



Cladding-Technology-Shanxi-Co.,-Ltd- CLADDING-MPS-025-General-Cladding- MPS-Template

主生产计划管理制度

Master Production Schedule Management Procedure

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1 目的 Purpose

建立科雷丁技术（山西）有限公司主生产计划管理体系，规范增材制造与精密堆焊产品从订单接收、计划编制、工艺路线确定到生产执行的全过程管理，确保法兰堆焊、管件堆焊、钢管堆焊、轴套管堆焊、模具堆焊修复及金属零部件增材制造等产品的交付及时性与质量稳定性，实现产能资源的最优配置。

Establish the Master Production Schedule management for CLADDING-Technology-Shanxi-Co.,-Ltd, standardize the full process management of additive manufacturing and precision cladding



products from order reception, plan formulation, process route determination to production execution, ensure the delivery timeliness and quality stability of flange cladding, pipe fitting cladding, steel pipe cladding, shaft sleeve cladding, mold cladding repair and metal component additive manufacturing products, and achieve optimal allocation of production capacity resources.

2 适用范围 Scope

本制度适用于公司所有堆焊产品与增材制造产品的生产计划编制与执行管理，包括但不限于：

This procedure applies to the production plan formulation and execution management of all cladding products and additive manufacturing products of the company, including but not limited to:

- 法兰堆焊产品 Flange cladding products
- 管件堆焊产品 Pipe fitting cladding products
- 钢管堆焊产品 Steel pipe cladding products
- 轴套管堆焊产品 Shaft sleeve cladding products
- 模具堆焊修复产品 Mold cladding repair products
- TIG 增材制造产品 TIG additive manufacturing products
- MIG 增材制造产品 MIG additive manufacturing products
- 梯度材料制备产品 Gradient material preparation products
- 工业零部件表面强化与再制造修复产品 Industrial component surface strengthening and remanufacturing repair products

3 职责 Responsibilities

3.1 生产运营部 Production Operations Department

- 负责主生产计划的编制、调整与下达
- Responsible for the formulation, adjustment and issuance of master production schedule
- 负责产能评估与资源协调
- Responsible for capacity assessment and resource coordination
- 负责生产进度跟踪与异常处理
- Responsible for production progress tracking and exception handling
- 负责月度生产计划与年度产能规划的制定
- Responsible for monthly production plan and annual capacity planning formulation

3.2 销售部 Sales Department

- 负责客户订单接收与需求确认



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- Responsible for customer order reception and demand confirmation
 - 负责订单交期承诺与客户沟通
 - Responsible for order delivery commitment and customer communication
 - 负责订单变更信息的及时传递
 - Responsible for timely transmission of order change information

3.3 技术工艺部 Technical Process Department

- 负责产品工艺路线制定与工艺文件编制
- Responsible for product process route formulation and process document preparation
- 负责关键控制点识别与工艺参数确定
- Responsible for key control point identification and process parameter determination
- 负责工艺变更评审与技术支持
- Responsible for process change review and technical support

3.4 质量部 Quality Department

- 负责产品质量标准的制定与检验计划编制
- Responsible for product quality standard formulation and inspection plan preparation
- 负责关键控制点的质量监控与验证
- Responsible for quality monitoring and verification of key control points
- 负责不合格品处理与质量改进
- Responsible for nonconforming product handling and quality improvement

3.5 采购部 Procurement Department

- 负责原材料与焊材的采购计划执行
- Responsible for raw material and welding consumable procurement plan execution
- 负责供应商交付进度跟踪
- Responsible for supplier delivery progress tracking

3.6 设备部 Equipment Department

- 负责生产设备维护保养与状态管理
- Responsible for production equipment maintenance and status management
- 负责设备产能评估与故障响应
- Responsible for equipment capacity assessment and fault response



4 管理内容与程序 Management Content and Procedures

4.1 订单接收与需求分析 Order Reception and Demand Analysis

4.1.1 订单信息收集 Order Information Collection

销售部接收客户订单后，应在 2 个工作日内完成以下信息的收集与确认：

After receiving customer orders, the Sales Department shall complete the following information collection and confirmation within 2 working days:

| 信息类别 | 具体内容 | 备注 |

| Information Category | Specific Content | Remarks |

| 产品规格 | 产品名称、型号、材质、尺寸公差 | Product specification, model, material, dimensional tolerance |

| 堆焊要求 | 堆焊层数、堆焊厚度、稀释率要求 | Number of cladding layers, cladding thickness, dilution rate requirement |

| 工艺要求 | TIG/MIG 工艺选择、焊接参数范围 | TIG/MIG process selection, welding parameter range |

| 质量标准 | 外观标准、无损检测要求、力学性能要求 | Appearance standard, NDT requirement, mechanical property requirement |

| 交付要求 | 交付数量、交付日期、包装运输要求 | Delivery quantity, delivery date, packaging and transportation requirement |

4.1.2 技术可行性评审 Technical Feasibility Review

技术工艺部应在 3 个工作日内完成技术可行性评审，重点评估：

The Technical Process Department shall complete technical feasibility review within 3 working days, focusing on:

- 产品结构与堆焊工艺的匹配性
- Matching of product structure and cladding process
- 母材与堆焊材料的相容性
- Compatibility of base material and cladding material
- 关键控制点的可实现性
- Achievability of key control points
- 特殊工艺要求的设备能力评估
- Equipment capacity assessment for special process requirements



4.2 主生产计划编制 Master Production Schedule Formulation

4.2.1 计划编制周期 Planning Cycle

- | 计划类型 | 编制周期 | 覆盖范围 | 责任部门 |
- | Plan Type | Formulation Cycle | Coverage | Responsible Department |
- | 年度产能规划 | 每年 12 月 | 次年 1-12 月 | 生产运营部 |
- | Annual Capacity Planning | December each year | January-December next year | Production Operations Department |
- | 月度生产计划 | 每月 25 日前 | 次月 1-30 日 | 生产运营部 |
- | Monthly Production Plan | Before 25th each month | 1st-30th next month | Production Operations Department |
- | 周生产计划 | 每周五前 | 次周 1-7 日 | 生产运营部 |
- | Weekly Production Plan | Before Friday each week | 1st-7th next week | Production Operations Department |
- | 日生产指令 | 每日 17:00 前 | 次日生产任务 | 生产运营部 |
- | Daily Production Instruction | Before 17:00 daily | Next day production task | Production Operations Department |

4.2.2 产能评估 Capacity Assessment

生产运营部在编制主生产计划前，应进行产能评估，评估内容包括：

Before formulating the master production schedule, the Production Operations Department shall conduct capacity assessment, including:

设备产能评估 Equipment Capacity Assessment

- | 设备类型 | 评估要素 | 评估方法 |
- | Equipment Type | Assessment Factor | Assessment Method |
- | TIG 堆焊工作站 | 有效作业时间、换型时间、维护时间 | Effective working time, changeover time, maintenance time |
- | MIG 堆焊工作站 | 有效作业时间、换型时间、维护时间 | Effective working time, changeover time, maintenance time |
- | 电弧增材制造设备 | 有效作业时间、程序准备时间 | Effective working time, program preparation time |
- | 热处理设备 | 炉次容量、升温降温时间 | Furnace capacity, heating and cooling time |
- | 机加工设备 | 加工工时、装夹时间 | Machining time, clamping time |

人员产能评估 Personnel Capacity Assessment



- TIG 焊工有效作业率：80%
- TIG welder effective working rate: 80%
- MIG 焊工有效作业率：85%
- MIG welder effective working rate: 85%
- 增材制造操作员有效作业率：82%
- Additive manufacturing operator effective working rate: 82%
- 检验人员有效作业率：75%
- Inspector effective working rate: 75%

4.2.3 计划编制原则 *Planning Principles*

- 客户交期优先原则：优先保障交期紧急的订单
- Customer delivery priority principle: Prioritize orders with urgent delivery dates
- 工艺相似性原则：相同或相似工艺的产品集中排产
- Process similarity principle: Products with same or similar processes are scheduled together
- 设备利用率最大化原则：合理安排设备负荷，避免闲置
- Equipment utilization maximization principle: Reasonably arrange equipment load to avoid idleness
- 质量风险可控原则：关键控制点充足的时间保障
- Quality risk controllable principle: Adequate time guarantee for key control points

4.3 工艺路线与关键控制点 *Process Route and Key Control Points*

4.3.1 法兰堆焊产品工艺路线 *Flange Cladding Product Process Route*

工序序号	工序名称	关键控制点	检验要求	标准工时
Process No.	Process Name	Key Control Point	Inspection Requirement	Standard Time
01	订单评审	技术要求确认	技术文件完整性检查	2h
01	Order Review	Technical requirement confirmation	Technical document completeness check	2h
02	母材检验	材质证明、外观检查	材质报告审核、表面缺陷检查	1h
02	Base Material Inspection	Material certificate, appearance check	Material report review, surface defect check	1h
03	焊前准备	坡口加工、清洁处理	坡口尺寸检查、清洁度确认	2h
03	Pre-welding Preparation	Groove machining, cleaning treatment	Groove dimension check, cleanliness confirmation	2h
04	预热处理	预热温度、保温时间	温度测量记录	1h



04 Preheating Treatment Preheating temperature, holding time Temperature measurement record 1h
05 TIG 打底焊 焊接电流、电弧电压、焊接速度 焊缝外观检查、稀释率控制 4h
05 TIG Root Welding Welding current, arc voltage, welding speed Weld appearance check, dilution rate control 4h
06 TIG 填充焊 层间温度、堆焊厚度 层间温度测量、厚度检测 8h
06 TIG Fill Welding Interpass temperature, cladding thickness Interpass temperature measurement, thickness inspection 8h
07 焊后热处理 加热速率、保温温度、冷却速率 热处理曲线记录 6h
07 Post-weld Heat Treatment Heating rate, holding temperature, cooling rate Heat treatment curve record 6h
08 机加工 加工余量、尺寸精度 尺寸检测、表面粗糙度检查 4h
08 Machining Machining allowance, dimensional accuracy Dimension inspection, surface roughness check 4h
09 无损检测 检测方法、验收标准 UT/MT 检测、检测报告 2h
09 Non-destructive Testing Testing method, acceptance standard UT/MT testing, test report 2h
10 最终检验 外观、尺寸、性能 综合检验、检验报告 2h
10 Final Inspection Appearance, dimension, performance Comprehensive inspection, inspection report 2h
11 包装入库 防护措施、标识 包装检查、入库记录 1h
11 Packaging and Warehousing Protection measures, marking Packaging check, warehousing record 1h

4.3.2 管件堆焊产品工艺路线 Pipe Fitting Cladding Product Process Route

工序序号 工序名称 关键控制点 检验要求 标准工时
Process No. Process Name Key Control Point Inspection Requirement Standard Time
01 订单评审 技术要求确认 技术文件完整性检查 2h
01 Order Review Technical requirement confirmation Technical document completeness check 2h
02 母材检验 材质证明、壁厚测量 材质报告审核、壁厚检测 1h
02 Base Material Inspection Material certificate, wall thickness measurement Material report review, wall thickness inspection 1h
03 焊前准备 内壁清洁、坡口加工 清洁度确认、坡口尺寸检查 1.5h



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- | 03 | Pre-welding Preparation | Inner wall cleaning, groove machining | Cleanliness confirmation, groove dimension check | 1.5h |
- | 04 | 预热处理 | 预热温度均匀性 | 多点温度测量 | 1h |
- | 04 | Preheating Treatment | Preheating temperature uniformity | Multi-point temperature measurement | 1h |
- | 05 | MIG 打底焊 | 焊接参数、熔敷效率 | 焊缝外观、熔深检查 | 3h |
- | 05 | MIG Root Welding | Welding parameters, deposition efficiency | Weld appearance, penetration check | 3h |
- | 06 | MIG 填充焊 | 层间温度、堆焊厚度 | 温度监控、厚度检测 | 6h |
- | 06 | MIG Fill Welding | Interpass temperature, cladding thickness | Temperature monitoring, thickness inspection | 6h |
- | 07 | 焊后热处理 | 热处理制度执行 | 热处理曲线记录 | 5h |
- | 07 | Post-weld Heat Treatment | Heat treatment procedure execution | Heat treatment curve record | 5h |
- | 08 | 内孔机加工 | 孔径精度、表面质量 | 孔径检测、粗糙度检查 | 3h |
- | 08 | Internal Bore Machining | Bore accuracy, surface quality | Bore inspection, roughness check | 3h |
- | 09 | 无损检测 | 检测方法选择 | UT/RT 检测、检测报告 | 2h |
- | 09 | Non-destructive Testing | Testing method selection | UT/RT testing, test report | 2h |
- | 10 | 最终检验 | 综合性能验证 | 检验报告、合格判定 | 2h |
- | 10 | Final Inspection | Comprehensive performance verification | Inspection report, qualification determination | 2h |
- | 11 | 包装入库 | 内孔防护、标识 | 包装检查、入库记录 | 1h |
- | 11 | Packaging and Warehousing | Bore protection, marking | Packaging check, warehousing record | 1h |

4.3.3 钢管堆焊产品工艺路线 Steel Pipe Cladding Product Process Route

- | 工序序号 | 工序名称 | 关键控制点 | 检验要求 | 标准工时 |
- | Process No. | Process Name | Key Control Point | Inspection Requirement | Standard Time |
- | 01 | 订单评审 | 技术要求确认 | 技术文件完整性检查 | 2h |
- | 01 | Order Review | Technical requirement confirmation | Technical document completeness check | 2h |
- | 02 | 母材检验 | 材质证明、几何尺寸 | 材质报告、尺寸检测 | 1h |
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02 Base Material Inspection Material certificate, geometric dimension Material report, dimension inspection 1h
03 焊前准备 表面预处理、坡口加工 表面清洁度、坡口尺寸 2h
03 Pre-welding Preparation Surface pretreatment, groove machining Surface cleanliness, groove dimension 2h
04 预热处理 预热温度控制 温度测量记录 1h
04 Preheating Treatment Preheating temperature control Temperature measurement record 1h
05 MIG 堆焊 焊接参数、熔敷效率 焊缝外观、堆焊厚度 8h
05 MIG Cladding Welding parameters, deposition efficiency Weld appearance, cladding thickness 8h
06 焊后热处理 热处理工艺执行 热处理曲线记录 6h
06 Post-weld Heat Treatment Heat treatment process execution Heat treatment curve record 6h
07 机加工 外径精度、表面质量 外径检测、粗糙度检查 4h
07 Machining Outer diameter accuracy, surface quality Outer diameter inspection, roughness check 4h
08 无损检测 检测方法、验收标准 UT 检测、检测报告 2h
08 Non-destructive Testing Testing method, acceptance standard UT testing, test report 2h
09 最终检验 综合性能验证 检验报告、合格判定 2h
09 Final Inspection Comprehensive performance verification Inspection report, qualification determination 2h
10 包装入库 防护措施、标识 包装检查、入库记录 1h
10 Packaging and Warehousing Protection measures, marking Packaging check, warehousing record 1h

4.3.4 轴套管堆焊产品工艺路线 Shaft Sleeve Cladding Product Process Route

工序序号 工序名称 关键控制点 检验要求 标准工时
Process No. Process Name Key Control Point Inspection Requirement Standard Time
01 订单评审 技术要求确认 技术文件完整性检查 2h
01 Order Review Technical requirement confirmation Technical document completeness check 2h
02 母材检验 材质证明、尺寸精度 材质报告、尺寸检测 1h



02 Base Material Inspection Material certificate, dimensional accuracy Material report, dimension inspection 1h
03 焊前准备 内孔保护、表面清洁 保护措施检查、清洁度确认 1.5h
03 Pre-welding Preparation Bore protection, surface cleaning Protection measure check, cleanliness confirmation 1.5h
04 预热处理 预热温度均匀性 多点温度测量 1h
04 Preheating Treatment Preheating temperature uniformity Multi-point temperature measurement 1h
05 TIG 堆焊 低稀释率控制、精密成型 焊缝外观、稀释率检测 6h
05 TIG Cladding Low dilution rate control, precision forming Weld appearance, dilution rate inspection 6h
06 焊后热处理 热处理制度执行 热处理曲线记录 5h
06 Post-weld Heat Treatment Heat treatment procedure execution Heat treatment curve record 5h
07 机加工 外径精度、表面质量 外径检测、粗糙度检查 3h
07 Machining Outer diameter accuracy, surface quality Outer diameter inspection, roughness check 3h
08 无损检测 检测方法选择 MT/PT 检测、检测报告 2h
08 Non-destructive Testing Testing method selection MT/PT testing, test report 2h
09 最终检验 综合性能验证 检验报告、合格判定 2h
09 Final Inspection Comprehensive performance verification Inspection report, qualification determination 2h
10 包装入库 内孔防护、标识 包装检查、入库记录 1h
10 Packaging and Warehousing Bore protection, marking Packaging check, warehousing record 1h

4.3.5 模具堆焊修复产品工艺路线 *Mold Cladding Repair Product Process Route*

工序序号 工序名称 关键控制点 检验要求 标准工时
Process No. Process Name Key Control Point Inspection Requirement Standard Time
01 订单评审 修复方案确认 技术文件完整性检查 2h
01 Order Review Repair scheme confirmation Technical document completeness check 2h
02 缺陷评估 缺陷类型、深度、范围 缺陷检测报告 2h
02 Defect Assessment Defect type, depth, range Defect inspection report 2h



03 焊前准备 缺陷清理、坡口加工 清理质量检查、坡口尺寸 3h
03 Pre-welding Preparation Defect cleaning, groove machining Cleaning quality check, groove dimension 3h
04 预热处理 预热温度控制 温度测量记录 1h
04 Preheating Treatment Preheating temperature control Temperature measurement record 1h
05 TIG 补焊 焊接参数、熔深控制 焊缝外观、熔深检查 4h
05 TIG Repair Welding Welding parameters, penetration control Weld appearance, penetration check 4h
06 TIG 堆焊 堆焊厚度、稀释率 厚度检测、稀释率控制 6h
06 TIG Cladding Cladding thickness, dilution rate Thickness inspection, dilution rate control 6h
07 焊后热处理 热处理制度执行 热处理曲线记录 5h
07 Post-weld Heat Treatment Heat treatment procedure execution Heat treatment curve record 5h
08 机加工 尺寸恢复、表面质量 尺寸检测、粗糙度检查 6h
08 Machining Dimension restoration, surface quality Dimension inspection, roughness check 6h
09 无损检测 检测方法选择 UT/MT 检测、检测报告 2h
09 Non-destructive Testing Testing method selection UT/MT testing, test report 2h
10 最终检验 尺寸精度、性能验证 检验报告、合格判定 2h
10 Final Inspection Dimensional accuracy, performance verification Inspection report, qualification determination 2h
11 包装入库 防护措施、标识 包装检查、入库记录 1h
11 Packaging and Warehousing Protection measures, marking Packaging check, warehousing record 1h

4.3.6 增材制造产品工艺路线 Additive Manufacturing Product Process Route

工序序号 工序名称 关键控制点 检验要求 标准工时
Process No. Process Name Key Control Point Inspection Requirement Standard Time
01 订单评审 技术要求确认 技术文件完整性检查 2h
01 Order Review Technical requirement confirmation Technical document completeness check 2h
02 母材检验 材质证明、尺寸精度 材质报告、尺寸检测 1h



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- | 02 | Base Material Inspection | Material certificate, dimensional accuracy | Material report, dimension inspection | 1h |
- | 03 | 工艺设计 | 路径规划、支撑设计 | 工艺文件评审 | 4h |
- | 03 | Process Design | Path planning, support design | Process document review | 4h |
- | 04 | 焊前准备 | 基板清洁、夹具准备 | 清洁度确认、夹具检查 | 1.5h |
- | 04 | Pre-welding Preparation | Substrate cleaning, fixture preparation | Cleanliness confirmation, fixture check | 1.5h |
- | 05 | 预热处理 | 预热温度控制 | 温度测量记录 | 1h |
- | 05 | Preheating Treatment | Preheating temperature control | Temperature measurement record | 1h |
- | 06 | 电弧增材制造 | 焊接参数、层间温度、成型精度 | 过程监控、尺寸检测 | 12h |
- | 06 | Arc Additive Manufacturing | Welding parameters, interpass temperature, forming accuracy | Process monitoring, dimension inspection | 12h |
- | 07 | 焊后热处理 | 热处理制度执行 | 热处理曲线记录 | 6h |
- | 07 | Post-weld Heat Treatment | Heat treatment procedure execution | Heat treatment curve record | 6h |
- | 08 | 支撑去除 | 去除方法、表面质量 | 去除质量检查 | 2h |
- | 08 | Support Removal | Removal method, surface quality | Removal quality check | 2h |
- | 09 | 机加工 | 尺寸精度、表面质量 | 尺寸检测、粗糙度检查 | 6h |
- | 09 | Machining | Dimensional accuracy, surface quality | Dimension inspection, roughness check | 6h |
- | 10 | 无损检测 | 检测方法选择 | UT/CT 检测、检测报告 | 2h |
- | 10 | Non-destructive Testing | Testing method selection | UT/CT testing, test report | 2h |
- | 11 | 最终检验 | 综合性能验证 | 检验报告、合格判定 | 2h |
- | 11 | Final Inspection | Comprehensive performance verification | Inspection report, qualification determination | 2h |
- | 12 | 包装入库 | 防护措施、标识 | 包装检查、入库记录 | 1h |
- | 12 | Packaging and Warehousing | Protection measures, marking | Packaging check, warehousing record | 1h |

4.4 关键控制点管理 Key Control Point Management

4.4.1 关键控制点分类 Key Control Point Classification

- | 控制点类别 | 控制要素 | 控制方法 | 记录要求 |



Control Point Category Control Factor Control Method Record Requirement
焊接参数控制 焊接电流、电弧电压、焊接速度、送丝速度 设备参数设定、过程监控 焊接参数记录表
Welding Parameter Control Welding current, arc voltage, welding speed, wire feeding speed Equipment parameter setting, process monitoring Welding parameter record sheet
温度控制 预热温度、层间温度、热处理温度 温度测量、自动记录 温度记录表
Temperature Control Preheating temperature, interpass temperature, heat treatment temperature Temperature measurement, automatic recording Temperature record sheet
尺寸控制 堆焊厚度、加工尺寸、形位公差 尺寸检测、在线测量 尺寸检测记录
Dimension Control Cladding thickness, machining dimension, geometric tolerance Dimension inspection, online measurement Dimension inspection record
质量检验 外观质量、无损检测、力学性能 检验执行、报告出具 检验报告
Quality Inspection Appearance quality, NDT, mechanical property Inspection execution, report issuance Inspection report

4.4.2 关键控制点监控要求 Key Control Point Monitoring Requirements

焊接参数监控 Welding Parameter Monitoring

- TIG 堆焊：焊接电流偏差 $\pm 5\%$ ，电弧电压偏差 $\pm 0.5V$
- TIG cladding: Welding current deviation $\pm 5\%$, arc voltage deviation $\pm 0.5V$
- MIG 堆焊：焊接电流偏差 $\pm 5\%$ ，电弧电压偏差 $\pm 1V$
- MIG cladding: Welding current deviation $\pm 5\%$, arc voltage deviation $\pm 1V$
- 焊接速度偏差 $\pm 10\%$
- Welding speed deviation $\pm 10\%$
- 送丝速度偏差 $\pm 5\%$
- Wire feeding speed deviation $\pm 5\%$

温度监控 Temperature Monitoring

- 预热温度：设定值 $\pm 10^{\circ}C$
 - Preheating temperature: Set value $\pm 10^{\circ}C$
 - 层间温度：按工艺要求控制，偏差 $\pm 20^{\circ}C$
 - Interpass temperature: Control according to process requirement, deviation $\pm 20^{\circ}C$
 - 热处理温度：按热处理曲线执行，偏差 $\pm 10^{\circ}C$
 - Heat treatment temperature: Execute according to heat treatment curve, deviation $\pm 10^{\circ}C$
-



4.5 生产计划执行 Production Plan Execution

4.5.1 日生产指令下达 Daily Production Instruction Issuance

生产运营部每日 17:00 前下达次日生产指令，内容包括：

The Production Operations Department shall issue next day production instruction before 17:00 daily, including:

- 生产任务单 Production task order
- 工艺文件 Process document
- 材料领用单 Material requisition form
- 质量检验要求 Quality inspection requirement

4.5.2 生产进度跟踪 Production Progress Tracking

| 跟踪频次 | 跟踪内容 | 跟踪方式 | 责任人员 |

| Tracking Frequency | Tracking Content | Tracking Method | Responsible Personnel |

| 每日上午 | 当日生产任务完成情况 | 现场巡查、系统查询 | 生产主管 |

| Daily morning | Daily production task status | On-site inspection, query | Production supervisor |

| 每日下午 | 当日生产进度、异常情况 | 现场巡查、系统查询 | 生产主管 |

| Daily afternoon | Daily production progress, abnormal situation | On-site inspection, query | Production supervisor |

| 每周汇总 | 周计划完成情况、下周计划调整 | 数据分析、会议沟通 | 生产运营经理 |

| Weekly summary | Weekly plan status, next week plan adjustment | Data analysis, meeting communication | Production operations manager |

4.5.3 异常处理 Abnormality Handling

生产过程中出现以下异常情况时，应立即启动异常处理程序：

When the following abnormalities occur during production, the abnormality handling procedure shall be initiated immediately:

- 设备故障 Equipment failure
- 材料短缺 Material shortage
- 质量问题 Quality problem
- 人员缺勤 Personnel absence
- 工艺异常 Process abnormality

异常处理流程 Abnormality Handling Process

1. 异常发现与报告 Abnormality detection and reporting



2. 异常原因分析 Abnormality cause analysis
3. 处理方案制定 Handling scheme formulation
4. 处理方案执行 Handling scheme execution
5. 处理结果验证 Handling result verification
6. 预防措施制定 Preventive measure formulation

4.6 计划调整 Plan Adjustment

4.6.1 计划调整触发条件 Plan Adjustment Trigger Conditions

- 客户订单变更 Customer order change
- 设备故障导致产能变化 Equipment failure causing capacity change
- 材料供应异常 Material supply abnormality
- 质量问题导致返工 Quality problem causing rework
- 紧急订单插入 Urgent order insertion

4.6.2 计划调整审批权限 Plan Adjustment Approval Authority

调整类型 调整幅度 审批权限 审批时限
Adjustment Type Adjustment Magnitude Approval Authority Approval Time Limit
日计划调整 单个订单交期变化 ≤ 3 天 生产运营经理 4小时
Daily plan adjustment Single order delivery change ≤ 3 days Production operations manager 4 hours
周计划调整 单个订单交期变化 ≤ 7 天 生产总监 8小时
Weekly plan adjustment Single order delivery change ≤ 7 days Production director 8 hours
月计划调整 单个订单交期变化 ≤ 15 天 总经理 24小时
Monthly plan adjustment Single order delivery change ≤ 15 days General manager 24 hours

5 监督考核 Supervision and Assessment

5.1 计划达成率考核 Plan Achievement Rate Assessment

考核指标 计算公式 目标值 考核周期
Assessment Indicator Calculation Formula Target Value Assessment Cycle
订单准时交付率 准时交付订单数/总订单数 $\times 100\%$ $\geq 95\%$ 月度
Order on-time delivery rate On-time delivered orders/Total orders $\times 100\%$ $\geq 95\%$ Monthly
计划达成率 实际完成产量/计划产量 $\times 100\%$ $\geq 90\%$ 月度



Plan achievement rate	$\text{Actual output} / \text{Planned output} \times 100\%$	$\geq 90\%$	Monthly
设备利用率	$\text{实际作业时间} / \text{可用作业时间} \times 100\%$	$\geq 75\%$	月度
Equipment utilization rate	$\text{Actual working time} / \text{Available working time} \times 100\%$	$\geq 75\%$	
Monthly			
一次交检合格率	$\text{一次交检合格数} / \text{总交检数} \times 100\%$	$\geq 90\%$	月度
First-time inspection pass rate	$\text{First-time pass number} / \text{Total inspection number} \times 100\%$	$\geq 90\%$	
Monthly |

5.2 考核结果应用 Assessment Result Application

- 月度考核结果纳入部门绩效考核
- Monthly assessment results are included in departmental performance evaluation
- 连续三个月未达标，启动专项改进
- If target is not achieved for three consecutive months, special improvement is initiated
- 年度优秀部门给予表彰奖励
- Outstanding departments are commended and rewarded annually

6 附则 Supplementary Provisions

6.1 相关文件 Related Documents

- 生产管理制度 Production Management Procedure
- 工艺管理制度 Process Management Procedure
- 质量检验管理制度 Quality Inspection Management Procedure
- 设备管理制度 Equipment Management Procedure
- 仓储管理制度 Warehouse Management Procedure

6.2 相关记录 Related Records

- 主生产计划表 Master Production Schedule
- 生产任务单 Production Task Order
- 工艺文件 Process Document
- 焊接参数记录表 Welding Parameter Record Sheet
- 温度记录表 Temperature Record Sheet
- 尺寸检测记录 Dimension Inspection Record
- 检验报告 Inspection Report
- 生产进度跟踪表 Production Progress Tracking Sheet
- 异常处理记录表 Abnormality Handling Record Sheet



- 计划调整审批单 Plan Adjustment Approval Form

6.3 修订记录 Revision History

| 版本号 | 修订日期 | 修订内容 | 修订人 | 审批人 |

| Version | Revision Date | Revision Content | Revised By | Approved By |

| A/0 | 2024-01-01 | 首次发布 | 生产运营部 | 总经理 |

| A/0 | 2024-01-01 | Initial release | Production Operations Department | General Manager |

编制 Prepared by: 生产运营部 Production Operations Department

审核 Reviewed by: 生产总监 Production Director

批准 Approved by: 总经理 General Manager

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