THERMAL SYSTEMS

VisionXP+ Vac

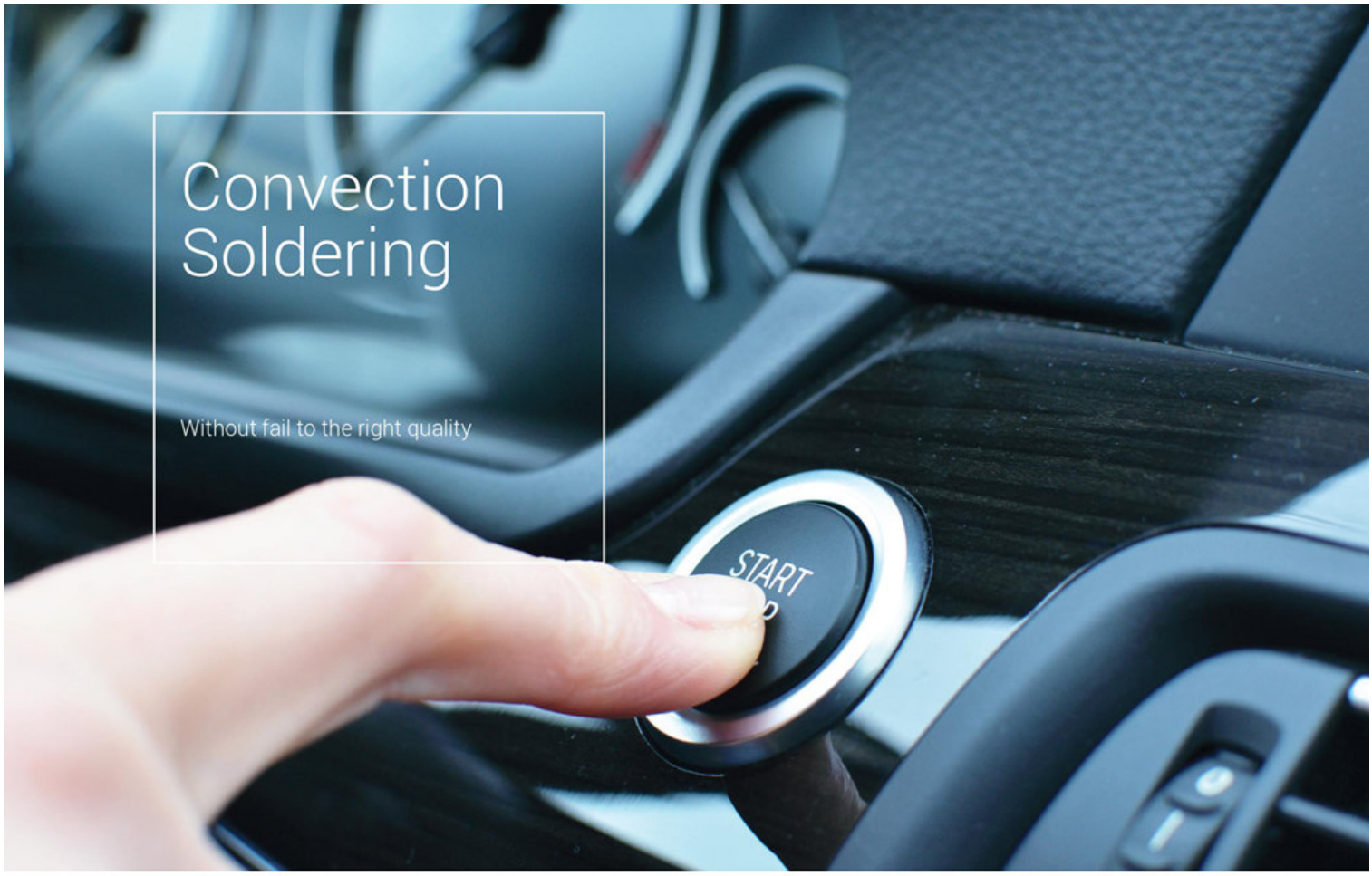
Efficient and powerful in every production ambience

Reflow convection soldering with flexibility and high throughput

性能强劲且高效，满足您对所有生产应用需求

满足灵活性和高产能需求的回流焊接系统

VisionXP+ Vac
Convection Soldering



Reflow soldering with convection
Diversity with the VisionXP+ Vac
多样化VisionXP+Vac回流焊接系统

Whether laptop, smartphone or in-car control systems – almost every technical end product contains sensitive electronics. The contacting of the electrical components on the circuit board using high-quality soldering is crucial when it comes to guaranteeing smooth function. Rehm Thermal Systems works to develop reflow soldering systems for your production which can be integrated seamlessly into the manufacturing environment.

Systematically applied technology and superb construction are the features of our convection reflow soldering systems. In the VisionX-Series the soldering process is performed on the basis of convection – that is, the transfer of heat via a flow of gases. Our systems are available in air or nitrogen versions. As an inert, protective gas, nitrogen is the ideal heat transfer medium and prevents disturbing oxidation during the soldering process. The modular system configuration of the VisionX-Series also offers a high level of flexibility for your production facility.

无论是笔记本、智能手机还是车载控制系统，几乎每一项科技产品都离不开敏感电子元器件，而通过高质量焊接制程保证电路板上元器件的良好接触性对确保科技产品正常工作至关重要。因此，锐德致力于为客户打造高品质回流焊接系统。

锐德VisionXP+Vac回流焊系统技术成熟、做工一流，采用对流式设计，通过气流传导热量 — 空气或氮气两种类型可选。作为一种惰性保护气体，氮气是最理想的热传导介质，还能够在焊接过程中防止发生氧化。模块化设计可以为您的生产线提供最高应用灵活性。

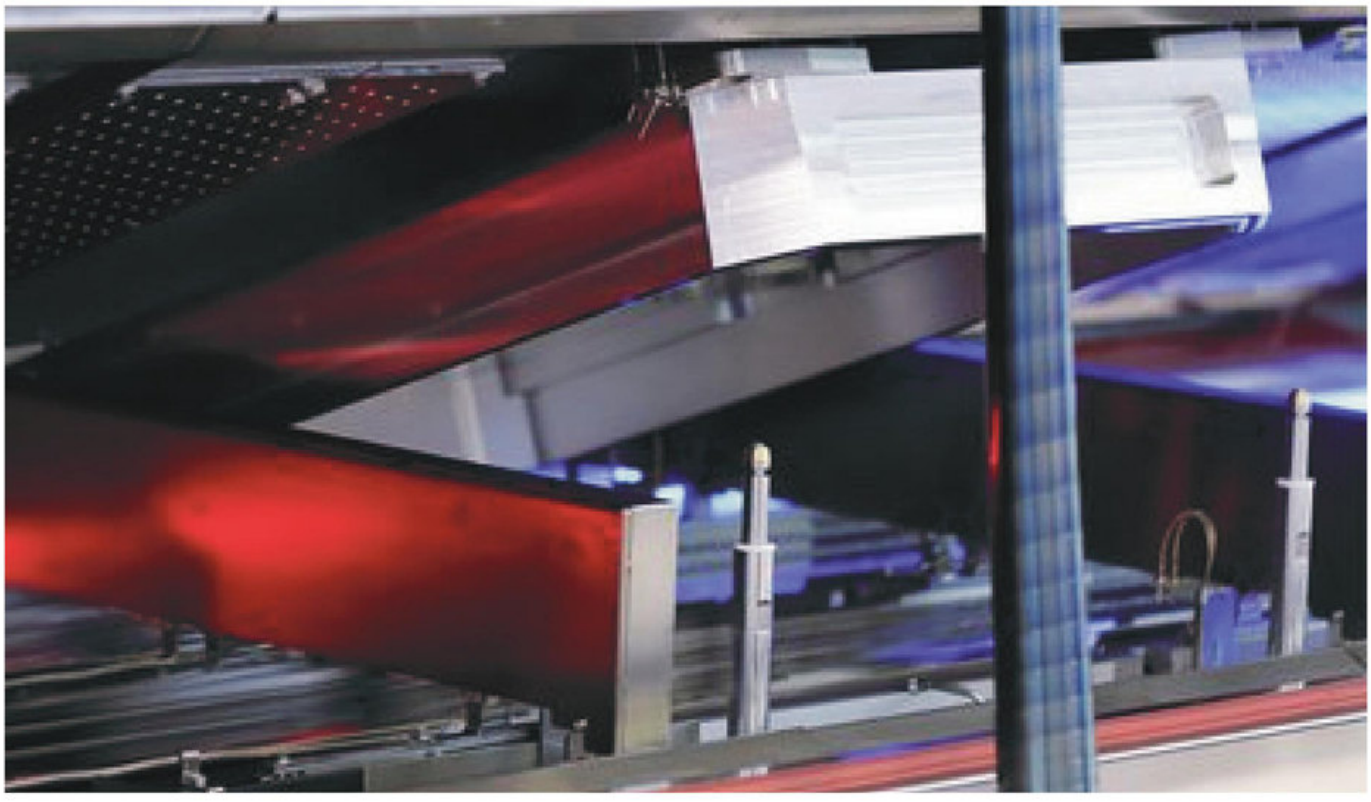
The VisionXP+ Vac
Flexibility for your production
满足个性化生产需求

Does your production environment need a compact system which can be adapted optimally to your requirements? Do you process sensitive electronic components which need to correspond to certain temperature conditions? Or would you like a system that can solder void-free under a vacuum? We have a diverse range of products!

您是否需要可精确匹配您个性化生产需求的焊接系统？您是否需要在特定温度下处理敏感电子元器件？您是否需要在真空环境下实现无空洞焊接？我们可以满足您的所有需求，为您提供多种个性化系统解决方案。

VisionXP+ Vac
Convection soldering with vacuum
全新真空回流焊接系统

- The 2-in-1 solution for voidfree reflow soldering
  2合1无空洞回流焊接解决方案
- Reliable reflow soldering process
  可靠焊接制程
- Vacuum down to 10 mbar for reducing the number of voids in the solder joints
  最低2mbar真空，有效降低焊点空洞数量
- Removes pores and voids immediately after the soldering process reliably and vibration free
  焊接后快速、可靠、无振动地去除气孔和空洞



The right system for every application
Innovative solutions from Rehm
锐德创新解决方案 适用于多种制程应用

Your production department can meet any requirement using manufacturing equipment from Rehm!

With the **VisionXP+Vac** we offer different systems for optimum soldering processes in the most diverse of manufacturing environments. Different process zone lengths are available depending on the type of system. The pre-heating, peak and cooling zones have the same pitch and therefore are constructed in a modular design. Additional features such as pyrolysis for a better cleaning result or underside cooling for gentle processing of high-mass boards are optionally available and can be added to the system concept seamlessly.

选择锐德，满足您的所有应用需求！

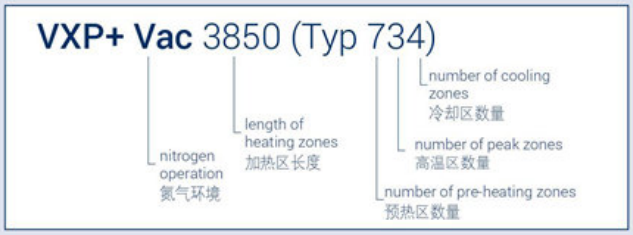
VisionXP+Vac可以针对不同生产环境和生产条件提供最佳解决方案，实现最佳焊接制程。根据系统类型，您可以选择不同长度的制程区。此外，预热区、高温区和冷却区拥有相同的节距，支持模块化配置和部署。您还可以根据具体需求，选择双热解装置（更出色清洁效果）以及底部冷却系统（平缓冷却高密度PCB板）等其他功能。

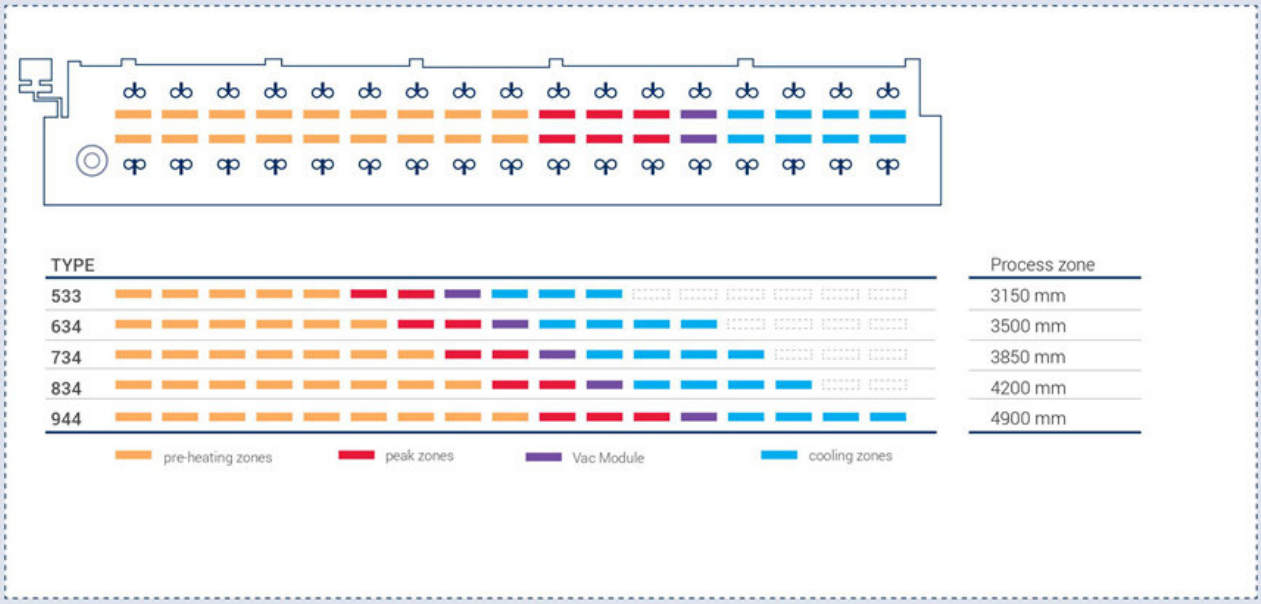
Save up to **20 %** energy!

- **Modular, flexible system concept**
  模块化灵活系统
- **Energy efficient system with lowest CO_2 emission**
  节能高效，最低二氧化碳排放
- **Highest process stability even with lead-free soldering**
  稳定的无铅焊接制程
- **Minimum downtime and lowest maintenance effort**
  最低停机时间和维护需求
- **Excellent traceability due to smart software tools**
  智能软件工具，提供最高可追溯性
- **Lowest “Total Cost of Ownership“**
  最低“总拥有成本”

System varieties
of VisionXP+ Vac:

系统类型
以VisionXP+ Vac氮气炉为例：





Large batch sizes – frequent product changes?
We will find the best system for you!
产品种类多---产品更换频繁? 我们为您提供最佳方案

Requirements in the field of reflow soldering are as varied as the products produced on an SMD production line. That is why we provide you with intensive guidance before the purchase decision as to which system is the most efficient for the applications you require.

We take all relevant parameters into consideration in the process of this. Take for example the throughput rate, this is one of the most important parameters for determining the optimum process zone length. If frequent product changes and multi-shift operation are added to the equation, additional options will be required that need also be taken into account. After clarifying all the process-relevant parameters, you can rest assured that you will have a reflow soldering system adapted to all your needs, one with which you can manufacture reliably and efficiently. The diverse range of options within the VisionXp+ Vac means that we have the right system for every manufacturing environment.

SMD生产线在生产不同产品时，对回流焊制程的要求也各不相同，因此我们将为您提供选型指导，帮助您选择最符合您需求的高效系统，做出最明智的决策。

进行系统选型时，我们会考虑与应用相关的所有参数，例如产能，这是确定最佳制程区域长度的一项重要参数。如果涉及到频繁换线和轮班运营，就需要选择额外选项。确定所有制程参数后，您就可以放心选择一套最适合您的回流焊系统，实现可靠、高效的生产运营。VisionXP+Vac回流焊系统提供了广泛选项可供选择，确保始终为您提供最佳生产解决方案。

Reliable from A to B
with flexible transport systems
灵活可靠的传输系统

Your component will run through various sections of the system during the soldering process: from the preheating zone, through the peak zone to the cooling zone. Secure transportation is a key entity when it comes to continuous processes. Rehm offers flexible systems for this.

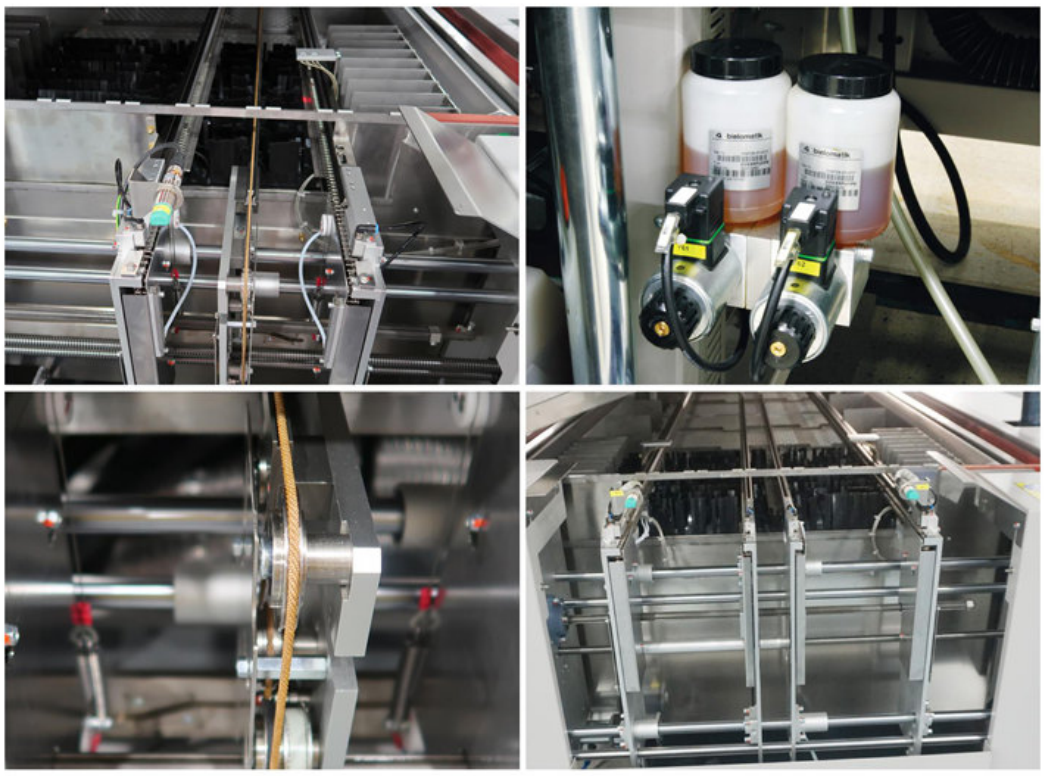
Our transport systems provide the perfect fit for your components regardless of the circuit board geometry. Transport lanes and speeds are variably adjustable and enable parallel soldering processes with lead-free or leaded soldering in one reflow system. Depending on the product requirements, you can choose from various transport models such as individual and double track transport.

The optional centre support enables even the processing of large circuit boards or boards with a flexible base material with ease and prevents any sagging during the reflow soldering, thus guaranteeing a maximum degree of process stability.

在焊接过程中，电子元器件将依次通过系统的各个区域：从预热区经过高温区再到冷却区。对连续制程而言，安全的组件传输尤为重要。因此，我们为您提供了一套高度灵活的传输系统。

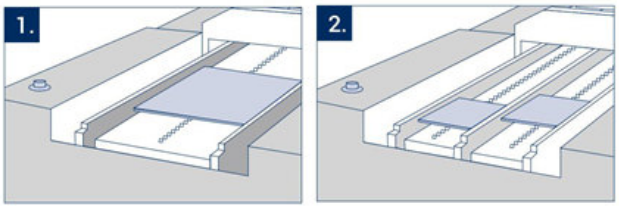
我们的传输系统可以不受电路板几何形状的影响，完美匹配您的组件。此外，传输轨道和传输速度都灵活可调，可以在一个回流焊系统中实现并行双轨焊接。根据具体需求，您可以选择不同的传输模式，例如单轨和双轨传输。

在焊接大型电路板或柔性基材时，中央支撑系统选项可防止组件发生形变，确保最高制程稳定性。



Top left: Single lane transport, Top right: chain oiler
Bottom left: lash chain centre board support, Bottom right: dual lane transport
左上：单轨传输；右上：轨道注油器
左下：中央支撑；右下：双轨传输

Transport systems | 传输系统



1. Single lane transport
one adjustable chain
单轨传输
一根可调节链条

2. Dual lane transport
two adjustable chains, synchronous/
asynchronous transport speed
双轨传输
两根可调节链条，同步传输速度

- **Reliable, failure-free production guaranteed by absolutely parallel transport**
  并行传输，实现可靠的无故障生产
- **Precise and repeatable adjustment of the transport width**
  传输宽度精确可调
- **No influence of the temperature profile by transport or center board support**
  温度曲线不受传输系统或中央支撑板影响
- **Reduced maintenance, transport drive mechanism is outside of the process chamber**
  传输系统驱动机构位于炉膛外，维护需求极低
- **Ideal for any application due to various transport systems**
  多种传输系统可选，适合所有应用
- **High process reliability by integrated center board support**
  集成中央支撑板，具有最高制程可靠性

From zero to 240 °C
due to optimized heat transfer
均匀的热传导性能

Each product has its own requirements in the manufacturing process. Optimized heat transfer over the entire soldering process is the basis for best possible results.

The VisionXP+ Vac offers flexibly controllable preheating zones within which your PCB is preheated and prepared for the actual soldering process. The individual zones can be controlled independently of each other via fan frequency, and assure best possible processes.

The VisionXP+Vac is equipped with special nozzle sheets for optimized heat transfer by means of uniform air flow over the PCBs. Flow speeds in the upper and lower heat zones can be separately controlled, assuring that your PCB is heated up through and through – completely and uniformly. This prevents stressing of the material which can disturb the soldering process. In addition, smaller componants are not overheated and bigger ones are still heated through enough.

To ensure that the heat flow in the system runs stably and the outward heat radiation is as low as possible, our VisionXP+ Vac systems have optimum insulation between the process chamber and the exterior wall.

Using precise profiling we can generate precision-reproducible temperature profiles which are tailored to component size, material or process parameters.

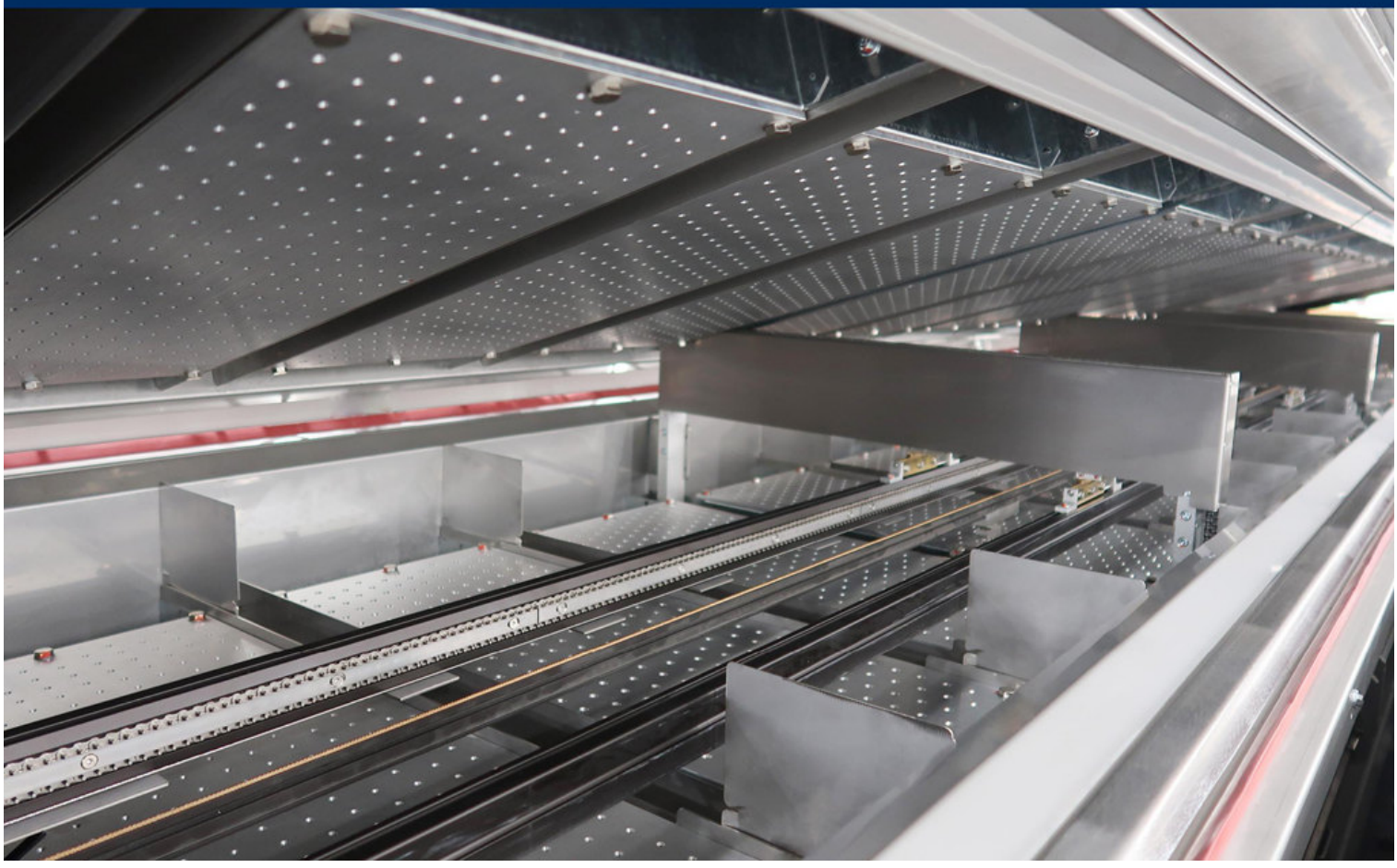
尽管不同产品具有不同的制程需求，但是，最佳热传导是所有产品实现出色焊接效果的基础。

VisionXP+Vac系列回流焊系统配备了可灵活调节的预热区，用于对PCB板进行预加热，使其达到实际焊接所需温度。此外，系统的各个区域均可通过调节风机频率进行独立控制，确保达到最佳效果。

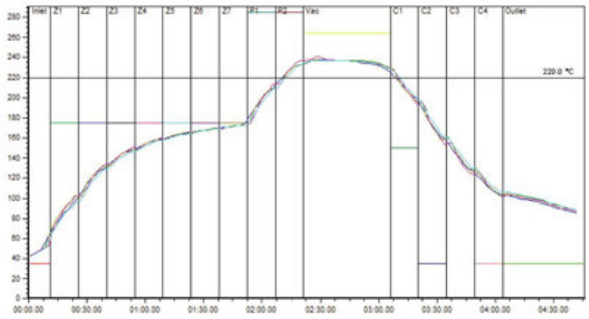
VisionXP+Vac配备了特殊的整流板，可确保气流均匀地通过PCB板，实现最佳热传导。另外，您还可以分别调节顶部和底部加热区的气体流速，使组件完整均匀地受热，防止材料应力对焊接制程产生干扰，同时确保小型部件不会过热，大型部件得到足够彻底的加热。

为使系统中气流稳定，最大限度降低向外的热辐射，VisionXP+Vac在炉膛和外壁之间采取了最佳隔热措施。

通过制定精确、可重现的温度曲线，我们的系统可完美契合您的制程要求，匹配您的组件尺寸、材质和其他制程参数。



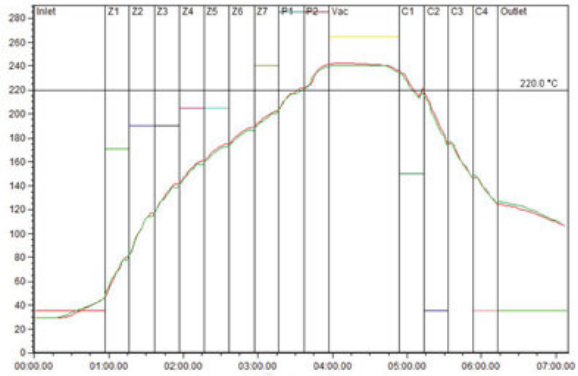
Saddle profile | 马鞍型温度曲线



The component is brought to a temperature of at least 240 °C for soldering. Using a saddle profile the board is gradually heated in line with pre-defined, individual temperature ranges. Even components with differing thermal masses are heated homogeneously and temperature differences minimised.

组件被加热至240°C进行焊接。在马鞍型温度曲线下，PCB板将逐渐加热到预定义温度范围。即使拥有不同热质量的组件也能得到均匀加热，最大限度降低温差。

Linear profile | 线型温度曲线



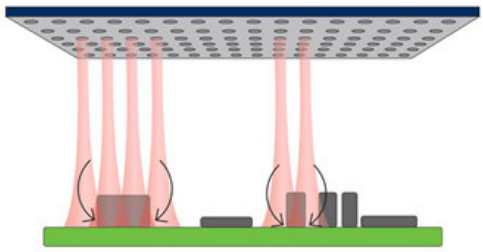
With a linear profile, the component is not heated in a stepped manner during soldering, in fact it is heated along an identical linear temperature gradient. Linear profiles can reduce cycle times and can help to reduce soldering errors such as tombstoning.

使用线型加热曲线时，组件不是以阶梯式加热，而是沿几乎完全相同的温度斜率加热。线型温度曲线可以缩短循环时间，消除元件立碑等焊接错误。

Convection | 对流

The centrepiece of our VisionXP+ Vac is the process chamber with its outstanding heat transfer owing to advanced hole nozzle geometry as well as monitored adjustable overpressure in the heating module, guaranteeing homogeneous and gapless heat transfer to the circuit board. The inert process atmosphere can be assured throughout the entire soldering process and beyond because the closed system ensures that no external air finds its way into the process chamber. The heat flow within the system takes place by means of circulation, i.e. the process gas of the preheating and peak zones is extracted, cleaned and reinserted into the process at the sides.

VisionXP+Vac系列回流焊系统的核心是不锈钢炉膛和先进孔型喷嘴带来的出色热传导性，同时加热模块中受控的可调过压保护也可以确保电路板得到均匀、无间隙的热传递。另外，高密封性炉膛使整个惰性气体焊接制程中无外部空气进入。热气流在系统内循环，预热区、高温区和冷却区的制程气体被抽出、清洁，然后在两侧重新注入炉膛。



Homogenous heat transfer

- **Separately adjustable heating zones**
  单独可调的加热区
- **Reproducible temperature profile**
  高重复精度的温度曲线
- **Outstanding process stability with the smallest possible ΔT**
  出色的制程稳定性，最小ΔT
- **Homogenous heat input over the entire PCB thanks to specially designed nozzles**
  采用特殊设计的喷嘴，对整个PCB板均匀加热
- **Low maintenance effort**
  低维护需求

A clean machine:
effective Residue Management
清洁型解决方案：高效的残渣管理

As is the case with all industrial processes, substances are generated during SMT production which have to be removed from the process cycle because they contaminate the system. Our highly effective residue management function purifies the process gas safely and reliably, and keeps your system clean and dry.

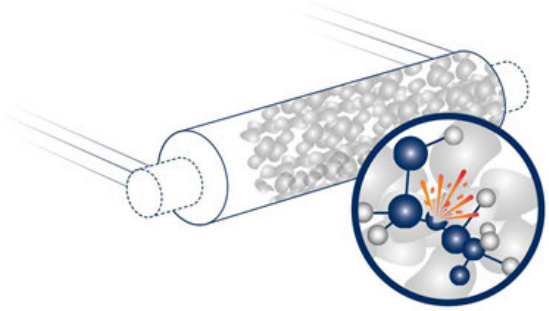
The residue management function included in the VisionX-Series combines depending on the system type two different modes of action: pyrolysis in the heat zone and cold condensation in the cooling tract's filter units. Liquid and crystalline residues are effectively removed by means of this combination.

Vision XP+ Vac is equipped with pyrolysis and filter units in the cooling zone as standard. In order to make your manufacturing system even more efficient, the VisionXP+ Vac is optionally available with double pyrolysis. Your system's cleaning efficiency is significantly increased. The first pyrolysis unit is located underneath the inlet area. It purifies the nitrogen from the heating zones. The second pyrolysis unit is installed on top of the inlet area and filters the process gas from the heating zones. Cleaning efficiency is significantly increased for the process gas and the soldering system's chambers are kept clean and dry with very little maintenance and minimal downtime.

和所有工业制程一样，SMT生产线同样也会产生可能污染系统的残渣，必须及时从制程循环中去除。高效残渣管理系统可以安全、可靠地净化制程气体，保持炉膛内洁净、干燥。

根据系统类型，VisionXP+Vac 回流焊系统的残渣管理结合了两套不同的机制，分别是加热区热解和冷却区过滤单元冷凝，确保有效去除液体和晶体焊渣。

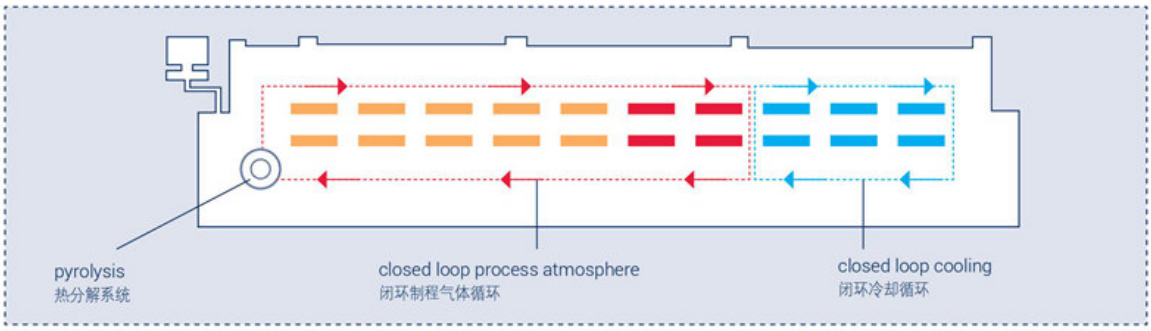
Vision XP+Vac系统标配热解装置和冷却区过滤单元,为实现更高生产效率，还可提供双热解装置选项：第一个热解装置位于入口区下方，对来自预热区的氮气进行净化；第二个热解装置位于入口区顶部，负责过滤来自高温区的制程气体。双热解装置显著提升了系统清洁效率，保持炉膛清洁、干燥，同时最大限度降低维护需求和停机时间。



Pyrolysis at 500 °C | 在500C°高温下的热分解

Residues are separated with the help of a special granulate during pyrolysis. Long molecular chains are broken down (cracked) into smaller elements by means of thermal fission. Temperatures from about 500 °C are required to this end. Afterwards, the molecular chains are small enough to be taken up by the granulate and removed from the production process. The granulate only needs to be changed once a year, making the pyrolysis unit easy to maintain – and you profit from minimal downtime. Your manufacturing processes continue to run smoothly.

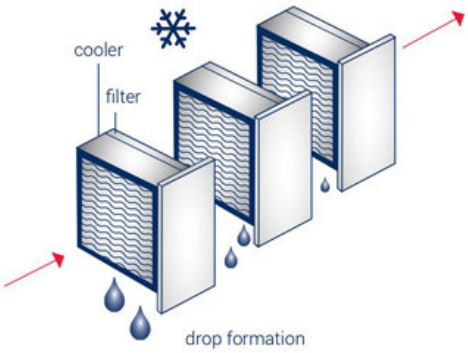
残渣在高温（500°C）作用下通过一种表面粗糙的特殊颗粒材料，大分子链被拆分为更小的分子（"裂解"）。随后，小分子沉积在颗粒材料表面并从制程中被去除。此颗粒材料每年仅需更换一次，因此热解装置的维护十分便捷，停机时间也大大降低，确保生产稳定进行。



Cold condensation | 冷凝

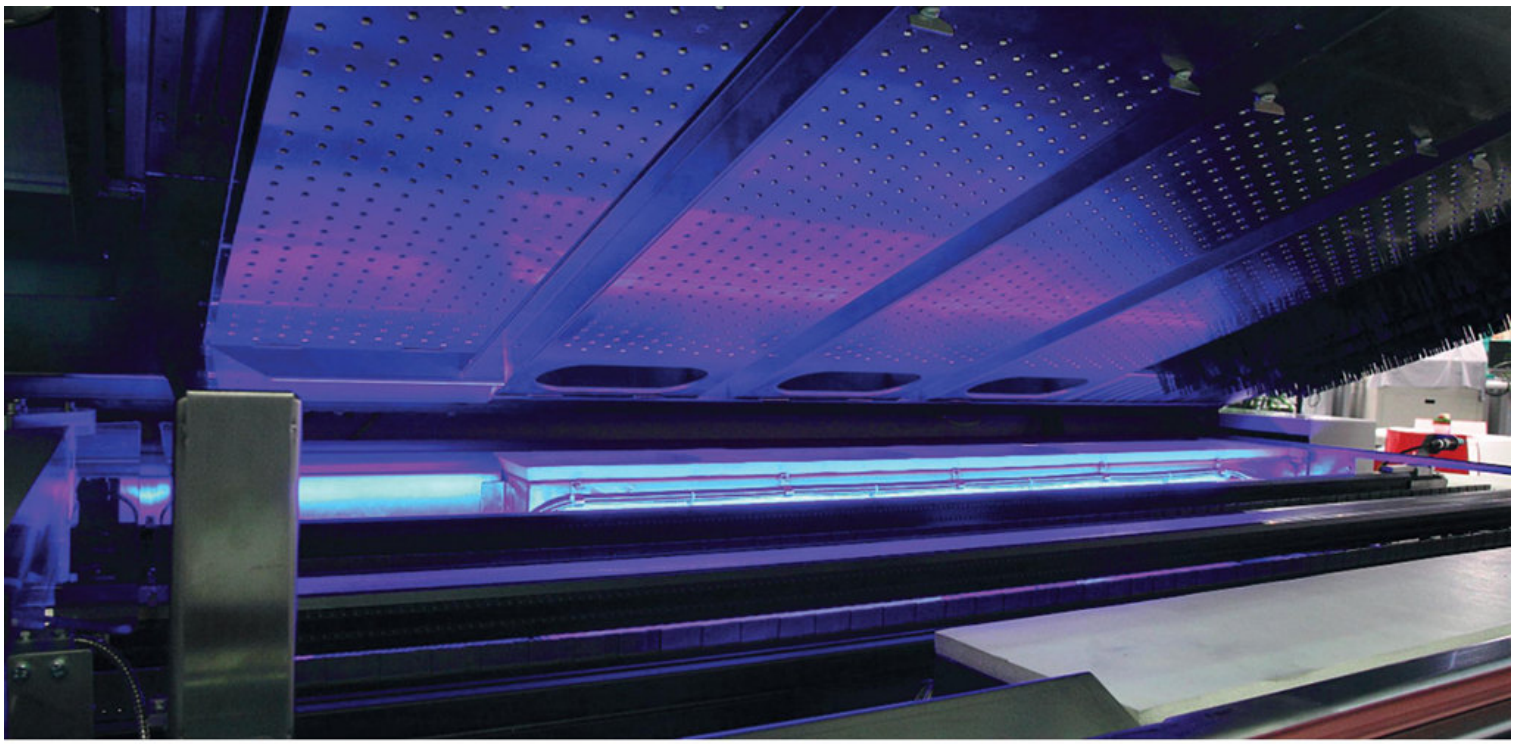
Liquid residues condense above all on the cooling tract's filter units, by which they are then removed. The system is easy to clean. The filters are exchanged in sets at the back of the system. The process chamber doesn't even have to be opened. Depending on system type, the oven is equipped with a 2, 3 or 4-stage condensation trap.

液体残留物首先在冷却区单元内冷凝过滤，然后被排出。过滤单元易于清洁，过滤器可以通过系统背部直接更换而无需打开炉膛。依据产品制程类型不同，设备可配备2、3或4段式松香冷凝过滤装置。



- **Efficient cleaning for a clean and dry process chamber**
  高效清洁，保证炉膛清洁、干燥
- **System integrated solution**
  一体化系统解决方案
- **Reliable, stable process**
  可靠、稳定制程
- **Easy accessibility**
  易于操作
- **Low maintenance effort**
  低维护需求

low maintenance expenses



Stress-free to below 50 °C
with powerful cooling systems

无应力冷却至50C°以下　性能强劲的冷却系统

It is important to have a high-performance cooling tract in order to guarantee optimum soldering results and ensure that modules are cooled gently.

Rehm Thermal Systems offers a wide range of cooling tract variants for reflow convection soldering with its VisionXP+ Vac which can be precisely fine-tuned to suit any production process. The water-cooled standard solution with heat exchanger and adjustable ventilation system works as an effective "Closed Loop" system. There are several efficient, additional options for large and high-mass boards, primarily a power cooling unit as an extended cooling tract or a bottom cooling system.

The VisionXP+ Vac transforms the classic cooling tract into a two or four-layer system, depending on the facility. This design incorporates an active cooling process, water-cooled using heat exchangers following an efficient "Closed Loop" system. The process air is cooled in the heat exchangers and then flows onto the module from above. The air is subsequently sucked underneath, cleaned using a filter system and is then ready for the next cooling process. Individually adjustable ventilators in each of the zones make it possible to precisely control the cooling process and influence the cooling gradient accordingly.

为获得最佳焊接结果以及组件得到平缓冷却，需配备高性能冷却系统。

锐德为VisionXP+Vac提供了多种冷却系统，并支持精确微调以适应个性化生产制程。带热交换器和可调通风系统的标准水冷解决方案可作为"闭环"系统，实现高效冷却。对于大型高密度PCB板，您可以加装其他选项，主要包括强力冷却单元（可用作扩展冷却区）和底部冷却系统。根据具体的生产线条件，VisionXP+Vac回流焊系统将冷却区分为2-4个阶段，在高效闭环系统后部署了一个配备热交换器的主动水冷过程：制程气体在热交换器中冷却，从上方输送至已焊接组件；随后制程气体进入底部过滤器进行清洁，并进入下一个冷却循环。每个冷却区中的风机可单独调节，从而精确控制冷却制程和冷却梯度。

- **Stress-free cooling using individually adjustable ventilators in the classic cooling zones**
  利用冷却区中多个可单独调节的风机实现无应力冷却
- **Gentle cooling through the use of the power cooling unit as an extended cooling tract**
  强力冷却单元（扩展冷却区），冷却过程更平缓
- **Optimum cooling of large, high-mass boards thanks to additional bottom cooling**
  提供底部冷却系统选件，完美冷却大型、高密度组件
- **Flexible combination possibilities through a range of different options**
  多种冷却选项。支持灵活配置
- **New, sustainable cooling principle as a result of liquid nitrogen cooling**
  创新型可持续液氮冷却技术

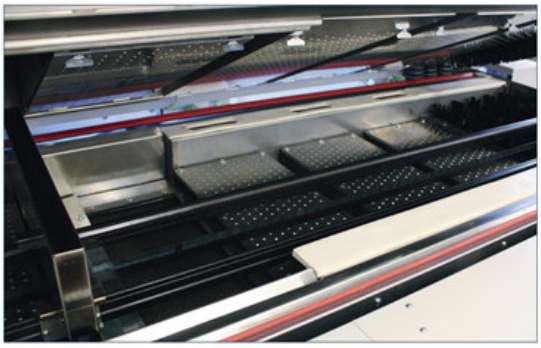
Power Cooling Unit | 强力冷却单元

In order to cool complex modules it is possible to extend the cooling zones using a power cooling unit. As part of this process, cold air is fed onto the board from above and below, where it can be cooled in a more intensive, gentle manner as a result of the process being extended. The power cooling unit can be implemented in the form of an extension to the standard cooling zones under nitrogen atmosphere and is also available as a separate, downstream module for increased cooling capacity for insensitive materials under normal atmospheric conditions.

对于复杂组件，可以使用强力冷却单元来扩展冷却区。在冷却过程中，冷空气从上方输送到PCB板，强劲但平缓地对PCB板进行冷却。强力冷却单元可作为扩展选项添加至标准氮气冷却区，也可以作为单独的下游部件以提升冷却性能，在正常大气条件下冷却非敏感组件。

Power Cooling Unit PCU
强力冷却单元PCU

Bottom Cooling | 底部冷却



Cooling zone with bottom cooling
配备底部冷却的冷却区

Bottom cooling makes it possible to cool high-mass boards easily and effectively. The cold process air is blown onto the board in equal measures from above and below in order to facilitate a particularly homogeneous cooling process and to reduce tension in the material. It is possible to adjust the ventilator speeds for each module. This means additional cooling measures, such as an outfeed belt with ventilators, are unnecessary thanks to the low outlet temperatures. It is predominantly modules with inhomogeneous distribution of the copper positions that will be protected against twisting and warping as a result of bottom cooling.

底部冷却系统能够可靠、高效地冷却重型PCB板：冷空气同时从上方和下方输送到PCB板，实现均匀冷却，降低组件应力影响。每一个模块区域的风机转速都可单独调节。底部冷却系统可以提供应用所需的超低出口温度，因此无需再使用带风机的出口传送带等其他额外部件。此外，底部冷却系统还能够可靠保护铜层分布不均匀的特殊组件，防止其发生扭曲和变形。

Optimised process changeover
Rapid switch to lower temperature profiles
优化制程切换 快速切换至更低温度曲线

Process changes often need to take place during a production shift, where the reflow soldering system requires longer periods to cool from a higher to a lower temperature profile. This is the case for example when changing from lead-free to leaded solders. For considerably quicker cooling Rehm offers various options which enable drastic reductions in waiting times.

在生产换线时通常需要对生产制程设置进行更改。从较高的温度曲线切换到较低的温度曲线时，系统需要的冷却时间较长，例如从无铅焊接转换到有铅焊接。为了更快冷却，锐德提供了多种选件以缩短等待时间。

Quick Exhaust | 快速排气

Quick exhaust serves to extract process atmosphere rapidly as a means of achieving the desired temperature change. Here the process gas in the cooling line is extracted via the internal exhaust system. Quick exhaust is automatically activated if there is a change of program to a colder profile. As soon as the temperature is within the tolerance range specified by the program, quick exhaust is automatically deactivated.

快速排气选项可快速抽出制程气体，达到所需温度变换。冷却管道内的制程气体通过内部排气系统抽出。如果焊接程序切换到更低温度曲线，则快速排气选项将自动激活，并在温度达到程序设定范围时自动停止。

SSP+

The SSP+ functions according to the same principle as the SSP in the case of a process change, but an additional setting possibility distinguishes it from SSP. When it comes to profiles with high temperature differences between the individual heating zones SSP+ can be used to achieve an optimum division of zones. Because temperature can overspill from a zone with a high temperature into neighbor zones, it may be necessary to actively cool this on a permanent basis in order to ensure the relevant temperature profile. Here the internal exhaust system draws the colder ambient air through correspondingly installed pipes and, in doing so, ensures precision temperature stability in the respective zone. The spill-over heat from neighbor zones is thus drastically reduced and optimum zone division guaranteed.

SSP+的工作原理和SSP一样，但具有和SSP不同的额外设置。当各加热区温差较高时，SSP+可实现更优化的区域分割。由于温度会从温度较高的区域溢出到邻近区域，因此必须进行持续冷却，确保获得所需温度曲线。此时，内部排气系统通过相应管道吸入温度更低的环境空气，使各个区域达到精确、稳定的温度。通过这种方式可以大幅降低邻近区域溢出的热量，保证实现最优化的区域分割。

2-in-1solution for reflow soldering
VisionXP+ Vac with or without vacuum

二合一回流焊解决方案
VisionXP+真空/非真空

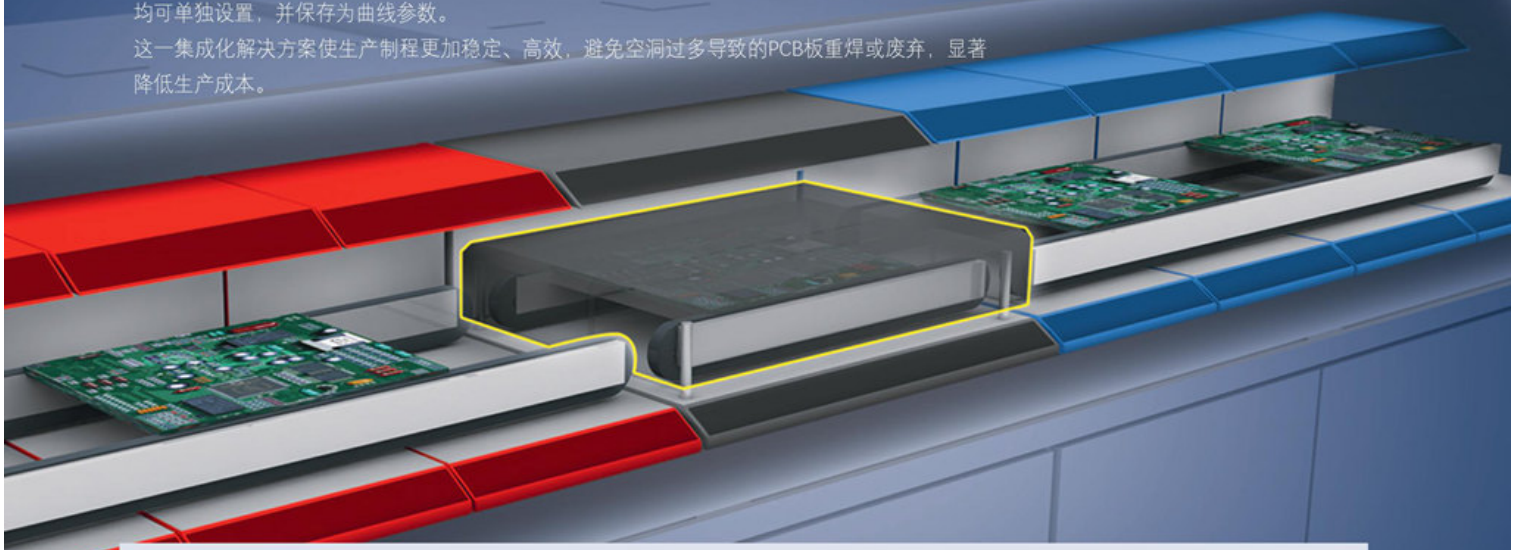
Energy-efficient, low-maintenance and voidless - Rehm offers innovative solutions for reflow soldering with a variety of VisionXP+ Vac options. A new vacuum unit now enables convection soldering processes with or without vacuum – with only one soldering system!

The VisionXP+ Vac reliably removes voids and outgassing immediately after melting the solder – while the solder alloy is completely in the liquid phase. Void rates of less than 2 % are made possible with vacuum values between 100 mbar – 10 mbar. Pressure progress and speed can be set individually and moreover be saved as profile parameter in the product recipe. This integrated solution results in a more time-efficient and stable production sequence.
A costly rework or rejection of the pcb assembly due to excessive voiding is obsolete!

void ratios below possible **2 %**

节能、低维护、无空洞 — 锐德通过各种VisionXP+Vac系统选项为您提供创新型回流焊解决方案。全新的真空选项支持客户在同一套系统上实现真空/非真空回流焊制程。

配备真空选项的VisionXP+Vac可靠而有效地解决了焊接后（当焊料处于最佳熔解状态时）出现气孔、空洞和空隙等问题，100mbar到10mbar真空最高可以将空洞率降到2%以下，真空压力和速率均可单独设置，并保存为曲线参数。
这一集成化解决方案使生产制程更加稳定、高效，避免空洞过多导致的PCB板重焊或废弃，显著降低生产成本。

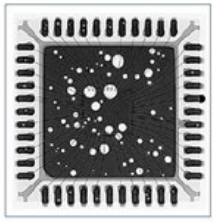


- **Vacuum measured in the process chamber and not at the vacuum pump**
  真空压力测量反映炉膛内数值而非真空泵数值
- **Vacuum down to 2 mbar for reducing the number of voids**
  低至2mbar的真空有效减少空洞数量
- **Three-part conveyor: heating zone, vacuum zone and cooling zone**
  三段式传输系统：加热区、真空区和冷却区
- **Automatic positioning of the process chamber to processing or maintenance position**
  炉膛自动定位至制程或维护位置
- **Outstanding cooling performance**
  出色的冷却性能
- **Minimal downtime thanks to low maintenance**
  低维护需求，减少停机时间

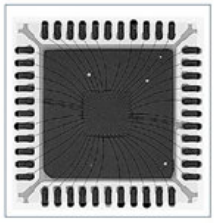
Efficient, easy to maintain and void-free | 高效、低维护、无空洞

The vacuum chamber is installed in the VisionXP+ Vac as an enhancement to the available peak zones. The integrated pyrolysis and separate filtering of the atmosphere extracted from the vacuum chamber are additional plus points in terms of maintenance and cleaning. A generously dimensioned vertical travel range of the vacuum chamber in the service position enables good access to the internal mechanisms during maintenance periods. The automatic running of the process chamber into the processing or maintenance positions minimises downtimes and reduces maintenance effort.

VisionXP+Vac系统配备真空单元，是对现有高温区的增强和扩展，而集成热解装置和过滤真空室排气对维护和清洁则具有重要意义。真空室具有较大的垂直移动范围，这使得工作人员可以更轻松地进行内部维护。此外，炉膛可以自动定位至制程或维护位置，由此可降低停机时间，简化维护工作。

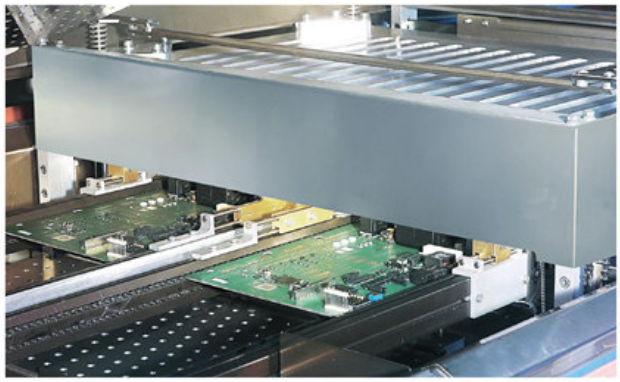


without vacuum



with vacuum

Divided, separately regulated transport system | 独立可控的传输系统



Opened vacuum chamber of the VisionXP+ Vac
打开状态下的VisionXP+ Vac真空单元

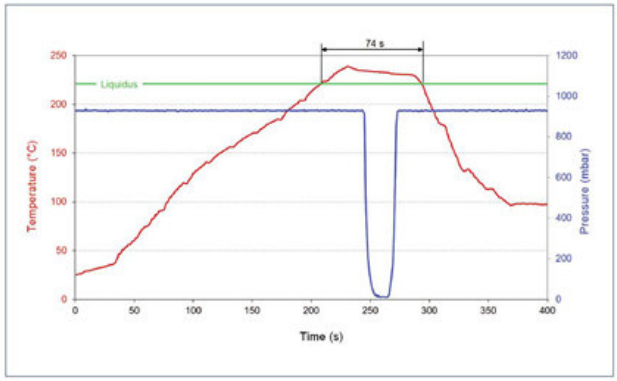
The VisionXP+ Vac has a tripartite transport system: pre-heating/peak area, vacuum unit and cooling zone. All three areas of the transport system can be optionally equipped with a central support for particularly wide boards. The possibility of reducing the transportation speed in the cooling zone when using the vacuum enables the extension of the cooling time of components and therefore guarantees an optimum temperature for subsequent process steps. The throughput of the system is additionally increased with the expansion of the transport system by a second track.

VisionXP+Vac配备三段式传输系统：预热区/高温区、真空单元、冷却区，三个区域都可选装中央支撑系统，以满足大型电路板需求。真空制程有助于降低冷却区中的组件传输速度，由此延长冷却时间，确保组件达到最佳出板温度。最后，采用双轨传输系统可以进一步提高系统产能。

Precise pressure and temperature profiling | 精确压力和温度曲线

All heating zones of the VisionXP+ Vac are regulated individually and separated from each other thermally, guaranteeing flexible profile guidance and a stable reflow process. The measurement of a temperature profile with the vacuum process switched on shows that despite a very low vacuum of 10 mbar, all profile settings have been fulfilled (≤ 3 K/s heating, tL ≤ 90 s, TP ≤ 240 °C). With the help of the heating integrated into the chamber, the temperature of the components inside the vacuum unit can be adapted to the settings of the most common standards. This refined solution ensures a time-efficient and stable production process.

VisionXP+Vac各加热区之间具备隔热性，且各加热区温度可以单独调节，确保实现灵活的温度曲线和稳定的焊接制程。开启真空制程时，即使压力低至10mbar，温度曲线依然能够达到所有设定值（加热速度≤ 3 K/s，tL ≤ 90 s，TP ≤ 240 °C）。借助炉膛内部集成的加热功能，真空单元内的组件温度能够达到常规标准设定。这一优化解决方案可以确保用户实现高效、稳定的生产制程。



Pressure and temperature profile of a soldering process with the VisionXP+ Vac
真空回流焊压力及温度曲线

1. Alarms | 警报

The top area of the screen gives you a clear overview where you can view, interpret and edit alarm messages.

屏幕顶部区域提供了清晰的信息概览，您可以在此查看、了解和编辑警报信息。

2. Favourites bar | 收藏栏

In the favourites bar you can view selected values. This then appears on the main screen and on every page in the defined position.

在收藏栏中您可以查看选中的参数，然后该参数将出现在主屏幕上以及每一页的特定位置。

3. Status bar | 状态栏

Colour-contrasting markings in the status bar provide you with information on the operating mode of the system.

状态栏上不同颜色的标记可以为您提供系统工作模式信息。

4. Machine view | 设备视图

The machine view offers an overview of the modular construction of your system, the current loading situation and the status of the process zones.

设备视图可显示系统的模块化结构、当前负载状态和各制程区域状态。

5. Options | 选项

Machine options can be set depending on the system equipment. For this there are up to ten different options available for your manufacturing process.

设备选项可根据系统设备进行设定 — 最多可提供10个选项。

6. Display area | 显示区

The display area shows you all profile parameter actual values, e.g. temperature, filter or system power consumption.

显示区可显示所有系统配置的实际数值，例如温度、过滤器或系统能耗。

ViCON VisionX

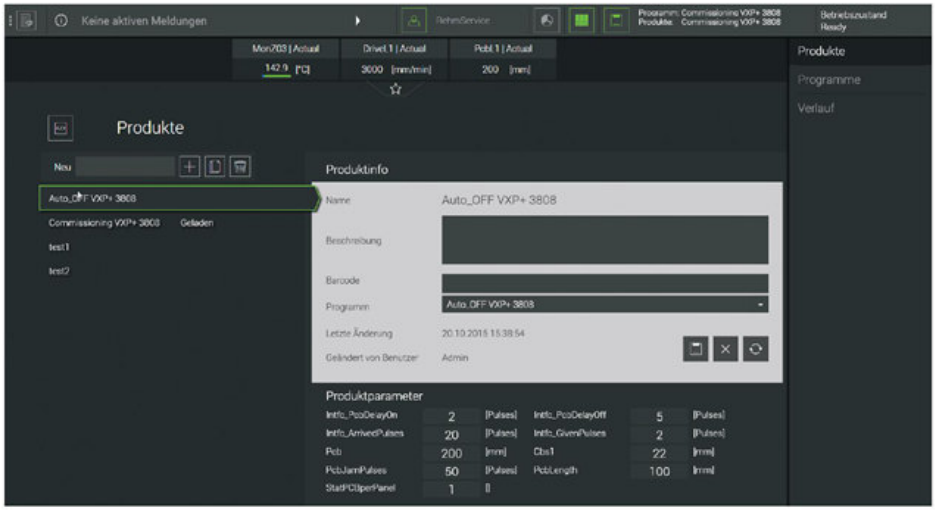
Innovative software
User-friendly and easy operation
创新软件 界面明晰易操作

With the ViCON Rehm offers straightforward software for the VisionX-Series, boasting intuitive operation with its touch-screen surface.

All messages, commands and parameters can be viewed at one glance on the main screen using machine view. With a number of features including a freely configurable favourites bar, the structured grouping of parameters or individual process tracking and documentation ViCON provides you with optimum assistance in your production processes.
While developing the software Rehm experts have refined many aspects including product management. The creation of new products or the copying of certain properties in parallel with production on the machine is enabled. The parameters for new creations are directly selectable, meaning that the production sequence can progress faster and without any disruption.
As well as that, you can immediately recognise which action mode the system is in from the operating status. Errors are easier to differentiate and alarm messages can be evaluated quickly and reliably.
Another plus of the ViCON is defining user administration. Through the assignment of specific user roles each user has exactly those rights activated that he or she needs for operation and work on the system – without any rigid hierarchy.

锐德为VisionXP+回流焊系统研发了简单明了的ViCON软件，通过触摸屏为您提供直观操作体验。

通过主界面上的设备视图，您可以轻松查看所有信息、命令和参数。ViCON提供了多种杰出功能，例如可自由配置的收藏栏、结构化参数分组、独立制程跟踪和归档等，为您的生产过程提供最佳辅助。
在软件研发阶段，锐德专家在包括产品管理在内的很多方面进行了深度改进，例如支持在生产进行的同时创建新产品或复制特定属性。另外，创建新产品时可以直接设置参数，这意味着能够更快速地开展生产且不会发生任何中断。
同样，根据工作状态，您可以立刻识别系统工作模式，更快速地发现错误，可靠地评估警报信息。
ViCON软件的另一大优势是支持用户管理。通过灵活分配用户角色，每个用户都可以获得相应的操作权限 — 无需严格的等级制度。



Clear product management with offline programming
支持离线编程的清晰产品管理

- **Intuitive software operation with touch-screen surface**
  带触摸屏的直观软件操作
- **Clear product management with offline programming**
  支持离线编程的清晰产品管理
- **Parameter transparency through module groupings**
  通过模块分组，实现参数透明
- **Easy adaption due to favourites bar**
  收藏栏，轻松适应不同制程
- **Multilingual software**
  多语言支持

Industry 4.0
Intelligent Software Solutions

工业4.0
智能软件解决方案

Software solutions from Rehm allow the reliable control and monitoring of systems from the VisionX-Series.

The software components are consisting of monitoring tools and various modules, each of which completes its own individual task. Master software compiles the data and evaluates it, for instance in order to keep the specified parameters constant for the respective manufacturing profile. The modular system can be assembled into individualized packages and matched to the customer's respective requirements. Custom tailored master software is available for each system type.

锐德软件解决方案可以对VisionX系列进行可靠控制和监控。

锐德智能软件解决方案由监控工具和支持各种任务的多种模块组成。主软件能够编辑和评估数据，例如保持特定参数恒定。我们的模块化系统支持个性化定制以适应客户的独特需求，主软件也可以针对每个系统类型进行定制。

Product management | 产品管理

Clearly structured product management ensures in everyday production that the right reflow program is clearly attributed to the component/item number to be manufactured. Alongside the oven settings, component-specific data can also be saved in product management.

在日常生产中，结构清晰的产品管理可以确保为特定组件/产品选择正确的回流焊程序。除焊炉设置外，特定组件的数据也可以保持到产品管理中。

Optimal
tracking

ProCap

ProCap guarantees the process stability of the reflow soldering system for each individual product. The process parameters are automatically stored for the product upon first start-up. Every additional order is compared with the parameters stored for this product. Each individual component is saved to the ongoing product and order and, where applicable, order numbers and serial numbers are stored along with these. Process deviations and operator errors are logged too. Gradual changes such as, for example, a clogged filter are reliably detected.

ProCap可确保在回流焊制程中每一件产品的制程稳定性。首次启动时，ProCap将自动保存产品制程参数。对于该产品的每一个追加订单，ProCap都将与已保存参数进行比较。另外，每一个组件参数都将保存到相应产品及其订单中，并在使用时保存订单编号和系列号。最后，ProCap还可以记录制程偏差和操作错误，可靠检测过滤器堵塞等变化。

Traceability and process interlocking | 可追溯性和制程锁定

A variety of packages are possible for the VisionXP+ design series in the field of traceability and process interlocking:
对于可追溯性和制程锁定，VisionXP+系统提供了多种功能包：

- **Traceability / Process traceability via hand-held scanner (order-specific)**
  通过手持式扫描仪实现制程可追溯性（订单参数）
- **Process interlocking via fixed position scanners**
  通过定位扫描仪实现制程锁定
- **Process interlocking and traceability via fixed position scanners**
  通过定位扫描仪实现制程锁定和可追溯性

A data set containing the relevant process parameters during the process is generated in a file for each component as a basis for all packages. Depending on the package, the components can, using the barcode scan, be identified on the component directly or using a routing slip scan (by hand or stationary). If the package contains process interlocking too, the scan is compared with the database and the component is only transported into the oven upon release. With the traceability option, a data set containing the relevant process parameters during the process is generated in a file for each soldered component.

对于每一个组件，都将生成一个包含相关制程参数的数据集文件，数据集文件是所有功能包的基础。根据具体的功能包，可通过直接扫描组件上的条码或通过传送名单扫描（手动或固定）进行识别。如果功能包包含制程锁定，则扫描结果将和数据库进行比较，且组件只有在释放后才被传输进入焊炉。通过可追溯性选项，可生成包含每个已焊接组件相关制程参数的数据集文件。

Total Cost of Ownership
Searching the true costs

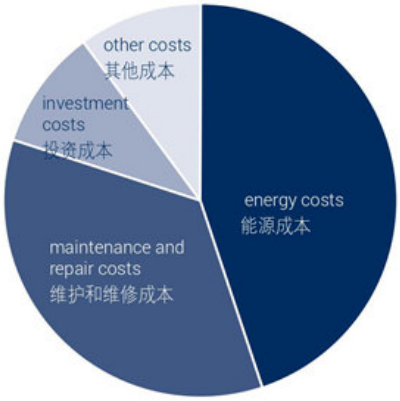
总体拥有成本 探寻真实成本

We are aware that the idea of investing in a machine go further than just the one-off cost. Which daily operating costs are taken into account? As can be produced optimally conserve resources? And how often is a maintenance necessary?

Against the backdrop of the current economic environment, companies need when purchasing their production equipment and of course to think about where savings are possible. The "Total Cost of Ownership" program Rehm provides answers to these challenges. It aims to help companies to reduce their operating costs over the long term and maximize profitability.

众所周知，设备投资需要考虑长期效益，而非一次性采购耗费。日常运营成本需要考虑哪些因素？如何才能保护资源？设备日常维护频率是多久？

在当前经济环境的大背景下，企业在采购生产设备时需要考虑如何节约生产成本。锐德的"总体拥有成本"项目解答了这一具有挑战性的难题，帮助企业长期持续降低经营成本，最大限度提升盈利空间。



Recordable apportionment of costs over the system life cycle
系统完整生命周期中的成本分摊

Factors of influence operating a soldering system
using the example of VisionXP + Vac

焊接系统运行影响因素 以VisionXP+Vac为例

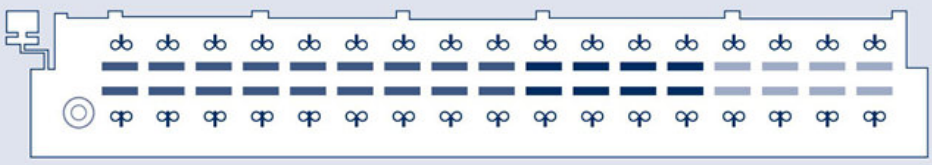
Our systems enable a particularly efficient production. They are equipped with several features like optimum insulation, best heating and cooling performance and stand-by mode, which protect both your pocket book and the environment on a sustainable and long term basis.

锐德系统可以帮助您实现高效生产。我们的系统具备多种功能特性，例如最佳隔热性、出色的加热和冷却性能、待机模式等，在保护环境的同时节省生产成本。

Power I 电源
- Stand-By-Mode
  待机模式
- Innovative fan control
  创新型风扇控制技术

Nitrogen I 氮气
- Sealed process chamber
  密封炉膛
- No nitrogen loss
  无氮气损耗
- Nitrogen control
  氮气控制

Water I 警报
- Closed cooling water loop
  闭环水冷



Noise emission I 噪音
- Insulation
  隔音
- No cover fans
  无机盖风扇

Production environment
生产环境
- High-quality insulation
  高质量保温
- Concept for heat recovery
  热回收

Emissions I 排放
- Pyrolysis
  热解
- Combined residue management (crystalline/liquid residues)
  组合式残渣管理（晶体/液体残渣）

Resource management
Environmental concerns in focus
资源管理 关注环境

Sustainability is essential – this realisation has long since dawned on the electronics sector. "Go Green" nothing more than a future vision of the industry? Not necessarily!
Investing in efficient systems can enable companies to reduce their energy consumption in the long term. We are no stranger to energy efficiency, sustainability and resource management.

For us, energy efficiency and resource management mean taking responsibility for our products throughout their entire life cycle. Using raw materials from suppliers from throughout the region we manufacture systems which hold their ground on the global market. Less material consumption and reliable valuable waste material recycling during production, short transport routes as well as robust, long-lasting and upgradable systems with low energy consumption values and minimum emissions form the basis of our product philosophy.

在电子领域中可持续发展是至关重要的这种认知早已存在。"环保绿色"无疑是行业的未来愿景!
从长远发展来看，投资高效系统不仅可以降低企业能源消耗，而且对能源效率、可持续发展及资源管理非常有效。

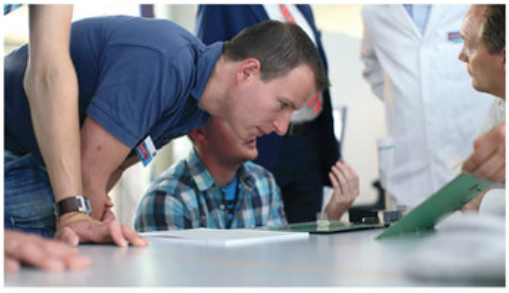
对我们而言，在产品的整个生命周期内，利用能源效率和资源管理可获得高质量产品。原材料采购来源于世界各地供应商，这使我们的回流焊接系统在全球占有一定的市场份额。在生产制造过程中，更低的材料耗损、可靠有价值的废料回收、更短的运输路程、更低的能耗以及更低的排放系统，构成了我们的产品理念基础。

- **20 % less energy consumption**
  能耗降低20%
- **Reduced operating costs**
  运营成本低
- **Improved site efficiency and minimized downtimes**
  工作效率高和停机时间短
- **Control of costs and performance of your reflow system**
  回流焊接系统的可控成本和性能
- **Optimized budget calculation**
  优化预估计算

Technology Center
Soldering process live.

技术中心
请您现场体验锐德焊接制程

How is it possible to create the ideal temperature profiles? Or which technology is best for avoiding voids in soldered joints? Rehm can answer these questions.
A high-tech applications and demonstration centre was established on an area of 460 m² at the company's headquarters in Blaubeuren. Here, customers can test modules in direct application of convection, condensation and vacuum soldering processes, create individual temperature profiles and, aided by our applications specialists, define the optimal parameters for the production process.
Additionally, the Technology Center is fitted with a complete state-of-the-art SMT production line – from the paste printer through placement machines to a reflow soldering system. A complete coating line for selective conformal coating demonstrates secure protection of modules from environmental influences. At Rehm, there is also extensive equipment for module testing and for test results analysis. You are welcome to arrange an appointment with us via **applikation@rehm-group.com** to visit the Technology Center and experience the soldering process live.



如何创建最佳温度曲线？采用何种技术方案才能避免焊接空洞？锐德给您答案。
锐德在德国布劳博伊伦总部及其中国东莞设立了高科技应用及演示中心。在这里，客户可以直接测试电子组件的对流、凝热及真空焊接制程，创建个性化温度曲线，并在应用专家的帮助下为生产制程设定最佳参数。此外，锐德技术中心还配备了目前最先进的，涵盖从锡膏印刷机到装配系统再到回流焊系统等设备的完整SMT生产线。还拥有一套完整的选择性防护层喷涂产线为您展示如何保证组件不受环境因素影响。最后，锐德技术中心还提供广泛的测试和分析设备，方便您进行组件测试和结果分析。您可以发送邮件至**applikation@rehm-group.com**进行预约，在我们的技术中心现场体验焊接制程。

MANUFACTURING EQUIPMENT
生产设备

- **VisionXP+ / Vac, VisionXC, CondensoXS, Protecto and RDS (Line), RDS 1200 UV**
- **Templates and paste printers**
  锡膏印刷模板和锡膏印刷机
- **Placement system**
  装配系统
- **Handling system**
  上/下板系统
- **Cleaning system**
  清洁设备

TEST EQUIPMENT
测试设备

- **Thermal imaging camera**
  热成像仪
- **X-ray inspection**
  X-Ray 检测仪
- **BGA inspector, Fly inspector**
  BGA检测仪、飞针测试仪
- **Rework station**
  返修台