

Innovative and sustainable solutions for dust reduction in the steel industry

PNR Italia helps to recover waste materials from steel production



SCENARIO FOR THE SECTOR

Cooling and dust abatement in steelworks

In the steel production process, **handling the slag is a critical phase in which the dust generated during the various processing stages can be dispersed in the environment.**

Slag is a by-product of the iron ore smelting and processing process for steel production, and its transport within steelworks can cause significant dust emissions.

During the slag's handling, fine particles are lifted into the air and transported by the wind, contributing to atmospheric contamination in the surrounding area. **These powders contain calcium, aluminum magnesium oxides, and other contaminants** that can negatively impact air quality and environmental safety.

THE PROBLEM OF OUR CLIENT

Our customer contacted us to meet different needs.

First, he needed to **effectively limit the dispersion of white slag dust (or ladle slag)** in the media discharge area; secondly, he had to **cool the same by wetting that area as evenly as possible.**

The request was that the water distribution during spraying not exceed a specific limit to avoid the risk of implosion below the surface level.

Last but not least, there was the need to recover the waste used in small parts in the same process, mostly recycled in the construction sector.

PNR ITALIA SOLUTION

We have proposed a spraying system with wall pipes that uses two different types of product: **our E series full cone nozzles and the J series flat fan nozzles**, two effective solutions to address the particular needs related to the cooling and handling of white slag, with the resulting problems.

The tubes are arranged in a mirror-like manner at a height between two and three meters above the containment wall of the slag discharge area to prevent damage to the pipes caused by the heat of the slag.

INDUSTRY
Steel and metal industry



APPLICATION
Dust and odor control | Cooling



PROBLEM
Limit waste dust dispersion for recycling



SOLUTION
Pipe with full cone and flat fan nozzles



We placed the **E nozzles with a parallel jet to the retaining wall to cool the surface close to the wall** and prevent any reinforced concrete failure over time.

In turn, **the J nozzles with adequate inclination allow a longer spraying radius** (more than 2.5 meters) to extend the wetting to the entire discharge area, cooling the slag farthest from the pipes.

ADVANTAGES FOR OUR CLIENT

Thanks to our solution, the customer has gained two significant advantages.

Firstly, **a better distribution of the liquid in the slag humidification system**, thanks to an adequate drop distribution.

The second advantage was **reducing and cooling white slag dust**, which is mainly composed of silicon oxide and is usually difficult to dispose of.

FOCUS ON THE PRODUCTS



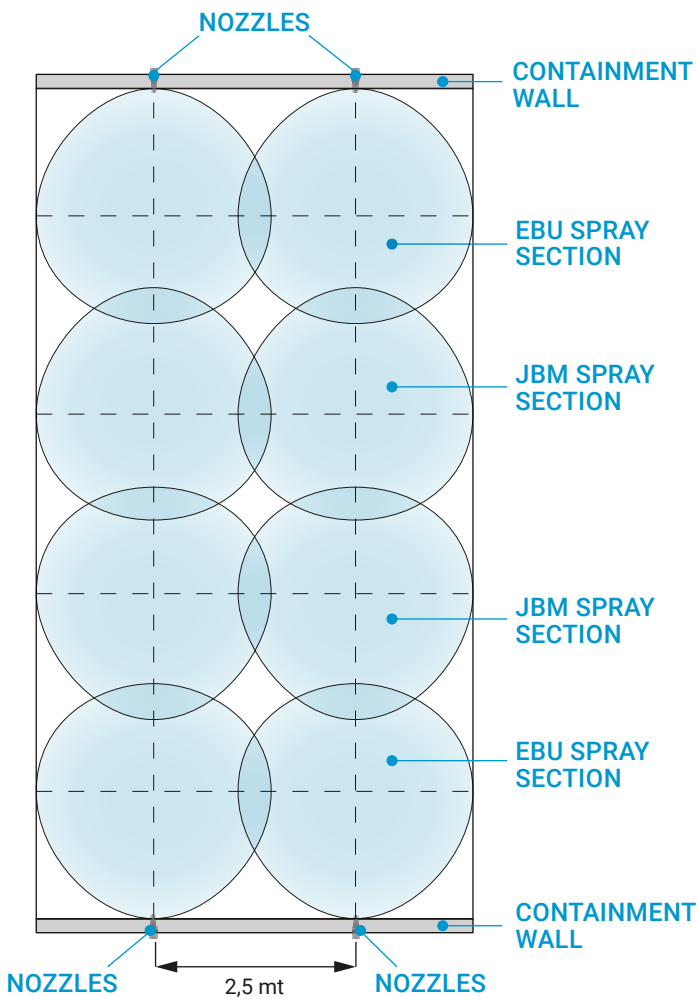
E
FULL CONE NOZZLE

E series full cone nozzle works on the impact principle by deflection of a water stream that impacts onto a spiral profiled surface, providing the desired spray angle. These are one-piece nozzles with no internal vane and a more comprehensive free passage.

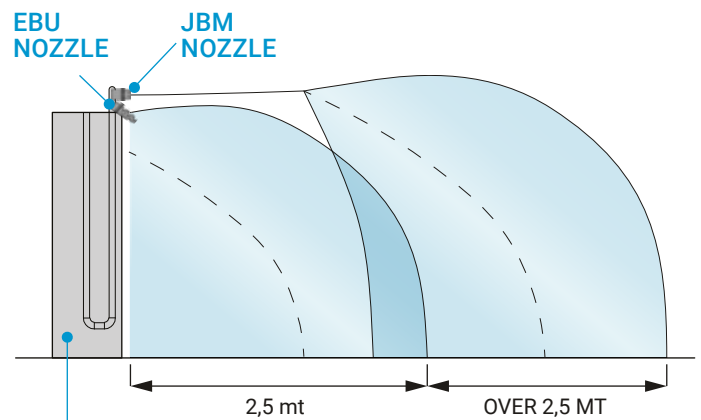


J
FLAT FAN NOZZLE

Standard flat fan nozzles are available in various capacities, spray angles, thread sizes, and materials. Used in several industrial applications, they produce a mist spray and supply an appropriate force of impact.



VIEW FROM ABOVE



CONTAINMENT WALL WITH PIPES

LATERAL VIEW

PNR Italia

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