

Zollner Electronic – Long-term partner of China's manufacturing industry

卓能电子——中国制造业的长期合作伙伴

—— Development achievements of Zollner Electronic (Taicang) Co., Ltd.

—— 记卓能电子（太仓）有限公司的发展成就

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卓能电子（太仓）有限公司成立于2004年，由印刷电路板装配起家。经过在亚洲地区十多年的发展与沉淀，如今卓能太仓在终端客户业务以外的诸多制造服务领域为国内外客户提供优质服务可靠的服务。

当经济报中国经济信息记者2007年第一次来到卓能的时候，卓能仅仅拥有28名员工，如今有500多名技术过硬，能力超群的员工加入卓能。2018年卓能太仓达到营收超1亿欧元。员工的增幅与营业额的涨幅同步，最直观地印证了卓能中国的业务已经从强手如云的激烈竞争中脱颖而出。其成功的秘诀就在于一贯坚持的质量和不断改进

的工艺。正因卓能注重对客户的承诺，使其在国内市场受到了普遍的青睞。

面对中国国内激烈的市场竞争与经济持续下行的不利现实，卓能成功贯彻落实其重市场发展战略“乘风破浪展新颜，卓能华夏广拓疆”。参与中国高铁项目便是一个绝佳案例。鉴于卓能在和谐号动车组项目上的卓越表现（连续被评为十佳供应商），卓能为自己赢得了参与中国自主研发的新型高铁“复兴号”项目的机会。目前卓能正在为高铁这类政府重大项目制造牵引和制动系统。事实胜于雄辩，数字即是最有力的证明：在如今的中华大地上，每日2000余辆列车上都有卓能制造的身影，它们以0技术故障保证旅客安全抵达目的地。正是基于其明智的发展战略决策，卓能才得以在中国的电子行业独占鳌头，并引起中国政府的高度关注。

基于深度开发且完备的全球供应链体系和强大的制造能力，

卓能致力于满足客户小批量多品种的生产需求。通过对厂区拓展及技术、产能、设备、工艺、工具和培训的大力资金支持，卓能可以对生产需求作出快速反应并及时扩大生产规模。

卓能在不断改善质量，提高可靠性以及缩减交货周期等方面做出的努力，最终会惠及客户，增强客户品牌效应和市场竞争能力。依靠丰富可靠的设计，工程，测试及精益生产经验，卓能可以为客户提供全面的技术支持和产品制造服务。

设计和工程能力为供应链体系提供稳定的基础，减少物料成本。卓能帮助客户识别规避供应链风险的能力属于行业领先，例如欧盟的RoHS法规。通过和客户的合作来鉴定潜在风险及评估技术等级来保证产品的可靠性。

卓能具备在新/现存产品整个产品生命周期内提供降低成本的能力。面向制造的设计理念将帮助客户在首件产品面市之前改善其设计缺陷，使设计转向生产的过程更加流畅高效。

卓能电子帮助客户在技术层面的决策保持领先，通过前端工



程工具来推动新产品引进。通过进行大量的内部原型制造及测试，包括功能测试、环境测试及压力测试等，来确保产品处于最佳的质量水平，最终为客户提供最安全可靠的产品。与重要供应商的同地协作保证了卓能以更低的价格水平，更高的灵活性和更好的表现提供上述技术服务。为满足客户定制化的需求，卓能不断引进次级制程的生产工艺，包括插件，保形涂敷，浸入式涂覆和机器人自动化装配设备等。通过回溯型的失效分析，从产品设计根源上发现问题，最终提高产品性能。

除了卓能自身过硬的生产能力，中国蓬勃发展的经济也为卓能电子带来了绝佳的发展机遇。因此，卓能得以在过去的十多年中高瞻远瞩，实现了和中国经济的同步飞跃。自公司成立之日起，卓能太仓便一直在寻求合适的机遇与中国政府在各个领域展开良好的开放式合作。

为贯彻环保理念，卓能工厂所有的工艺流程均有防尘且几乎不含化学制品。在2017年，工厂内部设立了100000过滤等级的无尘车间，用于满足国内新能源汽车先锋品牌“蔚来”汽车的生产要求。

2018年卓能太仓被江苏省太仓高新技术产业开发区政府授予“发展速度奖”，同时也被列入江苏省长三角地区高新技术企业名录。正是卓能与国内新兴自主的铁路及新能源项目的长期紧密合

早 在2007年，正值中国加入世贸组织（WTO）15周年纪念日，中国经济日报中国经济信息的记者就曾经第一次拜访卓能电子（太仓）有限公司。此番恰逢中国改革开放40周年，记者再次来到卓能，又一次被这家勤奋踏实的公司所取得的巨大发展成绩所震惊。

卓能电子作为一家电子制造服务供应商（EMS），致力于电子和机电一体化的工业化及制造，产品类型集中于小批量，多品种化的复杂系统装配。卓能电子秉承“质量第一”的企业精神，践行与客户共创双赢局面的商业原则，创造良好的可持续发展环境，凭借先进技术树立行业新标杆。

卓能集团总部位于德国南部的巴伐利亚州，全球共设有20个办事处及工厂为客户提供专业的电子制造服务，拥有员工超11000人，于2018年达到全年营收15亿欧元。



作，才为公司赢得此项荣誉。目前在国内外逐渐崭露头角的中国民机事业将会成为卓能在中国实现可持续发展的契机。

卓能非常看好中国市场的发展前景，尤其是在“中国制造 2025”计划中被政府列为重大项目的航空产业，对此公司计划将逐步开始向国内航空电子制造业进军。其产品的特殊性决定了质量必须百分之百的保证，而高质量恰是卓能一贯的优势。

在有了高铁项目的成功经验之后，目前卓能正在紧密布局发展国内航空事业。根据相关报告，在未来 20 年内，国内新的飞机需求将达到 7960 架。需求以单通道飞机为主，同时对宽体客机的需求也会持续快速增长。全球飞机总交付量预计 46460 架，总价值三万一千亿美元。显而易见，民机需求正在快速增长。而在如今的中国，飞机制造商们主要关注质量的管控，并开始在国内飞机制造领域引入相当数量的创新技术。卓能在中国的工厂能够提供从新产品引进到系统集成的一站式制造服务，并对产品进行供应链管理。通过这种全面的，终端到终端的服务，卓能有信心满足航空产业客户的生产需求。

在致力于小批量多品种化生产的同时，卓能太仓工厂正在紧锣密鼓地布局 AS9100 和 Nadcap 的认证流程，以求为航空事业提供更好的制造服务。

卓能在与多个业内领先的合作中都有着优异的表现，公司对于航空产业客户特殊需求的钻研精神打动了客户，他们一致认为卓能是可靠的长期合作伙伴。

当前卓能已经启动跟多家国内民机制造公司的商业洽谈，例如，昂际航电，上海航空电器，上海航空测控技术研究所等。公司将深耕中国市场，不断拓展客户群，为航空产业客户带去更多的市场价值。

除了正确的发展战略以外，公司员工同样是关键因素。由于



卓越的质量智能自制造之初便予以体现，不能依赖于维修去实现。因此，自 2010 年起，公司便在太仓建立起了分析实验室，这是保障公司高水准制造的企业“防火墙”。同时还会对所有员工提供严格的定期培训，并且详细记录在册。

完善、积极向上而又充满活力的人力资源环境体系激发了团队在日常工作中的凝聚力和向心力。全体员工就像家人一样一起



工作，互相关心照顾。另一个重要因素是核心人才的发展及其领导能力的培养。公司管理层对每一个保持员工流失减少与人才稳定的因素都加倍关注，切实保障员工与公司共同和谐稳定发展。

在中国，一切事物都处于一个动态发展变化的过程，人事需要时刻做出快速反应，所以人力资源管理有时并非易事。不过挑战伴随着机遇，历经重重困难，企业才能够蒸蒸日上，不断完善。

中国市场意义非凡，生机勃勃，暗涌着无数的业务发展机会，特别是在中国政府强有力的十三五计划及“中国制造 2025”的指导下，制造业必将迸发出新的活力。目前政府在其所运营的领域选择商业伙伴时也越来越多地向在华外资企业开放，这将会成为外企在中国取得成功的关键因素。

During the 15th anniversary of China's accession to the WTO in year 2007 the reporters of Economic Daily visited Taicang. And this time, by the 40th anniversary of China's Reform and Opening-up Policy, the reporters visited Zollner for the third time. Without doubt, the reporters were once again surprised by the rapid growth of this diligent team.

Zollner as an EMS provider (Electronic Manufacturing Services), is specialized in the industrialization and manufacturing of electronic and mechatronical components, as well as complex systems assembly in field of low volume - high mix industries. Zollner holds the spirit of "quality first", thus by executing the principle of "win-win" model together with its customers, and developing by that a favorable and sustainable environment, setting a new industry benchmark by its perfection in technology.

The headquarter of the Zollner Corporate Group is based in Bavaria in South Germany, and does operate actual 20 sites worldwide to provide Electronic Manufacturing Services to its customers with more than 11,000 employees, thus by a sales turnover of 1.5 billion EUR in year 2018.

The Zollner Electronic (Taicang) Co., Ltd. was founded in year 2004, starting with PCBA (Printed Circuit Board Assembly) manufacturing. After more than ten years of market presence in Asian region and rapid development, today manufacturing services in every branch except end-consumer business are offered to international and local customers.

When the reporters first time visited Zollner Taicang in year 2007, the company only counted 28 employees. Now they do have more than 500 employees onboard, all of them are highly skilled and qualified, achieving a sales turnover by last year of 104.93 million EUR. In aspects of staff increase and sales turnover wise, Zollner is a successful example to generate business in China among strong competition. Main key factors of success are the delivery of quality, as well as the industrialization of customer products; both strong sustained core competencies of the enterprise. By this commitment to



its customers, Zollner gained high popularity especially in the Chinese market over the last years.

In actual unfavorable situation of fierce market competition and increasing downward pressure in whole China, Zollner implemented the developmental strategy "Expansion in new branches and Extension of China market presence". A good example is CRH (China High Speed Rail), with excellent performance in the CRH project (Awarded as "Top 10 suppliers" annually from 2017-2019), Zollner earned its chance to set foot in the new China self-developed type CR train, also well known



as "FuXing Hao", manufacturing traction and brake systems exclusively for such governmental projects. Facts speak louder than words, and figures are the most powerful proof, now more than 2,000 trains are running with Zollner built electronics every day without any technical failure, bringing passengers to their destinations safely in whole China. The wise chosen developmental strategy enabled Zollner to expand well, and so Zollner gains high popularity, taking a lead position in the Chinese electronic industry, and so attracting the P.R. China

government's attention.

Zollner is focused on the distinct needs of high-mix low-volume production with well-developed specific supply chain management and manufacturing capabilities. The company continues to invest in plant expansions and improvements in technology, capabilities, process, equipment, tools, and training, which allow Zollner to rapidly scale to meet increasing production requirements.

Proven experience in design, engineering, test, and Lean manufacturing are offered to numerous blue-chip companies with a broad range of technology and products. Zollner's focus on continuously improving quality, reliability and delivery strengthens the brand and competitive position of customers.

Design and engineering services provide supply chain alignment early on – reducing material costs and creating a more stable supply base. Zollner is also an industry leader in helping customers mitigate the supply chain risks associated with existing and pending environmental legislation, such as the European Union's Restriction of Hazardous Substances (RoHS) legislation. Work together with customers to determine potential risks and leverage technical strength to ensure the reliability of the products.

Capabilities to cost reduce new and existing products throughout the entire product lifecycle are equipped. Design for manufacturing (DFM) expertise focuses on improving a design before the first product is built. This ensures a more streamlined and efficient transition to manufacturing.

Zollner helps companies stay ahead of the technology curve and use front-end engineering tools to streamline NPI activities. Extensive in-house prototyping and test facilities include functional, environmental and stress testing to ensure the highest levels of quality in order to deliver safe and reliable products. These services are co-located with key suppliers to deliver increased flexibility and performance at a lower cost. To meet customers' specialized requirements, Zollner implements extensive certification programs for secondary processes such as pin through hole (PTH), conformal coating and dipping and



robotic assembly. Robust failure analysis is provided to feed back into the product design – ultimately improving product performance.

Besides the strong manufacturing capabilities, the rapid growth of the economy in China, such as emerging high-speed rail industry, also brought successful development opportunities for Zollner, thus by great foresight and courage by keeping a close synchronized development with the Chinese economy in the past ten years. Zollner looked out from its early start onwards for very good and open minded cooperation with P. R. China government in any regard.

Talking of how Zollner fulfills the environmental protection concept, the reporters learned about that all manufacturing processes are dust and almost chemical free. A new "100,000 filter class" cleanliness room is built in its facility to fulfill the manufacturing

requirements of the new customer "NIO", which is one of the lead e-mobility companies in China.

Zollner Taicang was awarded last year by the P.R. China governmental authorities of Taicang High-tech Industrial



Development Zone as "Most Rapid Growth in 2018". By receiving this award, Zollner is listed at Jiangsu province bureaus in Yangtse Delta River region as High Technology Company. The key to success are long-term growing collaboration stories in local domestic Railway & Automotive businesses. Domestic Civil Avionics might be the next great trigger to growth in Zollner's China activities.

Zollner has a good prospect in Chinese market development, and forecasts further future growth, especially in raising aviation branch, as P. R. China government has clear indicated civil aviation will play a very important role in 'Made in China 2025'. The company convinced that this is a branch where 100% quality of any single component is a must, and that's exactly what Zollner is good at.

After a successful story with CRH (China High Speed Train), Zollner is now targeting on the civil aviation business in China. According to the report, China will need 7,690 new aircraft over



the next 20 years, mainly single-aisle aircraft, and the demand for wide-body aircraft will grow faster. The total number of aircraft delivered globally will reach 46,460, worth 3.1 trillion US dollars. It can be seen that the proportion of civil aircraft demand is growing rapidly. Now in China, Aircraft Manufactures mainly focusing on Quality Control lately and there are a number of innovative technologies began to be applied in the domestic aviation manufacturing field this year. Zollner site in China offers services ranging from new product introduction to systems integration and supply chain management. Through its comprehensive, end-to-end offering, Taicang plant meets the needs of aerospace customers. Specializing in ultra high-mix, low-volume manufacturing, and Zollner Taicang facility is on the journey to obtain both AS9100 and Nadcap certifications to better serve the aerospace customers in China.

Zollner has a proven track record with leading aerospace companies and works vigorously to understand the unique requirements of aerospace customers and are committed to being a reliable, long-term, trusted partner.

Business engagement has been started with multiple China civil aviation companies such as Aviage Systems, Shanghai Aviation Electrics and Shanghai Aero Measurement & Control Technology Research Institute. Zollner will keep expand their

customer base and continue driving greater values to the aerospace customers in China.

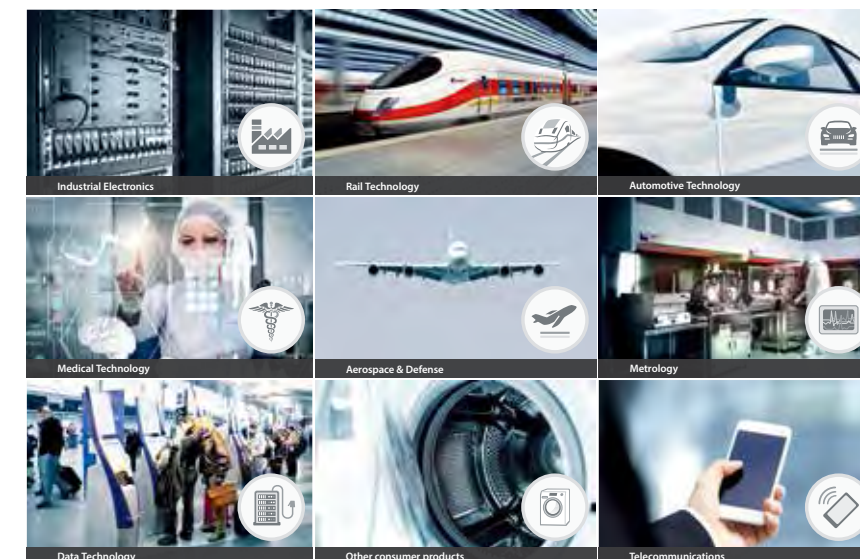
Besides the right development and market strategy, the employees of the enterprise are a crucial factor, too. Because quality only can be manufactured from the beginning on, but shall never be repaired. Therefore, since year 2010 an in-house analysis laboratory was opened in Taicang, what is the "fire wall" of the enterprise to ensure high level manufacturing, as well as regular trainings for all employees are executed and recorded very strictly.

Well established and active lived "Human Resources" environment as frame allowing the team to focus and concentrate on their daily work. All the employees are one family, and do act and behave so, everybody takes care about the other. Another important factor is the development of key talents, as well as coaching them in leadership. The management concentrated on many more factors, any is important to be taken care of to keep the fluctuation rate low, and the staff stable at the enterprise.



HR sometimes is not easy to handle, because of everything is so dynamic in China frequent changes and new given situations do appear suddenly, on what management must react quickly to adapt. But this matter of fact brings up many new opportunities to make the enterprise stronger and stronger, better and better continuously.

The China market is still as very interesting and dynamic to generate further business growth, especially in context with the P.R. China's government 13th 5-years plan and Made in China 2025. Now also governmental operated sites are more open to choose their business partners among foreign invested enterprises in China, which can be seen as a key factor for being successful locally.



卓能电子致力于复杂机电系统：提供从开发到售后的完整服务。作为全球顶级企业和中小型企业合作伙伴，卓能将为客户提供覆盖产品生命周期的集成系统解决方案。

公司于 1965 年在德国巴伐利亚州的赞特成立。通过持续的有机增长，卓能已跻身全球 15 大 EMS 机电一体化服务供应商之列，但从未生产过带有自己品牌的产品。

我们注重于长期的、可持续的客户合作伙伴关系。在我们位于德国、匈牙利、罗马尼亚、中国、突尼斯、美国、瑞士、哥斯达黎加和香港的 20 个办公和生产区域，卓能都依靠出色的质量、最佳性价比、技术竞争优势和横贯整个价值链的“最佳成本国家战略”来赢得客户信任。无论客户委托的是单个部件、模块、设备还是复杂的系统生产，卓能都可以从容应对，生产流程的深度由客户决定。

卓能电子于 2004 年进入中国，在江苏省太仓市成立卓能电子（太仓）有限公司，并且在 2014 年在太仓市经济开发区建造并搬入了属于卓能自己的新厂房。新厂房地 30,375 平方米，生产区域面积 10,970 平方米，拥有独立的内部实验室，并计划于 2019 年动工建设二期厂房。卓能太仓当前员工数超 500 人，年营收超 8 亿人民币。

Complex mechatronic systems from development to after-sales service: as a partner to globally acting top corporations as well as small and medium size companies, Zollner Elektronik AG offers cross-sector system solutions along the entire product life cycle.

The company was founded in 1965, in Zandt, Bavaria. Through continuous organic growth, Zollner has established itself among the top 15 EMS mechatronics service providers in the world, without producing any of its own products.

Long standing, sustained customer partnerships are important to us. At our 20 locations, in Germany, Hungary, Romania, China, Tunisia, the US, Switzerland, Costa Rica and Hong Kong, we bank on quality, an optimal price-performance ratio, a technological competitive edge and a best-cost-country-strategy along the entire value chain. Regardless of whether we are dealing with single parts, modules, devices or complex systems, the customer defines the depth of process.

Zollner Limited China was founded in 2004 in Taicang, Jiangsu Province, located in the Yantze Delta Region, where we built up our new plant with in-house laboratory in 2014. Till now we have a 30,375 m² plant with 10,970 m² production area and over 500 employees, achieving over 800 million RMB revenue, and are planning for phase II, which can double size the production area.

Zollner

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