



*Berry Metal Company supplies Water-Cooled Oxygen Lances, Post Combustion Lances, Sensor and Camera Lances, Furnace Deskulling Lances, Oxy-Fuel Burners and specially designed Forged and Cast Lance Tip Sub-Assemblies. Additionally, we provide repair service, technical support, complete replacement parts and field service.*

# BOF

## Products

Berry Metal Company is the world's largest Oxygen Lance designer and builder, and the No. 1 value-added Lance technology supplier in North America.

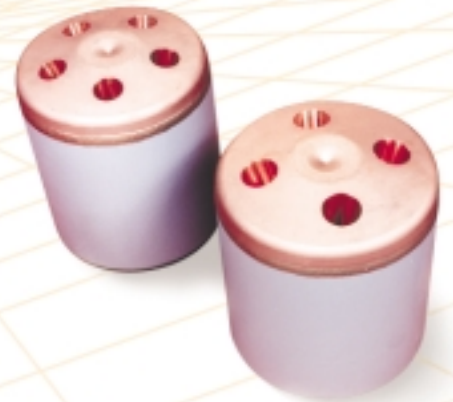
### **Steelmakers cite the following advantages of Berry Metal Company Lances:**

- Safety of design with water-cooled Cast and Forged Lance Tips.
- Non-consumable, reusable Lances that deliver long service life and improve overall refining performance.
- Low maintenance costs through replaceable Tip Sub-Assemblies using standard welding practice.
- Fast repair capability, easy Tip design change, all internal Lance seals, plus interchangeable parts.
- Immediate engineering and technical support, rated state-of-the-art worldwide for Lances and furnace practices.
- Capabilities for post combustion as well as lime, graphite and special purpose Lance Tips.
- Research and development to provide answers for extended Lance life.



### **Forged Lance Tip Sub-Assemblies**

- Our patented, specially designed Tips come in an array of sizes and hole configurations.
- Proven design with a forged copper Tip to provide maximum life.
- Designed for quick and safe Lance repairs.
- Specially designed water passages to allow for ideal water velocities and improved cooling dynamics to provide optimal heat transfer and maximum life.
- Engineered oxygen nozzles to provide desired bath penetration and coverage.





## Single and Double Flow Post Combustion Lances

- This state-of-the-art design allows steelmakers to maximize the heat energy in the furnace.
- It also is used as a maintenance tool to reduce and even eliminate Lance build-up or skulls as well as reduce build-up in the furnace mouth and cone areas.
- The Double Flow Lance design has two oxygen control systems that permit independent control of the secondary oxygen for the most efficient combustion of CO to CO<sub>2</sub>.
- The Single Flow Lance design "splits" a percentage of the main oxygen for the post combustion oxygen and can be easily retrofitted into an existing BOF Oxygen Lance.
- Allows for increased scrap consumption permitting greater flexibility in scrap-to-hot-metal ratios.
- Faster heat times from the increased heat generation created by "post-combusting" CO to CO<sub>2</sub>.

## Deskulling Lance Tips

- The patented Berry Metal design Deskulling Tip allows steelmakers the ability to deskull or "clean" their vessel.
- Various configurations and hole sizes can be implemented.
- The Deskulling Tip can be manufactured to fit any style Oxygen Lance.
- New multi-row, multi-angled Deskulling Tips are available.



For more information on this and other technological innovations, contact Berry Metal Company at 724-452-8040 or [www.berrymetal.com](http://www.berrymetal.com).



## Water-Cooled Oxygen Lance Design and Repair

- The double O-ring design provides protection for the intermixing of oxygen and water.
- Internal slip joints allow for thermal expansion and contraction resulting in no internal stresses.
- The modular design allows for easy inspection and repair.
- Delivery on special Berry Metal Company trucks is available.
- BMC offers excellent technical service as well as 50 years of steelmaking experience and service in the industry.
- Complete product failure analysis can be provided to help improve product performance.
- ISO 9001 Certified.







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## Single and Double Flow

# Post Combustion Lances

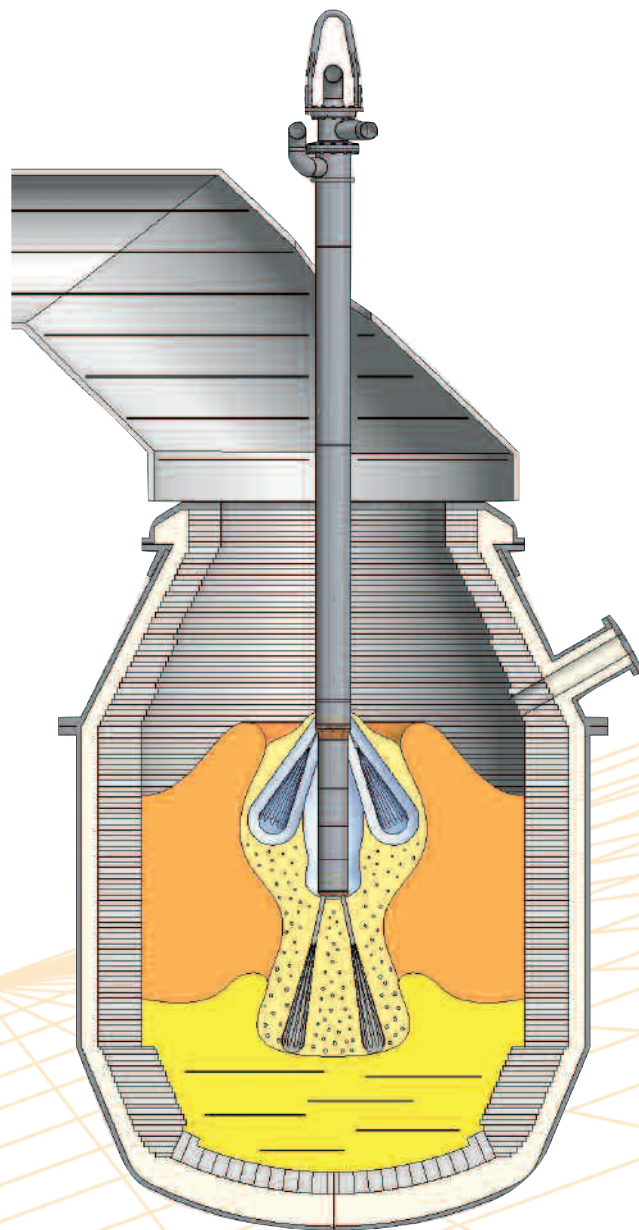
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## Single and Double Flow Post Combustion Lances

Berry Metal Post Combustion Lances allow BOF operators to take maximum advantage of the heat energy contained in the carbon monoxide (CO) gas produced in the vessel during the refining of a heat of steel. By increasing the Post Combustion ratio (reducing CO by the reaction  $\text{CO} + 1/2 \text{O}_2 = \text{CO}_2$ ) inside the BOF vessel, the thermal efficiency of the process is greatly enhanced.

The Post Combustion Lance is provided in two designs: a Double Flow design which contains two separate and independent oxygen systems; and a single flow or split flow design which contains an internal distribution system that "splits" a part of the main oxygen flow for the Post Combustion oxygen.

The special Double Flow Lance requires two oxygen control systems and two oxygen inlets to the Lance. This Lance has an additional advantage for independently controlling the secondary oxygen for the most effective combustion of CO to CO<sub>2</sub> during the heat refining period. The Single Flow Lance design can be easily retrofitted to an existing BOF system and requires modification to the lower Lance barrel only. In both designs, Post Combustion oxygen is introduced through the Distributor and is combined with the CO produced from the main oxygen reaction to liberate extra heat energy within the vessel.

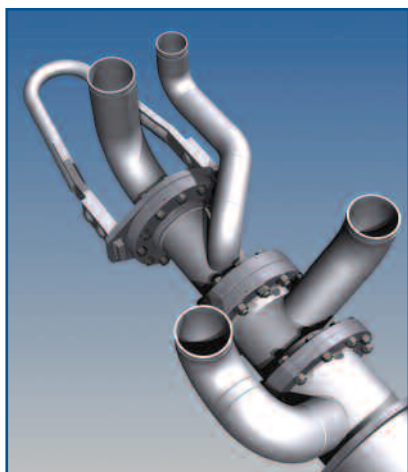


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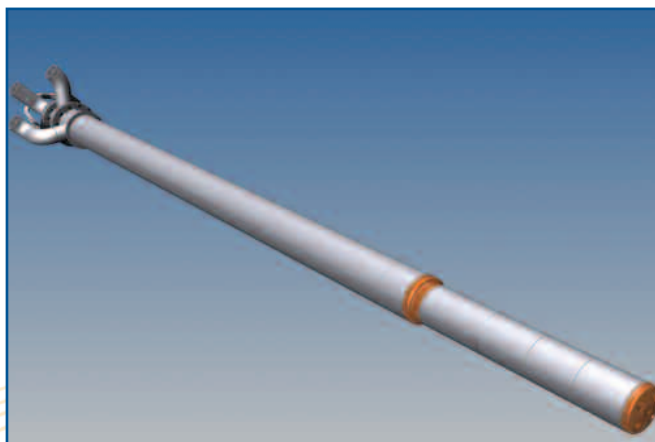




Single "Split" Flow



Double Flow



## The Benefits of Post Combustion Lances

- This state-of-the-art design allows steelmakers to maximize the heat energy in the furnace.
- PC is used as a maintenance tool to reduce and even eliminate build-up and skulls on Lance barrels.
- Post Combustion is used also to eliminate and reduce build-up in furnace mouth and cone areas.
- PC Lances allow for increased scrap consumption permitting greater flexibility in scrap-to-hot-metal ratios.
- Faster heat times from the increased heat generation created by "post combusting" CO to CO<sub>2</sub> above the bath level.
- Furnace utilization is maximized with deskulling technology.
- This technology is a good tool to be used in conjunction with slag splashing.
- Post Combustion can help reduce furnace slopping.
- Safety is improved as workers no longer need to manually deskull Lances.
- Potential for reduction in CO off-gas as CO is combusted to CO<sub>2</sub>.
- Lance utilization is increased because Lances are no longer required to be cleaned and deskulled.
- Post Combustion can help with dephosphorization.
- Reduce mechanical damage to the furnace mouth and cone areas caused by Gradall's and other heavy equipment.

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