



# Italian PM is back on the menu

## Liz Nickels

**News last month of a brand new metal powder production company in Italy made analysts look again at the development of the industry in the country. Liz Nickels spoke to its co-founder, Dr Paolo Folgarait, about the new company and how it could boost both traditional and new technologies.**

Last month, there was big news for PM: the creation of a whole new powder-producing company, named Numanova Spa and operating from the center of Italy, in the province of Terni (Umbria Region), close to Rome.

The company is a new development from Dr Paolo Folgarait and Italeaf, a holding company which describes itself as 'a business accelerator for companies and startups in the areas of innovation and cleantech'. With headquarters and plants in Italy at Nera Montoro (Narni), Terni, Milano and Lecce and international offices in London and Hong Kong, the company has its fingers in a number of pies, including renewable energy, energy efficiency and waste management, the 'internet of things', and the development and manufacture of civil and commercial drones in mini and micro classes for the professional market. Amongst all these up and coming technologies is Numanova.

Plans are for the company to be active in the production of metal powders of high-quality from metal alloys, ferrous and non-ferrous, for additive manufacturing (AM), metal injection molding (MIM) and hot isostatic pressing (HIP), plasma transferred arc (PTA), surface engineering and laser cladding processes. Potential applications include industries such as aerospace, energy, luxury, mechanical and biomedical. The expected production capacity at regime will be around 600 tons/year of metal powders for the field of additive manufacturing and 250 tons/year for other uses in areas such as aerospace, energy, mechanical, biomedical, surface engineering and laser cladding processes. The company will be equipped with the most advanced production technology of metal powders by gas atomization, and vacuum induction casting, along with atomization plasma technologies and electron beam melting processes.

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## Optimum time

Numanova Spa is co-founded by Dr Paolo Folgarait, who has been appointed general manager, executive director and shareholder. Previous to his role at Numanova, Dr Paolo Folgarait was CEO at Seamthesis Srl, a technology center of excellence for research, development and technology innovation (R&DTI) with headquarters and operation sites in Italy at Piacenza, Brescia, Nera Montoro (Narni), Rome and Naples. Previous to that, he was general manager at forging company Franchini Acciai SpA (Brescia) and corporate quality and R&D director at Allied International Pipes & Fittings (Piacenza). He was also head of the department metallurgy of steels and superalloys for long products, mechanics and energy at Centro Sviluppo Materiali, a materials company founded in 1963.

As a metallurgical specialist and an owner of several patents in the metallurgical sector, Dr Paolo Folgarait is keen to highlight the benefits of opening a new PM production center at the current time. 'The production of metal powders and the research and development activity to make new alloys are attracting interest and growing expectations on the global market,' he says. 'The versatility of the techniques of powder metallurgy can help to create complex and innovative metallic materials (as well as intermetallics, ceramics and composites) and introduce new forms of production in advanced sectors with high added value.'

'We believe, through the integration in the Italeaf group, to quickly develop an initiative of international value that meets the needs of highly competitive industries, which represent a new industry with high quality, standardization and innovation.'

Besides production, Numanova also focuses on R&D in the field of alloy design, metallurgy product and process, process modeling. Plans are for the company to be equipped with production technology including vacuum induction furnaces and plasma atomization

and already in August Numanova published plans to upgrade a plant and install two gas-atomization plants for the production of metal powders for AM.

### New plants

Numanova and TerniEnergia SpA, a smart energy company active in the fields of renewable energy, energy efficiency, waste and energy management, which is part of Italeaf Group, put together two EPC contracts for the order, which will be completed by TerniEnergia in the second half of 2017 at a cost of around €6.5 million.

The two plants, entitled EIGA (electro-induction melting inert gas atomization) and VIGA (vacuum-induction melting inert gas atomization), have been already authorized by the local authorities and will be installed in a building owned by Numanova in the industrial park owned by Italeaf in Nera Montoro (Narni), in the province of Terni, Italy. EIGA will be used for the production of metal powders from titanium and aluminum alloys, refractory materials, ceramics and intermetallics for AM, MIM and HIP, while VIGA will produce ferrous metal powders and alloys of nickel, cobalt and zirconium for the same applications.

Next up is design work, supply and turnkey installation, including electrical connections, electrical instrumentation and the commissioning and implementation of safety systems. The technology is provided by ALD Vacuum Technologies, a German company which supplies vacuum systems for casting, coating and heat treatment of metals, which is part of AMG Advanced Metallurgical Group NV Netherlands, a specialist in vacuum furnace systems and metal alloys and powders.

The Nera Montoro industrial park already has a broad portfolio of permits and authorizations, technical gas piping systems from a landline and operational infrastructure including industrial and office buildings, energy, water, technical gases, logistics and warehouse, served by both passengers trains and freight wagons, and is

close to the main national highway (A1) and Rome Fiumicino International airport, the company said.

### Market analysis

I asked Dr Paolo Folgarait what prompted the creation of a new PM production company in Italy. 'We conducted a deep and comprehensive market analysis, based on public literature, reports and interviews, starting with 3D printing and then going back to powder metallurgy,' he said. 'This was inspired by my more than 18 years' of experience in the metal industry and international centers carrying out industrial R&D for different applications.'

He says that he saw evidence of an irreversible decline of the traditional manufacturing sector in all of the west countries, prompting the need to focus on newer technologies.

'Last but not least, I felt the need to use my expertise and know-how gathered in many years of continuous development and innovation in the industry, to create something focused on my personal view of the world.'

Dr Paolo Folgarait is, however, optimistic about the future of the industry, thanks to the development of new technologies. 'The metal powder market is growing very well and all of the international sector operators and economic indicators are converging to depict a period of growth and reinforcement,' he notes. 'This is true in particular for metal powders for AM applications – a small part of the whole PM market, but rapidly increasing and representing an important and valuable asset to invest in.'

### PM renaissance

So how big is the impact of AM? 'Additive manufacturing is representing a renaissance for PM,' Dr Paolo Folgarait told me. 'The metal powder industry is as old as the steel one, and can be affected by many of the same economic problems (over productivity, low level products, and so on). AM is asking the PM industry to change pace, to propose new production technologies and



The new Numanova site in Nera Montoro (Narni), Italy.



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processes, to design new alloys, to specialize production to make highly customized solutions.'

According to Dr Paolo Folgarait, Italy is ripe for the development of 3D printing. 'At the beginning of our adventure, we mapped national and international PM producers,' he explained. 'Italy is well positioned, but has no powder production for AM at present. This was one of the very first reasons we decided to invest in Italy in this production sector.'

The country has an interesting position with regard to the market for powders and for ways to process them. 'On the other hand Italy is one of the most important EU markets for 3D printing machines, but all of the powder for AM is imported. For the time being, the direct sell of powder for AM (powder supplied by the same 3D machine maker) is in excess of 90% of the apparent PM market in Italy (a situation which is similar in the EU now but rapidly getting worse).

This could change in a few years if independent PM producers can begin operating and can ensure that their powder is suitable for a range of 3D printing technologies, he notes. Meanwhile, 'Numanova is the first company in Italy to understand this and begin the production of powders specifically for AM.'

### Complex process

Dr Paolo Folgarait admits that adapting powders for AM is not a simple process. 'The process depends a lot on the final application. Some requirements for AM powders are general and really transversal: very high inner quality (purity, homogeneity, repeatability), a strict control in morphology shape and size, a good hot

rheology, perfect packaging and complete reliability for the proposed applications are all vital features.'

However, engineers' skills are important too. 'The most important thing is to focus on investing in R&D and the most advanced production technologies. Technical skill and continuous training are also vital. Everyone agrees that metal powder for AM has to be a highly engineered product, and this explains its relatively high cost compared to more traditional metal products. Nevertheless, the pressure on prices may lead, in future, to a reduction in production costs and an increase in production volumes. But that is another story!'

**Numanova;** [www.numanova.com](http://www.numanova.com)

**Italeaf;** [www.italeaf.com](http://www.italeaf.com)

### The PM market in Italy

*The following covers a selection of PM-related companies in Italy. It is not intended to be a complete list.*

#### Carbosint SpA

Carbosint SpA is a manufacturer of brushes and components such as dies, tools, jigs, and fixtures. It is based in Ghisalba, Italy. [www.carbosint.com](http://www.carbosint.com)

#### Fibex Srl

Fibex Srl operates in the field of industrial furnaces for the thermic treatment of metals. It is situated in the North east of Italy, about 60 km north of Venice, in the province of Treviso, in the Veneto region. The company has twenty years' experience in the industrial furnaces production field, including hardening and tempering-carburizing in controlled atmosphere of small metal products, brazing in controlled atmosphere, controlled oxidation of sintered products, sintering of pieces carried out according to metal powder technology, annealing, and furnaces for the reduction of iron powders.

[www.fibex.it](http://www.fibex.it)

#### Gino Olivares Srl

Gino Olivares Srl was founded in 1959 as a die construction company. It recently created a new company, Sinter Meccanica Srl, which as well as carrying out pressing operations also machines sintered products and tools. It is based in Gessate, MI, Italy.

[www.ginoolivaressrl.com](http://www.ginoolivaressrl.com)

#### Intermetal SAS

Intermetal is a supplier of metal powders and additives for the production of diamond tools, based in Cinisello Balsamo, MI, Italy. These include powders made from cobalt, tungsten, tungsten carbide, cobalt/tungsten carbide mixes, bronze, copper, tin, iron, nickel, aluminum, silver, chrome, titanium and zinc. The company also offers technical consultancy for the planning of diamond tools, as well as the entire production process.

[www.intermetal.it](http://www.intermetal.it)

#### Linbraz

Linbraz is a manufacturer of metal powders, granules and brazing pastes for a range of applications including automotive, military, heating, aeronautic and nuclear, based in Sicily. It began as Dentallin Metalli & Co, a private company for the production of non-ferrous and precious alloys for dental and for brazing applications.

[www.linbraz.com](http://www.linbraz.com)

**Matrix Srl**

Matrix Srl has been a manufacturer of tools for punch presses and iron workers for over 25 years, based in Schio, VI, Italy.

[www.matrixtools.eu](http://www.matrixtools.eu)

**MBN Nanomaterialia Srl**

MBN Nanomaterialia is a producer of metals bonds for the manufacture of diamond tools suitable for working stone, ceramic and concrete, and titanium powders for coatings by thermal-spraying. MBN titanium powders have a unique particle shape, so that specific coatings can be obtained depending on specific client requirements. It is based in Vascon di Carbonera, TV, Italy.

[www.mbn.it](http://www.mbn.it)

**mG miniGears Spa**

Established in 1976, and employing 560 people, miniGears combines traditional steel machining with powder metal technologies. It creates sintered products created from powder using hydraulic and mechanical presses. The parts there then sintered, heat treated and machined. It is headquartered in Padova, Italy.

[www.hgears.com](http://www.hgears.com)

**MIMEST SpA**

MIMEST SpA is an ISO 9001-2008 certified metal injection molding (MIM) specialist focusing on titanium and titanium alloys. It is based in Pergine Valsugana, TN, Italy.

[www.mimest.com](http://www.mimest.com)

**Mimitalia Srl**

Mimitalia Srl was created to manufacture and market small metal precision parts made by powder metal injection molding (MIM). Mimitalia's objective is to become the leading Italian supplier of customized MIM components building on over ten year's experience and know-how and its in-house designing and mold fabrication facilities. It is based in Vado Ligure, SV, Italy.

[www.mimitalia.com](http://www.mimitalia.com)

**Pometon Spa**

Pometon, based in Maerne, VE, Italy, produces and sells worldwide ferrous powders, non-ferrous powders and advanced steel granules. The key processes it runs in its factories are water atomization for iron, copper, brass, bronze and derived alloys, gas atomization for stainless steel, air atomization for tin and zinc, electrolytic powder for copper, powders annealing for iron, copper, derived alloys and diffusion bonding for iron and copper based powders.

[www.pometon.com](http://www.pometon.com)

**SACMI**

SACMI is an international group manufacturing machines and complete plants for the ceramics, packaging, food industries and automation markets. The Sacmi Group has over 80 companies in 28 countries, production plants, distribution firms and service ones controlled by the parent company in Imola, BO, Italy.

[www.sacmi.com](http://www.sacmi.com)

**Sisma**

Established in Schio, Italy in 1961, Sisma designs and produces high precision 3D printing machinery. It is the creator of the Sisma MYSINT100 additive manufacturing machine which can make metal prototypes using the laser metal fusion of steel, gold, silver, bronze and chrome cobalt powders. Ultra-fine layers of powder are progressively laid and melted selectively by a laser source until a perfectly shaped metal prototype having characteristics superior to products made with investment casting is achieved.

[www.sisma.com](http://www.sisma.com)

**Silcon Plastic Srl**

Silcon Plastic is a specialist in metal injection molding (MIM) of austenitic stainless steel AISI 316L, martensitic stainless steel 17-4 PH, and titanium biomedical alloy Ti-6-Al-4V materials.

Since 2002, the company has unified its five different locations in a single plant in the industrial area of Forno di Zoldo, Belluno, Italy.

[www.silconplastic.it](http://www.silconplastic.it)