aichelin
industrial furnace solutions

密封箱式多用炉生产线

Multi-Purpose Chamber Furnace Plants

适用于各种工艺的通用型热处理装备

Universal Heat Treatment Plants

Reliability at Work

爱协林热处理系统（北京）有限公司

AICHELIN Heat Treatment Systems (Beijing) Co., LTd.

密 封 箱 式 多 用 炉 生 产 线

Multi-Purpose Chamber Furnace Plants

生产线概述 INTRODUCTION

爱协林密封箱式多用炉为世界著名品牌产品，拥有逾百年向众多国际知名企业提供优质服务的历史。

爱协林多用炉生产线一般由密封箱式多用炉、真空清洗机(爱协林创新技术)或普通双槽双液清洗机、回火炉、装卸料小车、升降台及备料台等设备共同组成；适用于各种类型复杂金属零件渗碳、碳氮共渗、复碳、再渗碳、保护气氛下加热淬火、油或硝盐淬火、正火、退火，可实现渗碳后直接淬火、渗碳后缓冷、渗碳缓冷后重新加热淬火(中冷)等热处理工艺。此生产线可根据用户产量和场地条件进行模块化组配。

此外，爱协林能够为客户提供包括备件销售、设备维修改造（节能）、软件升级、设备搬迁、预防性维护在内的全方位售后支持，确保设备长期稳定运行，助力客户实现高效生产。

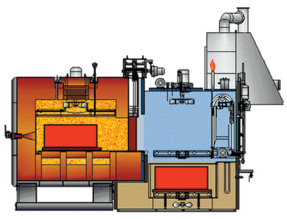
AICHELIN Multi-Purpose Chamber Furnaces are world-renowned products, backed by over a century of history in providing high-quality services to numerous internationally prestigious enterprises.

This furnace line typically consists of airtight chamber multi-purpose furnace, vacuum washing machine (AICHELIN's innovative technology) or double-tank washing machine, tempering furnace, loading and unloading cart, lifting table, prepartation table and etc.

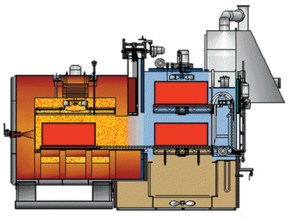
They are suitable for various heat treatment processes on complex metal parts, including carburizing, carbonitriding, recarburizing, heating and quenching under protective atmosphere, oil or salt quenching, normalizing, annealing and etc. The production line can be modularized according to the user's production output and site conditions.

Furthermore, AICHELIN can provide customers with comprehensive after-sales support including spare parts sales, equipment modification and retrofitting (for energy saving), software upgrades, equipment relocation, and preventive maintenance, ensuring long-term stable operation of the equipment and assisting customers in achieving efficient production.

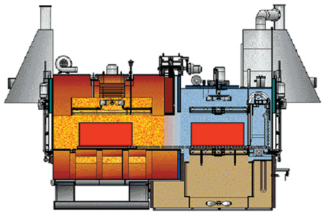
多用炉结构与功能的变化与增强 Changes and Enhancements in Multi-Purpose Furnace Structures



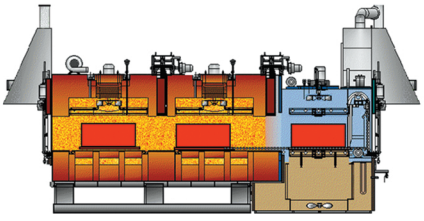
标准双室多用炉
Pre-Chamber furnace
(Standard-Construction)



前室二次装料（带顶缓冷室）
Pre-Chamber furnace
(2-stage-sluice)



贯通式多用炉
Continuous Chamber furnace



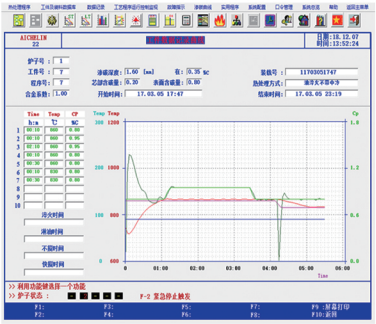
贯通式双加热室
Continuous Double-Chamber furnace

生产线特点 ADVANTAGES

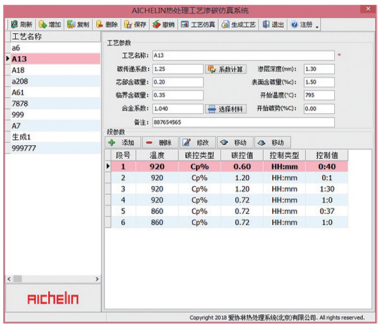
- 适用范围广：适用各种保护气氛
  Multi-purpose application: available for various protective atmosheres process
- 适用温度 ：760℃-960℃
  Temperature: 760 ℃-960 ℃
- 碳势范围：0.20%-1.3%C
  Carbon Potential: 0.20%C - 1.3%C

生产线特点 ADVANTAGES

- 辅助安装费用少：设备冷却不用水，不需循环水池、水泵、水处理设备、水冷却塔和水管， 不需二次能源；
  Lower cost of auxilliary installation: no water for cooling the equipment, no need for circulating pools, pumps, water treatment equipment, water cooling towers and pipes.
- 运行成本低：节能设计，渗碳采用二段通气法，可节气40%以上；
  Lower running costs: energy saving design; carburizing adopts 2-stage gasing, which can save more than 40% of gas consumption.
- 操作简单方便：只需按信号提示装/卸料盘工件，设备按选定程序自动完成工艺全过程，并在TPC1200上显示各动作执行情况及故障部位；
  Simple and reliable operation: load/unload manually whilist the rest of the process completed automatically according to selected pro gramme and displayed on TPC 1200 with default (if occurred) indicated.
- 先进的计算机控制系统：集成功能强大的渗碳控制软件，不仅具备离线仿真与在线自动控制能力，还能实时进行气氛计算及合金系数计算。该系统可自动生成控制工艺，并根据渗碳模拟结果优化工艺参数，在渗碳过程中动态显示工件的渗碳层深度及碳浓度梯度曲线。同时，系统自动记录所有工艺参数及故障信息，确保产品实现全程跟踪与追溯。此外，系统还可选配碳排放计算软件，支持分时段或汇总计算设备碳排放量，所有工艺及管理信息均可接入MES系统，便于实现统一的生产管理与调度。
  The advanced computer control system features carburizing software with offline simulation and online automatic control, performing real-time atmosphere and alloy coefficient calculations. It automatically generates and optimizes process parameters based on simulation results, dynamically displaying case depth and carbon concentration gradients. The system records all process data and faults for full product traceability. An optional carbon emission module calculates emissions by period or in total. All information can be integrated with the MES system for centralized production management.
- 自动化程度高：可实现手动、全自动操作模式，并可配对立体仓库，实现无人化作业；
  High automation: manual and fully automatic operation modes can be realized, and with stereoscopic warehouse can realize unmanned operation.
- 完善的安全设施，确保运行中操作人员、设备和产品的安全；
  Reliable safety device secures operator, equipments and products during the operation.
- 科学环保、绿色洁净生产方式（极少废气、废水排放）；
  Environmental friendly with lower emission of waste gas and water.



▲ 历史工件曲线记录



▲ 工艺渗碳仿真系统

规格型号 TYPES & SPECIFICATIONS

规格型号 Types	工作区尺寸(L*W*H) mm Working zone size	最大装炉量 Max. charging weight (Kg)	加热功率 Heating Power (kW)
VKE(G)s 2	900*550*500	350	57
VKE(G)s 3	1100*600*650	650	105
VKE(G)s 4/1	1300*700*650	1000	115
VKE(G)s 4/2	1300*700*850	1200	142
VKE(G)s 4/3	1300*700*1050	1200	142
VKE(G)s 5/1	1500*900*650	1200	135
VKE(G)s 5/2	1500*900*850	1500	144
VKE(G)s 5/2A	1500*900*1050	1800	166
VKE(G)s 5/3	1500*900*1150	1800	166
VKE(G)s 5/4	1500*1200*850	1800	166
VKE(G)s 5/4A	1500*1200*1050	1800	166
VKE(G)s 6/1	1800*900*850	2500	190
VKE(G)s 6/2	1800*1200*850	3500	260
VKE(G)s 6/3	1800*1200*1150	4500	260
VKE(G)s 6/4	1800*1500*1150	5000	280

其他特殊型号可根据客户要求定制 Special Size Customized

▲ 真空清洗机

密 封 箱 式 多 用 炉 生 产 线
Multi-Purpose Chamber Furnace Plants

多用炉加热方式 HEATING

用户可根据自身资源条件选用燃气加热或电热辐射管加热方式。

燃气加热采用高效节能燃气烧嘴系统及燃气辐射管。进入燃烧室的空气经高换热效率预热，燃烧器加热效率达82%以上。每一根气体辐射管都配有一根陶瓷片制成的柔性火焰管，将热量均布到整个管上，使用寿命更长。气体辐射管也可用作冷却元件,将热处理工件从渗碳温度迅速降低至淬火温度。电加热方式采用电热辐射管进行加热。加热元件的芯子由陶瓷与电热丝制成，外面用金属套管保护，以防止机械损伤和炉气侵蚀。

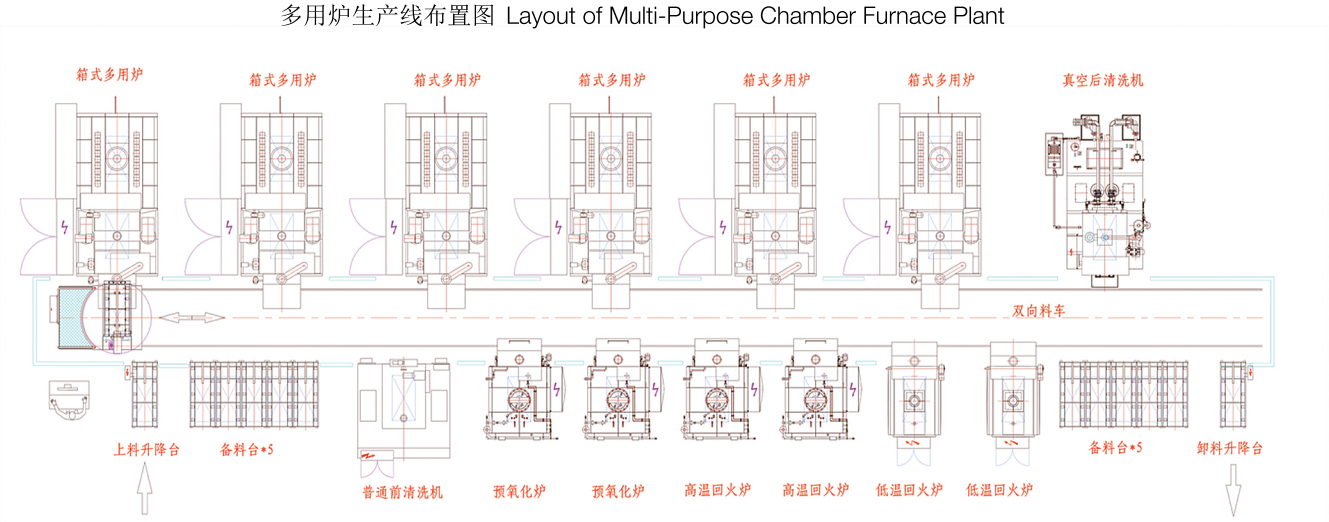
The heating is done selectively by single vertical radiant tubes, electrically or gas heated. Heat efficiency up to 82%. Each radiant tube is equipped with a flexible flame tube made of ceramic sheets, which distributes the thermal evenly over the entire tube for a longer service life. It can also be used as a cooling element to rapidly cool the workpiece from carburizing temperature to the quench ing. Electric heating adopts electric heating radiant tube. The core of the heating element is made of ceramic and heating wire, and the outside is protected by a metal sleeve to prevent from mechanical damage and furnace gas erosion.

可控气氛选择 GAS SUPPLY

爱协林多用炉为用户提供氮-甲醇+富化气(丙酮/异丙醇或丙烷/天然气)的供气方式，或吸热式气氛。可配备爱协林吸热式气体发生器或AFC-Holcroft EZ® 系列气体发生器。添加氨气可实现碳氮共渗。采用保护气氛发生器供气时，原料气耗量低，电耗低，维护费用低。控制系统控制精密，反应速度快，气氛容易调节，露点波动小，自动化程度高，设备运行安全稳定。

AICHELIN multi-purpose furnace has nitrogen-methanol + enriched gas (acetone/isopropanol or propane/natural gas) supply , or en dogas. Available with AICHELIN endogas generators or AFC-Holcroft EZ® series gas generators. Carbonitriding can be achieved by adding ammonia gas. With protective atmosphere generator for gas supply, it will have low consumption of raw gas, low power consumption and low maintenance cost. The control system is precise, fast speed, easy adjustment of atmosphere, low fluctuation of dew point, high degree of automation and safe and stable equipment running.

多用炉生产线布置图 Layout of Multi-Purpose Chamber Furnace Plant



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