

Titanium Metal

Global Industry, Markets & Outlook 2018

Global titanium sponge capacity peaked in 2013 at over 330ktpy following significant investment in China fuelled by a boom in demand for industrial applications. Oversupply and weakening demand led to falling prices and capacity closures in 2013–16. Capacity has recovered sharply in later years following the opening of new plants in China and most recently Saudi Arabia. The proportion used for premium (aerospace/rotor) grade has grown to an estimated 45% following demand from the aerospace industry. Production is concentrated in China where most is carried out by Luyang Sunri Wanji, Chaoyang Baisheng, Zunyi Titanium, Pangang Group and Baoti Huashen. VSMPO of Russia remains the single largest producer, followed by Japanese companies (Osaka and Toho). Virtually all US production is now from TIMET following plant closures by ATI, the last in 2016. Most of the balance is produced by UKTMP in Kazakhstan and ZTMK in Ukraine.

Titanium melt capacity has continued grow reaching over 450ktpy in 2018. The pronounced difference between sponge and melt capacity reflects the amount of double or triple melting undertaken to produce premium grade material. Melt capacity in China has lagged that of sponge and is likely to rise as demand for premium grade rises ahead of that for industrial material. Outside China, a significant proportion of investment in the sponge sector in recent years has been for electron beam capacity, primarily used for scrap recycling. Outside China, melted product output has become increasingly reliant on scrap. In 2017, some 90-100kt of melted products were produced from scrap. Much of this was produced in the USA where over 50ktpy of scrap was estimated to have been recycled into ingot during 2017. Much of the remainder was in Russia where VSMPO recycled an estimated 20ktpy in the same year. The remaining production took place in Europe and Japan. Global melted product output is expected to continue to recover alongside airliner build rates.

Aerospace applications consume over 60% of titanium mill product, of which over 75% was in civilian airframes and engines (for passenger and cargo planes). Growth in civil aerospace build rates since 2011 has reduced the market share of military and space titanium use, but these remain significant and high-value sectors for titanium. New civilian aircraft have a higher titanium content than the models they are replacing in order to save weight and therefore fuel consumption. Boeing's 787 comprises 15% of titanium in fly-weight, and Airbus's A320/350 12-14%, compared to 4-8% in most of older models. The remaining market is in industrial and commercial applications, which has declined as industrial plant, desalination and nuclear build rates fell after 2012.

Activity in the civilian airline industry will be closely linked to overall global economic conditions. Positive factors are growing passenger numbers in Asia and the Middle Eastern countries as well as replacements in the US fleet. In the longer term, rising passenger numbers and replacement of fleets by modern fuel-efficient aircraft will drive demand. The outlook for titanium use in aerospace remains positive but could be interrupted by unexpected events, such as in 9/11. The industrial market for titanium remains subdued but could return to growth. This will depend greatly on emerging economy industrialisation following growth in renewables outside China instead of nuclear power. The desalination market in the Middle East is expected to be an increasingly important sector in the future.

The market for titanium will be increasingly dominated by the aerospace sector. The titanium raw material market for aerospace grades has traditionally been largely controlled by companies in Europe, Japan, the CIS and the USA. Chinese premium sponge grade capacity now accounts for around 30% of the global total following the opening of 29ktpy in 2015–2017. Outside China, the supply of premium scrap will increase as greater numbers of both military and civil aircraft are dismantled. Competition between sponge and scrap is likely to keep raw material prices low, benefiting participants downstream.