精诚工科汽车系统有限公司（简称精工汽车 EA），总部位于河北省保定市，注册资本 10 亿人民币，公司拥有员工 11000 余人，年产值 135 亿元人民币，依据工艺特性分为三大板块，八大业务，下设 1 个研究院、16 个制造工厂，区域分布在河北、天津、江苏、重庆 4 个省市区。

工艺涉及冲压、液压成型、焊接、电泳、机加工、模具装配、铝合金铸造、模具铸造、热成型、辗压、模具设计与制造、自动化装备设计集成、资源回收再利用等。

产品涉及底盘系统、车身系统、动力系统、传动系统等相关部件及自动化生产装备。

Exquisite Automotive Systems Co., Ltd (referred to as EA), with headquarters located in Baoding, Hebei Province and registered capital of 1 billion RMB have annual output value of 13.5 billion RMB and more than 11000 staff. Its service has been divided into three divisions and eight major business according to the characteristics of the process. It has one R&D center and 16 manufacturing plants, which located in Hebei Province, Tianjin, Jiangsu Province and Chongqing.

The process technology includes cold stamping, hydraulic forming, welding, e-coating, machining, module assembly, aluminium alloy casting, mould casting, hot forming, rolling, mould design and manufacturing, design integration of automation equipment and material recycling and reusing, etc.

Its products cover parts of chassis system, vehicle body system, powertrain system and transmission system, and automatic production equipment.
精工模具简介

BEM Profile

保定精工汽车模具技术有限公司成立于 2005 年，十余年专注于汽车灯具模具的研发、制造，具备成熟的技术方案及项目管理经验。

公司占地面积 13800 m²，员工 245 人，年产模具 200 套，18 年总产值 1.6 亿元。

公司致力于打造高质量、高效率的模具产品，不断创新管理方法及技术方案，追求高质量、短周期，帮助客户提升产品竞争力。

Established in 2005, Baoding Exquisite Auto Mould Technology Co., Ltd (Shorted as BEM), with well-rounded technology plan and project management experience, has been focused on the development and manufacturing of automotive lamp mould for more than 10 years.

Covering 13,000 m², BEM has 245 employees with annual output of 200 sets and its total value has reached 160 million RMB in 2018.

We are committed to build the mould of high quality and high efficiency, keeping innovating our management and technology plan. With the pursuit of high quality and short cycle, we can help customers improve product competitiveness.

- 2005 年成立，占地面积 4800 m²，75 名员工，
  生产汽车内饰件模具
  Established in 2005, covered an area of 4800m², at first 75 employees, began to manufacture automotive interior and exterior trim mould.

- 2007 技术创新和产品升级，重点生产汽车保险杠、车灯等大型模具。
  Technical innovation and product upgrading, focused on manufacturing the mould of auto bumper, lamphase and other large moulds.

- 2009 成功研制出 15 种不同类型的保险杠、车灯模具，技术达到国内领先水平。
  Successfully developed 15 different types of moulds for bumper, headlamps lamphase, the technology reached the leading level in China.

- 2011 完善内部管理和质量管理体系，一次性通过德国 VDA6.4 体系认证。
  Improved the internal management and the quality management system, got the German VDA6.4 system certification at one time.

- 2012 大中型模具年产量达 100 套，产值超过 1 亿元。
  The annual output of the large and medium moulds reached 100 sets, and the output value exceeded 100 million yuan.

- 2013 技术升级，成功完成了双色车灯、尾灯等光板、微发泡等汽车前部模具的开发。
  Technology was upgraded and successfully finished the development of mould of double color headlight lamphase, thick wall light guide plate, micro foaming, front-end mould etc.

- 2015 投资 1.5 亿元新建 13000 平方米厂房，并搬迁完成，年产量 250 套。
  Invested 150 million yuan to build the new factory which covers 13000m² and completed the relocation, the annual output reached 250 sets.

- 2016 多年来专业生产保险杠模具和灯罩模具，技术达到国际水平。
  Specialized in manufacturing bumper mould and lamphase mould for years, the technology reached the international level.
BEM is located in Baoding, Hebei province which is one of central cities of Beijing, Tianjin and Hebei and also famous for its splendid scenery and convenient transportation. It is 5KM away from high-speed railway station, 7KM from entrance of Beijing-Hongkong-Macao Expressway, 191KM away from PEK Airport, 114KM away from Zhengding Airport.
BEM 提供的产品与服务
Products & Services

BEM 为客户提供从产品开发到模具全生命周期的一站式服务
BEM for the whole life cycle of customers from product development to mold one-stop service

1. 产品同步开发
   Product Synchronous Development
   - 样件、校正工装
   - The fixture, the school form tooling
   - SE 分析
   - SE analysis
   - 产品优化意见
   - Advice on product optimization
   - 结构设计
   - Structural Design
   - 成型分析
   - Forming analysis
   - 注塑工艺分析
   - Analysis of Injection Molding Technology
   - 模具强度分析
   - The mold strength analysis
   - 2/3D 设计
   - Two-thirds of d design

2. 设计
   Design
   - 模具加工
   - Mould processing
   - 模具装配
   - Mould assembly
   - 模具抛光
   - Mold polishing
   - 模具检测
   - Mould inspection

3. 制造
   Manufacturing
   - 模具试模
   - Mold test
   - 提供小批量件
   - To provide small batch samples
   - 产品检测（CMM CT X 光）
   - Product testing (CMM CT Xray)

4. 调试
   Test Debugging
   - 模具试模
   - Mold test
   - 提供小批量件
   - To provide small batch samples
   - 产品检测（CMM CT X光）
   - Product testing (CMM CT Xray)

5. 售后服务
   After-sales Service
   - 模具维修，技术支持
   - Mould doctor, technical support
   - 产品交付
   - Product delivery
   - 模具保养及保养
   - Mould Maintenance and Maintenance

注：这些服务项目也可以单独向客户提供，满足客户不同阶段的差异化需求。
Note: these services at the same time also can separate to provide customers, meet customer demand at different stages of differentiation.
单色、双色装饰框
Monochromatic and bicolor decorative frames

前灯双色、前灯单色、尾灯双色、尾灯三色灯罩等
Headlamp bicolor, headlamp monocolor, tail lamp bicolor, tail lamp tricolor shade, etc

灯壳类
Lampsheells

光导、厚壁透镜
Photoconductive thick-walled lens

导光及厚壁产品做为新的业务增长点，公司加强研发及资金投入
As a new business growth point, the company strengthens R&D and capital investment.
2018年，精工模具聚焦核心产品，收缩部分产能，专注于品种经营等策略，有效支持未来五年规划的目标。

Since 2018, in order to better support the target for the next 5 years, BEM started to focus on its core products, shrink part of production capacity and concentrate on product management strategy.
提升 CAE 准确度 | Improve accuracy of CAE

采用工艺策划路线：
SE 阶段：运用产品审核规范及 CAE 评价标准进行产品审核
试模阶段：根据试模问题情况总结试模案例库
试模后总结：试模案例库归纳完善产品审核规范及 CAE 分析评价标准

采用过程规划路线：
SE Stage: Product Audit Standards and CAE Evaluation Standards
Test stage: Summarize the case base of test mode according to the situation of test mode problems
Summary after test: The case base of test model is summarized and perfected to the product auditing criteria and CAE analysis and evaluation criteria

尺寸精度保证 | Dimensional accuracy assurance

原始数据变形分析 | Deformation Analysis of Raw Data
导出反向变形数据 | Derivation of reverse deformation data
反向变形数据 | Deformation Analysis of Reverse Deformation Data
变形分析 | Deformation Analysis

专利证书 | The patent certificate

技术配置 | Technical configuration

- 配备 MOLDFLOW、UG、CATIA、PROE、Tebis、Worknc 等先进 CAE、CAD、CAM 软件
- Equipped with MOLDFLOW, UG, CATIA, PROE, Tebis, Worknc and other advanced CAE, CAD, CAM software
- 公司重视创新，拥有模具结构、工装类发明专利 57 项，结构创新实用新型专利 123 项
- Our company attaches great importance to innovation. It has 57 patents for mould structure and tooling and 123 patents for structural innovation and utility model.

产品同步开发 | Product synchronous development

ABAQUS 模拟生产过程模具变形 | ABAQUS to simulate the production process of mold deformation

CAE 变形分析 | CAE Deformation Analysis

模型处理 | Model Processing
Moldflow 压力条件 | Moldflow pressure condition
边界条件及载荷 | Boundary Conditions and Loads

动态模压：最大 427 MPa
Dynamic modulus stress: maximum 427 MPa
分型面变形量：0.02mm
Deformation of parting surface: 0.02mm
内抽回退量：0.2mm
Internal withdrawal: 0.2mm
模具有稳定的保证能力

BEM的制造技术

Application of ABAQUS to Simulate the Strength and Deformation of Mould under Injection Pressure and Mould Locking Force.

机加工
Machining

调试检测
Tryout & testing

组合
Assembly

经验证的模拟分析可以帮助我们选择模具材料牌号及尺寸，兼顾客户使用模具的稳定性和经济性

Experiences and simulation analysis can help us to select mould material and size more accurately while ensuring the stability and economy of the mould.
<table>
<thead>
<tr>
<th>设备名称</th>
<th>品牌</th>
<th>型号</th>
<th>设备行程</th>
<th>数量</th>
<th>产地</th>
<th>原产国</th>
</tr>
</thead>
<tbody>
<tr>
<td>高速加工中心</td>
<td>MIKRON</td>
<td>VCP1000</td>
<td>1000<em>650</em>500</td>
<td>1</td>
<td>瑞士</td>
<td>Switzerland</td>
</tr>
<tr>
<td>大型五轴联动加工机（5轴）</td>
<td>FIDIA</td>
<td>FIDIA D318/B5H</td>
<td>3000<em>1000</em>900</td>
<td>3</td>
<td>意大利</td>
<td>Italy</td>
</tr>
<tr>
<td>航空高精度龙门五轴加工中心（5轴）</td>
<td>PARpas</td>
<td>PARpas X425</td>
<td>4000<em>2700</em>1500</td>
<td>1</td>
<td>意大利</td>
<td>Italy</td>
</tr>
<tr>
<td>德国五轴框架加工中心</td>
<td>DMG</td>
<td>DMG800</td>
<td>800<em>1050</em>850</td>
<td>1</td>
<td>德国</td>
<td>Germany</td>
</tr>
<tr>
<td>高精度立式加工中心</td>
<td>OKUMA</td>
<td>MB-65VB</td>
<td>1500<em>660</em>660</td>
<td>1</td>
<td>日本</td>
<td>Japan</td>
</tr>
<tr>
<td>大型五轴联动加工机</td>
<td>OKUMA</td>
<td>MA-600HB</td>
<td>1000<em>930</em>100</td>
<td>1</td>
<td>日本</td>
<td>Japan</td>
</tr>
<tr>
<td>东芝数控龙门加工中心</td>
<td>TOSIBA</td>
<td>MPF-3116D5</td>
<td>1900<em>3100</em>715</td>
<td>1</td>
<td>日本</td>
<td>Japan</td>
</tr>
<tr>
<td>东芝五轴加工中心</td>
<td>TOSIBA</td>
<td>BT-13F22</td>
<td>3000<em>2300</em>1600</td>
<td>1</td>
<td>日本</td>
<td>Japan</td>
</tr>
<tr>
<td>5轴深孔钻</td>
<td>HUANJIIU</td>
<td>D802515-15S</td>
<td>2500<em>1500</em>1200</td>
<td>1</td>
<td>中国</td>
<td>China</td>
</tr>
<tr>
<td>5轴深孔钻</td>
<td>HUANJIIU</td>
<td>CANDER3.6S</td>
<td>3000<em>1500</em>900</td>
<td>1</td>
<td>中国</td>
<td>China</td>
</tr>
<tr>
<td>VMC</td>
<td>LON IC</td>
<td>CV-1200A</td>
<td>1200<em>600</em>675</td>
<td>1</td>
<td>中国</td>
<td>China</td>
</tr>
<tr>
<td>VMC</td>
<td>CV-1600</td>
<td>1600<em>900</em>800</td>
<td>1</td>
<td>中国</td>
<td>China</td>
<td></td>
</tr>
<tr>
<td>VMC</td>
<td>TV-15BB</td>
<td>1500<em>660</em>750</td>
<td>1</td>
<td>中国</td>
<td>China</td>
<td></td>
</tr>
<tr>
<td>古野电火花</td>
<td>MAKINO</td>
<td>EDNC157</td>
<td>1500<em>700</em>500</td>
<td>1</td>
<td>日本</td>
<td>Japan</td>
</tr>
<tr>
<td>古野电火花</td>
<td>KOREAN</td>
<td>1500CNC</td>
<td>1500<em>600</em>500</td>
<td>1</td>
<td>韩国</td>
<td>Korea</td>
</tr>
<tr>
<td>古野电火花</td>
<td>HABAN</td>
<td>CNC-EDM HE200</td>
<td>(1200*1200)<em>700</em>500</td>
<td>1</td>
<td>中国</td>
<td>China</td>
</tr>
<tr>
<td>三光CNC加工</td>
<td>SANGJANG</td>
<td>CTW630TC</td>
<td>800<em>630</em>500</td>
<td>1</td>
<td>中国</td>
<td>China</td>
</tr>
<tr>
<td>三光CNC加工</td>
<td>MAKINO</td>
<td>DU064</td>
<td>650<em>400</em>420</td>
<td>1</td>
<td>日本</td>
<td>Japan</td>
</tr>
<tr>
<td>三光CNC加工</td>
<td>MITSUBISHI</td>
<td>MV4600</td>
<td>800<em>600</em>510</td>
<td>1</td>
<td>日本</td>
<td>Japan</td>
</tr>
<tr>
<td>三光CNC加工</td>
<td>MAKINO</td>
<td>E56</td>
<td>900<em>500</em>450</td>
<td>1</td>
<td>日本</td>
<td>Japan</td>
</tr>
<tr>
<td>三光CNC加工</td>
<td>V33</td>
<td>600<em>400</em>340</td>
<td>1</td>
<td>日本</td>
<td>Japan</td>
<td></td>
</tr>
<tr>
<td>三坐标测量机</td>
<td>ZEISS</td>
<td>CMM CONTURA 10/12/1 RDS</td>
<td>1000<em>1200</em>600</td>
<td>1</td>
<td>德国</td>
<td>Germany</td>
</tr>
<tr>
<td>三坐标测量机</td>
<td>ZEISS</td>
<td>CMM MMZ E 20/30/10</td>
<td>2000<em>3000</em>1500</td>
<td>1</td>
<td>德国</td>
<td>Germany</td>
</tr>
</tbody>
</table>