Technical data sheet

Titan Grade 4/unalloyed pure titanium

Manufacturer

S&S Scheftner GmbH
Dekan-Laist-Straße 52
55129 Mainz
Germany

S&S Scheftner GmbH is certified according to: ISO 13485

- **ISO 9001**
- **RL 93/42/ECC (CE0120)**

■ Description

Titan Grade 4 – Ti4 (unalloyed commercially pure titanium)
ISO 5832-2

■ Description

This material is unalloyed pure titanium. The grade of titanium corresponds to the content of oxygen and determines the properties of the material. Grade 1 titanium is the softest grades. Grade 4 titanium is the strongest of the four variants. Grade 4 has higher mechanical properties than grades 1 and 2. Its impeccable corrosion resistance and its low modulus of elasticity are outstanding.

The decision to use pure titanium Grade 4 instead of the titanium alloy Ti6Al4V (Grade 5) is due to the fact that titanium Grade 4 is a purer titanium alloy (the least alloy content), which is added to less third metals, resulting in a lower allergenic potential.

■ Indication

Titanium Grade 4 can be used to manufacture crowns and bridges for the anterior and posterior tooth area. Bridge substructures for the anterior teeth may be produced with up to 3 contiguous pontics. The connector cross-section must not be less than 6 mm². In the posterior tooth area, bridges may not contain more than 3 contiguous intermediate pontics. A connector cross-section of at least 9 mm² is recommended. Furthermore, bars, implant bridges and superstructure can be produced.

■ Veneering

Titanium framework can be veneered with a veneering ceramic suitable for titanium. Observe the operating instructions of the applicable manufacturer.

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■ Finishing/cleaning

The substructures can be finished using a clean, titanium-suitable carbide cutter. To do this, the tools must only be pulled over the surface in one direction in order to avoid material overlaps and possible bubble formation during ceramic veneering. In addition, the maximum speed of the instruments recommended by the manufacturer must be observed.
Subsequently, sand-blast the surfaces with pure aluminium oxide (ca.180 µm), using a pressure of 2-3 bar. Afterwards, thoroughly rinse the substructure under running water, or evaporate with hot steam and degrease with ethyl alcohol. Never use hydrofluoric acid!

■ Chemical composition

Fe (in %)	**C** (in %)	**N** (in %)	**O** (in %)	**H** (in %)	**Ti** (in %)
< 1	< 1	< 1	< 1	< 1	99

■ Physical/mechanical properties (guidelines)

Density **ρ**	**4.5** [g/cm^{3}]
Hardness (Vickers hardness)	**> 200 HV 5/30**

■ Tensile test at room temperature (guidelines)

Elastic limit $R_{P0,2}$ (min./max.)	**504** [MPa]
Tensile strength R_M	**599** [MPa]
Elongation at break **A**	**16** [%]

■ Thermal properties (guidelines)

Melting temperature T_M	**1,660** [°C]
CTE (25 - 600°C)	**9,7 x 10^{-6} K^{-1}**

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