Foundry & Caster Specification Sheet

Base-12 Meditation Vajra (144 mm) · One-off piece · Mesh modeled in millimeters at 1:1 finished scale · Prepared by R&R Droids

Please review the following before slicing the wax pattern. All dimensions below were measured directly from the supplied mesh (179,136 triangles, watertight).

Part Name	Base-12 Meditation Vajra (144 mm)
Process Requested	Lost-wax investment casting from a 3D-printed castable resin pattern. No rubber master mold required — this is a one-off.
Preferred Casting Alloys	C87300 Silicon Bronze (~95% Cu) — preferred. C83600 Red Brass (~85% Cu) acceptable.
If CNC Machining Instead	C14500 Tellurium Copper (~99.5% Cu). Note: near-pure copper is difficult to investment-cast in this thin open-cage geometry; C14500 is the machining route only.
Overall Bounding Box	144.0 mm (L) × 39.0 mm (W) × 34.1 mm (H). Width is measured across the outer prong cage.
Central Hub	Ø 24.0 mm nominal 12-sector fluted sphere (24.5 mm max across flutes).
Lotus Collars	28.7 mm envelope, 31.0 mm max across petal crests; 12 petals per side.
Prong Geometry	1 central (twisted hexagonal) shaft + 6 outer prongs per end; prongs Ø 4.8 mm at root, converging at a 12° taper into a faceted diamond tip.
Mesh Volume / Est. Weight	30.1 cm^3 → approx. 265 g finished in silicon bronze.

Shrinkage Compensation	Scale the mesh by **1.018× (+1.8% to +2.0%)** before printing the wax/resin pattern, for an exact 144.0 mm finished length.
Surface Finishing	**One end (−Z):** 220-grit bead-blasted satin finish. **Other end (+Z):** Mirror buff polish. The split finish is deliberate — it lets the holder feel the piece's orientation by touch.

Casting Notes

- **Sprue & gating:** The 6 outer prongs per side form an open cage around the central shaft. Attach the main feed sprue to the very tip of one end, or feed into the central 24 mm hub sphere with small auxiliary vents on the outer prong arches, so metal flows through all six prongs without trapping air.
- **Thin sections:** Minimum wall is the prong tube (Ø 4.8 mm at root, tapering to ~Ø 3.5 mm). Silicon bronze's fluidity is requested specifically for clean fill of the lotus petals and prongs.
- **Files supplied:** STL (primary), OBJ, and a 2D DXF profile drawing for dimensional verification. An interactive 3D viewer (HTML) is also included — open it in any browser to inspect the piece; its “Download .STL” button extracts the same mesh.

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generate_vajra_cad.py (base-12 parametric model, units: mm).