

## 汽车电子封装解决方案

### LOW PRESSURE INJECTION MOLDING SOLUTION FOR AUTOMOTIVE ELECTRONICS



NEEQ: 837355

#### 苏州康尼格电子科技股份有限公司 Suzhou KONIG Technologies Co., Ltd.

地址：江苏·苏州·常熟市辛庄镇长盛路33号

Add: No.33 Changsheng Road, Xinzhuang, Changshu, Suzhou, Jiangsu, China 215500

电话 Tel: 0512-5247 9018 传真 Fax: 0512-5247 9098

邮箱 Mail: info@konig.hk 网址 Website: www.konig.hk

2019年10月第三版。如有改动，恕不另行通知，敬请谅解。The 3rd Edition, Published in October 2019.

手册中涉及的其他公司品牌标识，本公司只涉及引用，如有不当之处请联系。  
Brands logo of other company in this handbook, KONIG is only involved in reference. If any improper, please contact us.



官网Web



公众号Wechat





## ABOUT KONIG

# 关于康尼格

康尼格—电子产品生产制造及方案定制设计的供应商，成立于2010年，获得ISO9001、CE、IATF16949、ISO13485等体系认证，是该行业“高新技术企业”。康尼格专注于电子产品生产工艺设计与开发，积极搭建战略平台，以满足多样化的客户需求。业务范围涵盖智能家居、穿戴设备、汽车电子、通讯电子、医疗电子等众多领域。

康尼格深耕低压注塑工艺数十年，在传感器、连接器、线束、电子元器件等领域积累了丰富的经验，推动国内低压注塑行业建立了完善的检测标准。我们为客户提前布局，优化流程管控，节约综合成本，缩短上市时间，为电子产品提高市场竞争力。

康尼格一直以创新和高效作为追求和核心，拥有成熟的项目管理机制和运营能力，提供一站式电子产品生产解决方案。从产品设计及生产工艺优化，到功能测试及整机组装，为客户提供高品质的制造服务。通过诚信可靠的商业操作，实现我们与合作伙伴的互利发展。帮助客户取得成功，令我们倍感骄傲。

KONIG is a global provider of electronic product manufacturing and customized design solutions, focusing on electrical product and process design and development to meet diversified custom demand with qualified system. Our business covers "Smart Home Appliance", "Smart Wearable Devices", "Automotive Electronics", "Communication Electronics", "Medical Electronics"... KONIG is established in 2010, certified with ISO9001, CE, IATF16949, ISO13485, belongs to High-Tech Enterprises.

KONIG has decades of manufacturing experiences in Low Pressure Injection Molding Solution(LPIM), driver of LPIM standards setting up in China with successful experiences in sensor, connector, wiring harness, electrical components. We plan ahead of time for customers, optimize process management and control; improve market competitiveness for electronic products.

KONIG, the company who is passion for innovation that high quality of work. We are formed with the experienced project management and operation team, provide customer total solution for electronic products. From product and process design, optimization, functional test and box build assembly, we offer customer excellent manufacturing services with high quality. Through honest and reliable business operations, we pursue win-win with our customer and partner.



## 研发 R&D

- 高新技术企业
- 低压注塑封装用热熔胶行业标准起草单位
- 江苏省电子产品封装保护技术研发中心
- 江苏省研究生工作站
- The Official Recognized High-Tech Enterprise
- The Drafter of Hot Melt Adhesive for LPIM
- The Provincial Overmolding R&D Center of Jiangsu Province
- The Graduate Student Work Station of Jiangsu Province



23项发明专利  
23 Invention Patents



19项外观设计专利  
19 Design Patents



38项实用新型专利  
38 Utility Model Patents

## 品质 QUALITY

### CE认证 CE Certification

- 熔胶单元
- 低压注塑设备
- Melting System
- Low Pressure Injection Molding Machine

拥有全部知识产权和核心专利  
Independent intellectual property rights and patents

## 经验 EXPERIENCE

### 项目经验 Project Experience

汽车轴承传感器封装，汽车一键启动线圈封装，SCR尿素管路封装...无论您的电子元器件有多复杂，我们都可与您一起评估，提供解决方案。

Automobile bearing sensor, One-button starting coil, SCR urea pipeline... No matter how complicated your electronic components are, we can evaluate and supply total solutions to you.

深耕多年，累积了丰富的项目经验  
Dedicated to LPIM for decades, accumulated rich project experience.

## 口碑 REPUTATION

### 优质服务 High Quality Service

泰科、舍弗勒、立讯、安费诺、麦格纳、亚大、亿万通、伟速达...服务整车厂优质配套企业，助力车辆优异表现。

TE, Schaeffler, Luxshare-ICT, Amphenol, Magna, Yada, IMS, Vast... Service vehicle factory quality suppliers, assist vehicles' excellent performance.

行业领先客户认可，持续合作  
Continuous cooperation with industry leading customers



## The Low Pressure Injection Molding Solution Makes Driving More Safe and Convenient

低压注塑工艺与安全便捷的驾乘体验同在

请联系我们，了解更多应用案例。Please contact us for more project info.

200+

### 传感器 SENSOR

目前一辆国内普通家用轿车上大约安装了几十个传感器，豪华轿车上的传感器数量多达两百个甚至更多，而其使用量随着汽车制造水平的发展还在增加.....

Nowadays, dozens of sensors are used on an ordinary family car. For luxury cars, sensors could be over 200. With the development of vehicle, the application amount of sensor is still increasing...



轴承传感器 Bearing Sensor



压力传感器 Pressure Sensor



无钥匙进入系统 Keyless Entry Sensor



速度位移传感器 Speed Displacement Sensor



安全带提醒装置 Safety Belt Reminding Sensor



后视镜温度传感器 Rearview Mirror Temperature Sensor



发动机节温器 Engine Thermostat



滤波器 Wave Filter



600+

### 连接器 CONNECTOR

未来每辆汽车则将使用到600至1000个电子连接器。作为连接电路的桥梁，连接器在汽车中起到疏通电路、接通电流的作用，对于汽车电子来说尤为重要。

In the future, each vehicle will have 600 to 1,000 electronic connectors. The connectors are dredging circuit and connecting current, paly a key role in automotive electronics system.



车载系统连接器 Vehicle Connector



4pin防水连接器 Waterproof Connector



防水连接器 Waterproof Connector



车用连接器 Vehicle Connector



防水连接器 Waterproof Connector



端子连接器 Terminal Connector



电源接头 Battery Connector



车用连接器 Vehicle Connector





## 1KM+ 线束 WIRING HARNESS

汽车电子线束系统是汽车的神经网络，所有线束连起来有几公里那么长.....

The automotive electronic wiring harness system is the neural network of vehicle, the total length is more than 1km.



## ≈25% 电子元器件 ELECTRONIC COMPONENTS

汽车零部件对于安全、可靠以及供货保证等有极高要求。汽车中电子元器件成本在25%左右，未来仍将继续提升。

Automotive components have high requirements for safety, reliability and supply guarantee. The cost of electronic components in a vehicle is around 25%, and it's still increasing.



## NEW ENERGY VEHICLE 新能源汽车

汽车电子成本占比已经达到47%，随着新能源汽车产量逐渐增加，汽车电子单车产值仍将持续提升.....

The cost of automobile electronic for a vehicle has come up to 47%. Since the production of New Energy Vehicle increases gradually, such spend will continue to increase...



## 47%+ 汽车电子成本 COST PROPORTION







#### 案例一 REFERENCE PROJECT 1

### SCR尿素管路封装

Overmolding for SCR Urea Pipeline



扫码登录康尼格优酷自频道  
观看案例视频  
KONIG Youku Video Channel

国五排放标准全面实施，缓解环保压力改善尾气排放质量。

目前国内柴油车尾气处理系统，大部分使用SCR系统，为尾气处理，治理雾霾做出了贡献。

Emission standard V has been fully in place to further improve the air quality.

At present, SCR system is applied to most diesel heavy trucks, which is another environment friendly efforts.



#### 工艺对比 PROCESS COMPARISON

塑料外壳+灌封 Plastic box + Potting

**2-24h** 成型时间 Curing Time: 2-24 H

多次灌封, 工艺繁琐  
Tedious process with many times potting

产品品质 Product Quality

- 内部填充状况无法保证
- 管子接口处断裂风险高
- 生产效率低下, 产品一致性差
- The internal filling condition can't be guaranteed
- Pipe interface with high fracture risk
- Low production efficiency and poor product consistency

材料评价 Material Evaluation

- 材料为环氧树脂, 聚氨酯或硅胶, 对环境不友善
- 固化时间长, 可塑性不佳
- Material is epoxy resin, polyurethane or silica gel, unfriendly to the environment
- Low production efficiency and poor product consistency

低压注塑 Low pressure injection molding

**45s** 成型时间 Curing Time: 45 S

一次成型, 操作简单  
Simple operation with one-time forming

产品品质 Product Quality

- 接头与管路 100% 密封
- 低温低压加热丝固型良好, 不易变形位移
- 产品一致性高, 保证优异性能
- Joint and pipeline is totally sealed
- The heating wire has good solid fixation with low temperature and low pressure
- Ensure excellent performance with good product consistency

材料评价 Material Evaluation

- 材料为热熔胶, 环保安全, 具环境亲和力
- 阻燃特性通过 UL94 V-0 认证, 高低温稳定性 (-40~150℃), 防水、防潮、电绝缘、抗冲击, 耐尿素溶液腐蚀性
- Material is hot melt adhesive, environmentally, safety, and environmental affinity
- Flame retardant properties are certified by UL94 V-0, high and low temperature stability (-40~150℃), waterproof, moisture-proof, electrical insulation, impact resistance, urea solution corrosion resistance

#### 您的利益 YOUR BENEFITS

提高生产效率  
Improve productivity

提高产品良率  
Improve product yield

低温低压保护精密部件, 加热丝固型良好, 不易变形位移  
Better protect the precision components with lower injection temperature and pressure, the heating wire has good fixation with no displacement



## PASSIVE KEYLESS ENTER

# 汽车无钥匙进入系统

汽车无钥匙进入系统 (Passive Keyless Enter)，简称PKE，接近即可打开车门，轻触按钮即可点火启动车辆，同时具有双重防盗功能，为车主最大限度的提供便利和安全。

行业标杆客户选用低压注塑工艺，来封装保护门把手低频天线，一键启动线圈—这种采用了世界最先进的RFID无线射频技术和最先进的车辆身份编码识别系统的产品。

Passive Keyless Enter, car door opens when the key near it, quick to start the vehicle by touching the button, and has dual anti-theft function, achieve convenient and reliable customer experience.

Industry benchmarking customers have chosen low pressure injection molding to protect these advanced products.

## 案例二 REFERENCE PROJECT 2

# 门把手低频天线封装

Overmolding for Low Frequency Antenna (for car door)



扫码登录康尼格优酷自频道  
观看案例视频  
KONIG Youku Video Channel



## 工艺流程 PROCESS

### 灌封工艺 Potting

工艺复杂，8步到位，固化时间2-24H小时  
The process is complex, 8 steps in place, curing time 2-24H hours



### 低压注塑工艺 Low Pressure Injection Molding

成型时间约60秒  
Molding time around: 60s



## 成本分析 COST ANALYSIS

项目 Item	灌封工艺 Potting	得分 Score	低压注塑工艺 Low pressure injection molding	得分 Score
设备	灌封设备 + 加热固化设备	2	低压注塑设备 + 模具	3
设备成本	200,000-300,000 RMB		100,000-150,000 RMB	
材料	环氧或者聚氨酯胶水	3	热熔胶	2
材料成本	50-200 RMB/kg		≈120 RMB/kg	
注胶时间	30s/pc 灌封时间 (10秒一次, 每个产品3次)	1	60s/pc 注胶成型时间 (含产品取摆时间)	3
固化时间	24 h	1		3
单个产品用量	≈15 g	1	≈12 g	2
单个产品成本	0.6-2.4 RMB	3	1.8 RMB	1
品质	产品内部腔填充性不佳, 品质无法保证, 产品一致性不高	1	产品成型快速, 一致性高	3
维保	维护保养程序繁琐。每次用完需要维护, 操作复杂: 排胶, 清洗, 更换管路。材料需要试样, 反复称重, 确定配比率。	1	维护保养简单。无需排胶, 清洗管路, 正常保养即可。材料品质稳定, 直接使用。	3
自动化实施	佳	3	佳	3
总分		16		23

\*以上数据取自具体案例 These data is from KONIG project

## 您的利益 YOUR BENEFITS



## 客户评价 Feedback from Customer

KONIG

### 钱工 | 研发部主管 Mr. Qian | R&D Department Director

低压注塑解决了灌胶开裂和效率低两大严重问题，康尼格在前期开发时积极配合我们的工作，目前已经完成样品验证；接下来的量产，我们对康尼格的设备和模具非常有信心。  
Low pressure injection molding solves the serious problems of potting cracking and low efficiency. KONIG actively worked with us during the earlier period development, the sample has been verified completely, and we trust KONIG for mass production.

### 何工 | 资深模具工程师 Mr. He | Senior Mold Engineer

康尼格设计能力强。量产用模具设计难度大，与康尼格模具工程师反复沟通，他们积极配合，给予我们最大的帮助。  
KONIG has strong design capability. The design of mold for mass production is difficult, we communicated it with KONIG mold engineers over and over again, and they actively cooperated with us, gave us the greatest help.





## 汽车座椅系统

汽车座椅系统，为客户提供增值驾驶体验，逐渐成为重要的品牌差异化因素之一。座椅加热，压力感应，安全带提醒等等，座椅控制系统必须依赖可靠的汽车电子来实现智能化。

Automotive seat system, which provides value-added driving experience for customers, has gradually become one of the important factors of brand differentiation. Seat heating, pressure sensing, seat belt reminder ... Seat control system must rely on reliable automotive electronics to achieve intelligent.

### 您的利益 YOUR BENEFITS



提高生产效率  
Improve productivity



提高产品良率  
Improve product yield



实现平台的通用性  
Improve generality



### 安全带霍尔传感装置 SEATBELT HALL SENSOR

含有霍尔元件的安全带霍尔传感装置在安全带扣中主要起到开关的作用，在遇到紧急制动时，令安全带发挥保护作用。

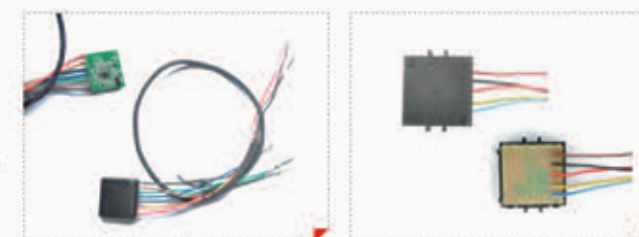
Seatbelt Hall sensor mainly plays the role of switch in the buckle of safety belt, and makes safety belt to protect passenger when encountering emergency braking.



### 座椅加热控制模块 SEAT HEATING CONTROL MODULE

座椅温度通过座椅加热控制模块调控，提升驾乘舒适度。

Seat temperature is regulated by seat heating control module to improve driving comfort.



### 座椅压力传感器 SEAT PRESSURE SENSOR

座椅压力传感器运用于汽车座椅乘员感知系统，当座椅受到外部的压力时产生触发信号，反馈给汽车系统以作下一步处理。

Seat pressure sensor is used in car seat occupant perception system. It generates trigger signal to the car system for next processing.





## 汽车天线

5G的商用将为车联网V2X提供条件。随着车联网的发展，车辆集成的无线连接和定位技术与日俱增：Wi-Fi、蓝牙、5G、用于车联网（V2X）的IEEE 802.11 WLAN系统以及GNSS定位等。支持多频通信、具有远程数据处理功能的智能天线，将更多的运用。

5G will provide conditions for V2X. With the development of Vehicle Networking, the technology of wireless connection and positioning for vehicle integration is increasing: Wi-Fi, Bluetooth, 5G, IEEE 802.11 WLAN system, GNSS positioning. Intelligent antenna with multi-frequency communication and remote data processing functions will be more widely used.

### 您的利益 YOUR BENEFITS

	提高生产效率 Improve productivity		降低复杂组装带来的高成本 Cost saving		IP67防水等级 IP67 waterproof
---	--------------------------------	---	-----------------------------	--	-----------------------------



汽车4G天线 Automotive 4G Antenna 	FPC汽车天线 FPC Automotive Antenna 	WiFi天线 WiFi Antenna 
新能源汽车高频天线 New Energy Vehicle High Frequency Antenna 	新能源汽车高频天线 New Energy Vehicle High Frequency Antenna 	新能源汽车高频天线 New Energy Vehicle High Frequency Antenna 

## 汽车氛围灯



氛围灯可以提高车内人员的乘车体验，营造舒适的氛围，更能够提高汽车品牌辨识度。在夜间行驶时，内饰氛围灯可降低视觉疲劳，在一定程度上提高驾驶员的行车安全性。

Automotive Ambient Lights can improve the passenger's experience, create a comfortable atmosphere, and can also improve the brand recognition of automobiles. When driving at night, interior ambient lights can improve driver's driving safety, while reduce visual fatigue.

### 您的利益 YOUR BENEFITS

	提高生产效率 Improve productivity		解决异型塑料壳体难填充 perfect filling special-shaped plastic shell
	快速装配 Rapid assembly		防尘防水 Dustproof and waterproof
	提高产品良率 Improve product yield		

汽车照地灯 Automotive Floor Light 	汽车照地灯 Automotive Floor Light 	车门氛围灯 Door Ambient Light 
车内氛围灯 Door Ambient Light 	车内氛围灯 Door Ambient Light 	日间行车灯 Day Traffic Light 



## 一键启动线圈封装

Overmolding for One-button Starting Coil

YOUKU  
优酷



扫码登录康尼格优酷自频道  
观看案例视频  
KONIG Youku Video Channel



客户定制设备，指定低压注塑工艺

Customized equipment, specified for low pressure injection molding

转盘式  
Turntable type

一模四穴  
1 mold 4 cavities

一上模配合两下模  
1 upper die + 2 lower die

### 低压注塑工艺优势 ADVANTAGES OF LOW PRESSURE INJECTION MOLDING

**1.5-40 bar**

注塑压力 Injection pressure

**180-200℃**

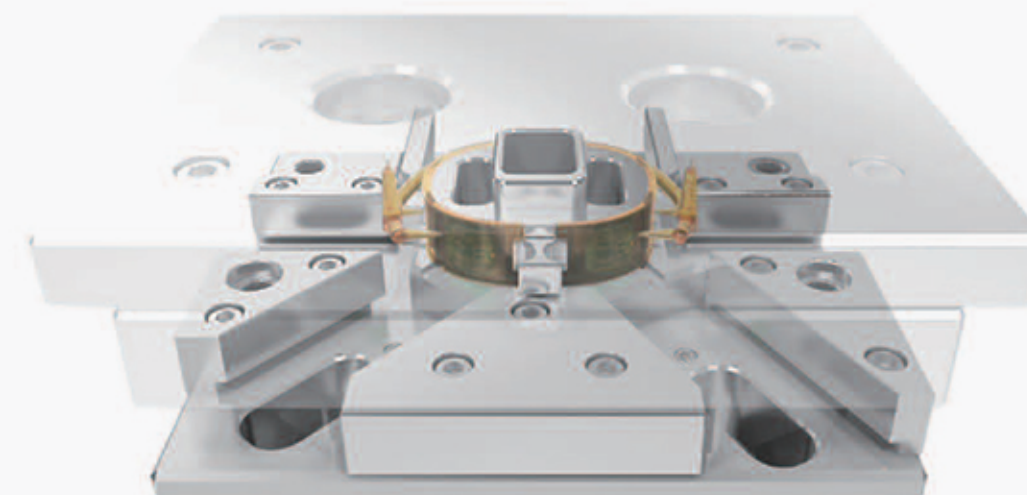
注塑温度 Injection temperature

**40s/4 pc**

40S完成4个产品 Finish 4 products in 40S

#### 工艺评价 Evaluation

- 热熔胶粘性可靠
- 更低温度，更低注塑压力，更好保护精密部件
- 防水、防潮、电绝缘、抗冲击，耐机油
- 线圈固型良好，不易变形位移
- 阻燃特性通过UL94V-0认证
- 高低温稳定性 (-40℃至150℃)
- Reliable adhesion of hot melt adhesive
- Better protect the precision components with lower injection temperature and pressure
- Waterproof, moisture-proof, electrical insulation, impact resistance, oil resistance
- Good coil solid type, not easy to displacement
- Flame retardant obtained UL94V-0 certification
- High-low temperature stability(-40-150℃)



## 低压注塑成型工艺 LOW PRESSURE INJECTION MOLDING

插件 Insert Products

注塑 Injection

测试 Testing

低压注塑成型工艺是以一种很低的注塑压力（1.5-60bar）将热熔胶材料注入模具并快速固化成型（5-50秒）的封装工艺，以热熔胶材料卓越的密封性和优秀的物理、化学性能，达到绝缘、耐温、抗冲击、减震、防潮、防水、防尘、耐化学腐蚀等功效。

Low pressure injection molding is an innovative manufacturing process evolved from injection molding and potting. The process is operated at very low pressures and very low temperature by using with hot melt adhesives. Typically benefit of superior material properties of water-tight encapsulation with excellent physical properties & chemical properties.

### 特点 ADVANTAGES



低至1.5bar的注塑压力，确保电子元件不被应力损坏  
Very low pressure to avoid damage electronic components

**1.5 bar**



成型速度快至5秒，极大限度提高生产效率  
Very fast cycle time to improve the productivity

**5 s**



注塑温度低至150摄氏度，即便是PCB软板也可轻松包裹  
Very low temperature with good adhesion with component

**150℃**





SOLUTION PROVIDER

## 一站式电子产品生产解决方案

我们提供的不只是元器件封装，而是电子产品生产制造及方案定制设计整体解决方案。帮助客户取得成功，令我们倍感骄傲。

What we supply is not only overmolding for components, but also the total solution of electronic product manufacturing. We are very proud to help our customer succeed.

### 领先的解决方案 Leading Solutions

- 提供电子产品生产制造，方案定制设计，低压注塑封装保护等完整的解决方案。
- 从产品设计阶段，到生产、检验和测试，时刻与客户保持彻底的、开放的沟通。
- Supplying the total solutions with electronic product manufacturing, conceptual design, low pressure injection molding etc.
- Keep open communication with customers in whole process on time, from product design, production to testing.

### 专业的产品和服务 Professional Products and Service

- 设备通过 CE 认证，高质量标准
- 提供安装、培训、检测和售后一体化的服务
- CE certified with high quality.
- Provide integrated service with installation, training, testing and service.



### 灵活的合作方式 Flexible Cooperation

- 出售设备
- 代理加工
- 整合采购
- Equipment
- OEM
- Integrated purchasing



### 可靠的伙伴关系 Reliable Partnership

- 与我们的客户在整个产品开发周期和多年来，形成持久可靠的商业伙伴关系
- Durable and reliable business partnerships with our customers.



YOUR RELIABLE PARTNER

## 您可信赖的合作伙伴

### 我们的客户 OUR CUSTOMER



### 客户评价 Feedback from Customer

KONIG

#### 蒋工 | 工程部经理 Mr. Jiang | Engineering Manager

低压注塑设备帮助我们泰科解决了生产效率，提高了产品品质。康尼格为我们提供了完整的解决方案，包括胶料、模具、设备。专业的技术能力和完善的售后服务为泰科增加了竞争力。

Low pressure injection molding equipment help us to solve the problem of production efficiency and improve the product quality. KONIG provides us with the complete solution, includes the material, mold and equipment. TE improves competitiveness due to KONIG professional technical ability and the perfect service.

#### 杨工 | 高级工程师 Mr. Yang | Senior Engineer

低压注塑解决了我们产品传统注塑的溢胶及防水性能差的问题，目前产品放在康尼格代工生产，十分放心，他们对我们的供应商来料认真检查，制程规范，良品率非常高。

The traditional injection would cause overflow, and the poor waterproof. Low pressure injection molding helps us solve these critical problems. Now our products have high yield after OEM in KONIG, and we trust KONIG a lot due to their responsible work attitude.

#### 曹工 | 采购工程师 Mr. Cao | Sourcing Engineer

康尼格技术团队支持和工作态度无可挑剔。KONIG has outstanding supporting and working attitude in technical team.

#### Mr. Tagliat | Industrial Engineering

Very good for every solution.

#### 钱工 | 采购工程师 Mr. Qian | Sourcing Engineer

这是我们第一次从中国本土购买国产设备，技术完全达到我们的要求，康尼格的设备已经达到先进水平。

It is our first time to purchase the equipment that made in China, the technology fully meets our requirements. KONIG equipments have reached advanced level.