



*SUPERSONIC WATER-COOLED*

*OXYGEN-CARBON INJECTION SYSTEMS*

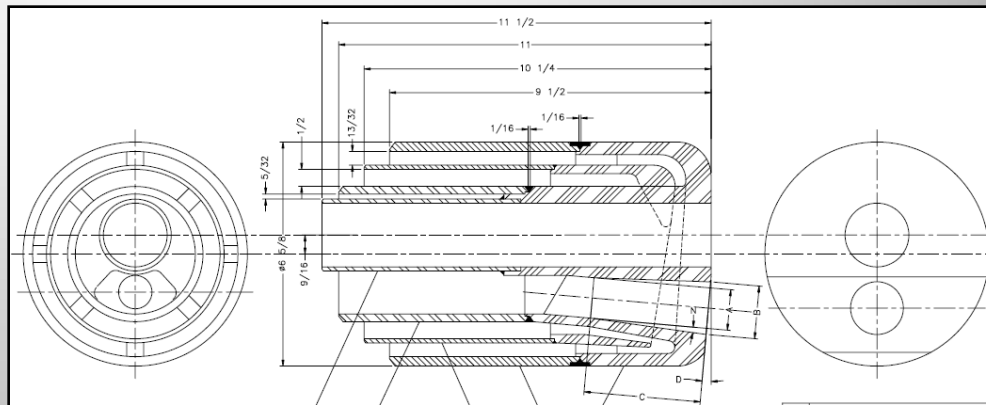
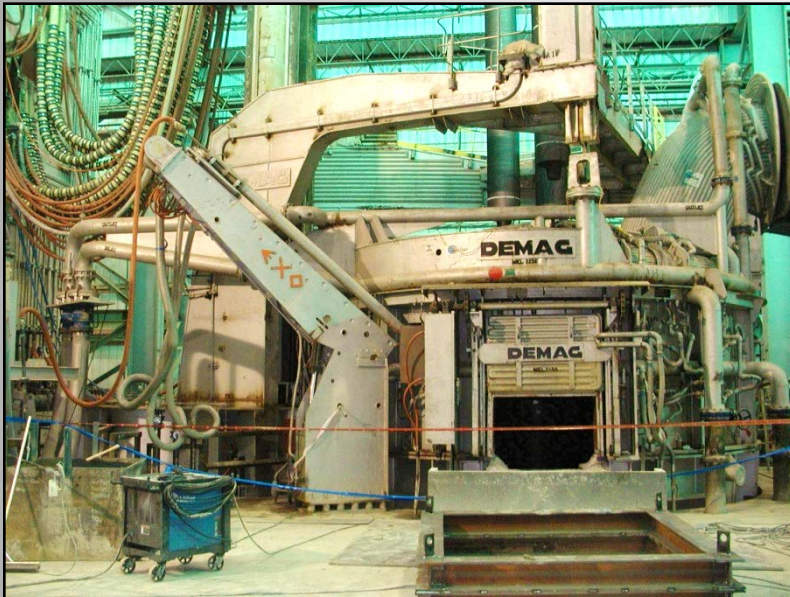
# *Sidewall Entry Water-Cooled Lance System*

## The Basics

- Manipulator fixed on the EAF platform.
- Manipulator moves together with EAF.
- Oxygen penetrates bath at fixed angle.
- Oxygen & carbon use common barrel.
- Optimum oxygen velocity mach  $2.0 > 2.2$ .
- Oxygen flow rates up to 8,000 Nm<sup>3</sup>/Hr.
- Decarburization rates up to 7 pts./minute.
- Carbon flow rates up to 100 kg/min.
- Copper tip life variable – 300 heat avg.
- Robust construction, hydraulic operation.



## Sidewall Entry System - Examples





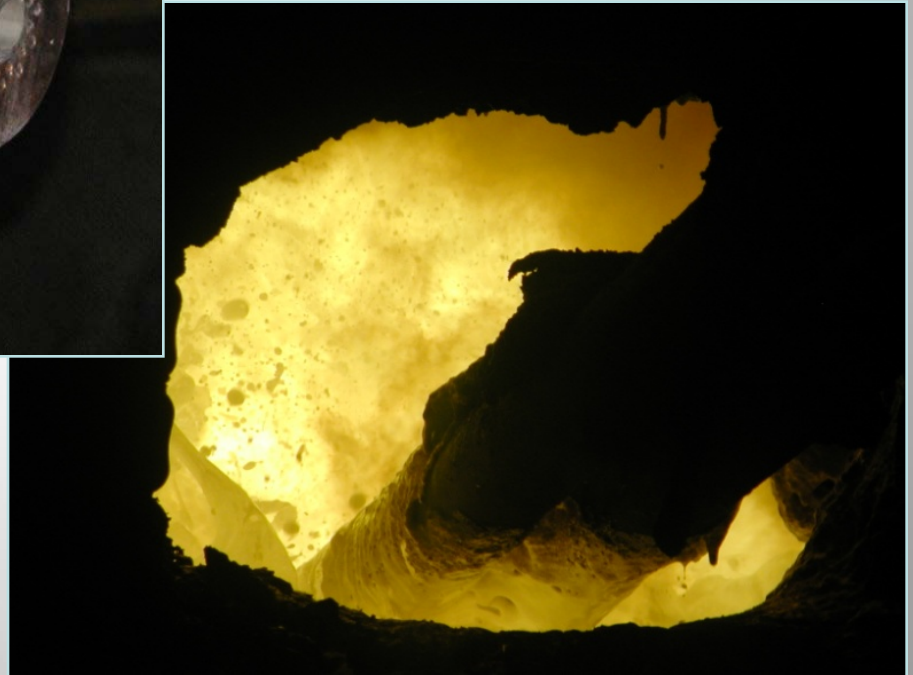
# *Door Entry Water-Cooled Lance System*

## The Basics

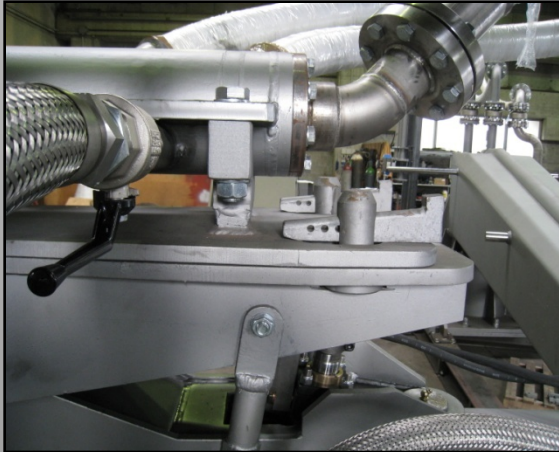
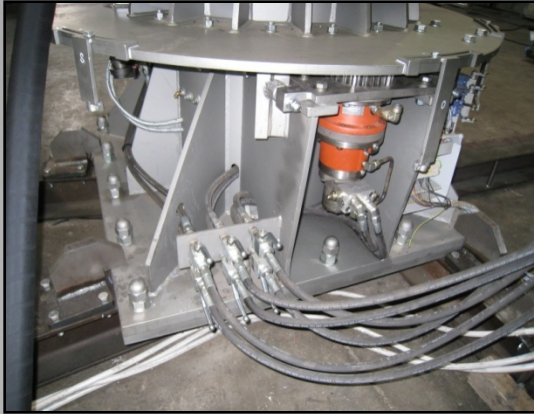
- Manipulator positioned on fixed platform.
- Lance(s) enter through slag door.
- Used during meltdown for scrap cutting.
- Used during refining for decarburization.
- Operator has excellent visibility of process.
- Optimum oxygen velocity mach  $2.0 > 2.2$ .
- Oxygen flow rates up to  $8,000 \text{ Nm}^3/\text{Hr}$ .
- Decarburization rates up to 7 pts./minute.
- Carbon flow rates up to 100 kg/min.
- Copper tip life variable – 500 heat avg.
- Robust construction, hydraulic operation.



## *Door Entry System - Examples*



# *Door Entry System - Main Components*

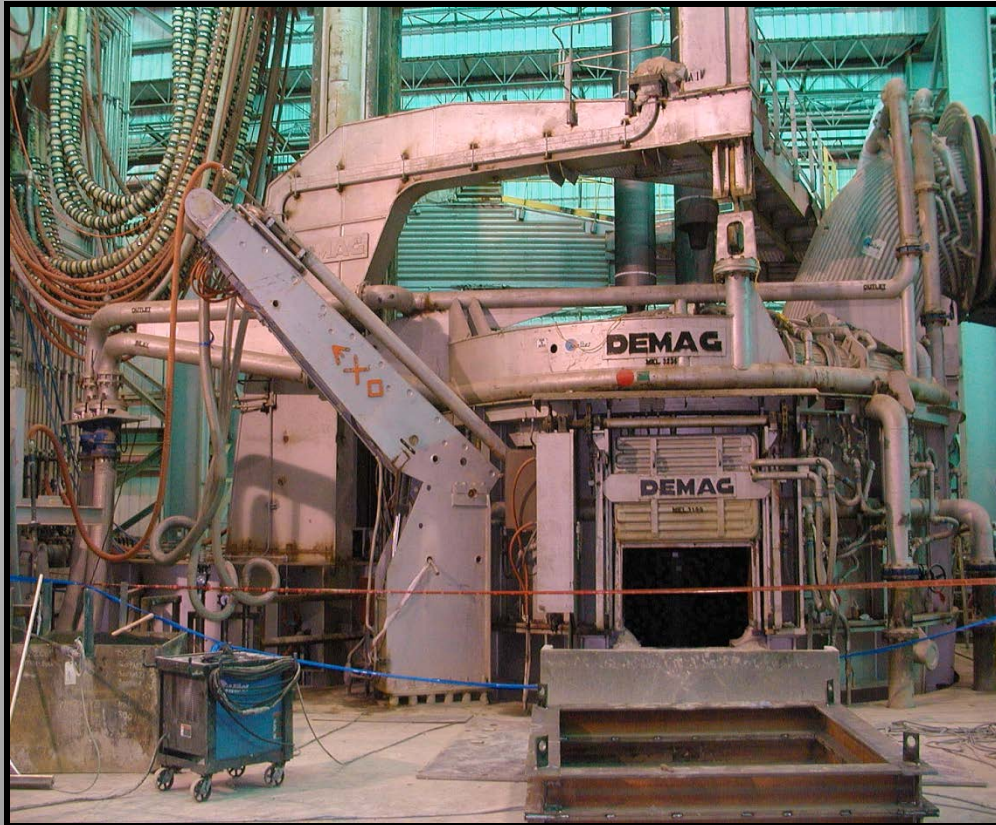




## *WATER-COOLED LANCE RESULTS*

- Oxygen-Carbon lances can be used for door clearing and scrap cutting.
- Oxygen lancing time is in excess of 90% of power-on-time.
- Oxygen flow rates can range from 300 to 8,000 Nm<sup>3</sup>/Hr.
- Mechanical reproducibility of lance position allows predictable results.
- Carbon and oxygen efficiency can be improved by approximately 30%.
- Electric energy savings of 10-20 kwh/ton can be realized.
- Oxygen and carbon lances can inject independently.
- Panels around the door do not need replacement from oxygen lance piercing.
- Average tip lifetime of 300/400 heats with 800 heats possible
- Lance change procedure requires less than 15 minutes.
- Manipulator is a simple piece of equipment demanding minimal maintenance.

## *RESULTS - SDI Structural Mill*



### BEST PERFORMANCE

Tap Weight: 125 Tons

Tap Carbon: .03% C

Power On Time: 26'

MWH: 38

Power: 304 kwh/ton

Oxygen: 1440 scf/ton

Charge Carbon: 2,000#

Injection Carbon: 2,500#





EXO TECHNOLOGIES

P.O. Box 302

Cedarburg, WI 53012

Phone: +1 262 375 1212

Fax: +1 262 375 1515

Email: [sales@exosteel.com](mailto:sales@exosteel.com)

Web: [www.exosteel.com](http://www.exosteel.com)