



Mastering the Titanium Claw: A Technician's Guide Guide to Flawless Through-Hole Soldering

Best practices for Selection, Operation,
and Maintenance to eliminate
defects and maximize yield.



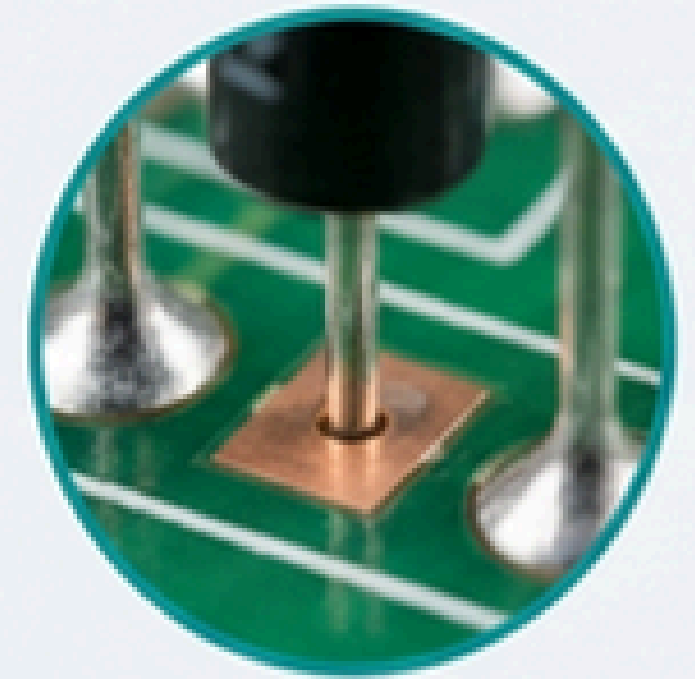
The Hidden Cause of Common Soldering Defects

When you see soldering defects, what's the first suspect? Flux? Solder? Temperature profiles? Often, the true culprit is mechanical: inconsistent PCB stability during transport. This instability is the root cause of issues like:

- ✓ PCB Vibration
- ✓ Board Warping or Sagging
- ✓ Inconsistent Wave Contact



Bridging



Solder Skips



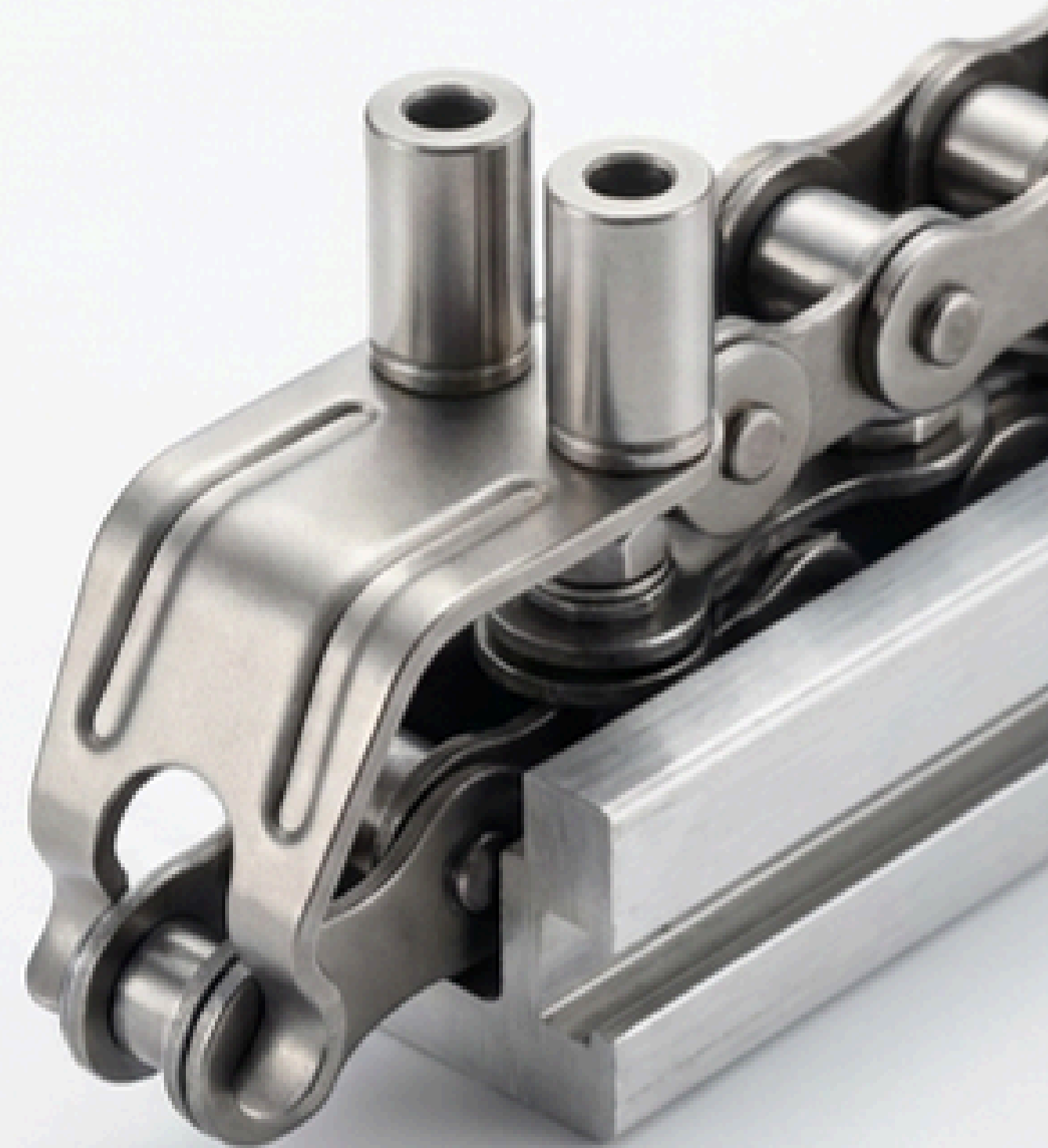
Icicles

The Critical Point of Contact: Your First Line of Defense

The titanium conveyor claw is the only component that maintains contact with the PCB throughout the entire thermal journey:

Fluxing → Preheating → Soldering → Cooling.
Its performance is fundamental to the soldering process.

- ✓ **Resists Deformation:** Ensures the PCB is held at a consistent angle.
- ✓ **Prevents Solder Adhesion:** Maintains a clean contact point for precise positioning.
- ✓ **Ensures Smooth Transport:** Eliminates jitter and vibration that cause defects.



Advanced Selection for Demanding Boards

Standard claws may not prevent warping or sag on heavier, larger, or thinner PCBs. This leads to inconsistent contact with the solder wave and results in defects.

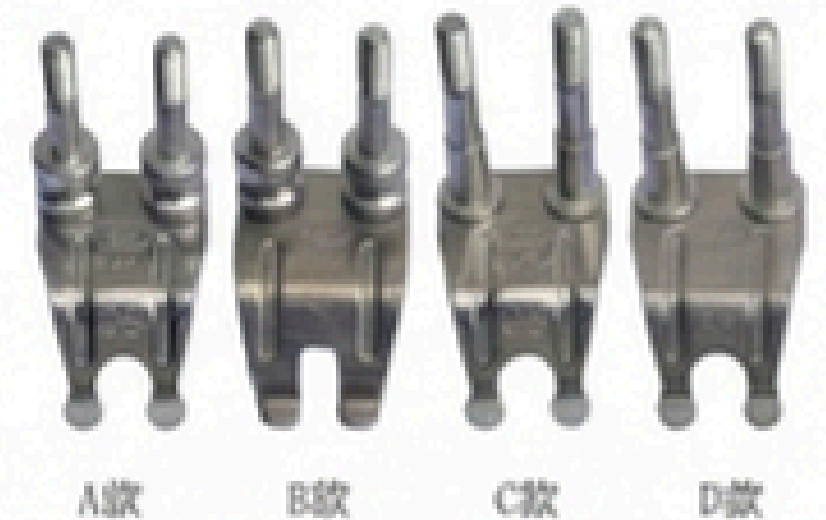
Solution Spotlight

Southern Machinery Dedicated Heavy Double Claw

- Engineered for maximum stability, capable of bearing up to **80KG**.
- The multi-part JT10434 series offers robust, configurable support to prevent board flex throughout the critical preheat and soldering stages.



JT10434



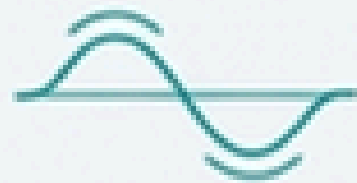
PILLAR 2: USE - A Stable System for a Stable Process

Before any run, verify the mechanical foundation of your wave solderer.
A high-performance claw requires a high-performance system.

Pre-Run Checklist for Process Engineers



Rail Parallelism: Verify **precision is less than $< 0.2\text{mm}$** . Our specialized aluminum rails with 6-point support ensure consistent guideway parallelism.



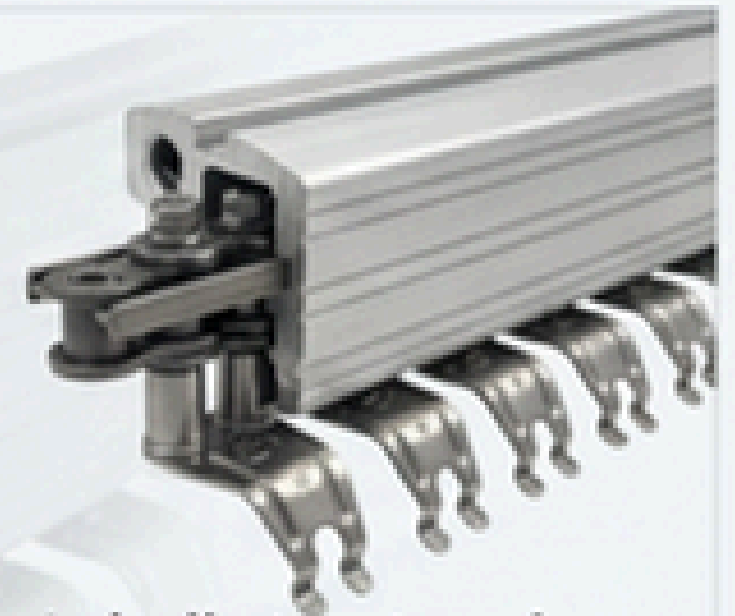
Jitter-Free Transport: Confirm the titanium claw transport system's ball structure is functioning correctly for "no friction resistance, no jitter."



Claw Consistency: Ensure all claws on the conveyor are identical in type, shape, and wear. Mismatched claws cause instability.



Speed Control: Utilize the electronic closed-loop control for smooth, precise conveyor speed (deviation range 0-10 mm/min).

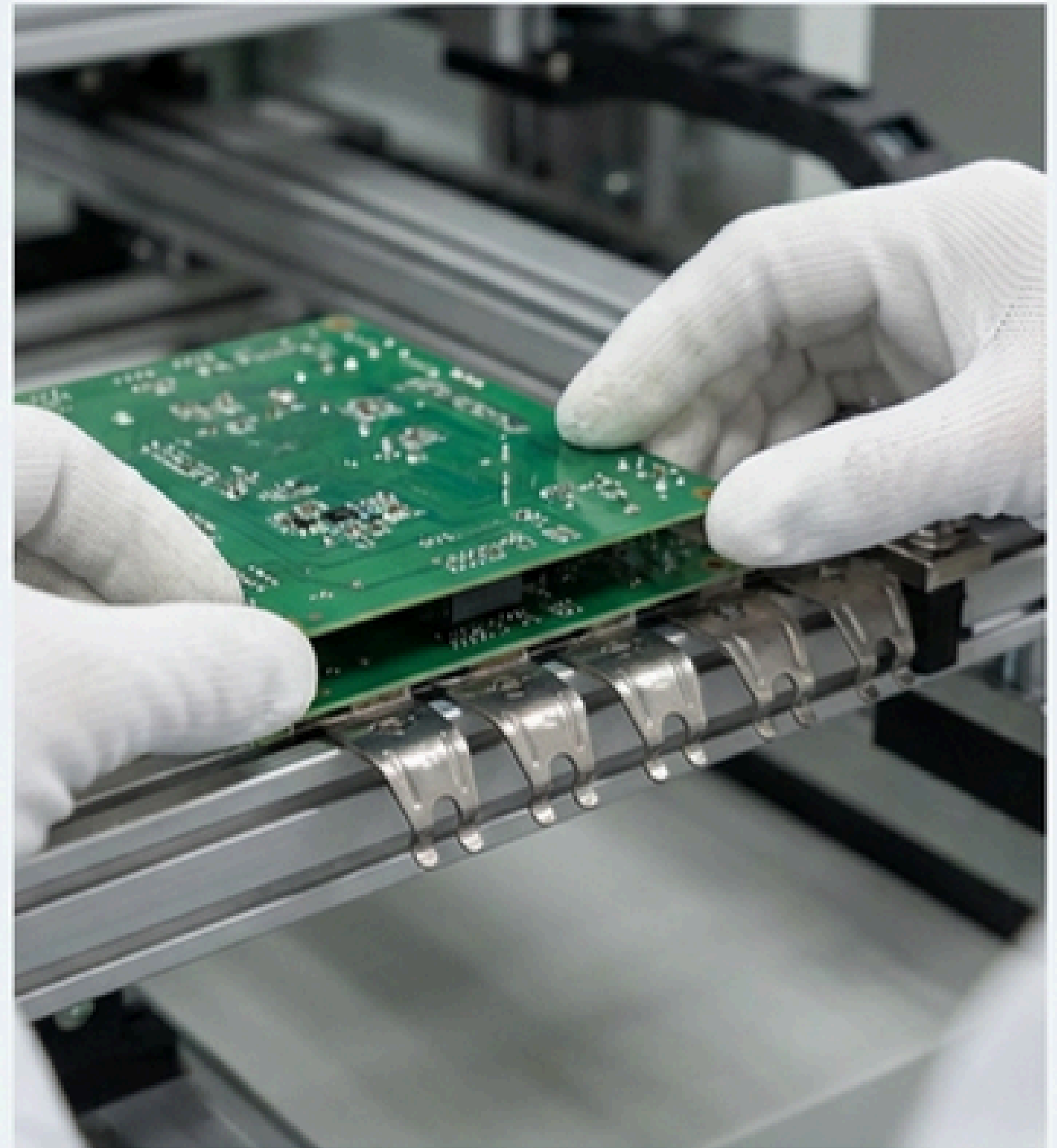


In-Process Checks to Prevent Defects

VISUAL INSPECTION: Between runs, quickly inspect claws for any visible flux or solder residue buildup. Even small amounts can affect PCB seating.

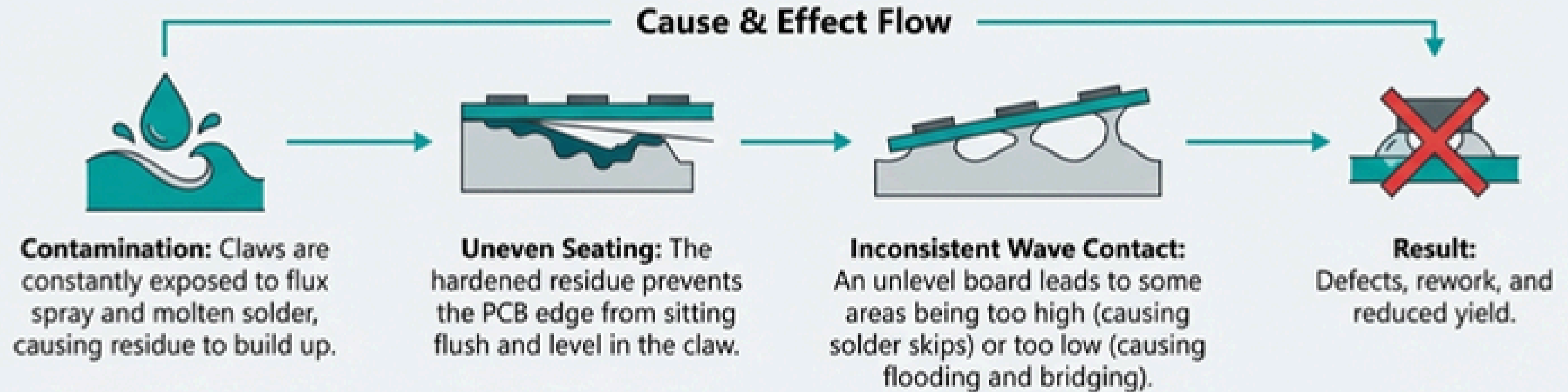
SECURE SEATING: Confirm each PCB is seated correctly and securely in the claws before it enters the machine. An improperly seated board is a guaranteed defect.

LISTEN FOR JITTER: Be attentive to any unusual sounds from the conveyor. The system is designed for smooth, quiet operation; audible jitter indicates a mechanical issue that requires attention.



PILLAR 3: MAINTAIN - How Residue Buildup Degrades Quality

Over time, baked-on flux and solder accumulation is the primary source of process instability and defects.



Contaminated



Maintained



The Gold Standard: Integrated, Automatic Claw Cleaning

Manual cleaning is prone to human error and inconsistency. An automated system delivers repeatable, reliable results, ensuring every claw is in optimal condition for every run.

Feature Spotlight: Automatic Washing Claw Device

- **Mechanism:** Imported high-quality micro anti-corrosion chemical pumps wash claws from both sides.
- **Solvent:** Utilizes propyl alcohol as the cleaning solvent.
- **Process:** Features a fully automatic cycle for consistent, hands-off cleaning of the chain and claws.



A Disciplined PM Protocol for Peak Performance

For all systems, a regular Preventive Maintenance (PM) schedule is non-negotiable for maintaining soldering quality.

PM Checklist

INSPECT (Weekly): Check for signs of physical damage, including bending, fatigue, or excessive wear on contact points.

CLEAN (Daily/Per Shift): Use approved solvents (e.g., propyl alcohol) and non-abrasive tools to remove all flux and solder residue.

VERIFY (Weekly): Check the integrity of all fasteners. Ensure each claw is securely mounted and aligned with the others.

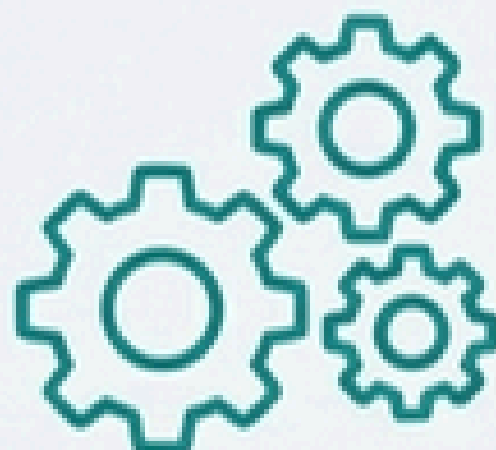
REPLACE (As Needed): Crucial: Always replace claws in complete sets to ensure evenness and maintain conveyor balance and parallelism. Never replace a single claw.

Your Framework for Soldering Excellence



SELECT

Match claw geometry (L-Type, V-Type, Heavy Duty) to the specific PCB design, weight, and component layout.



USE

Ensure machine stability through rigorous pre-run checks of rail parallelism (<math><0.2\text{mm}</math>) and jitter-free transport.



MAINTAIN

Implement a consistent cleaning protocol—automated or manual—to eliminate residue buildup, the #1 cause of instability.

Mastering these three pillars puts you in direct control of through-hole soldering quality.

A System Engineered for Stability, From the Ground Up

The performance of the titanium claw is guaranteed by the fundamental stability of the machine's core structure. Our S-WS series machines are designed to empower your process control.

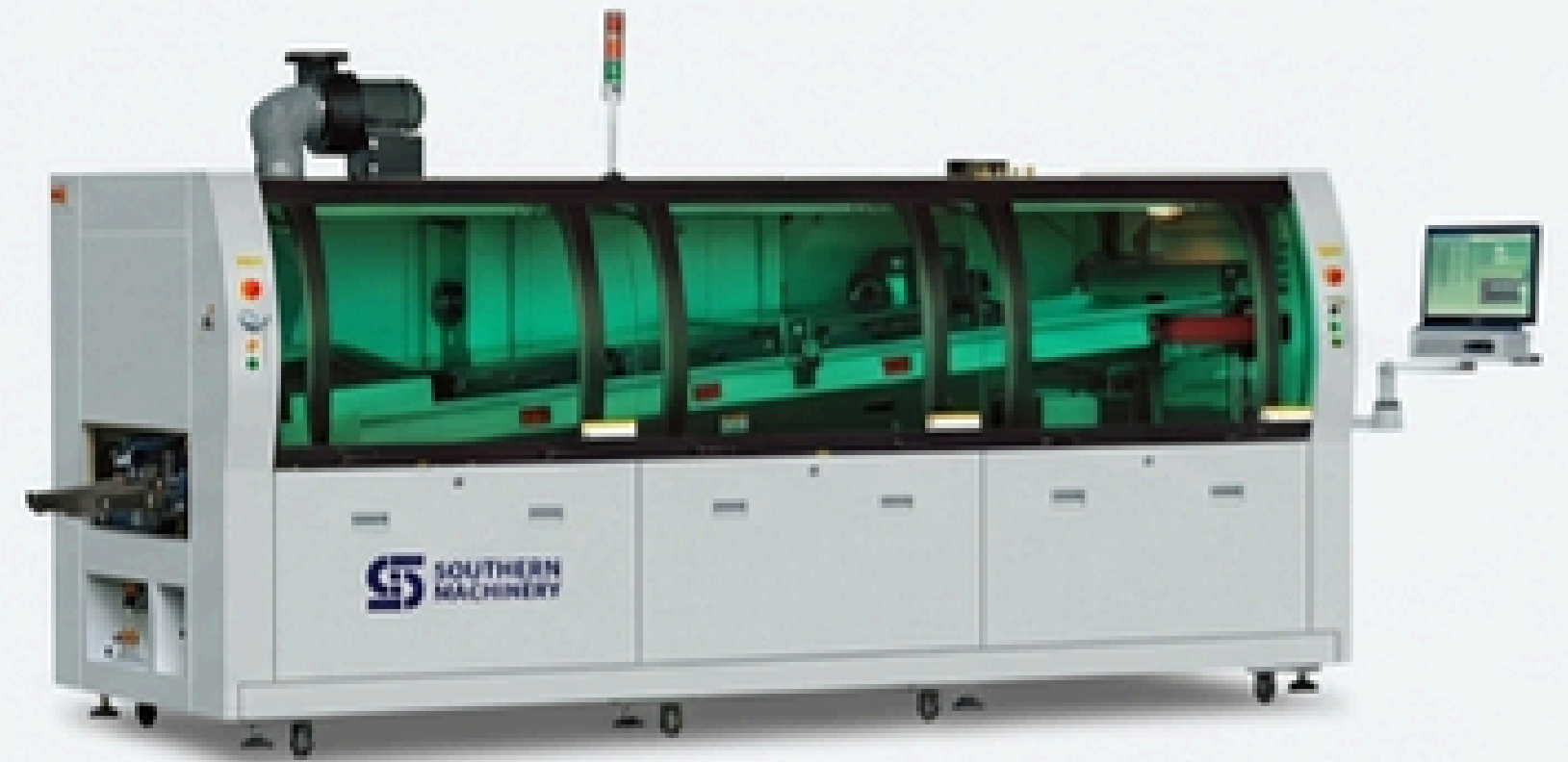
Robust Chassis:

Our chassis uses **120x60x5 square two-layer overlapping welding** to prevent deformation and ensure long-term stability.



Precision-Cast Steel Rails:

The main transport rail is made of **120x60x5 precision cast steel** to eliminate deformation that leads to board sag and inconsistent transport.





Your Partner in THT Automation

Southern Machinery is more than an equipment supplier; we are your technical partner. Discuss your specific PCB assembly challenges with our engineering team.

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Technical Resources & Documentation

Access detailed specifications, product galleries, and operating manuals for our full range of SMT and THT solutions.



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