

IMPROVING YIELD, THROUGHPUT AND COST PERFORMANCE ON THE VILOCA PRODUCTION LINE USING LEAN SIX SIGMA DMAIC

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1. BACKGROUND / PROBLEM

- The Viloca production line had historically low utilisation
- A rise in demand exposed process inefficiencies
- Main issues: high test reject rate, output below target, and elevated cost per passed device

2. AIM

Improve first-pass yield, increase hourly output, and reduce cost per passed device using Lean Six Sigma DMAIC

3. METHODOLOGY - DMAIC

D **M** **A** **I** **C**
DEFINE **MEASURE** **ANALYSE** **IMPROVE** **CONTROL**

A data-led Lean Six Sigma approach was used to define the problem, quantify baseline performance, identify root causes, implement improvements and sustain gains

4. MEASURE PHASE / BASELINE

Month	Output (Units/hour)
Apr	21
May	31
Jun	29
Jul	34
Aug	36
Sep	31
Oct	35
Nov	36
Dec	32

- Reject rate: 26%
- First-pass yield: 74%
- Fails per 1,000 devices: 264.5
- Average output: 33 units/hour
- Original target: 48 units/hour
- Cost per passed device: £3.37
- Target cost per passed device: £2.08
- Potential annual saving: £38,700

5. ANALYSE PHASE

KEY FINDINGS

- Largest failure by count: STS Average Value (2,528)
- Second largest: Device Serial Number (2,271)
- Top five failure categories accounted for 76.92% of failures
- Device Serial Number failures were outside project scope due to an inherent communication hardware limitation
- Largest scrap cost drivers: Soak A excessive misfires (£6,443), Soak A excessive misfires (£4,717), Cosmetic error (£2,684)

ROOT CAUSE SUMMARY

- Fan failures linked to fan connection / verification
- Process relied too heavily on operator memory
- Soak failures linked to fixture / setup / data separation issues

6. IMPROVE PHASE - PROCESS BALANCE

Before - Original Process Balance

After - Revised Process Balance

KEY IMPROVEMENT ACTIONS

- Local process changed from 3 assembly stages to 2
- First sub-assembly work transferred to China
- One local operator removed and remaining work rebalanced
- 500-piece trial completed; incoming sub-assemblies inspected by QC
- Test machine code updated using lessons learnt from other lines
- Start of shift checks strengthened
- Fixture cleaning process introduced
- End-of-line functional checks moved into laser etch machine
- Work instructions, PFMEA and training updated

7. RESULTS

RESULTS SUMMARY

- Output increased from 33 units/hour baseline to 56 units/hour by Week 5
- Revised target: 55 units/hour
- Recent production shift achieved 94% of target
- Overall failure rate reduced from 26% to 16% over the 5-week review period
- STS Average Value and Fan Speed Outside Limits dropped out of the top failure categories
- Communication related failures became the dominant remaining issue and remain outside project scope

8. CONTROL / SUSTAINABILITY

KEY KPIs

- Average hourly output
- First-pass yield
- Reject rate
- Failures per 1,000 devices
- Cost per passed device
- Start of shift check completion
- Fixture cleaning compliance
- Laser etch golden sample checks

The gains will be sustained through KPI monitoring, monthly Pareto review, updated standard work, training and PFMEA review

9. CONCLUSIONS

- DMAIC provided a structured approach to link quality, throughput and cost
- Practical process changes improved line balance and test control
- Output target was achieved by Week 5 and failure rate reduced to 16%
- Remaining communication related failures should be addressed in a separate engineering led project

PROJECT IMPACT

THROUGHPUT	YIELD	COST SAVING	LEAN CULTURE
+70%	74% - 84%	~£38,700	Strengthened