Taiko Introduction Video

10 min.
S. Yamamoto Self Introduction
2016 = Taiko’s 60th Anniversary Year!

Since 1956
TAIKO headquarter is in the town called “TABUSE” in Yamaguchi prefecture which is located in the west part of Japan. It is a small town with about 16,000 of population. Our location is surrounded by beautiful sea and mountains and air is very fresh! This town is also famous as the town which gave birth to 2 prime ministers of Japan in the past.
“TABUSE-TOWN (田布施町)”

ACCESS

By Airplane (Kansai International Airport)
- JR Airport Express Haruka to Shin-Osaka Sta. (50min)
  - Shinkansen to Hiroshima Sta. (90min) → Sanyo Main Line (90min) → Tabuse Sta. → Taxi (5min)
By Airplane (Fukuoka Airport)
- Subway to Hakata Sta. (5min) → Shinkansen to Tokuyama Sta. (70min)
  → Sanyo Main Line (30min) → Tabuse Sta. → Taxi (5min)
By Airplane (Hiroshima Airport)
- Airport bus to Hiroshima Sta. (50min) → Sanyo Main Line (90min)
  → Tabuse Sta. → Taxi (5min)
By Airplane (Iwakuni Kintaikyo Airport)
- Airport bus or Taxi to Iwakuni Sta. (7min) → Sanyo Main Line (40min)
  → Tabuse Sta. → Taxi (5min)

By Shinkansen (Sanyo Shinkansen)
- Hiroshima sta. → Sanyo Main Line (90min) → Tabuse Sta. → Taxi (5min)
- Tokuyama sta. → Sanyo Main Line (30min) → Tabuse Sta. → Taxi (5min)
In 1959, TAIKO succeeded in development of “Segmental Gear”
3 Fields of Technology

3 Business divisions approach directly to each customer: MARINE division approaches ship building yards, INDUSTRIAL division primarily manufacturing companies, and ELECTROMAGNETIC division medical/welfare/healthcare/environmental industries respectively.

3 Business divisions explore infinite potentials of pumps which can meet requirements of many diversified industries inside and outside of Japan.
Customers needs are expressed and achieved by Taiko pump professionals in R&D and Design/Engineering division.

The head factory has history beyond a half century since its foundation. “Taiko-Quality” products are being produced by severe quality control standard.
Production Network in Overseas

6 subsidiaries and merged companies in China

- SECHO SHANGHAI MEC.LTD.
- TAIKO KIKAI (QINGDAO)CO.,LTD.
- SHANDONG ZHANGHUANG MACHINERY INDUSTRIES Co.,Ltd.
- CHONGQING TAIKO AND KANGDA ENVIRONMENTAL PROTECTION TECHNOLOGY Co.,Ltd.
- SHANDONG TAIKO MACHINERY CO.,LTD.
- SHANDONG FENGHUANG FOUNDRY CO.,LTD.
Global Network

Built borderless service network through all over the world! Whenever, Wherever, we can offer rapid parts supply and after service.

Marine Bz. Partner in Dubai
Fuji Trading Co., LTD

Rep Office Opening
Target Apr 2017
Steady business growth of Taiko all in these 3 years
Marine business represents the biggest portion
Industrial business shows almost 2 digit growth year by year
Marine Pump Business
GEAR PUMP

[FEATURES]

COMPARISON OF SEGMENTAL GEAR WITH INVOLUTE GEAR

INVOLUTE GEAR

SEGMENTAL GEAR (TAIKO)

CLOSING PHENOMENON
Volume change between each gear tooth cause compression (A→B) and expansion (B→C) of pumping liquid. It brings vibration and noise.

Closing Phenomenon does not happen due to “one-point-continuous contact” of gear tooth

VIBRATION • NOISE REDUCTION
Taiko Marine Pump Use

## Pump Line-up for Marine Use

<table>
<thead>
<tr>
<th>PRODUCTS</th>
<th>FEATURES</th>
<th>USE</th>
</tr>
</thead>
</table>
| Gear      | High performance Segmental Gear pump for oil use with Low Noise, Low Vibration and High Durability. | ● F.O. TRANS. PUMP  
           |                                                                           | ● L.O. TRANS. PUMP  
           |                                                                           | ● F.O. CIRCULATING PUMP  
           |                                                                           | ● STERN TUBE L.O. PUMP |
| Screw     | Miniaturized and high performance screw pumps with Multi-Purpose Use.     | ● SLUDGE PUMP  
           | 1 Screw, 2 Screw & 3 Screw type of line up for flexible selection.        | ● CARGO PUMP  
           |                                                                           | ● MAIN L.O. PUMP  
           |                                                                           | ● M.G.O. SUPPLY PUMP |
| Centrifugal | Water and low viscosity oil use. These pumps also support to protect marine pollution. | ● COOL. F.W. / S.W. PUMP  
           |                                                                           | ● FIRE & G.S. PUMP  
           |                                                                           | ● H.T. COOL. F.W. PUMP  
           |                                                                           | ● BILGE & BALLAST PUMP  
           |                                                                           | ● S.W. SERVICE PUMP  
           |                                                                           | ● AIR COND. COOLING PUMP  
           |                                                                           | ● DISCHARGE PUMP       |
Taiko can supply all kinds of MRLINE pump & equipment and fully satisfy all the requirement from our respective marine customers.

**DRIVING RELATIVE**
- F.O./L.O.
  - Gear Pump
  - 3 Screw Pump
- COOLING WATER
- BOILER
- FEED/BALLAST
  - Centrifugal Pump

**LIFE RELATIVE**
- COOLING WATER...
  - S.W./F.W.
  - Centrifugal Pump
- SEWAGE
  - Centrifugal Pump
  - 1 Screw Pump
  - Sewage Treatment Plant

**FACILITY RELATIVE**
- FIRE FIGHTING/BILGE
  - Centrifugal Pump
- SLUDGE
  - 1 Screw Pump
- CARGO
  - Gear Pump
  - 2 Screw Pump
  - Centrifugal Pump
- BILGE
  - Piston Pump
  - 1 Screw Pump
  - Oily Water Separator
Taiko has been developing Marine pump business strongly on world-wide basis and has established the firm position in Marine pump market. Taiko has been gaining dominant market share especially in Japan and south east Asian market.

### Taiko Marine Pump Market Share in Japan

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centrifugal</td>
<td>37.7%</td>
<td>33.6%</td>
<td>39.8%</td>
</tr>
<tr>
<td>Oil Pump</td>
<td>66.7%</td>
<td>64.9%</td>
<td>79.8%</td>
</tr>
<tr>
<td>Oil Water Separator</td>
<td>60.1%</td>
<td>55.0%</td>
<td>66.9%</td>
</tr>
<tr>
<td>Sewage Treatment Device</td>
<td>48.5%</td>
<td>50.3%</td>
<td>57.8%</td>
</tr>
<tr>
<td>Cargo Pump</td>
<td>94.7%</td>
<td>97.1%</td>
<td>88.9%</td>
</tr>
</tbody>
</table>

No.1 Share in Japan domestic marine market
Taiko Pumps for FSO/FPSO Project (MODEC)

Southeast Asia
- FPSO Song Doc Pride MV19 (T/C)
- FSO Rang Dong MV17 (T/C)
- FSO Rong Doi MV12 (T/C)

Africa
- FPSO Kwame Nkrumah MV21 (O&M)
- FPSO Baobab Ivoirien MV10 (T/C)

Oceania
- FPSO Pyrenees Venture MV18 (O&M)
- FPSO Ranaa MV9 (O&M)
- FPSO Stybarrow Venture MV16 (T/C)
- FPSO MODEC Venture 11 (T/C)

MODEC
Mitsui Ocean Development & Engineering Co., Ltd

Project in Operation

Brazil

Under Construction

- OSX-3 FPSO (EPC)
- FPSO Cidade de Sao Paulo MV23 (T/C)
- FPSO Cidade do Angra dos Reis MV22 (T/C)
- FPSO Cidade de Santos MV20 (T/C)
- FPSO Cidade de Niteroi MV18 (T/C)
- FPSO Cidade de Macae MV15 (T/C)
- FPSO Cidade do Rio de Janeiro MV14 (T/C)
- FPSO Fluminense (O&M)

- Tullow T.E.N. MV25 FPSO (EPCI + T/C)

- FPSO MV25
  - MSDK x 6
  - MSB x 2

- FPSO MV27
  - MSDK x 6
  - MSB x 4
  - MSE x 1
  - NHG x 4
  - NHP x 1
Taiko Pumps for FPSO Project

Bumi Armada Bhd/ARMADA STERING FPSO
- NHG X 11
- HHB x 6
- LD x 2
- Sewage Treatment Plant
- Oily Water Separator

Bumi Armada Bhd/ARMADA STERING II FPSO
- NHG X 12
- HHB x 6
- LD x 1
- MSH x 2
- Sewage Treatment Plant
- Oily Water Separator

BW Offshore/BW JOKO TOLE FPSO
- Sewage Treatment Plant x 1

BW Offshore/BW Pioneer FPSO
- NHG X 4
- NHGH x 1
- HHB x 2

Chevron(SBM)/SANHA LPG FPSO
- MSH X 6
- MSE x 5
- CSLx 1
- HNP x 1
- Bilge Alarm x 1
Stable marine sales in these 3 years, 2014 tough year in terms of profit

V-shape recovery of profitability in 2015 by “Selection & Concentration” and spare parts business expansion
Industrial Pump Business
Industrial Pump Business Development

- Continuous business growth in these 3 years
- Remarkable improvement of profitability year by year
- "Industrial" is the strategic category for business expansion and profit generation

![Bar chart showing sales and profit growth from 2013ACT to 2015ACT]

- Sales and profit increase year by year
- Profit ratio shows steady improvement

2013ACT: $30 Mil US$, Profit $3 Mil, Profit Ratio 10.2%
2014ACT: $33 Mil US$, Profit $5 Mil, Profit Ratio 13.6%
2015ACT: $36 Mil US$, Profit $6 Mil, Profit Ratio 16.3%

Mil US$ sales and profit chart from 2013ACT to 2015ACT with an increasing trend.
## Taiko Industrial Pumps: Vacuum & Blower

<table>
<thead>
<tr>
<th>Category</th>
<th>Product</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacuum Pump</td>
<td>TD/BEH/TRIC</td>
<td>Semiconductor Manufacturing Process</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flat Panel Display Manufacturing Process</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Photovoltaics Manufacturing Process</td>
</tr>
<tr>
<td></td>
<td>TDA</td>
<td>Research &amp; Development</td>
</tr>
<tr>
<td></td>
<td>MDP/MDP-V /SLT/MDS/TRDS</td>
<td>Pharmaceutical Manufacturing Process</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chemical Products Manufacturing Process</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Single Crystal Pulling Process</td>
</tr>
<tr>
<td></td>
<td>SDV/SDF</td>
<td>Vacuum Washing Pump</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vacuum Adsorption Pump</td>
</tr>
<tr>
<td>Rotary Blower (Standard)</td>
<td>TSS/TSA/SSR/REX/L/TL</td>
<td>Water Treatment Aeration Blower</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pneumatic Conveyor Blower</td>
</tr>
<tr>
<td></td>
<td>R/TR</td>
<td>Chemical Gas Blower</td>
</tr>
<tr>
<td></td>
<td>SSC</td>
<td>Air Compressing Blower</td>
</tr>
<tr>
<td>Rotary Blower (Vacuum)</td>
<td>TSS-V/TSA-V/SSR-V/REX-V/L-V/R-V</td>
<td>Pneumatic Conveyor Blower</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dust Arresting Blower</td>
</tr>
<tr>
<td></td>
<td>REX-VT</td>
<td>Vacuum Truck Blower</td>
</tr>
<tr>
<td></td>
<td>L-W/R-W/TL-W/TR-W</td>
<td>Pressure Swing Adsorption Blower</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Paper Making Blower</td>
</tr>
</tbody>
</table>
## Taiko Industrial Pumps: Gear

<table>
<thead>
<tr>
<th>Category</th>
<th>Product</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gear Pump</td>
<td>NHG/NHG-MFT/NHG</td>
<td>Lubricating Oil Pump</td>
</tr>
<tr>
<td></td>
<td>/HHC/HC/HHG/BBG/VG/F</td>
<td>Fuel Oil Pump</td>
</tr>
<tr>
<td></td>
<td>WL/SP/SJ</td>
<td>Chemical Solution Pump</td>
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<tr>
<td></td>
<td>CGL/CWL/CUL/CJH</td>
<td>Organic Solvent Pump</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cargo Pump</td>
</tr>
<tr>
<td>Centrifugal Pump</td>
<td>MTDP</td>
<td>Deepwell Cargo Pump</td>
</tr>
<tr>
<td></td>
<td>EMC/ESC/EMD/ESD/TMC/EHC</td>
<td>Cooling Water Pump/Ballast Pump</td>
</tr>
<tr>
<td></td>
<td>ESC-D/EMD(2P)/VS/VS-S/TMS/EHS/EMS</td>
<td>Fire &amp; General Service Pump/Bilge &amp; Ballast Pump</td>
</tr>
<tr>
<td></td>
<td>EMCN/EHCV</td>
<td>Emergency Fire Pump</td>
</tr>
<tr>
<td></td>
<td>TMC(TMV)/TMS</td>
<td>Fresh Water Pump/Sanitary Pump</td>
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<tr>
<td></td>
<td>2MF/2BF</td>
<td>Feed Water Pump</td>
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<tr>
<td></td>
<td>EHC-J/HC-MJ</td>
<td>Boiler Water Circulating Pump</td>
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<td>CVC</td>
<td>Condensate Pump</td>
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<tr>
<td></td>
<td>C1T・C2T/DVC to 5DVC</td>
<td>Lubricating Oil Pump</td>
</tr>
<tr>
<td></td>
<td>HC/FHC/EHS/HD/2MS</td>
<td>Pump Room Pump</td>
</tr>
<tr>
<td></td>
<td>N・NVP</td>
<td>Priming Unit</td>
</tr>
<tr>
<td>Screw Pump</td>
<td>HNP</td>
<td>Sludge Pump/Bilge Pump</td>
</tr>
<tr>
<td></td>
<td>HNP-CS</td>
<td>Sludge Pump</td>
</tr>
<tr>
<td></td>
<td>HNFA-B</td>
<td>Mud Pump</td>
</tr>
<tr>
<td></td>
<td>CSL・CSE</td>
<td>Cargo Pump</td>
</tr>
<tr>
<td></td>
<td>MSH/MST</td>
<td>Lubricating Oil Pump/Fuel Oil Pump</td>
</tr>
<tr>
<td></td>
<td>MST-H</td>
<td>Crosshead Lubricating Oil Pump</td>
</tr>
<tr>
<td></td>
<td>MSB/MSH-X/MSE-X</td>
<td>Fuel Oil Burning Pump</td>
</tr>
</tbody>
</table>
Dry Vacuum Pump

TAIKO KIKAI INDUSTRIES CO., LTD
Taiko Dry Vacuum Pump 5 Key Features

No.1 : The World Lowest R.P.M.

Taiko, the world leader in dry vacuum technology, have attained the world lowest running speed (3600min⁻¹/60Hz, 3000min⁻¹/50Hz) in terms of screw type with an originally developed “Queen Bee Screw”.

Customer’s Benefits

- Long life-span of bearings/seals/gears
- Cost and energy saving
- Low noise and vibration

“Queen Bee Screw” originally designed and developed by Taiko
No.2 : eco VP Rotor

“Eco VP Rotor” has been originally developed by Taiko succeeding the technology of Queen Bee Screw. “Variable Pitch” realizes drastic energy saving in MDP-V series.

( Queen Bee Screw )

Equal Pitch

○ initial cost
○ high temperature discharge
× running cost

( eco VP Rotor )

Variable Pitch

○ running cost (40% less power consumption)
○ low temperature discharge (N2 unnecessary)
○ Compatibility for current MDP
× initial cost

★ Customer’s Benefits

☐ 40% less power consumption compared with predecessor
☐ eco VP Rotor compatible for current MDP series can be purchased as spare parts.
No.3 : Highly Efficient Discharging

Not only gases but also solidified material such as powders or dusts are effectively discharged without residue in the pump.

- (simple and short process)
- (1 time compression)
- (high temperature discharge)

★ Customer’s Benefits

- Effective discharge of condensates and dusts without residue
- High Temperature discharge of solidified gases
No.4 : Simple Structure with Less Parts

Simple structure with less parts allows easy assembly and disassembly.

Taiko Screw
Limited no. of parts

Competitor’s Multi-stage Roots
Too many parts

★ Customer’s Benefits
- Easy service maintenance capability
- Running cost saving
No.5 : Special Coating

Materials in contact with process gas are specially coated with superior corrosion resistivity. Upgraded version with metal plating and stainless steel is also available.

<table>
<thead>
<tr>
<th>Surface Treatment</th>
<th>Heat Resistance</th>
<th>Corrosion Resistance</th>
<th>Friction Coefficient</th>
<th>Work Period</th>
<th>Cost</th>
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</thead>
<tbody>
<tr>
<td>HMB-4(H-5) Standard</td>
<td>◎</td>
<td>△</td>
<td>Low</td>
<td>Short</td>
<td>Low</td>
</tr>
<tr>
<td>FBT-116</td>
<td>△</td>
<td>△</td>
<td>Low</td>
<td>Short</td>
<td>Low</td>
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<tr>
<td>Electroless Nickel Plating</td>
<td>◎</td>
<td>○</td>
<td>High</td>
<td>Long</td>
<td>Medium</td>
</tr>
<tr>
<td>Clean S</td>
<td>○</td>
<td>○</td>
<td>High</td>
<td>Long</td>
<td>High</td>
</tr>
<tr>
<td>Kaniflon</td>
<td>△</td>
<td>△</td>
<td>Low</td>
<td>Long</td>
<td>High</td>
</tr>
</tbody>
</table>

★ Customer’s Benefits

- Wide variety of special coating depending on customer’s needs
- Special coating enables corrosion resistance and longer life of rotor and casing
### Business Partners in Japan (Examples)

<table>
<thead>
<tr>
<th>Industry</th>
<th>Company Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEMICAL</td>
<td>Mitsubishi Rayon</td>
</tr>
<tr>
<td></td>
<td>Mitsubishi Chemical</td>
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<td></td>
<td>Formosa</td>
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<td></td>
<td>Idemitsu</td>
</tr>
<tr>
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<td>Nippon Soda</td>
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<td></td>
<td>Tosoh</td>
</tr>
<tr>
<td></td>
<td>Tokyo Chemical Industry</td>
</tr>
<tr>
<td></td>
<td>Nippon Pigment</td>
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<tr>
<td>PHARMACEUTICAL</td>
<td>Takeda Pharmaceutical</td>
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<td>Nippon Kayaku</td>
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<td>Daiichi Sankyo Propharma</td>
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<tr>
<td>PRINTING</td>
<td>Toppan Printing</td>
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<td>Dai Nippon Printing</td>
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<tr>
<td>FILM</td>
<td>Fuji Film</td>
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<td>TDK</td>
</tr>
<tr>
<td></td>
<td>Toyobo</td>
</tr>
<tr>
<td>FOOD</td>
<td>Kenko Mayonnaise</td>
</tr>
<tr>
<td>BEVERAGE</td>
<td>Coco Cola Japan</td>
</tr>
<tr>
<td>INDUSTRIAL EQUIPMENT</td>
<td>Minebea</td>
</tr>
<tr>
<td>TOOL EQUIPMENT</td>
<td>Hitachi Tool Engineering</td>
</tr>
<tr>
<td>MINING</td>
<td>Sumitomo Metal Mining</td>
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<tr>
<td>ENGINEERING</td>
<td>IHI Plant Engineering</td>
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<td>IHI</td>
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<td></td>
<td>Sanki Engineering</td>
</tr>
<tr>
<td></td>
<td>Tsukishima Kikai</td>
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<tr>
<td></td>
<td>Toyo Engineering</td>
</tr>
<tr>
<td></td>
<td>Nissan Engineering</td>
</tr>
</tbody>
</table>

**Business Partners**
Rotary Blower

TAIKO KIKAI INDUSTRIES CO., LTD
Rotary Blower Type: R

- Flagship Model: Horizontal Type with massive and rigid casing
- Wide Application (Handling Specialty Gas):
  Air, Carbonic Acid Mixture, Hydrogen, Hydrochloric Acid, Oxygen Gas, Steam, etc.
- Wide choice of material, seal, and coating depending on customer’s condition (Gas Type, Pressure, Temperature, etc.)
- Material: Cast Iron, Carbon Steel, Stainless Steel depending on customer’s choice
Rotary Blower Type: \textbf{L}

- Cost Competitive Model: Vertical Type with massive and rigid casing
- Large Size with FCD400 Impeller
- Handling Gas: Air only
- Suitable Model for PSA (Pressure Swing Adsorption) application

**PSA (Pressure Swing Adsorption)**

- Air
- O2Gas
- N2Gas

**Taiko Rotary Blower Type: \textbf{L}**
<table>
<thead>
<tr>
<th>Model Series</th>
<th>Impeller</th>
<th>Application</th>
<th>Dry Vacuum</th>
<th>Wet Vacuum</th>
<th>Photo</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSS</td>
<td>3 lobes</td>
<td>Air Only (small)</td>
<td>TSS-V</td>
<td>-</td>
<td><img src="image" alt="TSS-V" /></td>
</tr>
<tr>
<td>TSA</td>
<td>3 lobes</td>
<td>Air Only (small)</td>
<td>TSA-V</td>
<td>-</td>
<td><img src="image" alt="TSA-V" /></td>
</tr>
<tr>
<td>SSR</td>
<td>3 lobes</td>
<td>Air Only (medium)</td>
<td>SSR-V</td>
<td>-</td>
<td><img src="image" alt="SSR-V" /></td>
</tr>
<tr>
<td>REX</td>
<td>3 lobes</td>
<td>Air Only (medium)</td>
<td>-</td>
<td>REX-WT</td>
<td><img src="image" alt="REX-WT" /></td>
</tr>
<tr>
<td>R (2stage:TR)</td>
<td>2 lobes</td>
<td>Specialty Gas</td>
<td>R-V</td>
<td>R-W</td>
<td><img src="image" alt="R-W" /></td>
</tr>
<tr>
<td>RT (2stage:TRT)</td>
<td>3 lobes</td>
<td>High Pressure Specialty Gas</td>
<td>RT-V</td>
<td>-</td>
<td><img src="image" alt="RT-V" /></td>
</tr>
<tr>
<td>L (2stage:TL)</td>
<td>2 lobes</td>
<td>Air Only (Large)</td>
<td>L-V</td>
<td>L-W</td>
<td><img src="image" alt="L-W" /></td>
</tr>
</tbody>
</table>
Waste Water Treatment (Anaerobic Treatment)

- 3-lobe helical roots type rotary blower
- Best Seller Model for waste water treatment in ASEAN market
- High Cost Performance Model
- SSR-50/65/85/100/125/150 (Bore: 50A ~ 150A)

How is the blower demand for waste water treatment in the market?
Possible Business Chance in Petrochemical Industry?

**Polymerization Plant**
- Middlestream
- Highly Technological
- Customization
- Value Added

**Pneumatic Plant**
- Downstream
- Basic Technology
- Standard
- Competitive

**Utility Plant**
- Electricity
- Water
- Air
- Fuel
- N2 etc.

- Blower
- Screw
- Centrifugal
Possible Business Chance in Petrochemical Industry?

**Polymerization Plant**
- Middles
- High Technology
- Customization
- Value Added

**Pneumatic Plant**
- Downstream
- Basic Technology
- Standard
- Competitive

**Utility Plant**
- Electricity
- Water
- Air
- Fuel
- N2 etc.

- Blower
- Screw
- Centrifugal
# Actual Pump Sales to PP/PE Plant

<table>
<thead>
<tr>
<th>Customer</th>
<th>Model</th>
<th>Specification</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitsui Engineering &amp; Ship Building</td>
<td>RE-150P/200P/200KP/200VP/RF-295P/RE-100NSP</td>
<td>Air/N2/Mixed Gas</td>
<td>USA</td>
</tr>
<tr>
<td>Mitsui Engineering &amp; Ship Building</td>
<td>RD-100NSP</td>
<td>Mixed Gas</td>
<td>Japan</td>
</tr>
<tr>
<td>Mitsui Engineering &amp; Ship Building</td>
<td>RF-350NBZP</td>
<td>H-C Mixture Gas</td>
<td>Iran</td>
</tr>
<tr>
<td>Mitsui Engineering &amp; Ship Building</td>
<td>RF-240NSP</td>
<td>Mixed Gas</td>
<td>Qatar</td>
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<tr>
<td>Mitsui Engineering &amp; Ship Building</td>
<td>RE-150KSP/200KZP/150ZP/ED-80NFP</td>
<td>Propylene Gas/N2/Air/Waste Gas</td>
<td>Indonesia</td>
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<tr>
<td>Sinopec International</td>
<td>RD-80NFP/TF-250MUBP/RTF-290P</td>
<td>Mixed Gas/Air</td>
<td>China</td>
</tr>
<tr>
<td>Sinopec Petrochemical</td>
<td>RF-245P/300MP</td>
<td>Air/N2+H2O</td>
<td>China</td>
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<tr>
<td>Sinopec Engineering</td>
<td>TRTF-250MUBP</td>
<td>Mixed Gas</td>
<td>China</td>
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<tr>
<td>China Petro Chemical</td>
<td>RD-100NSP/RE-150KSP/-200KZP</td>
<td>Gas/Mixed Gas/N2Gas/Powder Transfer Air/Propylene</td>
<td>China</td>
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<tr>
<td>Shanghai KSD</td>
<td>RE-150KP/RTE-190P/190BP/250P/RTF-245P/RTF-290P/290P/RF-245P/250P/250BP/300MP</td>
<td>Air/N2+H2O</td>
<td>China</td>
</tr>
<tr>
<td>Lanzhou Petrochemical</td>
<td>RD-125KP/RF-240NSP/RMF-250KZP</td>
<td>Reactivation Gas/H-C Gas+N2/Power Transfer Air</td>
<td>China</td>
</tr>
<tr>
<td>Beijing Petrochemical Engineering</td>
<td>RE-150KSP/RE-200KZP/RF-250KZP</td>
<td>Propylene/N2</td>
<td>China</td>
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<tr>
<td>Yangzi Petrochemical</td>
<td>RF-240NSP</td>
<td>Recycle Gas</td>
<td>China</td>
</tr>
<tr>
<td>Hyundai Engineering</td>
<td>RE-145SP/RTTF-245MUBP</td>
<td>Air/Mixed Gas</td>
<td>Turkmenistan</td>
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<tr>
<td>Hyundai Engineering</td>
<td>RF-350KP/RMF-250P/300P/300VP/RE-200P/295P</td>
<td>N2&amp;H2O/N2/Air</td>
<td>Korea</td>
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<tr>
<td>Samsung Engineering</td>
<td>RTF-350NFZP/RE-130NFP#1</td>
<td>Mixed Gas/N2+Hexane Vapor</td>
<td>Uzbekistan</td>
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<tr>
<td>Samsung Engineering</td>
<td>RTF-350NBZP/RE-125NBP#1</td>
<td>H-C Mixture Gas/N2+Hexane Vapor</td>
<td>India</td>
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<tr>
<td>Samsung Engineering</td>
<td>RF-350NBZP/RE-100NSP</td>
<td>H-C Mixture Gas/N2+Hexane Vapor</td>
<td>Thailand</td>
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<tr>
<td>Daewoo Engineering</td>
<td>RF-350NBZP</td>
<td>H-C Mixture Gas</td>
<td>Thailand</td>
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<tr>
<td>Technip</td>
<td>RF-350NBZP</td>
<td>H-C Mixture Gas</td>
<td>Malaysia</td>
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<tr>
<td>SK Engineering</td>
<td>RG-450MBZP</td>
<td>N2+H2O</td>
<td>Vietnam</td>
</tr>
</tbody>
</table>
Possible Business Chance in Petrochemical Industry?

Polymerization Plant

- Company: Engineering Company
- Model: TRTF-250MUBP
- Application: Mixed Gas Recycling
Possible Business Chance in Petrochemical Industry?

Polymerization Plant

<Value Added Solution Provided by Taiko>

- Product Package Solution
- Design & Engineering
- Procurement
- Vender Management and Control
- Quality Control
- Scheduling, etc.

- Company: Engineering Company
- Model: TRTF-250MUBP
- Application: Mixed Gas Recycling
Approach to our Target

Bare blower unit

Price & Delivery: Less competitive
Quality: Good, No complaints
Competitors: Too many
Industrial Value: Not critical items

Target: Local Packagers for;
- Degassing system
- Industrial air conditioner
- Gas circulation, recover system

Blowers package like degassing system

Price & Delivery: Competitive
Quality: Good,
Advantage: EPC can save procurement cost and workload.
Competitors: Limited
Industrial Value: Critical package

Target: EPC to construct;
- Low Density Polyethylene Plant
- Polypropylene Plant
- Fertilizer
- Oil & Gas, Petrochem, Chemical...
Business Chance in the future?

Development of Taiko Centrifugal Pump with API

- **Pump Type**: Centrifugal Pump (Type: OH2)
- **Target Market**: Oil & Gas, Petrochemical, Fertilizer
- **Application**: Refining
- **Standard**: API 610 (11th Edition)
- **Mechanical Seal**: API 682
- **Coupling**: API 671
- **Launch Target**: 2018 Summer
### Business Chance in the future?

#### Which pump must have API610? How big is the business potential?

<table>
<thead>
<tr>
<th>Type Code</th>
<th>Non-API610</th>
<th>API610 Applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>OH2</td>
<td><img src="image1" alt="EHC" /> <a href="image2">EHC-J</a> <a href="image3">HC</a></td>
<td>HCP</td>
</tr>
<tr>
<td>OH3</td>
<td><img src="image4" alt="ESC" /> <a href="image5">ESC-D</a> <a href="image6">ESD</a></td>
<td>X</td>
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<tr>
<td>VS2</td>
<td><img src="image7" alt="C1T" /> <a href="image8">C2T</a></td>
<td>X</td>
</tr>
<tr>
<td>BB1</td>
<td><img src="image9" alt="HD" /> <a href="image10">2BF</a> <a href="image11">2MS</a></td>
<td>X</td>
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<tr>
<td>BB3</td>
<td><img src="image12" alt="4MS" /></td>
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### Business Chance in the future?

Which pump must have API610? How big is the business potential?

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<td><img src="image12" alt="X" /></td>
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<tr>
<td>BB1</td>
<td><img src="image13" alt="4MS" /></td>
<td><img src="image14" alt="X" /></td>
</tr>
<tr>
<td>BB3</td>
<td><img src="image15" alt="4MS" /></td>
<td><img src="image16" alt="X" /></td>
</tr>
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Centrifugal Pump with API610, which one has business potential?
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Air/N2/Mixed Gas
USA
Mitsui Engineering & Ship building
RD-100NSP
Mixed Gas
Japan
Mitsui Engineering & Ship building
RF-350NBZP
H-C Mixture Gas
Iran
Mitsui Engineering & Ship building
RF-240NSP
Mixed Gas
Qatar
Mitsui Engineering & Ship building
RD-100NSP/125KP/125NP/125NSP/RMF-250KP/
RF-240NSP/RE-150ZP/200KP/200ZP/250P/
250KPZ/350ZP/RG-400P/RF-250KZP/350P
Air/N2/Mixed Gas/Recycle
Gas/N2+H2O/Powder
Transfer/Reactivation Gas
China
Mitsui Engineering & Ship building
LIE-250ZP/400ZP/RD-130ZP#1/RD-100KP/
RF-250KZP/RF-300KZP/RE-200KZP/RME-200ZP/
250BP/RF-295ZP/RD-100ZP/125ZP/150ZP/
RME-200ZP/250BP/RF-295ZP/RD-100ZP/125ZP/
150ZP/RC-100KP
Air/N2+Hexane Vapor
/N2+Gas/N2+Hexane Vapor
Thailand
Mitsui Engineering & Ship building
RE-150KSP/200KZP/150ZP/ED-80NFP
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China Petro Chemical
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Gas/Mixed Gas/N2Gas/Powder
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RE-150KP/RTE-190P/190BP/250P/RTF-245P/
290P/RF-245P/250P/250BP/300MP
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N2+H20
Vietnam