ENGINEERING STANDARD • SHOP-FLOOR AUDIT

Pre-Owned Thermoforming Machine 45-Point Technical Inspection Checklist

A field-proven engineering protocol for plant maintenance managers and machine buyers to identify hidden mechanical fatigue, electrical obsolescence, and pneumatic leaks before purchase.

Why Pre-Purchase Inspections Protect Industrial Investments

In thermoforming packaging machinery, cosmetic cleanliness often conceals severe mechanical wear. A machine with worn toggle bushings, non-parallel platens, or failing servo drives can incur upwards of €45,000 in emergency rebuild costs and months of lost production. This standardized 45-point audit separates superficial cosmetic wear from critical functional integrity.

PASS / OPERATIONAL THRESHOLD

Score ≥ 88 / 100

Ready for immediate production under factory warranty.

CONDITIONAL ACQUISITION

Score 70 – 87

Requires budgeted component renewal prior to live commissioning.

WALK-AWAY THRESHOLD

Score < 70 or Red Flag

High risk of catastrophic platen failure or obsolete electronics.

5-Phase Machine Audit Sequence

1 Cold Walkaround
Inspect chassis weld integrity, guide columns, chain rail wear, and oil spill patterns under the base.

→

2 Heater & Vacuum
Thermal camera scan of top/bottom heater banks; test vacuum drawdown decay rate under dead-head gauge.

→

3 Control & Backup
Power up cabinet. Verify active alarms, servo drive diagnostics, and presence of PLC software backup.

→

4 Dry-Cycle Run
Cycle machine at 25, 35, and 45 dry cycles/min. Listen for bearing whine, toggle knock, or timing chain slap.

→

5 Test Sheet Form
Feed APET / PP test roll. Validate wall thickness consistency, punch trim clean cut, and stacker count accuracy.

Essential Tools Checklist for the Field Auditor:

Calibrated FLIR Thermal Imaging Camera • Mitutoyo 0.01mm Dial Indicator • Feeler Gauge Set • Digital Sound Level Meter • Digital Clamp Multimeter • 0-10 Bar Calibrated Pressure Manometer • USB Flash Drive for PLC Backup Check.

Section 1: Mechanical Structure, Platens & Sheet Feed (12 Points)

INSPECTION POINT & TOLERANCE STANDARD	PASS	MARGINAL	FAIL / CRITICAL	ENGINEER NOTES
1. Platen Parallelism: Dial indicator < 0.05 mm across full mold clamping area.	☐	☐	☐	Max dev: _____ mm
2. Toggle Clamping Linkages: Zero perceptible play in toggle pins and bronze bushings.	☐	☐	☐	Check grease lubrication
3. Tie Bars & Guide Columns: Chrome plating intact, zero scoring or hairline cracks.	☐	☐	☐	Check seal wipe collars
4. Spiked Transport Chains: Pitch elongation < 0.25% across 1,000 mm span. Needle teeth sharp.	☐	☐	☐	Chain wear gauge reading
5. Chain Rail Width Adjustment: Motorized/manual rail width drive parallel infeed to cut.	☐	☐	☐	Spindle synchronized
6. Sheet Infeed Roll Stand: Pneumatic roll lift arms, tension dancer brake, chucks sound.	☐	☐	☐	Brake pad thickness

Section 2: Heating Banks, Vacuum & Pneumatics (12 Points)

INSPECTION POINT & TOLERANCE STANDARD	PASS	MARGINAL	FAIL / CRITICAL	ENGINEER NOTES
7. Heating Bank Thermal Uniformity: Top and bottom infrared elements balanced ±5°C.	☐	☐	☐	Thermal camera scan
8. Solid-State Relays (SSRs): Zero burnt terminals, pulsing indicator LEDs responding per zone.	☐	☐	☐	Check heatsink fans
9. Vacuum Reservoir Hold Test: System draws ≥ -0.85 bar. Decay rate < 0.05 bar / 5 min.	☐	☐	☐	Pump oil color / hours
10. Forming Air Pressure Booster: Air tank maintains steady 6.0 bar during cavity pressurization.	☐	☐	☐	Fast exhaust valve speed
11. Pneumatic Valve Terminal Blocks: Zero audible hiss/leakage under full 7 bar factory air charge.	☐	☐	☐	Festo / SMC manifolds
12. Mold Water Cooling Circuit: Manifolds free of calcification. Couplers leak-free at 3 bar.	☐	☐	☐	Flow rate: _____ L/min

Section 3: Controls, Automation & Electrical Cabinet (11 Points)

INSPECTION POINT & TOLERANCE STANDARD	PASS	MARGINAL	FAIL / CRITICAL	ENGINEER NOTES
13. Original PLC Software Backup: CF/SD card or USB backup media with documented password.	☐	☐	☐	CRITICAL RED FLAG if missing
14. Touchscreen HMI Panel: Zero dead touch areas, backlight bright, recipe save/load intact.	☐	☐	☐	HMI firmware: _____
15. Servo Inverter Drives: Drive diagnostic logs clear of persistent overcurrent/encoder errors.	☐	☐	☐	Check capacitor bulges
16. Cabinet Thermal & Filter Status: Cabinet AC unit cools ≤ 28°C. Clean filter mats.	☐	☐	☐	AC fan tested

Section 4: Trimming Station, Punch & Automatic Stacker (10 Points)

INSPECTION POINT & TOLERANCE STANDARD	PASS	MARGINAL	FAIL / CRITICAL	ENGINEER NOTES
17. Cutting Die Base Platen: Steel cutting plate flat within 0.03 mm. Zero deep gouges.	☐	☐	☐	Plate thickness: _____ mm
18. Trim-to-Form Servo Registration: Optical photocell or servo index synchronizes within ±0.2 mm.	☐	☐	☐	Flange trim symmetry
19. Automatic Stacking Unit: Pusher fingers, count separator, delivery conveyor operate smoothly.	☐	☐	☐	Stack alignment test
20. Skeleton Scrap Winder / Granulator: Winder torque motor adjusts tension without web tear.	☐	☐	☐	Clutch / drive status

Final Inspection Scorecard & Engineering Verdict

TOTAL AUDIT SCORE: _____ / 100

[ ] UNCONDITIONAL PASS • [ ] CONDITIONAL WITH QUOTED REPAIRS • [ ] REJECT (WALK AWAY)

Inspector Signature: _____

Inspection Date: _____ / _____ / 2026

Allplastix On-Site Engineering Inspection Services

Cannot afford to dispatch your senior technical team abroad to inspect machinery? Allplastix maintains an independent network of accredited senior plastics machinery engineers throughout Germany, Italy, Turkey, and across Europe.

1. Full Physical Audit

Our engineer deploys directly to the seller factory with dial indicators, thermal cameras, and clamp meters to execute this complete 45-point protocol.

2. 4K Video & Live Stream

We record high-framerate 4K footage of dry cycles, mold clamping, forming, and trim registration, plus host a live interactive video session for your team.

3. Written Escrow Report

You receive an exhaustive written engineering report itemizing required immediate repairs, spare parts cost estimates, and an objective valuation verdict.

Pre-Purchase Escrow & Safe International Transaction Protection

- **Funds Held in Legal Escrow**
  Your purchase funds are safely held in European legal escrow until our engineer clears the final loading inspection.
- **OEM Software Backup Retrieval**
  We extract and archive a complete digital binary clone of the PLC, servo parameters, and HMI runtime before de-installation.
- **Industrial Rigging & Seaworthy Crating**
  Full supervision of heavy machinery cranes, barrier foil vacuum packing, and certified timber skid cradling.
- **Turnkey Commissioning Support**
  Optional on-site mechanical alignment, electrical hook-up, and mold startup assistance at your receiving factory.

Book an Engineer for Machine Inspection

Eyeing a machine in Germany, Italy, Turkey, or Eastern Europe? Let our certified industrial engineers inspect it on site before you wire a single Euro. Fast dispatch within 48 to 72 hours.

+90 532 717 33 63 | info@allplastix.com | www.allplastix.com

INSTANT WHATSAPP