

## PTFE Standard Compounds

| Property  | Test Method | Unit   | Virgin      | G Standard Compounds          |                               |                         |                               |                                    |                                       |
|---|-------------|--|-------------|-------------------------------|-------------------------------|-------------------------|-------------------------------|------------------------------------|---------------------------------------|
|   |             |  | G400        | G403<br>15%<br>Glass<br>Fiber | G405<br>25%<br>Glass<br>Fiber | G412<br>15%<br>Graphite | G415<br>25%<br>Soft<br>Carbon | G453<br>25%<br>Carbon/<br>Graphite | G458<br>60%<br>Bronze<br>2%<br>Carbon |
| <b>Molded</b>   |             |  |             |                               |                               |                         |                               |                                    |                                       |
| <b>Specific gravity</b>   | ASTM D792   | g/cm <sup>3</sup>  | 2.14 - 2.18 | 2.19 - 2.22                   | 2.20 - 2.26                   | 2.10 - 2.15             | 2.05 - 2.11                   | 2.05 - 2.11                        | 3.75 - 3.93                           |
| <b>Coefficient of linear thermal expansion 25-100°C</b>         | ASTM D696   | 10-5 (mm/mm)/°C  | 41609       | 11 -13                        | 7.5 - 11                      | 8 - 10                  | 9 - 12                        | 10 - 12                            | 7 - 8                                 |
| <b>Hardness Shore D</b>   | ASTM D2240  | Points   | ≥ 51        | ≥ 60                          | ≥ 70                          | ≥ 55                    | ≥ 60                          | ≥ 64                               | ≥ 62                                  |
| <b>Tensile Strength</b>   | ISO 527     | N/mm <sup>2</sup>  | ≥ 24        | ≥ 17                          | ≥ 17                          | ≥ 18                    | ≥ 15                          | ≥ 14                               | ≥ 15                                  |
| <b>Elongation at break</b>                                      | ISO 527     | %  | ≥ 250       | ≥ 250                         | ≥ 230                         | ≥ 200                   | ≥ 150                         | ≥ 90                               | ≥ 100                                 |
| <b>Compressive strength at 1% deformation</b>                   | ASTM D695   | N/mm <sup>2</sup>  | 4 - 5       | 6 - 7                         | 8 - 9                         | 6.5 - 7.5               | 7 - 9                         | 7 - 9                              | 10 - 11                               |
| <b>Deformation under load (24 h 13.7 N/mm<sup>2</sup> 23°C)</b> | ASTM D621   | %  | ≥ 17        | ≥ 14                          | ≥ 10                          | ≥ 10                    | ≥ 6.5                         | ≥ 7                                | ≥ 6                                   |
| <b>Permanent deformation (as above after 24 h relaxation)</b>   | ASTM D621   | %  | ≥ 9         | ≥ 7                           | ≥ 6.5                         | ≥ 6                     | ≥ 4                           | ≥ 5                                | ≥ 2.5                                 |
| <b>Kinetic coefficient of friction</b>                          | ASTM D1894  | /  | 0.03        | 0.12                          | 0.13                          | 0.07                    | 0.13                          | 0.11                               | 0.13                                  |
| <b>Wear factor at PV 100</b>                                    | ASTM D3702  | $\frac{\text{cm}^3 \cdot \text{min} \cdot 10^{-9}}{\text{Kg} \cdot \text{m} \cdot \text{h}}$ | 2.900       | 10 - 20                       | 10 - 15                       | 60                      | 20 - 30                       | 16 - 20                            | 10                                    |
| <b>Extruded</b>   |             |  |             |                               |                               |                         |                               |                                    |                                       |
| <b>Specific Gravity</b>   | ASTM D792   | g/cm <sup>3</sup>  | 2.14 - 2.18 | 2.18 - 2.21                   | 2.18 - 2.26                   | 2.09 - 2.14             | 2.04 - 2.10                   | 2.04 - 2.10                        | 3.80 - 3.88                           |
| <b>Hardness Shore D</b>   | ASTM D2240  | Points   | ≥ 40        | ≥ 60                          | ≥ 60                          | ≥ 55                    | ≥ 60                          | ≥ 64                               | ≥ 65                                  |
| <b>Tensile Strength</b>   | ISO 527     | N/mm <sup>2</sup>  | ≥ 20        | ≥ 15                          | ≥ 13                          | ≥ 14                    | ≥ 15                          | ≥ 12                               | ≥ 13                                  |
| <b>Elongation at break</b>                                      | ISO 527     | %  | ≥ 200       | ≥ 200                         | ≥ 180                         | ≥ 150                   | ≥ 50                          | ≥ 50                               | ≥ 80                                  |

### PROPERTIES FOR DESIGNING

Fillers blended with PTFE allow to improve some basic physical properties of virgin polymers.

The advantages are the following:

- enhanced compressive strength
- enhanced thermal conductivity
- reduced thermal expansion
- reduced wear factor

### MECHANICAL PROPERTIES

When talking about the material mechanical properties, tensile strength and elongation at break are usually the topics before others. However, these two properties, though the most common ones, do not always carefully reflect the behavior of the material itself in some applications, while compressive properties are actually the most important ones. We'd highlight compressive strength at a set deformation, deformation under constant load and permanent deformation at a set temperature.

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