PRECISION ENGINEERING PLASTICS LTD

INJECTION MOULDING PRE-TOOL DFM RISK CHECK

A quick sense-check before committing to steel

For engineers responsible for moulded components

Most moulding issues don't start in the press — they start in the design and tooling assumptions made early on.

This checklist is designed to help you spot **common risk areas before tooling is released**, when change is still quick and relatively inexpensive.

HOW TO USE THIS

- Use during **design reviews**, **supplier discussions**, or **pre-tool sign-off**
- You don't need perfect answers — the goal is to **consider risk early**
- If a question causes discussion, that's usually a good signal

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1. PART DESIGN – QUICK REALITY CHECK

- ☐ Are wall thicknesses as **consistent** as they reasonably can be?
- ☐ Are ribs, bosses and transitions designed to avoid sink and stress?
- ☐ Is there **enough draft** for the material and surface finish?
- ☐ Are cosmetic vs functional surfaces clearly understood?
- ☐ Have sharp corners and "nice-to-have" features been challenged?

Tip:
Small geometry decisions often drive tool complexity, cycle time and long-term stability more than expected.

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2. TOLERANCES – FUNCTION OR HABIT?

- ☐ Are tolerances driven by what the part actually needs to do?
- ☐ Has tolerance stack-up been considered, not just individual features?
- ☐ Are truly critical dimensions clearly defined?
- ☐ Has normal moulding variation been allowed for?

Tip:
Over-tight tolerances are a common cause of scrap, rework and capability headaches later.

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3. MATERIAL CHOICE – BEYOND THE DATASHEET

- ☐ Is the material selected for function and environment, not just cost?
- ☐ Have shrinkage, creep and long-term behaviour been considered?
- ☐ Is the material suitable for the required tolerances?
- ☐ Are alternative materials understood if things change later?

Tip:
Material behaviour often defines dimensional stability more than tooling quality.

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4. TOOLING STRATEGY – EARLY QUESTIONS THAT MATTER

- ☐ Has the basic tooling approach been discussed (cavities, inserts, steel)?
- ☐ Are gating, venting and cooling concepts understood early?
- ☐ Has mouldflow simulation been considered for higher-risk parts?
- ☐ Is access for maintenance and future changes considered?

Tip:
Once tooling is cut, options reduce quickly — early clarity avoids expensive changes.

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5. PROCESS, QUALITY & SIGN-OFF

- ☐ Is there a clear expectation for ISIR / PPAP-style approval (formal or informal)?
- ☐ Are critical features defined for inspection and control?
- ☐ Is the route to production sign-off agreed before trials start?
- ☐ Has the handover from design to production been thought through?

Tip:
Many delays happen during approval and handover — not during moulding itself.

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6. SUPPLY & LONG-TERM VIEW

- ☐ Does the design suit expected volumes and ramp-up?
- ☐ Are cycle time assumptions realistic?
- ☐ Is there a fallback if supply risk appears later?
- ☐ Will this design support stable production over its full life?

Tip:
The real cost of moulding is often felt years after the first samples.

EXPERT CHECK

If this went straight to tool tomorrow, **where would you expect the first issue to show up?**

If that's hard to answer, it's usually worth a deeper DFM or tooling risk review.

About this checklist

This checklist is based on how **Precision Engineering Plastics (PEP)** works with engineering teams — focusing on **early insight, manufacturability, tooling risk reduction and stable production outcomes**, rather than late-stage firefighting.

Use it freely. Share it internally. If it prevents one late tooling change, it's done its job.

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