

Meet the SPINMATE Partners!

MEET:



**Introducing Comau:** leading company in the industrial automation field, at a global level. Combining innovative engineering solutions with easy to use, open automation and enabling technologies, Comau helps companies of all sizes – and across a wide range of industrial segments – leverage the full potential of digital manufacturing. Comau's competency stems from 50 years of field proven-experience and a strong presence within every major industrial country.

<https://www.comau.com/en/>

WWW.SPINMATE.EU

**Hello Daniela Fontana! Thank you for this opportunity to meet you and talk about SPINMATE. To kick-off, could you give us, in your own words, a short introduction to Comau, and your role there?**

Hello! **Comau**, a member of Stellantis, is a worldwide leader in delivering advanced industrial automation solutions. Its portfolio includes technology and systems for electric, hybrid and traditional vehicle manufacturing, industrial robots, collaborative and wearable robotics, autonomous logistics, dedicated machining centers and interconnected digital services and products able to transmit, elaborate and analyze machine and process data. Headquartered in Turin, Italy, **Comau** has an international network of 6 innovation centers, 5 digital hubs, 9 manufacturing plants that span 13 countries and employ 3700 people.

I am part of the E-Mobility Global Competence Center, in the group of Battery Cell Manufacturing, which has the aim of developing automated systems for battery cell production. It couples the expertise of process engineers, able to drive the development and validation of the processes, with that of equipment and automation designers, to engineer and implement advanced solutions for cell production. We work in strict contact with customers and technology developers, also offering consultancy to support the upscaling of innovative manufacturing processes.

**To someone reading this who is still not familiar with SPINMATE, how would you describe it in simple terms, and how do you distinguish it from other projects or initiatives?**

**SPINMATE** initiative aims to develop innovative and scalable manufacturing techniques for solid-state battery cells. The project treats all the aspects related to cell development and production (preparation of the materials and components, cell assembly and testing, recycling), with a special focus on the industrial feasibility of each process: the product has to reach the desired performances, but also to be easily produced at large scale, with high throughput, cost-effective, safe and sustainable processes. To this end, proper equipment and digital approaches will be developed and tested during the project, to produce large format cells and demonstrate the transferability of the solutions to mass production.

Compared to previous initiatives, **SPINMATE** will help come closer the deployment of solid-state battery production

**COMAU will lead the development of the digitalisation approaches that will be implemented in the SPINMATE pilot line, as well as with the modelling of an industrial environment. Could you tell us more about the processes involved and which will be the main outcomes?**

The digitalisation plays an essential role in reducing time, cost, wastes, errors in a complex system such as the battery cell manufacturing: by elaborating the production data, it is possible to early detect quality issues, need of rework, need of maintenance, etc. This is one of the aims of **SPINMATE**. The starting point is to model each process step, to find cause-effect relationships among the parameters. Then, the single models are coupled to elaborate a model of the whole line, able to predict the product quality while it is still under manufacturing. The developed algorithms will become tools for plant control, supporting decision making and enabling the implementation of automated real-time adjustments.

Moreover, in the last period of the project, an industrial environment based on **SPINMATE's** processes and machines will be simulated, to verify the productivity, possible bottlenecks, effects of perturbations, etc. The scope is to identify possible further development needs, leading to the design of optimised equipment and plants.

**COMAU takes an important role on the specification requirements and standardisation for new SSBs, by defining the pilot line requirements for cells produced in SPINMATE project. Can you share with us more details on this task and which parameters will be important to assess (production performances, equipment needs and safety)?**

Within **SPINMATE**, the materials, components and cells will be manufactured using pilot lines already present at the facilities of the different partners. However, in most cases the machines were designed to handle state-of-the-art materials and could not perform well or even not work at all with the innovative materials.

The first step to define the line requirements is to identify the properties of the materials to be handled, the product to be manufactured and the needed productivity. This will allow to verify if there are safety issues related to the new materials and how to address them, if special environment conditioning has to be applied (e.g. dry or inert atmosphere) and which machines must be modified for the new production. To boost the deployment of solid-state batteries, the ideal solution is to use as much as possible commercial equipment, maybe just retooling part of them, and this is what we are aiming at **SPINMATE**.

**COMAU will be leading the equipment development for all-solid-state cell assembly by (i) modifying classical Li battery pilot line to manufacturing solid-state Li metal batteries and (ii) optimising the process as a testbench for the digital solutions. Which will be the main challenges expected to be found during these two stages?**

The main challenge is handling the metallic lithium. It is a material very sensitive to air and humidity and has mechanical properties different from standard electrode materials. It is sticky and for this reason a protective plastic film is applied on its surface to allow winding of the electrode foil: this film will then be removed during cell assembly, adding a step in the manufacturing process. Also, the solid electrolyte membrane has mechanical properties different from standard separators and will require retooling of the cell assembly line.

Regarding the implementation of digital solutions, the main challenge is the need of a large amount of data for the development of the models: we will strictly collaborate with the partners to limit as much as possible the experimentation but at the same time collect as many data as possible. Then, the application of the algorithms to the pilot line will help the validation, making the models ready for supporting the process optimisation.

**What are you personally most enthusiastic about achieving during SPINMATE?**

Personally, I am enthusiastic about seeing by the end of the project a complete production line for large format solid-state battery cells and the validation at pilot level of the results achieved in laboratory.

I am also excited thinking about the benefits that the application of innovative digitalisation tools will provide to R&D and industrial communities. The approach to product and process development and control, now mainly based on trial-and-error, will change thanks to a deeper understanding of the correlations among the different factors involved in manufacturing.

I think that both results will really represent a big step forward for the implementation of mass production of solid-state batteries.

**COMAU is a worldwide leader in industrial automation. How SPINMATE will be strengthening your position? Which will be the main benefits of COMAU by participating in this collaborative project?**

One of the aims of the competence center is to develop automated processes for upscaling next generation cells. Currently, several technologies are under development at academic and industrial levels and, unlike standard batteries, the manufacturing processes can be meaningfully different one from another.

**SPINMATE** gives **Comau** the opportunity to work in strict contact with the partners to engineer automation solutions properly designed for the technology of the project. The lessons learned during **SPINMATE** will lead to the development and optimisation of equipment able to deal with materials and processes like those addressed in the project, enabling the establishment of a new market for **Comau**.

Similarly, **SPINMATE** provides **Comau** the chance of developing proprietary algorithms that could then be implemented to the company's IoT platform, becoming a new product to be proposed to the market.

**Certainly, there will be readers interested to meet you and discuss your experience in SPINMATE. Which events will be possible to meet COMAU in the upcoming months?**

Comau will be present at Automatica (<https://automatica-munich.com/en/>) in June 27-30, booth BA.109.



**Daniela Fontana**

**Solutions Development Leader – E-Mobility**

**Funded Projects Management**



**INOVA+** – responsible for implementing the communication and dissemination activities in SPINMATE – conducted a series of interviews to the SPINMATE partners. If you would like to know more about the project partners, visit our online channels.

SPINMATE Website: [www.spinmate.eu](http://www.spinmate.eu)

SPINMATE Social media channels:



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