

KAPP: A Faithful Practitioner of "Industry 4.0" of Germany

卡帕：德国“工业4.0”忠实的践行者

—— Interview with Mr. Georg Feng, the General Manager of KAPP Asia Technologies (JiaShan) Co., Ltd.

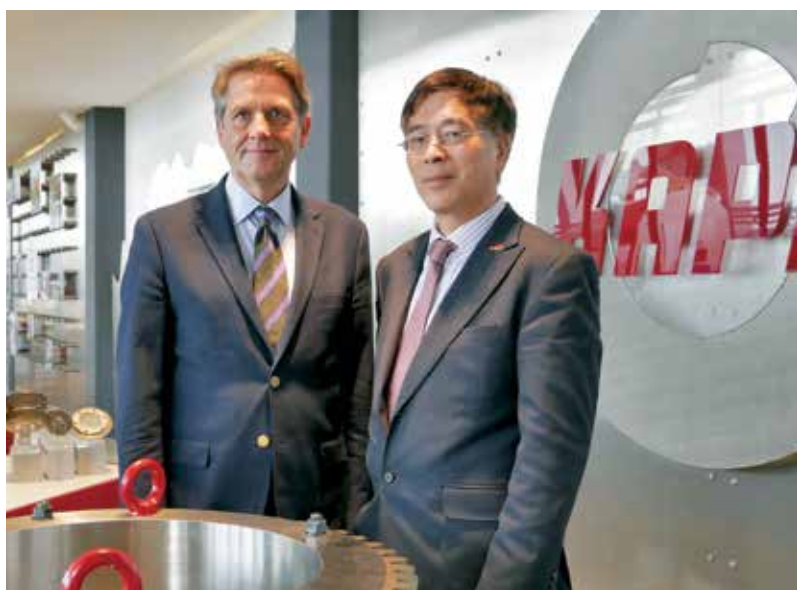
—— 访卡帕亚洲科技（嘉善）有限公司董事总经理冯国先生

□本刊记者 黄晏陵

德国制造业是世界上最具竞争力的制造业，在全球制造装备领域拥有卓越的地位。这在很大程度上源于德国专注于创新科研和开发，以及对复杂工业过程的管理。2013年德国政府提出“工业4.0”战略，2014年中德双方签署了《中德合作行动纲要》，2015年中国政府提出“中国制造2025”战略。卡帕亚洲科技（嘉善）有限公司董事总经理冯国先生说：“我们在中国销售的卡帕耐尔集团生产的齿轮磨床，全部来自德国原装进口，中国的工业建设需要类似于卡帕耐尔集团的数控机床和技术。能让这样的数控机床和技术在中国得到很好的应用，是我毕生的心愿。”

全球顶级精密磨床的杰出代表德国卡帕集团股份公司是德国“工业4.0”忠实的践行者，其在亚洲的子公司卡帕亚洲科技（嘉善）有限公司是“中国制造2025”与德国“工业4.0”对接中德合作的典范。

热情好客的冯国先生告诉记者：“卡帕集团股份公司成立于1953年，总部设在德国南部的古城科堡，是一家专业生产精密数控齿轮磨床的高科技龙头企业，也是全球著名的工具机床制造厂商，为用户提供世界最先进的磨齿机和直径在一厘米到八百厘米之间齿轮磨削设备和技术方案。卡帕集团专业生产上至航天飞机、商用飞机，下至赛车、集装箱大卡车上的精密齿轮，在北美洲、南美洲和亚洲设有六个分公司，在全球有将近一千名员工。用卡帕耐尔集团的设备生



卡帕集团总裁海穆特·诺思乐 (Helmut Nuessle) 先生和卡帕亚洲科技（嘉善）有限公司董事总经理冯国先生

产的精密齿轮，应用范围非常广泛：飞机制造业，汽车制造、港口机械，矿山设备，风力发电，工程机械，机床制造业，世界上的著名企业如奔驰、大众、通用、雷诺、西门子等都是卡帕集团的重要客户。卡帕集团的另一位重要成员是成立于1892年的耐尔公司，这家企业是原东德地区首屈一指的磨齿机供应商，在当年排名世界第一。KAPP和NILES两大品牌代表着齿轮精加工方面的领先解决方案。卡帕集团是唯一一家同时生产磨齿机和金刚砂CBN砂轮的专业公司，目前其规模和产量占世界第一。”

接着冯国先生介绍了卡帕亚洲科技（嘉善）有限公司，他说：“这是一家具有世界最先进的金刚砂CBN砂轮制造专业厂家。由德国卡帕控股公司投资建成，2006年落户浙江嘉善大云工业区，是当地政府引进的首家德资企业。企业所在的地理位置优越，距沪杭高速出口仅3公里，到高铁嘉善南站1公里，到上海虹桥机场一个小时车程、杭州萧山机场或浦东国际机场仅需1.5小时。公司占地面积11亩。卡帕亚洲科技（嘉善）有限公司现已成为嘉善大云工业区的标杆企业，成为中国第一家具有世界最先进的金刚砂CBN砂轮制造和重磨的专业厂家，并为客户提供最快最佳的技术服务和备品备件。目前我们已通过了ISO9001质量管理体系认证、ISO14000环境管理体系认



总部外景图 KAPP headquarter top view

总部大楼 Building KAPPN headquarter detail

证、ISO18000职业健康安全管理体系认证、TS16949质量管理体系认证，还获得国家高新技术企业、国家2级安全企业荣誉。”

谈及卡帕耐尔磨床的12大技术特色时，冯国先生总结道：“一，在加工工艺上的优势是模块化，以模块化机床组合件系统为基础，结合应用不同的工具和工艺技术，能提供最佳加工生产方案；二，一台机床上可进行连续的磨齿、间断成型磨齿，或是以上两种工艺相结合的磨齿；三，工具轴可以装上几个CBN工具，能同时装上粗磨和精磨工具，从而完成不同的磨削工艺；四，提供高精度齿轮加工服务，加工精度DIN2-3级，甚至更高；机床长年保证精度；五，适用于中等和大批量序列化产品及大批量高产量机加工；六，测量装置可以量测在齿轮机上磨削的全部齿轮大小；七，砂轮修正装置可以快速的修整刀具或者柔性，甚至万能的修整蜗杆砂轮；八，装卸自动化，根据不同任务要求，无论是工件的准备方式和储存容量，还是与自动程序的模式，都可以随意定义；九，在业内率先实现夹具的更换自动化；十，卡帕KN3G磨床实现触摸屏操作，可不使用键盘；十一，实现最快速度单件齿轮加工时间为15秒以内；十二，加工批量合格率高，cpk稳定1.67以上；生产过程中的自动抽样检测测量。最终达到为客户创造出最顶级最稳定的加工质量与最低加工成本的竞争优势。”

冯国先生还强调说：“我们在中国有一家合资企业和二家重要客户。重庆世玛德智能制造有限公司是一家2016年由德国卡帕集团

股份公司、重庆机床（集团）有限责任公司、浙江双环传动机械股份有限公司共同出资组建的中德合资公司，致力于自动化、智能化设备及配件的制造和数字化车间、智能化工厂自动化生产线的制造。浙江双环传动机械股份有限公司，2010年9月在深圳交易所公开上市，股票代码：002472，是全球最大的专业齿轮散件制造者和精密传动领导者，拥有全球最先进的120台套卡帕耐尔磨床。重庆机床集团是一家大型的国有企业。公司的另外一家重要客户是宁波鲍斯能源装备股份有限公司始创于2005年，公司主要从事螺杆压缩机核心部件及整机研发、生产及销售，是目前国内主要的螺杆主机供应商和领先的工艺流程用螺杆压缩机制造商。螺杆空气压缩机产量世界第一，2015年在深圳交易所公开上市，股票代码：300441，鲍斯公司订购了20多套最先进的卡帕耐尔数控转子磨床。”

最后，回顾卡帕在华的发展轨迹，冯国先生对未来寄予厚望，他说：“中国是卡帕集团股份公司最重要的市场。我们的理念是服务创造价值。在卡帕亚洲有两台加工中心，每一台价值1000万人民币，用于展示和客户培训。卡帕的服务工程师每两年有机会到德国总部轮训一次。我们的很多老客户，都是通过服务工程师的工作来加深对卡帕的理解，从而成就再次订单的。‘中国制造2025’与德国‘工业4.0’给了我们发展机会。未来，我们在中国最大的挑战是要超越自我，未雨绸缪，不断进取。”



German manufacturing industry, the most competitive across the world, is remarkable in the field of global manufacturing equipment, which is largely due to Germany's focus on innovative research and development, as well as the management of complex industrial processes. In 2013, the German government put forward the "Industry 4.0" initiative. In 2014, China and Germany signed the Joint Program of Action on Cooperation: Shaping Innovation Together, and in 2015, the Chinese government launched the "Made in China 2025" strategy. Mr. Georg Feng, the General Manager of KAPP Asia Technologies (JiaShan) Co., Ltd. said, "The gear grinding machines produced by KAPP NILES GmbH & Co. KG, which are sold in China, are all imported from Germany with original packaging. China's industrial construction needs CNC machine tools and technologies similar to those of KAPP NILES. It is my lifelong wish that such CNC machine tools and technologies can be well applied in China. KAPP, an outstanding representative of the world's top precision grinding machines, is a faithful practitioner of "Industry 4.0" of Germany, with its Asian subsidiary, KAPP Asia Technologies (JiaShan) Co., Ltd., as a model of China-Germany cooperation between "Made in China 2025" and "Industry 4.0".

A hospitable person, Mr. Georg Feng told the journalist, "Founded in 1953, KAPP is headquartered in the ancient city of Coburg, southern Germany. It is a leading high-tech enterprise specialized in the production of precision CNC grinding machines as well as a world-renowned machine tool manufacturer. It provides users with the world's most advanced gear grinding machines and gear grinding equipment in diameter ranging 1cm to 800cm and technical solutions. With nearly 1,000 employees worldwide and six branches set in North America, South America, and Asia, KAPP specializes in the production of precision gears for space shuttles, commercial aircraft, racing cars, and container trucks. Precision gears manufactured with the equipment of KAPP NILES enjoy a wide range of applications: aircraft manufacturing, automobile manufacturing, port machinery, mining equipment, wind power generation, construction machinery, machine tool manufacturing. Important customers of KAPP include world-famous enterprises such as Benz, Volkswagen, General Motors, Renault, and Siemens. Founded in 1892, Niles, another important member of KAPP, was a second-to-none gear grinding



machine supplier in the former East Germany and ranked Global No.1 in the same year. KAPP and NILES provide leading solutions to gear finishing. KAPP NILES is the only professional company that produces both gear grinding machines and CBN diamond grinding wheels, with its scale and output ranking at the first worldwide currently."

Then Mr. Georg Feng introduced KAPP Asia Technologies (JiaShan) Co., Ltd. He said, "It is a professional manufacturer of CBN diamond grinding wheels with the most advanced technology in the world. Invested by KAPP Holdings and settled in Dayun Industrial Zone, Jiashan, Zhejiang Province in 2006, it is the first German-funded enterprise introduced by the local government. The location of the enterprise is advantageous,

only 3km away from the exit of Shanghai-Hangzhou Expressway, 1km to Jiashan South Railway Station, 1hour's drive to Shanghai Hongqiao Airport, 1.5hours' drive to Hangzhou Xiaoshan Airport or Pudong International Airport. Covering an area of 11 mu (about 7,333 m2), KAPP Asia Technologies (JiaShan) Co., Ltd. has become a benchmark enterprise in Dayun Industrial Zone, Jiashan, and the first professional manufacturer in China with the world's most advanced technologies in CBN diamond grinding wheels manufacturing and re-plating, and provides customers with the fastest and optimal technical services and spare parts. At present, we have passed ISO 9001



quality management system certification, ISO 14000 environmental management system certification, ISO 18000 occupational health and safety management system certification, TS 16949 quality management system certification, and also the honor as a China national high-tech enterprise, and certified as a level II enterprise for work safety standardization in China."

Speaking about the twelve major technical features of its grinding machines, Mr. Georg Feng concluded, "1. our advantage in processing technology is modularization, providing optimal processing and production scheme based on modular machine tool assembly system, as well as the application of different tools and process technology; 2. we are able to provide continuous grinding, intermittent forming grinding, or grinding combining the above two processes on a single machine; 3. The tool shafts can be equipped with several CBN tools, both coarse and fine grinding tools, to complete different grinding processes; 4. we provide high-precision gear processing services, with a processing accuracy of DIN2-3 or even superior; in long-term use, machine will still be high stable; 5. our technology is applicable to machining of serialized products in medium and large quantities and high-yield products in large quantities; 6. the measuring device can measure all gears ground on the gear machine; 7. the dresser device can efficiently correct the tools or flexibly form any kind of shape on the grinding worm tools; 8. automation of loading and unloading can be defined at will according to requirements of different task, whether it is the preparation mode and scope of workpieces or the automation program related mode; 9. we are the first to realize automation of fixture replacement in the industry; 10. Kapp KN3G grinding machine can be operated via the touch screen without using keyboard; 11. the shortest time necessary for single gear processing is less than 15s; 12. batch processing enjoys a high qualified rate, cpk value 1,67 or above; samples are taken automatically for detection and measurement



during the production process. All these contribute to the competitive advantage of the finest and stable processing quality at the lowest cost for our clients."

He also stressed, "We have a joint venture and two major clients in China" A China-German joint venture co-funded by KAPP, Chongqing Machine Tool Group (Holdings), Zhejiang Shuanghuan Driveline, Chongqing Smart Manufacturing is committed to manufacturing

of automation and intelligent equipment and accessories, digital workshops, and automatic production line for smart plant. Zhejiang Shuanghuan Driveline was listed on the Shenzhen Stock Exchange in September 2010 with the stock code of 002472. With 120 sets of the world's most advanced KAPP-NILES grinding machines, it is the largest professional gear parts manufacturer and precision driveline leader across the world. Chongqing Machine Tool Group (Holdings) is a large state-owned enterprise. Another important client of the company is Ningbo Baosi Energy Equipment Co., Ltd. which was founded in 2005 mainly dealing with the R&D, production, and sales of the core components for and the whole machine of screw compressors. It is a major supplier for main body of screw compressors and a leading manufacturer of screw compressors for the technological process in China. With the output of screw air compressors ranking the first across the world, it was listed on the Shenzhen Stock Exchange in 2015 with the stock code of 300441. Baosi has ordered 20+ sets of the most advanced KAPP-NILES CNC rotor grinding machines.

Finally, looking back on the development track of KAPP in China, Mr. Georg Feng has great expectations for the future. He said, "China is the most important market for KAPP. We stick to the principle of 'your requirement - our portfolio'. There are two processing centers in KAPP Asia, each worthy of CNY 10 million, for exhibition and client training. Service engineers of KAPP have the opportunity to get training in rotation in the German headquarters every two years. Many of our regular clients deepen their understanding of KAPP through the work of service engineers and close deals repeatedly. "Made in China 2025" and "Industry 4.0" of Germany have provided us with an opportunity for development. In the future, our greatest challenge in China is to surpass ourselves, prepare for the rainy day, and keep forging ahead.

