Lean 3P Starter Kit

A practical starting point for designing product and production together

Use focused events, simple simulations, and practical tools to improve manufacturability, flow, and launch readiness.

For engineers, manufacturing leaders, operators, facilitators, and cross-functional product teams.

LeanPeak ProductLab
READ ● DECIDE ● ACT

Why Lean 3P matters

When a company launches a new product or redesigns a major process, most of the lifetime cost, quality, and safety performance is already being shaped long before the first unit is built. If manufacturing gets involved too late, problems usually show up at launch as long assembly times, awkward ergonomics, unstable flow, rework, and expensive fixes.

Lean 3P exists to avoid that pattern. It gives teams a structured way to design product and process together early enough that changes are still cheap, learning is still possible, and industrialization is not reduced to firefighting.

Typical late-launch symptoms:

- Overtime and workarounds.
- Capital band-aids.
- Fragile quality and rework.
- A process that “works” only because people compensate for the design.

Lean 3P moves learning forward in time so teams can improve the system while freedom to change still exists.

Use 3P when the change is big enough

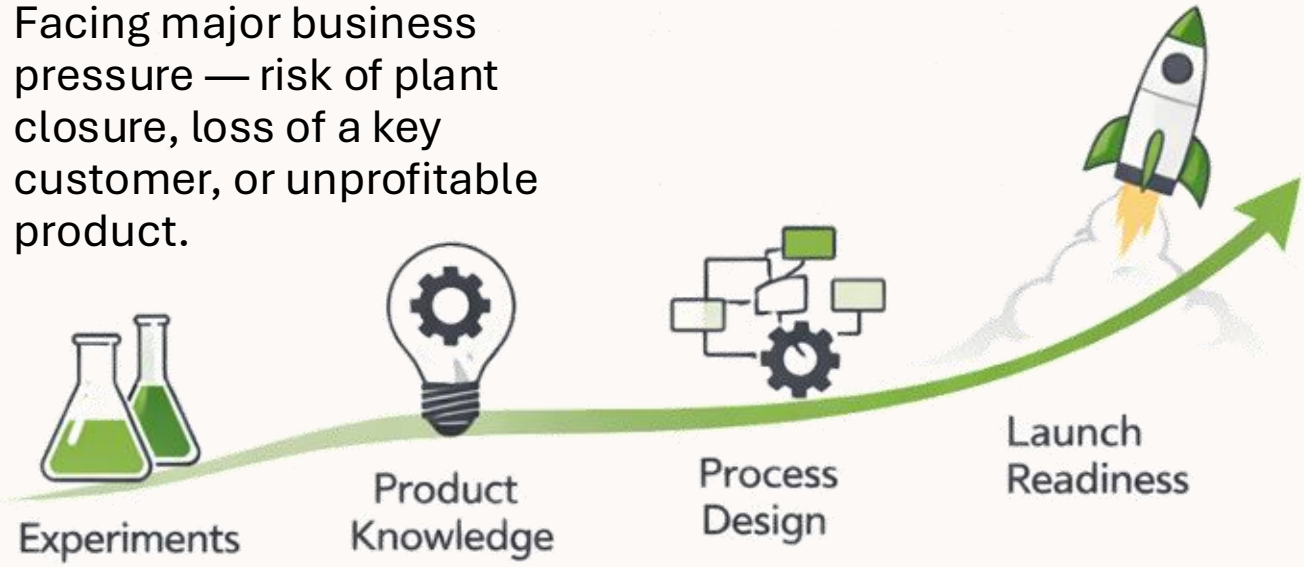
Lean 3P is a breakthrough method, not a tool for every small improvement. It is the right choice when the product or process change is large enough to lock in cost, quality, lead time, layout, or launch risk for years.

Use Lean 3P when you are:

- Launching a significantly new product or platform.
- Redesigning an existing process for radical cost, quality, or lead-time improvement.
- Building or reconfiguring a facility where layout and flow decisions will lock in cost for years.
- Facing major business pressure — risk of plant closure, loss of a key customer, or unprofitable product.

Use kaizen when you are:

- Fine-tuning a stable line or cell.
- Solving local problems with small, frequent changes.
- Driving incremental 10–30% improvements where the basic process is sound.



If you are designing from scratch or aiming for a step-change in cost and flow, use 3P. If you are improving what already exists, use kaizen on top of what 3P has created.

Four ideas behind Lean 3P

Lean 3P is not only a workshop format. It is a way of thinking about design and industrialization.

Four blocks

1. Set-based design

Instead of choosing one “best” idea early, teams keep several alternatives open and narrow them only as they learn. This is why tools like Quick-Look and 7 Alternatives matter so much.

2. Concurrent development

Product and process are developed together, not in separate handoffs. Manufacturing influences design early, and design choices influence the future process.

3. Delay decisions, not learning

Teams do not delay work; they delay irreversible commitment until they have learned enough. Mock-ups, simple trials, and simulations come before major tooling or layout decisions.

4. Operator as surgeon

The operator should be able to do value-adding work without hunting for tools, material, or information. Material flow, PFEP, routes, and standard work should support the operator rather than burden them.

These four ideas shape how 3P events are timed, how alternatives are explored, and how launch readiness is built.

The Lean 3P path

A Lean 3P effort usually moves through four overlapping phases: Information, Innovation, Process Design, and Optimization. Those phases are made practical through three core events: Design 3P, Process 3P, and Production 3P.

Four phases

- Information: understand history, volumes, takt, constraints, and early manufacturing assumptions.
- Innovation: identify CTQ/CTC drivers and explore alternatives.
- Process Design: shape the value stream, process choices, and line concept.
- Optimization: prepare readiness, trial builds, and vertical start-up.

Three events

- Design 3P: around 70–80% concept completion, before concept freeze.
- Process 3P: late in detailed design, before tooling and process choices are locked.
- Production 3P: pre-launch, often as a series of mini-events.

The purpose of this model is not to create bureaucracy. It is to help teams see where they are in the journey and choose the right kind of work next.

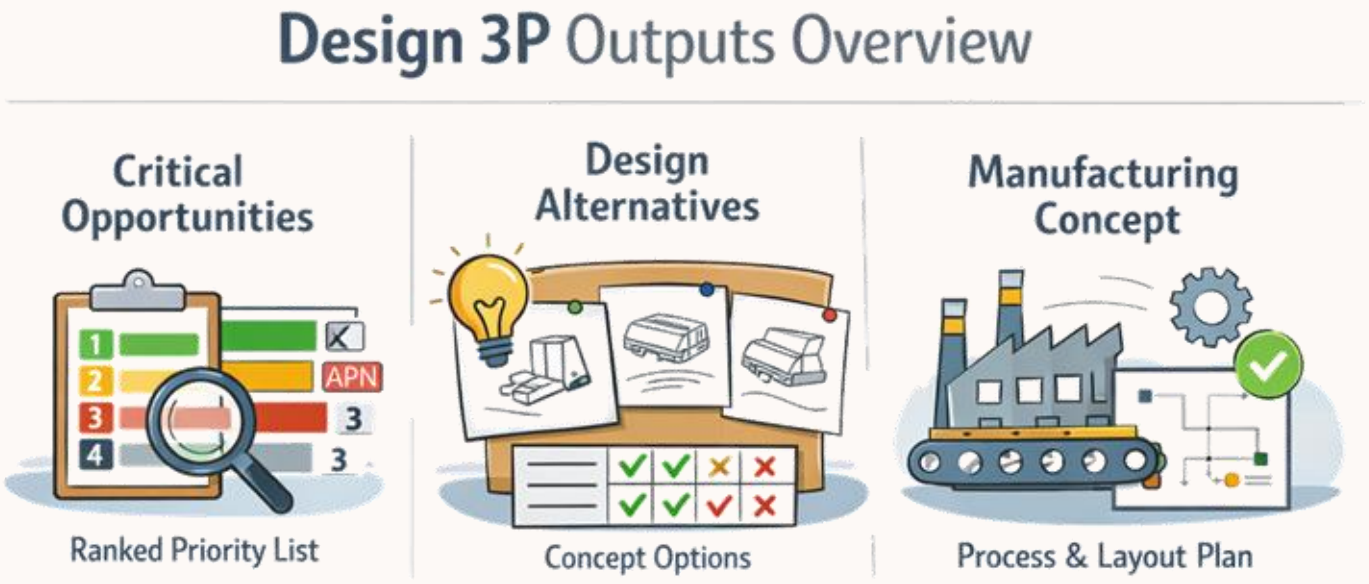
Start with Design 3P

For most teams, the best entry point into Lean 3P is the Design 3P event. This is where the concept is real enough to challenge, but still flexible enough to improve before cost, quality, and manufacturability problems get locked into the design.

When to run it
When the concept is roughly 70–80% defined, the basic architecture is visible, and major design decisions are still open.

What it focuses on
CTQ and CTC opportunities, manufacturability, concept risk, and the preliminary manufacturing concept.

What it should produce
A ranked opportunity list, a few promising alternatives, and a clearer manufacturing concept that can feed Process 3P.



A good Design 3P event does not try to solve everything. It focuses on the few design choices that matter most.

Prepare your first Design 3P event

A first Design 3P event works best when the scope is narrow and the target condition is clear. One product, one subsystem, or one major challenge is usually enough for a productive one-day workshop.

Section 1: Define the purpose
Use language like:

- Reduce assembly labour in a key module.
- De-risk a fragile concept before freeze.
- Surface cost and quality leverage points in a new product architecture.

Section 2: Gather the inputs
Prepare:

- Market requirements and customer needs.
- Key engineering requirements and interfaces.
- Concept sketches, CAD views, mock-ups, or prototypes.
- Preliminary manufacturing assumptions: where built, volume, takt, capital envelope.
- History from similar products: yield loss, scrap, rework, warranty, complaints.

Section 3: Build the team
Include:

- Product design / engineering.
- Manufacturing / process engineering.
- Operations / production.
- Quality / reliability.
- Supply chain / purchasing.
- Facilitator and sponsor.
- One or two operators or technicians with relevant experience.

A Design 3P event often succeeds or fails based on who is in the room and whether assumptions are visible early.

A simple one-day Design 3P agenda

For a first event, one intensive day is often enough to create momentum and useful outputs.

Agenda format

08:00–09:00
Present the product concept and preliminary manufacturing plan.

09:00–10:30

Brainstorm CTQ (Critical-to-Quality) and CTC (Critical-to-Cost) opportunities.

10:30–11:00
Prioritize using Action Priority Number.

11:00–12:00
Quick-Look cycle 1 on the top opportunity.

12:00–12:30
Lunch.

12:30–14:00
Quick-Look cycle 2 on the next opportunity.

14:00–15:00
Summarize design changes and manufacturing implications.

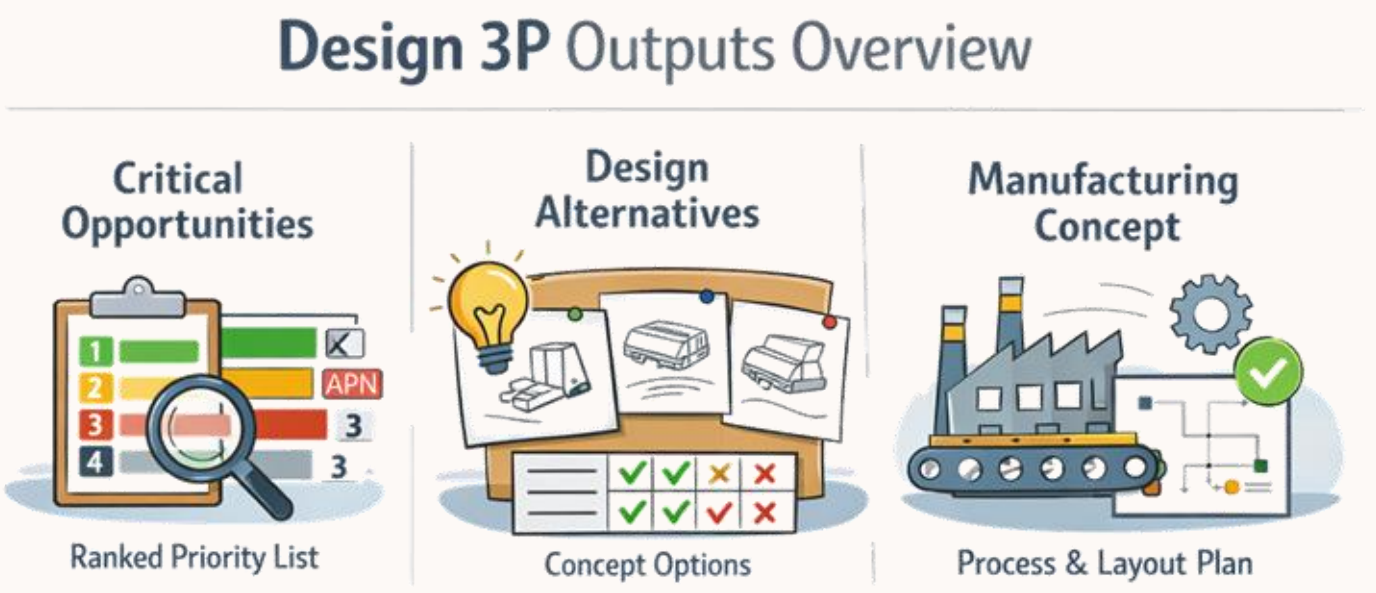
15:00–16:00
Build action plan and prepare management read-out.

What happens in the workshop
Show the product by function, not only by form.
Make assumptions visible and open to challenge.
Surface CTQ / CTC opportunities.
Rank what matters most using APN.
Run Quick-Look on a few high-leverage items.

What good output looks like

By the end of the event, the team should leave with a small number of clear, usable outputs rather than a wall full of sticky notes and no follow-up. The goal is not a polished report. The goal is a stronger concept and a better handoff into the next 3P work.

- Ranked CTQ / CTC opportunity list with APN values.
- Quick-Look summaries showing functions, alternatives, and selected next steps.
- Proposed design changes and expected cost / quality impact.
- Manufacturing implications such as changed steps, reduced parts, different suppliers, or layout consequences.
- Action list with owners and due dates.
- Short management read-out.



If these outputs are visible and used, Design 3P becomes the start of industrialization learning rather than a one-off workshop.

How Design 3P feeds the rest of 3P

Design 3P

Design 3P is the opening move, not the whole method. Its outputs should directly guide later value stream, process, layout, and launch work.

Process 3P

Use the Design 3P outputs to map internal and external value streams, identify knowledge gaps, and compare alternatives for capital-intensive, labour-intensive, or high-risk steps using the 7 Alternatives method.

Production 3P

Use the resulting production plan to design layout, PFEP, water spider routes, information flow, standard work, and a phased vertical start-up before full launch.

Simpler product choices from Design 3P often make later process, layout, and readiness work much easier.

The tools included with this kit

This Starter Kit is designed to be used with a small set of practical working sheets. The goal is not to give you every possible 3P form, but enough to run your first event and continue into later phases with confidence.

Tool list

- CTQ / CTC opportunity sheet.
- APN prioritization sheet.
- Quick-Look decision matrix.
- Value stream mapping canvas.
- Knowledge gap log.
- 7 Alternatives worksheet.
- PFEP card.
- Production readiness checklist.

These tools support the three-event path: Design 3P, Process 3P, and Production 3P.

Start with one real product

Do not start by rolling Lean 3P out across the whole organization. Start with one real product, one subsystem, or one industrialization challenge where cost, quality, or flow still have room to improve before launch.

Run one focused Design 3P event, use the tools to capture what you learn, and let those outputs shape what happens next in Process 3P and Production 3P. That approach is much more consistent with the playbook than trying to launch 3P as a broad training program first.

- **Pick one real challenge.**
- **Prepare one focused event.**
- **Learn early, decide wisely, industrialize robustly**

Lean 3P: Production Preparation Process

Design Efficient Products & Processes from the Start

Inputs & Criteria

- Customer Needs
- Baseline Flow
- Cross-Functional Team

Map Transformations

- Key Verbs & Steps
- Simple Process Map

Generate Alternatives

- 7+ Concepts per Step
- Creative Ideas

Evaluate Concepts

- Score Options
- Select Best 1–2

Full-Scale Mock-Ups

- Cardboard & Simulate
- Test & Refine

Right-Sized Design

- Takt-Based Equipment
- Lean Principles

Finalize & Implement

- Pilot & Ramp-Up
- PDCA Improvement

3P Quick Checklist:

- ☐ Clear Scope & Targets
- ☐ Cross-Functional Team
- ☐ 7+ Alternatives per Step
- ☐ Full-Scale Mock-Up
- ☐ Full-Scale Mock-Up
- ☐ Right-Sized Equipment