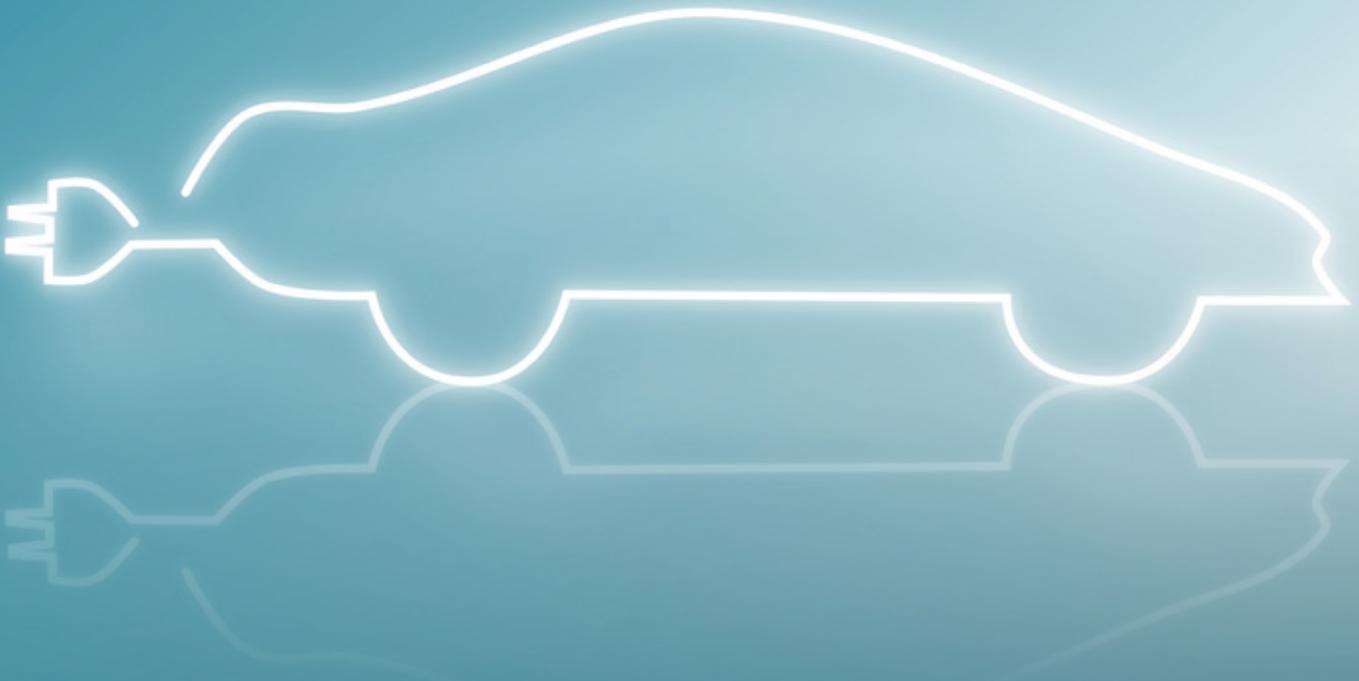
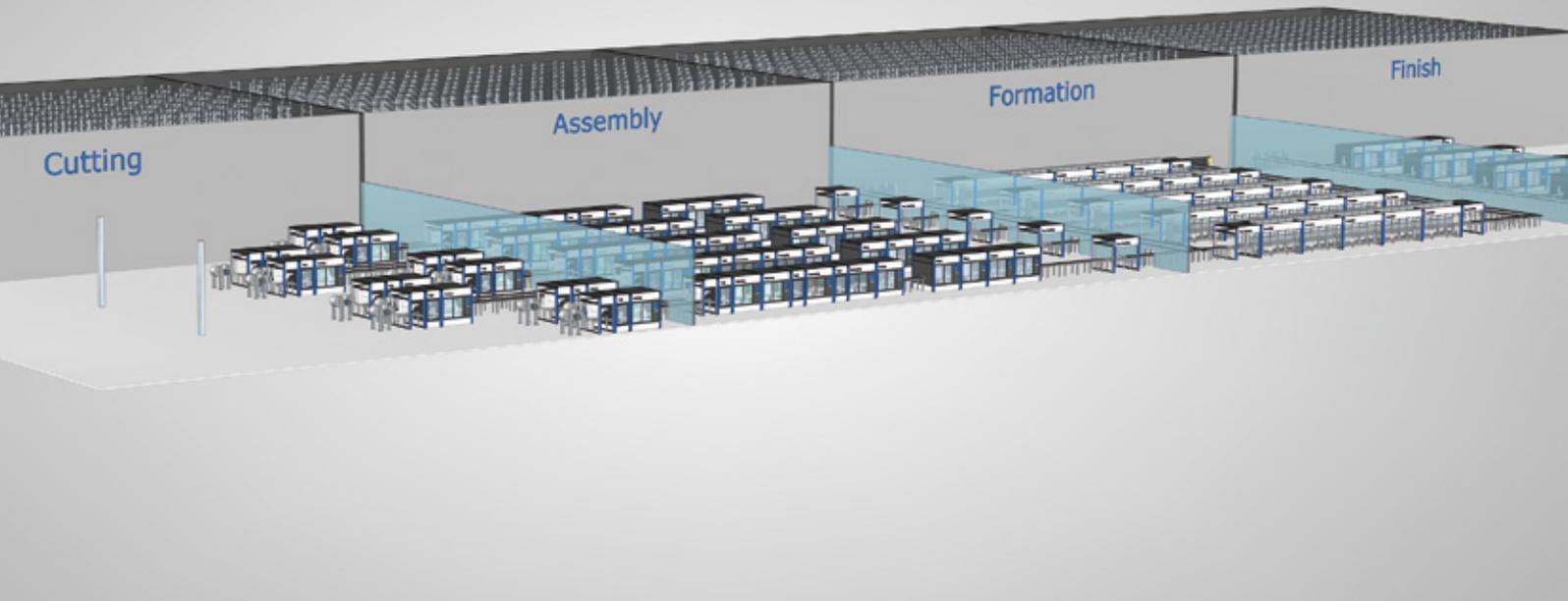


SUCCESS STORY

OEMs Indicate Interest in Expert Know-how for the Production of Electric Vehicle Batteries

Automotive





PARTNERSHIP WITH ENGINEERING FIRM CELONO IS A PERFECT FIT FOR THE INDUSTRY 4.0 STRATEGY

Ingenics plans and realizes battery assembly lines for the automotive industry

Market and customer requirements are extremely important in the automotive industry, and the same is true of the political and social background. Ambitious CO₂ targets for electric and hybrid vehicles have led to a growing demand for high-performance batteries. Most experts in mobile power solutions put their faith in lithium-ion cells. The expertise of Celono in cell production and battery assembly combined with the experience of Ingenics AG in assembly planning, logistics, manufacturing technology, and project management makes this a very attractive partnership.

About Celono

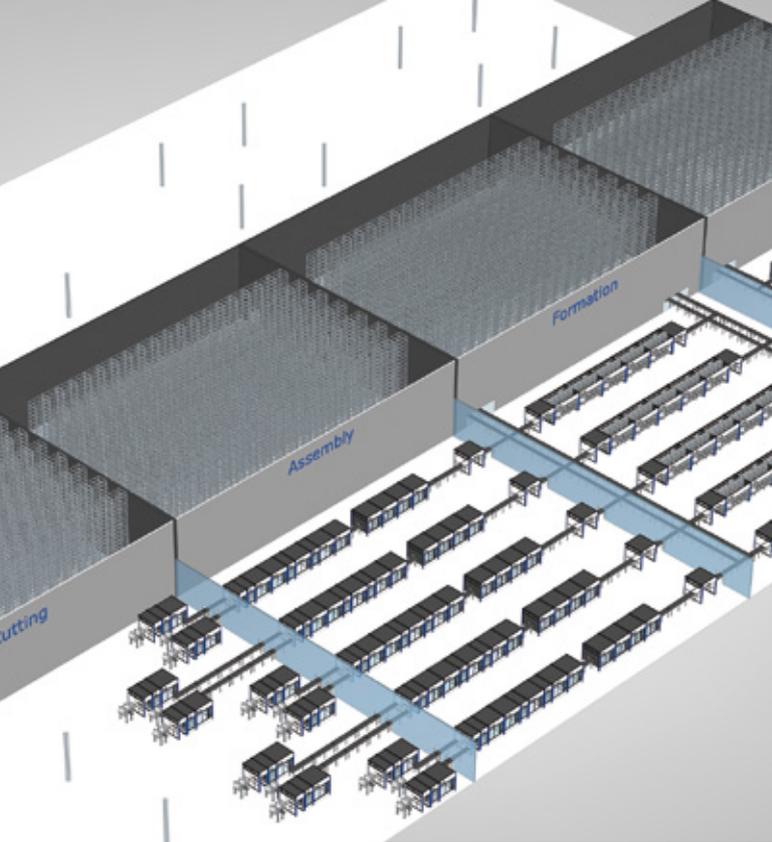
Celono is a collaborative partner in the technical area of battery module assembly. The company's areas of expertise include an understanding of vehicle assembly planning and lithium battery technology. Celono is able to support its clients with a wealth of experience from international restructuring and innovation projects, from product and process innovation to market launches.

Nobody contests the fact that the speed and direction of developments in business are determined by market and customer requirements as well as the overall political and social context. This is especially true for companies in the automotive industry. Ambitious CO₂ targets set out in international agreements or in legislation have accelerated the momentum of electric and hybrid vehicles – a trend of rapidly increasing economic importance.

One effect of this is that manufacturers are refining designs and developing lighter materials. Far more important, however, are the range and availability of high-performance batteries on the market. People consider lithium-ion cells to be the most promising candidates when it comes to the mobile power solutions of tomorrow.

Ingenics AG has secured a collaboration with Berlin engineering company Celono in order to respond to anticipated orders from the automotive industry in the area of battery assembly line design with the level of expertise that clients have come to expect.





The most important project results and Ingenics performances:

› Strategy and planning workshops with our partner Celono:

- › Functional and structural analysis of the product
- › Production and assembly strategies
- › Database and overview of status quo and technology
- › Assembly line design layouts
- › Benchmark cost structure
- › Process planning for technical detailing
- › Logistics and connection concepts

Celono thrives on an excellent reputation and the unique experience of automotive engineer Dr. Thomas Forchert. After managing end-of-line processes in assembly planning at Mercedes-Benz in Stuttgart, Dr. Forchert gained international experience directing cooperative projects at Stanford University (California, US). In 2009 he moved to Berlin and established Celono as a start-up engineering company.

Until then, he could make only limited use of his vast knowledge of battery assembly technology for electric and hybrid vehicles in Germany because manufacturers hesitated for a long time (to this day in some cases) to increase their production capacity for cells and batteries to a significant scale. However, it is certain that these will be needed in large numbers in a few years. According to customer demand and the decisions made by international competitors, there can be no doubt about the future development of the market for electric and hybrid vehicles.

The issue of battery cell production in Germany will thus remain urgent as long as there are no solutions to the problems surrounding the transport of cells from Asian factories to Germany, where they are then installed in batteries. Since cells are classified as dangerous goods under UN regulations, there is no question of arranging the delivery of larger batches.

“Celono is home to the most comprehensive expertise and is the ideal partner for us. In a very short time, concrete interest from some initial OEMs has clearly vindicated our choice.”

Andreas Hoberg,
Ingenics partner and business unit director

Offering a technical and organizational solution that takes into account both expected volume growth and the latest developments in factory planning, automation technology, safety technology, and production control in line with Industry 4.0, Ingenics is now able to respond positively to any request for the development of battery assembly lines, offering reliable services and realistic scenarios. The consulting firm has already carried out more than 5,100 successful projects in assembly planning, logistics, manufacturing technology, and project management.

Some of the planned large factories consist of fully automated production machines, manual workstations, and robot-controlled line sections. Lithium cells weigh up to two kilograms, and batteries contain as many as 100 cells, meaning they can only be moved with appropriate safety measures in place. First and foremost, the high fire risk (present with even minor mechanical damage) calls for extraordinary expenditure with respect to fire protection for buildings and equipment. This is where Celono has a unique selling point, offering a solution that can be integrated into assembly lines to overcome these specific hazards. That is just one reason why the managers at Ingenics believe Dr. Forchert is the ideal partner – and someone with the broadest possible range of expertise.

A few weeks after Celono was brought on board, Ingenics could confirm it made the right choice: some initial OEMs did not hesitate to register a specific interest.

Efficiency improvement³ – Building sustainable business success



In a nutshell, the core services of Ingenics can be summarized in three words: Planning. Optimization. Qualification. Or, to put it simply, efficiency improvement³. Our main focus is on three central areas of business – factories, logistics, and organization. Ingenics' history in these areas has been sustained for more than 35 years.

Benefit from unique experiences gained over the course of more than 5.100 successful projects. Discover how, considering your goals and objectives, we create space for your sustainable corporate success.

