About 94% of global titanium consumption in 2020 went into producing titanium dioxide. Analyzing patent data for 2002-2021 shows details about its production from ilmenite, a titanium ore.

### Titanium Dioxide from Ilmenite

Besides ilmenite, other sources are used to produce titanium dioxide and other products. Categorization of relevant patents according to the source of titanium used and the final titanium product. 29% of patents describe the transformation of ilmenite into titanium dioxide, 27% describe its transformation into slags and in 8% of patents the final product is synthetic rutile. A quarter of the patents describe generic ores, slags or tailings as starting material.

### Patent Landscape

- **Titanium Dioxide from Ilmenite**
- About 94% of global titanium consumption in 2020 went into producing titanium dioxide. Analyzing patent data for 2002-2021 shows details about its production from ilmenite, a titanium ore.

### Patents

**Patent families describing titanium dioxide production from ilmenite show an increase in patent filings since 2012.**

**Where were the patents filed?**


**Who were the top patent filers?**


<table>
<thead>
<tr>
<th>Patent Applicat</th>
<th>Filings</th>
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<td>BHP Billiton Innovation (Australia)</td>
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</tbody>
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### Patent Applicants

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### Patent Distribution

- **Titanium process**
  - Smelting: 244
  - Acid leaching: 170
  - Magnetics separation: 120
  - Sulphate: 114
  - Redox pretreatment: 73
  - Chloride: 63
  - Fluoride: 52
  - Microwave irradiation: 45
  - Alkaline leaching: 35
  - Other: 21

- **Titanium product**
  - Slag concentrate: 360
  - Rutile: 177
  - Synthetic rutile: 177
  - Not specified: 27
  - Other: 4