Regenerative burners for Aluminum holding furnace

Indonesia JCM Model Project

July 12, 2017

TOYOTSU MACHINERY CORPORATION
1. Company Profile

Head Office: Symphony Toyota Bldg,
4-11-7 Meieki Nakamura-ku, Nagoya, aichi, 450-0002 Japan

Establishment: February 23 1978
Capital: JPY 325,000,000
Gross sales: JPY 174,860 million
Employees: 705 people (as of Apr, 2017)
Share holder: TOYOTA TSUSHO CORP.
## 2. JCM Project Summary

| Counterpart                  | PT.Yamaha Motor Parts Manufacturing Indonesia  
                          | PT.Toyota Tsusho Indonesia                       |
|-----------------------------|------------------------------------------------|
| Project Site                | Kawasan Industri KIIC, West Java               |
| Technology                  | High efficiency Regenerative burner           |
| Supervisor                  | Hokuriku Techno co., ltd, PT.Hokuriku Techno Indonesia |
| Local manufacturer          | PT.Matahari Wasiso Tama                        |

### Project Site

**PT. YPMI PLANT**

![Project Site Map](image-url)
3. Needs & Regenerative burner

Increasing of Aluminum casting demand with energy reduction

Automotive production outlook

High efficiency **Regenerative burner** will reduce energy consumption
4-1. Crucible Holding Furnace

Crucible holding furnace with Regenerative burner will achieve fuel reduction (over 50%)

Open top crucible can use GBF and Semi solid mixer etc., and supply high quality molten metal for casting

with compact self type regenerative burner

Type: CRU-10
4-2. Crucible Holding furnace

Regenerative burner realize uniform temperature distribution and longer crucible life
5. Eligibility Criteria

<table>
<thead>
<tr>
<th>Criterion 1</th>
<th>The project replaces conventional burners with regenerative burners for aluminum holding furnaces.</th>
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</thead>
<tbody>
<tr>
<td>Criterion 2</td>
<td>Holding temperature of aluminum melt, which is determined in the furnace user’s specification, is within the range from 600 to 800 degrees Celsius.</td>
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<tr>
<td>Criterion 3</td>
<td>The regenerative burners have a structure which leads all exhaust gas to flow through the heat reservoir before discharging it into the atmosphere.</td>
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<td>Criterion 4</td>
<td>Periodical check is planned at least once a year.</td>
</tr>
</tbody>
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![Diagram showing the processes: Aluminum Melting Furnace, Holding Furnace, Casting Machine, Products (Parts)]
6. Monitoring & Emission Reduction

Monitoring parameters

- Consumption of natural gas by the project furnace
- The number of operating days

Emission Reduction

- Fuel consumption (Project)
- Working days
- Natural gas
- Electricity

Reference emission + Project emission = Emission Reduction

Gas Flow meter
Air Flow meter for Air ratio tuning
Holding furnace i
7. Fuel consumption reduction; Result

Average reduction rate: 30%
Natural Gas
8. GHG Emission Reduction

\[ ER_p = RE_p - PE_p \]

- \( ER_p \): Emissions reductions during the period \( p \) [tCO\(_2\)/p]
- \( RE_p \): Reference emissions during the period \( p \) [tCO\(_2\)/p]
- \( PE_p \): Project emissions during the period \( p \) [tCO\(_2\)/p]

11 Holding furnaces; 47 tCO\(_2\)/p
(Jan 2016 ~ Dec 2016)

For more reduction:
- Severe Air ratio tuning
- Maintain crucible – furnace top sealing
9. Project Schedule & Project Subject

Result
- Feasibility Study: 2013
- Validation: Mar 2016
- Public comment: Apr 2016
- Approved Methodology: Feb 10, 2017
- PDD public comment: Mar 2017

Plan
- Validation report: Jul ~ Aug 2017
- Project registration: Aug ~ Sep 2017

Widespread of Regenerative burner
1. Promotion activities in Indonesia
2. Build Maintenance and support system
3. Standardize and cost reduction of Crucible holding furnace

Technology replication opportunities
1. Develop the soaking furnace field for ferrous parts.

Contribution to sustainable development
1. Reduction of natural gas consumption.
2. Environmental preservation by reducing CO2 and NOx emissions
3. Technology transfer to a furnace manufacturer in Indonesia.
   (Production and construction by Indonesian manufacturer)
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Thank you for your attention