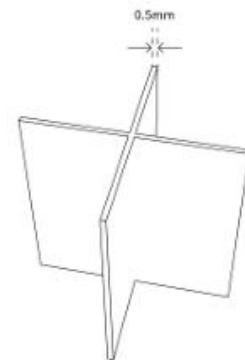


RMS220 Design Guide (PA Next) – User Edition

As with every additive manufacturing (AM) process, the quality of Selective Laser Sintering (SLS) parts is closely tied to the initial design stage. The key insights on part design and build-nesting (packing) strategies are summarized below. Before starting a build, please consult the design guidelines below to ensure parts that meet your expectations. For part features or nesting configurations not covered here, should any print-related issues arise, please contact our after-sales support team.

1. Thin Walls

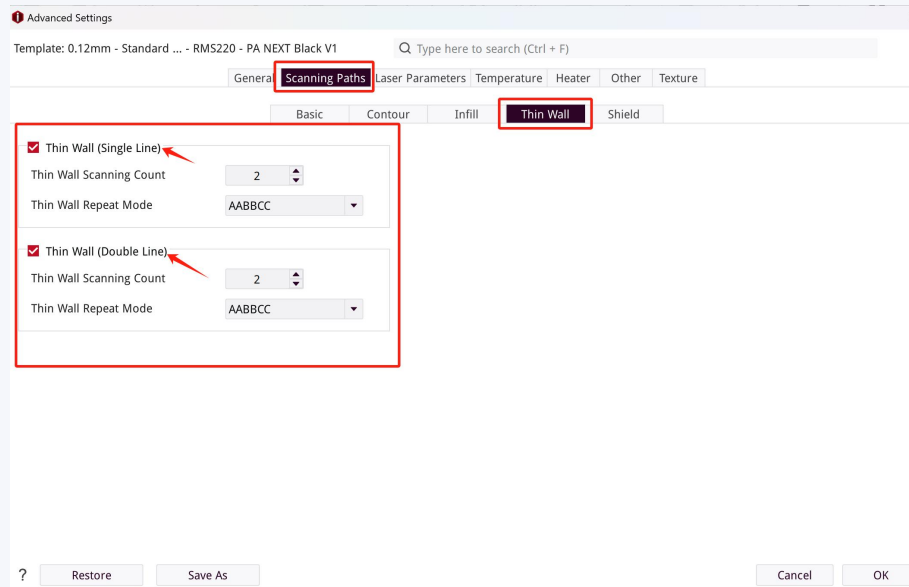
For PA Next, a greater wall thickness promotes a dense, robust solid surface, whereas a smaller wall thickness allows a certain degree of elastic (flexible) deformation. Considering the material's inherent strength and toughness, we recommend a minimum wall thickness of 0.5 mm; below this value the part is easily damaged during depowdering (part removal) and subsequent post-processing, making it difficult to maintain structural integrity.



When configuring thin-walled features in ideaMaker, it is recommended to orient them within the XY plane (as shown) to achieve more balanced dimensional accuracy and overall mechanical performance.

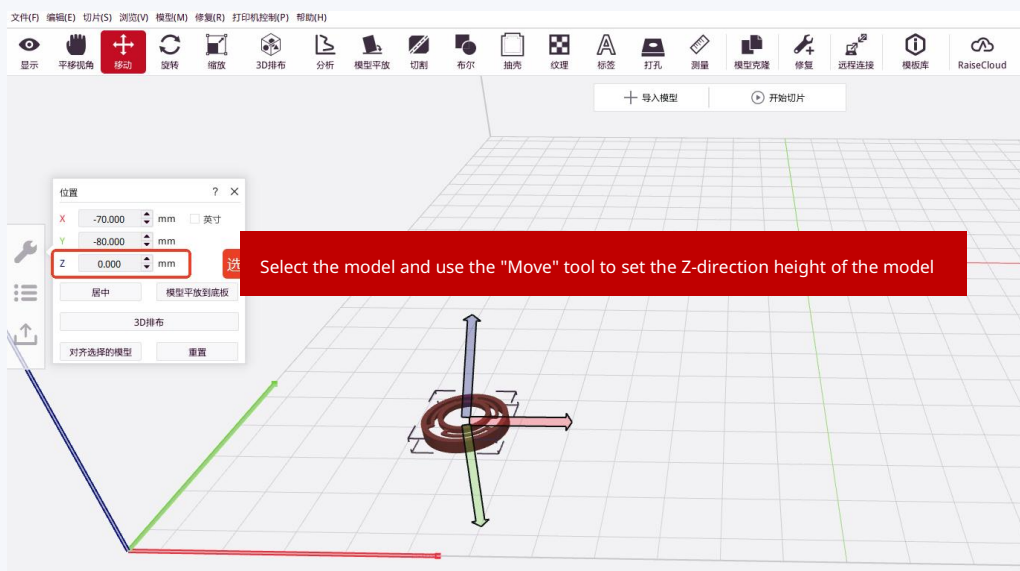
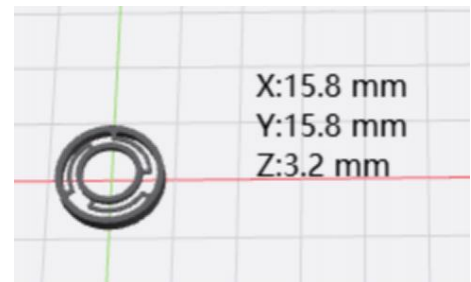
When the wall thickness is less than twice the contour compensation (typically for thin-walled parts below 0.4 mm), the thin-wall feature must be enabled to prevent thin-wall features from being dropped during laser scanning. Within the standard template, to avoid excessively sharp corners—which readily produce uneven notches during bead blasting (sandblasting)—this feature is disabled by default.

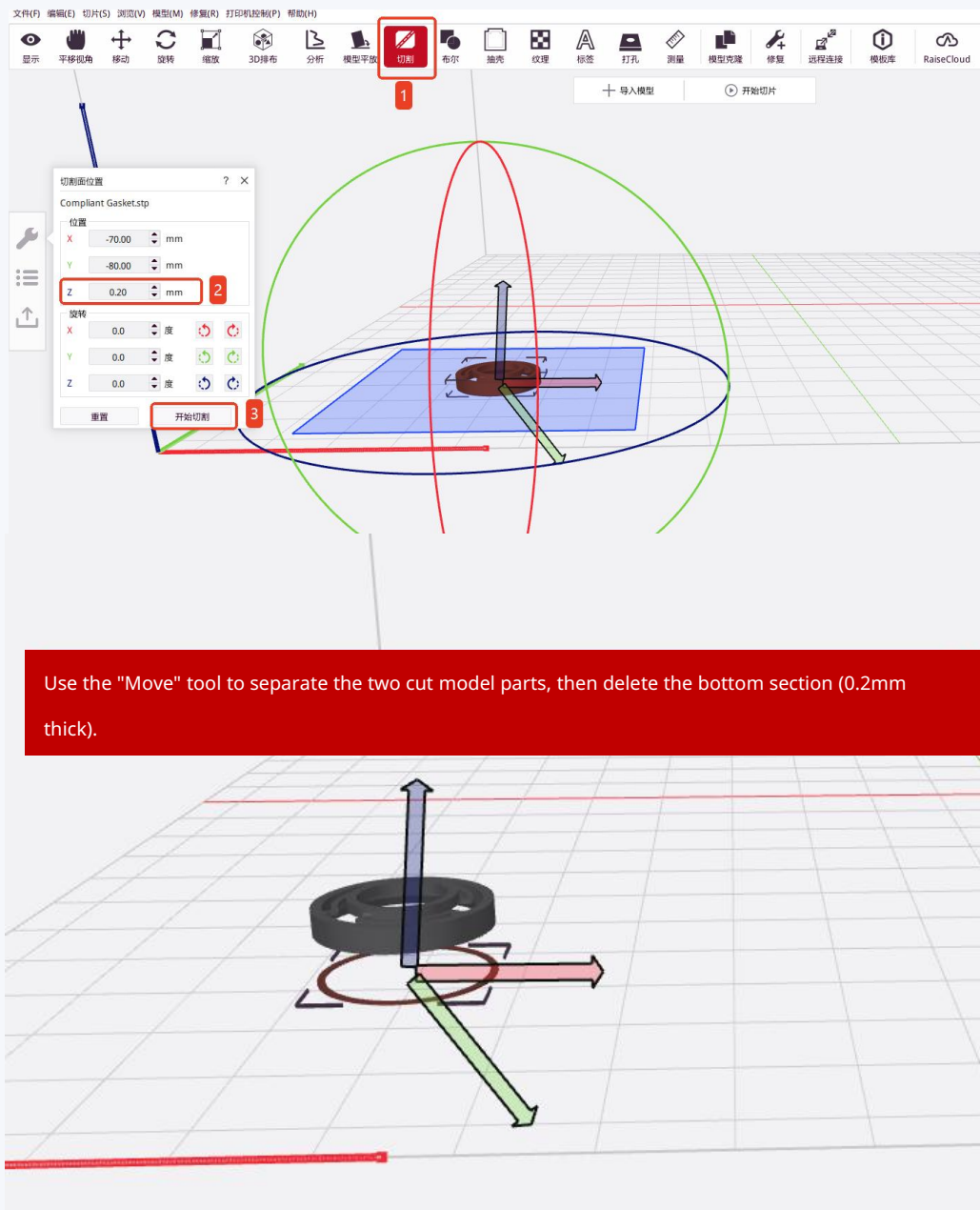




2. Small Size, Thin Walls

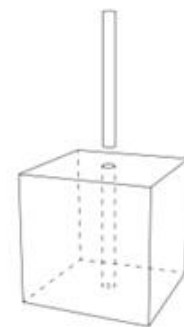
When the model is a small thin-walled part with a Z-height (build-direction) below 5 mm, the bottom face of the part is prone to sinkage, which can enlarge the Z-dimension. A currently effective mitigation strategy is to chamfer the bottom face of the model by approximately 0.2 mm.





3. Small Holes

Powder trapped inside holes stays at elevated temperature throughout the sintering process, which can cause hole shrinkage or even complete blockage. For PA Next we recommend a minimum hole diameter of 1 mm. For longer through-holes, the hole diameter should be increased during the design phase; for deeper blind holes or curved internal channels, a further increase is needed to ensure effective powder removal. For models with such complex



hole structures, please contact our after-sales support team in advance to confirm print feasibility.

When designing pins that mate with holes, special attention must be paid to circularity tolerance (i.e., the chordal / tessellation error). Too coarse a tolerance makes the circle approximate a polygon, causing a poor pin-to-hole fit; too fine a tolerance increases the number of corner points along the contour, raising the local energy density, which can in turn produce an undersized hole and an oversized cylindrical outer feature.

If the inner diameter of a hole is undersized while the outer diameter and wall thickness remain within normal limits, the inner-contour compensation feature can be enabled.

Inner Outline Subsection Offset

Diameter

3.0

mm

Offset

-0.100

mm

Add

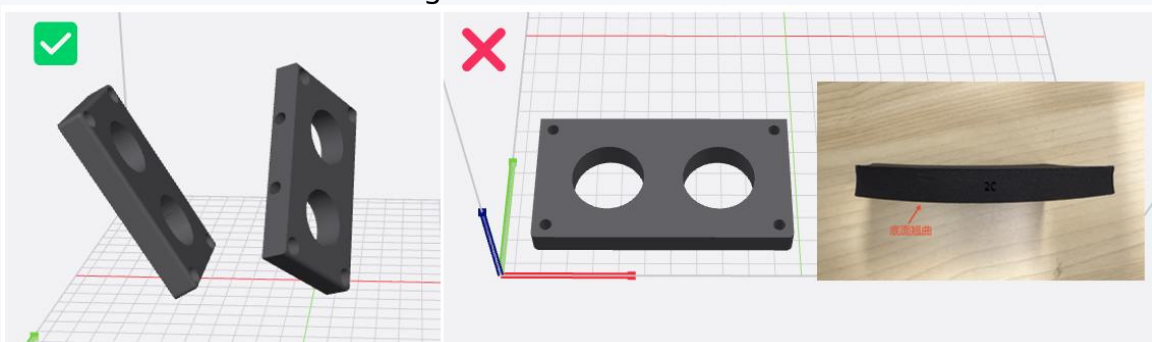
Remove

↺

Diameter	Offset
3.0	-0.100

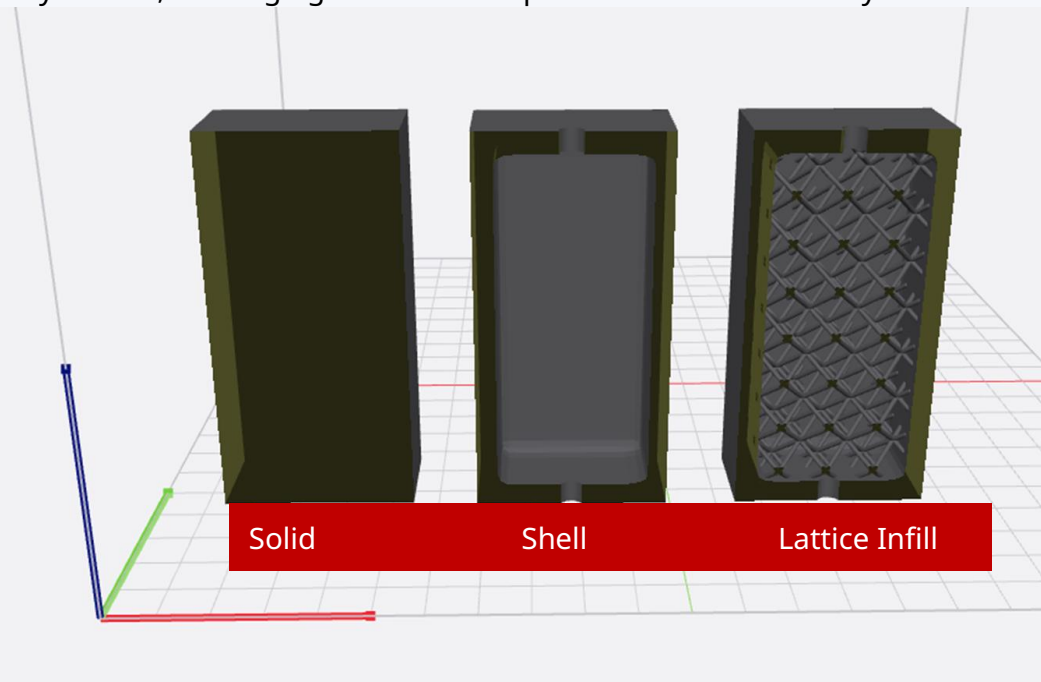
4. Solid / Bulk Parts

When the model is a solid or large part whose Z-axis (build-direction) solid height exceeds 10 mm, the bottom face is prone to warping. The most effective remedy is to build the model at a draw / tilt angle of 20°–70°. Note: when tilting the model, place the smaller cross-section or the angled face at the base.



For large solid parts with any dimension exceeding 100 mm, we recommend a shelling (hollowing) design prior to printing. This significantly reduces build time, sharply lowers powder consumption, and prevents deformation during shrinkage. The shelled wall thickness is generally recommended to stay within 5 mm.

Where components require high rigidity or compressive strength, a fully hollow design may lack sufficient strength. In such cases, support structures—such as internal lattices or reinforcing ribs—can be incorporated to enhance overall strength without compromising access to the internal powder for removal. Alternatively, the shell can be fully sealed, leveraging the residual powder inside the cavity as structural support.



For large shelled parts without special strength requirements, powder-removal (cleaning) holes must be provided on the shell, with a minimum diameter of 5 mm. It is recommended to place at least one hole at each end of the part's longest edge to facilitate airflow during bead blasting; if the internal structure is complex, add more holes. Finally, if the holes must be sealed after depowdering to preserve appearance, they can be designed as counterbores with matching printed plugs, sealed by heat-set (thermal) or solvent (chemical) bonding.

5. Build Nesting (Part Placement)

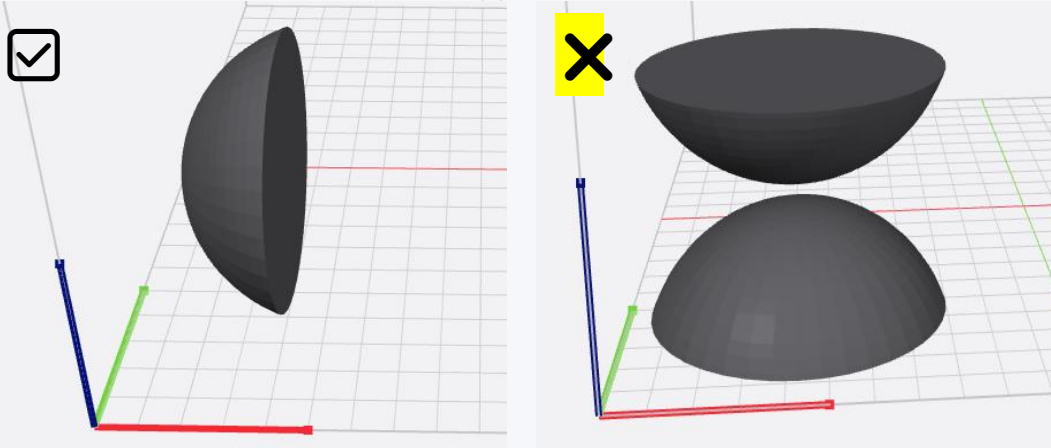
5.1 Fine Features



For fine features such as small text or surface textures, print clarity from best to worst is: top face > vertical wall > bottom face > upper overhang > lower overhang. If the feature lies on an inclined face, keep it above 45° relative to the build plane to avoid dense staircase-striation formation.

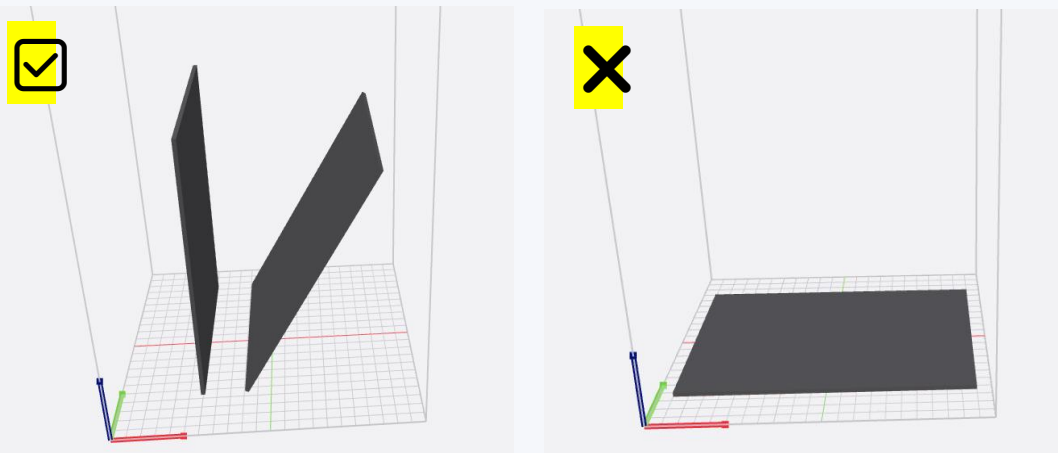
5.2 Curved / Arc Surfaces

For relatively shallow curved surfaces, orienting the surface on its side (upright) prevents the formation of dense staircase-stepped striations.



5.3 Large Flat Faces (area $\geq 10 \text{ cm} \times 10 \text{ cm}$)

For large flat plates, orient them at an angle or vertically; laying a large plate flat on the build plane may cause warping during the build. For a smoother surface finish, place the plate flat at the top of the build. For flat plates with a large specific surface area, significant deformation may occur during cooling and shrinkage—extra support helps (here, tilting the plate leaves more unsintered powder around it, which in turn provides greater support) to counteract internal stress. Alternatively, annealing (heat treatment) can be used to relieve internal stress and reduce deformation.

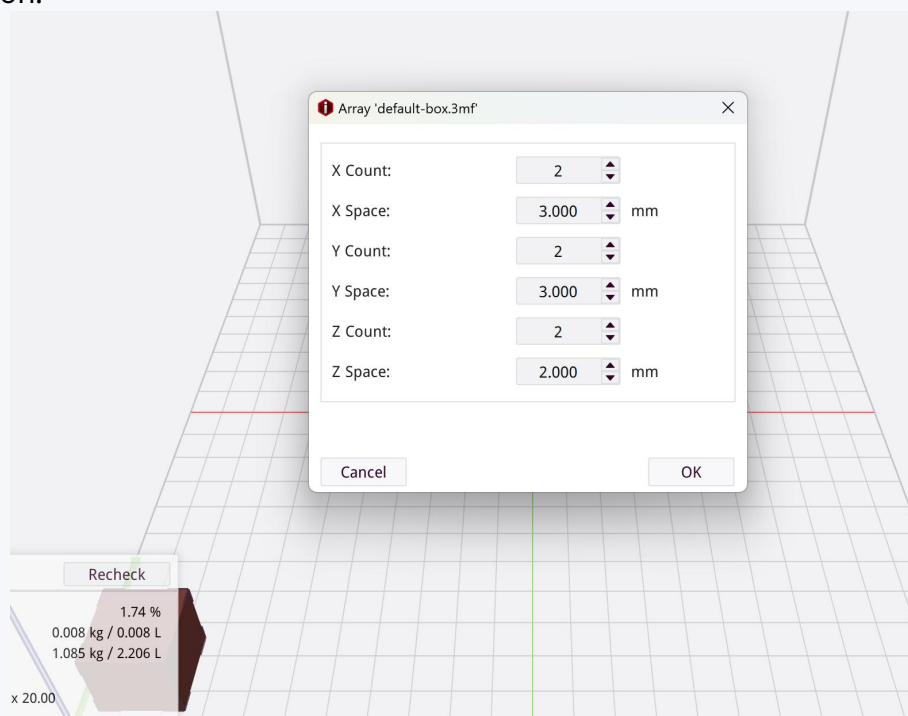


5.4 Assembly Fits

To ensure assembly precision, reserve a minimum fit clearance of 0.3 mm between mating features; during build nesting, keep all mating features at the same orientation angle to avoid assembly failures caused by differences in angular distortion.

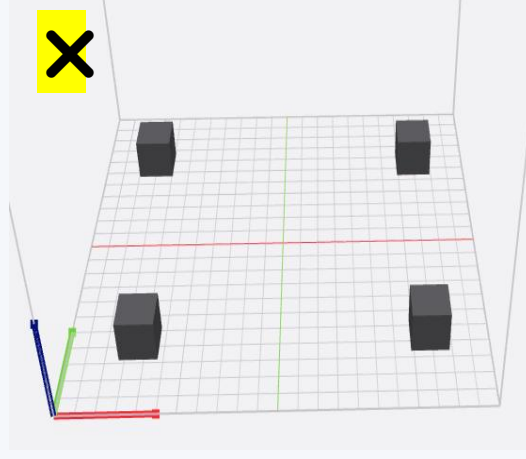
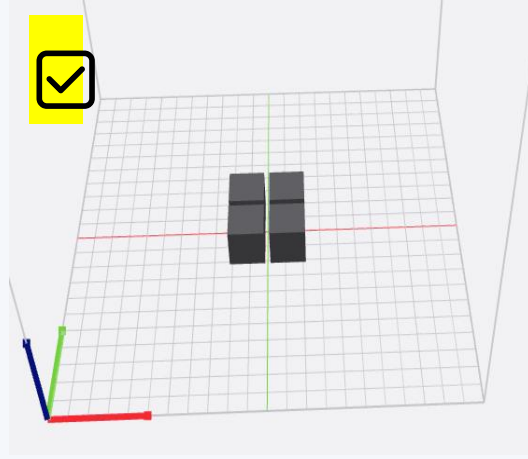
5.5 Part Spacing

When nesting parts in a batch, reserve a minimum spacing of 3 mm; for two parallel faces, allow a larger spacing based on their area (for two faces each larger than 10×10 cm, spacing should exceed 5 mm) to prevent thermal interaction that could lead to deformation.



5.6 Small Parts

When nesting small parts (cross-sectional area $\leq 1 \text{ cm}^3$), place them as centrally as possible on the build platform, since small melt pools bond weakly to the powder bed and edge placement may cause warping or the part being pushed out of position.



5.7 Build-Time & Material Savings

When printing non-planar parts, orient the part flat on the build platform wherever possible; this lowers the build height, shortens the build time and minimizes powder consumption.

