Outlook on Current Titanium Trends in Japan

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Sept. 25–28, 2016 • JW Marriott Desert Ridge Resort • Phoenix, Arizona
1. Trends & 2016 shipments of sponge titanium in Japan
2. Trends & 2016 shipments for mill products in Japan
   2.1 Mill products shipments by application
   2.2 Trends & 2016 mill products shipments
3. Developing applications
4. Recent activities of JTS
5. Summary
1. Trends & 2016 Shipments of Sponge Titanium in Japan

- Japan contributed almost 1/4 of global sponge production in 2015.

2015 production 179kt

- CIS 32%
- USA 10%
- China 35%
- Japan 23%

Estimated by Toho Titanium Co., Ltd.

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Japan has made efforts to stabilize sponge supply against highly volatile demand.

Kazuo Kagami,  Outlook on Current Titanium Trends in Japan

Sept. 25-28, 2016 • JW Marriott Desert Ridge Resort • Phoenix, Arizona
Efforts to stabilize supply of titanium sponge

- Japanese technology has been licensed to a new sponge plant in Saudi Arabia. (under construction)
- Contribute to a stable supply of sponge to global markets
2. Trends & 2016 Shipments for Mill Products in Japan

- In 2015, Japan supplied around 10% of mill products to the global market.

Estimated by Toho Titanium Co., Ltd.
2. Trends & 2016 shipments for mill products in Japan

2.1 Mill products shipments by application

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2.2 Trends & 2016 mill products shipments

- Japanese mill industry has faced new challenges since 2009.
- Application development could be a driver to create demand.
Specially treated titanium sheets and foils have been employed for such things as separators in fuel cell stacks.
**FCV market is expected to grow steeply.**

- Promotion of FCV is one measure against global warming.
- Competition will continue between titanium and other materials.
- Miniaturization of FCV stacks will proceed.
Increased use in PHE applications

- More reliable
- More effective (bigger and thinner)
- Lighter

Thinner titanium plates for PHE applications

<table>
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<tr>
<th>Initial stage</th>
<th>Current</th>
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<td>1~1.2mmt</td>
<td>0.4~0.5mmt</td>
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(Hisaka Works, Ltd.)
Non-industrial applications

- Non-industrial use of titanium’s characteristics:
  - Light, Rigid, Low maintenance, Allergy-free
3. Developing new applications

Proven durability for architecture

- Export of titanium composite panels with engineering services
- No browning by acid rain for 15 years
- Surface treated titanium sheets for roofing
4. Recent Activities of JTS

- **Foundation of the Japanese Titanium Association (JTS)**
  - In 1952, first titanium organization in the world

- **Current membership & associates: 220** (as of Sept. 1st 2016)

- **Example of activities**
  - Undertaking challenges in the “Plans on Competitiveness Improvement for Metallic Materials” by government
  - Sponsor for industry–university joint research to develop demand & social benefits
5. Summary

- JTS & the Japanese titanium industries will continue to promote investments in titanium development, production and distribution & roll out these achievements globally.

- JTS will work with ITA to promote the wider, more frequent & more convenient use of titanium world wide.

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