

# Fabrica Materials



NANODIMENSION

## Contact Us

[sales@nano-di.com](mailto:sales@nano-di.com)

[www.nano-di.com](http://www.nano-di.com)

November 2024





# Materials

Enable manufacturers to get true plastic and composite material properties with the highest precision in the market.

The wide range of materials displays a variety of mechanical properties, varying degrees of thermal resistance and specialized properties such as transparency and biocompatibility. Each material series brings unique advantages, giving you the flexibility to select the material best suited for your micro-manufacturing needs.



NANODIMENSION

-  **PERFORMANCE**  
for high thermal resistance
-  **DURABLE**  
for serial production of demanding applications
-  **TRANSPARENT**  
for translucent applications
-  **MEDICAL**  
for applications that require bio-compatibility

# Materials Data Sheet

| BASED ON STANDARD                                     |                                 | PERFORMANCE |                 | DURABLE         |       | TRANSPARENT     | MEDICAL         |
|---|---------------------------------|-------------|-----------------|-----------------|-------|-----------------|-----------------|
|   |                                 | P-900       | P-910           | D-810           | D-820 | T-700           | M-810           |
| Tensile strength (Mpa)                                | ASTM D-1708                     | 60          | 70              | 50              | 21    | 38              | 50              |
| Young's modulus (MPa)                                 |                                 | 660         | 635             | 550             | 321   | 460             | 550             |
| Elongation at break (%)                               |                                 | 11          | 15              | 11              | 7.5   | 12              | 11              |
| Flexural strength (MPa)                               | ASTM D-790                      | 98          | 110             | 80              | 31.4  | 73              | 80              |
| Flexural modulus (MPa)                                |                                 | 2000        | 2600            | 1600            | 512   | 1350            | 1600            |
| Flexural max strain (%)                               |                                 | 7.6         | 5.0             | 6               | 12    | 6.5             | 6               |
| Shore hardness  | Scale D<br>ASTM D 2240          | 90          | 89              | 88              | 76    | 84              | 88              |
| Tg (°C)   | DMA<br>ASTM D 7028              | 140         | 184             | 120             | 55    | 100             | 120             |
| CTE (ppm/K)<br>150°C-220°C                            | TMA                             |             | 133             |                 |       |                 |                 |
| Df (100GHz)<br>before/after<br>48h water<br>immersion | ASTM D150<br>ASTM<br>D 570 – 98 | 0.017       | 0.012/<br>0.012 | 0.017/<br>0.017 |       | 0.029/<br>0.023 | 0.017/<br>0.017 |
| Dk (100GHz)<br>before/after<br>48h water<br>immersion |                                 | 2.14        | 2.96/<br>2.97   | 2.85/<br>2.86   |       | 2.92/<br>2.91   | 2.85/<br>2.86   |
| Density of liquid resin (gr/cm <sup>3</sup> )         | ASTM D1475                      | 1.17        | 1.14            | 1.08            | 1.08  | 1.09            | 1.08            |
| Density (g/cm <sup>3</sup> )                          | ASTM D792                       | 1.27        | 1.24            | 1.15            | 1.19  | 1.15            | 1.15            |
| Refractive index<br>448nm-1550nm                      |                                 |             |                 |                 |       | 1.51-1.52       |                 |
| ISO-10993   |                                 |             |                 |                 |       | Non cytotoxic   | Non cytotoxic   |

This data represents typical tested values at a controlled environment. Material properties may vary with part geometry, print orientation, print settings, environmental conditions and additional variables. To learn more about specific testing conditions, please contact a Nano Dimension representative. Specific performance of customer parts should be tested in accordance with customer's specifications. The above detailed data should not be used to establish design, quality control, or specification limits, and is not intended to substitute customer's own testing to determine suitability for a particular application.

# Performance

The **Performance series** is designed to withstand high temperatures, perfect for miniaturized parts in high performance applications such as electronics or injection molding.

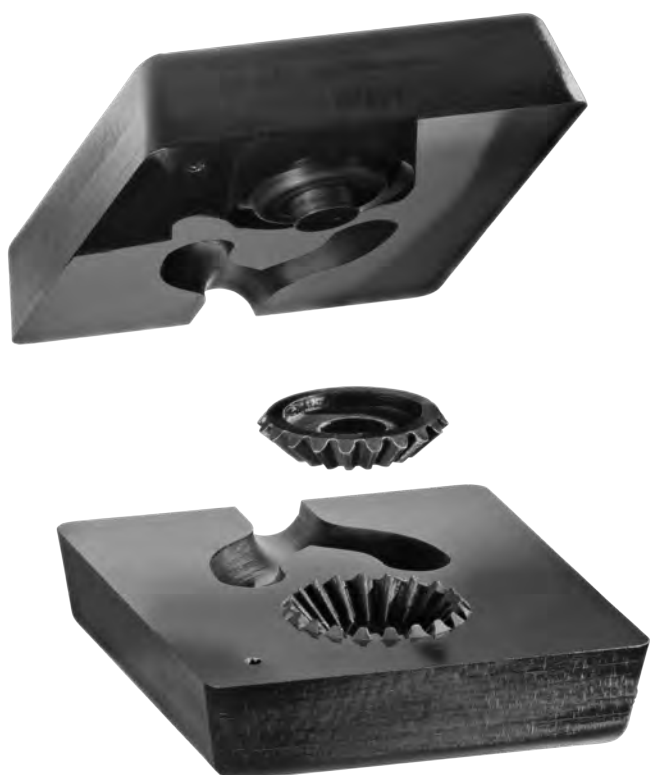
**P-900** is a high-resolution, composite ceramic loaded, material with upgraded mechanical properties that offers high-wear resistance for demanding applications.



## P-900

|                              |       |
|------------------------------|-------|
| Tensile strength (MPa)       | 60    |
| Young's modulus (MPa)        | 660   |
| Elongation at break (%)      | 11    |
| Flexural strength (MPa)      | 98    |
| Flexural modulus (MPa)       | 2000  |
| Flexural max strain (%)      | 7.6   |
| Shore hardness (scale D)     | 90    |
| Tg (°C)                      | 140   |
| Df (@10Ghz)                  | 0.017 |
| Dk (@10Ghz)                  | 2.14  |
| Density (g/cm <sup>3</sup> ) | 1.27  |

# Performance



**P-910** has an increased glass transition temperature of over 180°C and a heat deflection temperature of over 200°C, for extreme thermal performance. Ideal for prototyping and manufacturing precision parts that require high heat resistance, such as injection molding.

NANODIMENSION



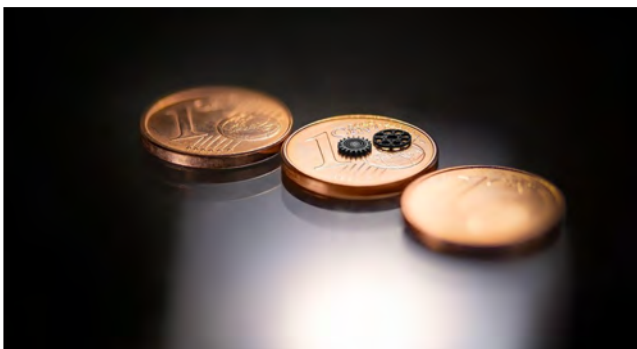
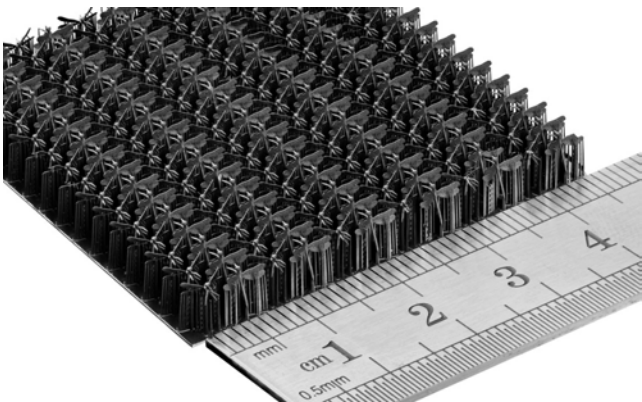
## P-910

|   |             |
|---|-------------|
| Tensile strength (MPa)                      | 70          |
| Young's modulus (MPa)                       | 635         |
| Elongation at break (%)                     | 15          |
| Flexural strength (MPa)                     | 110         |
| Flexural modulus (MPa)                      | 2600        |
| Flexural max strain (%)                     | 5           |
| Shore hardness (scale D)                    | 89          |
| Tg (°C)                                     | 184         |
| CTE (ppm/K) 150°C - 220°C                   | 133         |
| Df (10GHz) before/after 48h water immersion | 0.012/0.012 |
| Dk (10GHz) before/after 48h water immersion | 2.96/2.97   |
| Density of cured bulk (g/cm <sup>3</sup> )  | 1.24        |

# Durable

The **Durable series** of materials boasts versatile mechanical properties offering both rigid and semi-rigid options for demanding applications. These materials are ideal for serial production, such as consumer smart devices.

The **D-810** is a durable, versatile ABS-like material that enables high structural integrity with high-yield and cost-efficiency.



## D-810

|   |             |
|---|-------------|
| Tensile strength (MPa)                      | 50          |
| Young's modulus (MPa)                       | 550         |
| Elongation at break (%)                     | 11          |
| Flexural strength (MPa)                     | 80          |
| Flexural modulus (MPa)                      | 1600        |
| Flexural max strain (%)                     | 6.0         |
| Shore hardness (scale D)                    | 88          |
| Tg (°C)                                     | 120         |
| Df (10GHz) before/after 48h water immersion | 0.017/0.017 |
| Dk (10GHz) before/after 48h water immersion | 2.85/2.86   |
| Density (g/cm <sup>3</sup> )                | 1.15        |

# Durable



**D-820** is a PVC-like material. Components produced with this material have a high endurance over repeated use where flexibility is required, for example, in complex assemblies or parts that cannot be produced by a mold.



## D-820

|  |      |
|--|------|
| Tensile strength (MPa)                     | 21   |
| Young's modulus (MPa)                      | 321  |
| Elongation at break (%)                    | 7.5  |
| Flexural strength (MPa)                    | 31.4 |
| Flexural modulus (MPa)                     | 512  |
| Flexural max strain (%)                    | 12   |
| Shore hardness (scale D)                   | 76   |
| Tg (°C)                                    | 55   |
| Density of cured bulk (g/cm <sup>3</sup> ) | 1.19 |

# Transparent

The **Transparent series** are PMMA-like (polymethyl methacrylate) materials that are perfectly suited for production of parts that require varying levels of translucency such as optical elements, microfluidic chips and medical devices.

The **T-700** is a durable, non-cytotoxic rigid material that enables high structural integrity with high accuracy.



## T-700

|   |               |
|---|---------------|
| Tensile strength (MPa)                      | 38            |
| Young's modulus (MPa)                       | 460           |
| Elongation at break (%)                     | 12            |
| Flexural strength (MPa)                     | 73            |
| Flexural modulus (MPa)                      | 1350          |
| Flexural max strain (%)                     | 6.5           |
| Shore hardness (scale D)                    | 84            |
| Tg (°C)                                     | 100           |
| Df (10GHz) before/after 48h water immersion | 0.029/0.023   |
| Dk (10GHz) before/after 48h water immersion | 2.92/2.91     |
| Density (g/cm <sup>3</sup> )                | 1.15          |
| ISO-10993                                   | Non-Cytotoxic |



# Medical

The **Medical series** of materials have been specifically designed for use in applications that require bio-compatibility.

The **M-810** is a non-cytotoxic material according to **ISO-10993 (GLP Level)**

This material is suitable for tiny and precise medical device components such as cannula, medical diagnostics, imaging and manifolds.



## M-810

|   |               |
|---|---------------|
| Tensile strength (MPa)                      | 50            |
| Young's modulus (MPa)                       | 550           |
| Elongation at break (%)                     | 11            |
| Flexural strength (MPa)                     | 80            |
| Flexural modulus (MPa)                      | 1600          |
| Flexural max strain (%)                     | 6.0           |
| Shore hardness (scale D)                    | 88            |
| Tg (°C)                                     | 120           |
| Df (10GHz) before/after 48h water immersion | 0.017/0.017   |
| Dk (10GHz) before/after 48h water immersion | 2.85/2.86     |
| Density (g/cm <sup>3</sup> )                | 1.15          |
| ISO-10993                                   | Non-Cytotoxic |

# Anything's possible if you've got a FABRICA!

Precision parts are a huge deal across multiple industries.

The Fabrica micro-manufacturing hub is designed to free innovation from the constraints of traditional manufacturing.

With its incredibly high resolution and repeatable micro-level accuracy and precision, Fabrica transforms micro-additive manufacturing and empowers you to unleash innovation.

In addition to our Fabrica precision materials, the Fabrica systems allow the the printing of a wide range of external resins.

Please follow the guidance table to help ensure superior print results and to prevent damage to the system. Be sure to refer to the safety and technical data sheets of the material supplier to ensure compatibility and compliance.



| Parameter   | Value  |
|---|--|
| Wavelength (nm)                                   | 385  |
| Viscosity at printing temperature (cP)            | 50 - 300   |
| Temperature<br>TERA<br>GIGA                       | Room Temperature – 40C<br>Room Temperature   |
| Chemical compatibility<br>(resin – printer parts) | Ensure the material compatibility with : <ul style="list-style-type: none"> <li>• Aluminum</li> <li>• Aluminum coated with black (hard) anodize</li> <li>• FEP</li> <li>• Stainless steel</li> <li>• Steel</li> <li>• Wet painted Aluminum</li> <li>• Polycarbonate</li> </ul> |
| Safety  | Refer to resin safety data sheet for safety and handling guidelines  |





NANODIMENSION



## Contact Us

[sales@nano-di.com](mailto:sales@nano-di.com)

[www.nano-di.com](http://www.nano-di.com)

November 2024