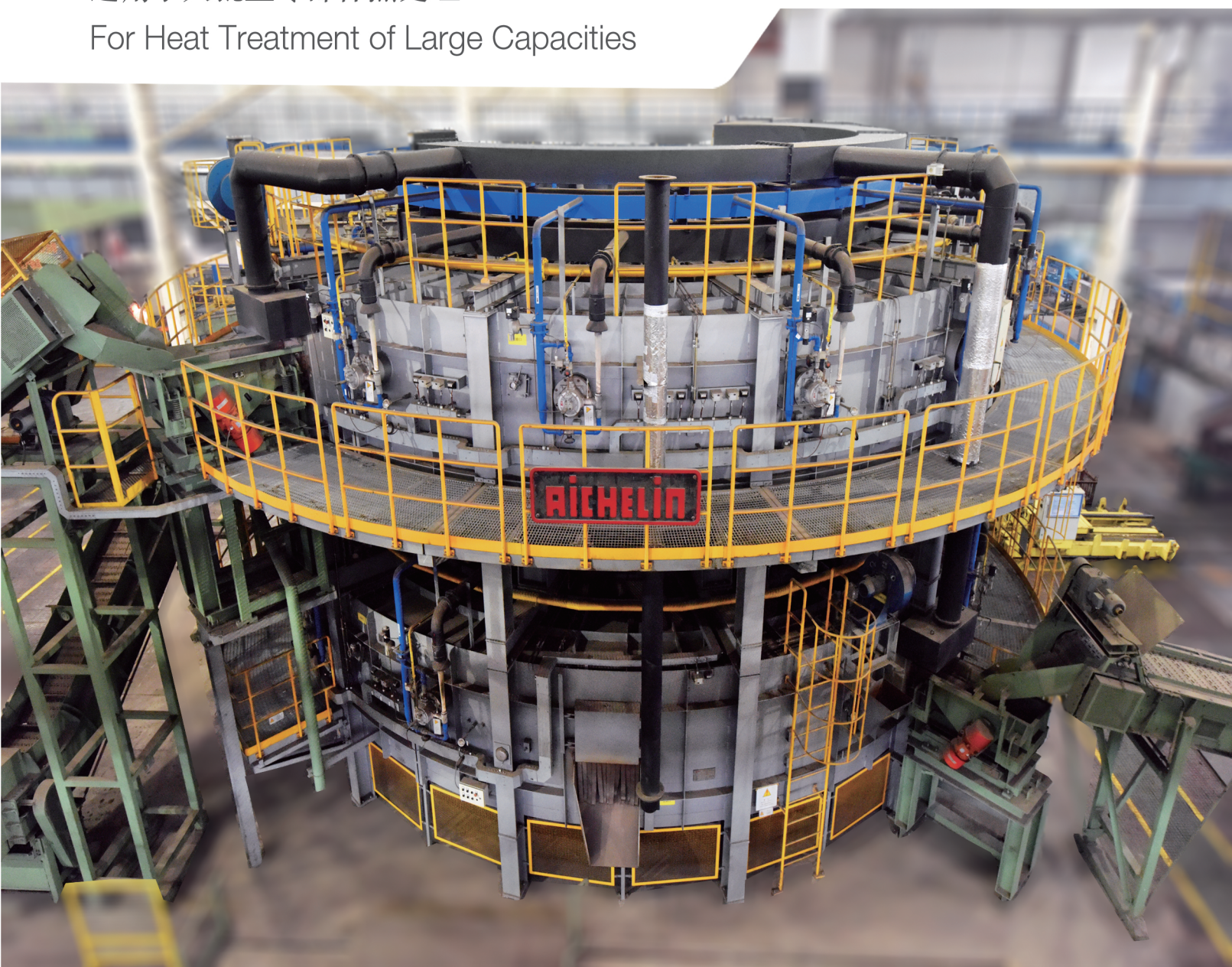


# 等温正火 / 退火热处理生产线

Isothermal Normalizing / Annealing Furnace Plants

适用于大批量零部件热处理

For Heat Treatment of Large Capacities



Reliability at Work

爱协林热处理系统（北京）有限公司  
AICHELIN Heat Treatment Systems (Beijing) Co., Ltd.

# 等温正火热处理生产线

## Isothermal Normalizing Furnace Plants

### 生产线概述 INTRODUCTION

正火与退火是热处理行业中应用最广的工艺。普通正火零件堆冷时，内外温差较大，冷速过快零件或部位形成颗粒贝氏体组织；而冷速过慢零件或部位析出过多的先共析铁素体，出现组织和硬度的不均匀。等温正火线解决了这一弊端。爱协林等温正火自动线有推盘式、辊底式、环形式等多种规格选择。

Normalizing and annealing are the most widely applied processes in the heat treatment industry. When ordinary normalizing workpiece in pile to cooling, the temperature difference between inside and outside is large, and the workpiece or sections with fast cooling speed form the grain Bainite structure; However, the workpiece or sections with too slow cooling rate precipitate too much proeutectoid ferrite, resulting in uneven structure and hardness. So isothermal normalizing furnace has solved this problem. There are pusher type, roller type, ring type, etc. for option.

等温正火线一般由升降式移动上料小车、推盘式（辊底式、环形式）加热保温炉、推盘式（辊底式、链式）快冷室、快冷风机及换向装置、料盘移动小车、推盘式（辊底式、环形式）等温炉、推盘式（辊底式）风冷台、自动翻料台、电气控制系统等设备组成。

The isothermal normalizing line is generally composed of a lift-type transfer car, a pusher type (roller type, ring type) heating and holding furnace, a pusher type (roller type, chain type) fast cooling chamber, a fast cooling fan and a reversing device, trays transferring car, pusher type (roller type, ring type) isothermal furnace, pusher type (roller type) air cooling table, automatic flipping table, electrical control system, etc.

待处理的零件由人工上料，经由升降式上料小车转移到加热保温炉内。零件在炉内加热到一定温度进行保温，之后进入速冷室在速冷室内经过强冷和缓冷的方式冷却到等温温度。再由横向料盘转移机构将零件送入等温炉。等温后零件进入风冷台，冷却至常温后进入自动翻料台卸料。卸料后的空料盘由升降式上料小车送至上料位置，由人工上料。

The workpieces are manually loaded and transferred to the heating and holding furnace via a lift-type transfer car. The parts are heated to a certain temperature in the furnace for heat preservation, and then transfer to the quick-cooling chamber and cool to the isothermal temperature by means of strong cooling and slow cooling in the quick-cooling chamber. Then the workpieces are sent to the isothermal furnace by the manipulator and then to the air-cooling table and unloading. The empty tray is transferred to the loading table by the transfer car.

### 快冷室 RAPID COOLING CHAMBER

等温正火的关键设备为快冷室。其快冷供排风系统由高温风机，电动闸阀，管道，排气管，室内导风装置等组成。快冷室工件温度由进口红外测温传感器测量。出口风温由热电偶测量。快冷速度及工件温度控制由红外测温传感器电动蝶阀和快冷供排风系统PLC配合实现。当工件温度在设定值以上时，热空气直接排空实现强冷。工件温度降至设定温度后热空气部分或全部经电动蝶阀自动进行内循环实现弱冷，以实现工件的可控冷却。需氮气保护的快冷室其快冷需通过热交换器完成。

Rapid cooling chamber is the key equipment of isothermal normalizing plant. The rapid cooling air supply & exhaust system consists of high temperature fan motor, electric gate valve, pipe, vent pipe, indoor air guide, etc. The workpiece temperature is measured by imported infrared temperature measurement sensor. Outlet air temperature is measured by thermocouples. Rapid cooling speed and workpiece temperature controlled by infrared temperature measurement sensor electric butterfly valve and rapid cooling air supply & exhaust system PLC. The rapid cooling chamber which using nitrogen protect atmosphere needs heat exchanger to achieve rapid cooling.



## 推盘式等温正火线 **PUSHER TYPE ISOTHERMAL NORMALIZING FURNACE**

- 适用于大批量工件的正火连续热处理生产，产品质量稳定，一致性好

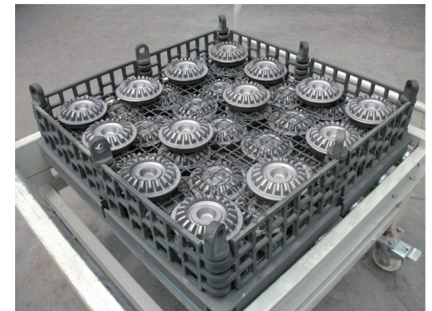
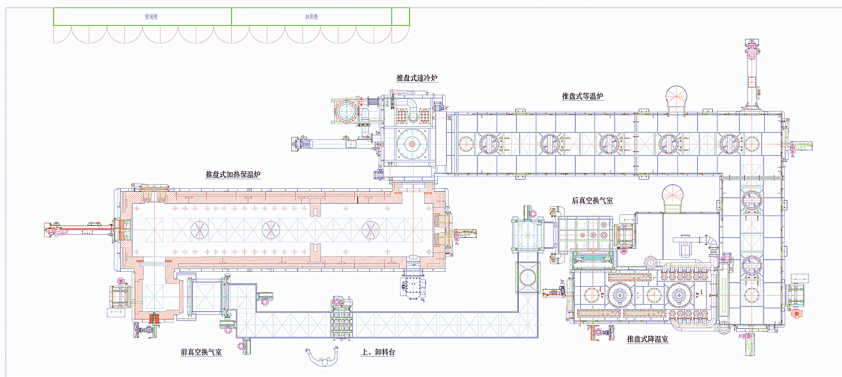
It is suitable for normalizing continuous heat treatment production of large capacities of workpieces, with stable product quality and good consistency.

- 在可控气氛下加热，配有前后真空锁气室，工件表面无氧化、脱碳

Heating in controlled atmosphere; the furnace equipped with front and post vacuum sluice; the surface of the workpiece is free from oxidation and decarburization.



▲ 真空锁气室 Vacuum Sluice



▲ 热处理后的工件 Workpieces After Heat Treatment

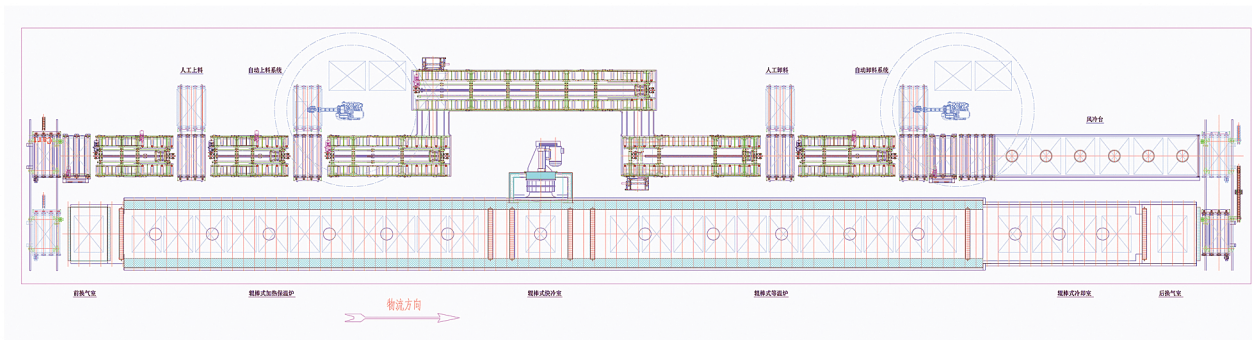
## 辊底式等温正火线 **ROLLER TYPE ISOTHERMAL NORMALIZING FURNACE**

- 加热炉采用辊底式，加热元件上下布置，加热更均匀

The heating furnace drives with rollers; the heating elements are installed vertically which can make the heating more uniform.

- 在炉内工件既可向前运行，也可向后运行，便于故障处理

The workpiece can move forward or backward in the furnace, which is convenient for repair and maintenance.



# 等温正火热处理生产线

Isothermal Normalizing Furnace Plants

## 环形等温正火线 RING TYPE ISOTHERMAL NORMALIZING FURNACE

由于在可控气氛下进行等温正火，精锻齿轮等工作件表面无氧化、脱碳。节材、节能效果十分显著。

As a result of isothermal normalizing in controlled atmosphere, the forging gear workpiece surface achieve no oxidation and no decarburization. Significant saving material and energy.

### 环形余热等温正火线

#### RING TYPE WASTE HEAT ISOTHERMAL NORMALIZING FURNACE

本公司研发的环形余热等温正火线，能与国外先进的锻造自动线并线运行。其自动化程度较高，充分利用锻造余热，节能效果十分显著。

This line, which is research and development by AICHELIN can integrate with foreign advanced forging automatic line. It's higher degree of automation and can fully use of forging waste heat to save energy consumption.



▲ 环形等温正火线 Ring Type Isothermal Normalizing Plant

# 辊底式氮基保护气氛球化退火热处理生产线

Roller Hearth Isothermal Annealing Furnace Plants

## 生产线概述 INTRODUCTION

此生产线采用前后真空锁气室和氮基保护气氛加热空气风冷管快速冷却技术，各区独立控温，碳化物细小均匀，减少了氧化脱碳，为轴承最终热处理做好了组织准备。其加热区和等温区分别采用燃气加热和电加热，大大提高加热效率且节能环保。该线一般由上料台、前真空锁气室、辊底式加热炉、快冷室、辊底式等温炉、后真空锁气室、风冷台、卸料台及电气控制系统等组成。

The plant adopts nitrogen base protective atmosphere heating, it equipped with pre/post vacuum sluice and air-cooling tube. Independent temperature control for each zone. The carbides are small and well-distributed. It can reduce the oxidation and decarburization. The heating zone and the isothermal zone respectively adopt gas heating and electric heating to improve the heating efficiency and energy saving. The plant consists of loading table, pre vacuum sluice, roller hearth heating furnace, rapid-cooling chamber, roller hearth isothermal furnace, post vacuum sluice, air cooling table, unloading table, and control systems, etc.



AICHELIN Ges.m.b.H  
Fabriksgasse 3  
A-2340 Mödling, Austria  
Phone: +43(2236)23 646-0  
Telefax: +43(2236)22 229  
E-mail: marketing@aichelin.com  
www.aichelin.com

爱协林热处理系统（北京）有限公司

地址：北京市昌平区北七家镇未来科学城南区未来中心G座8层  
传真：010-5081 5997  
总机：010-5081 5998  
销售热线：010-5081 5959  
邮箱：China.Sales@aichelin.com

www.aichelin.com.cn