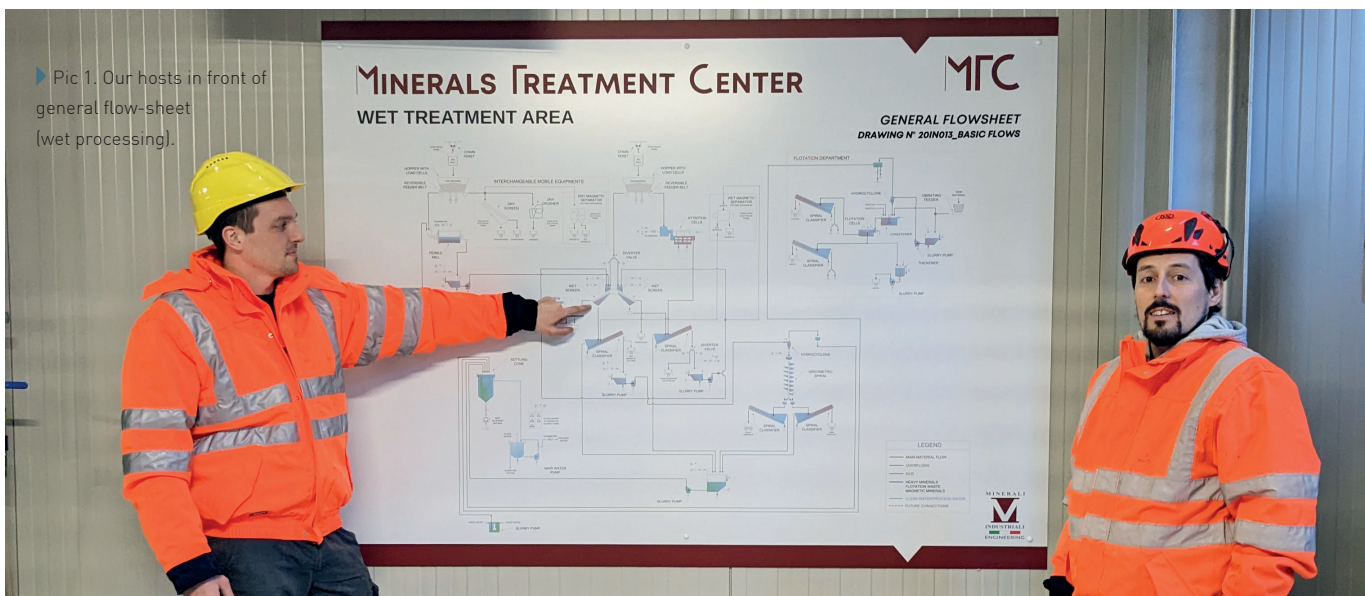


An insight into a Minerals Treatment Centre

Italian raw material company Minerali Industriali recently opened its Minerals Treatment Centre (MTC). The centre reproduces numerous wet and dry industrial treatment processes continuously on a small scale. It is therefore able to perform reliable tests aimed at optimising glass plant engineering decisions. Jean Hardy* visited the MTC.



Minerali Industriali is a supplier of silica sand, feldspar and kaolin. Its main customers are glass producers (40 %) and the ceramic sector (30%).

It is also active in industrial waste management and, with the Engineering Department, in the supply of original equipment to the minerals sector. It has annual sales of €200 million and 27 sites located in Europe, South America, North Africa and Asia.

The historical cradle of the company is located in the northwest of Italy. In Masserano, a small Piedmontese town in Italy where it manages a quarry and has concentrated its Engineering and R&D activities for several years, its new Minerals Treatment Centre (MTC) was inaugurated in September 2022.

The centre's aim is to provide customers

with the opportunity to reproduce on a small scale (a few tons sample) various industrial treatment processes (i.e. crushing, screening, milling, washing, magnetic separation, gravitational separation, flotation, etc.), to perform reliable tests in order to evaluate the best treatment solutions according to their needs.

The MTC is flexible: the sequence of treatments can be varied according to the customer's request.

It is possible to treat samples from min. 100 kg to 2 tons. The average output can vary from 100 to 500 kg/h due to the different processes involved. The test can last indicatively between half a day to 3 days, including the plant preparation, start-up, finding the correct setting and final shut down and cleaning. The MTC consists of several treatment modules

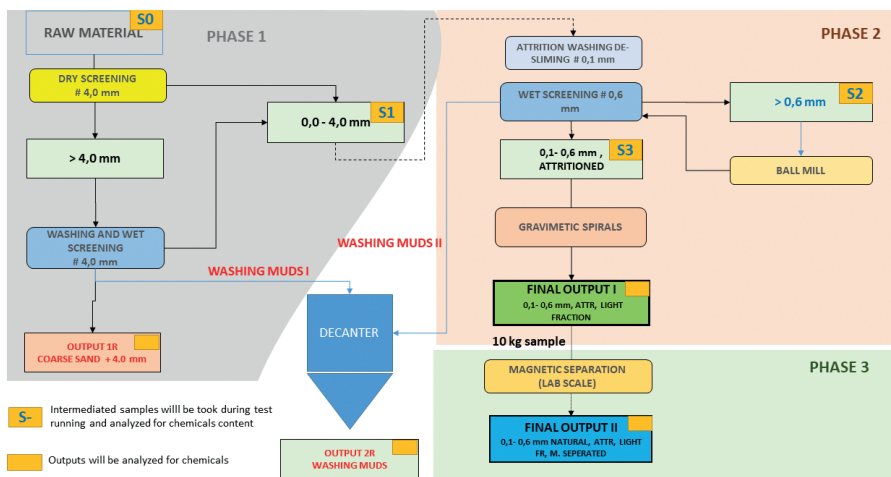
grouped into three treatment areas: crushing and screening, dry treatment area and - where I was today - the wet treatment area.

I visited Masserano, responding to an invitation from the management. My main questions were: what place will MTC occupy in the organisation of Minerali Industriali and what profit will the glass producers get out of it?

My hosts, Niccolò Storni and Lorenzo Teluzzi, introduce themselves, give me the safety equipment and invite me to follow them. They are waiting for me to start the industrial phase of some tests.

They give me some words of explanation before starting the tests, which will occupy most of our time.

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▲ Pic 2 Simplified flow-sheet for today's test.

*They are two trained geologists. Niccolò began his mission at Minerali Industriali just a few months ago, after completing an internship here.

Lorenzo is a bit older and has already been involved in various projects at the company.

* Today's tests are done on silica sand extracted from a quarry located in southern Europe. The owner of the quarry wants to know if his sand is suitable for industrial use, for example as a raw material in a glass factory.

The laboratory tests are, at first glance, promising, but before they can decide, an industrial scale test must be carried out. This is where MTC offers an incomparable full-scale tool.

The visit begins with a briefing in front of the general wet processing flow-sheet (pic 1). If I quickly recognize some classic phases of a silica sand processing plant, I am nevertheless impressed with the high number of phases that are planned.

My hosts reassure me: depending on the test to be performed, only some of these phases are selected. Pic 2 shows the circuit which had been prepared before my arrival.

Adapting the flow to each particular case is easy: just a few 'diverters' to operate, or phases to short-circuit.

The test

Niccolò goes with me up to the command post, and, by activating a switch on the console, starts the whole installation. Buckets begin to fill up and to empty into hoppers, endless screws come into action: the raw material (the sand provided by the customer) is driven by a flow of water (as we are experimenting the wet process). I quickly find myself squatting near the

exit of one of the treatment phases. We take in hand a little of the product being treated and compare it with the initial product before treatment.

Even if the treatment is far from over, we can already see that it is no longer quite the same product. The particles, such as mica (which constitute the nightmare of glassmakers because they do not melt at



▲ Pic 3 Checking the flow of raw materials.

usual furnace temperatures), have already been removed, and the main part of the clay which coats the silica grains has been eliminated by attrition.

Surprise (or naivety on my part?), the test will take longer than I thought. This is because the approach is really dynamic. According to what we observe during the test, we begin to adapt the flows.

The leitmotiv here is flexibility!

In addition, there are some unforeseen events: a partially clogged pump, which will have to be unblocked. Fortunately, the problem is solved in a few minutes by two technicians.

During the technicians' intervention, I ask questions to my two hosts.

Q: Is it normal that the test takes so long?

A: Yes, this is normal. MTC is here to experiment new ways of processing. Each test is unique because each sample has its own specificities. And this very recent installation must 'prove itself'. The time that we seem to lose in testing will be gained in operation by the end customer. That is the most important thing.

In fact, there is no standard duration for the tests. It depends on the quantity of material to be treated and the different treatments to be carried out. Taking into account the preparation of the installation, we can consider an average duration of half a day to three days.

Q: Does the customer impose the flow to be carried out, or does it leave room for your own initiative?

A: Both cases exist. Customers who are familiar with the products will tend to impose a specific flow. But others are more open.

We have also to take into account a recent evolution of the required tests. Until a few years ago, the tests were limited to obtaining a single product, the one sought, and to providing the customer the expected prices, both OPEX and CAPEX.

The customer was not taking much into account the ancillary products, the waste generated, etc. But the situation has completely changed. Now the customer has realised he is living in the 'circular economy' era. It is no longer enough to obtain such a product sought, but he has also to know what he is going to do with the 'ancillary products' and other rejects found at the different stages. Hence the importance of being able to adapt our flows during the test.

My time is up. I would have gladly stayed longer as I still have many questions to ask. I didn't even have time to go to the other wing of the MTC, the dry factory where you can find a lot of other interesting equipment such as Roll Magnetic Separator, Optical Sorting, Electrostatic Separations, Milling, De-

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▲ Inside the MTC.

ironing, Screening, De-dusting, Air Separation.

I have to go already, leaving my two hosts to finish their test.

But they will give me the main results: yes, the customer will be able to valorize his silica sand and probably become a supplier of a glass furnace.

Before leaving for the company's headquarters in Novara, I thanked Niccolò and Lorenzo for the time they devoted to me and for their enthusiasm in implementing this remarkable tool.

At the company's headquarters in Novara, I meet Vittorio Costa, CEO of Minerali Industriali Engineering (MIE). He has been involved in all the company's major projects at all latitudes, which amounts to more than €100 million in a few years.

Customers are both external and internal (subsidiaries of Minerali Industriali).

That's why I was interested to know his point of view on this 'new baby'.

Especially knowing that MIE has developed, for several years, the "360°: From Mine to Products" concept that distinguishes six successive phases in any mineral project:

- Phase 1: Geological Survey
- Phase 2: Laboratory Test
- Phase 3: Industrial Test
- Phase 4: Layout Definition & Engineering
- Phase 5: Dedicated turn-key solutions
- Phase 6: Customer Care

I asked him if he did not want to rethink the sequence of the phases

and to integrate a phase which would correspond to the activity of the MTC? Why not, here too, a "diverter"!?

My proposal made him smile... His answer was: No, MTC does not change the 360° concept, but gives it more consistency. Before MTC, there was real a gap between Phase 2 and Phase 3. Thus Phase 3 was put aside: ie. industrial tests were 'outsourced' on sites outside MIE, which was implied risk contamination. Thanks to the MTC approach, Phase 2 and Phase 3 are supported by the same people, on a unique site, Masserano, and become complementary. This to the best benefit of the customer.

I finished my tour in the office of the organisation's President, Giorgio Bozzola. First, he reminded me of the main phases

in the development of the group:

** Its roots go back to the early 20th century
Initially only quarry operator and supplier of raw materials, Minerali Industriali gradually became a designer of equipment for the extractive industry, and finally a developer of original solutions in waste recovery. His greatest pride today: 650 motivated staff members, half in Italy, the other half all over the world.

When I ask him what his main objective was for 2023, he answered me without hesitation: to make the MTC the flagship of the Minerali Industriali fleet!

According to Mr. Bozzola, the Minerals Treatment Centre must become the platform where all the players interested in the development of innovative processes, capable of responding to energy and ecological challenges, can meet.

Q: Why not a Treatment Academy open to universities, research centers, etc.?

A: A good idea! In fact, MTC already welcomes an industrial partner, Mogensen, a specialist in the treatment of bulk materials. There is still room to welcome other actors in MTC.

It is on this nice perspective that I left Mr. Bozzola, wishing him and all his employees' success in this new challenge.

For further information:

www.mineraliengineering.it

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See www.jhfinaglass.eu



▲ A spiral classifier inside the MTC wet plant. By "VL Studio - Vittoria Lorenzetti Photographer