



冰箱钣金生产线  
Refrigerator Shell Forming line

青岛海德马克智能装备有限公司  
Qingdao HDMECH Intelligent Equipment Co.,LTD.

地址:青岛市高新技术开发区春阳路8号  
Add:Chunyang Road,8th Qingdao High-  
tech Development Zone  
电话Tel: 0532-85012522  
邮编: 266071  
<http://www.hdmech.com>  
编号: JT-MKT-FM-BXXY20170202/A-00654





# HDMECH

QINGDAO HDMECH INTELLIGENT EQUIPMENT CO.,LTD

## 精细化的产品 国际化的海德马克

[www.hdmech.com](http://www.hdmech.com)

## 公司简介 Company Profile

青岛海德马克智能装备有限公司（“海德马克”或“公司”）原青岛华东工程机械有限公司，成立于1994年10月28日，注册资金6166万元，位于青岛市高新技术产业开发区春阳路北侧、思源路西侧，公司厂区占地面积13.9万平方米（208亩），总资产3.57亿，现有员工170余人。

海德马克，是一家从事智能化生产线、机器人、物联网技术研发、设计、制造、销售、服务于一体的国家高新技术企业。主要产品包括：冰箱（冷柜）智能化生产线、洗衣机智能化生产线、油烟机智能化生产线、热水器智能化生产线、工业机器人、智能无人精密锻造操作装备、径锻机、智能数控碾环机、智能数控热处理装备等。

海德马克，先后服务于海尔、海信、美的、澳柯玛、TCL、GE、格力、倍科、一重、二重、上重、太重、沈重、大连华瑞、无锡叶片、马钢、宝钛以及德国罗特艾德等知名企业。

Qingdao HDMECH Intelligent Equipment Co. Ltd. (“HDMECH”) Qingdao Huadong Engineering Machinery Co. Ltd., founded in October 28, 1994, registered capital of 61.66 million yuan, is located in Qingdao high tech Industrial Development Zone, between the north of Chunyang Road, and the west of Siyuan Road, the company covers an area of 139 thousands square meters (208 acres), with total assets of 357 million and enrolled employees more than 170.

HDMECH, is a national high-tech enterprise engaged in the R&D, designing, manufacturing, sales of home appliance intelligent production line, robot, internet of things technology. The main products include: refrigerator (freezer) intelligent production line, wash machine intelligent production line, kitchen ventilator intelligent machine production line, heater intelligent production line, intelligent unmanned-operation high precision forging equipment, industrial robots, intelligent CNC ring rolling machine, radial forging machine, intelligent CNC heat treatment equipment etc..

HDMECH has been supplied production line for Arcelik, Haier, Hisense, Midea, AUCMA, GREE, TCL, GE, and CFHI , CNEG, TAYOR, TYHI, NHI, DHHI, WTB, MIS, BaoTi and Germany Rothe Erde and other famous enterprises.

国家高新技术企业  
 山东省企业技术中心  
 青岛市液力装备工程技术研究中心  
 多个创新研发项目列入国家、省市重点技术创新项  
 60t数控重载锻造操作机技术被列入2010年度国家火炬计划  
 1000kg全液压重载机器人项目列入国家扩大内需重点资金支持项目  
 智能无人高精度锻造操作装备（800KN）被评为2015年度山东省首台套技术装备  
 260t锻造操作机项目获得青岛市重点技术攻关项目  
 数控精密锻造基层技术研发，被列入青岛市关键技术攻关计划  
 “18MN径向锻造压机、径向锻造操作机”被认定为2014青岛市企业技术创新重点项目  
 冷柜全自动钣金铆接线开发被列入青岛市企业技术创新重点项目计划  
 对开门冰箱门壳自动化生产线的开发被列入青岛市企业技术创新重点项目计划  
 洗衣机全自动内筒成型线的开发被列入青岛市企业技术创新重点项目计划

National high-tech enterprise  
 Shandong Enterprise Technology Center  
 Qingdao hydraulic equipment Engineering Technology Research Center  
 A number of innovative R & D projects included in the national, provincial key technological innovation projects  
 60t CNC heavy duty forging manipulator technology was included in the 2010 National Torch Program  
 1000kg all hydraulic heavy duty robot project included in the national expansion of domestic demand key funding projects  
 Intelligent unmanned operation high precision forging equipment (800KN) was named the 2015 annual Shandong province first sets of technical equipment  
 The project of 260t forging machine has been awarded the key technical project of Qingdao  
 CNC precision forging technology research and development, has been included in the key technology projects in Qingdao  
 "18MN radial forging press, radial forging manipulator" was identified as the 2014 Qingdao enterprise technology innovation key projects  
 Refrigerator automatic sheet metal rivet line development was included in the key projects of Qingdao city enterprise technology innovation plan  
 The development of the automatic door shell production line of the French door refrigerator was included in the key project of Qingdao enterprise technology innovation  
 The development of full automatic washing machine drum forming line of was included in the key project of enterprise technology innovation in Qingdao



## 技术专利 Technology Patents

## 合作与交流 Cooperation and Exchange

装料取料伺服仿真机械手发明专利  
 生产线传输对中机构及其方法发明专利  
 金属板料滚边装置及其方法发明专利  
 机械手及其夹持方法发明专利  
 钣金件复合加工模具及其方法发明专利  
 装出料机及其控制方法发明专利  
 机械手控制系统及控制方法发明专利  
 自动对中装置、对中方法及带有此装置的仿真手柄发  
 冰箱隐形门折弯模具及其折弯方法发明专利  
 .....



Patent of loading and reclaiming servo simulation manipulator  
 Patent of production line transmission centering mechanism and method  
 Patent of sheet metal rolling device and method  
 Patent of manipulator and its clamping method  
 Patent of sheet metal part composite machining die method  
 Patent of charging and discharging machine and its control method  
 Patent of Robot control system and its control method  
 Patent of automatic centering device, centering method, and simulation handle with this device  
 Patent of refrigerator invisible door bending die and its bending method

荣获100多项国家发明专利及实用新型专利 Won more than 100 national invention patents and utility model



公司一直与上海交通大学、燕山大学、中国海洋大学、济南铸锻所、中国重型机械研究院、马钢设计院等高校及科研院所保持着长期战略合作关系，通过与高校和科研院所的交流与合作提高技术创新能力。

HDMECH has maintained long term strategic relationship with Shanghai Jiao Tong University, Yanshan University, Ocean University of China, Ji'nan JFMMRI, Chinese Heavy Machinery Research Institute, Maanshan Institute and other universities and research institutes, and to improve the technological innovation capability through the exchange and cooperation with universities and research institutes

# 设备参数表

## Technical specifications

Perfect Product / International Hdmech  
精细化的产品 / 国际化的海德马克



辊轧工位 Rolling station



铆接工位 Riveting station



贴附工位 Condenser pipe pasting



打Z工位 Z press



折U机器人 Condenser pipe pasting

系列 Description	冰箱系列 Refrigerators		
产品类型 Product Type	冰箱U壳、侧板钣金成型线 Refrigerator U shell Side panel forming line	冰箱门壳成型线 Refrigerator forming line	冰箱背板成型线 Refrigerator back panel line
成品图 Finished product			
截面图 Section drawing			
成型产品尺寸范围 Product Forming Dimension	U型成型高度范围：450-2000mm； U型成型深度范围：360mm-800mm； U型成型宽度范围：420-1200mm； 侧板成型高度范围：700-2000mm； 侧板成型宽度范围：360-800mm；	U forming height range：450-2000mm； U forming depth range：360mm-800mm； U forming width range：420-1200mm； Side-panel forming height range：700-2000mm； Side-panel forming width range：360-800mm；	对开门门壳线 门壳宽度：390-600mm； 门壳长度：820-1700mm； 普通门壳线 门壳宽度：400-800mm； 门壳长度：200-1700mm； 门壳高度：820-1700mm； French door shell line Door forming width：390-600mm； Door forming height：820-1700mm； Normal door shell Door forming width：400-800mm； Door forming height：200-1700mm； Door forming height：820-1700mm
设备节拍 Cycle time	U壳≤15s/件；侧板≤13s/件 U shell≤15s/piece；Side-panel≤13s/piece	对开门≤20s/件 普通门≤13s/件 French door≤20s/piece Normal door≤13s/piece	≤15s/件 ≤15s/piece
适用材料 Applied Material	PCM板，冷轧板 PCM sheet, cold-rolled sheet	PCM板，VCM板，冷轧板，合金钢板 PCM/VCM sheet, cold rolled sheet, alloy sheet	PCM板，压花铝板，镀锌板 PCM sheet, galvanized sheet, embossed sheet
产品合格率 Qualified product ratio	≥99.8%	≥99.8%	≥99.5%
工艺流程 Technological Process	自动上料→冲切→翻折→辊轧→打Z、中切→L弯→门以磁铆接→冷凝管贴附→折U→下料 automatic loading→punching→rotation→rolling→Z press→mid-cutting→L shape→door hinge riveting→Condenser pipe pasting→U bending→unloading	自动上料→纵向切边→组合冲切→纵向切边→组合折弯→深部切边→侧板翻边→一切二→下料 automatic loading→transverse film mchling→compound punching→longitudinal film mchling→compound bending→head flanging→display flanging→dividing→unloading	自动上料→冲切→再侧折弯→再侧折弯→下料 automatic loading→punching→two sides bending→two head bending→unloading
设备构成 Equipment Structures	1. 自动上料机：1套 2. 冲压机：2套 3. 翻板机：1套 4. 辊压机：1套 5. 打Z、中切工位：1套 6. L弯工位：1套 7. 门磁铆接工位：1套 8. 冷凝器手动贴附段：2套 9. 冷凝器自动贴附段：1套 10. 折U工位：1套 11. 机器人下料工位：1套 12. 液压和气控系统：配套 13. 电气控制系统：配套 14. 配套模具：配套	1. automatic loading machine one set 2. Press 1 and 2, each one set 3. Rotation machine one set 4. roller machine one set 5. Z press mid-cutting station one set 6. L shape station one set 7. Door hinge riveting station one set 8. Condenser pipe hand-pasting station one set 9. Condenser pipe auto-pasting station one set 10. U bending station one set 11. Robot unloading station one set 12. Hydraulic and Pneumatic system corollary equipment one set 13. Electrical control system corollary equipment one set 14. Matched mold one set	1. 自动上料机：1套 2. 冲压机：1套 3. 再侧折弯机：1套 4. 再侧折弯机：1套 5. 下料工位：1套 6. 液压和气控系统：配套 7. 电气控制系统：配套 8. 配套模具：配套

# 冰箱侧板和U壳线

## Refrigerator Side Panel and U shell forming line

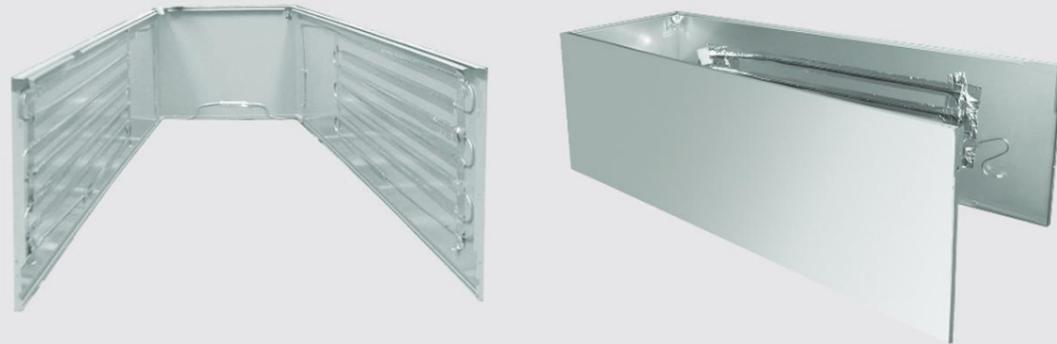
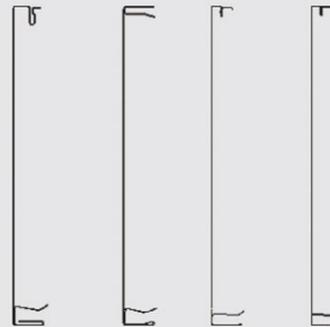
Perfect Product / International Hdmech  
精细化的产品 / 国际化的海德马克

**HDMECH**  
海德马克

该设备用于生产客户指定形状和尺寸的冰箱侧板和U壳。  
成型材料可选择VCM、PCM等，经模具冲切、辊扎、贴覆（冷凝器）、折弯等工序加工后出料，用于冰箱下一步组装。

This equipment is used for refrigerator side panel and U shell with customer specified shape and dimension.

The applied material can be VCM and PCM, etc, and the finished sheet can be used for next refrigerator assembling after die punching, rolling, condenser pipe pasting, bending and some processes.



我公司设计生产的冰箱侧板和U壳生产线，整套设备技术源于日本，在行业内具备国际领先的技术优势。公司自1994年成立以来，得到了国内外家电厂商的广泛认可。生产线由自动上料、冲切、180° 翻转、辊扎成型、中间切断、打Z、包角成型、折弯成型、冷凝器自动贴覆、折U成型、下料机械手等各机构组成。

设备（或DP）网络的有效应用，使整套设备可无人化自动运行。在更换生产型号时在工控电脑上提前设置各型号的生产数量，自动实现混产，整套设备完全自动化；效率高，侧板线生产节拍：12秒/对；U壳线生产节拍：15秒/个；成型精度高，产品合格率：等于或大于99.5%以上。

Our design and manufactured refrigerator U shell and side panel production line is originated from Japan technology, which keeps us possess high technology advantages in this industry. This production line includes automatic loading, punching, 180° rotation, rolling, middle cutting, Z shaping, condenser pipe pasting, U bending, unloading, and corollary equipment such as pneumatic system, hydraulic system and electrical system etc. The whole production line can satisfy client's diversified requirement by offering many shape and dimension options. This production line controlled by PIC system, can achieve Non-operators automatic continuous production with cycle time less than 12s for side panel and less than 15s for U shell line, and keep high accuracy degree and the qualified rate can be more than 99.5%.



# 冰箱门壳线

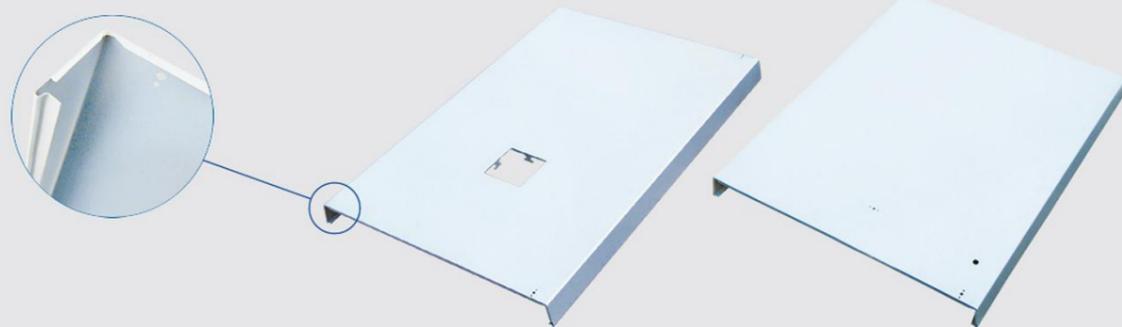
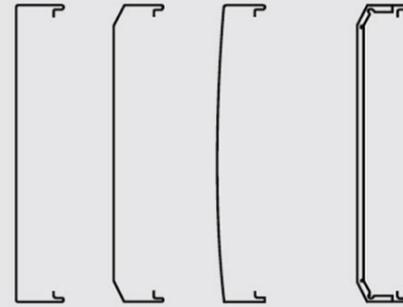
## Refrigerator Door shell forming line

Perfect Product / International Hdmech  
精细化的产品 / 国际化的海德马克

**HDMECH**  
海德马克

该设备用于生产客户指定形状和尺寸的冰箱门壳。成型材料可选择VCM、PCM、不锈钢板等，经模具冲切、翻边等工序的加工后出料，以便进行冰箱门体组装。门壳截面形状等可根据客户图纸给出具体的解决方案。

This production line is used to manufacture refrigerator door shell with customer specified shape and dimension. The applied material can be VCM and PCM, stainless steel etc, and the finished sheet can be used for next refrigerator door assembling after die punching, edge flanging, bending and some processes. The door shell section shape can be offered the solution based on the client's drawing.



我公司设计生产的冰箱门壳生产线，借鉴国外先进技术并结合自主研发，已成为公司成熟产品，在同行业具备较高的技术优势。生产线由自动上料、冲切机、划膜机、折边机、出料段以及配套的气动系统、液压系统与电控系统等部分组成。

整套设备有较多成型选择和较大的尺寸范围，可满足客户多样化生产的要求。整套设备通过计算机控制并连成线体，可连续生产，节拍小于10秒，可无人化自动运行，比传统的专机生产模式节约时间和人力的投入。

Our design and manufactured refrigerator door shell production line is matured product and combined advanced abroad technology and our independent R&D, which keeps us possess high technology advantages in this industry. This production line includes automatic loading, punching, filming, bending, unloading, and corollary equipment such as pneumatic system, hydraulic system and electrical system etc.

The whole production line can satisfy client's diversified requirement by offering many shape and dimension options. This production line controlled by PIC system, can achieve Non-operators automatic continuous production with cycle time less than 10s, it save huge time and operators' investment than conventional out-of-date signal machine production mode.

# 冰箱钢顶盖线

## Refrigerator Steel Top panel Shell forming line

Perfect Product / International Hdmech  
精细化的产品 / 国际化的海德马克

**HDMECH**  
海德马克

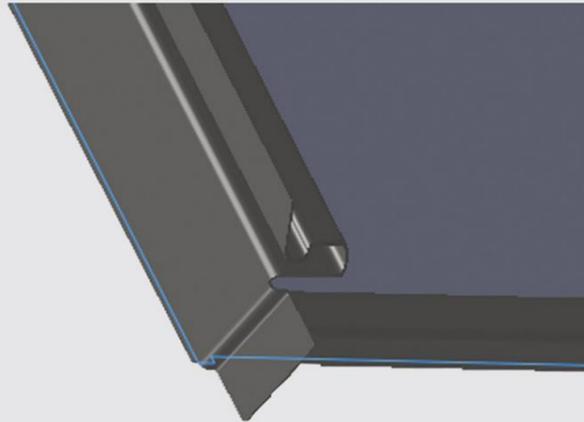
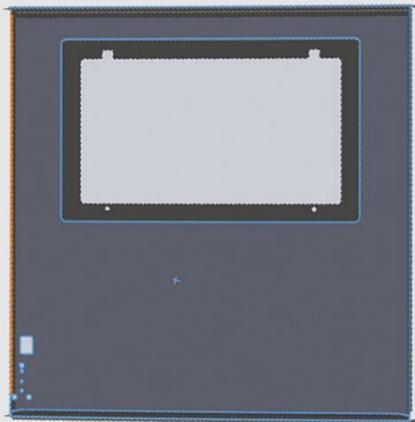
近几年，由于冰箱箱体钢顶盖成本低，整体性好等优势，已经开始取代传统塑料顶盖的结构。鉴于此我公司推出了冰箱箱体钢顶盖自动化生产线。

该设备用于生产客户指定形状和尺寸的冰箱钢顶盖。成型材料可选择VCM、PCM等，经模具冲切、辊扎或折弯、包角等工序的加工后出料，以便进行冰箱箱体组装。顶盖截面形状等可根据客户图纸给出具体的解决方案。

During the recent years, the refrigerator steel top panel was low cost, the entire performance is better, so the traditional plastic top is replaced. HDMECH develops the refrigerator steel top panel shell forming line according.

This production line is used to manufacture refrigerator steel top shell with customer specified shape and dimension. The applied material can be VCM and PCM, stainless steel etc, and the finished sheet can be used for next refrigerator cabinet assembling after die punching, rolling, bending, angle shaping, and some processes.

The top shell section shape can be offered the solution based on the client's drawing.



我公司设计生产的冰箱钢顶盖生产线借鉴国外先进技术并结合自主研发，已成为公司成熟新产品，在同行业具备较高的技术优势。生产线由自动上料、冲切机、包角机、折边机、出料段以及配套的气动系统、液压系统与电控系统等部分组成。

整套设备有较多成型选择和较大的尺寸范围，可满足客户多样化生产的要求。整套设备通过计算机控制并连成线体，可连续生产，节拍小于15秒一套，可无人化自动运行，比传统的专机生产模式节约时间和人力的投入。

Our design and manufactured refrigerator steel top panel shell production line is matured product and combined advanced abroad technology and our independent R&D, which keeps us possess high technology advantages in this industry. This production line includes automatic loading, punching, angle shaping, bending, unloading, and corollary equipment such as pneumatic system, hydraulic system and electrical system etc.

The whole production line can satisfy client's diversified requirement by offering many shape and dimension options. This production line controlled by PIC system, can achieve Non-operators automatic continuous production with cycle time less than 15s, it save huge time and operators' investment than conventional out-of-date signal machine production mode.



# 冰箱背板成型线

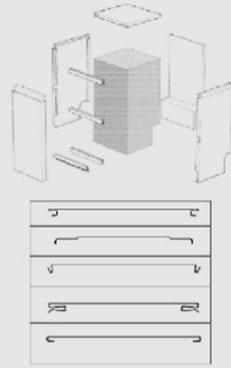
## Refrigerator Back panel Shell forming line

Perfect Product / International Hdmech  
精细化的产品 / 国际化的海德马克

**HDMECH**  
海德马克

该设备用于生产指定形状和尺寸的冰箱背板线，成型材料可选择VCM、PCM等，经模具冲切、折弯、包角等工序的加工后出料，以便进行冰箱箱体组装，侧板界面形状可根据客户图纸给出具体的解决方案。

This production line is used to manufacture refrigerator back panel line with customer specified shape and dimension. The applied material can be VCM and PCM, etc, and the finished sheet can be used for next refrigerator cabinet assembling after die punching, bending, angle shaping, and some processes. The back panel section shape can be offered the solution based on the client's drawing.



我公司设计的冰箱背板线，借鉴国外先进技术并结合自主研发，已成为公司成熟新产品，在同行业具备较高的技术优势。该线用作冰箱后背板成型，由自动上料、冲切机、折边机、包角机、下料皮带线等工位，和气动系统、液压系统以及电控系统等部分组成。

整套设备有较多成型选择和较大的尺寸范围，可满足客户多样化生产需求。整套设备通过计算机控制并连成线体，各专机可单独控制，可实现单独手动、自动生产，同时可全线自动生产。节拍≤12秒/件；合格率大于99.5%。在界面上选择型号设定数量后实现全自动换型，无需手动操作。比传统的单板生产模式节约时间和人力的投入。

Our design and manufactured refrigerator back panel production line is matured product and combined advanced abroad technology and our independent R&D, which keeps us possess high technology advantages in this industry. This production line includes automatic loading, punching, angle shaping, bending, unloading, and corollary equipment such as pneumatic system, hydraulic system and electrical system etc.

The whole production line can satisfy client's diversified requirement by offering many shape and dimension options. This production line controlled by PIC system, can achieve Non-operators automatic continuous production with cycle time less than 12s, it save huge time and operators' investment than conventional out-of-date signal machine production mode.

