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formnext magazine



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producing metal
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On Roboze and
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by **formnext**

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EDITORIAL

For nearly a year, our computer screens more or less shaped our view of the world and served as the window through which we could still get in touch with other people. This summer, however, the importance of the monitor has diminished somewhat, at least for much of Europe. Travel is once again possible, which is opening the door to many more in-person interactions.

We're among those who have taken the opportunity to meet up with various key contacts. To get to know our partner country for 2021 and its AM landscape a bit better, Thomas Masuch – the twice-vaccinated editor-in-chief of our Formnext magazine – paid a visit to numerous companies in Italy this past July. Besides reporting back to us with his exciting impressions of specific Italian firms in the AM industry, he also regaled us with stories of inspiring places and encounters.

The companies and employees Thomas met in Piedmont, Lombardy, Friuli, and Trentino went to great lengths to give him a warm welcome, as did a number of private hosts who were thrilled to have guests again following the lean times caused by the pandemic. In some places, our correspondent described feeling like he was part of the family, if only for a short time.

At first, we had our doubts as to whether a long trip like this would be worth the effort considering how we'd all become fully digitalized experts at working from home. Couldn't we just visit companies and conduct interviews for the magazine over the internet, as well? Thomas had barely gotten started out on his journey before we were reminded that there's just no substitute for real

human interactions and the chance to get a feel for other places in person. Especially when you're talking about Italy!

Lasting impressions, electrifying companies, inspiring personal interactions, and the sense of belonging to one big famiglia are just a few of the highlights you can look forward to once again at this year's Formnext. Our event team and more than 450 exhibitors are already fully engaged in their preparations to take you on an international tour of the world of AM from 16–19 November in Frankfurt.

Things won't be all the way back to normal at Formnext 2021, of course: We'll be taking all the necessary precautionary measures to keep you safe and healthy in line with the current situation and the related legal requirements.

Depending on where you're from and how long it takes to get to Germany, you may face some hurdles on your travels, as well. Still, opportunities to forge ahead, make valuable new contacts, and find new sources of information for your business are opening up again, and I'd say it's about time.

Sincerely, Sascha F. Wenzler
Vice President Formnext



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FRANKFURT / MAIN

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30 Nov. & 1 Dec. 2021

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AM LIVE AND IN COLOR: FORMNEXT 2021 TO BE HELD AS ON-SITE PHYSICAL EVENT IN FRANKFURT

Following almost two years of almost entirely digital encounters, whether it be creative exchanges, product demonstrations or meetings, the team in Frankfurt and the AM community are eagerly waiting to get back into the halls in Frankfurt so their 3D-printing ideas can take shape in an effective and creative way.

In discussions with members of the community over the last couple of years, the Formnext team has once again come to realize the significance of Formnext. »This fair has an exuberance and spirit of innovation that is unbeatable. Just knowing that we can again offer this type of creative space where people can talk face-to-face, enjoy productive chats over coffee, touch products and discuss their progress embraced by the support of the whole community is wonderful«, commented Sascha F. Wenzler, Vice President of Formnext at Mesago Messe Frankfurt GmbH.

Preparations are full steam ahead for Formnext 2021 and the event is shaping up to be an unmissable one. Highlights are to include

high-caliber talks by industry experts, the presentations from Italy as the partner country, the innovations from the purmundus challenge, and Start-up Challenge Pitch-Next Event as well as the TCT Conference and Stage plus VDMA's and BE-AM's (Built Environment) special areas. Moreover ASTM (American Society for Testing and Materials) organizes as a premiere an international standards workshop on the day before Formnext starts. The Formnext team is going all out to make this first event after a year of not meeting physically one to remember.

Formnext will, as ever, be frequented by the majority of the most significant companies in the industry. Around 450 exhibitors, including 55% from abroad, have already registered as of mid-August.

Whilst there is clearly a lot to look forward to, the health and safety of all attendees remains paramount. The protection and hygiene concept, which was developed last year to comply with, and even exceed, the legal requirements, is therefore continuously being adapted to the pandemic situation. Wider aisles in the halls, as well as additional communication and waiting areas in higher frequented zones at the event will help people maintain the necessary social distancing. A 3G concept will also be introduced (vaccinated, recovered, tested).

The physical event will be complemented with the Formnext Digital Days two weeks later from 30 November – 1 December 2021. With the rapid growth of the AM community and demand for 3D-printed products in all areas of industry, it is vital to enable those still facing travel restrictions to participate in the exchange of ideas.

In 2021, Formnext is set to offer even more: On October 20-21, a digital pre-heat event will set the mood for the year's hot topics with some inspiring keynotes. For the first time, industry insiders will also have the chance to become part of the show and present their expertise and latest developments to the international AM community as speakers. A corresponding call – which includes other Formnext events, as well – has already begun.

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HOT METAL AND ACCURATE ANALYSES

In the start-up Mimete, the industrial group Fomas has built up a highly qualified powder manufacturer within a short period of time

The neatly packed ingredients that will be used to prepare a metallic menu a little later are already lined up on the factory floor: small nickel ingots, a few bars of cobalt, and a few dozen kilograms of iron chips. Andrea Tarabiono, manufacturing manager at Mimete S.r.l., points up to a shiny metallic cylinder that's raised almost all the way up to the hall's ceiling by a huge steel frame. »There in the melting furnace, this is heated to between 1,600 and 1,800 degrees. The electrical induction currents enable the metals to mix very well,« he explains. A little lower down, the liquid melt mixes with argon and falls as a metallic mist. At the bottom, the alloyed droplets – which have since cooled to form fine powder grains – are collected, separated from the gas, and taken to the adjacent warehouse for further processing (e.g. sieving, quality control, and packaging).

The production of metal powder at Mimete in Biassono, Italy, is by no means limited to atomization in the VIGA (Vacuum Induction Gas Atomizer) machine that operates 12 meters above the ground. From the delivery of raw materials to packaging, samples are regularly brought in for examination in a laboratory located in a separate room of the production hall. »This is the only way we can ensure that the powder meets our strict quality specifications and can be used in customers' applications afterwards,« says Francesca Bonfanti, technical development manager at Mimete.



Text: Thomas Masuch

Photos: Thomas Masuch

FROM HEAVY INDUSTRY TO AM POWDER

Mimete, a start-up founded four years ago that has been operating near the world-famous Formula 1 circuit in Monza since 2019, focuses on the production of metal powders for additive manufacturing. It was set up by the Fomas Group, which has been forging heavy-industry components from steel and other alloys for decades at its headquarters in Osnago barely 20 kilometers away. For Fomas and the 1,450 people it employs around the world, the fast-growing additive manufacturing of metal parts »appeared to be both a threat and an opportunity« according to Magda Perez Gila, the group's corporate communications manager.

Besides pouring significant resources into Mimete's modern powder atomization system in Biassono, Fomas has thus invested in an elaborate production process that includes the aforementioned laboratory, which is equipped

with the latest instruments. Mimete employs a young and high-powered team of 15 employees, some of whom previously worked at Fomas, and it also has some of its parent company's departments (such as marketing, accounting, and sales) at its disposal thanks to their close proximity.

At Mimete, the prevailing atmosphere is a mix of youthful team spirit and professional cooperation. Even though the company's team is still quite small, its processes are reminiscent of a well-established industrial group, and they consistently demonstrate the close relationship Mimete has with its parent company. Occupational safety, for example, is a top priority: As a visitor, you're only allowed into production areas wearing a helmet, a high-visibility vest, and safety shoes – and only after watching a detailed video on safety guidelines. In addition, access to the laboratory, the packaging depart- »



Opposite page:
The lab at Mimete plays a crucial role – in the center image, Francesca Bonfanti examines a sample
This page:
Operating at a height of 12 meters, the VIGA installation represents the core of powder production at Mimete

ment, or the VIGA machine is only permitted to those who also work there. »We also like to go out together in the evening.« explains Andrea Tarabiono, »but here in the production hall, we do our best to maintain the highest level of professionalism.«

A CERTAIN LEVEL OF QUALITY TAKES A CERTAIN AMOUNT OF EFFORT

Powder production in the VIGA, which generates up to 300 kilograms per batch and consumes up to 2,000 cubic meters of argon per hour, is by no means the end of the process. In containers filled with argon gas, the powder enters the post-processing department,

where it is sieved, then rotated in a container for homogenization purposes, and later packaged. »In the quality assurance system we've implemented, we take samples after each production step and analyze them,« says Andrea.

An important component of Mimete's complex production process is its laboratory, where powders are examined using XRF, ICP-OES, an automatic image analyzer, a Hall flowmeter, a laser diffraction analyzer, and various other techniques and devices. »Among other things, this allows us to identify the chemical elements in the samples, the granularity of the powder, and powder flowability, which is crucial for additive production,« says

Francesca Bonfanti. These extensive checks result in a workflow that takes 10 days to proceed from atomization to packaging.

In addition to their own samples, the lab staff examine the raw materials that are delivered. »We get them from certified partners, but also check them again ourselves to make sure no defects find their way in,« Francesca continues.

Mimete's high quality standards in production also require many other details, including the three hours it can take to fill the company's sieving machine with argon gas. »It's far more involved than simply opening a valve,« explains Andrea Tarabiono. The gas can also be heated

Top image:
A large storage area for raw materials
Bottom image:
From atomization to eventual shipping, the powder is hermetically sealed off from the outside air



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Top image (from left):
Francesca Bonfanti, Andrea Tarabiono, Magda Perez Gila, and Giulia Conti
Middle image:
Mimete also tests the stability of components made from its powder
Bottom images:
The raw materials used for atomization include loose chips or rods of metal

to 500 degrees for atomization to further improve the quality of the powder. Even the quality of the bottles into which the powder is later filled and shipped has to meet special requirements: They're also filled with argon, after all, which forms a hermetic seal between the powder and the outside air from atomization to shipping.

CREATIVE NAMING

In going to all these lengths, Mimete wants to secure a place for itself as a supplier of high-quality powders among the numerous material providers in AM. The standard powders it offers are divided into the product groups Mars, Venus, and Neptune. The name of the company itself also stems from one of its founders' creative ideas: It references the Italian writer and chemist Primo Levi, who published a collection of short stories (Storie naturali) back in the 1960s that described a machine – the Mimete – that was capable of cloning any object or living being.

The young company's stable of customers already includes several OEMs (e.g. from the oil and gas and aerospace sectors), manufacturers of 3D printers, and research institutions. »We also produce for conventional material manufacturers that now want to sell their proven metals in powder form,« reports Giulia Conti, who works in sales support at Mimete. Many customers have been in the market for a long time and know exactly what they want in terms of element composition and flow rate, for example. »For them, we produce powder that meets their precise specifications – certified, of course,« Conti adds.

In addition to standard materials, the start-up has already achieved some initial success with the new alloys it's developing. »For a manufacturer of 3D-printed tool inserts, we adjusted some parameters of a certain alloy in order to enhance the durability of tools,« Francesca Bonfanti reports.

PLANS FOR FURTHER DEVELOPMENT

Mimete currently manufactures around eight tons of powder at its factory in Biassono every month, and it plans to significantly increase that amount in the future. At its production facility, neatly demarcated open spaces already indicate the further investments will soon follow. Andrea Tarabiono has a fairly precise plan in mind in this regard, and also sees the company as having reached another milestone in its development: »After two years, we have a very clear sense of the further equipment we need and the suppliers that will be a good fit for us.«

Over the summer, Mimete also made a somewhat smaller investment: A large olive tree was planted on the edge of the company premises that has since been enabling the company's production and lab employees to enjoy their lunch breaks in the shade. If Mimete continues to grow at the same pace, it won't be long before someone makes the connection between the tree and the subject of cloning!



+ FURTHER INFORMATION:

» formnext.com/fonmag

» mimete.com