MARKING TECHNOLOGY
Continuous casting
Dependable permanent and contrast marking for darned hot products
MARKING TECHNOLOGY

Continuous Casting

Alpine Metal Tech offers a range of high-quality dependable permanent and contrast marking technologies for the continuous casting area. Our strength lies in combination machines for the permanent and high-resolution marking of steel products as well as for the optical recognition and validation of the marking. Our marking machines are available in different versions - floor, bridge or robot type - and are fit to customers individual needs. Reading and tracking systems are available as an add-on feature. Our experienced Alpine Metal Tech team is a strong partner to our customers throughout the product and plant lifecycle. Our expertise in consulting and engineering, commissioning and service is the key to sustainable project success.

OUR TECHNOLOGIES

» Metal Powder Marking
   Slabs, Blooms

» Hot Spray Marking
   Slabs, Blooms

» Single Nozzle Marking
   Slabs, Blooms, Billets, Coils

» Dot Paint Marking
   Slabs, Blooms, Billets, Coils

» Revolving Head
   Slabs, Blooms, Billets
The Metal Powder Marking Machine is designed for marking of slabs and blooms, even in the harsh environment of steel plants. Marking is performed by blowing metal powder through a gas flame for melting it to the surface of the product. Metal Powder Marking Machines are distinguished especially by marking long-lasting, clear and bright characters, which can vary in size and number of lines depending on individual customer requirements. The complete equipment is manufactured using standardised modules, which result in high reliability and low maintenance of equipment, and specially selected electrical and mechanical parts that are designed, well tested and proven to function in heavy industries.

» Low production costs
   Low operating costs for high temperature products compared to marking machines with filling wire, low consumable costs, besides electrical and pneumatic media, only natural gas or LPG. One type of marking powder across full temperature range fits all applications and results in lower storage costs

» High visibility
   Large characters offer a high visibility even from the crane operator. Better visibility compared to wire marker

» Long durability
   Durability of marking at least a half year at outdoor storage

» Easy maintenance
   Application of just one marking media allows easier maintenance handling
Marking is performed by blowing metal powder through a gas flame for melting it to the surface of the product.
MARKING
## TECHNICAL DATA

| Usual application | Slabs  
<table>
<thead>
<tr>
<th></th>
<th>Blooms</th>
</tr>
</thead>
</table>
| Machine types     | Floor  
|                   | Bridge  
|                   | Robot  |
| Machine data      | Temperature range: 400 °C to 1100 °C  
|                   | Marking types: Alphanumeric and special characters  
| Measurement positions | Character size: 40 – 150 mm  
|                     | Number of lines: 1 or 2, depending on character size  
|                     | Typical time of marking: Approx. 60 s for 10 characters at 100 mm size  
| Electrical data   | Main supply: 3 x 400 V, 50 Hz (other voltages possible)  
|                   | Power consumption: Approx. 13 kVA  
|                   | Control voltage: 24 VDC  
| Pneumatic data    | Compressed air: Filtered and drained  
|                   | Pressure: Min. 4 bar  
|                   | Consumption: Max. 0.2 Nm³/min  
| Gas               | Oxygen: Min. 99.5% purity  
|                   | Pressure/Consumption: Min. 3 bar/approx. 2 Nm³/min  
|                   | Consumption per cycle: Approx. 50 Ndm³  
|                   | Natural gas/LPG: Dry and clean without settling elements  
|                   | Pressure/consumption: Min. 1.5 bar/approx. 0.8 Nm³/h  
|                   | Consumption per cycle: Approx. 20 Ndm³  
| Consumables       | Aluminium based powder  

All rights reserved including errors and technical changes.

## OPTIONS

» Other control systems available
The Hot Spray Marking Machine is designed for the marking of slabs and blooms, even in the harsh environment of steel plants. Marking is performed by blowing liquid metal which is melt in an electric arc between two wires to the surface of the product. Hot Spray Marking Machines are distinguished especially by marking of long-lasting characters, which can vary in size and number of lines depending on individual customer requirements. The complete equipment is manufactured using standardised modules, which result in high reliability and low maintenance of equipment, and specially selected electrical and mechanical parts that are designed, well tested and proven to function in heavy industries.

The Hot Spray Marking Machine frame consists of a robust fabricated construction with U-profiles. By means of an external signal „material in marking position“ the machine case advances towards the product that is to be marked and is stopped by means of a touch contact of the mechanical descaler. With the rotating mechanical descaler the whole surface to be marked will be cleaned from loose scale. Afterwards the marking head will be positioned and controlled in the x and y axes to apply the characters during back movement. After the last mark on the product has been made the machine case retracts and returns to its home position and awaits the next marking cycle. In the marking head the spray wires are transported via the feed rollers through the wire nozzles to the point of short circuit in the nozzle system. The arc continuously melts off the spray wires. The spraying air coming from the air nozzle system takes the fused drops, atomises them and transports them onto the prepared surface of the material.

» **Low production costs**  
Low operating costs due to use of standard aluminium welding wires up to 900 °C. Low consumables costs.

» **High visibility**  
Large characters offer a high visibility even from the crane operator.

» **Long durability**  
Durability of marking at least a half year at outdoor storage

» **Extendable**  
Automatic OCR Reading System available
Marking is performed by blowing liquid metal which is melt in an electric arc between two wires to the surface.
1. Base frame / Bridge
2. Marking unit
3. Feed rollers
4. Wire nozzle
5. Air nozzle
6. Pressure lever
7. Pressure plate
8. AC motor
9. Current supply
10. Spraying air supply

MARKING
## TECHNICAL DATA

<table>
<thead>
<tr>
<th>Usual application</th>
<th>Slabs</th>
<th>Blooms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine types</td>
<td>Floor</td>
<td>Bridge</td>
</tr>
</tbody>
</table>

### Machine data
- **Temperature range:** 20 °C to 900 °C
- **Marking types:** Alphanumeric and special characters

### Measurement positions
- **Character size:** 60 - 150 mm
- **Number of lines:** 1 or 2, depending on character size
- **Typical time of marking:** Approx. 60 s for 10 characters at 100 mm size

### Electrical data
- **Main supply:** 3 x 400 V, 50 Hz (other voltages possible)
- **Power consumption:** Approx. 13 kVA
- **Control voltage:** 24 VDC

### Hydraulic data
- **Compressed air:** Filtered and drained
- **Pressure:** Min. 4 bar
- **Consumption:** Max. 0.2 Nm³/min

All rights reserved including errors and technical changes.
SINGLE NOZZLE MARKING

The Single Nozzle Paint Marking Machine is designed for the marking of coils, tubes and sections as well as for slabs, blooms and billets, even in the harsh environment of the steel plant. The system is based on paint marking with single-nozzle marking heads. The complete equipment is manufactured using standardised modules, which results in high reliability and low maintenance of equipment and specially selected electrical and mechanical parts that are designed, well tested and proven to function in heavy industries.

Robot version:
The Single Nozzle Marking Machine is based on a foundry industrial robot. The characters are generated by the robot moving the marking head (single nozzle technology) along the product.

Floor/bridge version:
The Single Nozzle machine frame of the floor/bridge version consists of a robust fabricated construction, linear rails and safety devices for the marking head. The characters are generated by an electrical writing movement of the marking head with x and y axis driven by servo motors.

The paint quantity is easily adjustable at the marking nozzle. The machine is controlled by a SPS type Siemens S7 with standard interfaces to steel plant equipment and fault diagnostic system.

» Uniform marking image
   Due to a continuous fluent writing movement

» High visibility
   Large characters offer a high visibility even from the crane operator.

» Short marking cycles
   Extremely short marking cycles, as printing movement is performed by the "wrist of the roboter"
The system is based on paint marking with single-nozzle marking heads.
MARKING
### TECHNICAL DATA

| Usual application | Coils  
| Slabs  
| Blooms  
| Billets  |
| Machine types | Floor  
| Bridge  
| Robot  |
| Machine data | Temperature range: -5 °C – 1100 °C  
| Marking types: Alphanumeric characters and special characters  
| Marking data: Character size 30 – 150 mm  
| Number of characters and lines on request  |
| Electrical data | Main supply: 3 x 400 V, 50 Hz (other voltages possible)  
| Power consumption: Approx. 10 kVA  
| Control voltage: 24 VDC  |
| Pneumatic data | Compressed air: Filtered and drained  
| Pressure: Min. 5 bar  
| Consumption: Max. 0.1 Nm³/min during marking process  |
| Consumables | Paint: Water based for hot products (<1100 °C)  
| Solvent based for cold products (-5 °C to ~200 °C)  |

All rights reserved including errors and technical changes.

### OPTIONS

- Air processing unit with refrigerator dryer
- Heat protection covers
- Air compressor with processing unit
- Water-based or mechanical descaling for hot applications
The Dot Paint Marking Machine is designed for the marking of coils, slabs, blooms, plates and billets, even in the harsh environment of the steel plant. The system is based on paint marking with 7 or 9 nozzle marking sections. The marking equipment can be combined with all NUMTEC base machines and is available as stand-alone machine or in combination with MX Punch Marker. The complete equipment is manufactured using standardised modules, which results in high reliability and low maintenance of equipment and specially selected electrical and mechanical parts that are designed, well tested and proven to function in heavy industries.

Robot version:
The Dot Paint Marking Machine is based on a foundry industrial robot. The characters are generated by the robot moving the marking head (seven or nine nozzle technology) along the product.

Floor/bridge version:
The Dot Paint machine frame of the floor/bridge version consists of a robust fabricated construction, linear rails and safety devices for the marking head.

The size of dots and the paint quantity are easily adjustable at the marking nozzle. The machine is controlled by a SPS type Siemens S7 with standard interfaces to steel plant equipment and fault diagnostic system.

» High visibility
  Large characters offer a high visibility even from the crane operator.

» Short marking cycles
  Extremely short marking cycles, as marking is done in one movement

» Flexibility
  Highly flexible system due to possibility of expansion of the functionality
The characters are generated by moving the product along the dot paint marking head or the dot paint marking head along the product.
MARKING
## TECHNICAL DATA

<table>
<thead>
<tr>
<th>Usual application</th>
<th>Coils</th>
<th>Slabs</th>
<th>Blooms</th>
<th>Billets</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Machine types</strong></td>
<td>Floor</td>
<td>Bridge</td>
<td>Robot</td>
<td></td>
</tr>
<tr>
<td><strong>Machine data</strong></td>
<td>Temperature range: -5 °C to 1100 °C</td>
<td>Marking types: Alphanumeric and special characters within 7 x 5 or 9 x 7 dot matrix</td>
<td>Marking data: Character size 30 – 150 mm</td>
<td>Numbers of characters and lines on request</td>
</tr>
<tr>
<td><strong>Electrical data</strong></td>
<td>Main supply: 3 x 400 V, 50 Hz (other voltages possible)</td>
<td>Power consumption: Approx. 10 kVA</td>
<td>Control voltage: 24 VDC</td>
<td></td>
</tr>
<tr>
<td><strong>Pneumatic data</strong></td>
<td>Compressed air: Filtered and drained</td>
<td>Pressure: Min. 6 bar</td>
<td>Consumption: Max. 1.2 Nm³/min during marking process</td>
<td></td>
</tr>
<tr>
<td><strong>Consumables</strong></td>
<td>Paint: Water based for hot products (&lt;1100 °C)</td>
<td>Solvent based for cold products (-5 °C - -200 °C)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### OPTIONS

- Air processing unit with refrigerator dryer
- Heat protection covers
- Air compressor with processing unit
- Water-based or mechanical descaling for hot applications
REVOLVING HEAD STAMPING

Revolving Head Stamping Machines are distinguished especially by the stamping of unmistakable and full characters, which can vary in size and number of lines depending on individual customer requirements.

Stamping is done with simple pneumatic impact cylinders. To ensure product tracking in further production process, the Inline Revolving Head Marking Machine is expandable with the NUMTEC OCR Reading system. The complete equipment is manufactured using standardised modules, which result in high reliability and low maintenance of equipment, and specially selected electrical and mechanical parts that are designed, well tested and proven to function in heavy industries.

» Low production costs
  Very low running costs, no consumables costs, except set of stamps (insignificant). Marking during casting, no separate marking position, shorter run out area

» 100% product identification
  No tracking because of marking before cutting

» High visibility and long durability
  High legibility with human eye due to unmistakable character design, Permanent and destroyable marking because of the penetration depth with impact cylinder, application possible on rough surfaces

» Easy maintenance
  Low maintenance because there are no hydraulic components installed with sealing and leakage problems
Stamping is done with simple pneumatic impact cylinders.
MARKING
## TECHNICAL DATA

<table>
<thead>
<tr>
<th>Usual application</th>
<th>Slabs</th>
<th>Blooms</th>
<th>Billets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine types</td>
<td>Floor</td>
<td>Bridge</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine data</td>
<td>Temperature range: 600°C to 1,000°C</td>
<td>Character size: 12, 15, 20, 25 mm</td>
<td>Marking head with: 16, 19, 20, 24 mm</td>
</tr>
<tr>
<td></td>
<td>Number of lines: 1-4</td>
<td>Typical time of marking: Approx. 12 s for 10 characters in one line</td>
<td></td>
</tr>
<tr>
<td>Electrical data</td>
<td>Main supply: 3 x 400 V, 50 Hz (other voltages possible)</td>
<td>Power consumption: Approx. 7 kVA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Control voltage: 24 VDC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pneumatic data</td>
<td>Compressed air: Filtered and drained</td>
<td>Pressure: Min. 5 bar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Consumption: Max. 0.3 Nm³/min</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All rights reserved including errors and technical changes.

## OPTIONS

- Expandable with automatic fixed OCR reading systems