



**LECN** / 力成专机  
BESPOKE MACHINE WORLD / 智慧专机智能联线



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■ 自动化与联线  
Automatic & connect line  
■ 车削  
Turning  
■ 铣齿机  
Rolling machine  
■ 深孔钻床  
Deep hole drilling machine

■ 磨床  
Grinding machine  
■ 等速万向节专机  
CV joint machine  
■ 铸端面钻中心孔机床  
Facing and centering machine  
■ 镗铣专机  
Boring & milling machine

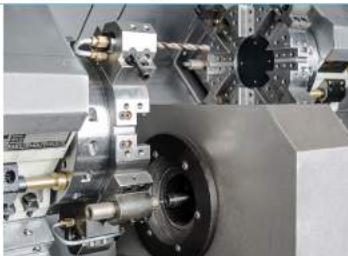
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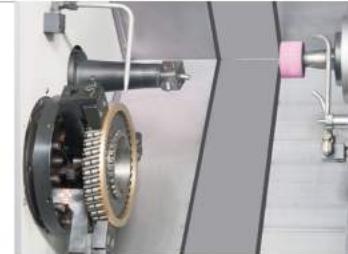
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# 关于我们

About Us



## 搓齿专家

Rolling experts

## 等速万向节整线输出

CV joint whole production line

## 轴部件全面解决方案

Shaft parts comprehensive solution

## 智能制造解决方案

Intelligent manufacturing solutions

我们 致力于您现在及未来需求的实现，  
为您提供全面的解决方案；  
我们致力于仅在少数领域内更专业，  
为您提供顾问式的销售和服务；  
我们致力于现代化装备的制造与探索，  
并把他当成毕生的事业；  
因此——对于您的挑剔和苛刻我们始终心怀感恩！

We are always committed to catering for your demands, offering you overall solutions;  
We are devoted to being more professional in a minority of field, providing you with consultative sales and service;  
We are applied to the manufacturing and exploration of modern equipment, working for that as a life career; thus we are always grateful for your critics.



LECN 总部位于长三角城市群之安徽池州，自 2003 年创始于美丽的玉环岛上，一直以来，专注于轴类零件高效专机的研发和全面解决方案的探索。

LECN 营销及售后网络遍及国内工业重镇和制造业集聚区，并在韩国、日本、美国、俄罗斯、东南亚等国家和地区均设有常驻代表处。作为国内装备领域的主要成员之一，力成团队以勤勉致知、持续创新的工匠精神，在花键成形和等速万向节制造等多个领域开启了专机定制和行业机床标准化的先河。十余年来，力成团队以广阔的技术视野和丰富的设计经验，曾服务于全球众多行业的 900 余家用户，在业内广为知晓。

以精密搓齿机、数控车床、双头车床、铁打专机、球差专机等为代表的 8 大系列 80 余种专用机床、行业机床和自动化生产线紧密的契合用户需求。广泛应用于汽车（变速箱、发动机、起动机、传动轴、转向系统、制动系统、等速万向节等）、摩托车、纺织行业、工程机械、电动工具、水暖阀门、五金家电等行业用户的箱类加工现场。力成朴素、简洁的设计风格和稳定、耐用的产品品质，深得用户口碑。

按照现代精密装备的技术条件建设的生产和办公场所共 30000 余平米，包含设计中心、运营中心、检测中心、精密加工、恒温部装、整机组装、钣金制造等。配备有加工中心、龙门镗床、龙门导轨磨床等关键工序加工设备 30 余台套，检测中心包含齿轮廓检测中心、三坐标测量仪、激光干涉仪，动平衡仪等国际先进的检测手段。即使面对订单多样化的运营环境，也可以借助供应链体系以及 ERP 管理系统，实现快速交付。

LECN 以“反省、宽和、严谨、自由”的企业价值观，构建员工正确为人的心智模型和职业修养，积极提升管理水平和产品制造标准。根植东方，面向全球，以前瞻的思维专注于用户需求，把最具有竞争力的现代化装备带给全球的制造业用户。



LECN headquartered in Chizhou, Anhui Province, is located in the Yangtze River Delta Urban Agglomeration. Since its founding on the beautiful Yuhuan Island in 2003, it has been focusing on the research and development of high-efficiency special aircraft for shaft parts and the exploration of comprehensive solutions.

LECN marketing and after-sales network covers major industrial towns and manufacturing agglomeration areas in China, and has permanent representative offices in Korea, Japan, Britain, Russia, Southeast Asia and other countries and regions. As one of the important members in the field of domestic equipment, Licheng team, with the spirit of diligent knowledge and continuous innovation, has opened the pioneer of customization of special aircraft and standardization of industrial machine tools in many fields such as spline forming and constant velocity universal joint manufacturing. Over the past ten years, Licheng team has served more than 900 users in many industries around the world with broad technical vision and rich design experience. It is widely known in the industry.

More than 80 kinds of special machine tools, industry machine tools and automatic production lines, represented by rolling machine, CNC lathe, double head CNC lathe, faceing and centering machine and CV joint machine, closely meet the needs of users. Widely used in automobile (gearbox, engine, starter, transmission shaft, steering system, braking system, CV joint, etc.), motorcycle, textile industry, construction machinery, electric tools, plumbing valves, hardware and household appliances and other industries users of the shaft processing site. LECN's simple and concise design style and stable and durable product quality have won the praise of users.

According to the technical conditions of modern precision equipment, more than 30,000 square meters of production and office space are constructed, including design center, operation center, testing center, precision processing, constant temperature part assembly, whole assembly, sheet metal manufacturing, etc. It is equipped with more than 30 sets of processing equipment for key processes such as machining center, gantry boring and milling, gantry guide grinder and so on. The testing center includes gear testing center, three coordinates measuring instrument, laser interferometer, dynamic balance instrument and other international advanced testing means. Even in the face of diversified operating environment of orders, rapid delivery can be achieved by means of supply chain system and ERP management system.

With the enterprise values of "self-examination, harmony, preciseness and freedom", we should build the mental model and professional accomplishment of employees to correctly conduct themselves, and actively improve the management level and product manufacturing standards. Rooted in the East, facing the whole world, with forward-looking thinking, focusing on user needs, bringing the most competitive modern equipment to the global manufacturing users.

## 部分客户名录

已为国内外近900多家汽车零部件生产企业提供产品及交钥匙工程。

It has provided products and key delivery projects for more than 900 auto parts manufactures at home and abroad.



## 按笔画排列

大连创新零部件制造有限公司  
万向钱潮等速驱动轴工厂  
山东光大机械制造有限公司  
山东金马工业集团股份有限公司  
广东富华重工制造有限公司  
广西汽车集团有限公司  
无锡威孚高科技集团股份有限公司  
太仓南雁新能源传动有限公司  
日本三井物产机床贸易(上海)有限公司  
日本电产(浙江)有限公司  
东风汽车电气有限公司  
东华汽车实业有限公司  
北方重工集团有限公司  
宁波惠元精密机械有限公司  
宁波皓能装备股份有限公司  
台湾华德机械工业股份有限公司  
西安铁路信号有限责任公司  
西班牙西艾意汽车零部件(上海)有限公司  
成都青山实业有限公司  
庆铃汽车股份有限公司  
江苏塑阳控股集团  
安徽万安汽车零部件有限公司  
安徽江淮汽车集团股份有限公司  
安徽星瑞齿轮传动有限公司  
青岛阿迪尔桥制造有限公司  
奇精机械股份有限公司  
河南中轴中汇汽车零部件有限公司  
陕西东风车桥传动系统有限公司  
南京康尼精密机械有限公司  
耐世特凌云工业股份有限公司  
科费尔(常州)传动技术有限公司  
重庆龙润汽车转向器有限公司  
重庆北特科技有限公司  
重庆市北碚区顾宏齿轮工业有限责任公司  
重庆市诚润机械有限公司  
重庆兰德动力传动机械股份有限公司  
重庆环松工业(集团)有限公司  
重庆建设工业(集团)有限责任公司  
莱州市金田机械有限公司  
株洲欧格瑞传动股份有限公司  
格林精密部件(苏州)有限公司  
唐山通力齿轮有限公司  
浙江万达汽车方向机股份有限公司  
浙江双环传动机械股份有限公司  
浙江世宝股份有限公司  
浙江东音泵业股份有限公司  
浙江向隆机械有限公司  
浙江宏鑫曲轴有限公司  
浙江欧迪恩传动科技股份有限公司  
深圳市比亚迪汽车有限公司  
湖北三环集团有限公司  
温州市冠盛汽车零部件制造有限公司  
富顺安建汽车零部件(东莞)有限公司  
韶能集团韶关宏大齿轮有限公司  
鹤山捷士克汽车配件有限公司  
襄阳汽车轴承股份有限公司  
襄阳博亚精工装备股份有限公司

DALIAN INNOVATION PARTS MANUFACTURING COMPANY  
WANXIANG QIANCHAO CO.,LTD.  
SHANDONG EVERBRIGHT MACHINERY MANUFACTURING CO., LTD.  
SHANDONG JINMA INDUSTRIAL GROUP CO.,LTD.  
GUANGDONG FUHUA HEAVY INDUSTRY CO., LTD.  
GUANGXI AUTOMOBILE GROUP CO.,LTD.  
(GERMANY)WEIFU GROUP  
TAICANG NANYAN NEW ENERGY TRANSMISSION CO.,LTD.  
(JAPAN) MITSUI&CO.,LTD.  
JAPAN NIDEC CORPORATION(ZHEJIANG)CO.,LTD.  
DONGFENG MOTOR ELECTRIC CO.,LTD.  
DONGFENG AUTOMOTIVE INDUSTRIAL CO.,LTD.  
NORTH HEAVY MACHINERY CO.,LTD.  
CHONGQING HUANSONG INDUSTRIES(GROUP)CO.,LTD.  
BAOSI SHARES  
TAIWAN HUAYONG MACHINE INDUSTRY  
CRSC(X'IAN)RAIL TRANSIT INDUSTRY GROUP CO.,LTD.  
(SPANISH)CIE AUTOMOTIVE GROUP  
CHENGDU QINGSHAN  
QINGLING MOTOR CO.,LTD.  
JIANGSU GANGYANG HOLDING GROUP  
ZHEJIANG VIE SCIENCE & TECHNOLOGY CO., LTD.  
JAC(ANHUI)JIANGHUA AUTOMOBILE GROUP CORP.,LTD.  
ANHUI STARGEAR TRANSMISSION CO.,LTD.  
(ITALY)QINGDAO ADR AXLES MANUFACTURING CO.,LTD.  
FINE MACHINERY CO., LTD.  
HENAN ZHONGZHOU DEPARTMENT OF BEIJING GREAT AUTOMOTIVE COMPONENTS CO.,LTD.  
SHANXI TRANSMISSION DONGFENG AXLE CO.,LTD.  
NANJING CONNIE PRECISION MACHINERY CO., LTD.  
LINGYUN INDUSTRIAL CORPORATION LIMITED  
THE POPULAR SCIENCE FAIR DRIVE TECHNOLOGY (CHANGZHOU) CO., LTD.  
CHONGQING LONGRUN AUTOMOBILE STEERING GEARS CO.,LTD.  
CHONGQING BEITE  
YAHONG GEAR INDUSTRY CO.,LTD.  
CHONGQING EMBELLISH MACHINERY CO., LTD.  
CHONGQING BLUE POWER TRANSMISSION MACHINERY LIMITED BY SHARE LTD.  
NINGBO HUIYUAN PRECISION MACHINERY CO.,LTD.  
CHONGQING JIANSHE INDOSTRY(GROUP)CO.,LTD.  
LAIZHOU JINTIAN MACHHINERY CO.,LTD.  
ZHUZHOU OUGERUI TRANSMISSION CO.,LTD.  
GREEN PRECISION COMPONENTS (SUZHOU) CO., LTD.  
TANGSHAN TONGLI GEAR CO.,LTD.  
ZHEJIANG WANDA AUTOMOBILE DIRECTION MACHINE CO., LTD.  
ZHEJIANG SHUANGHUA DRIVELINE CO.,LTD.  
ZHEJIANG SHIBAO CO.,LTD.  
ZHEJIANG DONGYIN PUMP INDUSTRY CO.,LTD.  
ZHEJIANG JIALONG MACHINE CO.,LTD.  
ZHEJIANG HONGXIN  
ZHEJIANG OUDIEN AUTO PARTS CO.,LTD.  
BYD COMPANY LIMITED  
TRI-RING GROUP CORPORATION  
WENZHOU GUANSHENG AUTOPARTS CO.,LTD.  
RICH SUNAN BUILD AUTO PARTS (DONGGUAN) CO., LTD.  
SHAONENG GROUP SHAOGUAN HONGDA GEAR CO.,LTD.  
HESHAN GCK AUTO PARTS CO.,LTD.  
XIANGYANG BEARING CO.,LTD.  
XIANGYANG SEIKO EQUIPMENT CO., LTD.

LECN



## 自动化与联线

### AUTOMATIC & CONNECT LINE

力成丰富的专机产品线和多年交钥匙经验,可以为用户提供零件的全面解决方案,并使之实现单机自动化或自动化联线。

LECN can provide users the parts overall solutions because we have all kinds of special purpose machine lines and turn-key experiences many years, so we achieve the single automatic & connect lines.



1

自动化与联线 Automatic & connect line

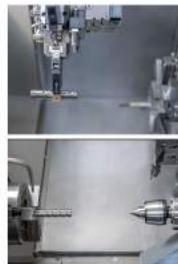
## 自动生产线 Automatic production line

轴类自动车削单元（桁架式机器人）



铣端面钻中心孔机床+数控车床+桁架式机器人

facing and centering machine+CNC lathe+Truss robot



自动化与联线 Automatic & connect line

## Automatic production line 自动生产线

Shaft type automatic turning unit (Truss robot)



扫二维码看机床工作视频

自动化与联线 Automatic & connect line

## 自动生产线 Automatic production line

双头数控车床+数控车床+桁架式机器人

Double head CNC lathe+CNC lathe+Truss robot



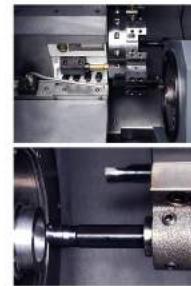
铣端面钻中心孔机床+数控车床+桁架式机器人

facing and centering machine+CNC lathe+Truss robot



双头数控车床+关节式机器人

Double head CNC lathe+Joint robot



搓齿机+切槽机+桁架式机器人

Rolling machine+Slot cutting machine+Truss robot



自动化与联线 Automatic & connect line

## 单机自动化 Single machine automation

数控车床+桁架式机器人

CNC lathe+Truss robot



双头数控车床+桁架式机器人

Double head CNC lathe+Truss robot



自动化与联线 Automatic & connect line

## Single machine automation 单机自动化

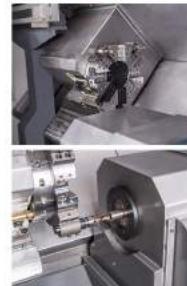
双头数控车床+桁架式机器人

Double head CNC lathe+Truss robot



双头数控车床+桁架式机器人

Double head CNC lathe+Truss robot



自动化与联线 Automatic & connect line

## 单机自动化 Single machine automation

搓齿机+桁架式机器人



Rolling machine+Truss robot



自动化与联线 Automatic & connect line

## Single machine automation 单机自动化

搓齿机+桁架式机器人



Rolling machine+Truss robot



自动化与联线 Automatic & connect line

## 单机自动化 Single machine automation

搓齿机+桁架式机器人



Rolling machine+Truss robot



自动化与联线 Automatic & connect line

## 单机自动化 Single machine automation

搓齿机+桁架式机器人



Rolling machine+Truss robot



自动化与联线 Automatic & connect line

## 单机自动化 Single machine automation

铣端面钻中心孔机床+桁架式机器人



facing and centering machine+Truss robot



自动化与联线 Automatic & connect line

## Single machine automation 单机自动化

保持架窗口铣床+桁架式机器人

Cage milling machine+Truss robot



保持架窗口磨床+桁架式机器人

Cage grinding machine+Truss robot



# 车削

## TURNING

2



因提供全面解决方案的需求而研发的更适合生产线的全功能车床，  
加载了我们多年的专机设计经验。

The full function lathe with our many years design experience,  
is more suitable for production line.



车削 Turning

## 双头数控车床 Double head CNC lathe



Bespoke Machine



## 性能特点 Function features

- ◎ 立式整体式框架机身，刚性好，易排屑；
- ◎ 应对多变零件，只需要更换夹具和治具；
- ◎ 一次装夹两端同时加工，效率高精度好；
- ◎ 特别结构的中置主轴，可响应高转速和切削刚性的需要；
- ◎ 左右独立式排刀单元，配可伸缩刀具，可有效解决刀具干涉；
- ◎ 双通道控制器，左右同步作业轻松应对；
- ◎ 可搭载桁架式或关节式机器人，支持自动化联线。
- ◎ vertical integral frame body, rigidity, easy chip;
- ◎ respond to different parts, only replace the collet and fixtures;
- ◎ fix one time, processing both end at one time, high efficiency, good precision;
- ◎ the special structure central spindle can respond to high speed and cutting rigid;
- ◎ independent row cutter with telescopic tool, effectively solve the tool interference;
- ◎ dual-channel controller, easily respond to synchronization processing;
- ◎ can carry with truss or joint robot and automatical line .

车削 Turning

## Double head CNC lathe 双头数控车床

Bespoke Machine

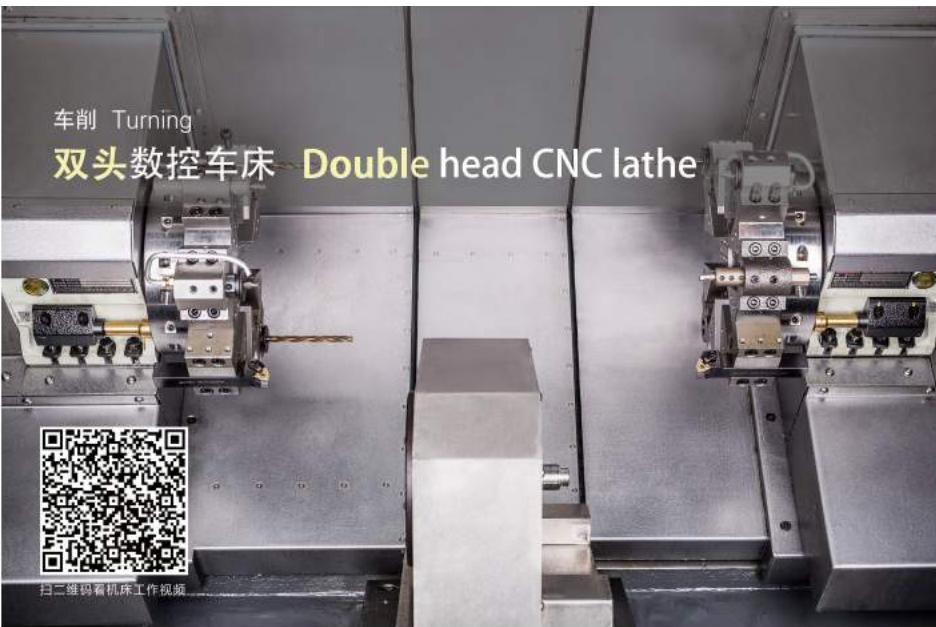


## 主要参数 The main parameters

项 目	ITEM	DNL061	DNL062
床身最大旋转直径	max body rotate diameter	mm	Ø200
夹持直径范围	clamping diameter scope	mm	Ø15-Ø50
车削长度范围	turning length scope	mm	100-300
主轴最大夹持直径	spindle clamp diameter	mm	Ø50
X/Z 轴行程	X/Z travel	mm	280/180
X/Z 轴快速移动速度	X/Z fast speed	m/min	18/24
刀座形式	tool type		排刀 (cutter)

车削 Turning

## 双头数控车床 Double head CNC lathe



扫二维码看机床工作视频



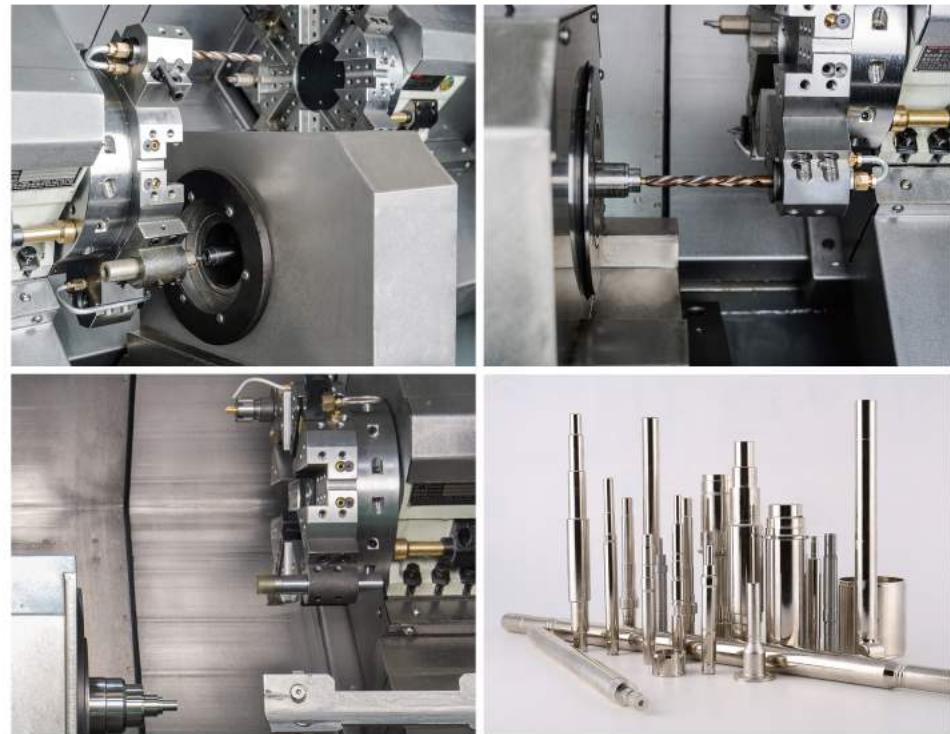
## 性能特点 Function features

- ◎ 斜式整体式框架机身，刚性好，易排屑；
  - ◎ 应对多变零件，只需要更换夹具和治具；
  - ◎ 一次装夹两端同时加工，效率高精度好；
  - ◎ 特别结构的中置主轴，可响应高转速和切削刚性的需要；
  - ◎ 左右独立刀塔；
  - ◎ 双通道控制器，左右同步作业轻松应对；
  - ◎ 可搭载桁架式或关节式机器人，支持自动化联线。
- ◎ inclined integral frame body, rigidity, easy chip;
  - ◎ respond to different parts, only replace the collet and fixtures;
  - ◎ fix one time, processing both end at one time, high efficiency, good precision;
  - ◎ the special structure central spindle can respond to high speed and cutting rigid;
  - ◎ independent turret;
  - ◎ dual-channel controller, easily respond to synchronization processing;
  - ◎ can carry with truss or joint robot and automatical line .

车削 Turning

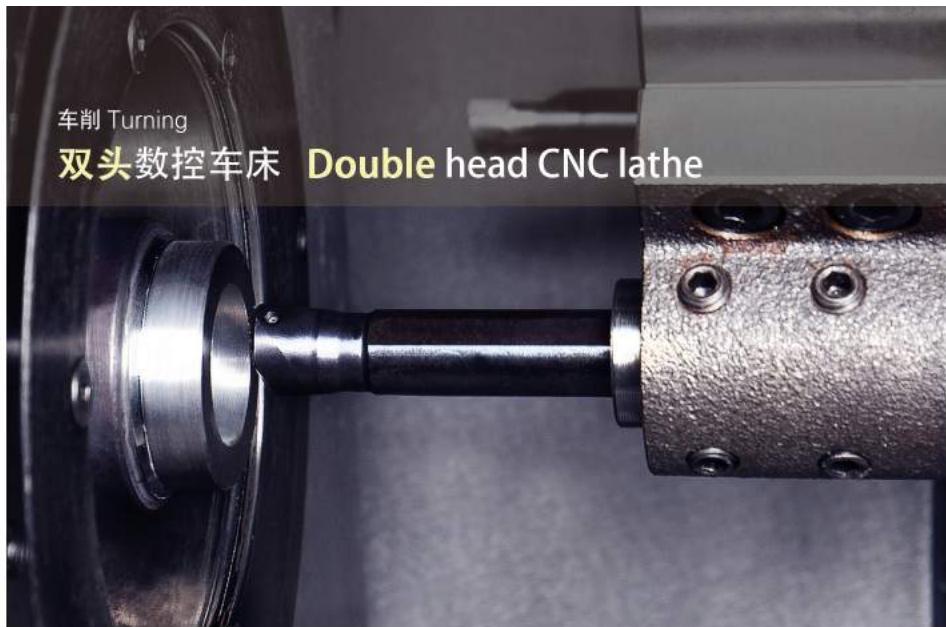
## Double head CNC lathe 双头数控车床

Bespoke Machine



## 主要参数 The main parameters

项 目	ITEM	DNL081	DNL081G	DNL082	DNL082G	DNL083	DNL083G
床身最大旋径	max body rotate diameter	mm	Ø300	Ø300	Ø300	Ø300	Ø300
夹持直径范围	clamping diameter scope	mm	Ø20-Ø70	Ø20-Ø70	Ø20-Ø70	Ø20-Ø70	Ø20-Ø70
车削长度范围	turning length scope	mm	100-300	100-300	300-500	300-500	500-750
主轴最大夹持直径	spindle clamp diameter	mm	Ø70	Ø70	Ø70	Ø70	Ø70
X/Z 轴行程	X/Z travel	mm	160/200	280/200	160/200	280/200	160/350
X/Z 轴快速移动速度	X/Z fast speed	m/min	18/24	18/24	18/24	18/24	18/24
刀座形式	fool type		刀塔 (turret)	排刀 (cutter)	刀塔 (turret)	排刀 (cutter)	刀塔 (turret)



车削 Turning

## 双头数控车床 Double head CNC lathe

Bespoke Machine



## 性能特点 Function features

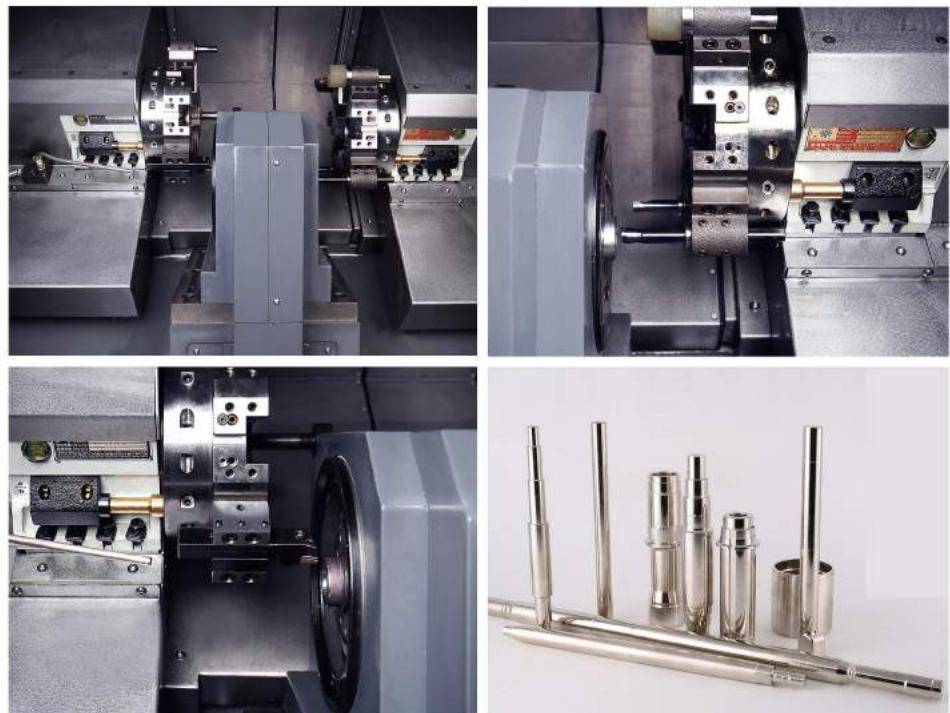
- ◎ 斜式整体式框架机身，刚性好，易排屑；
  - ◎ 应对多变零件，只需要更换简夹和治具；
  - ◎ 一次装夹两端同时加工，效率高精度好；
  - ◎ 特别结构的中置主轴，可响应高转速和切削刚性的需要；
  - ◎ 左右独立刀塔；
  - ◎ 双通道控制器，左右同步作业轻松应对；
  - ◎ 可搭载桁架式或关节式机器人，支持自动化联线。
- ◎ inclined integral frame body, rigidity, easy chip;
  - ◎ respond to different parts, only replace the collet and fixtures;
  - ◎ fix one time, processing both end at one time, high efficiency, good precision;
  - ◎ the special structure central spindle can respond to high speed and cutting rigid;
  - ◎ independent turret;
  - ◎ dual-channel controller, easily respond to synchronization processing;
  - ◎ can carry with truss or joint robot and automatical line .



车削 Turning

## Double head CNC lathe 双头数控车床

Bespoke Machine



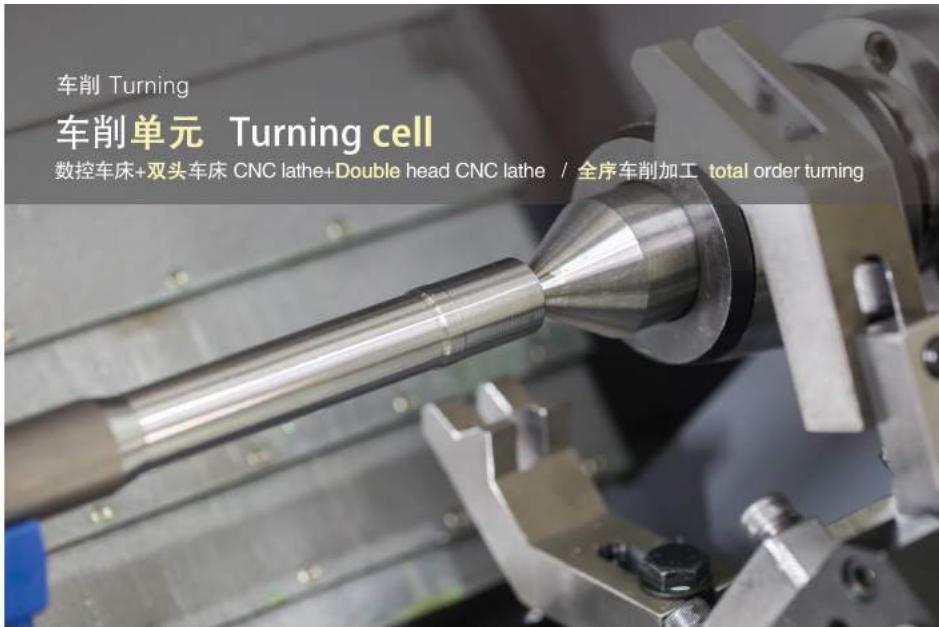
## 主要参数 The main parameters

项 目	ITEM	DNL121	DNL122	DNL162
床身最大旋径	max body rotate diameter	mm Ø300	mm Ø300	mm Ø400
夹持直径范围	clamping diameter scope	mm Ø70-Ø120	mm Ø70-Ø120	mm Ø100-Ø160
车削长度范围	turning length scope	mm 100-300	mm 300-500	mm 200-400
主轴最大夹持直径	spindle clamp diameter	mm Ø120	mm Ø120	mm Ø160
X/Z 轴行程	X/Z travel	mm 180/200	mm 180/200	mm 180/200
X/Z 轴快速移动速度	X/Z fast speed	m/min 18/24	m/min 18/24	m/min 18/24
刀座形式	tool type		刀塔 (turret)	刀塔 (turret)

车削 Turning

## 车削单元 Turning cell

数控车床+双头车床 CNC lathe+Double head CNC lathe / 全序车削加工 total order turning



Bespoke Machine



## 性能特点 Function features

○ 双头车工位+车床工位，全序车削加工，效率高；

○ 整体框架机身，刚性好，易排屑，占地面积最小；

○ 三通道控制器 左右同步作业和独立作业互不干涉；

○ 可搭载桁架式或关节式机器人，支持自动化联线。

双头车

○ 应对多变零件，只需要更换筒夹和治具；

○ 一次装夹两端同时加工，效率高精度好；

○ 特别结构的中置主轴，可响应高转速和切削刚性的需要；

○ 左右独立式排刀单元，配可伸缩刀具，可有效解决刀具干涉。

车床

○ 全行程可调节油压尾座或编程尾座；

○ 就近选刀的精密刀塔。

○ double head CNC lathe+CNC lathe,total order turning,high efficiency;

○ integral frame body, rigidity, easy chip,smallest footprint;

○ dual-channel controller, easily respond to synchronization processing;

○ can carry with truss or joint robot and automatical line .

Double head CNC lathe

○ respond to different parts, only replace the collet and fixtures;

○ fix one time,processing both end at one time ,good precision;

○ the special structure central spindle can respond to high speed and cutting rigid;

○ indepent row cutter with telescopic tool,effectively slove the tool in terference;

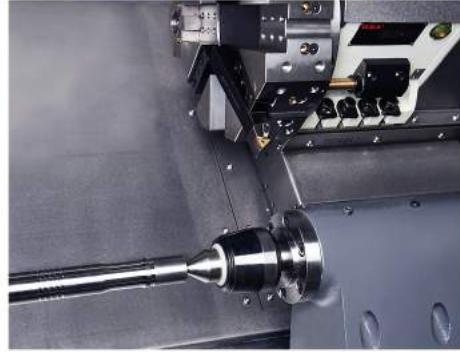
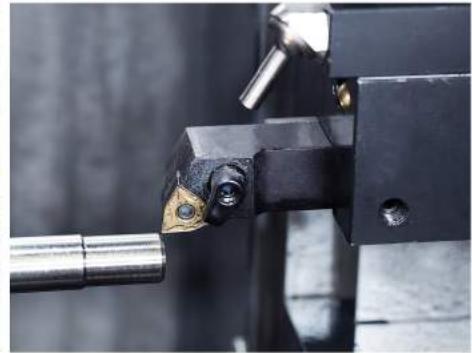
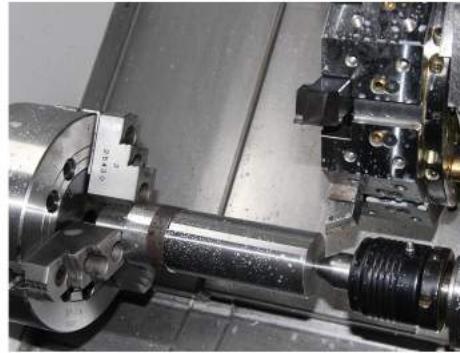
CNC lathe

○ programmable hydraulic tailstock or programme tailstock ;

○ precision turret selection is near;

## 车削单元 Turning cell 车削单元

Bespoke Machine

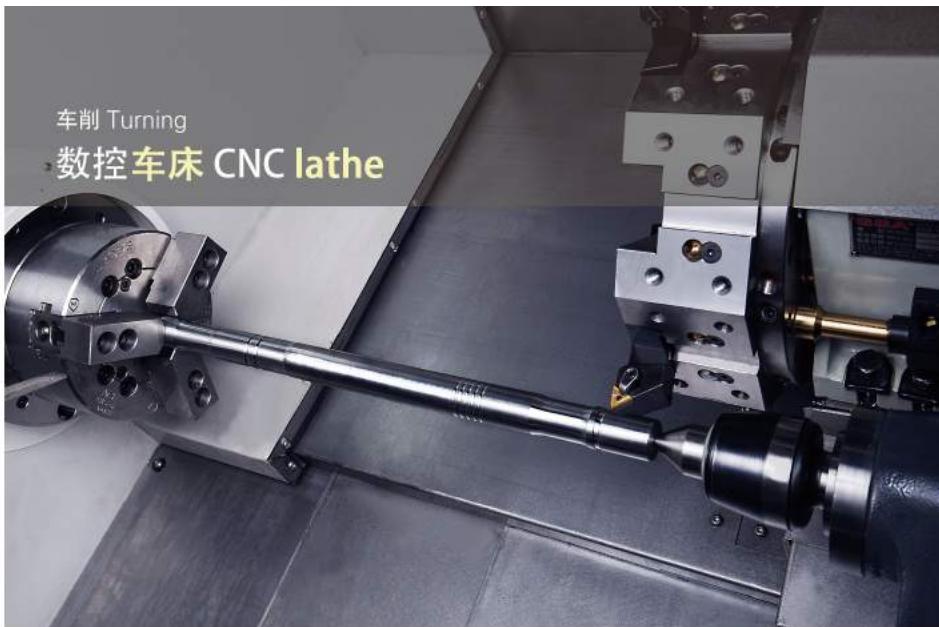


## 主要参数 The main parameters

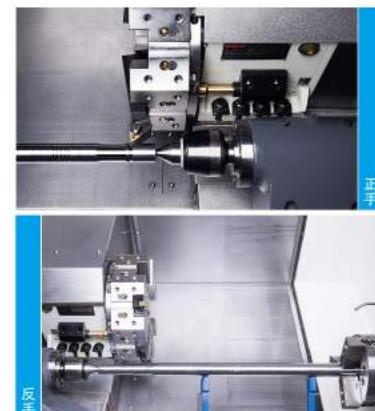
项 目	ITEM	SNL081	
		车床工位	双头车工位
床身最大旋径	max body rotate diameter	mm	Ø300
最大夹持直径	max clamping diameter	mm	Ø150
车削长度范围	turning length scope	mm	100-300
X/Z 轴行程	X/Z travel	mm	160/350
X/Z 轴快速移动速度	X/Z fast speed	m/min	18/24
刀座形式	tool type		刀塔 ( turret )
			排刀 ( cutter )

车削 Turning

## 数控车床 CNC lathe



Bespoke Machine



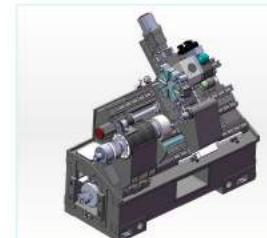
## 性能特点 Function features

- 整体45度斜背式高刚性低重心机身；
- 高精度高刚性精密主轴单元；
- 全行程可调节油压尾座或编程尾座；
- 就近选刀的精密刀塔；
- 可搭载桁架式或关节式机器人，支持自动化联线。
- 45 degrees hatchback body high rigidity low center；
- high precision and high rigidity precision spindle unit；
- programmable hydraulic tailstock or programme tailstock；
- precision turret selection is near；
- can carry with truss or joint robot and automatical line .

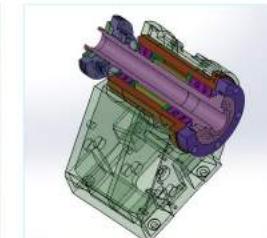
车削 Turning

## Introduction to all functional modules 各功能模块的介绍

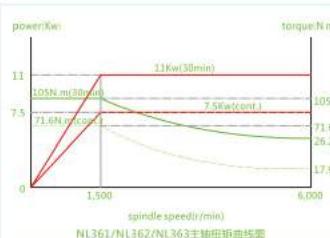
Bespoke Machine



1.床身:经过有限元分析的45斜背式整体床身，紧凑的结构和低重心的Z轴传动，是高速重切削时的重要保障。



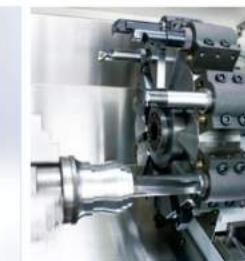
2.主轴特殊主轴箱结构设计可以有效的防止热变形造成精度损失，配有高精度轴承并经动平衡处理。主轴大孔径通孔设计可以支持后送料。最高转速5000r/min.



3.主轴扭矩曲线图。



4.主轴式的自旋转尾座，在高速旋转的同时提供最具刚性的部件支撑。



5.八工位的精密油压刀塔，重复定位精度为±1°,就近换刀时间0.6sec。



6. NL系列车床X,Z轴均安装有线性导轨，配合精密丝杆可实现快速移动速度24m/min,减少了非切削时间，提高了生产效率。



7. X, Z轴均采用双螺母滚珠丝杠和精密的丝杆专用轴承，滚珠丝杠以双轴的方式固定并实施预拉伸，确保输送稳定性及热胀后精度保持性。



8.伺服电机均通过精密联轴器进行直连，可优化因载荷引起的输送精度变化。

## Bespoke Machine

		NL 361	NL361G	NL 362	NL 363
加工范围	单位				
床身最大旋径	mm	500	500	500	500
床鞍最大旋径		450	450	450	450
最大切削直径	mm	360	360	360	360
最大切削长度	mm	300	300	500	750
棒材最大直径	mm	Ø43	Ø43	Ø43	Ø43
行程					
X轴	mm	195	300	195	195
Z轴	mm	330	330	550	800
主轴					
主轴转速	rpm	4000	4000	4000	4000
三爪夹头尺寸	inch	8	8	8	8
主轴鼻端	mm	A2-6	A2-6	A2-6	A2-6
主轴功率	kw	7.5/11	5.5/7.5	7.5/11	7.5/11
刀塔					
刀座数量	pcs	8	3(排刀)	8	8
外径刀柄尺寸	mm	25	25	25	25
镗孔刀柄尺寸	mm	Φ32	Ø32	Φ32	Φ32
刀塔分度时间	sec/step	0.6		0.6	0.6
快速进给速度					
X/Z快速位移	M/min	18/24	18/24	18/24	18/24
伺服马达					
X轴	kW	1.5	1.5	1.5	1.5
Z轴	kW	1.5	1.5	1.5	1.5
尾座					
套筒直径	mm	75		75	75
套筒行程	mm				80
尾座行程	mm	300		500	750
套筒锥孔	M.T	4		4	4
桶容量					
切削油	L	100	100	100	100
润滑油	L	2	2	2	2
机台尺寸					
机器重量	KG	3500	2800	4000	4500
机器总长	mm	1800	1800	2075	2350
机器总宽	mm	1480	1480	1480	1480
机器总高	mm	1700	1650	1700	100
电力容量	KVA	15	13	15	15

## Standard configuration &amp; optional configuration 标准配置&amp;选择配置

## Bespoke Machine

		标准配置&选择配置			
		●标准	○选择	·没有	
主轴&卡盘		NI361	NL361G	NI362	NI363
三爪中空卡盘(配软爪)	6"	○	○	○	○
	8"	○	○	○	○
三爪中卖卡盘(配软爪)	6"	○	○	○	○
	8"	●	●	●	●
简式夹头		○	○	○	○
标准硬爪(一套)		○	○	○	○
卡盘夹紧脚踏开关		●	●	●	●
刀塔					
油压刀塔		●		●	●
C轴及动力刀塔		○	○	○	○
端面刀座	□20*20	○	○	○	○
	□25*25	●		●	●
Φ20	○	○	○	○	○
Φ32	●	●	●	●	●
夹刀片组		●		●	●
尾架					
套筒式尾座		○			●
主轴式尾座		○		○	○
自动尾座		●		●	○
尾座脚踏开关		○		○	●
冷却液&吹气装置					
刀塔冷却液(喷嘴)		●		●	●
卡盘上部冷却(油管)		○	○	○	○
油水分离器		○	○	○	○
吹气枪		○	○	○	○
安全装置					
全密封防护装置		●	●	●	●
电动装置					
显示灯	三色	●	●	●	●
机箱内电子照明灯		○	○	○	○
自动关闭电源		○	○	○	○
检测装置					
对刀仪		○	○	○	○
加工环境					
电器箱热交换机		●	●	●	●
除湿器		○	○	○	○
夹具及自动化					
自动门		○	○	○	○
进料器		○	○	○	○
送料器		○	○	○	○
控制系统					
三菱(MITSUBISHI)		●	●	●	●
发那科(FANUC)		○	○	○	○
西门子(SIEMENS)		○	○	○	○
主电机					
主轴伺服电机		○	○	○	○
主轴变频电机		●	●	●	●
排屑设备					
排屑箱		○	○	○	○
自动排屑机		●	●	●	●
蓄屑推车		○	●	●	●
排屑机位置(铰链/刮板)	前(右)	●	●	●	●
	后(后部)	○	○	○	○

3

## 智能搓齿 立卧全系

ROLLING MACHINE  
VERTICAL & HORIZONTAL



无论立式还是卧式，无论伺服还是油压；从单机到自动化，从单段到多段成形；从13英寸到60英寸，全系列完美呈现；百种案例，千台业绩。

Either vertical or horizontal, CNC or hydraulic; From single to automation , single to multi section forming; 13 inches to 60 inches ,the whole series of the perfect show; One hundred cases, thousands of achievement .



渐开线花键  
involute spline



斜齿花键  
helical spline



锥齿花键  
bevel spline



蜗杆  
worm



并齿花键  
merge teeth spline

LECN



网纹  
anilox roller



螺纹  
thread



直纹  
straight grain



6/12 齿  
6/12 teeth



花键倒角  
chamfer spline

# LECN prduction advantage for rolling machine 力成搓齿技术优势

## Bespoke Machine



- ◎ 2003年力成自主开发的首台花键冷成型产品GZ730-A搓齿机开发成功并正式向客户介绍。
- ◎ 2004年推出经全面优化的GZ730-A1型搓齿，并拓展出适用于长轴类任意位置花键成型的GZ730-A2型搓齿机。
- ◎ 2005年LC系列精密搓齿机LC1000问世，及全面升级的GZ730-B系列搓齿产品。备受主机配套客户青睐，并普及国内市场，力成也由此成为国内花键冷成型设备的领先制造商。
- ◎ 2006年与高校正式合作，对LC系列品种覆盖能力、功能范围及模块可拓展进行了全面的规划，LC500/LC800/LC1500相继开发完成，当年获得出口台湾及马来西亚订单。
- ◎ 2007年力成在多工位一次成型及大模数成型技术上的探索上进展顺利，LC1500多工位搓齿机验收成功并交付使用。
- ◎ 2008年批量投入全新的加工装备和检测设备。
- ◎ 2009年引入咨询机构建设质量管理体系和流程梳理，同年推出首台立式搓齿产品。
- ◎ 2011年安徽公司建成投产，同年推出全电控搓齿机。
- ◎ 2012年LC系列卧式液压精密搓齿机全面升级为A型，整机质量和性能有较大提升。
- ◎ 2013年LC系列卧式油压搓齿机问世，全面推向市场。
- ◎ 2014年研发检测中心竣工动工。
- ◎ 2015年推出智能自动化生产线。
- ◎ 2016年推出智能化搓齿机。
- ◎ 2018年由搓齿机制造商向智能制造商进军。

- ◎ The 2003 force into the first independent development of spline GZ730-A rolling machine successfully developed and formally introduced to customers.
- ◎ The 2004 launch of the GZ730-A1 type fully optimized tooth, and expand the GZ730-B type for long splines at any position rolling machine.
- ◎ The 2005 LC series precision LC1000 rolling machine come out, and a comprehensive upgrade of the GZ730-B series of tooth products, has been supporting host customers, and the popularity of the domestic market, LECN also became the leading manufacturer of domestic spline rolling equipment.
- ◎ The 2006 and the formal cooperation, coverage, scope and function modules of LC series varieties can expand a comprehensive planning, LC500/LC800/LC1500 have been developed, in Taiwan and Malaysia to obtain export orders.
- ◎ The 2007 stress exploration in forming a multi station and large modulus molding technology on the smooth progress of LC1500 multi-functional rolling machine successfully delivered for use and acceptance.
- ◎ The 2008 new batch input processing equipment and testing equipment.
- ◎ The consulting agency introduced in 2009 the construction of quality management system and process, the same year the launch of the first vertical tooth products.
- ◎ The Anhui company in 2011 put into operation, the same year to launch a full electric rolling machine.
- ◎ The 2012 LC series horizontal hydraulic precision rolling machine upgrade for A type, quality and performance of the whole machine is greatly improved.
- ◎ The 2013 LC series horizontal CNC rolling machine, fully into the market.
- ◎ The 2014 R & D center ground detection.
- ◎ The 2015 rolling machine full line automation.
- ◎ The 2016 rolling machine intelligent line delivery.
- ◎ The 2018 it was made from the rolling mechanism manufacturer to the intelligent manufacturing solution integration provider.

# LECN prduction advantage for rolling machine 力成搓齿技术优势

## Bespoke Machine

力成在十多年的经营中一直秉持在少数领域为客户提供最专业的服务和最全面的产品选择的理念，花键冷成形技术一直是力成深度研发的重要领域，在十多年来为300余家海内外用户提供了近1000台的搓齿机装备，遍及汽车摩托车的变速箱、发动机、传动轴、方向机、起动机、制动器、弹簧扭杆，纺织罗拉，洗衣机、电机、升降器、减速机等诸多领域。

LECN supply the most professional service and the most comprehensive products for customers, rolling technology is LECN the most important research and development field, in past ten years we has supply more than 1000 sets rolling machine for more than 300 customers, ranged cover such as motor gearbox, engine, transmission shaft, traversing torsion bar, start motor, brake, spring torsion bar, textile roller, laundry machine parts, motor, elevator, reducer and so on.

在和用户多年的相互学习和交流中，丰富了力成不断的将用户的需求付诸现实的实战经验，并将这些需求整理规划后细分的展现在力成目前立式、卧式两大系列搓齿机产品。

These years LECN learning and through exchange with customer, continue to promote the customer requirement to reality, and this needs will be displayed in the subdivision plan after finishing force into the vertical, horizontal two series of products rolling machines.

### 卧式搓齿机系列 Horizontal rolling machines



LECN prduction advantage for rolling machine

## 力成搓齿技术优势

### Bespoke Machine

#### 立式搓齿机系列 Vertical rolling machines



- 1) 无论立式机还是卧式机，力成都有全系列的可以搭载油压驱动或伺服驱动的机型可供选择。  
No matter vertical or horizontal, we have all series machine which can with hydraulic and CNC.

- 2) 无论何种油压机型均选择同步齿轮机构保证精密度同步，并配用力成独有的同步间隙微调整专利技术。  
No matter what type of oil pressure type, LECN hydraulic rolling machine is selected to ensure precise synchronization, and the matching force becomes the unique technique of micro adjustment of synchronous gap.

- 3) 无论立式或卧式的伺服搓齿机力成均采用双伺服电机+滚珠丝杆+精度补偿的全闭环专利技术，从而有效的避免了传动时因滚珠丝杆磨损及温升而导致搓齿模具安装基准的偏差和搓齿精度的丧失。  
No matter vertical or horizontal CNC rolling machine we all use: double servo motor+ ball screw + full closed loop patent technology with precision and simplicity this authorized to avoid wear and increase temperature extend ball screw cause rolling tools fixture datum drift and rolling precious loose, solved the problem of rolling precious depend on ball screw.

- 4) 无论立式或卧式的伺服搓齿机力成采用中空丝杆，配独立油冷机，丝杆恒温，精度稳定。  
Both vertical and horizontal CNC rolling machine use hollow wire rod, with independent oil cooler, the wire rod is constant temperature, and the precision is stable.

- 5) 无论新老客户，力成所拥有日本知名模具制造商在中国的特权代理以及与国内外搓齿模具制造商的合作背景，都能在用户紧急需求的情况下，最快在4周内提供全新搓齿模具、2周提供修复模具，可减少客户采购和维护时间。  
Both new and old customers, LECN privileged agent in Japan and China well-known mold manufacturers in the background of cooperation at home and abroad rack die manufacturers, users can in emergency needs of the situation, the fastest in 4 weeks to provide a new tooth mould, 2 weeks to provide grinding mold, can reduce the customer purchase and maintenance time.

- 6) 无论客户的花键冷成型技术需求如何，力成在搓齿领域拥有十多年制造经验的专业化团队都可以为您提供最佳解决方案或建议。  
No matter customer have any request for rolling, we have one special group which have more than 10 years experience can supply the best case or suggest for you.

- 7) 力成拥有多项搓齿关键技术的专利，主导制定了搓齿机标准。  
LECN has a number of key technology of the patent, leading the formulation of the standard.

在此基础上我们积累了为  
用户提供延伸服务：  
We extension following  
service for customers

- 单机自动化 Single machine automation
- 多机联线 More machines automation
- 搓齿成本估算 Cost estimate for rolling machines
- 花键搓齿工艺的编排 The process layout for rolling machines
- 搓齿模具的短期调剂 Short-term adjusted for rolling moulds
- 用户小批量样本免费试制 Users free trial—manufacture small batch sample piece
- 国内外各种花键标准的查询、测绘 The varior spline standard all country inquiry,plotting
- 搓齿模具的快速交付、修磨（多家协议供应商） Rolling moulds fast delivery, repair moulds

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Bespoke Machine



搓齿机 Rolling machine

## MINI 立式搓齿机 MINI Vertical rolling machine



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## 性能特点 Function features

- 采用特殊材质的耐磨铸件和框架预紧式刚性机身;
- 丰富的模具组合方式，可逆向搓齿节省模具;
- 一次装夹，可往复多段搓齿(VLC500A、VLC500EA);
- 智能导轨润滑检测功能、工件成形大流量冷却;
- 合理的结构设计，首人的操控高度，节省占地面积;
- 可搭载桁架式或关节式机器人，支持自动化联线。
- VLC500E、VLC500EA伺服机型
- 双伺服电机全闭环同步驱动，实现低噪音精确成形过程;
- 智能全伺服前后顶技术，有效解决装夹安全识别。
- VLC500、VLC500A油压机型
- 进口油压原件，双油缸驱动平稳成形。
- 独特的同步齿轮齿条和间隙微调技术，使同步精度提升至极。
- use special materials wear-resistant castings and pretensioners rigid frame body;
- rich mold combination, can save reverse roll forming mold;
- clamping one time can forming few steps(VLC500A、VLC500EA);
- intelligent rail way lubrication detector function, workpiece forming with big cooling flow;
- reasonable structure design, pleasant handling height, small footprint;
- can carry with truss or joint robot and automatical line .
- VLC500E、VLC500EA CNC model
- double servo motor full closed-loop drive, low noise and precise forming process;
- intelligent all-around top servo technology to effectively solve clamping secure identification.
- VLC500、VLC500A hydraulic model
- original hydraulic parts imported, double cylinder driving, forming steady;
- unique synchronous gear rack and clearance technique to make synchronization precision ascend to the utmost.

搓齿机 Rolling machine

## MINI Vertical rolling machine 立式搓齿机

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## 主要参数 The main parameters

项 目	ITEM	VLC500	VLC500E	VLC500A	VLC500EA
最大模数	max module	mm	1.0	1.0	1.0
最大外径	max out diameter	mm	Ø20	Ø20	Ø20
最大搓齿宽度	max tool width	mm	40	40	40
最大工件长度	max workpiece length	mm	400	400	600
最大装刀宽度	max installing tool width	mm	90	90	300
开口尺寸	the open part size	mm	139.7	139.7	139.7
装刀规格	tool size	inch	13 或 16	13 或 16	13 或 16
最大行程	max travel	mm	500	500	500
机床重量	weight	kg	3200	3200	4200
占地面积	length x width	mm	950 x 2600	950 x 2000	1150 x 3300
驱动方式	drive way		油压 (hydraulic)	伺服 (CNC)	油压 (hydraulic)
			伺服 (CNC)		

特 殊 规 格 可 定 制

搓齿机 Rolling machine

## 立式搓齿机 Vertical rolling machine



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## 性能特点 Function features

- 采用特殊材质的耐磨铸件和框架预紧式刚性机身;
  - 丰富的模具组合方式，可逆向搓齿节省模具;
  - 一次装夹，可往复多段搓齿;
  - 智能导轨润滑检测功能、工件成形大流量冷却;
  - 合理的结构设计，首人的操控高度，节省占地面积;
  - 可搭载桁架式或关节式机器人，支持自动化联线。
- VLC800E、VLC800EA伺服机型
- 双伺服电机全闭环同步驱动，实现低噪音精确成形过程;
  - 智能全伺服前后顶技术，有效解决装夹安全识别。
- VLC800、VLC800A油压机型
- 进口油压原件，双油缸驱动平稳成形;
  - 独特的同步齿轮齿条和间隙微调技术，使同步精度提升至极。
- use special materials wear-resistant castings and pretensioners rigid frame body;
  - rich mold combination, can save reverse roll forming mold;
  - clamping one time can forming few steps;
  - intelligent rail way lubrication detector function, workpiece forming with big cooling flow;
  - reasonable structure design, pleasant handling height, small footprint;
  - can carry with truss or joint robot and automatical line .
- VLC800E、VLC800EA CNC model
- double servo motor full closed-loop drive, low noise and precise forming process;
  - intelligent all-around top servo technology to effectively solve clamping secure identification.
- VLC800、VLC800A hydraulic model
- original hydraulic parts imported, double cylinder driving, forming steady;
  - unique synchronous gear rack and clearance technique to make synchronization precision ascend to the utmost.

搓齿机 Rolling machine

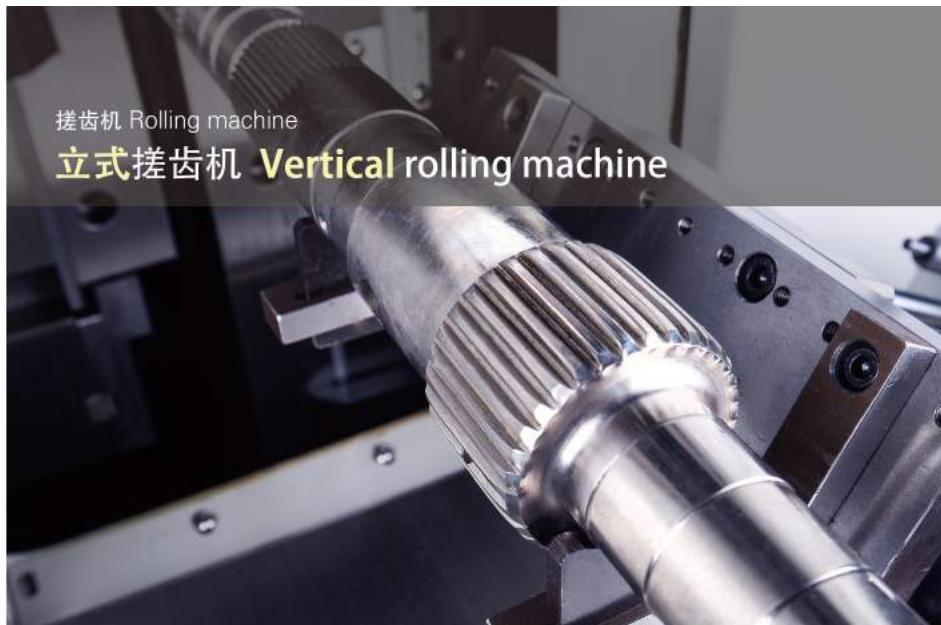
## Vertical rolling machine 立式搓齿机

Bespoke Machine



## 主要参数 The main parameters

项 目	ITEM	VLC800	VLC800E	VLC800A	VLC800EA
最大模数	max module	mm	1.3	1.3	1.3
最大外径	max out diameter	mm	Ø40	Ø40	Ø40
最大搓齿宽度	max tool width	mm	80	80	80
最大工件长度	max workpiece length	mm	1000	1000	1000
最大装刀宽度	max installing tool width	mm	120	120	300
开口尺寸	the open part size	mm	139.7	139.7	139.7
装刀规格	tool size	inch	24 或 16 或 13	24 或 16 或 13	24 或 16 或 13
最大行程	max travel	mm	760	760	760
机床重量	weight	kg	7500	7500	9000
占地面积	length x width	mm	1420 x 3700	1420 x 3000	1580 x 3900
驱动方式	drive way		油压 (hydraulic)	伺服 (CNC)	油压 (hydraulic)
			特 殊 规 格 可 定 制		



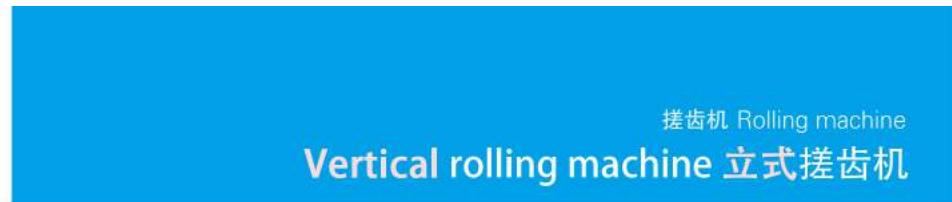
搓齿机 Rolling machine

## 立式搓齿机 Vertical rolling machine



## 性能特点 Function features

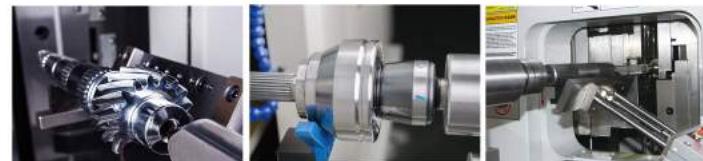
- 采用特殊材质的耐磨铸件和框架预紧式刚性机身;
  - 丰富的模具组合方式，可逆向搓齿节省模具;
  - 一次装夹，可往复多段搓齿;
  - 智能导轨润滑检测功能、工件成形大流量冷却;
  - 合理的结构设计，首人的操控高度，节省占地面积;
  - 可搭载桁架式或关节式机器人，支持自动化联线。
- VLC1000EA伺服装机型
- 双伺服电机全闭环同步驱动，实现低噪音精确成形过程;
  - 智能全伺服前后顶技术，有效解决装夹安全识别。
- VLC1000A油压机型
- 进口油压原件，双油缸驱动平稳成形;
  - 独特的同步齿廓齿条和间隙微调技术，使同步精度提升至极。
- use special materials wear-resistant castings and pretensioners rigid frame body;
  - rich mold combination, can save reverse roll forming mold;
  - clamping one time can forming few steps;
  - intelligent rail way lubrication detector function, workpiece forming with big cooling flow;
  - reasonable structure design, pleasant handling height, small footprint;
  - can carry with truss or joint robot and automatical line .
- VLC1000EA CNC model
- double servo motor full closed-loop drive, low noise and precise forming process;
  - intelligent all-around top servo technology to effectively solve clamping secure identification.
- VLC1000A hydraulic model
- original hydraulic parts imported, double cylinder driving, forming steady;
  - unique synchronous gear rack and clearance technique to make synchronization precision ascend to the utmost.



搓齿机 Rolling machine

## Vertical rolling machine 立式搓齿机

Bespoke Machine



## 主要参数 The main parameters

项 目	ITEM	VLC1000A	VLC1000EA
最大模数	max module	mm	1.5
最大外径	max out diameter	mm	Ø50
最大搓齿宽度	max tool width	mm	100
最大工件长度	max workpiece length	mm	1000
最大装刀宽度	max installing tool width	mm	300
开口尺寸	the open part size	mm	139.7
装刀规格	tool size	inch	36 或 24, 13
最大行程	max travel	mm	1160
机床重量	weight	kg	12000
占地面积	length x width	mm	1580 x 4200
驱动方式	drive way		油压 (hydraulic )
			伺服 ( CNC )

特 殊 规 格 可 定 制



搓齿机 Rolling machine

## 卧式搓齿机 Horizontal rolling machine

Bespoke Machine



## 性能特点 Function features

- 采用铸件整体C型框架机身，刚性强；
- 镶钢导轨液压滑台，耐磨，导向精度好；
- 丰富的模具组合方式，可逆向搓齿节省模具；
- 国产品牌油压原件及风冷却机，双油缸驱动平稳成形；
- 智能导轨润滑检测功能、工件成形大流量冷却；
- 合理的结构设计，宜人的操控高度，节省占地面积；
- 可搭载桁架式或关节式机器人，支持自动化联线。
- c-shapde casting body , high rigid;
- rich combination of mold , can reverse twist save teeth mold;
- rich mold combination, can save reverse roll forming mold;
- china brand oil hydraulic parts,double cylinder driving forming steady;
- intelligent rail war lubrication detector function, workpiece forming with big cooling flow;
- reasonable structure design, pleasant handling height, small footprint;
- can carry with truss or joint robot and automatical line .

搓齿机 Rolling machine

## Horizontal rolling machine 卧式搓齿机

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## 主要参数 The main parameters

项 目	ITEM	LC730
最大模数	max module	mm 1.3
最大外径	max out diameter	mm Ø40
最大搓齿宽度	max tool width	mm 60
最大工件长度	max workpiece length	mm 1000
最大装刀宽度	max installing tool width	mm 90
开口尺寸	the open part size	mm 139.7
装刀规格	tool size	inch 24 或 16
最大行程	max travel	mm 800
机床重量	weight	kg 9000
占地面积	length x width	mm 3100 x 4000
驱动方式	drive way	油压 (hydraulic)

特 殊 规 格 可 定 制

搓齿机 Rolling machine

## 卧式搓齿机 Horizontal rolling machine



Bespoke Machine



## 性能特点 Function features

- 采用特殊材质的耐磨损铸件和C型闭式框架机身;
  - 丰富的模具组合方式，可逆向搓齿节省模具;
  - 一次装夹，可往复多段搓齿;
  - 智能导轨润滑检测功能、工件成形大流量冷却;
  - 合理的结构设计，宜人的操控高度，节省占地面积;
  - 可搭载桁架式或关节式机器人，支持自动化联线。
- LC800EA 伺服机型
- 双伺服电机闭环同步驱动，实现低噪音精确成形过程;
  - 智能全伺服前后顶技术，有效解决装夹安全识别。
- LC800A 油压机型
- 进口油压原件，双油缸驱动平稳成形;
  - 独特的同步齿轮齿条和间隙微调技术，使同步精度提升至极。
- using special materials wear-resistant castings and C closed frame body;
  - rich combination of mold, can reverse twist save teeth mold;
  - clamp one time can forming few steps;
  - intelligent rail lubrication detecting function, forming a large flow of cooling the workpiece;
  - reasonable structure design, pleasant handling height, small footprint;
  - can carry with truss or joint robot and automatical line.
- LC800EA CNC model
- double servo motor full closed-loop drive, low noise and precise forming process;
  - intelligent all-around top servo technology to effectively solve clamping secure identification.
- LC800A hydraulic model
- original hydraulic parts imported, double cylinder driving, forming steady;
  - unique synchronous gear rack and clearance technique to make synchronization precision ascend to the utmost.

搓齿机 Rolling machine

## Horizontal rolling machine 卧式搓齿机

Bespoke Machine



## 主要参数 The main parameters

项 目	ITEM	LC800A	LC800EA
最大模数	max module	mm	1.3
最大外径	max out diameter	mm	Ø40
最大搓齿宽度	max tool width	mm	80
最大工件长度	max workpiece length	mm	1000
最大装刀宽度	max installing tool width	mm	300
开口尺寸	the open part size	mm	139.7
装刀规格	tool size	inch	24 或 16 或 13
最大行程	max travel	mm	800
机床重量	weight	kg	10000
占地面积	length x width	mm	2400 x 4400
驱动方式	drive way		油压 (hydraulic)
			伺服 (CNC)

特 殊 规 格 可 定 制

搓齿机 Rolling machine

## 卧式搓齿机 Horizontal rolling machine



Bespoke Machine



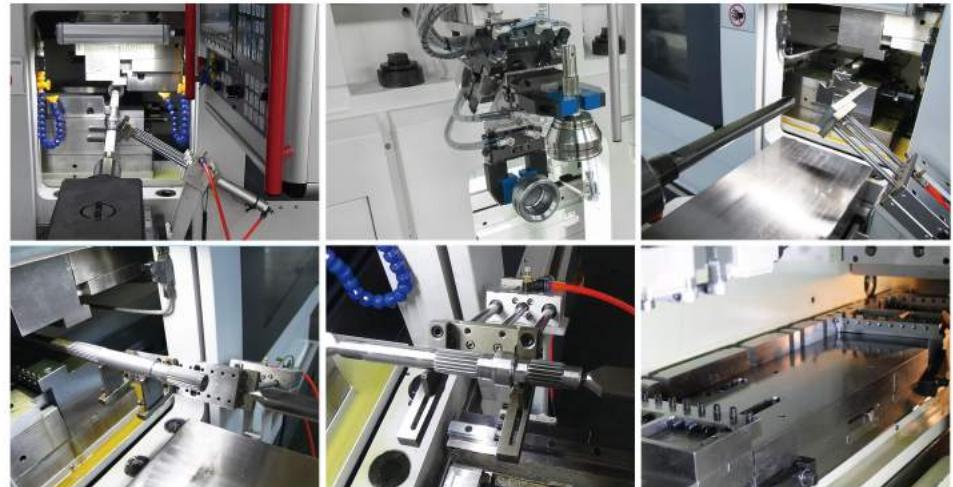
## 性能特点 Function features

- 采用特殊材质的耐磨损件和C型闭式框架机身;
  - 丰富的模具组合方式, 可逆向搓齿节省模具;
  - 一次装夹, 可往复多段搓齿;
  - 智能导轨润滑检测功能、工件成形大流量冷却;
  - 合理的结构设计, 宜人的操控高度, 节省占地面积;
  - 可搭载桁架式或关节式机器人, 支持自动化联线。
- LC1000EA伺服机型
- 双伺服电机全闭环同步驱动, 实现低噪音精确成形过程;
  - 智能全伺服前后顶接技术, 有效解决装夹安全识别。
- LC1000A油压机型
- 进口油压原件, 双油缸驱动平稳成形;
  - 独特的同步齿轮齿条和间隙微调技术, 使同步精度提升至极。
- using special materials wear-resistant castings and C closed frame body;
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- LC1000EA CNC model
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- LC1000A hydraulic model
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  - unique synchronous gear rack and clearance technique to make synchronization precision ascend to the utmost.

搓齿机 Rolling machine

## Horizontal rolling machine 卧式搓齿机

Bespoke Machine



## 主要参数 The main parameters

项 目	ITEM	LC1000A	LC1000EA
最大模数	max module	mm	1.5
最大外径	max out diameter	mm	Ø50
最大搓齿宽度	max tool width	mm	100
最大工件长度	max workpiece length	mm	1000
最大装刀宽度	max installing tool width	mm	300
开口尺寸	the open part size	mm	139.7
装刀规格	tool size	inch	36 或 24, 13
最大行程	max travel	mm	1160
机床重量	weight	kg	13000
占地面积	length x width	mm	3200 x 4400
驱动方式	drive way		油压 (hydraulic)
			伺服 (CNC)

特 殊 规 格 可 定 制

搓齿机 Rolling machine

## 卧式搓齿机 Horizontal rolling machine



扫二维码看机床工作视频

Bespoke Machine



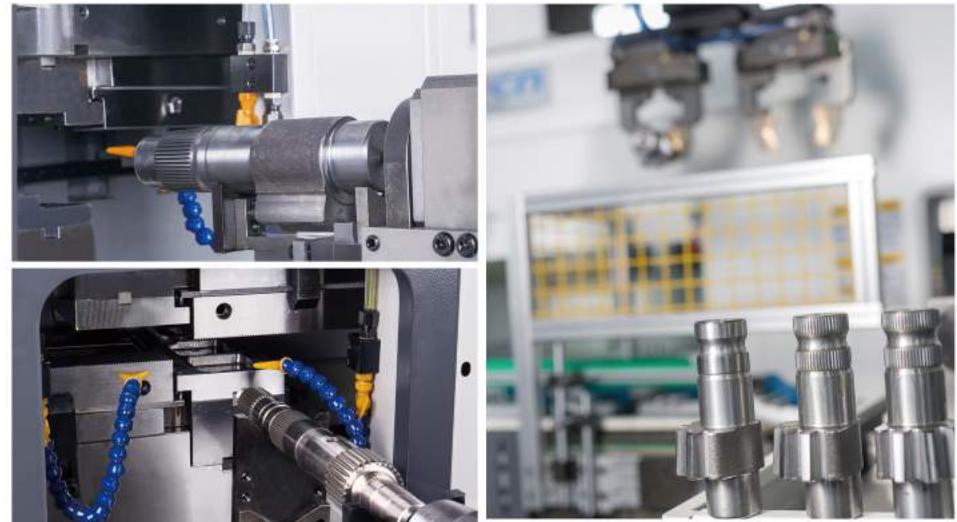
## 性能特点 Function features

- 采用特殊材质的耐磨铸件和C型闭式框架机身;
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- 一次装夹，可往复多段搓齿;
- 智能导轨润滑检测功能、工件成形大流量冷却;
- 合理的结构设计，宜人的操控高度，节省占地面积;
- 可搭载桁架式或关节式机器人，支持自动化联线。
- LC1500EA、LC2000EA伺服装机型
- 双伺服电机全闭环同步驱动，实现低噪音精确成形过程;
- 智能全伺服前后顶技术，有效解决夹紧安全识别。
- LC1500A油压机型
- 进口油压原件，双油缸驱动平稳成形;
- 独特的同步齿轮齿条和间隙微调技术，使同步精度提升至极。
- using special materials wear-resistant castings and C closed frame body;
- rich combination of mold, can reverse twist save teeth mold;
- clamp one time can forming few steps;
- intelligent rail lubrication detecting function, forming a large flow of cooling the workpiece;
- reasonable structure design, pleasant handling height, small footprint;
- can carry with truss or joint robot and automatical line.
- LC1500EA、LC2000EA CNC model
- double servo motor full closed-loop drive, low noise and precise forming process;
- intelligent all-around top servo technology to effectively solve clamping secure identification.
- LC1500A hydraulic model
- original hydraulic parts imported, double cylinder driving, forming steady;
- unique synchronous gear rack and clearance technique to make synchronization precision ascend to the utmost.

搓齿机 Rolling machine

## Horizontal rolling machine 卧式搓齿机

Bespoke Machine



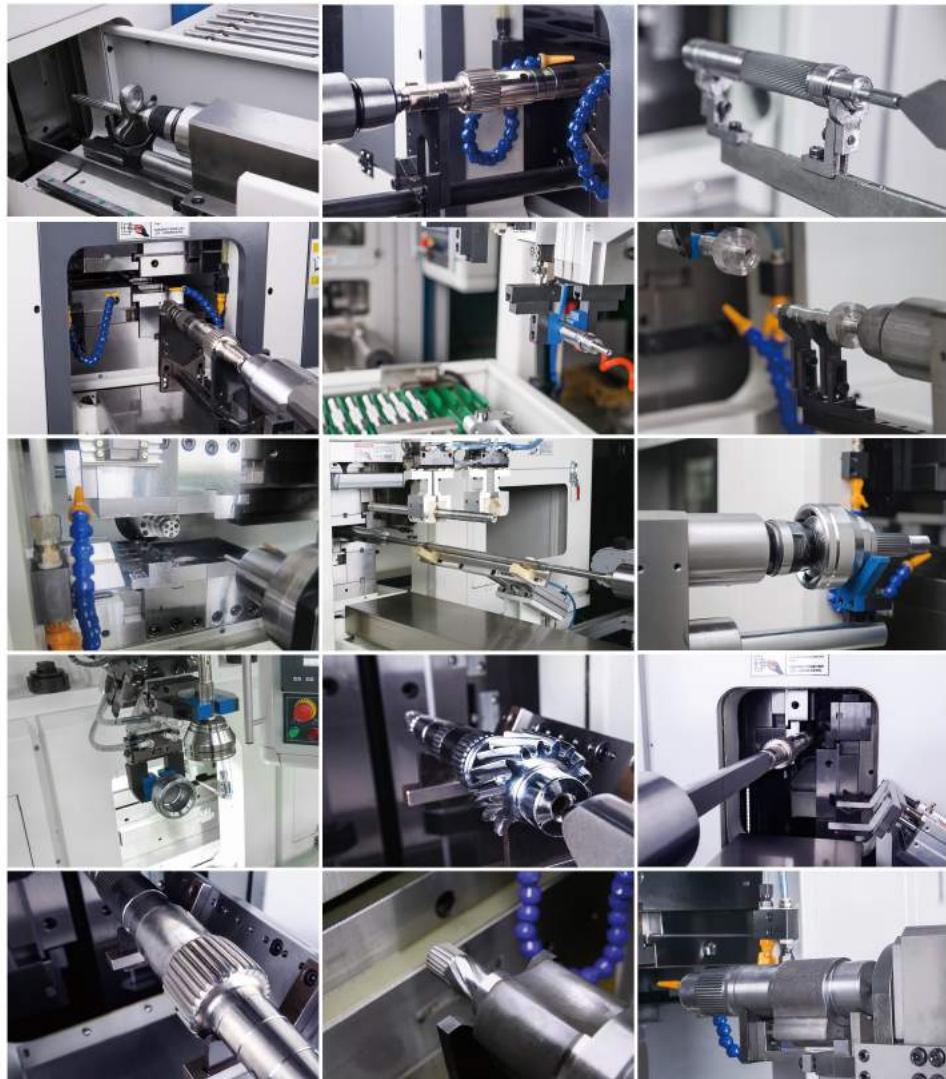
## 主要参数 The main parameters

项 目	ITEM	LC1500A	LC1500EA	LC2000EA
最大模数	max module	mm	1.75	1.75
最大外径	max out diameter	mm	Ø60	Ø60
最大搓齿宽度	max tool width	mm	120	120
最大工件长度	max workpiece length	mm	1000	1000
最大装刀宽度	max installing tool width	mm	300	300
开口尺寸	the open part size	mm	152.4	152.4
装刀规格	tool size	inch	48 or 24、24 or 13、36	48 or 24、24 or 13、36
最大行程	max travel	mm	1560	1560
机床重量	weight	kg	18000	18000
占地面积	length x width	mm	4000 x 4600	5600 x 3800
驱动方式	drive way		油压 (hydraulic)	伺服 (CNC)
特 殊 规 格 可 定 制				

搓齿机 Rolling machine

## 加工实例 Sample show

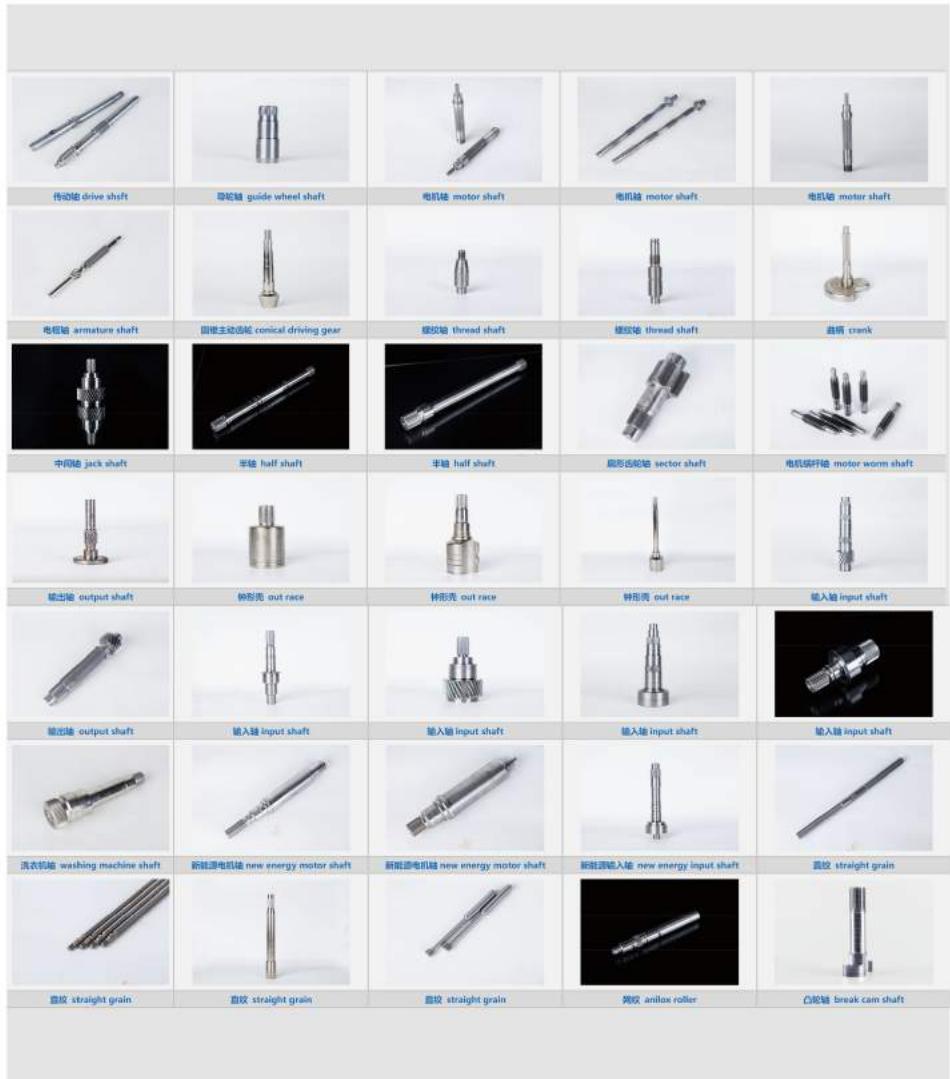
Bespoke Machine



搓齿机 Rolling machine

## 零件展示 Sample show

Bespoke Machine



# Rolling technology and selection 搓齿技术及选型

## Bespoke Machine

冷成形搓齿因其精密、高效、经济、节能的出色工艺优势，搓齿机及其相关模具技术在制造业发达国家得到长足发展，搓齿机的制造商有德国EXCELLO公司、英国MARBAIX公司、LAPOINTE公司、美国ANDERSON-COOK公司、日本的NACHI、NHK公司等。历经多年，搓齿机已 经普遍使用。我国的台湾也是精密搓齿机在工业制造中使用较早的地区。

直至上个世纪九十年代，国内开始有少数院校将精密搓齿机及相关技术作为专门的研究课题，进行理论及其制造工艺研究，达到一定高度，但精密搓齿机及模具的精度要求高、工艺复杂，在国内未能得到很好的发展，也未有正式生产厂家。

力成作为国内首家制造搓齿机专业公司，在上世纪九十年代末在国内传统加工工艺精度低、效率低、进口搓齿机床价格昂贵的迫切形势下，以替代进口、全面国产化为已任，综合国内外同类产品，取其精华、舍其不足，结合自身的开发研制能力，全身心的投入到搓齿机的开发研制。

经过多年的艰苦奋斗，力成已成功开发了两大系列十多个品种的搓齿机产品，并在实践中摸索和总结了丰富模具经验，改写了国内精密搓齿机及模具依靠进口的历史。

Thanking to precise, efficient, economical and energy-saving technological advantages of cold roll forming, roll forming machine and relative moulding technology have made a rapid progress in the developed countries of manufacturing industry, in which the manufacturers involve EXCELLO(Germany), MARBAIX(UK), LAPOINTE(UK), ANDERSON-COOK(USA), NACHI(Japan), NHK(Japan) and so on. Through several year's development, the roll forming machine has been widely applied, besides, Taiwan area is also one of earliest applying areas of precision roll forming machine in commercial manufacturer.

In the late nineties of last century, a few domestic institutions added precision roll forming machine and relative technologies into special research issues to make theoretical and manufacturing study; it has made a leap to a certain extent, however, because of high requirements on the precision of precision roll forming machine and mold and its complicated procedure, it has not been well developed in the country, still far away from the establishment of official manufacturer.

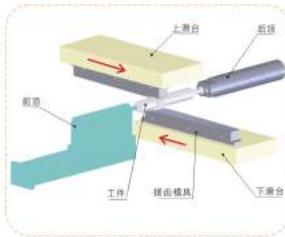
In the late nineties of last century under the urgent situation of short precision and low efficiency in domestic traditional machine workmanship and high cost of imported roll forming machine, as domestic first professional manufacturer of roll forming machine, LECN devotes to the development and research of roll forming machine by comparing with domestic and foreign similar products (rejecting the dross and assimilating the essence) and combining with our own research ability, has successfully developed three major series involving 10 odd specifications of roll forming machines through several years' hard work; furthermore, a rich experience of mold fabrication has been explored during the practice, which rewrites the history that domestic precision roll forming machine and mold have been importing.

## ◆ 搓齿机的成形原理

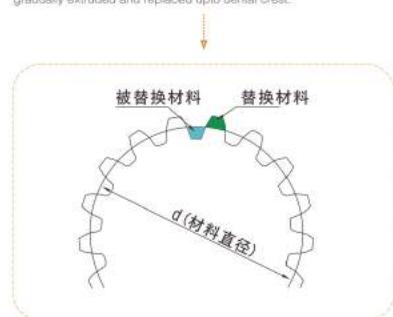
安装在滑台上的对置的两副搓齿模具，在经同步齿轮回步后由油压或伺服电机驱动作相对直线运动，模具被磨削或逐渐切入的齿形，工件由前后顶尖支撑，并可以通过前后顶尖的位移功能方便的调整工件加工部位，模具相对运动驱动工件旋转并逐渐的将工件挤压成形，经整形后最终退出。花键的成形精度及稳定性是由搓齿模具的预置刚性距离而获得，数秒钟内完成无屑成形。

### ◆ Shaping Principles of Roll Forming Machine

Two upside-down rolling molds installed on moving table make rectilinear motion driven by oil pressure or actuating motor after synchronizing synchronizer gear, in which the molds are sharpened into gradually-inclined tooth shape, the workpiece is supported by front & rear tail stocks, the processing part of the workpiece is easily adjusted by displacement function of front & rear tail stocks, where the relative motion of up & down molds can drive the workpiece to rotate gradually for extrusion moulding. It is finally withdrawn after restricting, the forming precision and stability of spline are decided by preset rigid distance of up & down forming molds, the shaping without stock removal can be completed within several seconds.

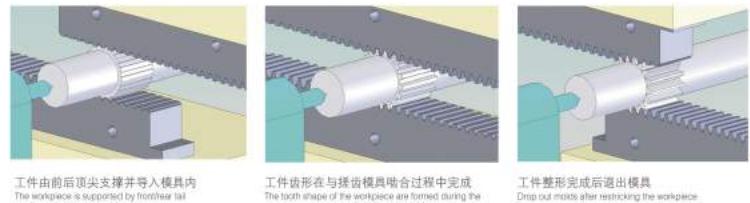


花键冷成形实际上是一次齿根材料被逐渐挤压替换到齿顶的一个无屑加工过程。The spline cold forming is actually a shaping process without stock removal, in which dental-root materials are gradually extruded and replaced upto dental crest.



# Rolling technology and selection 搓齿技术及选型

## Bespoke Machine



## 冷搓成形工艺的优点 (与传统的切削加工相比)

- ◆ 效率提高30倍以上 (约10~20秒/件)
- ◆ 工件承载能力比切削件提高40%
- ◆ 粗糙度可达Ra0.4以下
- ◆ 节约材料9%~15%
- ◆ 经冷成形的齿形的疲劳强度及扭转强度及耐磨性大幅提高

### Merits of cold roll forming workmanship (compared with traditional cutting operation)

- ◆ The efficiency increases over 30 times (about 10~20 s per piece)
- ◆ The bearing capacity of the workpiece is 40% superior to cutting piece
- ◆ The roughness can be reachable below Ra0.4
- ◆ which can save materials from 9% to 15%.
- ◆ The fatigue strength, torsion strength and abrasion resistance of cold-rolled tooth shape are greatly enhanced.

## 应用范畴:

- ◎ 适用汽车变速箱齿轮轴、球笼等速万向节、花键轴、电机轴、纺织罗拉、弹簧扭杆、方向机、曲轴等各式轴类零件上的直齿、(斜齿)花键、螺纹、蜗杆、直纹、油槽的精确无屑冷成形加工。
- ◎ 冷成形的材料要求：材料拉升系数不低于8%，常用C45、40Cr、Cr53、20Cr、20CrMnTi Q235及其他合金材料，材料需进行退火处理。
- ◎ 可加工花键标准：GB/T3478.1-1995 ISO-4156、DIN-5480、SASI-92.1-1970、SNSIB92.2、M-1980等。

## Applied Categories

- ◎ Applicable for the precision chipless cold forming process of straight-gear or bevel-gear spline, thread, worm, straight line and oil bath on various shaft components including gear shaft of the motorcar transmission case, ball cage constant-velocity joint, spline shaft, motor shaft, torsion bar spring, steering gear and crankshaft etc..
- ◎ Material requirements for cold forming: the stretching coefficient of materials should not be less than 8%, commonly applies C45, 40Cr, Cr53, 20Cr, 20CrMnTi Q235 and other alloy materials, all materials must be annealed.
- ◎ Processing standards applicable for spline: GB/T3478.1-1995, ISO-4156, DIN-5480, ASI-92.1-1970, SNSIB92.2, M-1980 and so on.

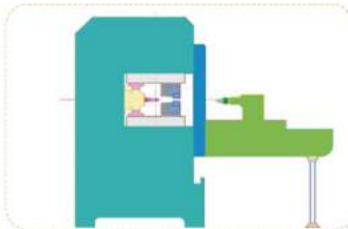


# Rolling technology and selection 搓齿技术及选型

## 搓齿机功能剖析

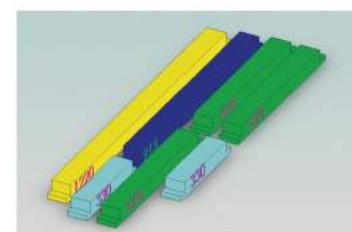
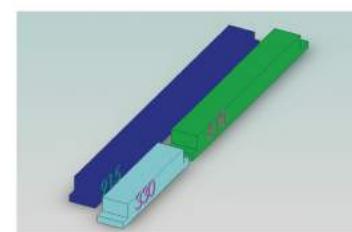
Functional Profile of Roll Forming Machine

**1** C形框架结构机身可以使精度长久保持稳定  
C-shape frame construction can ensure precision to be durable and stable



**2** 精确的模具装卸模块使模具更换简便快捷，无需对齿  
Precise clamping module of mold make the mold more convenient and faster without gear coupling.

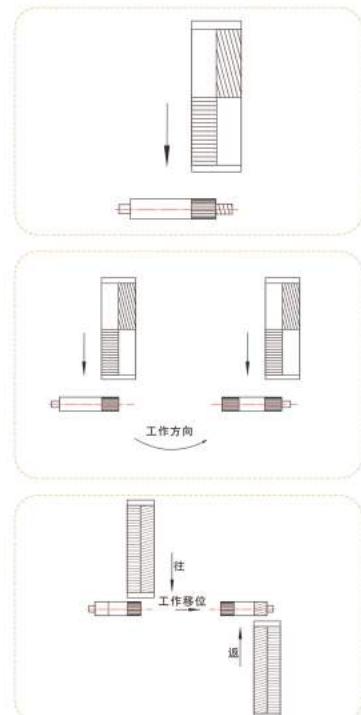
**3** 模具夹紧模块具有变化的组合功能  
Various combination functions of clamping module



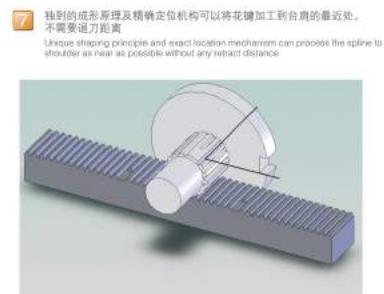
**4** 具有可以逆向加工及工件轴向精确定位功能  
Can be inversely processed and have precise axial displacement function of workpiece

**5** 通过工作移位、逆向加工、模具组合等方式可以一次装夹多部位加工  
The clamping of multi-part processing can be done by the displacement, reverse processing and mold combination of workpiece

## Bespoke Machine



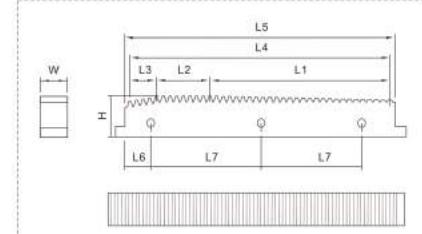
**6** 具有工件需要定向加工或者不完整齿加工的特殊功能  
Special function of designated processing or incomplete gear processing on workpiece



# Rolling technology and selection 搓齿技术及选型

## Bespoke Machine

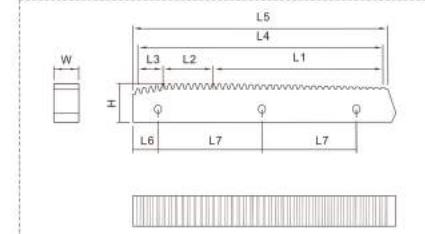
### 平压紧式 Platen-clamp type



搓齿模具适用机器 Applicable machines of roll forming mold	平压紧式 Platen-clamp type		楔压紧式 Wedge-clamp type	
	立式或卧式搓齿机 Wedge-clamp type	立式搓齿机 Vertical roll forming machine	立式搓齿机 Vertical roll forming machine	立式搓齿机 Vertical roll forming machine

磨具型号 Mold Model No.	搓齿模具尺寸 Sizes of roll forming mold			
	平压紧式 Platen-clamp type	楔压紧式 Wedge-clamp type	平压紧式 Platen-clamp type	楔压紧式 Wedge-clamp type
7	178	210	178	195
9	229	261	229	245
11	280	312	280	295
13	330	361	330	345
16	407	439	407	422
20	508	540	508	523
24	610	642	610	623
28	712	744	712	725
32	813	845	813	826
36	915	947	915	928
42	1067	1099		
48	1220	1252		

### 楔压紧式 Wedge-clamp type



**1** 定制全新的精密度模最快可在4周内交付使用  
A wholly-new precision rail forming mold can be delivered within 4 weeks at soonest after making order.

**2** 搓齿模具的使用寿命及修磨  
The service life and sharpening of roll forming mold

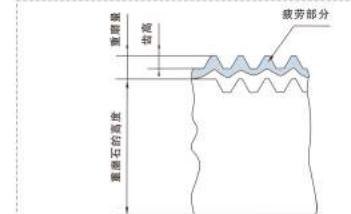
◎材料大于220HB硬度工具压角越小时搓齿模的寿

命会受影响而降低，搓齿模一般可进行3~5次的重磨

◎重磨后的模具寿命约相当于全新模具的80%

◎我们为您提供疲劳后的搓齿模具重磨服务

◎The service life of mold will be shortened if the hardness of materials is larger than 220HB and the pressure angle of workpiece is getting smaller, the mold can be re-sharpened for 3 to 5 times.  
◎The life of the re-sharpened mold is similar to 80% of that of new mold.  
◎We can offer you re-sharpening service for fatigue roll forming mold.



**3** 搓齿模具的形式及相关尺寸  
Form and relative sizes of roll forming mold

机床型号 Machine Model	刀具组合方式 Tool combination method	机床型号 Machine Model	刀具组合方式 Tool combination method
VLC500 VLC500E		VLC800A VLC800EA LC800A LC800EA	
VLC500A VLC500EA		VLC1000A VLC1000EA LC1000A LC1000EA	
VLC800 VLC800E		LC1500A LC1500EA	



## Rolling technology and selection 搓齿技术及选型

### Bespoke Machine

力成拥有立式、卧式、油压驱动、伺服驱动全系列多品种搓齿机，具有多年制造及服务经验，为了让用户在选型之时能明辨良莠，我们将各类搓齿机的相关信息罗列出来，以期用户可根据自身目标零件的需求理性选型。当然所有比较仅限在卧式机和立式机、油压机和伺服机的同规格机型之间进行，同时因限于我们的经验，粗浅之处望同行指正。

LECN covered all series of vertical, horizontal, hydraulic drive, CNC, full series rolling machines and experience in manufacturing and services. In order to customer choose the correct one from different quality similar machine, we list different rolling machine information hope can have any help for you.

卧式VS立式 horizontal VS vertical

优点 Advantage

缺点 Disadvantage



卧式机 Horizontal



立式机 Vertical

- 1) 主机着地面积大、重心低整体刚性好，加工过程中吸震能力好，加工能力及噪音要优于立式机，机器耐久性更好；
- 2) 日常的装料、装刀、机器调整高度均在1000mm左右，无需登高作业，作业安全及操作便利性较好。但较小规格的机型与立式差异不明显（小于24INCH的机型）；
- 3) 卧式机多数采用可拆卸的滚导轨维修便利。维修维护都不必登高作业（机器总高一般不超过1700mm）；
- 4) 运输便捷，安装及调整方便。

- 1) 立式机型的占地面积较小，对于场地紧张的用户是不错的选择；
- 2) 联线时跨距相对较短，可降低传递节拍。

- 1) 小型机型，占地面积小，工厂客户选择好；
- 2) 加工线距离短，可以减少传输时间。

- 1) 占地面积较大（仅在于24INCH以上规格机型，机型越大越明显），不利于场地紧张的用户选用；
- 2) 联线时跨距较大，但如果搓齿作为联线末尾工序时则无此忧。

- 1) Large floor area, no recommend small area customer choose
- 2) When you arrange automatic line, the distance cross is large, but this machine if put the end of this line be no problem.

- 1) 整体刚性和加工吸震的能力不如卧式机。基于这两个条件，加工能力一般稍逊于卧式同规格机型；
- 2) 日常进行的装料、装刀、机器调整均因操作高度超出真人高度（需要登高作业），不如卧式机便利、安全、快捷（机型越大越明显）；
- 3) 大规格机型运输、安装都相对麻烦（机型越大越明显）。

- 1) Rigidity and shock damping capacity lower than horizontal, so the machinery capacity will lower than same model horizontal machine;
- 2) Loading work piece, fix tools, adjust machine isn't convenience, safety and quickly as horizontal machine because the average height over than comfortable height loading work piece , fix tools, adjust machine no need (more big machine more obvious);
- 3) Transport and installation are not convenience(more big machine more obvious).

# Rolling technology and selection 搓齿技术及选型

## Bespoke Machine

	优点 Advantage	缺点 Disadvantage
油压驱动 hydraulic	<p>1) 采用的油缸驱动，由于没有机械摩擦副（滚珠丝杆），驱动的寿命长，很少需要维护；          2) 由于油压驱动的良好的过载性能，在被加工零件较大或某些条件下需要过载时，很容易实现；          3) 油压设计合理时，在承受搓齿尤其在大模数成形时的交变受力具有不可比拟的驱动平稳性；          4) 由于油压阻尼减速这一特性，在某些时候对于减少搓齿机真的损伤有利；          5) 相对经济。</p> <p>1) Use hydraulic drive, no mechanical friction will extending derive life ;          2) Because hydraulic drive with good overload performance so can easy to implement big work piece or need overload situation ;          3) When rolling big module work piece if oil pressure design reasonable the alternating stress have incomparable driving stability ;          4) Because oil pressure will slow down by block, so sometime rolling tools will be damaged.</p>	<p>1) 由于油液的需要量，通常需要600L以上的油压站，使机器的占地面积增大；          2) 不可避免的存在少量的滴漏现象和油压站产生的60分贝左右的噪音；          3) 不可避免的存在油液温升的问题，一般油路不可编程。</p> <p>1) Need more than 600L hydraulic oil station, so machine area enlarged ;          2) Oil drip and noise over than 60 decibels is unavoidable ;          3) Hydraulic oil temperature increase and oil rout cannot be programmed is unavoidable.</p>
伺服驱动 CNC	<p>1) 没有油站作为驱动源，设备周边环境整洁，占地面积缩小；          2) 一般工作噪音不超过40分贝，基本没有滴漏污染；          3) 搓齿过程可以通过编程获得合适的速度曲线；          4) 伺服驱动可以在机器不工作的时节电（但由于搓齿机属于高耗电产品，长时间待机外这一优势并不明显）。</p> <p>1) Without hydraulic oil station ,machine looks clean and area is small ;          2) Normally working noise no over than 40 decibels ;          3) Through programming will be easy get appropriate speed curve ;          4) Servo drive will save power when machine not in working .</p>	<p>1) 在没有同步齿轮条的机型上，同步精度依赖的滚珠丝杆作为摩擦副相对于油压件来说，更容易磨损失效；          2) 由于搓齿机的通过能力预置的特性，在某些情形下造成的卡机现象时，不如油压机可以无损伤脱困；          3) 在零件模数大、齿数多、花键长、硬度高时，很难提供持续过载能力；          4) 零件更换的成本较高。</p> <p>1) Machine without synchronous gear and rack;the screw compare hydraulic drive will be easier wear ;          2) Because spline machine have ability preset characters ,in some block situation, compare hydraulic drive cannot be solved without any damage ;          3) If work piece is big module, many teeth, long spline, high hardness will be hard to supply continue over load performance .</p>

### 国内外搓齿机制造的状况 The present situation of the rolling machine manufacturing

相对于其他加工机器来说，搓齿机在国内外制造厂家并不多，主要与这一机型的高效产出和制造难度较大有关。我们将全球知名厂家罗列如下，从中我们似乎不能看出，德国、美国、英国、台湾地区等厂家均偏好于卧式搓齿机制造，这可能是在于他们对设备刚性及耐久性的追求，也可能是因为其长期制造经验的驱动，而日本、韩国偏好于立式搓齿机，这有可能得益于他们的环保意识。

Compared to other processing machines, rolling machine manufacturers at home and abroad are not many, the main difficulty with the efficient production and manufacture of this type. We will be the world famous manufacturers are listed below, from which we seem to see not hard, Germany, Britain, American manufacturers, Taiwan area have preference on the horizontal rolling machine. It may be that their rigidity and durability of the equipment pursuit, it may be because of other long-term manufacturing experience. Japan, South Korea's preference for vertical rolling machine, which has the potential to benefit from their awareness of environmental protection.

公司名称	生产机型	Company name	Machine type
德国EXCELLO	主要生产卧式搓齿机，很少见有立式机型	(Germany) EXCELLO	Main is horizontal, very little vertical
英 国 M ARBAIX 和 LAPOINTE	主要生产卧式搓齿机，立式机型也不多见	(U.K.) MARBAIX & LAPOINTE	Main is horizontal, also very little vertical
美 国 ANDERSON-COOK	生产卧式搓齿机，未见有立式机型	(U.S.A)ANDERSON-COOK	Only produce horizontal ,no vertical
西班牙ROTO-FLO	生产卧式搓齿机，未见有立式机型	(Spain)ROTO-FLO	Only produce horizontal , no vertical
台湾某公司	主要生产卧式机型，近年有小规格立式机推出，市场并不多见	(Taiwan) one company	Main is horizontal, these years have vertical but very little

# Rolling technology and selection 搓齿技术及选型

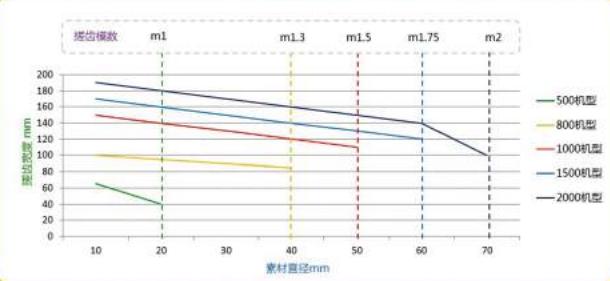
## Bespoke Machine

日本NACHI	主要生产立式搓齿，但大规格的(36INCH以上)仍采用卧式机型	(Japan) NACHI	Main is horizontal but over 36inch still is horizontal
日本NHK	主要生产36INCH以下的立式搓齿	(Japan) NHK	Main is lower than 36 inch's vertical
韩国某公司	主要生产36INCH以下的立式搓齿	South Korea	Main is lower than inch's vertical
中国LECN公司	生产卧式、立式全系列搓齿机	China LEVN	Full series of horizontal and vertical

### 小结 Summary

- 各 优 劣
- 无论是立式、卧式、油压、伺服搓齿机，主要是在于占地面积、操作便利、加工能力、设备耐久、维护维修、环境友好等方面的不同，在不同的机型上各有优劣。
- 设计细节、工能能力决定加工精度
- 无论哪种机型，驱动方式，除了以上的几点区别外，其对于产品精度、加工效率影响并不十分明显，正机型数据范围内产品的加工精度取决于机器的设计细节和制造商的工艺能力。
- 卧式可以覆盖立式机型所有规格
- 24inch以下非自动化机型立式机占地面小、操作更便利的优势，卧式可以覆盖立式机型所有规格和功能，反之，立式不备。

### LECN搓齿机型选型表



根据以上比较，用户可根据自身需求理性选择，我们就此提出如下建议：

According to the above comparison, customer can according to their requirement make rational choose, following are our selection suggestions:

用户在如下情形下，建议选用卧式机型，反之可选择立式机型

- 目标零件的花键有效长度可能超过80mm的；
- 目标零件花键模数可能大于1.27mm的；
- 目标零件花键部位直径可能超过40mm的；
- 目标零件花键模数可能有较大变更的；
- 目标零件可能用到24INCH以上的机型的；
- 对于占地面积不足寸必争的或介意登高作业的；
- 操作者习惯及维护人员熟悉卧式机型的；

用户在如下情形下，建议选择油压搓齿机，反之可选择伺服搓齿机

- 目标零件属于模数大、齿数多、花键长、硬度高的类别的；
- 对占地面积不是很敏感的；
- 可以接受油压可能存在的少量滴漏及存在的60分贝左右的噪音的；
- 对于购机和维修成本要求相对经济的。
- 对于机型超过36INCH的（超过36INCH时，立式机已经难以实现，卧式机丝杆传动长度受限）

I User in following situation please choose horizontal

- work piece 's spline length 80mm;
- work piece's spline module over than 1.27mm的；
- work piece spline diameter over 40mm的；
- work piece spline module will be big changed;
- work piece need use over 24inch machine ;
- if no mind floor area and climb operate ;
- operate used to and maintenance know horizontal machine well.

User in following situation please choose hydraulic drive

- work piece with big model, many teeth, long spline,high hardness;
- no mind for floor area;
- no mind for oil pressure will be little, oil drip and noise about 60 decibels;
- choose or maintenance want economic;
- workpiece need use over 36 inch(if over 36 inch,vertical has cannot meet requst,horizontal screw transmission length is limited.)

# 4

## 深孔钻床

### DEEP HOLE DRILLING MACHINE

#### 深孔钻床 Deep hole drilling machine

深孔钻床是一种高精度、高效率、高自动化的深孔加工专用机床，依靠先进的孔加工技术（枪钻、BTA钻、喷吸钻等），通过一次连续的钻削即可达到一般需钻、扩、铰工序才能达到的加工精度和表面粗糙度。加工孔孔径尺寸精度：IT7~IT11；加工孔偏斜度： $\leq 0.5\text{~}1/1000$ （加工孔深）；加工孔表面光洁度：Ra0.2~6.3μm。

Deep hole drilling machine is a kind of special machine tool for deep hole processing with high precision, high efficiency and high automation. Depending on advanced hole processing technology (gun drill, BTA drill, spray suction drill, etc.), the processing accuracy and surface roughness can be achieved by one continuous drilling process, which generally requires drilling, expanding and reaming processes. Machining hole size accuracy: IT7~IT11; Machining hole deviation:  $\leq 0.5\text{~}1/1000$  (Machining hole depth); Machining hole surface finish: Ra0.2~6.3μm.

#### 枪钻系统



主要用于小直径（一般小于35mm）深孔的钻削加工。属于内冷外排屑方式。切削液通过钻杆内部到达钻头头部进行冷却润滑，切屑从钻头及钻杆外部的V型槽排出。

#### Gun drill system

Mainly used for drilling small diameter (generally less than 35 mm) deep holes, which belongs to the internal cooling and external chip removal mode. Cutting fluid is cooled and lubricated by reaching the bit head through the hollow drill pipe, and chips are discharged from the V-groove outside the bit and the drill pipe.

#### BTA单管钻系统



主要用于直径大于12mm的深孔钻削加工。属于外冷内排屑方式。切削液通过授油器从钻杆外壁与工件已加工表面之间进入刀具头部进行冷却润滑，切屑由钻杆内部排出。授油器具有导向作用并向切削区提供润滑油道。与枪钻相比，高的切削液压力使得单管钻系统更加可靠，更适合难以断屑的材料（如低碳钢和不锈钢等）加工。

#### BTA Single Pipe Drilling System

It is mainly used for deep hole drilling with diameter greater than 12 mm, and belongs to external cooling and internal chip removal mode. The cutting fluid enters the tool head through the oil feeder from the outer wall of the drill pipe to the machined surface of the workpiece for cooling and lubrication, and the chips are pushed out from the inside of the drill pipe. The oil feeder has the guiding function and provides the oil transportation channel to the cutting area. Compared with spray suction drill, the high cutting hydraulic pressure makes the single pipe drilling system more reliable, and more suitable for processing materials that are difficult to break chips, such as low carbon steel and stainless steel.

#### 喷吸钻系统



主要用于直径大于18mm深孔钻削加工。属于内排屑深孔钻削加工。切削液由联结器上油口进入，其中大部分的切削液向前进入内钻杆之间的环形空间，到达刀具头部进行冷却润滑，并将切屑推入内钻杆内部后排出。较BTA系统所需的切削液压力更低，并降低了钻系统的密封要求。

#### Jet suction drilling system

It is mainly used for deep hole drilling with diameter greater than 18 mm, and belongs to deep hole drilling with internal chip removal. The cutting fluid enters through the oil feeding port on the coupling. Most of the cutting fluid enters the annular space between the inner and outer drill pipes forward, reaches the tool head for cooling and lubrication, and pushes the chips into the inner drill pipe cavity and discharges backwards. Compared with the BTA system, the cutting hydraulic pressure required is lower and the sealing requirement of the drilling system is reduced.



## Deep hole drilling machine

# 深孔钻床

适用于汽车刹车泵、方向机、减震器系统活塞主孔、接头和各种轴的深孔钻削加工。  
Brake Pump, Director, Shock Absorber System Piston Main Hole, Joints and Shafts



扫二维码看机床工作视频



Bespoke Machine

## 性能特点 Function features

- 框架式刚性机身、线性导轨，经久耐用；
- 立式结构，排屑容易；
- 特殊结构的高刚性主轴，抗震性好，寿命长；
- 专用液压组合夹具，特殊结构的液压夹头，夹紧可靠，精度稳定；
- 多种夹具可选，应对不同工件定位方式；
- 抢钻切割、内喷式高压冷却过滤，效率快、精度高；
- 左右加工参数独立设置，可独立加工；
- 可搭载桁架式或关节式机器人，支持自动化联线。



- rigid body frame, high rigidity rectangular hardened rails, durable;
- vertical structure, chip easily;
- special high rigidity spindle structure, seismic resistance, long life;
- special hydraulic modular fixture, special structure, clamping reliable, accuracy stability;
- a variety of fixtures optional respond to different workpiece positioning;
- rush drill cutting, high pressure spray cooling filtration efficiency block, high precision;
- set meeching parameters independent, and operate independent;
- can carry with truss or joint robot and automatical line .

## Deep hole drilling machine

# 深孔钻床

适用于汽车刹车泵、方向机、减震器系统活塞主孔、接头和各种轴的深孔钻削加工。  
Brake Pump, Director, Shock Absorber System Piston Main Hole, Joints and Shafts

Bespoke Machine



## 主要参数 The main parameters

项 目	ITEM	VSMGD0145D	VSMGD0145T	VSMGD0145F	VSMGD0245D	VSMGD0245T	VSMGD0245F	VSMGD0445D
最大钻孔直径	max drilling diameter mm	Ø5-Ø12	Ø5-Ø12	Ø5-Ø12	Ø10-Ø20	Ø10-Ø20	Ø10-Ø20	Ø18-Ø40
最大夹持直径	max clamping diameter mm	Ø60						
最大工件长度	max workpiece length mm	450	450	450	450	450	450	450
工位数	number stations	2	3	4	2	3	4	2
机床重量	weight kg	4000	4500	5700	4000	4500	5700	4000
占地面积	length x width mm	3000 x 2500	3000 x 2500	3200 x 2500	3000 x 2500	3000 x 2500	3200 x 2500	3000 x 2500

# 5

## 磨床

GRINDING MACHINE



提供轴类、盘类零件的内孔、外圆与端面磨削加工全套解决方案，可搭载桁架式或关节式机器人。

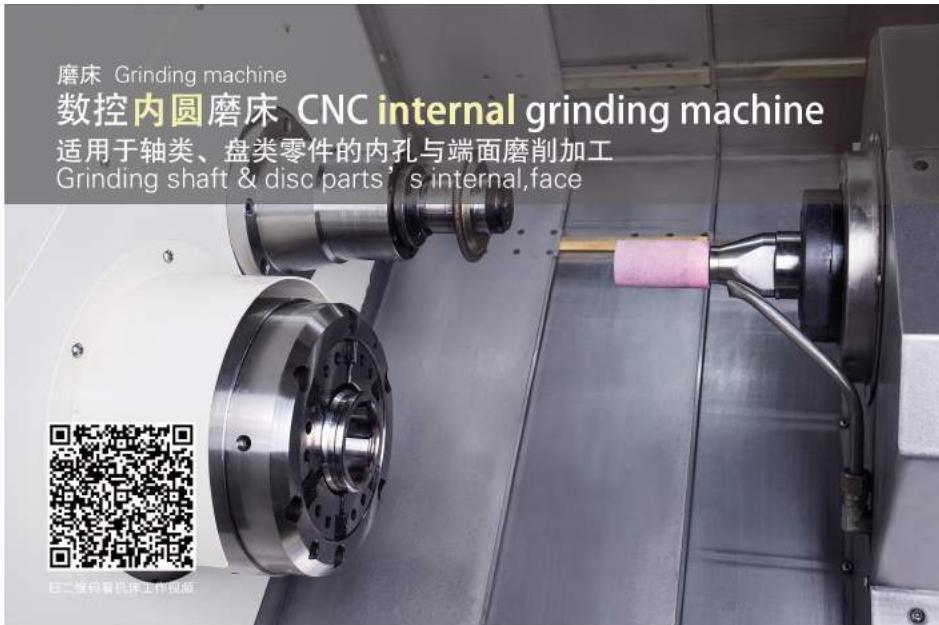
欢迎垂询定制专用磨床。

Provide a complete solution  
for internal , cylindrical and  
end face grinding of shaft  
and disc parts.  
Welcome to contact custom  
grinder.

磨床 Grinding machine

## 数控内圆磨床 CNC internal grinding machine

适用于轴类、盘类零件的内孔与端面磨削加工  
Grinding shaft & disc parts' s internal, face



白二维码看机种工作视频

Bespoke Machine



### 性能特点 Function features

- 45度斜背式高刚性机身、高速线性导轨，经久耐用；
- 专用夹具，夹紧可靠，精度稳定；
- 高刚性电主轴，抗震性好，寿命长；
- 伺服驱动金刚滚轮或金刚笔修整器，支持任意曲面；
- 可搭载桁架式或关节式机器人，支持自动化联线。
- 45 degrees hatchback body with high rigidity, high-speed linear guide rail, durable;
- special fixtures, clamping reliable, accuracy steady;
- high rigidity spindle, shock resistance, long life;
- Servo driven diamond wheel or diamond dresser to support any surface;
- can carry with truss or joint robot and automatical line .

磨床 Grinding machine

## CNC internal grinding machine 数控内圆磨床

适用于轴类、盘类零件的内孔与端面磨削加工  
Grinding shaft & disc parts' s internal, face

Bespoke Machine



### 主要参数 The main parameters

项目	ITEM	MK2112
最大夹持直径	max clamping diameter	mm Ø115
最大工件长度	max workpiece length	mm 150
最大磨削内孔直径	max grinding hole diameter	mm Ø120
工件最大柄部直径	max workpiece handle diameter	mm Ø40
砂轮直径范围	grinding wheel diameter scope	mm Ø30- Ø50
机床重量	weight	kg 2800
占地面积	length x width	mm 2000 x 1600

磨床 Grinding machine

## 数控外圆磨床 CNC cylindrical grinding machine

适用于轴类、盘类零件的外圆磨削加工  
Grinding shaft & disc parts's out circle

Bespoke Machine



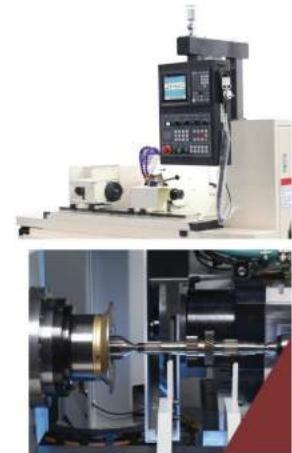
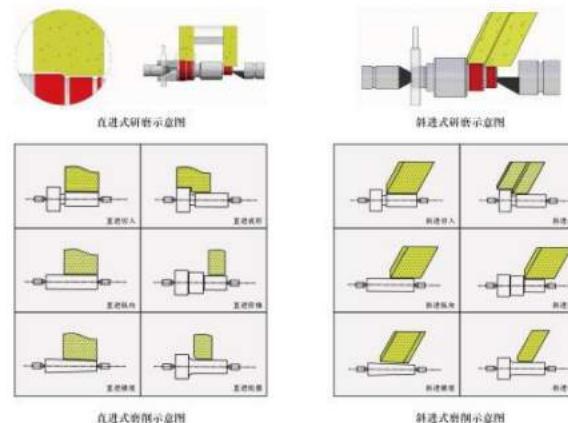
## 性能特点 Function features

- 采用特殊材质的耐磨铸件和框架刚性机身；
  - 静压导轨，耐磨，导向精度好；
  - 特殊主轴，抗震性好，寿命长；
  - 伺服驱动金刚滚轮或金刚笔修整器，支持任意曲面；
  - 可搭载桁架式或关节式机器人，支持自动化联线。
- 
- use special materials wear-resistant castings and pretensioners frame body;
  - hydrodynamic guides, can reverse twist save teeth mold;
  - special spindle, shock resistance, long life;
  - Servo driven diamond wheel or diamond dresser to support any surface;
  - can carry with truss or joint robot and automatical line .



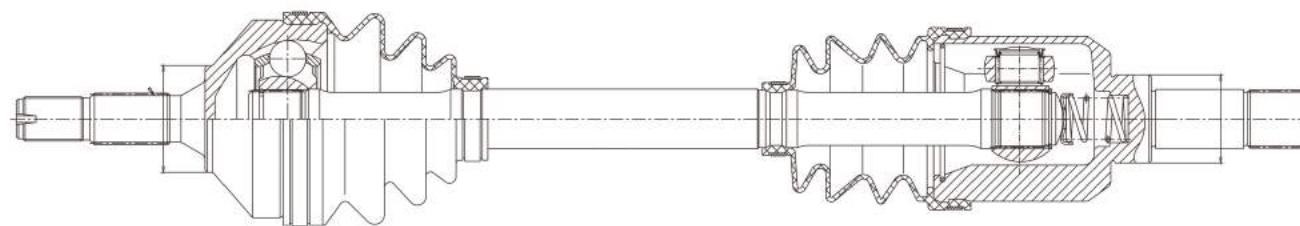
磨床 Grinding machine  
CNC cylindrical grinding machine 数控外圆磨床  
适用于轴类、盘类零件的外圆磨削加工  
Grinding shaft & disc parts's out circle

Bespoke Machine



## 主要参数 The main parameters

项目 ITEM	MA2030	MP2030	MA2060	MA2060
两顶尖最大距离 max tow centre distance mm	300	300	600	600
工作台最大旋转半径 max table rotate diameter mm	200	200	200	200
最大荷重 max loading kg	80	80	80	80
最大加工直径 max workpiece diameter mm	190	190	190	190
机床重量 weight kg	3500	3500	3500	3500
占地面积 length x width mm	3200 x 1850	3200 x 1850	3200 x 1850	3200 x 1850



6

## 等速万向节专机及整线输出

CV JOINT MACHINE AND  
THE WHOLE PRODUCTION LINE

机型 machine	NL361G	VQG040D	NL361	VLC1000/LC1000	QKA1250/QKA125	SMT011T	NL361G	QMH125	QMA125	QXA125
球道 groove										
加工 content	粗车 UFI SX DOI	滚槽	滚槽孔PUL rolling face and drilling hole	粗车 rough turning	滚槽 rolling	粗车 drilling hole	精车 finishing	精内孔 grinding inner face	精外孔 grinding groove	硬车 hard miling groove
机型 machine	NL361G	NL361G	QXB1250	QMB125	QXK125					
球道 groove										
加工 content	车端面及外圆 UFI SX DOI	车端面及孔 turning face and hole	软车球道 soft miling groove	硬车球道 hard miling groove	车端面及孔 turning face and hole					
机型 machine	NL361G	NL361G	QXA125	QMGA125	QMH125					
示意图 diagram										
加工 content	车端面及外圆 turning face and exircle	车端面及孔 turning face and hole	精窗口 milling cage	精窗口 grinding cage	精内孔 grinding inner face					

**LECN**  
Bespoke Machine

机型 machine	NL361G	NL361G	QXC125D	QYXC125	机型 machine	NL361G	NL361G	QXC125D	QYXD125
球道 groove					示意图 diagram				
VL/CG					VL/CG				
加工 content	车端面及外圆 turning face and exircle	车端面及孔 turning face and hole	软车球道 soft miling groove	硬车球道 hard miling groove	加工内容 content	车端面及外圆 turning face and exircle	车端面及孔 turning face and hole	软车球道 soft miling groove	硬车球道 hard miling groove
机型 machine	NL361G	NL361G	QXA125	QMGA125	QMH125				
示意图 diagram									
加工 content	车端面及外圆 turning face and exircle	车端面及孔 turning face and hole	精窗口 milling cage	精窗口 grinding cage	精内孔 grinding inner face				



球笼系列专用机床是力成积多年生产等速万向节的基础上逐步发展起来的。历经多年，力成已具备球笼产品球道铣磨加工的全套设备制造能力、以及传动轴平面钻中心孔机床，花键冷成形设备，遍及于国内等速万向节制造企业，业内深受用户信赖。

CV joint bespoke machine is gradually developed based on the production of CV joint for several years.LECN has strong manufacturing capacity of complete equipment involving CV joint milling and grinding,facing and centering machine ,rolling machine equipment, spread over domestic CV joint manufacturers and are well trusted by customers.

等速万向节专机及整线输出 CV joint machine and the whole production line

## 球笼弧沟道铣床 CV joint arc groove milling machine

适用于球笼钟形壳或星形套弧沟道的铣削加工 Milling BJ,UFJ,SX,DOJ groove



Bespoke Machine



## 性能特点 Function features

○ 一次装夹可依次完成钟形壳（或星形套）弧沟道的铣削加工；

○ 整体铸件机身，高刚性矩形淬硬导轨，经久耐用；

○ 端齿式油压分度，精度高；

○ 专用液压弹性夹具，夹紧可靠，精度稳定；

○ 特殊结构的高刚性主轴，抗震性好，寿命长；

○ 可搭载桁架式或关节式机器人，支持自动化联线。

QXA125/QYXB125/QYXA175/QYXB175球笼弧沟道专用机

○ 具热后硬铣，以铣代磨，可简化工艺、强化被加工零件表面质量。

○ 蜗轮蜗杆式底座重心台。

QYA125D/QYB125D双工位球笼弧沟道铣床

○ 采用双工位结构、插补加工，粗、精铣一次加工，精度高。

○ clamping one time can milling outer race(inner race) arc groove;

○ rigid body frame, high rigidity rectangular hardened rails, durable;

○ hydraulic end tooth indexing high precision;

○ special hydraulic elastic clamp, clamping reliable, accuracy stability;

○ special high rigidity spindle ,long life;

○ can carry with truss or joint robot and automatical line .

QYXA125/QYXB125/QYXA175/QYXB175 Cv joint arc groove milling machine

○ 毫米代替磨，简化工艺，加强零件表面质量；

○ 蜗轮蜗杆式底座重心台。

QYA125D/QYB125D Duplex Cv joint arc groove milling machine

○ double position rough milling,fine milling ,produce once machining ,high precision.

等速万向节专机及整线输出 CV joint machine and the whole production line

## CV joint arc groove milling machine 球笼弧沟道铣床

适用于球笼钟形壳或星形套弧沟道的铣削加工 Milling BJ,UFJ,SX,DOJ groove

Bespoke Machine



## 主要参数 The main parameters

项 目	ITEM	QYXA125	QYXB125	QYXA175	QYXB175	QYA125D	QXB125D
最大夹持直径	max clamping diameter	mm	Ø110	Ø35 ( 内涨 )	Ø175	Ø60 ( 内涨 )	Ø110
最大工件长度	max workpiece length	mm	260	60	260	70	260
最大回转角度	max rotating angle	°	110	110	120	120	-----
加工沟道直径范围	groove diameter scope	mm	Ø45- Ø100	Ø20- Ø65	Ø45- Ø130	Ø25- Ø100	Ø45- Ø100
工件所配钢球直径范围	diameter of steel ball scope	mm	Ø12.7- Ø22	Ø12.7- Ø22	Ø22- Ø42.2	Ø22- Ø42.2	Ø12.7- Ø22
工件最大柄部直径	max workpiece handle diameter	mm	Ø40	-----	Ø55	-----	Ø40
机床重量	weight	kg	4100	4100	5500	5500	5500
占地面积	length x width	mm	2500 x 1800	2500 x 1800	3000 x 1800	3000 x 1800	2700 x 1800

等速万向节专机及整线输出 CV joint machine and the whole production line

## 球笼斜(直)沟道铣床 CV joint beve(straight) milling machine

适用于球笼钟形壳或星形套斜(直)沟道的铣削加工 Milling VL,CG(DOJ)groove



Bespoke Machine



## 性能特点 Function features

- 一次装夹可依次完成钟形壳(或星形套)斜沟道的铣削加工;
- 整体铸件机身、高刚性矩形淬硬导轨，经久耐用;
- 预置式斜角机构，倾斜角度可靠;
- 端齿式油压分度，精度高;
- 专用液压弹性夹具，夹紧可靠，精度稳定;
- 特殊结构的高刚性主轴，抗震性好，寿命长;
- QYXC125/QYXD125球笼斜沟道硬态铣床
- 真热后硬铣，以铣代磨，可简化工艺、强化被加工零件表面质量。
- 主轴回转定位加工，可防止刀具干涉，减少刀具磨损。
- QXC125D/QXD125D双工位球笼斜沟道铣床
- 采用双工位结构，粗、精铣一次加工，精度高。
- clamping one time can milling outer race(inner race) bevel groove;
- rigid body frame, high rigidity rectangular hardened rails, durable;
- preset bevel mechanism, tilt angle reliable;
- hydraulic end tooth indexing high precision;
- special hydraulic elastic clamp, clamping reliable, accuracy stability;
- special high rigidity spindle, earthquake resistance long life.
- QYXC125/QYXD125 Cv joint bevel groove milling
- milling instead of grinding,simplify process,strengthen work piece surface quality;
- spindle rotational position process to prevent tools interference,reduce tool wear.
- QXC125D/QXD125D Duplex Cv joint bevel groove milling
- double position rough milling,fine milling ,produce once machining ,high precision.

等速万向节专机及整线输出 CV joint machine and the whole production line

## CV joint beve(straight) milling machine 球笼斜(直)沟道铣床

适用于球笼钟形壳或星形套斜(直)沟道的铣削加工 Milling VL,CG(DOJ)groove

Bespoke Machine



## 主要参数 The main parameters

项 目	ITEM	QYXC125	QYXD125	QXC125D	QXD125D	QXE125	QXF125	QXE160	QXF160
最大夹持直径	max clamping diameter	mm Ø110	Ø35 (内胀)	Ø110	Ø35 (内胀)	Ø110	Ø35 (内胀)	Ø110	Ø35 (内胀)
最大工件长度	max workpiece length	mm 260	60	260	60	260	60	260	60
最大回转角度	max rotating angle	° ±16	±16	-----	-----	-----	-----	-----	-----
加工沟道直径范围	groove diameter scope	mm Ø45- Ø100	Ø20- Ø65	Ø45- Ø100	Ø20- Ø65	Ø45- Ø100	Ø20- Ø65	Ø100- Ø160	Ø30- Ø80
工件所配钢球直径范围	diameter of steel ball scope	mm Ø12.7- Ø22	Ø22- Ø42.2	Ø22- Ø42.2					
工件最大柄部直径	max workpiece handle diameter	mm Ø40	-----	Ø40	-----	Ø40	-----	Ø48	-----
机床重量	weight	kg 4100	4100	4300	4300	2900	2900	4800	4800
占地面积	length x width	mm 2500 x 1800	2500 x 1800	2600 x 1900	2600 x 1900	2500 x 1800	2500 x 1800	3000 x 2000	3000 x 2000

等速万向节专机及整线输出 CV joint machine and the whole production line

## 保持架窗口铣床/磨床 Cage milling (grinding) machine

适用于球笼保持架窗口的铣削或磨削加工 Milling (Grinding) cage



扫二维码看机床工作视频

Bespoke Machine



## 性能特点 Function features

- 一次装夹可依次完成球笼保持架窗口的铣削或磨削加工；  
○ 整体铸件机身、高刚性矩形淬硬导轨，经久耐用；  
○ 铣轴垂直调整结构，可任意调整窗口上下铣削面的铣削量和高度误差；  
○ 伺服驱动的工作轴，可高频来回旋转和精确圆周等分；  
○ 专用气动夹具，夹紧可靠，精度稳定；  
○ 可搭载桁架式或关节式机器人，支持自动化联线。
- clamping one time can milling or grinding window cage in order;  
○ rigid body frame, high rigidity rectangular hardened rails, durable;  
○ milling axis perpendicular adjust structure, can adjust window's upper and lower milling surface's milling quantity and height tolerance;  
○ servo drive workpiece axis can rotate back and forth and precise circumference of the high-frequency decile;  
○ special pneumatic clamps, clamping reliable, accuracy stability;  
○ can carry with truss or joint robot and automatical line .

等速万向节专机及整线输出 CV joint machine and the whole production line

## Cage milling (grinding) machine 保持架窗口铣床/磨床

Milling (Grinding) cage 适用于球笼保持架窗口的铣削或磨削加工

Bespoke Machine



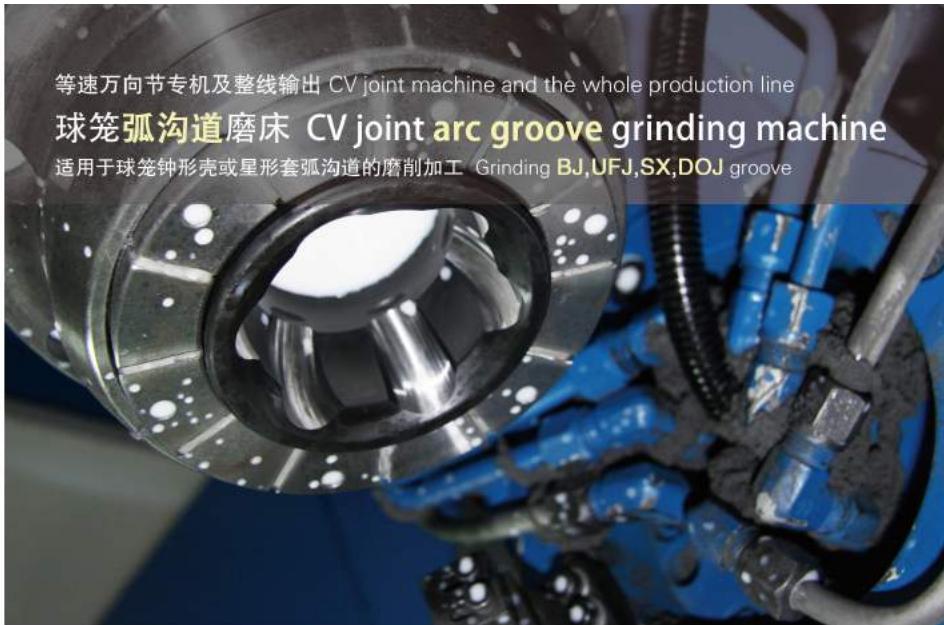
## 主要参数 The main parameters

项 目	ITEM	QXGA125	QMGA125	QMGA135
夹持直径范围	clamping diameter scope	mm Ø40-Ø120	Ø40-Ø70	Ø70-Ø135
最大工件高度	max workpiece height	mm 60	50	70
加工窗口高度范围	window height scope	mm 12-50	12-40	40-50
刀具直径范围	tool diameter scope	mm Ø6-Ø12	Ø6-Ø12	Ø6-Ø16
机床重量	weight	kg 3000	3500	3600
占地面积	length x width	mm 3200 x 2200	3650 x 2500	3650 x 2500

等速万向节专机及整线输出 CV joint machine and the whole production line

## 球笼弧沟道磨床 CV joint arc groove grinding machine

适用于球笼钟形壳或星形套弧沟道的磨削加工 Grinding BJ,UFJ,SX,DOJ groove



Bespoke Machine



## 性能特点 Function features

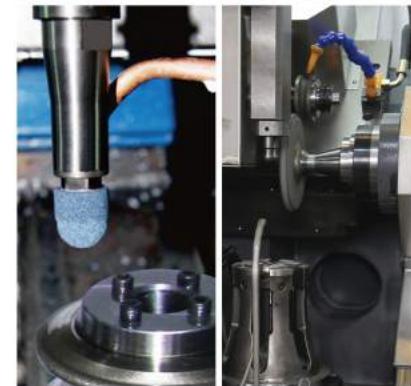
- 一次装夹可依次完成球笼钟形壳或星形套弧沟道的磨削加工;
- 框架式刚性机身、高速线性导轨，经久耐用;
- 转台驱动工件摇摆成形沟道，较插补式中心距稳定;
- 丝杆驱动转台摇摆，寿命长;
- 端齿式油压分度，精度高;
- 专用液压弹性夹具，夹紧可靠，精度稳定;
- 伺服驱动金刚滚轮修整器，可应对不同沟道尺寸工件;
- 高刚性电主轴，抗震性好，寿命长。
- clamping one time can grinding outer race or inner race arc groove;
- rigid body frame, high rigidity rectangular hardened rails, durable;
- stutable drive workpiece swing to form groove ,interpolation center distance steady;
- screw drive turntable swing, long life;
- terminal gear hydraulic indexing, high precision;
- special hydraulic elastic deep, clamping reliable, accuracy stability;
- servo drive diamond roller dresser, can respond to different groove size workpiece;
- high rigidity spindle, shock resistance, long life.

等速万向节专机及整线输出 CV joint machine and the whole production line

## CV joint arc groove grinding machine 球笼弧沟道磨床

适用于球笼钟形壳或星形套弧沟道的磨削加工 Grinding BJ,UFJ,SX,DOJ groove

Bespoke Machine



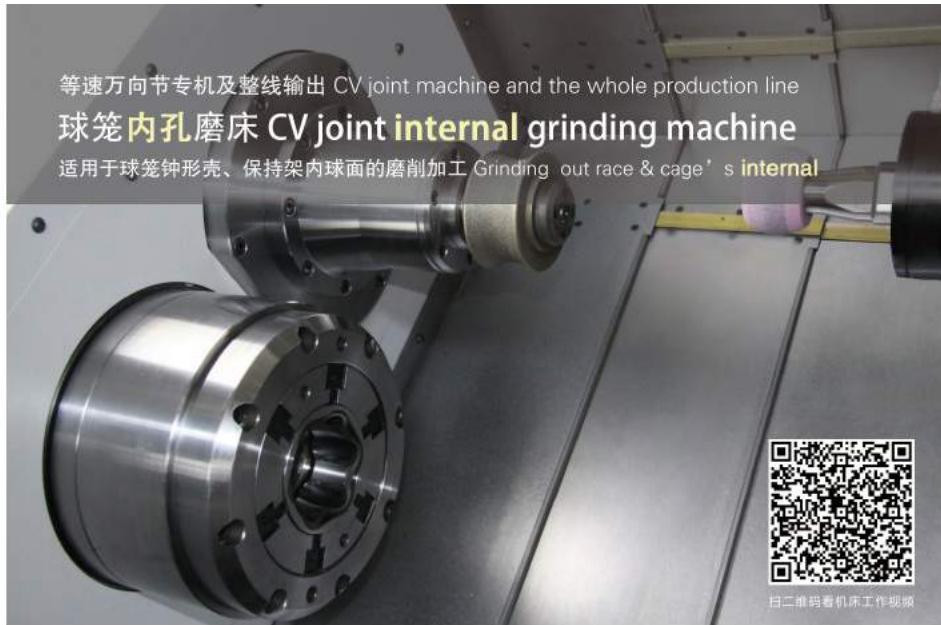
## 主要参数 The main parameters

项 目	ITEM	QMA125	QMB125
最大夹持直径	max clamping diameter	mm	Ø115
加工沟道直径范围	groove diameter scope	mm	Ø45-Ø100
工件所配钢球直径范围	diameter of steel ball scope	mm	Ø12.7- Ø22
工件最大柄部直径	max workpiece handle diameter	mm	Ø40
机床重量	weight	kg	4000
占地面积	length x width	mm	2200 x 1800

等速万向节专机及整线输出 CV joint machine and the whole production line

## 球笼内孔磨床 CV joint internal grinding machine

适用于球笼钟形壳、保持架内球面的磨削加工 Grinding out race & cage's internal



Bespoke Machine



## 性能特点 Function features

- ◎ 45度斜背式高刚性机身、高速线性导轨，经久耐用；
  - ◎ 专用夹具，夹紧可靠，精度稳定；
  - ◎ 高刚性电主轴，抗震性好，寿命长；
  - ◎ 伺服驱动金刚滚轮修整器，支持曲面任意变形；
  - ◎ 可搭载桁架式或关节式机器人，支持自动化联线。
- ◎ 45 degrees hatchback body with high rigidity, high-speed linear guide rail, durable;
  - ◎ special clamp, clamping reliable, accuracy steady;
  - ◎ high rigidity spindle, shock resistance, long life;
  - ◎ servo drive diamond roller dresser, support any surface deformation ;
  - ◎ can carry with truss or joint robot and automatical line .

等速万向节专机及整线输出 CV joint machine and the whole production line

## CV joint internal grinding machine 球笼内孔磨床

Grinding out race & cage's internal 适用于球笼钟形壳、保持架内球面的磨削加工

Bespoke Machine



## 主要参数 The main parameters

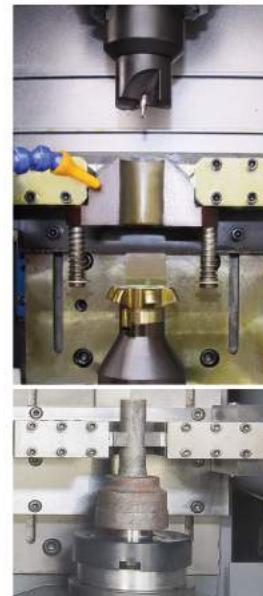
项 目	ITEM	QMH125	
		钟形壳(outer race)	保持架(cage)
最大夹持直径	max clamping diameter	mm	Ø115 Ø210
最大工件	max workpiece	mm	260(长度 length) 200 (高度 height)
加工内孔直径范围	inner hole diameter scope	mm	Ø45- Ø100 Ø25- Ø120
工件最大柄部直径	max workpiece handle diameter	mm	Ø40 -----
砂轮直径范围	grinding wheel diameter scope	mm	Ø30- Ø50 Ø30- Ø60
机床重量	weight	kg	2800 2800
占地面积	length x width	mm	2000 x 1600 2000 x 1600

等速万向节专机及整线输出 CV joint machine and the whole production line

## 双工位球笼立式刮打机 Duplex CV joint horizontal scraping and milling machine

适用于球笼钟形壳柄部刮端面钻中心孔加工 Milling face and drilling hole

Bespoke Machine



### 性能特点 Function features

- 一次装夹可完成球笼钟形壳柄部刮端面钻中心孔加工；
- 框架式刚性机身、高刚性矩形淬硬导轨，经久耐用；
- 立式结构，换屑容易；
- 特殊结构的高刚性主轴，抗震性好，寿命长；
- 专用液压夹具，夹紧可靠，精度稳定；
- 多种夹具可选，应对不同工件定位方式；
- 左右加工参数独立设置，可独立加工；
- 可搭载桁架式或关节式机器人，支持自动化联线。

- clamping one time can scraping and drilling outer arc handle part;
- rigid body frame, high rigidity rectangular hardened rails, durable;
- vertical structure, chip easily;
- special high rigidity spindle structure, seismic resistance, long life;
- special hydraulic clamp, clamping reliable, accuracy stability;
- clamp can be choosed, respond to different workpiece fix position;
- set parameters independent, and can operate independent;
- can carry with truss or joint robot and automatical line .

### 主要参数 The main parameters

项目	ITEM	VQG0430D
最大加工直径	max process diameter	mm Ø40
工件长度范围	workpiece length scope	mm 50-300
中心孔最大夹持直径	max center drilling clamping diameter	mm Ø16
机床重量	weight	kg 2200
占地面积	length x width	mm 1400 x 1200

等速万向节专机及整线输出 CV joint machine and the whole production line

## CV joint handle drilling machine 球笼柄部钻孔机

Drilling hole 适用于球笼钟形壳柄部插销孔的加工

Bespoke Machine



### 性能特点 Function features

- 一次装夹可完成球笼钟形壳柄部四个中心孔及两个通孔的加工；
- 油压驱动的钻孔动力头，维护简单，寿命长；
- 专用液压夹具，分度夹紧可靠，精度稳定。
- clamping one time can processing outer arce handle part's four centre holes and tow through holes;
- hydraulic drive drilling power head , easy maintenance, long life;
- special hydraulic clamp, indexing clamping reliable, accuracy steady.

### 主要参数 The main parameters

项目	ITEM	SMD0110T
工件柄部长度范围	workpiece handle length scope	mm 80-120
工件柄部直径范围	workpiece handle diameter scope	mm Ø10- Ø40
最大加工中心孔	max drilling center hole	mm A6.3 (B5)
机床重量	weight	kg 2200
占地面积	length x width	mm 2000 x 1800



7

## 铣端面钻中心孔机床 FACING AND CENTERING MACHINE

关于3米以下轴端的铣削、套车、钻中心孔、钻孔、攻牙、镗孔、铰孔、切槽等一揽子解决方案，适用于桁架式或关节式机器人的全系列立、卧式、斜式机型。十六年专注，上千种案例。

About three meters below the shaft surface milling, chisel, drilling center hole, drilling, tapping, boring, reaming, grooving package of solutions for the entire department or truss articulated robot column vertical, horizontal and slant models. Sixteen years focused, thousands of cases.



立式 vertical

卧式 horizontal

斜式 slant



铣端面钻中心孔机床 Facing and centering machine

## 立式铣端面钻中心孔机床

Vertical facing and centering machine

Bespoke Machine



## 性能特点 Function features

- 一次装夹可完成轴类件铣端面、钻中心孔加工；
- 框架式刚性机身、高刚性矩形淬硬导轨，经久耐用；
- 液压自定心夹具，夹紧可靠，精度稳定；
- 特殊结构的高刚性前用主轴，使用寿命长；
- 立式结构，排屑容易，较卧式节省占地面积；
- 可搭載桁架式或关节式机器人，支持自动化联线；
- 特别适合于关节式机器人自动线。
- clamping one time can processing face, drilling hole;
- rigid body frame, high rigidity rectangular hardened rails, durable;
- hydraulic self-centering jig, clamping reliable, accuracy stability;
- special high rigidity spindle, long life;
- vertical structure, chip easily;
- floating distance, maintenance is simple;
- can carry with truss or joint robot and automatical line ;
- more suitable for joint robot support automated on-line.

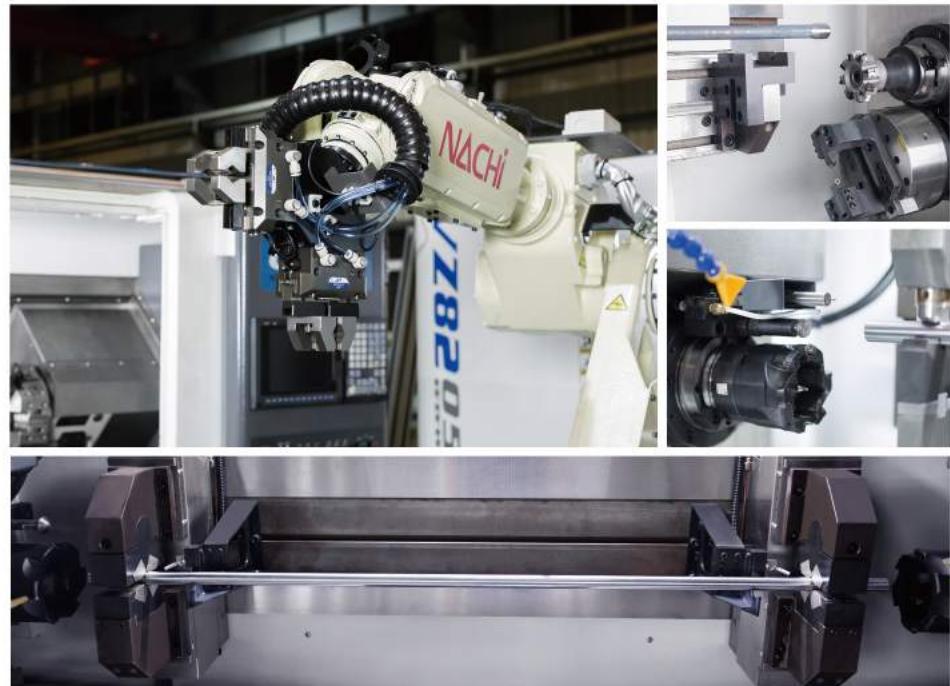


铣端面钻中心孔机床 Facing and centering machine

## 立式铣端面钻中心孔机床

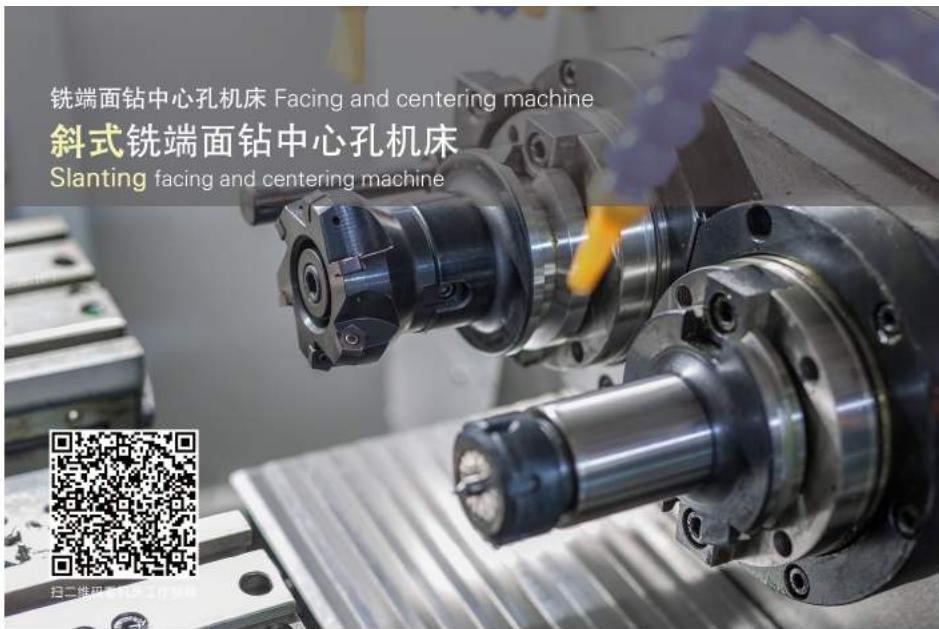
Vertical facing and centering machine

Bespoke Machine



## 主要参数 The main parameters

项 目	ITEM	VZ820550	VZ8205100	VZ8205130
夹持直径范围	clamping diameter scope	mm Ø15- Ø50	Ø15- Ø50	Ø15- Ø50
加工长度范围	workpiece length scope	mm 100-500	100-1000	100-1300
中心钻最大夹持直径	max center drilling clamping diameter	mm Ø16	Ø16	Ø16
最大铣削量(单边)	max milling amount (one side)	mm 4	4	4
机床重量	weight	kg 2600	3600	4500
占地面积	length x width	mm 2500 x 1500	2800 x 1500	3400 x 1500



铣端面钻中心孔机床 Facing and centering machine

## 斜式铣端面钻中心孔机床

Slanting facing and centering machine



扫二维码获取更多信息

*Bespoke Machine*



## 性能特点 Function features

- 一次装夹可完成端面、钻中心孔加工；
  - 框架式刚性机身、高刚性矩形淬硬导轨，经久耐用；
  - 液压自定心夹具，夹紧可靠，精度稳定；
  - 特殊结构的高刚性前用主轴，使用寿命长；
  - 脱式结构，拆装容易；
  - 斜卧式上料距离短，调整维护方便；
  - 可搭载桁架式或关节式机器人，支持自动化联线；
  - 特别适合于桁架式机器人自动线。
- clamping one time can processing face, drilling hole;
  - rigid body frame, high rigidity rectangular hardened rails, durable;
  - hydraulic self-centering jig, clamping reliable, accuracy stability;
  - special high rigidity spindle, long life;
  - slanting structure, chip easily;
  - feeding distance, maintenance is simple;
  - can carry with truss or joint robot and automatical line;
  - more suitable for truss manipulator support automated on-line.

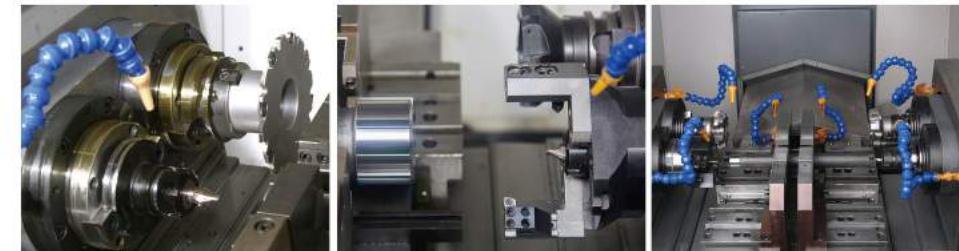


铣端面钻中心孔机床 Facing and centering machine

## 斜式铣端面钻中心孔机床

Slanting facing and centering machine

*Bespoke Machine*



## 主要参数 The main parameters

项 目	ITEM	SZ820530	SZ820550	SZ821060	SZ821080
夹持直径范围	clamping diameter scope	mm Ø15- Ø50	mm Ø15- Ø50	mm Ø15- Ø100	mm Ø15- Ø100
加工长度范围	workpiece length scope	mm 100-300	mm 300-500	mm 200-600	mm 300-800
中心钻最大夹持直径	max center drilling clamping diameter	mm Ø16	mm Ø16	mm Ø26	mm Ø26
最大铣削量(单边)	max milling amount (one side)	mm 4	mm 4	mm 5	mm 5
机床重量	weight	kg 2800	kg 3000	kg 5000	kg 5000
占地面积	length x width	mm 2400 x 1400	mm 2800 x 1400	mm 3200 x 1600	mm 3200 x 1600



铣端面钻中心孔机床 Facing and centering machine

## 卧式铣端面钻中心孔机床

Horizontal facing and centering machine



## 性能特点 Function features

- 一次装夹可完成轴类件铣端面、钻中心孔、套车外圆、倒角等加工;
- 卧式整体铸件机身，较立式机刚性更强;
- 高刚性矩形淬硬导轨，经久耐用;
- 液压自定心夹具，夹紧可靠，精度稳定;
- 特殊结构的高刚性前用主轴，使用寿命长;
- 可搭载桁架式或关节式机器人，支持自动化联线;
- 特别适用于桁架式机器人自动线。
- clamping one time can milling face, drilling hole, teles copling, chamfer;
- rigid body frame;
- high rigidity rectangular hardened rails, durable;
- hydraulic self-centering jig, clamping reliable, accuracy stability;
- special high rigidity spindle, long life;
- floating distance, maintenance is simple;
- can carry with truss or joint robot and automatical line;
- more suitable for truss manipulator support automated on-line.



铣端面钻中心孔机床 Facing and centering machine

## 卧式铣端面钻中心孔机床

Horizontal facing and centering machine

Bespoke Machine



## 主要参数 The main parameters

项 目	ITEM	Z820530	Z820550	Z821060	Z810580
夹持直径范围	clamping diameter scope	mm Ø15-Ø50	mm Ø15-Ø50	mm Ø15-Ø100	mm Ø15-Ø100
加工长度范围	workpiece length scope	mm 100-300	mm 300-500	mm 200-600	mm 300-800
中心钻最大夹持直径	max center drilling clamping diameter	mm Ø16	mm Ø16	mm Ø26	mm Ø26
最大铣削量(单边)	max milling amount (one side)	mm 4	mm 4	mm 5	mm 5
机床重量	weight	kg 2500	kg 2700	kg 4500	kg 4500
占地面积	length x width	mm 2400 x 1400	mm 2800 x 1400	mm 3200 x 1600	mm 3200 x 1600

铣端面钻中心孔机床 facing and centering machine

## 卧式铣端面钻中心孔机床

Horizontal facing and centering machine



Bespoke Machine



## 性能特点 Function features

- 一次装夹可完成轴类件铣端面、钻中心孔、套车外圆、倒角等加工;
- 卧式整体铸件机身，较立式机刚性更强;
- 高刚性矩形淬硬导轨，经久耐用;
- 液压自定心夹具，夹紧可靠，精度稳定;
- 特殊结构的高刚性削用主轴，使用寿命长;
- 可搭载桁架式或关节式机器人，支持自动化联线;
- 特别适用于桁架式机器人自动线。
- clamping one time can milling face, drilling hole, teles copling, chamfer;
- rigid body frame;
- high rigidity rectangular hardened rails, durable;
- hydraulic self-centering jig, clamping reliable, accuracy stability;
- special high rigidity spindle, long life;
- floating distance, maintenance is simple;
- can carry with truss or joint robot and automatical line;
- more suitable for truss manipulator support automated on-line.

铣端面钻中心孔机床 facing and centering machine

## 卧式铣端面钻中心孔机床

Horizontal facing and centering machine

Bespoke Machine



## 主要参数 The main parameters

项 目	ITEM	Z8210120	Z8210150	Z8210200	Z8220150	Z8220200	Z8220300
夹持直径范围	clamping diameter scope	mm Ø15-Ø100	Ø15-Ø100	Ø15-Ø200	Ø100-Ø200	Ø100-Ø200	Ø100-Ø200
加工长度范围	workpiece length scope	mm 300-1200	300-1500	400-2000	300-1500	400-2000	1500-3000
中心钻最大夹持直径	max center drilling clamping diameter	mm Ø26	Ø26	Ø26	Ø26	Ø26	Ø26
最大铣削量 (单边)	max milling amount (one side)	mm 6	6	6	6	6	6
机床重量	weight	kg 7500	8500	12000	11000	13000	16000
占地面积	length x width	mm 3600 x 1700	4000 x 2000	5000 x 2200	4000 x 2200	5000 x 2300	7000 x 2300

铣端面钻中心孔机床 Facing and centering machine  
加工实例 Sample show

Bespoke Machine



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**LECN**  
*Bespoke Machine*



## 镗铣专机 BORING & MILLING MACHINE

更多专机 欢迎垂询 More request welcome contact



镗铣专机 Boring & milling machine

## 制动凸轮专用铣床 Break cam milling machine

适用于汽车制动凸轮轴、纺织凸轮及圆周曲线工件的铣削加工 Milling break cam



Bespoke Machine



### 性能特点 Function features

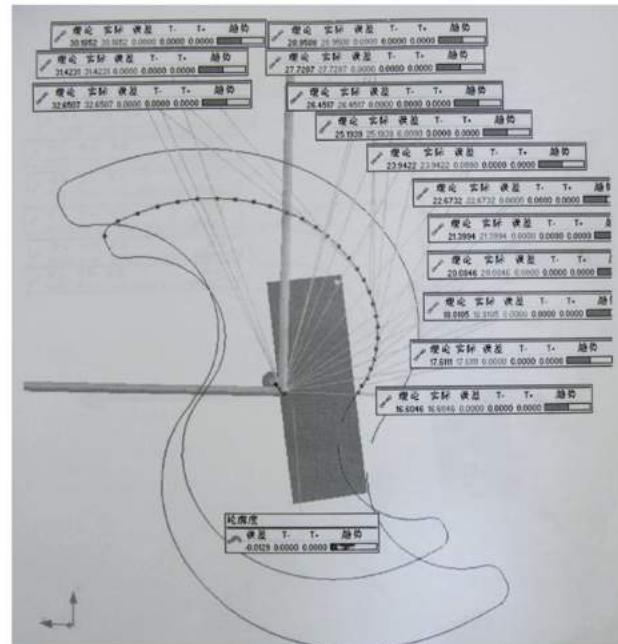
- 整体铸件机身、高刚性矩形淬硬导轨，经久耐用；
- 进口CNC转台，精密耐重；
- 专用液压夹具、长轴支撑的夹持单元，夹紧可靠，精度稳定；
- 特殊结构的高刚性主轴，寿命长；
- 定向开发的CNC数控系统，程序自动生成。
- rigid body frame, high rigidity rectangular hardened rails, durable;
- imported CNC table, high resistance weight;
- special hydraulic clamp, long axis support clamping unit, clamping reliable, accuracy steady;
- special structure high rigidity spindle , long life;
- directed development CNC system, automatically generating program.

镗铣专机 Boring & milling machine

## Break cam milling machine 制动凸轮专用铣床

Milling break cam 适用于汽车制动凸轮轴、纺织凸轮及圆周曲线工件的铣削加工

Bespoke Machine



### 主要参数 The main parameters

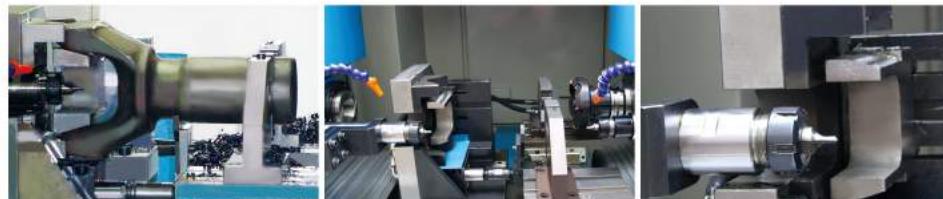
项 目	ITEM	CM0525
最大夹持直径	max clamping diameter	mm Ø50
最大工件长度	max workpiece length	mm 1000
最大凸轮直径	max cam diameter	mm Ø250
机床重量	weight	kg 5500
占地面积	length x width	mm 2500 x 1750

镗铣专机 Boring & milling machine

## 传动轴叉铣打机 Drive shaft yoke milling machine

适用于传动轴叉铣端面钻中心孔加工 Milling face and drilling hole

Bespoke Machine



### 性能特点 Function features

- 一次装夹可完成传动轴叉铣端面钻中心孔加工；
- 整体铸件机身、高刚性矩形淬硬导轨，经久耐用；
- 专用液压夹具，夹紧可靠，精度稳定；
- 特殊结构的高刚性耐用主轴；
- 可搭载桁架式或关节式机器人，支持自动化联线。

- clamping one time can processing face, drilling center hole;
- rigid body frame, high rigidity rectangular hardened rails, durable;
- special hydraulic clamp tools, clamping reliable, accuracy stability;
- special structure high rigidity spindle ;
- can carry with truss or joint robot and automatical line .

### 主要参数 The main parameters

项目 ITEM		CZ821080
夹持直径范围	clamping diameter scope	mm Ø15- Ø100
加工长度范围	workpiece length scope	mm 300-800
中心钻最大夹持直径	max center drilling clamping diameter	mm Ø26
最大铣削量 (单边)	max milling amount (one side)	mm 6
机床重量	weight	kg 4500
占地面积	length x width	mm 3200 x 1600

镗铣专机 Boring & milling machine

## Duplex crank scraping machine 双工位曲柄刮打机

Milling face and drilling hole 适用于曲柄铣端面钻中心孔加工

Bespoke Machine



### 性能特点 Function features

- 一次装夹可完成两个曲柄刮端面钻中心孔加工；
- 整体铸件机身、高刚性矩形淬硬导轨，经久耐用；
- 专用液压夹具，夹紧可靠，精度稳定；
- 特殊结构的高刚性耐用主轴；
- 可搭载桁架式或关节式机器人，支持自动化联线。

- clamping one time can scraping face, drilling hole two pcs cranks;
- whole casting body, high rigidity rectangular hardened rails, durable;
- special hydraulic ,clamping reliable, accuracy stability;
- special structure high rigidity spindle ,long life;
- can carry with truss or joint robot and automatical line .

### 主要参数 The main parameters

项目 ITEM		QBZ0520D
夹持直径范围	clamping diameter scope	mm Ø15- Ø50
加工长度范围	workpiece length scope	mm 80-150
中心钻最大夹持直径	max center drilling clamping diameter	mm Ø16
最大铣削量 (单边)	max milling amount (one side)	mm 5
机床重量	weight	kg 2500
占地面积	length x width	mm 2400 x 1400

镗铣专机 Boring & milling machine

## 十字轴专机 Joint cross machine

适用于十字轴铣端面、展车外圆、倒角、钻中心孔加工 Milling face, turning outer circle and drilling hole



Bespoke Machine



## 性能特点 Function features

- 一次装夹可完成十字轴铣端面、展车外圆、倒角、钻中心孔加工；
- 整体铸件机身、高刚性矩形淬硬导轨，经久耐用；
- 液压夹具，夹紧可靠，精度稳定；
- 专用伺服展刀；
- 特殊结构的高刚性附用主轴；
- 可搭载桁架式或关节式机器人，支持自动化联线。
- one clamping can complete the end face of the joint cross, the outer circle of the car, the chamfer, drilling hole;
- rigid body frame, high rigidity rectangular hardened rails, durable;
- hydraulic fixture, reliable clamping, precision stability;
- special servo tool
- special high rigidity spindle, long life;
- can carry with truss or joint robot and automatical line .

## 主要参数 The main parameters

项目 ITEM	ITEM	CZ821030
加工直径范围	workpiece diameter scope	mm Ø15-Ø60
加工长度范围	workpiece length scope	mm 100-300
展刀行程	expanding travel	mm 20
机床重量	weight	kg 5500
占地面积	length x width	mm 3500 x 1500

镗铣专机 Boring & milling machine

## Link block machine 十字轴连接块专机

Boring and drilling hole 适用于十字轴连接块镗孔、钻中心孔加工



Bespoke Machine



## 性能特点 Function features

- 一次装夹可完成十字轴连接块镗孔、倒角加工；
- 整体铸件机身、高刚性矩形淬硬导轨，经久耐用；
- 液压夹具，夹紧可靠，精度稳定；
- 特殊结构的高刚性附用主轴；
- 可搭载桁架式或关节式机器人，支持自动化联线。
- one clamping can complete the link block boring,drilling hole ;
- rigid body frame, high rigidity rectangular hardened rails, durable;
- hydraulic fixture, reliable clamping, precision stability;
- special high rigidity spindle ,long life;
- can carry with truss or joint robot and automatical line .

## 主要参数 The main parameters

项目 ITEM	ITEM	TZ820510
镗孔直径范围	boring diameter scope	mm Ø25-Ø50
加工长度范围	workpiece length scope	mm 100
机床重量	weight	kg 3000
占地面积	length x width	mm 2800 x 1400

镗铣专机 Boring & milling machine

## 连杆双面铣床 Connecting rod milling machine

适用于连杆两侧面或分割后的两平面铣削加工 Milling face



### 性能特点 Function features

- 一次装夹可完成两个连杆两侧面或分割后的两平面铣削；
  - 整体铸件机身、高刚性矩形淬硬导轨，经久耐用；
  - 专用液压芯轴夹具，夹紧可靠，精度稳定（铣侧面）；
  - 专用可调宽度液压夹具，夹紧可靠，精度稳定（铣分割面）；
  - 特殊结构的高刚性耐用主轴；
  - 可搭载桁架式或关节式机器人，支持自动化联线。
- 
- clamping one time can milling and turning two pieces linrk rods two sides or the divided tow face;
  - rigid body frame, high rigidity rectangular hardened rails, durable;
  - special hydraulic mandrel fixture, clamping reliable, accuracy and stability (milling side);
  - special adjustable width hydraulic fixtures, clamping reliable, accuracy and stability (milling dividedsurface);
  - special high rigidity spindle ,long life;
  - can carry with truss or joint robot and automatical line .

### 主要参数 The main parameters

项 目	ITEM	LG820550-1	
		铣侧面(milling side face)	铣断面 (milling divided face)
夹持宽度	clamping width	mm	60
工件宽度范围	workpiece width scope	mm	50-100
工件长度范围	workpiece length scope	mm	-----
最大铣削量(单边)	max milling amount (one side)	mm	2
机床重量	weight	kg	2500
占地面积	length x width	mm	2400 x 1400
			2400 x 1400

镗铣专机 Boring & milling machine

## Automobile torsion beam milling machine 汽车扭梁端面铣床

Milling face 适用于汽车后扭梁焊接总成左、右轮毂安装端面的铣削



### 性能特点 Function features

- 一次装夹可完成汽车后扭梁焊接总成左、右轮毂安装端面的铣削；
  - 整体铸件机身、高刚性矩形淬硬导轨，经久耐用；
  - 坚固的矩形导轨，确保高精度和稳定性；
  - 特殊结构的高刚性耐用主轴；
  - 可搭载关节式机器人，支持自动化联线。
- 
- clamping one time can milling and turning behinde torsion beam welding assembly , hub's install face;
  - rigid body frame, high rigidity rectangular hardened rails, durable;
  - special hydraulic self-centering, clamping reliable, accuracy stability;
  - special structure high rigidity spindle ,long life;
  - can carry with truss or joint robot and automatical line .

### 主要参数 The main parameters

项 目	ITEM	X8220125
工件长度范围	workpiece length scope	mm
前束调整量(单边)	toe-in adjustment (one side)	°
外倾调整量(单边)	toe-out adjustment (one side)	°
机床重量	weight	kg
占地面积	length x width	mm
		3500 x 1500

