With the accumulated know-how and technology inherited from POSCO Steel Works, POSHI Caster (POSCO High Integration Caster) is designed to produce high quality slabs with high productivity and strength for AHSS (Advanced High Strength Steel).
POSHI Caster - High Performance Continuous Casting Machine

POSHI Caster (POSCO High Integration Caster) is designed with accumulated know-how and technology inherited from POSCO. POSHI Caster boasts of its production capacity of 1 million ton per year of AHSS (Advanced High Strength Steel), considering usual production capacity of other facilities. POSHI-Caster represents POSCO E&C’s excellence in its stability and high-end technology.

In order to float non-metallic inclusions up on the meniscus, the caster is vertical bending type. The roll pitch profile of the caster suits for high speed casting (2.3 meter per minute) and wide casting. Short roll pitch and little repeatability minimize meniscus hunting by dynamic bulging. Spray width adjustment and marging control technology are adapted as precise temperature control of slab corner. Strand guide equipment is robust than existing ones due to strength increase points. Strongly cooled roll can protect equipment from heat and help slab be cooled.

Steel grade
- Ultra low carbon (Exposed steel, Gi. GA)
- Low carbon (HSLA pipe grade, API X52, API-2H-50)
- Medium low carbon (Boiler & Pressure vessel)
- Medium carbon (SM490A, Ship building, TMCP)
- High carbon (API J55)
- AHSS (Advanced High Strength Steel)
- TWIP (Twining Induced Plasticity)
- TMCP (Thermo Mechanical control process)

In order to provide high strength slabs such as AHSS with high casting speed, the following methods are applied.

1. Pass-line

Roll Geometry and Cooling Zone Design

Client Requirement
- Production Size
- Steel Grade
- Annual Production
- Steel making information

Roll Geometry
- Casting Radius
- Roll arrangement
- Roll type

Thermal
- Cooling zone
- Solidification and position

Strain/strain rate
- Strain Analysis to Prevent Cracking

Design Data
Machine, Piping, EIC

Roll pitch is determined to reduce mold fluctuation due to dynamic bulging and internal crack. It is considered withdrawal force, segment reduction force, roll deflection and bearing load to design. Therefore this is optimized design for guarantee the high performance.

2. Mold and Oscillator

Mold Assembly
Since the higher casting speed incurs more break-outs, the height of copper plates is longer than conventional casters in order to ensure strong solidified shell at right under the mold exit. Two divided cooling zones for narrow side can be chosen according to casting speed and steel grade.

Oscillator Assembly
Since each oscillator is identical, the user can prepare the minimum number of exchange part with low cost. Transverse error is measured under 0.1 mm during oscillation. This provides high performance to casting.

3. Bender and Segment

Bender
It is essential to reduce the deflection of the guide roll and frame in order to produce high strength steel grade. So, the roll is designed with back-up roll to support the strand guide roll, and the frame is the structure of the side box form and thickened frame beam is also equipped with sufficient rigidity.

Segment
Spray width controller is provided for high quality of slab with symmetric precision spray nozzle control, and dry casting is possible by applying the small-diameter steel cooled roll with excellent cooling capacity.
Value added technology in BOF Steel Plant

EPPM (End Point Prediction Model) of BOF

- **System Selection**
  - No Sub-Lance Prediction
  - With Sub-Lance Prediction

- **View Option**
  - Total Prediction Model
  - Carbon Prediction Model
  - Temperature Prediction Model
  - Error Analysis

- **Technical Support**
  - Remote Support by Developer
  - Self Diagnosis

- BOF: Basic Oxygen Furnace
- EPPM: End Point Prediction Model

EPPM BOF STEEL PLANT

<table>
<thead>
<tr>
<th>Factor</th>
<th>Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>End-Point C, 75% of heats</td>
<td>± 0.005%</td>
</tr>
<tr>
<td>End-Point C, 90% of heats</td>
<td>± 0.008%</td>
</tr>
<tr>
<td>End-Point C, 93% of heats</td>
<td>± 0.01%</td>
</tr>
<tr>
<td>End-Point Temperature</td>
<td>± 15°C</td>
</tr>
</tbody>
</table>

EPPM BOF is composed of two process control models, one is end point carbon prediction model, the other is temperature prediction model. These two models can communicate with each other and adjust several factors for accuracy by program developer on online network.

Mainly EPPM BOF system predicts temperature and carbon contents of molten steel from 80% to 100% of oxygen blowing with sub-lance. (If there is no sub-lance system, accuracy of EPPM BOF can be lower than with sub-lance from 0% to 100% of oxygen blowing). After checking carbon contents and temperature of molten steel using sub-lance at 80% of oxygen blowing, EPPM BOF can be operated to predict and give operator temperature, carbon contents and oxygen flow rate required to meet the target.

EPPM SYSTEM CONFIGURATION

The EPPM BOF system reads several data from process of converter and off-gas treatment system to expect tapping temperature and carbon contents, but the most important feature is off-gas composition from an analyzer.

The analyzer is Non-Dispersive InfraRed (NDIR) type and installed behind Electro-Static Precipitator (E.S.P). Because of the location of analyzer, there is extremely a low possibility of malfunction by dust, which is a different point from the other End Point Prediction technology based on off-gas analysis.
POS Un C introduces the New Technology in Indian market

POS Un C signed a Memorandum of Agreement (MOA) with Shree Umm Steel and Power Ltd., the Indian firm, for the integrated steel plant of an estimated annual production capacity of 1.5 MTPA in Maharashtra on 11th August, 2015.

Mr. Ankil Migiani (Deputy Managing Director) of Uttam Galva said, “We have been working with POSUn C for the steel business over the years. Today’s signing shows our intention to further advance the collaboration with POSUn C to a higher level on the value chain.

Also, we assume that the future of the Indian Steel Industry is bright and this collaboration could lead to a leap on the global steel stage.

We hope to create an integrated steel plant with POSUn C’s help, which will be a center of manufacturing excellence.”

The plant will be located at Satara in Sindhudurg district in two phases and become the first project for POSUn C with POSUn C’s holding technologies, POIST (combined FINEX® with CEM®), to execute in India.

POSUn C will be in charge of the Project Engineering, Procurement and Construction as a single EPC Contractor and plan to start the construction work at the end of 2016. The whole project works is scheduled 36 months to complete.

POS Un C receives the Letter of Award for Carmichael Mine CHPP

On 28th July, Adani Mining Pty. Ltd. (Adani) issued the Letter of Award (LOA) to engage POSUn C with the right to perform the Engineering Procurement and Construction (EPC) works for the Coal Handling and Preparation Plant Package of the Carmichael Coal Mine. This contract will be delivered by a joint venture between POSUn C and DOWNER EDI Engineering Power Pty Ltd, and valued at AUD 420 million.

Through strategic partnership with Downer, a leading contractor in mining sector in Australia, POSUn C has significant experience and capability in managing and delivering integrated EPC service for mineral mining projects.

With this opportunity, POSUn C expects to offer total-packaged solution from Pit to Port in an effort to provide greater satisfaction and services to its customers around the world by further strengthening its core technologies and expertise.

Co-marketing efforts with POSUn C to meet the increased demand of CEM technology

POSUn C has spurred the co-marketing campaign with POSUn C for the POSUn C’s propriety developed Compact Endless Casting & Rolling Mill (CEM®). The technology has gained great attention of worldwide steel companies in China, India, America and etc. As part of the campaign, visiting marketing services at clients’ premises has been implemented to assess the clients’ needs and this campaign has also been continued during the major steel conferences. In addition, they plan to elevate the maturity of the technology through sharing CEM with each other on an ongoing basis.

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