



PTFE Laser Branded  
Go on [www.b-u-g.de](http://www.b-u-g.de)



**Beichler +  
Grünenwald**  
Plastics technology

# PTFE coatings...

*... with unrivaled properties*



**Intelligent plastics solutions  
for unmistakable results**

## High-tech plastics solutions – if the customer wants something, we make it possible!



**Beichler + Grünwald** designs, develops and produces innovative plastics solutions in the material PTFE.

We are a medium-sized family business boasting extensive expertise and decades of experience in the production of customer-oriented semi-finished products, extrudates, coatings and special shapes for a wide range of industrial sectors and application fields.

An in-house design office combined with a superbly equipped production center with a high-end machine park allow us to produce large or small series of technically challenging finished parts based on a drawing or sample. Our committed team of experienced employees supports our customers with technical expertise and a high level of service.

We are always willing to take unconventional routes and to accept new challenges. By combining the unbeatable properties of PTFE with other materials and substances to form new high-performance products, for example.

We are happy to be guided by the challenging specifications of our customers in this respect. Our motivated and rigorous team develops chemical formulations, designs customized tools and employs a wide range of technologies to produce the required results.



Our goal is to exploit the huge versatility of PTFE and to derive benefit from this material.

Innovative spirit, creativity and the ability to implement ideas are always governed by the objective of creating a profitable and customer-oriented solution.

### One material – countless possibilities: PTFE

With properties like

- Universal chemical resistance
- Continuous use from -200°C to +260°C
- Lowest friction coefficient of all solids
- Absolute anti-adhesion
- Very good electrical insulation properties

PTFE offers an almost limitless scope of application. The material is used in the food industry, in the pharmaceutical sector and medical technology, in the construction industry and the mechanical engineering sector, in the automotive industry and aircraft manufacturing, as well as in electrical engineering and electronics. And this list is by no means exhaustive.

PTFE is not used exclusively in its pure, white natural color. Special properties – such as high resistance to wear – are achieved through the addition of various additives in a range of different processes. This makes it possible to create property profiles which increase the service life or lifespan of a component a thousandfold – as compared with pure PTFE, for example.

PTFE does not age; it does not become brittle over time. Furthermore, no critical plasticizers can escape and the material does not harm the environment in its waste form. Today thousands of tons of PTFE waste are already being split into close to 100% of their original components and, after a purification process, are being polymerized to produce new high-grade PTFE.

### Limitless diversity of applications

PTFE is always given preference over other materials when several of its excellent properties are needed in the same component. One such case is bridge bearings which require a low friction coefficient and which are exposed to temperatures from -50°C to +50°C.

Or electrical insulations which are subjected to extreme temperature fluctuations in the aerospace industry.

PTFE components are also used in dental treatment for the provision of oil-free air. In the paper and printing industry, roller coatings, guide rails and diverters made from PTFE allow sheets of paper to glide easily and without soiling. The material is used for many applications in the food industry – for example in bottling machines for a wide range of liquids and on rollers and chutes in bakeries.

### The B+G purity law

B+G works exclusively with high-grade materials from reputable and reliable global suppliers. This provides us with the best possible foundation for the production of first-class semi-finished products for our customers.



The chemical industry uses PTFE for lining tanks, pipes and seals. In addition to its chemical resistance, the outstanding anti-adhesion properties and high thermal resistance are in great demand.

### High-frequency technology applications

PTFE is selected for use in high-frequency technology due to its outstanding electrical properties. A very low dielectric constant of 2.1 and a dielectric loss factor of  $\tan \delta < 0.0001$  make it possible to use the material as a transmitter and receiver antenna for radar and microwave devices.

The combination with other properties – such as universal chemical resistance to acids and alkalis or resistance to ageing – makes PTFE very suitable for use as a signal transmitter and receiver for level measurements in tanks, or even outdoors for radio and radar systems.

Compression-molded massive and filigree components made from PTFE can be relied on to meet the functional and economical requirements in the high-frequency range.

The molded parts offer maximum precision thanks to the precise machining methods employed by the experienced service provider B+G.

### Pressing processes

PTFE semi-finished products are produced by means of static or isostatic pressing.

The difference between the two processes lies in the pressing direction employed to produce the unfinished parts. The unfinished parts from both pressing processes are sintered in special furnaces. Whereas static pressing uses hydraulic pressure to compress PTFE in press molds to form simple molded parts, isostatic pressing compresses the material in tailor-made tools from all sides with a uniform pressure. Thanks to the extremely homogeneous material structure, isostatic pressing optimizes the already excellent properties of PTFE. A further advantage is that casings with complicated contours can be lined with PTFE. Static pressing comes up against its limits here.

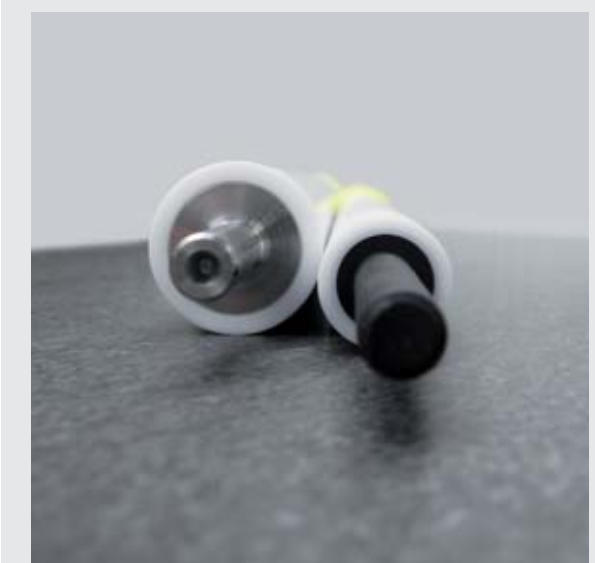
B+G designs and constructs tools for customer-specific component production which make material savings of up to 90% possible. Special processes are used to prepare the surfaces to be coated such that an absolute, vacuum-tight union is achieved.

### Laser branding

We use the latest laser techniques to label our PTFE products, thus ensuring that they are unmistakable and traceable. This allows our customers to reliably and conclusively verify the origin and quality of our semi-finished products and extrudates.



## Coatings from B+G – diversity of form and application



# PTFE/PFA and ETFE properties...

... an overview

WA B-E-R-G.de/6.2015 engl.

| Property                     | Unit              | PTFE pure white | PTFE TFM 1600 | PFA          | ETFE         |
|------------------------------|-------------------|-----------------|---------------|--------------|--------------|
| Tear strength                | N/mm <sup>2</sup> | >23             | >28,5         | >31          | >44          |
| Tensile elongation at break  | %                 | >260            | >300          | >300         | >200         |
| Hardness                     | Shore D           | >54             | >56           | >60          | >60          |
| Elastic modulus              | N/mm <sup>2</sup> | 550             | 650           | 690          | 690          |
| Continuous thermal stability | °C                | -200<br>+260    | -200<br>+260  | -200<br>+260 | -190<br>+155 |
| Density                      | g/cm <sup>3</sup> | 2,12 - 2,20     | 2,12 - 2,20   | 2,15         | 1,70         |
| Dielectric strength          | KV/mm             | >20             | >20           | -            | -            |



### Our certifications

**Beichler + Grünenwald** has been certified according to the DIN EN ISO 9001 quality management system since 1996. Our products comply with nearly all quality standards and norms. Our archive organization allows us to create 3.1 inspection certificates according to DIN 10204 and/or declarations of conformity at any time - even retrospectively - at the customer's request based on the material certificate and the material inspection number. Moreover, we will be one of the first PTFE processors with this specific certification once the migration tests that are currently in progress for approval according to EU 10/2010 are complete.

### It's all in the mix!

**Beichler + Grünenwald** employs innovative methods to design, develop and produce extrudates, semi-finished products, coatings and special shapes for customers worldwide. Leading plastics technology is born out of Swabian inventiveness combined with a commitment to the location and the people of the region.

Extrudates/Semi-finished products



Coatings



„There is Pow(d)er inside“

We advise you...  
...develop with you...  
...produce results...

in accordance with the B+G PTFE purity law.

Special shapes



Special mixtures

