



Patent Landscape

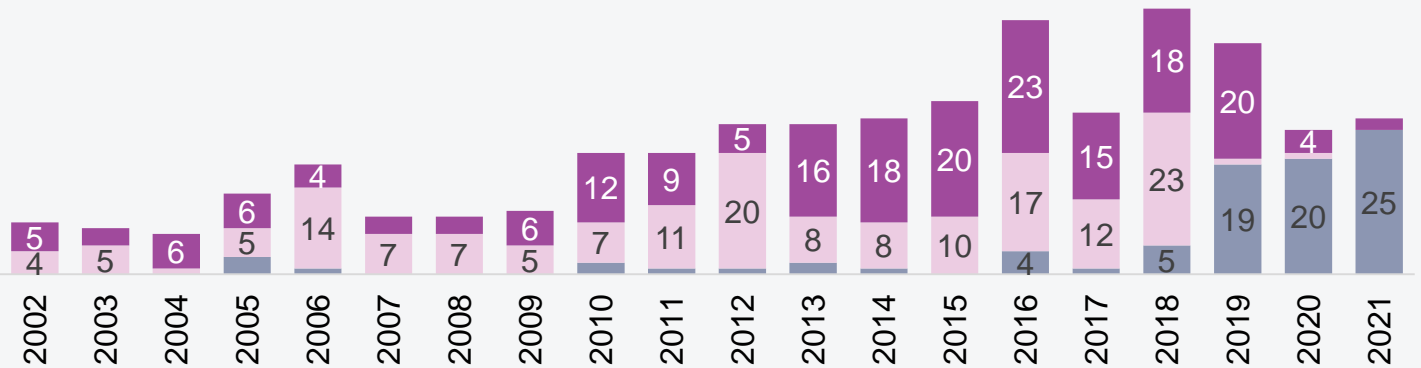
Titanium Dioxide from Ilmenite

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.

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

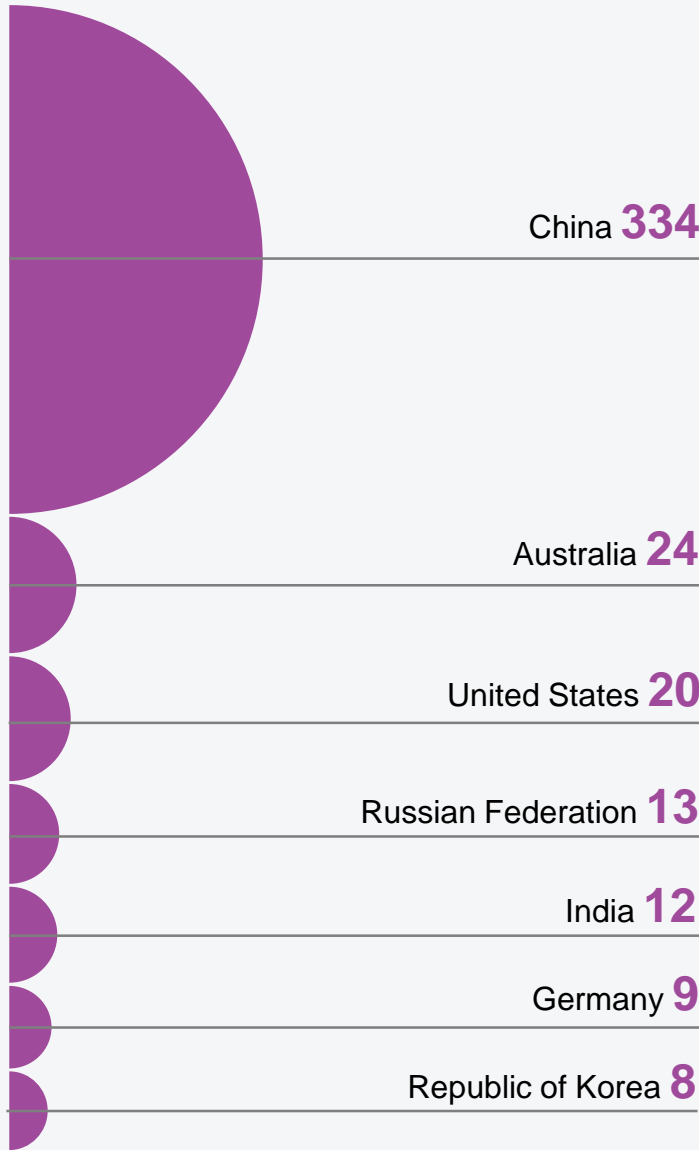
Relevant patent families describing titanium dioxide production from ilmenite, 2002–2021.

Pending Lapsed Granted



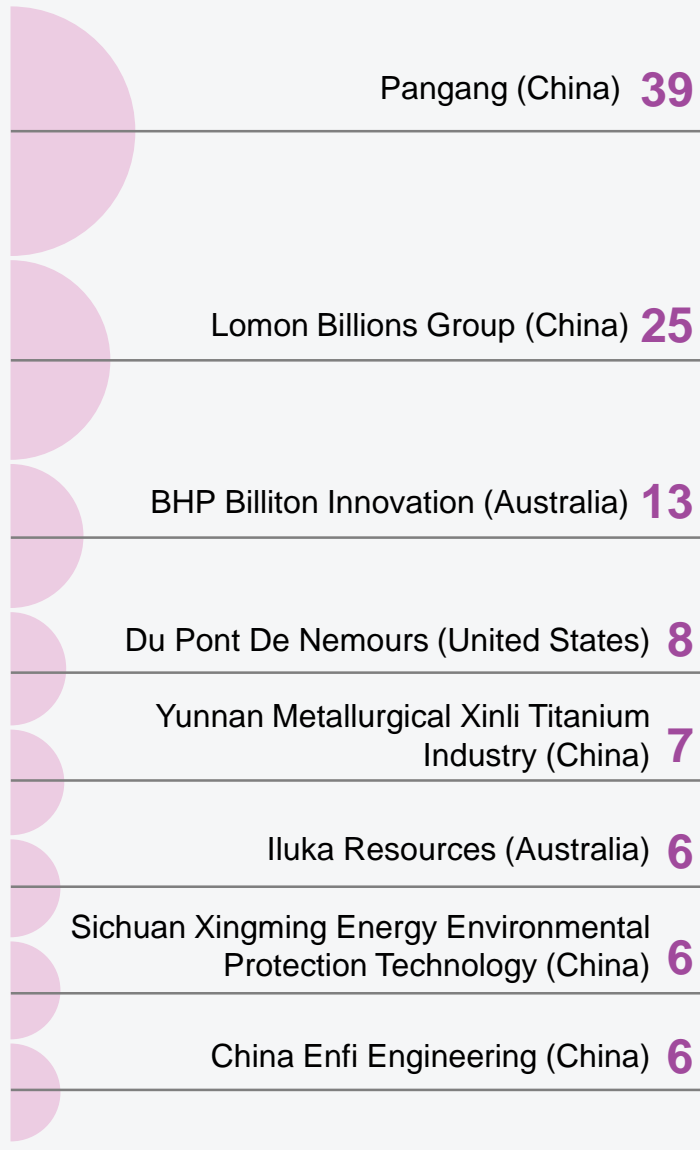
Where were the patents filed?

Relevant patent families by jurisdiction of first priority, 2002–2021



Who were the top patent filers?

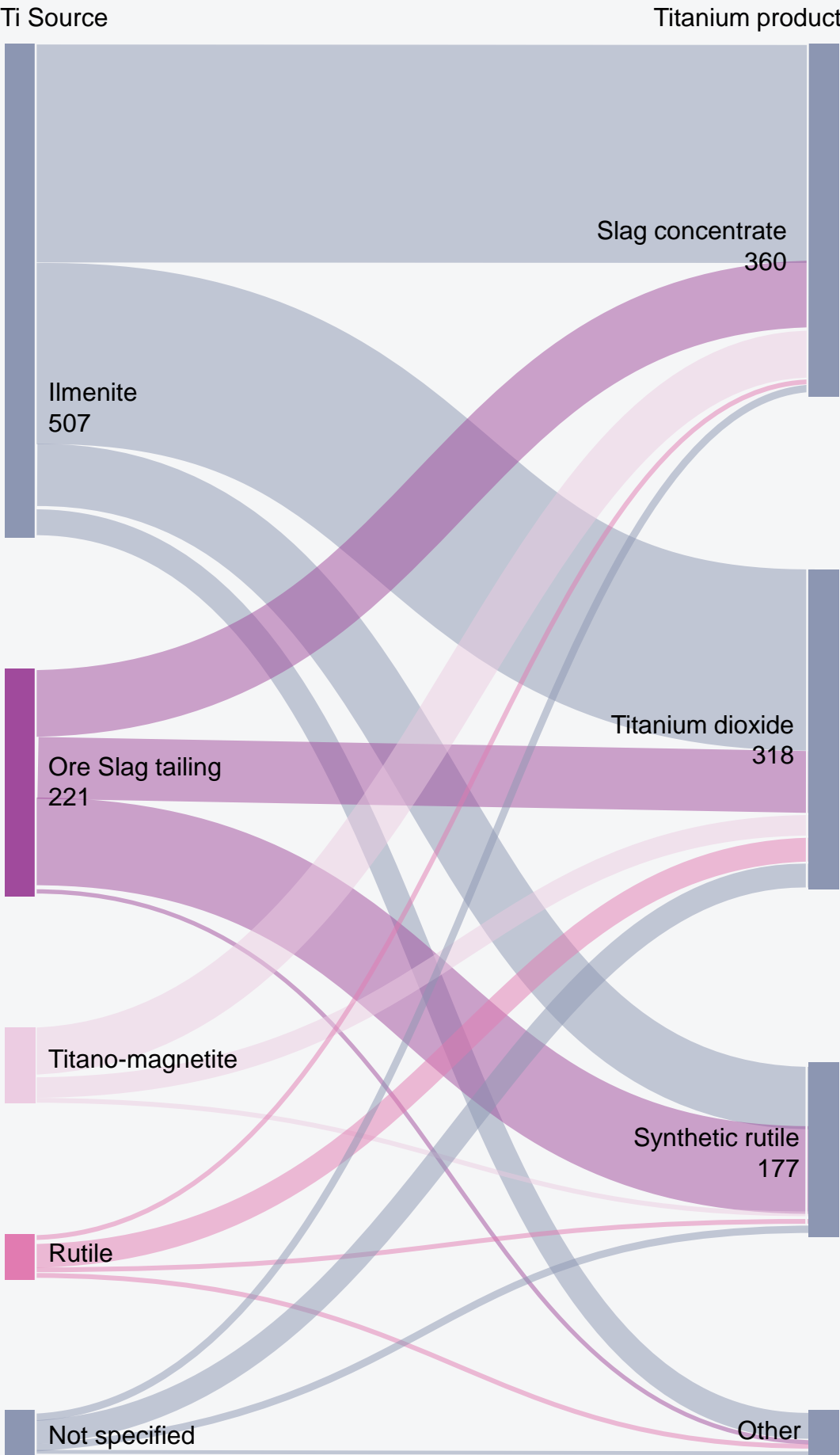
Relevant patent families by patent applicants, 2002–2021



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



Different processes to treat ilmenite

Categorization of relevant patents according to the process used and the final titanium product.

Smelting is mentioned in 43% of patent families, is used in combination with magnetic separation and mainly leads to slags. Acid leaching is mentioned in 37% of patent families, either as a pre-treatment or as a direct process to obtain TiO₂ or synthetic rutile. The sulfate process is protected in 23% of patent families and is almost exclusively used to obtain TiO₂, while the chloride process is only mentioned in 8% of patent families.

