



公众号 Official Account



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RTC-Batch 配液配料工艺模块

Liquid Batching Process Module

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关于镇田
About Jhenten



镇田机械创建于1986年，超过35年的不断积累，我们的业务范围遍及制药工程、食品饮料、精细化工、新能源等行业，并致力于为客户提供最具挑战性和核心价值的工艺罐体及工艺模块系统解决方案。镇田始终坚持以稳定的产品质量，严谨的工程设计和完善的用户服务，赢得客户的长期信赖，助力全球客户实现高效生产与持续发展。

Zhejiang Jhen Ten Machinery Co.,Ltd, established in 1986, has over 35 years of continuous innovation and expertise accumulation. Our solutions span across pharmaceutical engineering, food & beverage, fine chemicals, and the new energy sector, specializing in delivering highly challenging and value-driven process vessels and modular process systems. Committed to consistent product quality, rigorous engineering design, and comprehensive customer support, Jhen Ten has earned long-term trust from global clients. We empower industries worldwide to achieve efficient production and sustainable growth through cutting-edge technological integration.

35+

超35年行业制造经验
More than 35 years of industry
manufacturing experience

300+

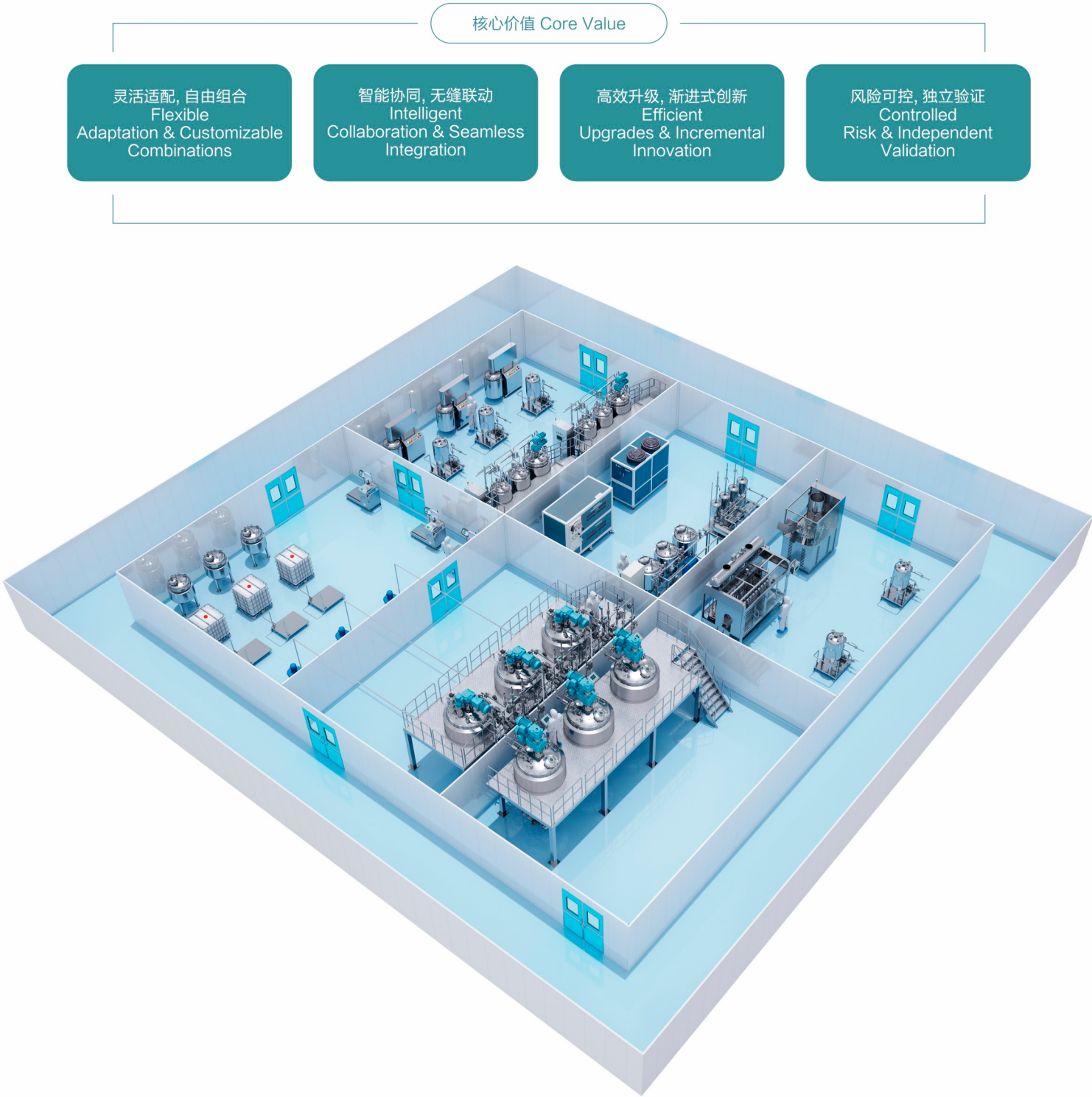
公司员工300多名
More than 300 employees

40000+

现代化厂房40000多平方米
More than 40,000 square meters
factory area



模块化解决方案 Modular Solution



RTC-Batch 配液配料工艺模块
Liquid Batching Process Module

行业应用 Industry Applications

- 制药工程：大输液配液、口服液配液、疫苗佐剂混合、细胞培养基配制、发酵液补料、蛋白纯化缓冲液制备等。
 - 精细化工：涂料分散、胶黏剂合成、反应液调配、化学品制备等。
 - 食品饮料：添加剂配置、液体调配系统。
 - 新能源及电子半导体：锂电池电解液精密配制、燃料电池催化剂浆料均质化、半导体光刻胶稀释定容、晶圆清洗液在线混配系统等。
- Pharmaceutical Engineering: Large-volume IV solution preparation, oral liquid formulation, vaccine adjuvant homogenization, cell culture media preparation, fermentation broth feeding, protein purification buffer preparation, etc.
 - Fine Chemicals: Paint dispersion, adhesive synthesis, reaction mixture adjustment, chemical product manufacturing, etc.
 - Food & Beverage: Additive dispensing systems, liquid batching systems.
 - New Energy & Electronics/Semiconductors: Lithium battery electrolyte precision formulation, fuel cell catalyst slurry homogenization, semiconductor photoresist dilution and volume calibration, wafer cleaning solution online mixing systems.



02 混合反应罐
Mixing & Reaction Vessel

03 自动化控制系统
Automation Control System

- PLC/HMI人机界面，预设标准化工艺配方。
- 支持OPC-UA、Modbus协议，无缝对接MES/ERP系统。
- PLC/HMI interface with preloaded standardized process recipes.
- OPC-UA/Modbus protocol support for seamless integration with MES/ERP systems.

04 辅助系统
Auxiliary Systems

- 真空上料系统
- 原位清洗
- 温控模块TCU
- 废液废气回收与处理装置
- Vacuum feeding system
- CIP
- Temperature control modules (TCU)
- Waste liquid/gas recovery and treatment systems

01 原料储罐与输送模块
Raw Material Storage & Transfer Module

05 称量配液模块
Weighing & Batching Module

RTC-Batch 配液配料工艺模块
Liquid Batching Process Module

防差错配料管理系统
Error-Proof Ingredient Management System

核心工艺控制点 Key Process Control Points

- 精准称量投料：精度称重传感器，失重/增量称量技术，独立称量模块、密闭投料口及粉尘捕集装置。

· 动态混合均质：多级搅拌适配不同黏度液体，实时监测电导率等参数，层流/湍流切换防气泡。

· 温控监测：夹套罐体PID控温，在线监测温度等参数。

· 清洁灭菌：全管路及罐体CIP/SIP，316L不锈钢材质。

· 数据管理：SCADA系统记录批次数据，支持电子签名与审计追踪。

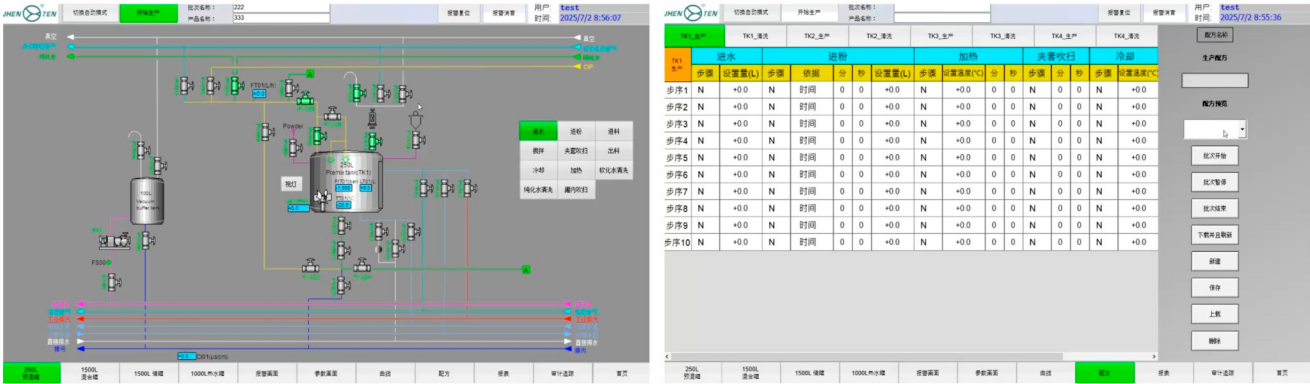
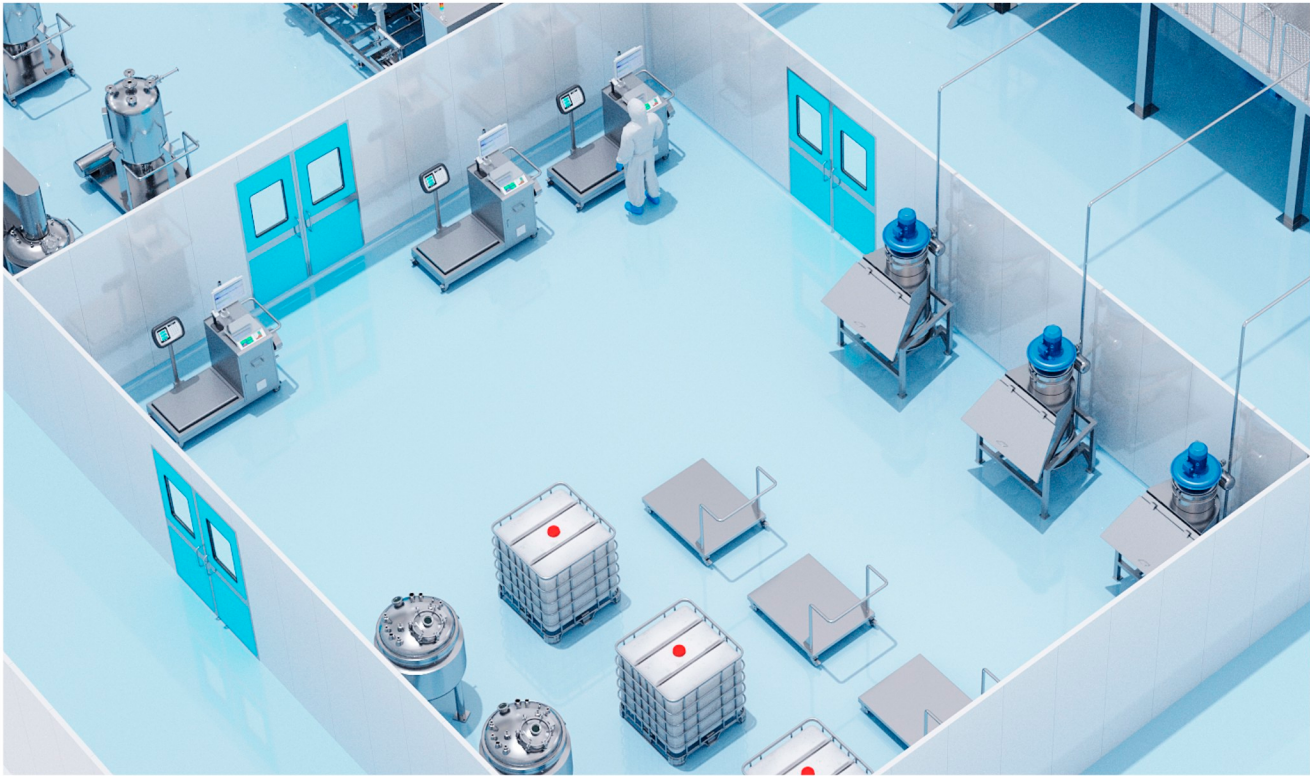
· Precise Weighing & Dispensing: Employing high-accuracy load cells with loss-in-weight/gain-in-weight technology. Features independent weighing modules, sealed feeding ports, and dust collection systems.

· Dynamic Mixing & Homogenization: Multi-stage agitation adapts to liquids of varying viscosities. Real-time monitoring of conductivity and other parameters. Laminar/turbulent flow switching prevents bubble formation.

· Temperature Control & Monitoring: PID-controlled temperature regulation via jacketed vessels. In-line monitoring of temperature and critical parameters.

· Cleaning & Sterilization: Full CIP (Clean-in-Place)/SIP (Steam-in-Place) capabilities for pipelines and vessels. 316L stainless steel construction.

· Data Management: SCADA system records batch data with support for electronic signatures & audit trails.



核心优势 Core Advantages

- 全面防错，源头防报废。

· 精准配料，自动校准。

· 精细的库存与成本管理。

· 数据全程追溯。

· 无纸运作，电子数据自动记录。

· 移动称料小车与固定站灵活部署。

· 支持远程监控。

· 应用扩展性强。
- Comprehensive error-proofing to prevent waste at source.

· Precision ingredient dispensing with auto-calibration.

· Granular inventory and cost control.

· End-to-end data traceability.

· Paperless operation with automatic electronic recording.

· Flexible deployment via mobile weighing carts & fixed stations.

· Remote monitoring support.

· High scalability.



RTC-Clean CIP/SIP 工艺模块
CIP/SIP Process Module

核心工艺控制点 Key Process Control Points

清洗参数精准控制
Precision Cleaning Control

- ◆多级清洗程序
 - 预冲洗→碱洗→酸洗→终淋洗
 - 支持自定义程序切换
- ◆关键参数监控
 - 温度
 - 流速
 - 浓度
- ◆Multi-stage programs:
 - Pre-rinse → alkaline wash → acid wash → final rinse
 - Customizable sequence switching
- ◆Critical parameter monitoring:
 - Temperature
 - Turbulent flow
 - Concentration

灭菌有效性保障
Sterilization Efficacy Assurance

- ◆纯蒸汽灭菌(SIP)
 - 温度-压力-时间三重验证
 - 生物指示剂挑战性测试
 - 过热水灭菌
- ◆Pure steam sterilization (SIP)
 - Temperature-pressure-time validation
 - Biological indicator testing
 - Overheated water sterilization

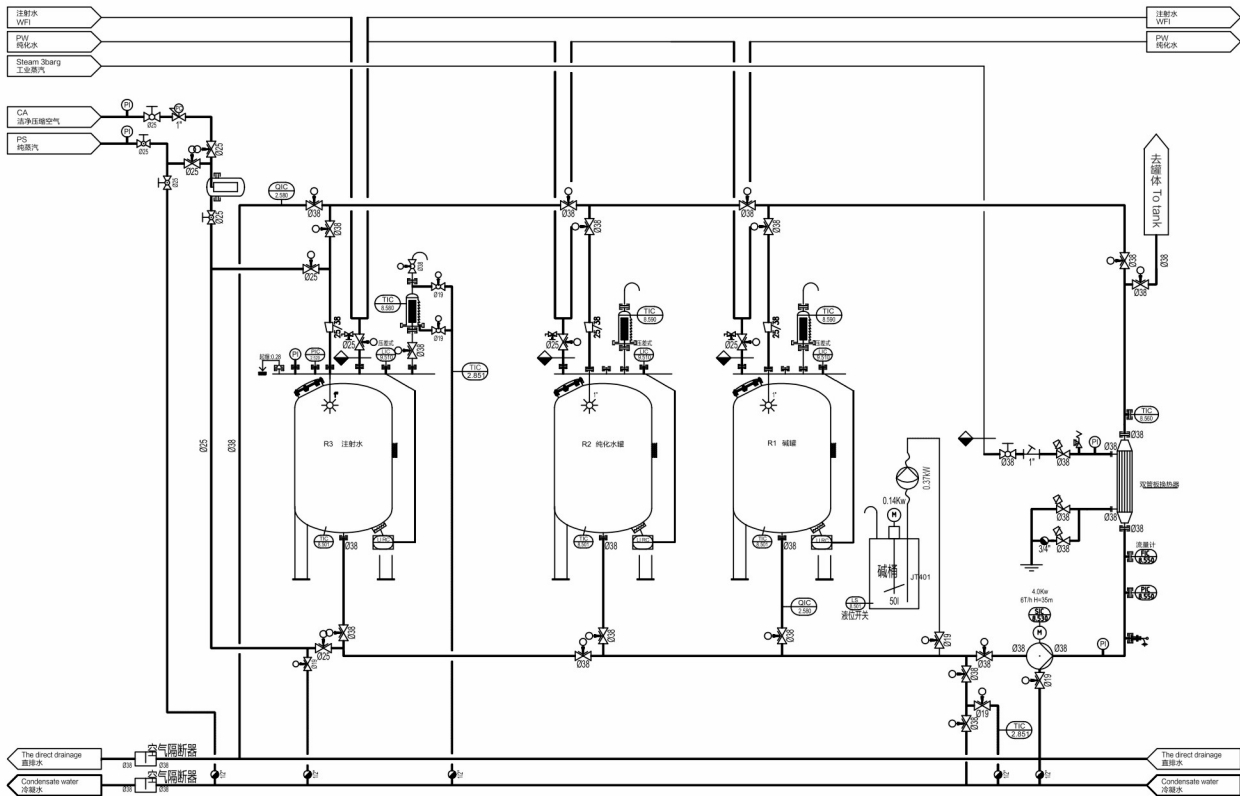
清洗介质管理
Cleaning Media Management

- ◆清洗剂智能配比
 - 酸碱储罐带液位与浓度闭环控制
- ◆清洗液回收
 - 过滤后回用(制药级)或中和排放(食品级)
- ◆Smart dosing
 - Closed-loop control of concentrations
- ◆Recycling
 - Reuse filtered solutions (pharma) or neutralize discharge (food)



数据完整性与追溯
Data Integrity & Traceability

- ◆电子记录符合21 CFR Part 11
 - 自动生成清洗/灭菌报告
 - 一键生成完整可审计的批次报告
- ◆审计追踪
 - 记录参数修改、操作员权限变更及系统报警事件
- ◆21 CFR Part 11-compliant electronic records
 - Automated cleaning/sterilization reports.
 - Generate audit-ready batch reports with a single click.
- ◆Audit trails
 - Logs for parameter adjustments, operator privilege changes, and system alarms.



RTC-Thermal TCU 温控工艺模块
Temperature Control Unit

产品全生命周期服务
Product Life Cycle Service

组成部分 Components

包含加热和冷却装置、循环泵、PLC控制系统及管道阀门过滤器等组成。系统通过PID算法精确计算加热或冷却量，输出信号控制加热器和冷却装置达到精确控温。

Include heating and cooling devices, circulating pumps, PLC control systems, and pipeline valves, filters, etc.The system precisely calculates the heating or cooling capacity through the PID algorithm and outputs signals to control the heater and cooling device to achieve precise temperature control.

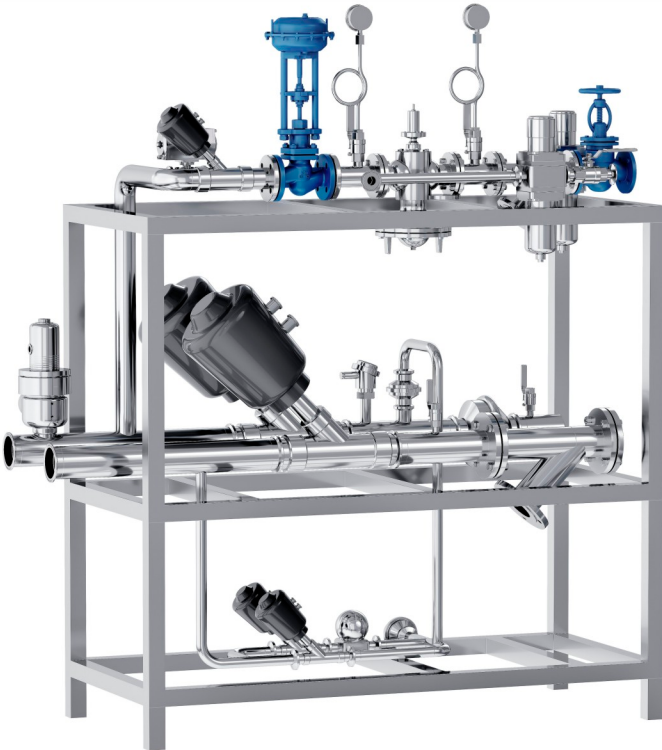
定制服务 Customization Services

可选防爆认证(如Ex d IIB T4 Gb)、不锈钢流路材质、不同导热介质、移动脚轮设计及外配冷却系统，适应各类洁净、腐蚀与防爆场景。

Optional explosion-proof certification (e.g., Ex d IIB T4 Gb), stainless steel fluid path, various heat transfer media, mobile caster design, and external cooling systems to suit clean, corrosive, and explosive environments.

核心优势 Key Advantages

- 控温精度高($\pm 0.1^{\circ}\text{C} \sim \pm 0.5^{\circ}\text{C}$)，有效保障产品质量。
- 宽温域覆盖($-80^{\circ}\text{C} \sim +300^{\circ}\text{C}+$)，一机满足多种需求。
- 全密闭循环设计，延缓介质氧化，提升安全与节能性。
- 自动化运行，减少人工干预，保护反应设备免受热应力冲击。
- High temperature control accuracy ($\pm 0.1^{\circ}\text{C} \sim \pm 0.5^{\circ}\text{C}$), ensuring product quality
- Broad temperature range ($-80^{\circ}\text{C} \sim +300^{\circ}\text{C}+$), meeting diverse needs with one unit
- Fully enclosed circulation design, reducing media oxidation and improving safety and energy efficiency
- Automated operation minimizes manual intervention and protects reaction equipment from thermal stress impact



分析与咨询
Analysis & Consultation

- 工艺可行性评估Process feasibility assessment
- 成本与能耗分析Cost & energy consumption analysis
- 定制化方案设计Customized solution design

设计与开发
Design & Development

- 3D建模与仿真验证3D modeling & simulation validation
- 材料选型Material selection
- 模块化设计Modular design

制造与质检
Manufacturing & Quality Control

- 材料溯源Material traceability
- 精密加工Precision machining
- 特殊加工Specialized processing
- 标准品控Standardized quality inspection

退役与循环
Decommissioning & Recycling

- 残值评估Residual value evaluation
- 环保拆解Environmentally compliant disassembly
- 技术迭代Technology iteration

运维与优化
Maintenance & Optimization

- 预防维护Preventive maintenance
- 备件响应Spare parts rapid response
- 远程监控Remote monitoring
- 工艺优化Process optimization

交付与实施
Delivery & Implementation

- FAT测试FAT (Factory Acceptance Testing)
- 全球服务Global service network
- 操作培训Operational training
- 智能集成Smart system integration

