



Korea

# Korean Life Savers

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*JS Park  
Overseas Sales Team Leader*

Fifty-six years ago, Kia started building bicycles in Korea. A nation of tired bicyclists soon demanded motorized vehicles. So that's what Kia built. First motorcycles. Then trucks. And, of course, cars. At last count, more than 2,000,000 Kias have rolled off the factory floor and on to the roads in more than 170 countries around the world. Founded in 1944 as a manufacturer of steel tubing and bicycle parts, Kia quickly evolved. The company became the first Korean company to build internal combustion engines and the first to build passenger cars. Its Hwasung manufacturing plant now covers more than 3.3 million square meters and has the capacity to produce more than 1,000,000 vehicles annually.

Behind the glamour of the motorcar industry however, lies a highly technical and experienced group of research, design and manufacturing operations.

Bontec Co. Ltd. is Kia's electronics manufacturing subsidiary, established in 1993 from the merger of two smaller companies in collaboration with Alpine, the Japanese manufacturer of audio, video and navigation systems. Its facilities are based at JinChun-Gun, to the South of Seoul. The factory employs 380 staff in the production of in-car audio visual entertainment units, remote locking systems and electronic control units (ECUs) for a variety of automotive functions used in all Kia automobiles. The JinChun Factory is 164,000 square feet in size and has almost all the facilities along with R&D laboratories to run the entire business operations. Almost all the products produced there except a few items for export are supplied to Kia Motors, and that includes 600,000 audio systems, 300,000 airbags and 300,000 wiring harnesses.

The development plan for new products is clearly defined, and Kia's long term goal is to integrate many of today's digital technologies into its vehicles of the future. For example,

起亚(Kia) 是韩国第一家轿车厂商, 年产量超过100万辆。但是, 在光彩夺目的汽车行业的背后, 是一系列高技术、有经验的研究、设计和制造作业。Bontec Co. Ltd. 位于汉城南郊 JinChun-Gun, 是起亚的电子品生产子公司。这家工厂有380名人员, 生产包括安全气囊在内的几种轿车设备。用于PCB测试的GenRad 228x系统具有一系列功能和测量技术, 最适合复杂的用途。





“We are the only manufacturer of airbag ECU's to test to the NHTSA International Standard, and we are required to undertake product liability tests for all products exported by Kia,” explains JS Park.

“In manufacturing terms we achieve only 0.3% failure at ICT stage and zero failures after final functional testing.

current audio technologies such as DVD, MP3 and Mini-disc will converge towards a common in-car digital video standard. The personal digital assistant you carry in your pocket today will one day plug into your car, to facilitate in-car navigation, planning and communications. Safety features are also expected to improve using futuristic techniques such as head-up displays used by fighter pilots and voice control.

A major line at the factory is the ECU which controls vehicle airbags, first introduced in November 1995. JS Park, the company's Overseas Sales Team Leader explains the project:

“We began developing our own airbags partly due to the partnership with TRW in the United States. The Airbag Integrated Electronic Module (AIEM) consists of an accelerometer which senses any changes in speed and triggers airbag deployment when impact shock exceeds a predefined threshold. The unit contains a built-in power supply which enables all functions to be maintained even in the case of loss of main battery power. Reliability, performance and advanced features are thanks, in part, to the use of ASICs which perform all critical functions within the circuit.”

The manufacturing line currently produces 40,000 units per month, with the capacity to double this if required. A unit which fails in the field could clearly mean the difference between life and death, so production and test strategy is geared entirely towards one goal - zero defects.

Achieving this requires reliable and accurate test systems. GenRad's 228x system is the main platform used,” says H O Yoon, Assistant Manager in the ECU Technical Team. The 228x systems in use have a very wide range of functions and measurement techniques, making it ideal for complex or mixed signal applications. Additional capabilities include ASIC, PAL and FPGA test program generation.

“GenRad has provided training for our engineers in Singapore, much more convenient than travelling to the United States,” remarked H O Yoon.

Kia has won numerous accolades for its superior achievements in quality control. It was the first automotive manufacturer to receive Korea's Total Quality Control (TQC) Grand Prize at the 17th annual National Quality Control and Standardization Contest in 1996, the Korean equivalent to Japan's famous Deming Prize and America's Malcolm Baldrige Award. Bontec was also the first manufacturer to receive the Grand Prize from the President for Quality Control management in Korea's 100 PPM Quality Management Competition in 1998.

Continuous research and development is the backbone of the company's philosophy and the company's history has involved several partnerships, most notably the relationship with Alpine, and technical partnerships with Yazaki (Japan) and TRW (USA). Given the company's rapid growth and considerable achievement, it would seem to be the philosophy for success.

