Item Process/Step	Potential Failure Mode	Potential Effects of Failure	Severity	Potential Causes of Failure	Occurrence	Current Controls	Detection	RPN	Recommended Actions
Customer Ordering	Order cancellation after order has been processed	Excess inventory, wasted resources, lower customer satisfaction	6	Unclear purchasing process, change in customer demand, delay in processing	5	Order confirmation system, customer service follow-up	4	120	Develop a more intuitive ordering system, implement real-time order tracking, enhance customer communication protocols
Receiving	Receiving wrong materials	Production delays, increased handling costs, project timeline disruption	7	Vendor mislabeling, purchase order errors	3	Incoming inspection protocols	5	105	Increase frequency of vendor audits, improve purchase order verification steps
Tubular Steel Cutting	Inaccurate cuts due to equipment misalignment	Wasted material, potential for non-conformant final products	5	Equipment wear, incorrect setup	3	Regular maintenance, calibration checks, operator training	6	126	Automate cutting process, introduce laser-guided cutting systems for precision
Color Paint	Paint adhesion failure leading to peeling	Customer complaints, lower throughput	5	Inadequate surface preparation, incorrect paint mixture	3	Adherence to painting procedures, regular paint batch testing	4	84	Implement surface energy measurement, upgrade to higher-quality paint supplies
Touch-up & Quality Check	Overlooked defects due to inspection oversight	Higher defect rate, compromised product integrity	10	Inspection fatigue, lack of detailed guidelines	4	Detailed quality checklists, random quality audits	5	**160**	Introduce automated optical inspection, provide additional training for inspectors
PCB Functional Testing	PCBs passing with undetected failures	Subsequent product failures, customer safety incidents	9	Faulty test fixtures, incorrect test sequence implementation	5	Rigorous test procedure, routine test equipment checks	4	**180**	Employ automated test equipment with self-diagnostic capabilities, enhance test coverage
Scooter, Stem, and Handlebars Assembly	Improper torque application on assembly screws	Scooters may disassemble during use, leading to accidents	5	Bad training	4	Torque specification adherence, random post-assembly testing	3	120	Deploy smart tools with programmed torque settings, introduce a worker certification program
Scooter Metal Base Assembly	Weld failure resulting in structural compromise	Increased risk of injury due to base collapse	5	Inconsistent welding techniques, material impurities	4	Weld strength tests, in-process inspections	4	**144**	Implement real-time weld monitoring systems, standardize materials from certified suppliers
Weld Stem and Metal Base	Weak weld joints	Compromised product durability, potential safety hazards	5	Improper welding parameters, operator error	4	Weld inspection procedures, operator training	4	144	Introduce automated welding with quality feedback loops, periodic welder recertification
Machine Changeover	Extended downtime	Production delays, missed deadlines	10	Machines that are not maintained well	2	Changeover checklists, training sessions	6	60	Standardize changeover procedures, implement SMED (Single-Minute Exchange of Dies)
Electronics Assembly	Incorrect component placement	Nonfunctional electronics, potential recall	7	Component mislabeling, machine misalignment	3	Component verification system, assembly automation	5	120	Improve component traceability, enhance machine vision systems for placement verification
Final Assembly	Missing parts	Incomplete product, customer dissatisfaction	6	Inventory shortages	4	Final inspection checklist, assembly line monitors	3	84	Integrate parts verification system in the assembly line, apply IoT tracking for inventory
Packaging	Inadequate packaging	Damaged product during shipping, returns	6	Poor material quality, improper packaging technique	2	Packaging standards, random sample checks	7	84	Upgrade to robust packaging materials, provide specialized packaging training
Finished Product Shipped	Delay in shipment delivery	Customer dissatisfaction, order cancellation	6	Logistic inefficiencies, carrier delays	3	Logistics planning, carrier performance monitoring	5	90	Implement advanced logistics software, diversify carrier options, establish contingency plans

Inventory on the Floor	Excess inventory accumulation	Increased storage costs, reduced cash flow	4	Overproduction, forecasting errors	3	Inventory management system, regular audits	6	72	Refine demand forecasting, enhance just-in-time (JIT) inventory practices, regularly review inventory levels
Workplace Environment	Poor ergonomic design leading to worker injury	Decreased productivity, worker's compensation claims	7	Inadequate workplace design, insufficient ergonomic tools	3	Ergonomic assessments, staff training	4	84	Conduct regular ergonomic workshops, invest in ergonomic equipment, perform routine workplace safety audits