

LEAN MANUFACTURING

A Practical Quick Guide to Improving Flow, Quality, and Productivity

LEARN Understand the work	IMPROVE Find the waste	SUSTAIN Keep the gains
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Use this guide as a starting point for team discussions, workplace observations, and small experiments. Adapt each method to your process, safety requirements, and customer needs.

An introductory learning resource • Version 1.0

1. What is Lean Manufacturing?

Lean Manufacturing is a way of improving how work gets done by increasing value for the customer and reducing activities that consume time, effort, space, or materials without adding value. Lean is not simply about working faster or cutting staff. It depends on understanding the process, involving the people who do the work, solving problems, and sustaining improvements.

Core principles

Define value: Understand what the customer needs, including quality, delivery, and reliability.

Map the value stream: Follow the steps and information needed to deliver the product or service.

Create flow: Reduce interruptions, queues, unnecessary movement, and avoidable handoffs.

Use pull: Replenish or produce based on real demand and agreed signals, where appropriate.

Improve continuously: Test changes, check results, and standardize what works.

2. The Eight Common Types of Waste

Waste	What it can look like	Question to ask
Defects	Errors, scrap, rework, incorrect orders.	Where do we find and correct mistakes?
Overproduction	Making more or earlier than needed.	What demand or signal authorizes this work?
Waiting	People, materials, or equipment idle.	What is blocking the next step?
Unused talent	Ideas and skills not used.	Who doing the work can help solve this?
Transportation	Unneeded movement between areas.	Can the route be simplified?
Inventory	Excess work-in-process or stock.	What is the right amount and trigger?
Motion	Searching, reaching, walking, repeated handling.	Can tools and materials be placed closer?
Extra-processing	Steps, checks, or features not required.	Does this step add value or manage risk?

Some Lean references group these as the seven classic wastes; many modern lists add unused human talent as an eighth. Waste categories are prompts for observation, not a reason to blame people.

3. Practical Tools

5S workplace organization

Sort: remove what is not needed. Set in Order: make needed items easy to find and return. Shine: clean while inspecting. Standardize: agree on visual expectations and routines. Sustain: audit, learn, and improve. Keep safety and ergonomics central.

Kaizen and the PDCA cycle

Plan: State the problem, baseline, likely cause, and a small test. **Do:** Try the change on a limited scale. **Check:** Compare results with the baseline. **Act:** Adopt, adapt, or abandon the change and record what was learned.

Kanban and pull

A Kanban signal authorizes replenishment or work. Define the signal, quantity, owner, and response. Avoid adding cards or inventory without understanding demand, lead time, variability, and shortage risks.

Value Stream Mapping

Map the actual current process from request to delivery. Capture process steps, queues, information flow, cycle times, changeover times, uptime, and lead time where relevant. Identify constraints and design a realistic future state.

4. A Simple Improvement Routine

Use this sequence for one clearly defined problem. Involve operators and other people affected by the process.

1. Describe the problem

Use observable facts. Example: Orders waited an average of 18 minutes between packing and dispatch last week.

2. Establish a baseline

Choose a measure and collect enough data to understand normal variation.

3. Observe the work

Go to the actual workplace, follow the process, and ask respectful questions.

4. Explore causes

Use a process map, five whys, or a cause-and-effect diagram. Verify causes with evidence.

5. Test a small change

Define who will do what, when, and how safety and quality will be protected.

6. Check the outcome

Compare results to the baseline and watch for unintended consequences.

7. Standardize and follow up

Update the standard work, train affected people, and schedule a check to see if the gain lasts.

5. Metrics Worth Tracking

Metric	Meaning	Use carefully
Lead time	Elapsed time from request to delivery.	Separate processing time from waiting time.
Cycle time	Time to complete a defined work cycle.	Define the start and end points consistently.
First-pass yield	Share of units completed correctly without rework.	Keep definitions and inspection rules stable.
On-time delivery	Share of orders delivered by the agreed date.	Pair with quality and customer impact.
Work-in-process	Items started but not yet completed.	Too little can also create shortages or instability.
Safety / ergonomics	Hazards, near misses, strain, and safe-work conditions.	Never trade safety for speed.

Do not optimize one metric in isolation. A faster process is not an improvement if defects, injury risk, customer problems, or total cost increase.

6. One-Week Starter Plan

Day	Activity	Output
1	Choose one problem and hear from the people doing the work.	Clear problem statement.
2	Observe and map the current process.	Simple current-state map.
3	Collect baseline data and investigate likely causes.	Baseline and tested hypotheses.
4	Run a small, safe improvement experiment.	Documented test.
5	Review data, agree on next action, and assign follow-up.	Decision and owner.

7. Team Worksheet

Problem statement

What is happening, where, when, and how often? Avoid jumping straight to a solution.

Baseline measure and date range

What we observed at the workplace

Possible causes and evidence

Small test: owner, timing, safety checks

Result compared with baseline; what we learned

Next action and follow-up date

Key reminder

Lean works best as a respectful system for learning and improving work. Make problems visible, involve the people closest to the process, test changes carefully, and sustain what demonstrably helps customers and employees.

This original introductory guide is for general education. It is not a substitute for site-specific safety procedures, technical standards, or professional advice. Verify requirements that apply to your industry and workplace.