

Process / Product Failure Modes and Effects Analysis (PFMEA)

产品料号/版本号： Part Number/Revision：		20098635 REV B	制程任务 Process Responsibility	成品加工 Finished Good Processing	组员 Team Member:	Chew Ee Hang Chu Guochun Zhao Renyan	Lu Chuanhai Gan Chungh Chu Libo	Chen Hang Gan Cheng Wu Zhouwei	PFMEA 日期（开始/版本） PFMEA Date (Begin/Rev)		2024.06.03	文件号/版本号 Document Number/ Revision:	PFMEA-20098635B-01				
制程名称 Process Name：		PU注塑 PU injection molding	准备人： Prepared By：	Chu Li Bo					PFMEA 修改日期 PFMEA Revision Date:		/	版本号 Revision:	01				
步骤 Step No.	制程工位 Process Step	主要的制程输入 Key Process Input	潜在失效模式 Potential Failure Mode	潜在失效结果 Potential Failure Effects	S 严重 E 严重 V 性	潜在的原因 Potential Causes	O 发生 C 性 生 性	目前控制方法 Current Controls	D 检出 E 性 性	R 得分 P N	维持的对策 Actions Recommended	负责人 Resp.	维持采取的对策 Actions Taken	S 严重 E 严重 V 性	O 发生 C 性 性	D 检出 E 性 性	R 得分 P N
过程步骤 Process steps	当前是哪个制程工 位？ What is the process step	当前工位的主要输入是什 么？ What is the Key Process Input?	主要的输入会以哪种形式出 错？ In what ways can the Key Input go wrong?	对输出变量造成什么影响？输出是只客 户要求或者内部要求 What is the impact on the Key Output Variables (Customer Requirements or internal requirements)？	对客户使用有什么 影响？ How severe is the impact on the customer?	什么输入产生了错误？ What causes the Key Input to go wrong?	失败发生的频率？ How often does cause or PM occur?	目前有什么使用中的控制方法和预防方法？ 需要什么 SOP 编号 What are the existing controls and procedures (inspection and tests) that prevent with the Cause or the Failure Mode? Should include an SOP number.	怎么检出故障？ How well can you detect cause or PM?		针对降低发生率和提高检出性采取什么措施？ What are the actions for reducing the occurrence of the Cause, or improving detection?	谁是对策的负责人？ Whose Responsible for the recommended action?	哪些对策被彻底执行了？ 使用周，月的数据比较 What are the completed actions taken with the recalculated RPN? Be sure to include completion week/month				
10	业务 business	接受订单 Receive Customer Order	订单信息不清楚 Order information unclear	影响生产和出货 Affect production and delivery	4	英文未及时翻译 Translation not done in time	2	由专人接受客户订单，对订单内容进行翻译。将重要 信息邮件通知各负责人。 The designated personnel to accept customer's order, translate the contents of the order and email the important information to all person in charge	4	32							
20	生产 Production management	下达生产指令 Issue production order	生产指令不清楚，内容不完整 production order is not clear and the content is not complete	影响生产和出货 Affect production and delivery	4	订单内容识别误差 Order content identification error	2	核对要货订单及 BOM 表 Verify with PO and BOM list	4	32							
30	采购 procurement	采购材料及配件 Purchase material and components	材料及配件采购错误 Erroneous of material and components purchase	影响生产和出货 Affect production and delivery	5	人员失误 Human error	2	核对要货订单及 BOM 表 Verify with PO and BOM list	3	30							
40	仓储 warehouse	接受材料及配件 Receive material and components	产品数量及发错货 Quantity is incorrect or wrong parts sent	影响生产和出货 Affect production and delivery	5	人员失误 Human error	2	核对要货订单及 BOM 表 Verify with PO and BOM list	3	30							
50	KQC	进料检验 Incoming Quality Inspection	漏检 Missing incoming material inspection	影响生产和出货进度 Affect production and delivery schedule	4	来料检验流程错误 Error in IQC	2	来料检验报告和供应商提供的质保书 IQC inspect report& CDC From suppliers	5	40							
			检验结论错误 Erroneous inspection result	影响生产和出货进度 Affect production and delivery schedule	6	来料检验错误 Error in IQC	2	来料检验报告和供应商提供的质保书 IQC inspect report& CDC(Certificate) From suppliers	3	36							
60	仓库 warehouse	原材料及配件储存 Store Raw Material and components	包装损坏 Package was destroyed	原材料受污染、受潮 Raw material may to be contaminated and affected by damp conditions	3	在包装过程中外力太大造成 External force during packing	3	6S 检查 6S checking	4	36							
			物料损坏 Raw material damaged	影响生产和出货进度 Affect production and delivery schedule	5	在包装过程中外力太大造成 External force during packing	2	6S 检查 6S checking	4	40							
			数量错误 Wrong quantity	影响生产 Affect production	4	库存管理过程中出问题 Mistake in inventory control	3	库存管理台账，定期盘点 Inventory management ledger，Cycle count	3	36							
70	生产部 production department	领料 Material Requisition	使用错误的料号，和错误的数量，没有 按照先进先出的原则 Use of wrong part number and/or quantity, not following FIFO	产品返工或报废，产品质量问题无法追溯 Rework or scrap,hard to trace for quality issues	6	外包装无日期，品名等标识，仓管员未 按照先进先出执行 Packaging lacks labels for date, part number, etc.; warehousing staff did not comply with FIFO	2	仓管员收货核对并产品的标识及数量等进行核对，材 料标识清晰，先后批次标识区分摆放。 Warehouse verify the quantity and identification card of material, Clear labelling, organise labelled materials according to FIFO	4	48							
		成型前准备 Preparation before molding	POI 料与 ISO 加料过程中混料 POI and ISO material mixing	原料后，两种材料将在机台料桶内发生反 应，堵塞喷嘴。管道及枪头，造成枪头， 料道及管道堵塞。影响正常交货 After mixing, the two materials will react in the mixing head and can clog the supply lines, pipes and injector nozzle which can cause the parts to go out of commission, affecting normal consignment lead time	8	1. 加料人员不熟悉及上岗前未做相 关培训 2. 两种材料标识不能明显的区分开 1.The operator is not familiar with the operation operation or has yet to receive training. 2. Labels cannot be distinguished between the two materials.	4	在 POI 料桶 与 ISO 料桶表面喷涂与机台料桶对应的 颜色的 POI 和 ISO 字标识 Spray paint written labels the surface of the POI barrel and ISO barrel with the color corresponding to that of the feed tanks	3	96	一次更换一个桶，不允许同时从两个桶中取出两个泵。在桶桶上加紧 锁，只有经过授权的人才能从生产经理那里拿到钥匙。油漆桶位置相同 的颜色。由另外一个负责人进行检查所有加料清单。 One barrel at a time for changing, not allow to remove both pumps from both barrels at the same time. Add lock to barrel belt, only authorized personal can sign out key from production manager. Paint barrels location with same colours. Add checking list by another engineer before pump can be on.	作业员/部门经理 Operator/Department manager	材料领用记录表 Material recipients records	8	2	3	48
		成型灌注 Molding	漏装螺母或组件 Missing installation (screw or insert)	产品漏装螺母或结构不符报废 Missing installation or structure	8	作业员疏忽 Operator negligence	2	制作专用的子弹盒，将螺母与子弹组后全部插 入子弹盒内，检查螺母数量及是否与子弹组装到 位。没有可后，再安装到模具内。 fabricated a cassette with the correct number of pockets to contain the brass screw insert to avoid any missing or incorrect number of brass screw inserting into the mold	3	48	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			气泡不良 Air bubbles	产品表面凹坑，缺料，强度降低 Dimples, holes on the surface of the parts. Short shots; reducing strenght	8	注射过程中，注射压力不够 模具内排气不畅 Injection pressure was not enough. The mold venting is not good.	4	注射前严格按照工艺参数调整好注射压力，对模 具排气不良的位置进行改模维修 Injection pressure is set strictly in accordance with the parameters; modify mold to correct undesirable venting	3	96	更改模具，增加排气料包或排气嘴件 Mold modification, increase overflow material or venting inserts.	作业员/模具工程师 Operator/Mould Engineer	模具排气料包或嘴件修改变更单 Mold with overflow material for venting or insert changes form.	8	2	2	32
		PU 固化 Curing reaction	产品固化时间不够 Curing time is not enough	产品开模后变形，外形尺寸不符合要求 Dimension is out of spec	7	机台工艺参数或时间设置较短 Time set is too short	6	严格按工艺单调整 Adjust in strict accordance with the parameters	1	42	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		脱模 Part Ejection	产品脱模不良 Part stuck on the mould	造成产品缺料，破损，变形。拉伤 Loss of material, damage, deformation	5	反应注塑前，模具温度低于标准范 围 The mold temperature is lower than specifications before molding	7	反应注塑前，模具充分的对模具进行加热，记 录，验证效果，形成标准，并记录在工艺单内， 按工艺单执行 Heat up the mold sufficiently before molding. The process is recorded with the results to ensure the process is repeatable, and made into a standard which is to be documented into the molding card and carried out accordingly.	1	35	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		脱模剂 Mould Release	产品粘模 Parts stuck on the mold	模具内取出困难 Hard to remove part from the mold	2	模具表面光洁度不够 The mold surface is not smooth enough	4	生产时喷脱模剂 Using mold release agent during production	1	8	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		修除锋与飞边 Remove flashes	打磨过度或打磨不到位 Excessive or improper polishing	产品返工或报废 Rework or Scrap	5	砂纸型号用错，打磨方式不正确 Incorrect sandpaper is incorrect, sanding method is incorrect	5	专职人员修整打磨 delegated professionals to sand again and repair	3	75	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		嵌子灰填补空穴 Putty filler to repair voids	嵌子灰粘接不牢固 Putty adhesiveness not strong enough	产品表面凹坑，缺料不良 Dents on surface, short-shots	5	凹坑类修补 Omitted to patch up the sink marks or voids	7	专职人员修整 delegated professionals to repair	3	105	作业人员完成后自检，确认后由检验员再次进行全部检查 Workers after the completion of the self-checking, confirmed by the inspectors to check all again later	作业员 检验员 Operator/Inspector	检验记录 Inspection Record	5	5	2	50
80	喷漆 painting	喷漆 Painting	产品喷漆不良 Finishing issue on painted surface.	导致产品返工，返测困难 Parts need to rework, hard to trace	6	未按作业指导书要求作业 Failure to follow instructions	2	喷漆作业指导书 Spray paint inspection work instruction	2	24	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		喷漆品全检 Complete inspection of painted products	产品表面划痕伤 Scratches on part surface	产品返工或报废 Rework or Scrap	6	人员及检验员疏忽 Staff negligence	1	检验员 100% 检查 100% full inspection	2	12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			油漆调配比例不对 Wrong paint mixing ratio	油漆后的产品油漆性能测试达不到要求， The paint layer abrasion resistance test of the part after painting failed to meet the requirements.	7	人员及检验员疏忽 Staff negligence	1	按照油漆厂家配方进行调配，按比例写入喷漆作业指 导书内。每批油漆调配时，做好相关调配记录 Make the mixture according to the paint manufacturer's formula, record the ratio into the spray painting operation instructions. When mixing each batch of paint, make relevant mixing records	6	42	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		油漆调配 Paint Mixing	油漆调配比例不对 Wrong paint, hardener and thinner were used.	1. 附着力达不到标准要求，喷漆后产品表面会 脱落。 2. 油漆无法固化。 3. 造成喷漆完成后，产品外观质感与标准色板 有差异，颜色不符合要求。 1. The adhesion does not meet the standard requirements, the surface of the part will have peeling and pattern after spray painting. 2. The paint cannot be cured. 3. After the painting is completed, the appearance and feel of the part are quite different from the standard color plate, the color does not meet the requirements.	6	作业人员不清楚油漆配方， The operator not sure of the paint formula.	1	将油漆，稀释剂，固化剂和稀释剂，写入喷漆作业 指导书。每批调配严格按指导书要求调配。 Record the paint, thinner, curing agent models and ratios into the spray painting operation instructions. Each batch is prepared in strict accordance with the instructions.	3	18	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		喷漆过程 Spray painting process	喷漆过程中，灰尘落到产品表面，造成 产品颗粒不良。 During the painting process, dust falls on the surface of the part, causing defective part particles.	产品返工 Rework	5	产品打磨后表面有灰尘未清理干净，带 入喷漆室 After the part was polished, the dust on the surface was not cleaned and brought into the spray paint room.	3	1. 要求作业员每天上下班打扫现场卫生， 2. 产品完成抛光打磨后，将表面灰尘清理干净再进入 喷漆室。 1. Operators are required to clean the site every day on and off work. 2. After the part is grinded and polished, clean the surface dust before flowing into the spray paint room	3	45	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		喷漆后烘烤产品 Heated parts after spray painting	油漆烘烤后烘烤温度偏高 The heating temperature is too high after paint spraying	造成产品变形，鼓包不良。 Resulting in part deformation and defective bulging	5	烘烤温度设置不当 Improper heating temperature setting	2	确定好烘烤温度，加入到喷漆作业指导书，员工按指 导书要求作业。 Determine the heating temperature and add it to the spray painting instructions. Employees work according to instructions.	3	30	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			油漆烘烤后烘烤温度偏低 The heating temperature is too low after paint spraying	造成油漆干不透，附着力差。 As a result, the paint cannot dry completely and has poor adhesion.	6	烘烤温度设置不当 Improper heating temperature setting	2	确定好烘烤温度，加入到喷漆作业指导书，员工按指 导书要求作业。 Determine the heating temperature and add it to the spray painting instructions. Employees work according to instructions.	3	36	N/A	N/A	N/A	N/A	N/A	N/A	N/A
		丝印 Silk Screen Print	丝印颜色或附着力差 Silk screen print poor on the adhesive and abrasion	导致产品返工，返测困难 Parts need to rework, hard to trace	6	油墨配比测试不符合要求 Mixing of ink not meet requirements	2	1. 油墨调配厂家重新调配。 2. 丝印产品前先用色签核对，检查合格后再将产品 投入到丝印。 1. Ink screen print or color coupon for review to ensure that the color and logo are correct before proceeding to print on the part. 3. Screen printing operation instruction	2	24	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			丝印颜色不符合要求， Silk screen print colour difference	导致产品返工，返测困难 Parts need to rework, hard to trace	6	油墨配比测试不符合要求 Mixing of ink not meet requirements	2	1. 油墨调配厂家重新调配。 2. 丝印产品前先用色签核对，检查合格后再将产品 投入到丝印。 1. Ink screen print or color coupon for review to ensure that the color and logo are correct before proceeding to print on the part. 3. Screen printing operation instruction	2	24	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			丝印颜色不符合要求， Silk screen print colour difference	导致产品返工，返测困难 Parts need to rework, hard to trace	6	丝印作业不规范。 Screen printing operation instruction	2	丝印印刷作业指导书 Screen printing operation instruction	2	24	N/A	N/A	N/A	N/A	N/A	N/A	N/A
90	QC	产品在货架上摆放整齐，避免碰 碰 The products are neatly placed on the shelves to avoid collisions.	产品表面划伤伤 Scratches on part surface	导致产品返工，返测困难 Parts need to rework, hard to trace	6	人员及检验员疏忽 Staff negligence	1	检验员 100% 检查 100% full inspection	2	12	N/A	N/A	N/A	N/A	N/A	N/A	N/A
100	生产部 production department	领料 Material Requisition	使用错误的料号，和错误的数量，没有 按照先进先出的原则 Use of wrong part number and/or quantity, not following FIFO	产品返工或报废，产品质量问题无法追溯 Rework or scrap,hard to trace for quality issues	6	外包装无日期，品名等标识，仓管员未 按照先进先出执行 Packaging lacks labels for date, part number, etc.; warehousing staff did not comply with FIFO	2	仓管员收货核对并产品的标识及数量等进行核对，材 料标识清晰，先后批次标识区分摆放。 Warehouse verify the quantity and identification card of material, Clear labelling, organise labelled materials according to FIFO	4	48	N/A	N/A	N/A	N/A	N/A	N/A	N/A
110	生产部 production department		飞边(外观面上不允许有飞边) Flash (Free of Flash on the AAR surface)	影响产品装配 Affect assembly	2	注塑条件不佳 Molding conditions not optimised	3	受控工艺参数表 Authorised parameter form	4	24	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			漏检 Missing First-off-Part Inspection	影响生产和增加生产成本 Affect production and increases production costs	6	检验员疏忽 QC Inspector negligence	1	首件检验报告 First Off-Part Inspection Report	6	36	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			检验结论错误 Erroneous inspection result	影响生产和出货进度 Affect the production and delivery schedule	6	检验员能力不够 QC Inspectors not competent enough	1	首件检验报告 First Off-Part Inspection Report	5	30	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			尺寸超差 Dimensions out of tolerance	影响装配 Affect assembly	6	注塑工艺不佳 Molding parameter not optimised	2	受控工艺参数表 Authorised parameter form	3	36	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			导光灯杂质不良。	影响透光性	3	空气中的杂质混入，或者材料内有杂质 混入。	5	注塑完成后，灯光治具 100% 全检查	3	45	N/A	N/A	N/A	N/A	N/A	N/A	N/A
120	仓管员 Store Keeper		零件和数量错误 Wrong parts and quantity	影响出货 Affect delivery	4	状态标示不清楚 Identification of part status not clear	2	入库记录表 Storage Record Form	2	16	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			包装损坏 Packaging damaged	影响产品储存 Affect finished parts storage	4	在包装过程中外力太大造成 External force during packing	2	入库检验 Checking before storage	2	16	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			产品损坏 Finished Goods Damaged	客户不接收这批货 Customer does not accept the parts	6	在包装过程中外力太大造成 External force during packing	1	入库检验 Checking before storage	1	6	N/A	N/A	N/A	N/A	N/A	N/A	N/A
			标识与实物不符 Labeling not tally with Part	影响出货 Affect delivery	4	标签打印错误 Error labeling	2	入库检验 Checking before storage	1	8	N/A	N/A	N/A	N/A	N/A	N/A	N/A

130	生产部 production department	物料 Material Requisition	使用错误的材料，和错误数量，没有按照先进先出的原则 Using the wrong material (number) and wrong quantity; not in accordance to FIFO principle	产品返工或报废，产品质量问题无法追溯 Rework or scrap, quality issues will be difficult to trace	6	外包装无日期，品名等标识，仓管员未按照先进先出执行 No identification and indicating "Date, Part no., etc." on label; not following FIFO	2	仓库管理员收货并对产品的标识及数量等进行核对 Warehouse verify the quantity and identification of Part and quantity	2	24	N/A	N/A	N/A	N/A	N/A	N/A
140	生产部 production department	组装 Assembly	1.组装间隙，错位，脱落等不良。 Assembly gap, misalignment, dropping off issue and other defects. 2.漏装等配件。 Missing of components	产品不合要求 Part does not meet requirements	6	作业方法不对 Incorrect working method	2	组装作业指导书 Assembly Work Instruction	0		N/A	N/A	N/A	N/A	N/A	N/A
			使用的胶水超过有效期 The glue used exceeds the expiration date	导致产品无法粘接，或粘接不牢固 As a result, the part cannot be bonded or the bonding is not strong.	6	作业人员使用前，未仔细核对胶水有效期 The operator did not carefully check the expiration date of the glue before using it.	2	1.后续购买胶水时，购买小瓶的胶水，避免多次使用不完造成浪费浪费。2.增加胶水使用记录表，记录下每位生产使用的胶水批次号及有效期 When purchasing glue later, purchase small bottles of glue to avoid expiration waste caused by incomplete use. 2. Add a glue usage record sheet to record the batch number and expiration date of the glue used in each batch of production.	4	48	N/A	N/A	N/A	N/A	N/A	N/A
			点胶机气压过大或不足。 The air pressure of the dispensing machine is too high or insufficient.	导致点胶量不稳定，点胶不均匀。 Resulting in unstable dispensing amount. Uneven dispensing.	6	未明确设置气压参数及点胶移动速度。 The air pressure parameters and air pressure dispensing movement speed are not clearly set.	2	设定好指定的点胶速度及气压参数，加入组装指导书。（每班生产前，批生产结束时，检查并记录） Set the fixed dispensing speed and air pressure parameters and add the assembly instructions. (Check and record before each batch of production and at the end of batch production)	4	48	N/A	N/A	N/A	N/A	N/A	N/A
			点胶机程序错误 Dispensing machine program used incorrectly	导致点胶位置错误，无法正常作业。 As a result, the dispensing position is wrong and normal operation cannot be performed.	8	无点胶机使用作业指导书。 Instructions for using glue-free dispensing machines.	2	制作点胶机使用作业指导书，按指导书操作。 Make the operating instructions for the dispensing machine and operate according to the instructions.	3	48	N/A	N/A	N/A	N/A	N/A	N/A
			产品放入点胶台过程中，产品表面划伤不良。 During the process of placing the part into the dispensing jig, the surface of the part was badly scratched.	导致产品外观不良，需重新返序处理。 Resulting in poor part appearance. Need to be rework again.	5	点胶工具上的旧胶等杂质或作业不规范造成。 The paper tape on the dispensing fixture is damaged or the work is irregular.	3	点胶前及点胶后，检查产品外观是否完好，及台具上的防护膜是否破损。如有异常，及时处理。Before and after dispensing glue, check whether the appearance of the part is intact and whether the protective film on the fixture is damaged. If there are any abnormalities, handle them promptly.	3	45	N/A	N/A	N/A	N/A	N/A	N/A
			产品放入点胶台后，检具压块没锁牢固。 After the part is put into the dispensing jig, the clamping block of the inspection tool is not firmly locked.	导致点胶时，产品松动，点胶位置偏差。 As a result, the part becomes loose during dispensing and the dispensing position deviates.	5	手动拧紧螺丝过程中，不能保证用力大小一致，造成部分压块未锁紧。 During the manual tightening of the screws, the force cannot be guaranteed to be consistent, causing some of the pressure blocks to not be locked.	2	提醒检查员检查电动扳手力矩大小是否调整到位，将力矩要求加入到组装指导书内。 Before tightening the screws, check whether the force value of the electric wrench is adjusted properly. Add force requirements to assembly instructions.	4	40	N/A	N/A	N/A	N/A	N/A	N/A
			将产品推入紫外线下烘箱时，没推到合适的位置。 When pushing the part into the UV heating chamber, it was not pushed to the proper position.	导致胶水固化不均匀，产品粘接不牢固 As a result, the glue solidifies unevenly and the part is not firmly bonded.	4	指导书未明确规定推入紫外线下烘箱的位置。 The instructions do not specify where to push the UV chamber.	2	将台具上加入防错手板，当治具底不到位时，将门挡无法关上。 Add an error proof hand plate to the fixture. When the fixture cannot be pushed in place, the door baffle cannot be closed.	4	32	N/A	N/A	N/A	N/A	N/A	N/A
			装配点胶时，胶水量不多 When dispensing glue during assembly, the amount of glue is not enough	导致产品粘接不牢固，后续使用存在粘接位置开裂风险。 As a result, the part is not firmly bonded and there is a risk of cracking at the bonding location during subsequent use.	8	当注射枪内胶水较少时，作业人员未及时添加胶水。 When there was less glue in the injection gun, the operator did not add glue in time.	2	每件产品点胶完成后，需检查胶水剩余量及点胶量，视需要及时添加。 After the glue dispensing of each part is completed, the remaining amount of glue and the amount of glue dispensed need to be checked and timely addition is required as needed.	5	80	N/A	N/A	N/A	N/A	N/A	N/A
			装配点胶时，胶水外溢出 Glue overflows when dispensing glue during assembly	导致产品外观不良，重新返工。 Resulting in poor part appearance, rework again.	7	作业方法不对 Incorrect working method	2	组装作业指导书 Assembly Work Instruction	3	42	N/A	N/A	N/A	N/A	N/A	N/A
			胶水固化时间不够 Glue curing time is not enough	导致产品粘接不牢固，后续使用存在粘接位置开裂风险。 As a result, the part is not firmly bonded, there is a risk of cracking at the bonding location during subsequent use.	6	未明确规定胶水固化所需时间。 The time required for the glue to cure is not specified.	2	将固化时间写入组装作业指导书内，≥40s. 要求将产品放入柜子，盖上门板，开启光源后，再开启计时器，时间到达后再等0.5秒左右，才关闭光源外光。现场使用计时器。 Record the curing time in the assembly operation instructions, ≥40s. It is required to put the part into the cabinet, cover the door panel, turn on the light, source and then turn on the timer. After the time is up, wait for about 0.5 seconds before turning off the UV light. On-site use timer.	6	72	N/A	N/A	N/A	N/A	N/A	N/A
			粘胶位置偏离 The position of the film is deviated	影响产品质量 Affect part quality	3	贴膜作业不规范 Film work process not standardised	2	贴膜作业指导书 Film work instructions	3	18	N/A	N/A	N/A	N/A	N/A	N/A
150	生产部 production department	视频扫描检查 Video Recording Check	视频无法清晰捕捉区域/角度 area/angle not able to capture clearly by video	导致产品返工，追溯困难 Parts need to rework, hard to trace	6	检验员疏忽 Staff negligence	1	视频检查前，包装人员拿起产品，对所有的面进行仔细检查。Before the video inspection, the packer picks up the part and carefully inspects all the sides. (零件必须从任何角度进行检查，不合指定角度，No angle will be specified and parts are subject to check at any angles.)	2	12	N/A	N/A	N/A	N/A	N/A	N/A
		包装 Packaging	包装不能有效保护产品。 Packaging does not effectively protect the part.	导致产品外观不良，重新返工。 Resulting in poor part appearance, rework again.	5	没能选择适合的包材。 Failed to choose suitable packaging material.	3	针对产品造型设计合适包材，包装经过自由落体验证后，确定能完好时保护产品后，才能批量使用。 Appropriate packaging materials are designed according to the part shape, the packaging can be used in batches only after it has been verified by free fall and can protect the part is intact.	3	45	N/A	N/A	N/A	N/A	N/A	N/A
			包装产品过程破损不良。 The process of packaging parts is defective.	导致产品外观不良，重新返工。 Resulting in poor part appearance, rework again.	5	包装台外无光防护，包装作业时容易碰撞产品。 The packaging table has no protection against leakage. It is easy for parts to be bumped during packaging operations.	3	包装台垫上海棉。 Cover the packaging table with foam.	3	45	N/A	N/A	N/A	N/A	N/A	N/A
			包材用错。 Wrong packaging material used.	造成产品无法包装，或者包装后产品保护不到位 The part cannot be packaged or the part is not properly protected after packaging.	5	包装人员不清楚包材规格。 Packaging personnel do not know the packaging material specifications.	2	包材规格及用量写入包装指导书内，包材放入仓库固定位置，使用时由专人到库领取。 The specifications and amount of packaging materials are written in the packaging instructions, the packaging materials are placed in a fixed location in the warehouse. When used, a designated person will pick them up at the location.	3	30	N/A	N/A	N/A	N/A	N/A	N/A
160	仓库 warehouse	库存 Product storage	成品存储超过有效期 Expired shelf life of finished goods.	影响产品性能 Affect function and performance	6	没有遵循先进先出原则 Failure to follow FIFO	2	物料接收章和先进先出管理 Receiving Stamp and FIFO Management	3	36	N/A	N/A	N/A	N/A	N/A	N/A
170	仓库 warehouse	出货 Outgoing Shipment	发货错，少量 The delivery is short of quantity	影响客户生产 Affect customer production line	6	没仔细核对发货单 Not checking the invoice carefully	2	发货单 Invoice	4	45	N/A	N/A	N/A	N/A	N/A	N/A
180	仓库 warehouse	发运 Forwarding despatch	发货错，少量 The delivery is short of quantity	影响客户生产 Affect customer production line	6	没仔细核对发货单 Not checking the invoice carefully	2	发货单 Invoice	4	45	N/A	N/A	N/A	N/A	N/A	N/A
			产品受损 Products to receive damage	影响产品质量 Affect product quality	6	运输过程防护不当 Improper protection during transportation	2	产品的防护管理程序 Preservation of product procedure	4	45	N/A	N/A	N/A	N/A	N/A	N/A

用户后果 (Customer Effect)	HANSON Factory 制造/生产后果 (Manufactory effect)			标准 (Criteria: Severity of Effect Defined)	Effect	评分 (Ranking)
潜在失效模式影响安全性能或包含不符合法规情形，失效发生时无警告	Potential failure mode affects safety or involves noncompliance with government regulation. Failure occurs without warning.	可能危及作业人员（机械或电路）而无警告	Hurt operator (machine) without warning	May endanger operator. Failure mode affects safe vehicle operation and / or involves noncompliance with government regulation. Failure will occur WITHOUT warning.	Hazardous-without warning	10
潜在失效模式影响安全性能或包含不符合法规情形，失效发生时无警告	Potential failure mode affects safety issue or involves noncompliance with government regulation. Failure occurs with warning.	可能危及作业人员（机械或电路）但有警告	Hurt operator (machine) with warning	May endanger operator. Failure mode affects safe vehicle operation and / or involves noncompliance with government regulation. Failure will occur WITH warning.	Hazardous-with warning	9
丧失基本功能（产品不能运行，但不影响安全性）	Loss of primary function (Product cannot be used but does not affect safety)	产品可能必须受 100% 丢弃 产线停止并停止发运	Product may be scrapped 100% stop line ,stop shipment	Major disruption to production line. 100% of product may have to be scrapped. Vehicle / item inoperable. Loss of primary function. Customer very dissatisfied.	Very High	8
主要功能降低（产品可运行，但性能显著降低）	Primary function reduced (product can be used, but functional performance degraded)	产品可使用一部分，(少于100%)必须丢弃。主要过程中出现偏差（生产稼动率降低或需要增加人力）	A part of product can be used, (less than 100%) may be scrapped. Major process has problem (production line speed will be slower or increase manpower)	Minor disruption to production line. Product may have to be sorted and a portion (less than 100%) scrapped. Vehicle / item operable, but at a reduced level of performance. Customer dissatisfied.	High	7
次要功能丧失（产品可运行，但便利功能丧失）	Loss of minor function (product can be used but with loss in functions such as convenience)	产品使用必须在 100% 返工之后	Must rework the 100% product off-line before use. A part of product may be scrapped	Minor disruption to production line. A portion (less than 100%) may have to be scrapped (no sorting). Vehicle / item operable, but some comfort / convenience item(s) inoperable. Customers experience discomfort.	Moderate	6
次要功能降低（产品可运行，但便利功能降低）	Reduction of minor function (product can be used but with degradation in functions such as convenience)	一部分产品使用必须经过返工	A part of product must be rework off-line before use	Minor disruption to production line. 100% of product may have to be reworked. Vehicle / item operable, but some comfort / convenience item(s) operable at reduced level of performance. Customer experiences some dissatisfaction.	Low	5
产品可使用，但是外观或噪音等项目不合格，并大多数（>75%）客户会发现这些缺陷	Product can be used but aspects such as cosmetic appearance and sound insulation doesn't meet spec; majority (>75%) user can detect these defects	产品使用必须在 100% 在线返工之后	Must rework the 100% product on the production line before use	Minor disruption to production line. The product may have to be sorted and a portion (less than 100%) reworked. Fit / finish / squeak / rattle item does not conform. Defect noticed by most customers.	Very Low	4
产品可使用，但是外观或噪音等项目不合格，并多（50%）客户会发现这些缺陷	Product can be used but aspects such as cosmetic appearance and sound insulation doesn't meet spec; many (50%) user can detect these defects	一部分产品使用必须经过在线返工	A part of product must be rework on the line before use	Minor disruption to production line. A portion (less than 100%) of the product may have to be reworked on-line but in-station. Fit / finish / squeak / rattle item does not conform. Defect noticed by average customers.	Minor	3
产品可使用，但是外观或噪音等项目不合格，并少数（<25%）有辨别能力客户会发现这些缺陷	Product can be used but aspects such as cosmetic appearance and sound insulation doesn't meet spec; some (<25%) user can detect these defects	对过程，作业或作业人员带来轻微不便	Make inconvenience for process, operation or operator	Minor disruption to production line. A portion (less than 100%) of the product may have to be reworked on-line but in-station. Fit / finish / squeak / rattle item does not conform. Defect noticed by discriminating customers.	Very Minor	2
没有可识别的后果	No identifiable effect	没有可识别的影响	Even operator find out the defect, no actions needed	No effect.	None	1

RPN得分与对策基准对照表 (RPN value and corrective actions matrix)				
等级 (Grade)	得分 (RPN value)	对策基准 (Action standard)		备注 (Notes)
S	≥512	设计变更对策 (Design change)		
A	≥216	一定要下对策 (Prevent action required)		
B	≥100	尽量下对策 (Take actions if possible)		
C	≥27	视情况下对策 (Take action considering manufacturing impact)		
D	<27	视情况下对策 (Take action considering the risk)		
Occurance>7 or Severity>7 or Detection>7		一定要下对策 (Preventive action required, it is imperative to act regardless of the RPN value)		列入A (Same as A)

HAINAN Production Quality FMEA & OCCURRENCE EVALUATION RANKINGS						
失效可能性 (Probability of Failure)	失效可能性 (Possible Failure Rates)	Cpk	PPM	%	(评价) Ranking	
Very High. Failure is almost inevitable	很高: 失效几乎是必然的	1 in 2	Persistent failures >= 100,000 ppm	>= 10	10	
		1 in 3	>= 50,000 ppm < 100,000 ppm	5	9	
High. Generally associated with processes similar to previous processes that have often failed	高: 发生在与之前经常有失效的类似过程	1 in 8	>= 20,000 ppm < 50,000 ppm	2	8	
		1 in 20	Occurrence about 1 per month or >= 10,000 ppm < 20,000 ppm	1	7	
Moderate. Generally associated with processes similar to previous processes which have experienced occasional failures, but not in major proportions	中等: 发生在与之前偶尔有失效的类似过程	1 in 80	Occasional Failure of about 1 every 3 months or >= 5,000ppm < 10,000ppm	0.5	6	
		1 in 400	Occurrence about every 6 to 12 months or >= 2,000 ppm < 5,000 ppm	0.2	5	
		1 in 2,000	1000 ppm	0.1	4	
Low. Isolated failures associated with similar processes	低: 孤立的失效发生在大多数类似过程	1 in 15,000	500 ppm	0.05	3	
Very Low. Only isolated failures associated with almost identical processes	很低: 孤立的失效发生在特定类似过程	1 in 150,000	100 ppm	0.01	2	
Remote. Failure is unlikely. No failures ever associated with almost identical processes	极低: 失效可能性低。在大多数的过程中都没有发生过失效	1 in 1,500,000	10 ppm	<0.001	1	

HANSON Production Quality FMEA Detection Rankings						
可探测 (Detection)		危险类型		人工检查 Visual	注释 - 缺陷数量之可能输出率 Criteria: Likelihood the existence of a defect will be detected by test content	评分 (Ranking)
		系统故障 SFC	测量 Measure			
Almost impossible	几乎不可能			o	确定无法探测, 也没有检查。 (No way to detect and inspect)	10
Very Remote	很难小			o	现在的控制方法不可能探测, 仅能以间接或偶然的机会来发现。 (Current control processes cannot detect, can only be detected via indirect or sampling methods)	9
Remote	渺小			o	现在的控制方法有微小机会去探测, 仅能以目视检查来达到控制。 (Current control processes can detect with a low possibility, can be detected with visual inspection)	8
Very Low	很低			o	现在的控制方法有微小机会去探测, 现场无法察觉, 需要工程师利用视觉检查或手助力来发现, 或通过双通道目视检查来达到控制。 (Current control processes can detect with a low possibility; cannot be detected on site and requires engineers to use equipment with complex procedures or repeated visual inspection to detect)	7
Low	低		o	o	现在的控制方法可能可以探测, 但失败无法察觉或不能及时发现, 只能通过图表方法 (比如: SPC) 来达到控制。 (Current control processes may be able to detect but loss in efficiency is difficult if not impossible to detect; control can be achieved only with graphical methods such as SPC chart)	6
Moderate	中等		o	o	现在的控制方法可能可以探测, 但只能在给定的由其他测量设备才能发现。 (Current control processes may be able to detect but gauge or measuring instruments must be used to detect)	5
Moderately High	中上	o	o	o	现在的控制方法有很好的机会去探测, 可在操作过程中探测失败, 或操作作业前和部件的可靠性探测失败。 (Current control processes can detect at a high chance; failure can be detected in the subsequent operation or through pre-operations preparation and during FA inspection)*	4
High	高	o	o	o	现在的控制方法有很好的机会去探测, 本工作也可发现失败, 或后续作业中可探测到失败。 (Current control processes can detect at a high chance; failure detection can occur in the current operation or the subsequent operation)	3
Very High	很高	o	o	o	现在的控制方法几乎可以探测, 或制造设备都可自动探测到失败, 失败产品不能继续通过。 (Current control processes can detect almost all the time; on-site production facilities can determine and detect failure automatically. Unqualified products shall not pass.)	2
Almost Certain	几乎肯定	o			现在的控制方法肯定可以探测, 已设计了防错, 失败产品不会发生。 (Current control processes can definitely detect; prevention ensures that failed products do not occur)	1

* Note: Identical to Manual except for Rankings of 6 and 4. Words "OR gauging performed on setup and first piece check" moved from a detection of 6 to a detection of 4