



WAE LZ OXIDE PLANTS

sarralleTM

Environment & Energy

The future as BUSINESS OPPORTUNITIES for
"Waste Ferrous Hazardous Material"

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SARRALLE OVERVIEW

Founded in 1965, and nowadays with more than 55 years' experience on international projects, SARRALLE is your partner in the Environment, Energy & Steel Worlds.

We are an innovative Design, Engineering, Manufacturing and Installation company, with more than 700 dynamic, highly-qualified and multicultural employees.



Steel Melting Plant

- Scrap Cleaning Machine
- Electric Arc Furnaces (AC/DC EAF)
- Secondary Metallurgy (LF/VD-VOD/VIC/RH)
- Continuous Casting Machines (CCM) billet, bloom and slab
- Fume Extraction Systems (FES)
- Waste Heat Recovery System
- Material Handling Systems (MHS)
- Hydrogen Technologies
- Water Treatment Plants
- Electrical, Control & Automation
- Auxiliary Equipments
- Spares & Service Solutions

ABOUT SARRALLE

700 EMPLOYEES

Dynamic, highly-qualified and multicultural team.

4 BUSINESS LINES

Environment, Energy and Steel sectors.

10 LOCATIONS

Spain, Italy, USA, Mexico, UAE, India, China.

OWN MANUFACTURING FACILITIES

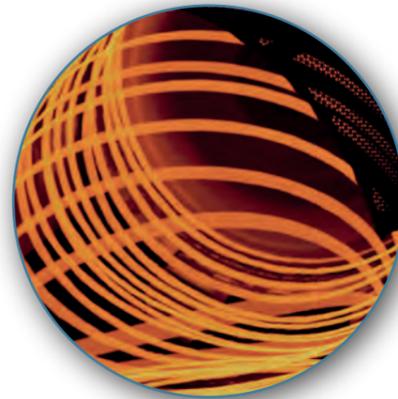
Europe and India

TAILORED SOLUTIONS

Greenfield or Brownfield

TECHNOLOGY & INNOVATION

Constant research for smarter, automated, environment friendly, efficient and safe plants.



Rolling Mill

- Medium Section Mills
- Heavy Section Mills
- Merchant Bar Mills (MBQ) / Bar Mills
- SBQ Mills
- Wire Rod Mills
- Reheating Furnace (Green Hydrogen)
- Hot Charging System
- Water Treatment Plants
- Electrical, Control & Automation
- Spares & Service Solutions



WHY SARRALLE?

SERVICE

The best during and after sales service.

CLOSENESS

Direct relationship.

ADAPTABILITY & FLEXIBILITY

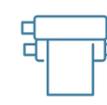
What do you need? We can adapt for you. Tailored solutions.

TECHNOLOGY & SUSTAINABLE SOLUTIONS

Our solutions and products with the latest technology.

COST EFFECTIVE

Best balance between the best technology with a correspondence price offer and perfect after sales.



Processing Lines

- Cut-to-length Lines (CTL)
- Slitting Lines (SLL)
- Recoiling and Inspection Lines
- Packaging Lines
- Pickling Lines
- Tension leveling Lines
- Electrical, Control & Automation
- Spares & Service Solutions

OUR SERVICES

- EPC Projects
- Greenfield & Brownfield Project
- Management & Control
- Engineering & Design
- Process Consultancy
- Own Manufacturing & Assembly
- Factory Acceptance Test
- Logistics
- Site Construction
- Comissioning & Start Up
- Training
- Spare Parts & After Sales Service



Environment & Energy

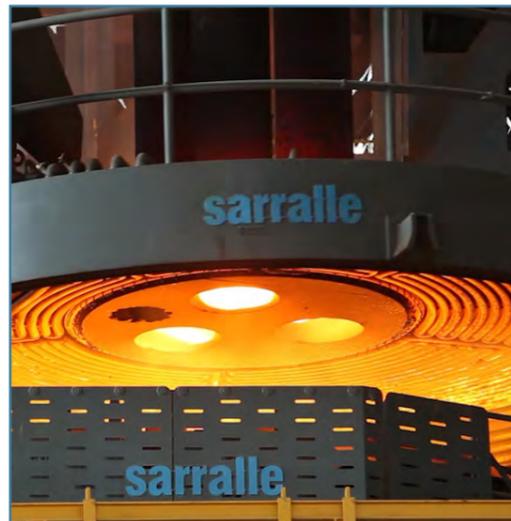
- Industrial Water Treatment
- Waelz Oxide & Metal Recovery
- Hydrogen Technologies
- Waste Treatment



WAEZL OXIDE RECOVERY ACTIVITY fits into the Eco Industry sector, because it involves recycling activity of EAF DUST generated in Steel Melting Plants.



Scrap EAFD GENERATION HAZARDOUS MATERIAL

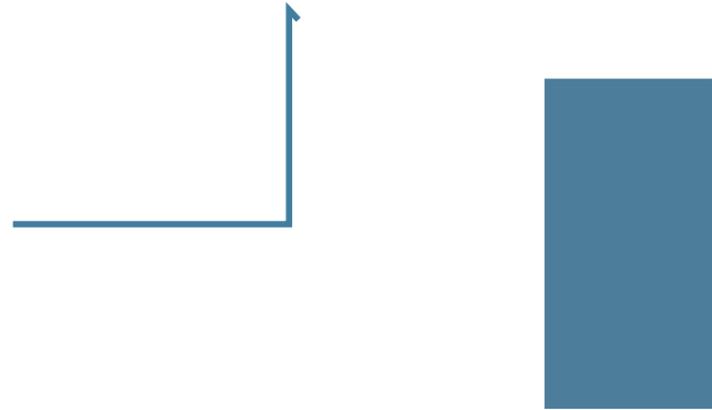


Governments growing concerns about waste disposal on their lands are increasing pressure on the existing heavy industry to better manage the waste of their processes and avoid the use of landfills.

Regulations are becoming more and more demanding over the coming years.

The response to these regulations can signify increased COST for a company or can create a BUSINESS OPPORTUNITY.

Zinc Source



BUSINESS OPPORTUNITY

SCRAP use in Steel Melting Shop:

The use of SCRAP itself makes STEEL MANUFACTURING more PROFITABLE.

SCRAP is a source of ZINC, which translates into the option of EAFD RECYCLING in a WAEZL OXIDE (WOx) PLANT, instead of considering to Landfill.

The possibility of making a profit from EAFD drives the motivation for a more efficient collection system (Fume Exhaust System) and obtain cleaner emissions in the Steel Melting Shop.

WOx Plant means HAZARDOUS MATERIAL TREATMENT:

COST SAVINGS & PROACTIVELY ADDRESSING FUTURE ENVIRONMENTAL RESTRICTIONS.

The cost of not recycling is variable and depends on Federal and Local Regulations, Government Environmental Concerns, and other factors.

Landfill cost for EAFD can be around 50-100 \$/Tn.

Created Sellable Products:

Waelz Zinc Oxide:

Waelz Zinc Oxide (WOx) sales Price is mainly linked to the Zinc Value in the market (London Metal Exchange). This value fluctuates around **1.600-2.400 \$/ZnTn**.

Depending on productivity, a ton of EAFD yields around 30% weight WOx.

Inert Slag:

It is used as an iron aggregate and as fill material in the construction industry, rockwool, gardening,...

Sales prices can have big variation. Reasonable price can be consider between **1-5 \$/Tn**.



WOx Plant Operating cost:

This value also depends on electricity, Natural Gas, Water, Reducing Agents and Lime cost in the market, but a current estimated value is around: **160-180 \$ per EAFD Tn**.

The only created WASTE: Stack Emissions

The plant has a single emission source constituted by the Waelz Kiln Stack.

Additionally, prior to the Stack there is an Additive System where dioxins, furans, and traces of hazardous materials are removed.

Zinc Smelters
Zinc Compounds
Manufacturers

Cement/Roadfill

WAEZL OXIDE PLANT Raw Material: EAFD





ACTIVITY DESCRIPTION

WOx Process:

Best available technique for EAFD recycling, according to European IPPC Bureau and EPA (USA).

Main Equipment:

- Rotary Kiln => through combination of reducing / oxidizing atmosphere => Zinc and Iron are separated.
- Vaporized Zinc is cooled in a Settling Chamber, and it is further collected in a high efficiency bag house installed next to them.

Single Emission point: Fume Stack

With a prior System to remove dioxins, furans and hazardous materials from the off gases.

SARRALLE'S CONTRIBUTION TO THE MARKET

EPC Construction of 110.000 Tn/year

with Ø4 x 55 m Rotary Kiln for Pyrometallurgical and Hydrometallurgical processes



RECENT REFERENCES

The Pyrometallurgical process is enough for WOx production, but the Hydrometallurgical process improves the zinc concentration of the Final Product, improving investment return.

1. BEFESA SILVERMET ISKENDERUN (TURKEY): 2019
2. BEFESA ZINC ENVIRONMENTAL PROTECTION TECHNOLOGY (JIANGSU) Co., Ltd.: 2021
3. BEFESA ZINC ENVIRONMENTAL PROTECTION TECHNOLOGY (HENAN) Co., Ltd.: Commissioning and Ramp-Up Stage

OTHER WORKS:

BEFESA ZINC ASER: (Several since 2014)





ARE YOU INTERESTED
IN LEARNING MORE
ABOUT THE SARRALLE'S
CAPABILITIES?

LET'S GET TOGETHER
AND HAVE A MORE
DETAILED PRESENTATION

Social Media

SARRALLE WEB
FACEBOOK
INSTAGRAM
LINKEDIN

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