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LEARNING NUGGET LN-005

Cell Manufacturing

OPEX – THE AUK WAY

Faster flow, less waste, more flexibility — by grouping the work into small, self-contained cells.

What you will take away

A practical, shared understanding of how cellular manufacturing improves flow — and how to apply it on the floor.

01

Read the idea

Recognise what a manufacturing cell is, and why it beats batch-and-queue production.

02

See how it flows

Understand the cell layout, one-piece flow and the pull principle behind it.

03

Apply it

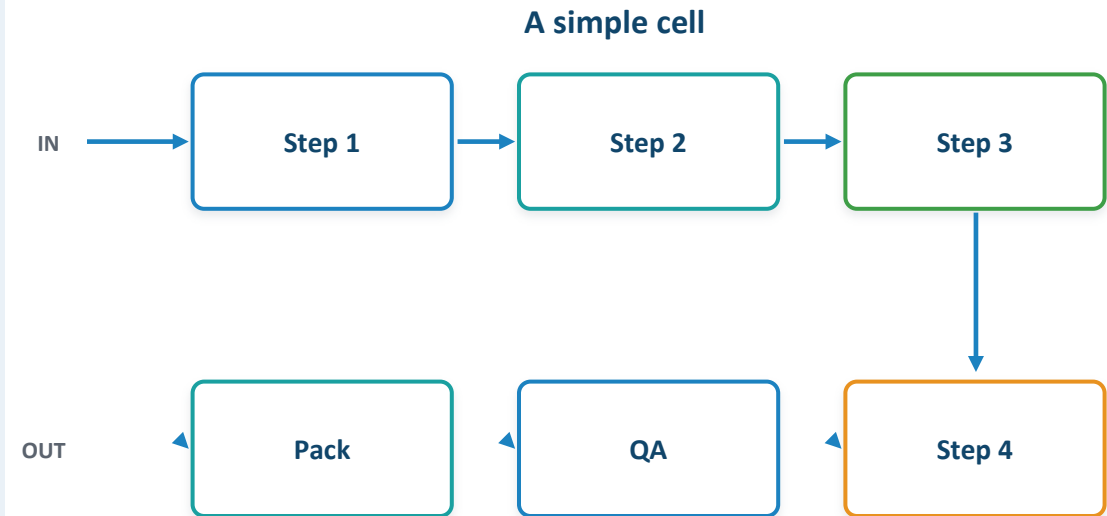
Know the six steps to build a cell — and what it means at your own station.

What is cellular manufacturing?

A lean method that organises workstations into cells, each one set up to produce a family of similar products.

The goal is simple: move the product through the process quickly, one piece at a time, with as little waste as possible.

- Resources are grouped into independent, self-sufficient cells.
- Each cell holds the machines, tools and people it needs end-to-end.
- People are cross-trained; the team balances the work between them.
- Especially valuable where products are varied but share common steps.



One family flows through every step in sequence — no batches waiting between departments.

Why it matters

The benefits are not abstract — they show up directly in delivery, quality and cost.

1

Less waste

Removes non-value work — waiting, transport and excess stock between steps.

2

Higher productivity

Shorter set-up and lead times, lower work-in-progress, less material handling.

3

More flexibility

A cell adapts quickly to product variants and to changes in customer demand.

4

Lower cost & footprint

Less space and capital, and lower energy and waste per unit produced.

How a cell works

Three simple ideas turn separate operations into one smooth flow.

Group

Similar parts or products are grouped together into one cell, by their shared processing route.

Cross-train

The people in the cell are trained on several stations, so they can balance the work between them.

Flow

The product moves through the cell one piece at a time, in sequence — not in large batches that wait.

Building a cell — six steps

A disciplined sequence: analyse first, then design, standardise and keep improving.

1

Analyse the process

Map the current flow; find bottlenecks and waste.

2

Group into families

Cluster products that share the same processing route.

3

Design the layout

Arrange stations for least movement — often a U-shape.

4

Assign & cross-train

Define roles and build flexibility across the team.

5

Standardise the work

One agreed method, the same on every shift.

6

Monitor & improve

Measure, adjust, repeat — a cell is never finished.

Functional layout vs. the cell

The difference is what gets optimised — each machine in isolation, or the flow of the whole product.

Functional / process layout

- Machines grouped by type (all of one kind together).
- Large batches pushed from department to department.
- Long travel, high work-in-progress, faults found late.

Best for high volume of one standard product.

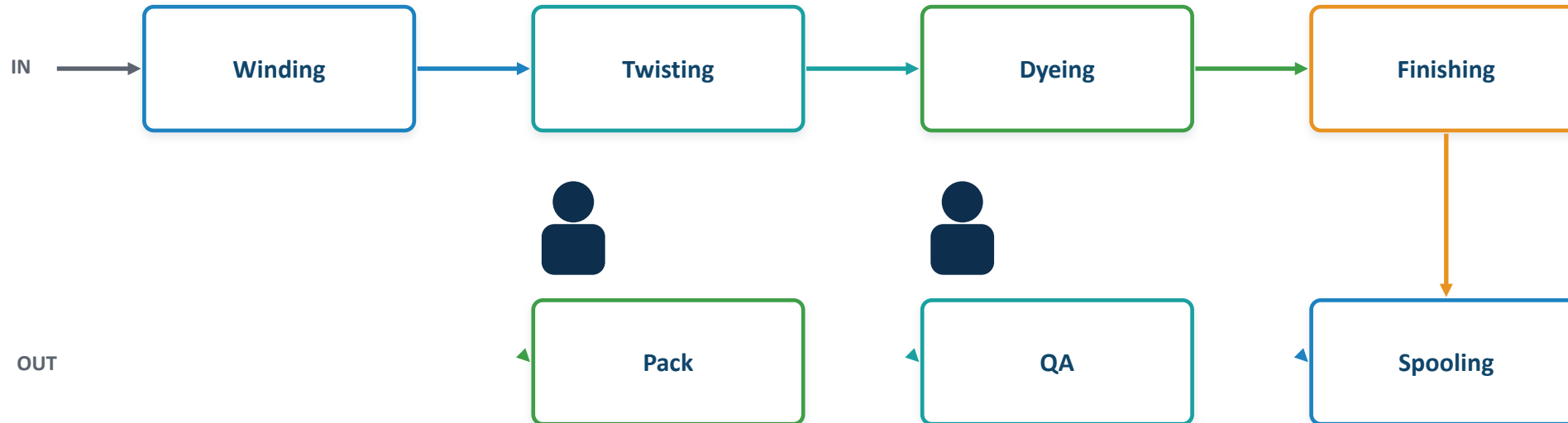
Cellular layout

- Machines grouped by product family, in sequence.
- One-piece flow; short distances; low work-in-progress.
- A problem is seen at once by the next pair of hands.

Best for variety that shares common steps.

Inside a cell

An example for thread: one product family carried end-to-end — instead of separate departments.



Cross-trained operators move with the work and tend several stations.

Material flow and information flow

Two flows run in opposite directions — and the customer sets the pace.

Material flows forward — one piece at a time



Information pulls back — each step signals what it needs (kanban)

One-piece flow Finish one, pass it on — problems show at once.

Pull (kanban) Make only what the next step has taken.

Takt The customer's demand sets the cell's pace.

Gains in quality, time and cost

The same people and machines deliver more — by arranging the work better.

Quality at source

Each piece is checked as it passes — faults are caught early, not multiplied across a batch.

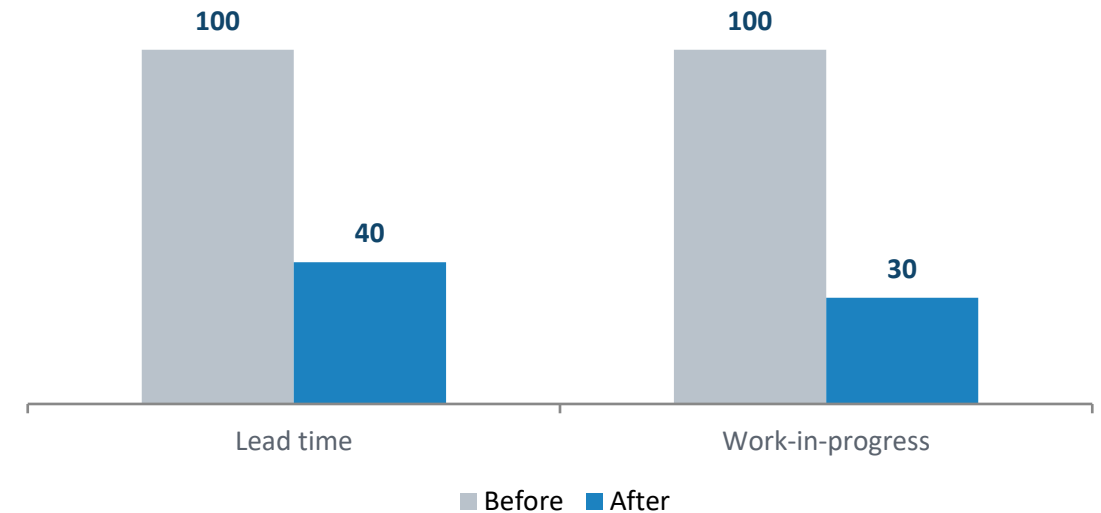
Shorter lead time

No batch waiting and short distances cut lead time sharply — commonly by 30–70%.

Higher productivity

Balanced work and less handling raise output — without new machines.

Before vs. after — illustrative (index, before = 100)



Less waiting · less stock · more output

What it means for people

A cell changes the work itself — not only the machines.

Multi-skilling

People learn several operations instead of one repetitive task — building capability.

Shared ownership

The team owns its own quality, output and delivery, close to where decisions are made.

Safer & ergonomic

Smaller quantities are moved, so handling is lighter and the workplace is safer.

Visible progress

Work is balanced and shown on a board — no one is overburdened, effort is recognised.

Typical challenges

It is not automatic — name the obstacle, then plan for it.

High variety

Forming clean product families can be hard.

Long changeovers

They break one-piece flow — reduce them first.

Layout & capex

Re-arranging the floor takes effort and investment.

Skills take time

Multi-skilling needs training and patience.

Balancing

An unbalanced cell creates a bottleneck.

Demand swings

Volatile demand strains a steady-beat cell.

What makes it work

None is dramatic on its own — together, and sustained, they turn a layout into a habit.

Map the value stream first

Change the right thing, not the easy thing.

Reduce changeover time (SMED)

Flow can only run if set-ups are short.

Right-size & standardise

Smaller, flexible machines; one agreed method, built-in quality.

Make it visible

A board and a few clear measures — OEE, FPY, lead time, OTIF.

Involve people & lead at the gemba

Cross-train, design the cell together, improve every week (kaizen).

How it fits OPEX – THE AUK WAY

A cell is one structural way to live the operational-excellence model.

Visual management

The cell's board and short daily huddle make status visible — Process Excellence & Safety.

Built-in quality

Checking and stopping at each step — our Commitment to Quality, from first filament to packaging.

The same measures

Judged by OEE, first-pass yield, lead time and on-time-in-full delivery.

People at the centre

A cross-skilled, accountable team — with leaders present at the gemba.

Key terms at a glance

Cell / U-cell — Compact, often U-shaped layout enabling one-piece flow and multi-skilled work.

Takt time — Available time ÷ customer demand — the pace the cell must keep.

Pull / Kanban — A signal to make or replenish only what the next step has consumed.

Heijunka — Levelling volume and mix to keep the flow and the team stable.

One-piece flow — Moving units one at a time through consecutive steps, with minimal buffers.

Work-in-progress — Inventory sitting between the start and finish of the value stream.

Standard work — The best-known method — documented, visible and repeatable.

OEE / OTIF — Overall Equipment Effectiveness; On-Time-In-Full delivery — core measures.

IN CLOSING

Built into the flow. Powered by people.

Group the work into cells, let it flow one piece at a time, and improve it a little every day.

AMANN Group · Operational Excellence · Together we drive performance up.