

STANDARD OPERATING PROCEDURE: NON-CONFORMANCE CONTROL, REWORK & RE-INSPECTION PROTOCOL

不合格输出控制、受控返工与复检放行标准操作规程（中英文完整技术版）

1. Identify
发现记录2. Quarantine
标识隔离3. Assess Scope
范围评估4. Disposition
处置评审5. Rework/Repl.
受控返工6. Re-Inspect
全项复检7. Release/Reject
放行拒收8. CAPA
纠正预防

1. SCOPE & QUALITY POLICY (适用范围与核心方针)

1.1 Purpose & Scope: This standard defines the strict technical process for identifying, segregating, evaluating, reworking, re-inspecting, and dispositioning non-conforming items across inflatable Stand-Up Paddle Boards (SUP), kayaks, and related accessories manufactured under Qingdao Vatrads Group Co., Ltd.

1.1 目的与范围: 本规范规定了青岛万国通衢进出口有限公司在充气桨板 (SUP)、充气皮划艇及配套附件生产制造过程中, 针对不合格品的识别、隔离、评审、返工、复检与处置的全流程技术要求。

1.2 Quality Mandate: No product or raw material failing defined acceptance criteria (approved golden sample, engineering drawing, artwork vector file, BOM, and QIP) shall be processed, assembled, or packed for export without authorized disposition and 100% re-inspection sign-off.

1.2 质量铁律: 凡未达到规定验收标准 (签样封样件、工程图纸、矢量图稿、BOM物料表及质量检验计划) 的原材料或半成品/成品, 未经正式评审授权及100%全项复检签字, 严禁转序、装配或包装出口。

2. MULTIDISCIPLINARY AUTHORITY MATRIX & MRB (处置权限矩阵与物料评审委员会)

Defect Severity (缺陷等级)	Typical Trigger / Scenario (典型场景)	Review Authority (评审决策主体)	Required Sign-off & Document (必需签署与文档)
Minor (轻微缺陷)	Minor accessory packaging misalignment, superficial carton smudge, slight EVA edge trimming burr (< 1mm).	Shift QC Lead + Assembly Line Supervisor (工段班组长)	Standard NCR Sign-off within 2 hours. 内部NCR快速签批与记录。
Major (主要缺陷)	Slow valve air leakage, EVA misalignment (> 2mm), missing accessory, color shade mismatch within delta tolerance.	QA Manager + Production Manager + Technical Engineer	Authorized Standard Rework Instruction (SRI) + Full Re-test Report. 受控返工工单+全套复检单。
Critical (严重缺陷)	Drop-stitch inner burst, main seam rail delamination under pressure, logo misprint/typo, unapproved spec change.	Material Review Board (MRB) + Client Written Approval (客户书面批准)	Mandatory Concession Approval Form or Scrap Destruction Certificate. 必须客户书面让步协议或报废销毁证明。

3. END-TO-END 8-STAGE DETAILED TECHNICAL PROCEDURE (8阶段技术规程细则)

Stage 1: Detection & Immediate Containment (工序发现与即时阻断)

Upon discovering defects at IQC (fabrics, valves, glue), IPQC (heat-welding, gluing, EVA lamination), or FQC (inflation hold), the inspector issues an immediate "Line Hold". The physical station is halted for that batch within 15 minutes to prevent downstream spillover.

阶段1: 发现与即时阻断 —— 在IQC来料、IPQC热合/贴合/EVA定位或FQC充气保压检测中一旦发现异常, 检验员立即下达停线指令, 15分钟内锁定工位, 防止批量流入下道工序。

Stage 2: Labeling & Physical/Digital Quarantine (状态标识与双重隔离)

Physical Tagging: Attach fluorescent yellow "HOLD" or red "REJECTED" tag specifying NCR ID, SKU, Date, Defect Code, and Qty. Digital Locking: Barcode locked in ERP/MES system to prevent scanning into next stage or shipping lot.

阶段2: 标识与隔离 —— 物理悬挂黄底"HOLD"或红底"REJECTED"标签, 详细标注NCR编号、SKU、日期及缺陷代码; 同时在ERP/MES系统中锁定对应条码, 杜绝扫码出库。

Stage 3: Boundary & Scope Assessment (批次边界与影响范围追溯)

Quality Engineering traces raw material lot # (e.g., PVC fabric batch, adhesive pot-life timestamp, valve vulcanization lot). All boards produced in the same 8-hour shift or using the same tooling are placed under quarantine for statistical AQL expansion testing.

阶段3：范围追溯 —— 质量工程追溯PVC面料批号、胶水配制时间戳、气阀硫化批次。同班次、同模具生产的所有浆板全部纳入隔离范围，启动AQL加严抽检或100%筛查。

Stage 4: MRB Disposition Review (MRB多方处置决策)

Options: [1] Controlled Rework (SRI-guided), [2] Component Replacement, [3] Supplier Return (RMA), [4] Scrap & Structural Destruction, [5] Concession (Requires written client sign-off). Unauthorized cosmetic patching is strictly forbidden.

阶段4：处置决定 —— 路径包括：受控返工、零部件替换、供应商退货（RMA）、物理销毁报废、让步接收（必须客户书面签署）。严禁一线工人未经审批私自涂胶修补。

Stage 5: Standardized Rework Execution (受控返工技术规范)

All rework must follow written Standard Rework Instructions (SRI). Parameters (hot air temperature 320°C–380°C, clean MEK surface prep, two-component PU glue curing time 24h) are strictly recorded with operator badge ID.

阶段5：受控返工实施 —— 返工必须依令执行，严格记录作业参数（热风枪温控320°C–380°C、MEK专用溶剂表面脱脂活化、双组份PU胶水24小时恒温固化），登记操作工号。

Stage 6: Independent 100% Re-Inspection Protocol (独立全项复检规范)

Independent QA (not the rework artisan) executes re-inspection. For all seam/valve interventions: re-inflate to maximum rated PSI (15–18 PSI), hold for 24–48 hours; pressure decay must not exceed ≤ 0.05 PSI at calibrated ambient temperature.

阶段6：全项独立复检 —— 由独立品控员检验。凡涉及接缝、导轨、气阀等返工，必须重新充气至15–18 PSI满压，重新执行24-48小时保压复测，温补校准后压降不得超过0.05 PSI。

Stage 7: Release Sign-off or Permanent Scrap (授权放行与破坏性报废)

Passing items receive QA Release stamp and ERP status release. Irreparable boards have their D-rings cut and PVC hulls structurally slit into non-reusable pieces under QA supervision to prevent black-market or counterfeit circulation.

阶段7：放行与报废 —— 复检合格后盖章放行并解锁系统。对报废板体，在QA监督下剪除D扣并划破气室，执行破坏性报废，杜绝残次品流入灰色市场。

Stage 8: Root Cause Analysis & CAPA Loop (根因分析与纠正预防闭环)

Whenever defect rate on any line exceeds 1.5%, an 8D / 5-Why investigation is initiated within 24 hours. Corrective actions (jig redesign, adhesive mixing SOP revision, supplier audit) are verified over the next 3 successive production lots.

阶段8：CAPA闭环 —— 当工序不良率超过1.5%时，24小时内启动8D/5-Why分析，工程与工艺措施在后续连续3批生产中跟进验证有效性。

4. SUP DEFECT DISPOSITION & RE-INSPECTION MATRIX (常见缺陷处置与复验矩阵)

Defect Category	Standard Disposition & Engineering Protocol	Re-Inspection & Validation Benchmark	Web Status
Slow Valve Leakage 气阀/阀座慢漏气	Isolate board. Dismantle valve core with calibrated torque wrench (25 N·m). Clean inner threads, replace silicone O-ring, re-torque.	Submerge valve housing in bubble solution; re-inflate to 18 PSI for full 24h pressure-drop test (≤ 0.05 PSI delta).	Controlled Rework
Rail Seam Bubbles 侧围双层导轨起泡虚粘	Quarantine shift batch. Heat-delaminate bubble zone, remove residual glue using solvent, apply 2-component PU glue, heat-press at 5 bar.	100% visual/tactile inspection along entire 360° rail circumference; 1.25x proof pressure burst-safety check + 48h airtightness hold.	Full Pressure Re-test
EVA Pad Skew / Lift EVA防滑垫偏斜/起边	Heat-assist peel using temperature-regulated nozzle (80°C). Strip contact adhesive without fabric gouging. Re-align with precision acrylic jig.	Tolerance check against outline ($\leq \pm 1.5$ mm). 180° peel strength test on sample swatch. Edge adhesion probe test.	Controlled Jig Rework
Branding Typo / Misprint 客户Logo错版/色差超标	Halt printing line immediately. Hold all printed panels. Review vector revision with client account manager.	Spectrophotometer color check ($\Delta E \leq 1.5$). 100% visual text alignment verification against client-signed vector PDF.	Client Sign-off Req.
Carton Packing Mismatch 配件漏装/说明书错版	Quarantine entire export pallet batch. Unbox and perform 100% BOM item-by-item verification (pump, fin, leash, paddle, repair tube).	Inline dynamic electronic checkweigher validation (± 30 g variance). Optical 2D barcode scanner verification against PO SKU.	100% Unbox & Re-check

5. FORMAL NON-CONFORMANCE REPORT (NCR) & CAPA FORM (NCR标准表单模板)

NCR Report Number:	NCR-2026-SUP-0814	Date & Shift:	2026-08-14 / Shift A (Morning)
Customer / PO Ref:	OEM Client Code / PO# 20260801	Detection Stage:	[] IQC [] IPQC [x] 24h Airtightness [] FQC
Product / SKU:	10'6" Touring Inflatable SUP (Dual Layer)	Batch / Lot #:	FAB-202608-01 / GLUE-PU-88
Inspected Quantity:	120 Units	Defect / Hold Qty:	3 Units (Airtightness decay > 0.1 PSI)
Defect Description:	Micro-porosity detected around rear valve flange welding zone. High-res macro photo recorded in QC file #P2608-3.		
MRB Disposition:	[x] Controlled Rework per SRI-V08 [] Return to Vendor [] Scrap / Destroy [] Client Concession		
Rework & Re-Inspection:	Replaced valve flange silicone seal; re-torqued to 25 N-m. 48h pressure test completed: Final pressure 15.02 PSI (Delta = 0.00 PSI). Result: PASS.		
Signatures:	Lead QC: Zhang Wei (QA-04)	Prod Engineer: Li Ming (ENG-02)	QA Director: Approved (QA-DIR)

Corporate Quality Commitment (万国通衢全球客户品质承诺):
Qingdao Vatrado Group Co., Ltd. operates with zero tolerance for compromised water safety. Our open-door ISO 9001:2015 tracking architecture guarantees that every SUP reaching international waters has undergone rigorous, documented, and fully validated quality release procedures.