



## Reaching New Productivity Levels for Stainless Steel Operation with BSE Oxygen Technology

### Tilttable VLB System Installations at Outokumpu in Sweden and USA

**O**utokumpu is a global leader in stainless steel. The market is picking up and there is a demand to sell more volume. Thus the production facilities have to be equipped for the increased demand – in the case of Outokumpu by installation of state-of-the-art oxygen technology systems at the EAFs.

The excellent results achieved with the BSE Virtual Lance Burner (VLB) system at Outokumpu Tornio (Finland), the benefits of the unique tiltable design and the confidence of Outokumpu management in BSE/BSW were the main reasons to extend the cooperation with BSE by ordering two further VLB systems for Outokumpu's plants in Calvert (USA) and Avesta (Sweden).

#### Outokumpu Calvert (USA)

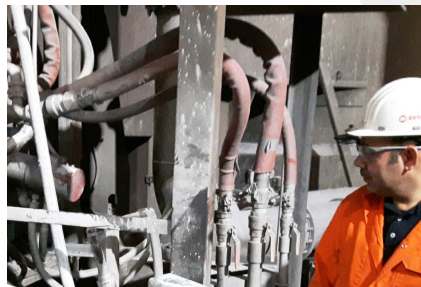
Since its installation in 2012, the 165 metric ton AC EAF at Outokumpu's Calvert facility had operated without a side-wall burner system, limiting the melting functionality to only its electrodes. With the installation of the Tilttable VLB by BSE the Outokumpu team expected to realise an increase in the furnace's productivity coupled with a reduction in conversion costs.

The concept mutually developed by Outokumpu and BSE comprised the elimination of the existing cold spots within the EAF by installation of three VLBs and necessary auxiliaries. With these energy sources a more homogenous heat distribution around furnace should be achieved.

An investigation conducted by BSE prior to the project found out that parts of the equipment including the valve racks for oxygen and natural gas could be re-used (with minor modification) from the idle Outokumpu plant in Bochum (Germany).



Tilttable VLB panel complete with hydraulic cylinder and hoses



Visual check by BSE experts during installation and optimisation phase

The VLB system was commissioned and started up in July 2017, including process optimisation and training for operation and maintenance staff. The positive experience of the project and detailed results will be presented by Outokumpu at the **AISTech conference in May 2018 in Philadelphia (USA)**.

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#### Outokumpu Avesta (Sweden)

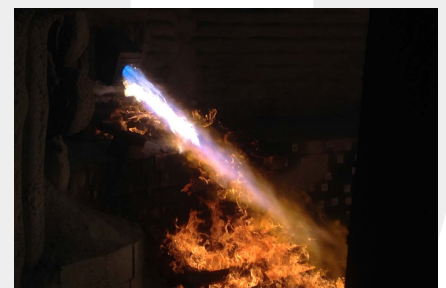
Due to productivity increase at the AOD converter, the 90 ton EAF has become the bottleneck in the meltshop.

In order to increase the productivity also at the EAF, Outokumpu decided to replace

the 20 year old burner system (3x3 MW) with a new tiltable VLB system from BSE. Beside the increase in burner power (up to 3x5 MW), the new system should also be more reliable and maintenance friendly, e.g. the old burners were often clogged due to inappropriate operation mode.



Furnace view with VLB in operation – burner mode with flat angle ...



... and lancing mode with steep angle

The first results after the start-up in August 2017 were promising: For the two reference steel grades, the **power-on time decreased by 11 % and 7 %**. **Electrical energy consumption decreased by 8 % and 5 %**. Due to the flexibility of the BSE VLB system and its variety of operation modes, Outokumpu is ready to achieve this new level of performance also for further steel grades.

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