PrintKinetic RESOURCE

Post-Processing Decision Guide

https://printkinetic.com/resources/post-processing-decision-guide/ · Last updated 2026-09-08

Post-processing has its own cost in time, risk, and sometimes dimensional accuracy, so it is worth choosing deliberately rather than applying by habit. A part that will sit inside an enclosure does not need the same surface work as a cosmetic front panel, and a part that needs a threaded fastener needs a different decision entirely than a part that just needs a smoother surface. This guide connects six post-processing decisions around the same question: what specific outcome does this part actually need.

Support removal is usually the first post-processing step any supported print needs, and it is also one of the easiest steps to damage a part during. The Support Removal Strategy engine compares removal approaches, mechanical break-away, dissolvable support material, or careful trimming, against the part's support pattern and the surface finish that removal needs to preserve, because the wrong removal method can leave more damage than the supports themselves would have.

Surface finish route selection comes next for any part where the as-printed surface is not good enough. Sanding, vapor smoothing, filler primer, and other finishing routes each trade off differently between labor time, cost, and how much of the layer-line texture they actually remove. The Surface Finish Route Selector matches a finishing route to the part's material, geometry, and the finish quality actually required, rather than defaulting to whichever method is most commonly mentioned online regardless of whether it suits this specific material.

Heat-set inserts and adhesive-or-fastening decisions both address how a printed part connects to something else, and they fail differently when chosen wrong. A heat-set insert installed with too much heat can deform the surrounding plastic; installed with too little, it can pull out under load. The Heat-Set Insert Process Planner and Adhesive and Fastening Selector work through those specific failure modes against the part's material and expected load, because "just glue it" or "just melt an insert in" are not decisions, they are placeholders for a decision that still needs to happen.

Painting, coating, and annealing are the two post-processing steps most likely to change the part in ways that are hard to reverse. Paint and coating adhesion depends heavily on surface preparation specific to the base material; skipping that preparation is a common reason coatings peel or chip soon after application. Annealing can meaningfully improve heat resistance and strength, but it does so by relieving internal stress in a way that also risks warping the part, which is a real tradeoff, not a pure upgrade. The Painting and Coating Readiness and Annealing Tradeoff Planner engines both treat these as decisions with genuine downside risk, not automatic finishing steps.

Consider a painted enclosure that looked flawless right after finishing but started peeling at the edges within a week of light handling. The paint itself was applied carefully, but the surface preparation step, sanding and priming keyed for the printed material's specific surface energy, was skipped in favor of painting directly over the as-printed surface. Run through the Painting and Coating Readiness engine, the actual cause traces back to that skipped preparation step, not the paint product or application technique, which is exactly the kind of failure that shows up well after the job looked finished rather than during the finishing work itself.

Sequencing matters as much as selection once more than one post-processing step is needed on the same part. Support removal generally has to happen before surface finishing, since finishing a surface that still carries support scars wastes the work when removal happens afterward and reopens the surface; inserts and fasteners generally go in after any heat- or solvent-based finishing step that could loosen or deform them. Planning the order of these steps, not just which ones apply, avoids redoing finishing work that a later step would have disturbed anyway.

Material also changes which post-processing routes are even viable, independent of the outcome desired. Vapor smoothing works on ABS because acetone dissolves it at the surface, but the same technique does nothing useful to PLA or PETG, which need a mechanical or primer-based route instead. Choosing a finishing technique before confirming it is even compatible with the part's actual material is a separate failure mode from choosing the wrong technique for the desired outcome, and it is worth checking first since it rules out options before the outcome-matching decision even begins.

A common mistake is choosing a post-processing route before confirming the part actually needs it. Every finishing step adds time and a chance of damaging an otherwise good part,

so the first question should always be what specific problem this step solves for this specific part, not which post-processing techniques are available in general.

FAQ

Does every printed part need post-processing?

No. Post-processing has its own time and risk cost, so it should be chosen for a specific outcome, such as surface finish, dimensional accuracy, or a fastening need, not applied by default.

Is annealing always worth the dimensional risk?

Not automatically. Annealing can meaningfully change strength and heat resistance, but it also risks warping the part, so it belongs on parts where the tradeoff is deliberate.