1. Trends in shipments of titanium sponge in Japan
2. Trends in shipments of titanium mill products in Japan
3. Expanding to new applications & Expectations for new market
4. Innovative technology development assisted by Japanese government
5. Recent activities in the Japan Titanium Society
6. Summary
Japan accounts for about 1/4 of global titanium sponge production.

- Japan: 26%
- China: 31%
- CIS: 38%
- USA: 5%

Total 193KT

Estimated by OSAKA Titanium technologies Co., Ltd.

2017 Titanium Sponge Production
1. Trends in shipments of titanium sponge in Japan(2)

* Japan supports stable supply of titanium sponge against volatile demand.
* Shipments are expected to grow stably because of demand for aircrafts and industries.
Japan accounts for about 10% of global titanium mill products shipments.

2017 Titanium Mill Products Shipments

- China: 34%
- Europe, CIS, etc: 32%
- USA: 23%
- Japan: 11%
- Total: 163KT

Estimated by OSAKA Titanium technologies Co., Ltd.
2. Trends in shipments of titanium mill products in Japan (2)

* Japanese mill industry has faced two times of drastic decline after Lehman.
* Shipments are on the rise again mainly in the export sector in recent years.

Source: Japan Titanium Society
2. Trends in shipments of titanium mill products in Japan(3)

* Shipments to power generating plants and PHE take up a large portion.
* Shipments for electrolysis have recently increased in a strong world economy.

![Graph showing trends in titanium mill product shipments in Japan](image)

**Source:** Japan Titanium Society
3. Expanding to new applications & Expectations for new market(1)

* In other fields, the growth around the field of automobile and building is anticipated in future

2017 Titanium mill products shipments by application in Japan

Source: Japan Titanium Society
3. Expanding to new applications & Expectations for new market(2)

* Titanium has been applied for separators in fuel cell vehicles (FCV).
* FCV are expected to increase to 800 thousand units by 2030.
In the field of building materials, usage expansion is anticipated by new challenges.

**Anodized Titanium, giving similar appearance of a moss**

- M6B2 Tower of Biodiversity
  - Paris, France (2016 Nippon Steel & Sumitomo Metal Corporation)
  - Titanium application area: 3,000 m²
  - Quantity: 5 tons

**Restoration of historical steel construction with Titanium Foils**

- Kakezuka lighthouse
  - Shizuoka, Japan
  - Originally built in 1868 (executed by Nippon Steel & Sumikin Anti-Corrosion Co., Ltd.)
  - Titanium application area: 109.2 m²
  - Quantity: Approx 50Kg

Pasting Ti Foils (0.1mm) instead of heavy anti-corrosion painting

*1, *2: Nippon Steel & Sumikin Anti-Corrosion Co., Ltd. © All rights reserved
3. Expanding to new applications & Expectations for new market(4)

* Additive Manufacturing technologies expected to expand new applications for Titanium.

< Demand of titanium powder for Additive Manufacturing>

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Yasuaki Sugizaki, Outlook on Current Titanium Trends in Japan

SmarTech Report (2016)
4. Innovative technology development assisted by Japanese government

SIP(*) industry-government-university cooperation → Research and development for aero engine

Metal Injection Molding (MIM) Technology

- Performance improvement of MIM material (Kyushu University)
- High quality titanium powder production (OTC)
- Manufacturing technology development of MIM component (IHI)

Target for Practical Use

Application of high quality and highly accurate MIM technology to aero engine components

- MIM nickel alloy: To establish material database and to apply practical components
- MIM titanium alloy: To improve fatigue strength and to show the capability for practical use

(*) Cross-ministerial Strategic Innovation Promotion Program (SIP)
5. Recent Activities in Japan Titanium Society (JTS)

JTS contributes towards the development of the titanium industry and the Japanese economy.

* Foundation of the JTS In 1952, it was the first titanium public institution in the world

* Current membership & associates: 220 (as of Sept. 1st 2018)

* Activities
  - Undertaking challenges in industry –government-academia partnership to further competitiveness improvement
  - Promotion to explore new titanium applications by supporting challenges for industry-academia joint research
  - Support Japanese young generations to exhibit interest in learning more about the titanium industry
6. Summary

* Important issue for Japanese titanium industries is to maintain a higher level of product while also providing a stable supply to the world market.
* With the support of the Japanese government to create more demand, we challenge by proactively cooperating with the titanium industry.
* JTS is supporting the development of technology as well as making efforts for further encouraging the Japanese government.

Through this, the Japanese titanium industry and JTS will continue to contribute to the development of the titanium industry for ITA and the world.

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