Titanium-Silicon sputtering targets.

Together, titanium and silicon (TiSi) make an outstanding team for nitride hard material coatings. Silicon guarantees excellent resistance to oxidation while the presence of titanium ensures particularly hard coatings. When combined, the two elements are wear resistant even at very high temperatures.

TiSiN-coated tools are extremely wear-resistant and permit high machining speeds. Machining operations without the use of coolants also pose no problem. Even tough materials such as nickel-based alloys and titanium-based materials are easy to machine using titanium-silicon nitride-coated tools.

The titanium nitride crystals are embedded in an amorphous Si$_3$N$_4$ matrix and together form a ceramic nanocomposite coating. TiSiN layers are applied to the tool using the reactive magnetron sputtering or arc evaporation process.
Our targets and cathodes are available from stock in the following typical material compositions in various dimensions:

- TiSi 85 / 15 %
- TiSi 80 / 20 %
- TiSi 75 / 25 %

### The most important details at a glance

<table>
<thead>
<tr>
<th>Titanium/silicon content [at%]</th>
<th>85 / 15</th>
<th>80 / 20</th>
<th>75 / 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purity [%]</td>
<td>99.8</td>
<td>99.8</td>
<td>99.8</td>
</tr>
<tr>
<td>Guaranteed density [g/cm³]</td>
<td>4.40</td>
<td>4.37</td>
<td>4.35</td>
</tr>
<tr>
<td>Grain size [µm]</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

**Our optimum microstructure. Your perfect coating.**

![Microstructure Image](image)

Because we take particular care when mixing the powder, the microstructure of our materials is significantly more homogeneous and fine-grained than in materials produced using a melting process. This means that significantly fewer droplets form on your product. The result: outstandingly smooth coating layers.
High ductility. Long service life.

During the coating process, our targets and cathodes have to withstand a lot. The material at the edge of the target can be exposed to forces of up to one tonne during coating. When brittle materials are used, these forces may cause the target to break. Because in our material, silicon-containing intermetallic particles are embedded in a matrix of pure titanium, our targets are particularly ductile. In addition, thanks to the powder metallurgical production process we employ, our targets achieve a high density. The result: breakage-resistant, long-lived targets.

Even more support for our targets.

We have a license agreement with Hitachi Metals Ltd. relating to the patent JP-3765475. And of course, we also want you to benefit from this advantage: Customers who use our TiSi targets are also authorized to manufacture TiSi-based coatings under the patent JP-3765475.
Guaranteed purity.

The purer the coating material, the better the quality of the hard material layer. From the very outset, we use only the finest powder which we mix in our own equipment to ensure outstanding material purity. We monitor every step - from the powder through to the finished product - and make sure that only targets with the specific guaranteed density, purity and a homogeneous microstructure are shipped from our factories.

Flawless quality from a single supplier.

As a leading manufacturer of sputtering targets, we perform every stage of the production process ourselves. From the mixing and compacting of the metal powder through to the forming, machining and bonding of our targets: including the development of new materials to optimize your coating processes and films. And naturally we also verify the quality of our targets using state-of-the-art measuring methods.

You want the perfect coating? We create it.
There's one thing we know perfectly well: in the PVD coating process, everything must fit together perfectly. Only through the perfect combination of high-quality sputtering targets and arc cathodes, coupled with carefully chosen process parameters, is it possible to create a coating that precisely meets your requirements. And this cooperation with our customers and numerous development institutes results in a constant flow of new coating materials.

Are you looking for the perfect coating? Take advantage of our long-standing experience and our extensive database of chemical compositions and production processes. Our team develops our sputtering targets and arc cathodes continually and improves the following material and coating properties:

- Grain size and microstructure
- Ductility
- Material hardness
- Resistance to oxidation
- Coefficient of friction
- Temperature resistance

We introduce further elements to perfect our titanium-silicon mix to meet your exact requirements. Just contact us!
We have something else for you.

We would also be delighted to supply the corresponding fixing materials such as graphite foils, screws, washers and bolts.

Take a look at our targets and cathodes made from titanium-aluminum, aluminum-chromium, chromium, titanium, zirconium, tungsten carbide and titanium diboride.