The indispensable complement to a melting furnace

ALUMINIUM RECOVERY SYSTEM

Sanshin Sanwa ARS can:

- Do what press and rotary methods cannot
- Achieve over 90% aluminium recovery rate
- Preserve environment
- Deliver rapid ROI and further raise company profits
ALUMINIUM RECOVERY SYSTEM

TOWARDS A NEW ERA FOR THE ALUMINIUM INDUSTRY WITH 3R

RECOVER ALUMINIUM • REUSE RESIDUAL DROSS • REDUCE WASTE MATERIAL
· **Unrivalled reclamation efficiency**
The industry’s first unique, over 90% ratio aluminium alloy reclamation attainment.

· **First-time implementation of continuous, integrated processing**
No pollution will be generated during processing, while all of the residual dross after aluminium recovery can be safely reused or disposed.

· **Short-term cost recovery**
Excellent reclamation efficiency and high-speed processing makes quick ROI possible within a few months of the system’s implementation.

· **A non-polluting system that is easy on the environment**
Leading the factory forefront toward non-dust polluted work environments.

· **Dominant market share of unique technology patents**
Takes pride in the achievement of hundreds of deliveries domestically as well as rapid expansion abroad.

· **Innovative design with completely enhanced automation by sensor**
Over twenty years of automation application.
Aluminium Recovery Process

Dross processing machine, cooled dross supplier, transfer unit, super cooler and classification/sorting unit

Completely Automated Process: Stirring • Cooling • Discharge

Aluminium and dross are separated within the pot

Aluminium Recovery

Residual Hot Dross

Transfer Unit:
Feeder, Pot Inverting Machine

Super Cooler

Classification:
Fine-grain, medium-grain, coarse-grain

Sell & Reuse:
deoxidizing agent, insulation agent, pavement/cement material

Depending on the amount of hot dross to process, we offer the following line-up:

Models 250,350,600,800

Dross Processing Method Comparison

<table>
<thead>
<tr>
<th>Dross Processing Method</th>
<th>Aluminium Recovery, Processing Time</th>
<th>System Integration</th>
<th>State of Residual Dross</th>
<th>Reuse of Residual Dross</th>
<th>Environmental Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sanshin Sanwa Group’ s ARS</td>
<td>Over 90% 5x2min</td>
<td>• Maximum metal recovery • Residual dross cooling • Mesh classification</td>
<td>• Cooled to &lt;50°C in 15-20min</td>
<td>Direct reuse possible: • Deoxidizing agent • Insulation agent • Pavement material</td>
<td>None. Remaining oxides after metal recovery are inert</td>
</tr>
<tr>
<td>Press Method</td>
<td>1-10% 10min+</td>
<td>• Incomplete metal recovery • Cooling</td>
<td>• Large skull head</td>
<td>Additional processing necessary</td>
<td>Some. Chemical reaction risk with water, residual metallic dust, odor, pollution, ammonia emissions</td>
</tr>
<tr>
<td>Rotary Furnace</td>
<td>50-70% 10min+</td>
<td>• Metal Recovery</td>
<td>• Salt Cake</td>
<td>Additional processing necessary</td>
<td>Some. Chemical reaction risk with water, residual metallic dust, odor, pollution, ammonia emissions</td>
</tr>
<tr>
<td>Sieve</td>
<td>50-60% 10min+</td>
<td>• Minimal metal recovery • Classification</td>
<td>• Salts included, uneven distribution</td>
<td>Additional processing necessary</td>
<td>Some. Chemical reaction risk with water, residual metallic dust, odor, pollution, ammonia emissions</td>
</tr>
</tbody>
</table>
High-Speed Aluminium Dross Processing Machine

The metal aluminium present in the hot dross, which was produced in the melting furnace, is reclaimed. Using the thermite reaction of the aluminium oxide (hot dross), the system separates the aluminium oxide and molten aluminium metal through specific gravity and vane stirring. The molten aluminium metal is recovered into an ingot case, and the residual dross is transferred to be separately cooled and classified.

- With the transportable pot, directly rake hot dross into the processing pot that was placed in front of the furnace and set it into the dross processing machine.
- Increased stirring efficiency with the specially-designed double-vane structure
  - Inner and outer double-vanes
  - Variable-speed vane stirring
  - Triangular vane cross section for improved agitation
  - Speed changer for vane rotation is unnecessary
  - Transfer torque is amplified two-fold by using a roller chain transmission
  - Clear-cut design employs only one geared motor to drive the vanes
- Processing time: 5 minutes/pot ± 2 minutes
- Maximum yield rate: 90% or more in ratio to actual aluminium content in dross
- The vanes are integrated into the machine, which prevents malfunctions that could be caused by the vertical motion.
- Dust-proof design through the application of positive air pressure inside the machine housing

Cooled Dross Supplier

Regulates the temperature of hot dross during processing by adding cooled dross to the charge

- Improves work environment hygiene and safety
- Decreases rigorous manual labor
- Unique to our system and cannot be offered by other manufacturers
- Vibration damping device leads to trouble-free operation
- Collects any cooled dross that has overflowed in the super cooler into the system’s flexible container bags
Transfer Unit
Transfers the residual hot dross that was left over after dross processing/aluminium recovery to the Super Cooler

- Unique inverting mechanism allows the machine to work at floor level without needing to create a pit
- All residual dross in the pot is completely discharged and sent to cooling by tilting the pot 145 degrees

Feeder
- Super-roller chain tow style eliminates breakdowns
- Decreased dust production
- Complete automation
- Saves space with its compact design
- Simple setup

Pot Inverting Machine
- Requires minimal space
- Automatically inserts dross into container
- Airtight design facilitates dust collection and prevention
- Ultimately improve workers’ factory environment

Super Cooler
Cools and sorts the residual hot dross after aluminium recovery stage

- Precise design allows for extreme cooling efficacy
- Cooling efficiency: over 95% (to about 50 degrees Celsius) using only a small quantity of circulation water
- Space saving Φ 2000×6500L (Sorter: 3500L) x 16t
- Easy-to-maintain open type water spray system
- Steam-release duct with a natural exhaust system
- No need for pit construction

(the above requirements refer to the 350-model.)
Conveyor

Transfers the classified dross that was previously cooled and sorted

Cooled Dross Supply Conveyor
- The conveyor chains, which are exposed to the hardest loads, provide extreme durability.
- A wear-resistant steel plate used for the round shape of the bottom of the housing offers enhanced durability.

Screw Conveyor
- Transfers fine and medium-size dross particles after being sorted by the cooler.
- A single bearing design is employed to handle the dross without transfer problems that often occur from trapped ash and overloads
- V-shaped housing and adjustable pitch distance also aids in assuring smooth operations

Classification System

Upon its discharge from the cooler, this turn-style sifter automatically classifies the cooled particles by grain size into 2-3 types.

The classified particles can be safely reused as cooled ash for this machine’s temperature control and possibly resold as heat insulation agents, deoxidizing agents, refractory materials and/or pavement and cement materials.

Electrical Control System

Employs Mitsubishi Electric’s advanced PLC System to manage the plant’s various functions

Dust Collector

When dust and ash are produced from dross processing, environmental pollution from dust diffusion can be prevented depending on how the dust is sent to the dust collector. This dust collecting system is determined to abate harmful pollution that can be caused from hot dross processing systems.

- Insulation agent

Overall Design & Operation Features
- All of the equipment is installed directly on the floor, so the system is safe to operate as well as simple to inspect and clean.
- Compact design
- Greater efficiency design since the need for forklift truck operation has been reduced to a minimum.
# High-Speed Aluminium Recovery System Reference Table

<table>
<thead>
<tr>
<th><strong>Dross Processing Machine</strong></th>
<th>800</th>
<th>600</th>
<th>350</th>
<th>250</th>
<th>150 horizontal</th>
<th>150 vertical</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions (L/W/H)</strong></td>
<td>1750/2000/6500 mm</td>
<td>1750/2000/6500 mm</td>
<td>1600/1300/5500 mm</td>
<td>1300/1200/4800 mm</td>
<td>1000/2000/2500 mm</td>
<td>1200/1000/3800 mm</td>
</tr>
<tr>
<td><strong>Pot dimensions (ID/Depth)</strong></td>
<td>Ø1120/1000 mm</td>
<td>Ø1050/900 mm</td>
<td>Ø900/700 mm</td>
<td>Ø830/600 mm</td>
<td>Ø680/490 mm</td>
<td>Ø680/490 mm</td>
</tr>
<tr>
<td><strong>Pot height</strong></td>
<td>1100H</td>
<td>1000H</td>
<td>800H</td>
<td>700H</td>
<td>1000H</td>
<td>700H</td>
</tr>
<tr>
<td><strong>Pot capacity</strong></td>
<td>0.8m³</td>
<td>0.6m³</td>
<td>0.35m³</td>
<td>0.25m³</td>
<td>0.14m³</td>
<td>0.14m³</td>
</tr>
<tr>
<td><strong>Processing capacity</strong></td>
<td>1050±100kg</td>
<td>780±100kg</td>
<td>450±50kg</td>
<td>320±50kg</td>
<td>150±50kg</td>
<td>150±50kg</td>
</tr>
<tr>
<td><strong>Processing time</strong></td>
<td>10±3min</td>
<td>10±3min</td>
<td>5±2min</td>
<td>5±2min</td>
<td>5±2min</td>
<td>5±2min</td>
</tr>
<tr>
<td><strong>Aluminium reclamation rate</strong></td>
<td>Over 90%</td>
<td>Over 90%</td>
<td>Over 90%</td>
<td>Over 90%</td>
<td>Over 90%</td>
<td>Over 90%</td>
</tr>
</tbody>
</table>

## System Specifications

### Super Cooler Unit

<table>
<thead>
<tr>
<th><strong>Dimensions (OD/L)</strong></th>
<th>2000/4500 mm</th>
<th>2000/4000 mm</th>
<th>2000/3000 mm</th>
<th>2000/3000 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cooling performance</strong></td>
<td>Over 95% heat removal</td>
<td>Over 95% heat removal</td>
<td>Over 95% heat removal</td>
<td>Over 95% heat removal</td>
</tr>
<tr>
<td><strong>Processing capacity in weight</strong></td>
<td>2100±100kg</td>
<td>1750±100kg</td>
<td>1500±100kg</td>
<td>1500±100kg</td>
</tr>
<tr>
<td><strong>Required water volume</strong></td>
<td>180±30 ℓ/min</td>
<td>180±30 ℓ/min</td>
<td>150±30 ℓ/min</td>
<td>150±30 ℓ/min</td>
</tr>
</tbody>
</table>

### Transfer Device

<table>
<thead>
<tr>
<th><strong>Maximum load weight</strong></th>
<th>4.5t</th>
<th>4.5t</th>
<th>3t</th>
<th>3t</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pot inversion/transfer time</strong></td>
<td>3 min</td>
<td>3 min</td>
<td>3 min</td>
<td>3 min</td>
</tr>
<tr>
<td><strong>Inversion angle</strong></td>
<td>145 d/c</td>
<td>145 d/c</td>
<td>145 d/c</td>
<td>145 d/c</td>
</tr>
</tbody>
</table>

### Cooled Dross Supplier

<table>
<thead>
<tr>
<th><strong>Cooled dross cut volume</strong></th>
<th>Proper amount</th>
<th>Proper amount</th>
<th>Proper amount</th>
<th>Proper amount</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cooled dross material</strong></td>
<td>Residual waste, dried sand</td>
<td>Residual waste, dried sand</td>
<td>Residual waste, dried sand</td>
<td>Residual waste, dried sand</td>
</tr>
</tbody>
</table>

### Cooled Dross Transfer Conveyor

| **Scaper Type** | ○ | ○ | ○ | ○ |
| **Screw Type** | ○ | ○ | ○ | ○ |

### Operation and Control Panel

| **Push-button switches** | ○ | ○ | ○ | ○ |
| **Touch Panel**          | ○ | ○ | ○ | ○ |

### Total Installation Dimensions (L/W)

| 14000/6000 mm | 12000/6000 mm | 10000/5000 mm | 8000/4000 mm | 2000/2000 mm | 2000/2000 mm |

### Dust Collector (sold separately)

| **Required air volume flow (reference values)** | 350 ~ 400 m³/min. | 350 ~ 400 m³/min. | 300 ~ 350 m³/min. | 300 ~ 350 m³/min. | 80 m³/min. | 80 m³/min. |

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History:
1978 Establishment
1981 Delivered its first high-speed aluminium recovery machine
1986 Utility Model Registration approved for the high-speed aluminium recovery machine
1990 Delivered its first high-speed aluminium recovery machine abroad
2008 Acquired 3 patents in China for the high-speed aluminium recovery system
2010 Approximate total of 400 high-speed aluminium recovery systems delivered

ISO9001:2008

Main Deliveries:
Nikkei MC Aluminum Co., Ltd.
Fujisash Co., Ltd.
Kobe Steel, Ltd.
Honda Motor Company
Toyota Motor Corporation
Furukawa Electric Co., Ltd.
Nissan Motor Co., Ltd.
Denso Corporation
Nippon Kinzoku Co., Ltd.

Abroad: China, Thailand, Malaysia, United States

International Distributor: