



Ferro Bio

A new sustainable
desulphurisation method

How to solve a problem by improving
the environment.



MBC CHEMICAL INDUSTRIES



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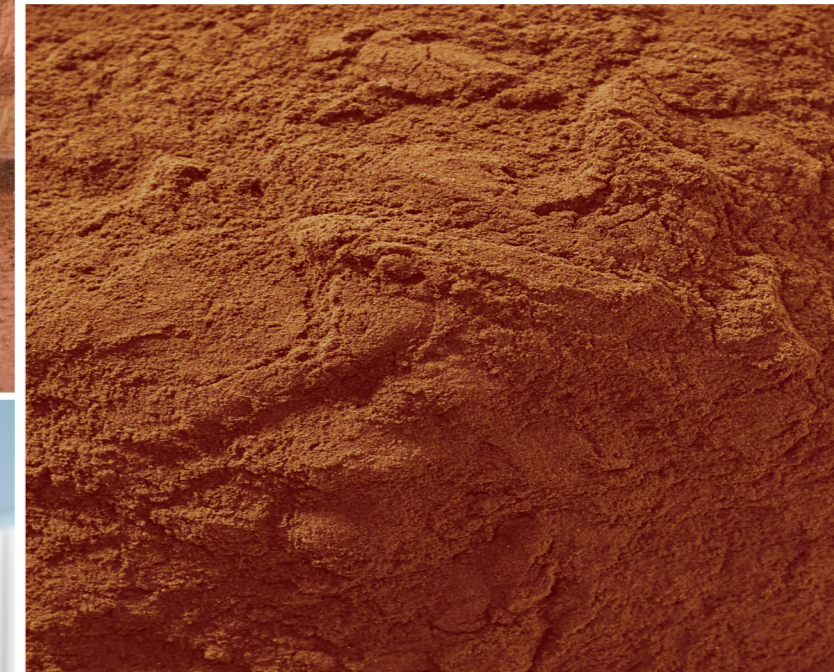


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Who are we?

MBC Chemical Industries is a Spanish family business that extracts, transforms and develops solutions for the **biogas** sector from iron hydroxide and oxides.

We have various processing facilities for materials extracted from the mines. In **Monreal del Campo**, Teruel the material is dried and classified, while in **Andorra** it is processed, bagged and stored for subsequent national and international sale.

We're offering three labels: **FerroBio**, **FerroBio+** and **MBC Chemicals Industries**.

FerroBio, an innovative product to desulphurise biogas

FerroBio is a natural product, composed of iron oxides & hydroxides, together with other functional oxides. The product was launched after a complex and lengthy process of studies & testing, and it has been specifically developed to be added directly to the fermentation digester.

FerroBio reacts with hydrogen sulfide, generating iron sulfide and sulfur, which are common components of fertilizers, used in order to improve its properties.

FerroBio is available in BigBags or in 20 kg paper bags that can be added directly to the process, without opening them.

In addition, our laboratory offers a dosage calculation consultancy service as well as trace elements.



1000kg

20kg

How does a biogas plant work?

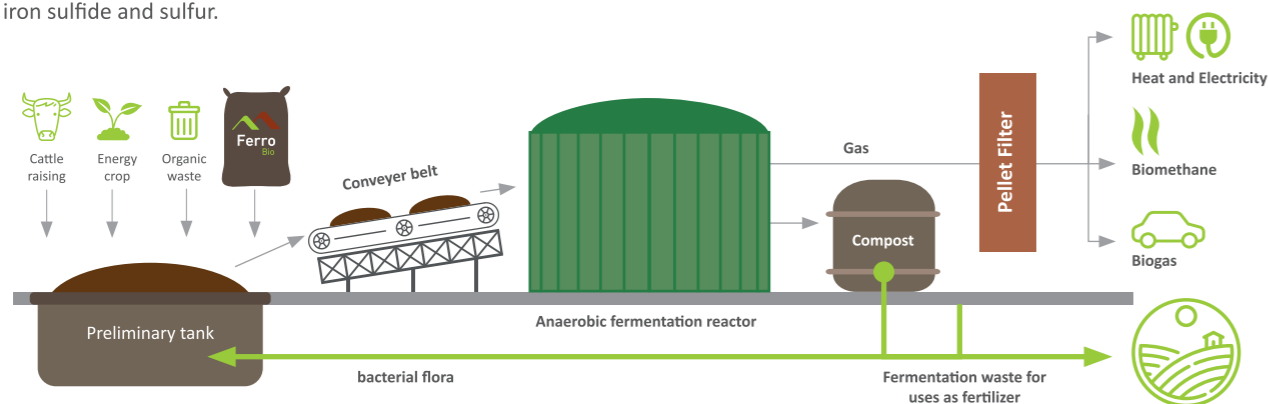
A biogas generation plant processes urban, forestry and agricultural organic materials, among others, under anaerobic conditions (absence of oxygen).

The decomposition and fermentation of these materials produces biogas composed mainly of methane, in addition to CO₂ and hydrogen sulfide (H₂S). Depending on the organic materials used, different % of these three mentioned gases will be generated, methane being the majority, and H₂S the minority.

FerroBio is added at the time of introducing the organic matter, which once inside the digester, and over a few days, will react with the H₂S converting it into iron sulfide and sulfur.

Advantages of FerroBio vs alternative iron hydroxides.

FerroBio is mainly composed of naturally occurring iron oxides & hydroxides, but it also contains clays composed of a multitude of trace elements including Cobalt (Co), Copper (Cu), Manganese (Mn), Molybdenum (Mo), Nickel (Ni), Potassium (K), Selenium (Se) & Zinc (Zn) that help the development and life of the methanogenic bacteria inside the Digester.



Why is FerroBio an ideal method to capture H₂S from biogas?

Comparative table on the efficiency of further methods of desulfurization	FerroBio	Iron chloride	Biological desulphurisation
Corrosivity	●●●	●●●	●●
Presence of harmful substances	●●●	●●●	●●●
Methane concentration	●●●	●●	●●
Easy use	●●	●●●	●●
Friendly with the bacterial chain	●●●	●●	●●
Efficiency	●●●	●●●	●●
Explosion hazard	●●●	●●●	●
"Buffer" effect (process stability)	●●●	●●●	●●●
Undisired reaction product	None	Hydrochloric acid	Sulfuric acid

● Optimum ● Unfavorable

Benefits of FerroBio.

- **Avoids toxicity and physical risks.**
FerroBio is a product that is not harmful to people, equipment or the environment.
- **Absence of risk of explosive mixtures.**
Makes oxygen injection unnecessary.
- **Compost with improved characteristics.**
In addition to not generating any toxic byproducts, **FerroBio** produces iron sulfide and sulfur, both of which are components that improve the properties of fertilizers.
- **Minimized corrosion damage.**
Reduces the cost of equipment maintenance.
- **More economical and efficient desulfurization.**
In addition to being an effective H₂S capture method, the reactor's productivity improves and biogas production increases.
- **Efficient handling.**
Its dosing system is easy and simple.
- **Compatible with organic fertilizer.**
- **Furthermore.**
FerroBio does not require a special storage system, and specific training is not required for its use, as it is not a dangerous subject.

FerroBio+ as a substitute for Iron Chloride

While **FerroBio** is designed to eliminate H₂S by reacting in several days (buffer effect), which is the most effective way to control H₂S in the digester, el **FerroBio+** is designed to act immediately.

FerroBio+ is a product developed in our laboratory to act quickly in less than 24 hours. It acts in a similar way to iron chloride but with the advantage of being much easier to handle, with the same storing and handling conditions as the normal **FerroBio**.

