

**Typical physical properties of virgin and filled PTFE (Teflon).** The properties of PTFE products depend on the resin grade (conventional, chemically modified or filled), resin particle size and shape, filler type and content, and the manufacturing process (compression moulding, ram extrusion, isostatic moulding or paste extrusion). The values below are therefore given as typical ranges.

| Sr. | Property                                        | Unit                | Test method | Virgin PTFE | Chemically Modified PTFE | 25% Carbon Filled PTFE (23% carbon + 2% graphite) | 25% Glass Filled PTFE | 15% Glass + 5% MoS <sub>2</sub> Filled PTFE | 15% Graphite Filled PTFE | 40% Bronze / TSQ Filled PTFE | 40% Bronze + 5% MoS <sub>2</sub> Filled PTFE | 60% Bronze Filled PTFE |
|-----|-------------------------------------------------|---------------------|-------------|-------------|--------------------------|---------------------------------------------------|-----------------------|---------------------------------------------|--------------------------|------------------------------|----------------------------------------------|------------------------|
| 1   | Density                                         | g/cc                | ASTM D-792  | 2.1–2.2     | 2.15–2.2                 | 2.0–2.2                                           | 2.22–2.25             | 2.20–2.24                                   | 2.10–2.16                | 3.0–3.2                      | 3.0–3.2                                      | 3.8–4.0                |
| 2   | Tensile strength                                | kgf/cm <sup>2</sup> | ASTM D-638  | 210–375     | 300–325                  | 125–200                                           | 125–200               | 150–220                                     | 150–200                  | 125–225                      | 125–225                                      | 100–200                |
| 3   | Elongation at break                             | %                   | ASTM D-638  | 250–400     | 400–450                  | 80–150                                            | 200–300               | 220–320                                     | 150–250                  | 200–350                      | 200–350                                      | 150–300                |
| 4   | Compressive strength                            | kgf/cm <sup>2</sup> | ASTM D-695  | 40–50       | 45–55                    | 75–85                                             | 75–85                 | 65–75                                       | 65–75                    | 85–100                       | 80–95                                        | 115–125                |
| 5   | Deformation under load (max.)                   |                     |             |             |                          |                                                   |                       |                                             |                          |                              |                                              |                        |
| a   | 2 h, 23 °C, 113 kgf                             | %                   | ASTM D-621  | 12          | 3.5                      | 5                                                 | 9                     | 10                                          | 6                        | 5                            | 5                                            | 4                      |
| b   | 24 h, 23 °C, 113 kgf                            | %                   | ASTM D-621  | 15          | 5                        | 7                                                 | 11                    | 12                                          | 8                        | 6                            | 6                                            | 5                      |
| c   | Permanent                                       | %                   | ASTM D-621  | 8           | 2.5                      | 3.5                                               | 7                     | 7.5                                         | 4.5                      | 3                            | 3                                            | 2.5                    |
| d   | 2 h, 150 °C, 113 kgf                            | %                   | ASTM D-621  | 55          | 40                       | 35                                                | 50                    | 50                                          | 43                       | 42                           | 42                                           | 40                     |
| 6   | Impact strength                                 | J/cm                | ASTM D-256  | 1.4–1.5     | 1.6–1.75                 | 0.7–0.8                                           | 1.0–1.1               | 1.2–1.3                                     | 0.8–0.9                  | 0.9–1.0                      | 0.9–1.0                                      | 0.8–0.9                |
| 7   | Hardness                                        | Shore D             | ASTM D-2240 | 58–62       | 56–62                    | 60–65                                             | 58–63                 | 60–65                                       | 60–65                    | 62–66                        | 62–66                                        | 64–68                  |
| 8   | Coefficient of friction                         |                     | ASTM D-1894 |             |                          |                                                   |                       |                                             |                          |                              |                                              |                        |
| a   | Dynamic (P = 7 kg/cm <sup>2</sup> , V = 0.5)    |                     | ASTM D-1894 | 0.04–0.06   | 0.02–0.03                | 0.12–0.17                                         | 0.5–0.54              | 0.15–0.20                                   | 0.11–0.16                | 0.11–0.15                    | 0.10–0.14                                    | 0.12–0.16              |
| b   | Static (P = 35 kg/cm <sup>2</sup> )             |                     | ASTM D-1894 | 0.05–0.08   | 0.04–0.06                | 0.09–0.11                                         | 0.11–0.13             | 0.08–0.01                                   | 0.08–0.10                | 0.08–0.10                    | 0.075–0.09                                   | 0.08–0.10              |
| 9   | Wear rate (max.)                                | g/s                 | ASTM G-137  | 0.01        | 0.01                     | 0.01                                              | 0.01                  | 0.01                                        | 0.01                     | 0.01                         | 0.01                                         | 0.01                   |
| 10  | Water absorption (max.)                         | %                   | ASTM D-570  | 0           | 0                        | 0                                                 | 0.013                 | 0.015                                       | 0                        | 0                            | 0                                            | 0                      |
| 11  | Continuous service temperature                  | °C                  | ASTM D-648  | +260        | +260                     | +260                                              | +260                  | +260                                        | +260                     | +260                         | +260                                         | +260                   |
| 12  | Heat resistance (max.)                          | %                   | ASTM D-648  | 0.01        | 0.01                     | 0.01                                              | 0.01                  | 0.01                                        | 0.01                     | 0.01                         | 0.01                                         | 0.01                   |
| 13  | Linear thermal expansion (max.), axial / radial |                     |             |             |                          |                                                   |                       |                                             |                          |                              |                                              |                        |
| a   | 30–150 °C                                       | %                   | ASTM D-696  | 1.5 / 1.5   | 1.5 / 1.5                | 1.2 / 1.0                                         | 1.5 / 0.7             | 1.5 / 1.0                                   | 1.3 / 1.0                | 1.15 / 0.95                  | 1.15 / 0.95                                  | 1.1 / 0.9              |
| b   | 30–200 °C                                       | %                   | ASTM D-696  | 2.4 / 2.3   | 2.4 / 2.3                | 1.9 / 1.5                                         | 2.2 / 1.0             | 2.3 / 1.8                                   | 2.0 / 1.7                | 1.85 / 1.55                  | 1.85 / 1.55                                  | 1.8 / 1.5              |
| c   | 30–250 °C                                       | %                   | ASTM D-696  | 3.4 / 3.6   | 3.4 / 3.6                | 2.7 / 2.4                                         | 3.2 / 1.4             | 3.3 / 2.2                                   | 3.0 / 2.5                | 2.55 / 2.25                  | 2.55 / 2.25                                  | 2.5 / 2.2              |
| 14  | Dielectric strength                             | kV/mm               | ASTM D-149  | 22–24       | 30–35                    | 1–2                                               | 11–12                 | 15–16                                       | 1–2                      | Conductive                   | Conductive                                   | Conductive             |
| 15  | Dimensional stability                           |                     |             |             |                          |                                                   |                       |                                             |                          |                              |                                              |                        |
| a   | Length                                          | %                   | ASTM D-1710 | 1.5–3       | 1.5–3                    | 1.5–3                                             | 1.5–3                 | 1.5–3                                       | 1.5–3                    | 1.5–3                        | 1.5–3                                        | 1.5–3                  |
| b   | Diameter                                        | %                   | ASTM D-1710 | 0.5–1       | 0.5–1                    | 0.5–1                                             | 0.5–1                 | 0.5–1                                       | 0.5–1                    | 0.5–1                        | 0.5–1                                        | 0.5–1                  |
| 16  | Chemical resistance (max.)                      |                     |             |             |                          |                                                   |                       |                                             |                          |                              |                                              |                        |
| a   | Permeability                                    | %                   | ASTM D-543  | 0.01        | 0.01                     | 0.01                                              | 0.01                  | 0.01                                        | 0.01                     | 0.01                         | 0.01                                         | 0.01                   |
| b   | Dissolution                                     | %                   | ASTM D-543  | 0.01        | 0.01                     | 0.01                                              | 0.01                  | 0.01                                        | 0.01                     | 0.01                         | 0.01                                         | 0.01                   |

**16c. Chemical resistance:** PTFE is chemically inert and unaffected by almost all known chemicals, except molten or dissolved alkali metals (such as sodium and potassium), fluorine gas and certain fluorine compounds at elevated temperatures. Filled PTFE grades take on the chemical resistance limits of their filler (for example, glass is attacked by hydrofluoric acid and strong alkalis; bronze by acids and ammonia).

Data quoted are typical average values for guidance only and must not be used as design values. Properties of grades and compositions not listed here, and the exact values for a supplied batch, are given in the Material Test Certificate supplied with every order. Diode Trading EST supplies PTFE (Teflon) sheets, rods, tubes, gaskets, tapes and machined components across Saudi Arabia and the GCC.