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FILAMENTS

Outdoor Part Planning Checklist

Material choice matters, but outdoor durability starts with the actual service environment and the design.

- Sun and weather
  Define UV exposure, rain, humidity, standing water, dirt and expected service life. ASA is generally the first choice when long-term UV/weather resistance is important.
- Temperature
  Estimate both ambient and local heat. A dark part inside a parked vehicle can see very different temperatures from a shaded garden clip.
- Loads
  Identify sustained loads, impact, vibration and fastener loads. Do not assume ASA is suitable for safety-critical structural use without validation.
- Print orientation
  Orient the part so important loads do not rely unnecessarily on the weakest layer-to-layer direction.
- Stress concentrations
  Use generous radii or fillets around corners, holes and section changes where practical.
- Fasteners
  Provide enough wall thickness and bearing area around holes. Consider washers, inserts or captured hardware where appropriate.
- Water management
  Avoid pockets that trap rainwater or debris. Add slopes, drain holes or open-bottom geometry where needed.
- Color and solar heat
  Dark colors absorb more solar heat. Consider the real thermal environment when selecting color, wall thickness and clearance.
- Inspection and replacement
  Make exposed parts easy to inspect and replace. Consider how wear, cracking or deformation would be noticed before it causes a larger problem.
- Validate the real part
  Test the actual printed part, filament grade, orientation and load case before relying on it in demanding service.

This checklist is a planning aid, not an engineering certification. Material properties and printed-part performance depend on grade, process, geometry and orientation.

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