

Engineering Patternmaker interview questions

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What to expect

Engineering Patternmaker interviews are usually run by a pattern shop supervisor, a foundry or manufacturing manager, or both. Expect the conversation to move between your trade knowledge, your CAD and machining skills, and how you handle the moment a casting does not come out to size.

- **Technical and trade knowledge:** Questions about shrinkage and draft allowances, pattern materials, core boxes and how you read an engineering drawing.
- **Process walk-through:** You describe the sequence from drawing or CAD model to a finished, gauged pattern, often in your own words rather than as a textbook answer.
- **Scenario and problem solving:** A casting has failed inspection or a pattern is not performing. You talk through how you would isolate the cause.
- **Behavioural:** Past examples of repairing patterns, working with foundry staff, or dealing with a job that went wrong.
- **Safety and workshop practice:** Machine guarding, dust and resin handling, manual handling and how you keep a pattern shop safe.
- **Client and foundry liaison:** How you communicate with moulders, engineers and customers when a tolerance or a lead time is under pressure.

A typical interview starts with a short tour and an informal chat in the pattern shop, then settles into a structured conversation covering your trade background, a drawing or model you are asked to interpret, and two or three behavioural or scenario questions. Some employers set a practical task such as reading a drawing, identifying the allowances or describing how you would machine a specific pattern. You usually get time at the end to ask about the shop, the materials they work in and the type of castings they produce.

1. Walk me through how you take a casting drawing or CAD model and turn it into a finished pattern.

Why they ask

This is the core of the trade, and the interviewer wants to hear your sequence and where your judgement sits inside it, not a recital of machine names.

How to structure your answer

A staged walk-through. Move through the job in order, naming what you check at each stage and why. Drawing and model review, material choice, shrinkage and draft allowances, machining and assembly, core boxes, finishing, gauging. Finish with how the pattern goes to trial.

Example answer

"First I read the drawing properly, including the machining allowances, and check the material the part will be cast in, because that drives the shrinkage figure. I model or mark up the pattern at the finished size plus shrinkage, and add draft so it draws cleanly from the sand. Then I choose the material, timber or resin for a one off, sometimes metal or composite for a long run, and machine the sections on the CNC router or by hand where the shape needs it. I assemble and check the core box at the same time so there are no surprises when the moulder uses it. After finishing and sealing I gauge it against the drawing, then stay with it through the first trial cast and adjust if anything is out."

2. A trial casting comes back out of tolerance on a critical dimension. How do you work out what went wrong?

Why they ask

Patternmaking is where problems get solved quietly before they reach production. The interviewer is testing whether you can reason under pressure instead of guessing.

How to structure your answer

Judgement under pressure. State your first assumption, then list what you would rule out in order, work from the least disruptive check to the most, and say who you would involve. Close with how you would confirm the fix rather than assume it worked.

Example answer

"I would not touch the pattern straight away. First I would recheck the drawing and my own gauging of the pattern to confirm the pattern is actually the problem and not the measurement. If the pattern is correct, I would look at the mould and the pour with the foundry staff: parting line, draft, how the sand formed, where the metal went. If it comes back to the pattern, I would recalculate the shrinkage for that alloy and check whether the section moved during machining or assembly. Once I have a likely cause I would correct it, then ask for another trial cast and measure the same dimension before calling it fixed."

3. Tell me about a time you repaired or modified an existing pattern rather than making a new one.

Why they ask

Repair and modification work is a large part of the job and shows whether you can think economically and work accurately around someone else's pattern.

How to structure your answer

STAR. Situation, what the pattern was and why it needed work. Task, what had to change. Action, how you assessed the existing pattern, what you did and how you held the tolerance. Result, what improved for the foundry or the customer, described in time or rework saved.

Example answer

"We had an old timber pattern for a valve body that had been dropped and cracked along a parting line, and the customer needed two castings within a fortnight. Making a new pattern would not have fit the window. I inspected it, found the crack had moved the section by a small amount, and rather than patch it I cut the damaged section out, remachined the joint face flat and built the section back in resin so it would hold its shape better than the original timber. I gauged it against the drawing before it went back to the floor. The foundry ran the two castings and they passed inspection, and the repaired pattern stayed in service for the repeat orders after that."

4. How do you check your own work before a pattern leaves the shop?

Why they ask

Patternmakers work largely unsupervised on precision jobs. The interviewer wants proof that you build checking into the job rather than relying on the foundry to catch mistakes.

How to structure your answer

Process answer with a quality control flavour. Describe your checks in the order you do them, from in process measurement to final gauging, and mention the paperwork or records that go with it.

Example answer

"I measure as I go rather than waiting until the end, because by then it is expensive to correct. For a pattern I check the critical dimensions against the drawing as each section comes off the machine, then check the assembled pattern and its core box together, since the relationship between the two matters more than either one alone. Final gauging is against the drawing and any customer specification, using hand metrology or the coordinate measuring machine where the geometry is awkward. I record what I measured and note any departure from the drawing so the next person knows. If something is borderline I raise it before it goes to the foundry, not after a casting fails."

5. You and a moulder disagree about whether a fault sits in the pattern or in the mould. How do you handle it?

Why they ask

The pattern shop and the foundry floor have to work together, and the interviewer is checking whether you can hold your ground technically without creating friction.

How to structure your answer

Client and colleague facing structure. Acknowledge the other person's view, describe how you would gather evidence rather than argue, then how you would agree on a way forward and keep the relationship intact.

Example answer

"I would start by saying what I have measured, because that is common ground, and then ask them to show me what they are seeing on the mould side. If we still disagree, the trial cast settles it. We can run one casting, section it or measure it, and see which of us is right, and I am happy to be the one who is wrong. What matters is the next casting, not winning the conversation. I would make sure we both know what was changed so the result means something, and I would follow up with them afterwards rather than leaving it."

6. What does safe practice look like in a pattern shop, and how do you keep it up on a busy day?

Why they ask

Pattern shops combine woodworking machines, resins, dust and heavy materials. Employers need to know you treat safety as part of the job, not a set of rules you recite.

How to structure your answer

Safety answer. Group your points by hazard: machines, dust and chemicals, manual handling and housekeeping. Then explain how you keep them under control when the pressure is on, which is the part interviewers actually care about.

Example answer

"Machines come first: guarding in place, correct blade or cutter for the material, and no reaching in while something is still moving. Dust and resin handling is the other big one, so extraction on, correct gloves and respiratory protection, and no eating or drinking in the work area. Then manual handling, because pattern materials are heavy and awkward, so I use the trolley or get a second person rather than lifting something badly. Housekeeping holds it together. When a job is running late the temptation is to skip the setup and rush, and that is exactly when people get hurt, so I slow down at the setup and keep the floor clear. I also speak up if I see something unsafe, including my own habits."