WORLD TITANIUM SPONGE
SUPPLY TRENDS

Sylvain GEHLER, UKTMP Chairman
1. DEVELOPMENTS AFFECTING THE TITANIUM SPONGE SUPPLY.

2. WORLD TITANIUM SPONGE SUPPLY
   - A. WORLD TITANIUM SPONGE PRODUCTION
   - B. CURRENT PRODUCTION LEVEL AT EACH PRODUCER
   - C. US IMPORTS
   - D. TI SPONGE PRODUCTION CAPACITY VERSUS ACTUAL PRODUCTION
   - E. TI SPONGE INVENTORY LEVEL

3. CONCLUSION AND EXPECTATION FOR 2019
NEW DEVELOPMENTS AFFECTING TITANIUM SPONGE MARKET

1. Demand for TiO2 pigment in the market at large is still very strong. 95% of world Titanium feedstock is used for TiO2 pigment production. Sponge producers will have to compete with pigment producers for feedstock.

2. Operational problems at Titanium feedstock suppliers added pressure on the supply situation.

3. TiO2 pigment prices have increased steadily over the last 2 years affecting feedstock prices.

4. Record level of TiO2 pigment production in China has affected negatively the Ti feedstock supply of Chinese sponge producers.
NEW DEVELOPMENTS AFFECTING TITANIUM SPONGE MARKET

5. Increased demand for Titanium products in China and South East Asia for chemical, oil and gas, energy and defense industries.

6. Strong demand for Ti mill products has lifted Russian sponge production close to a full capacity.

7. Titanium sponge inventory has decreased worldwide, the biggest decrease is in the U.S.
Low Titanium sponge inventory has triggered an additional demand for sponge and increased sponge production.

CIS Titanium sponge producers were first to react to the additional demand for sponge, sponge production in the CIS countries increased by 22% over the last 2 years.
WORLDWIDE TITANIUM SPONGE PRODUCTION
In 2018 World Titanium Sponge production will increase by 10,278 MT compared to 2017.
Titanium Sponge Production in CIS countries

In 2018 CIS Titanium Sponge production will increase by 11,200 MT compared to 2017
US Imports of Titanium Sponge
from Kazakhstan, Japan, China, Russia and Ukraine

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<th>Year</th>
<th>Kazakhstan</th>
<th>Japan</th>
<th>Ukraine</th>
<th>China</th>
<th>Russia</th>
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<td>16,763</td>
<td>24,900</td>
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<td>20,694</td>
<td>139,639</td>
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Source: USGS

US imports increased in 2017 by 7,374 MT which reflects replacement of decreased inventory.
US Imports of Titanium Sponge July 2017 vs July 2018
from Kazakhstan, Japan, China, Russia and Ukraine

US import from January to July 2018 compared to the same period of 2017 is stable.

Source: USGS
Titanium Sponge Production in Asian countries

In 2017 Chinese Titanium Sponge production increased by 5,845 MT compared to 2016.
At the end of 2017 world Titanium sponge capacity was rated at 255,300 T. Chinese sponge capacity increased from 88,000 T to 93,000 T.
World Titanium Sponge Capacity vs Production
estimated at the end of 2018

Average rate of utilization of sponge capacity is 77%
US Titanium Sponge Inventory
metric tons, end of quarter, Q1 2016 thru Q1 2018

Source: USGS
Titanium Sponge Stocks

metric tons, end of year, end of Q1 2018

At the end of 2017 total world Titanium sponge inventory was estimated at 23,200 T and at the end of Q1 2018 – 19,200 T.

Source: USGS for US inventory
CONCLUSION

- Supply of sponge to continue growing in 2019 but at a lower rate.
- Titanium sponge producers (except China) still have an operational production capacity reserve of 26,550 mt.
- Aerospace industry is not the only driver of this increased demand due to emergence of regional markets.
- Melters outside the U.S. are more dependent on sponge than on scrap, which will encourage sponge producers to increase production.
- The main issue for sponge producers will be the sourcing of feedstock at a reasonable price level.
THANK YOU FOR YOUR ATTENTION