oxide is an advanced ceramic widely used in the industry, because of its superior mechanical strength, its good electrical resistance, its high coefficient of expansion (close to metal), and its low thermal conductivity.
ZrO2 can resist up to 1200°c, however its mechanical strength starts to weaken above 450°c.

10 rue des rosiéristes
ZAC des carrés du parc
69410 Champagne au Mont d'or

**T** +33 (0)4 78 30 83 64
**F** +33 (0)4 78 28 63 68
**E** contact@sceram.com

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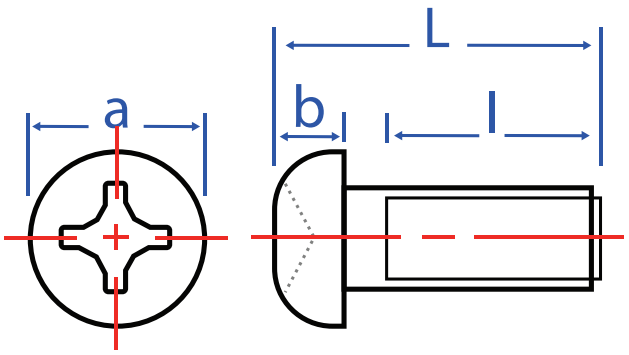
**ALUMINA (AL203 99,7%) AND ZIRCONIA (ZrO2)**

| Size | Pitch | a | L | l |
|---|---|---|---|---|
| M2 | 0,4 | 3,9 | 3 | 1,7 |
| | | | 5 | 3,7 |
| | | | 8 | 6,7 |
| | | | 10 | 8,7 |
| M3 | 0,5 | 5,3 | 5 | 3,7 |
| | | | 8 | 6,7 |
| | | | 10 | 8,7 |
| | | | 12 | 10,7 |
| | | | 16 | 14,7 |
| | | | 20 | 15 |
| M4 | 0,7 | 7,8 | 8 | 6,7 |
| | | | 10 | 8,7 |
| | | | 12 | 10,7 |
| | | | 16 | 14,7 |
| | | | 20 | 15 |
| | | | 25 | 15 |
| M5 | 0,8 | 9,3 | 8 | 6,7 |
| | | | 10 | 8,7 |
| | | | 12 | 10,7 |
| | | | 16 | 14,7 |
| | | | 20 | 15 |
| | | | 25 | 15 |
| | | | 30 | 15 |
| M6 | 1 | 11,8 | 8 | 6,7 |
| | | | 10 | 8,7 |
| | | | 12 | 10,7 |
| | | | 16 | 14,7 |
| | | | 20 | 15 |
| | | | 25 | 15 |
| | | | 30 | 15 |
| | | | 35 | 15 |
| | | | 40 | 15 |




**ALUMINA (AL203 99,7%) ONLY**

| Size | Pitch | a | L | l |
|---|---|---|---|---|
| M8 | 1,25 | 15,8 | 10 | 8,7 |
| | | | 12 | 10,7 |
| | | | 16 | 14,7 |
| | | | 20 | 15 |
| | | | 25 | 15 |
| | | | 30 | 15 |
| | | | 35 | 15 |
| | | | 40 | 15 |
| | | | 45 | 15 |
| M10 | 1,50 | 19,7 | 10 | 8,7 |
| | | | 12 | 10,7 |
| | | | 16 | 14,7 |
| | | | 20 | 15 |
| | | | 25 | 15 |
| | | | 30 | 15 |
| | | | 35 | 15 |
| | | | 40 | 15 |
| | | | 45 | 15 |

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| Material | Unit | Typical steel | Zirconia Oxide (yttria stabilized) | Alumina (99,7%) |
|---|---|---|---|---|
| Density | g/cc | 7,6 | 6 | 3,95 |
| Hardness | HV | 700 | 1200 | 1800 |
| Hardness | HRC | 62 | 70 | 80 |
| Young modulus | GPa | 208 | 210 | 380 |
| Thermal expansion | $10^{-6}K$ | 10 | 10,5 | 9,1 |
| Thermal conductivity | W/M/°K | 30-40 | 2 | 25 |
| Max use temprature | °C | 120 | 500 | 1850 |
| Poisson's ratio | | 0,3 | 0,3 | 0,27 |
| Flextural strength (800°c) | MPa | 2400 | 300 | 220 |
| Compressive strength | MPa | - | 2100 | 1500 |
| Electrical resistivity | Ohms.m | 0,1-1 | $10^{15}$ | $10^{8}$ |
| Toughness | MPam½ | 25 | 10 | 4,6 |
| Corrosion resistance | | Common | Excellent | Excellent |

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