

## TECAPEEK® ELS nano black - Stock Shapes (rods, plates, tubes)

### Chemical Designation

PEEK (Polyetheretherketone)

### Colour

black opaque

### Density

1.36 g/cm<sup>3</sup>

### Fillers

CNT

### Main features

- high dimensional stability
- high continuous use temperature
- high strength
- very good chemical resistance
- electrically conductive
- high thermal and mechanical capacity
- good machinability
- high toughness

### Target Industries

- aircraft and aerospace technology
- electronics
- mechanical engineering
- semiconductor technology
- computer technology

| Mechanical properties                 | condition                           | value                             | unit                          | test method          | comment  |
|---------------------------------------|-------------------------------------|-----------------------------------|-------------------------------|----------------------|--|
| Tensile strength                      | 2 in/min                            | 15400                             | psi                           | DIN EN ISO 527-2     | (1) For tensile test: specimen type 1b   |
| Modulus of elasticity (tensile test)  | 0.039 in/min                        | 696000                            | psi                           | DIN EN ISO 527-2     | 1) (2) For flexural test: support span 2.52", norm specimen.   |
| Tensile strength at yield             | 2 in/min                            | 15400                             | psi                           | DIN EN ISO 527-2     | (3) Specimen 0.39" x 0.39" x 0.39"   |
| Elongation at yield (tensile test)    | 2 in/min                            | 4                                 | %                             | DIN EN ISO 527-2     | (4) Specimen 0.39" x 0.39" x 0.39"   |
| Elongation at break (tensile test)    | 2 in/min                            | 4                                 | %                             | DIN EN ISO 527-2     | (5) Specimen 0.39" x 0.39" x 0.39"   |
| Flexural strength                     | 0.078 in/min, 2.25 lbf              | 25800                             | psi                           | DIN EN ISO 178       | 2) (6) Specimen 0.39" x 0.39" x 1.97", modulus range between 0.5 and 1% compression.   |
| Modulus of elasticity (flexural test) | 0.078 in/min, 2.25 lbf              | 682000                            | psi                           | DIN EN ISO 178       | (7) For Charpy test: support span 2.52", norm specimen.  |
| Compression strength                  | 5% strain<br>0.197 in/min, 2.25 lbf | 15400                             | psi                           | EN ISO 604           | 3) (8) Specimen in 0.157" thickness  |
| Compression strength                  | 2% strain<br>0.197 in/min, 2.25 lbf | 6820                              | psi                           | EN ISO 604           | 4)   |
| Compression strength                  | 1% strain<br>0.197 in/min, 2.25 lbf | 3920                              | psi                           | EN ISO 604           | 5)   |
| Compression modulus                   | 0.197 in/min, 2.25 lbf              | 522000                            | MPa                           | EN ISO 604           | 6)   |
| Impact strength (Charpy)              | ft-lbs/in <sup>2</sup>              | 27.6                              |                               | DIN EN ISO 179-1eU   | 7)   |
| Ball indentation hardness             |                                     | 36700                             | psi                           | ISO 2039-1           | 8)   |
| Thermal properties                    | condition                           | value                             | unit                          | test method          | comment  |
| Glass transition temperature          |                                     | 297                               | °F                            | DIN EN ISO 11357     | 1) (1) Found in public sources.  |
| Melting temperature                   |                                     | 646                               | °F                            | DIN EN ISO 11357     | (2) Found in public sources.   |
| Service temperature                   | short term                          | 572                               | °F                            | -                    | 2) Individual testing regarding application conditions is mandatory.   |
| Service temperature                   | long term                           | 500                               | °F                            | -                    |  |
| Thermal expansion (CLTE)              | 73 - 140°F, long.                   | 2.78                              | *10 <sup>-5</sup> in/in/°F    | DIN EN ISO 11359-1;2 |  |
| Thermal expansion (CLTE)              | 73 - 212°F, long.                   | 2.78                              | *10 <sup>-5</sup> in/in/°F    | DIN EN ISO 11359-1;2 |  |
| Thermal expansion (CLTE)              | 212 - 300°F, long.                  | 3.89                              | *10 <sup>-5</sup> in/in/°F    | DIN EN ISO 11359-1;2 |  |
| Specific heat                         |                                     | 0.00026                           | BTU/lb-F°                     | ISO 22007-4:2008     |  |
| Thermal conductivity                  |                                     | 3.19                              | BTU-in/hr-ft <sup>2</sup> -°F | ISO 22007-4:2008     |  |
| Electrical properties                 | condition                           | value                             | unit                          | test method          | comment  |
| surface resistivity                   | Conductive rubber, 73°F, 12% r.h.   | 10 <sup>2</sup> - 10 <sup>4</sup> | Ω                             | DIN EN 61340-2-3     | 1) (1) Specimen in 0.787" thickness  |
| volume resistivity                    | Conductive rubber, 73°F, 12% r.h.   | 10 <sup>3</sup> - 10 <sup>5</sup> | Ω*cm                          | DIN EN 61340-2-3     |  |
| Other properties                      | condition                           | value                             | unit                          | test method          | comment  |
| Water absorption                      | 24h / 96h (73°F)                    | 0.02 / 0.03                       | %                             | DIN EN ISO 62        | 1) (1) Ø ca. 1.57", h=0.512"   |
| Resistance to hot water/ bases        |                                     | +                                 | -                             |                      | 2) (2) + good resistance   |
| Resistance to weathering              |                                     | (+)                               | -                             |                      | 3) (3) (+) limited resistance  |
| Flammability (UL94)                   | corresponding to                    | V0                                |                               | DIN IEC 60695-11-10; | 4) (4) Corresponding means no listing at UL (yellow card). The information might be taken from resin, stock shape or estimation. Individual testing regarding application conditions is mandatory. |

→ TECAPEEK products are based on Victrex® PEEK polymer.

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