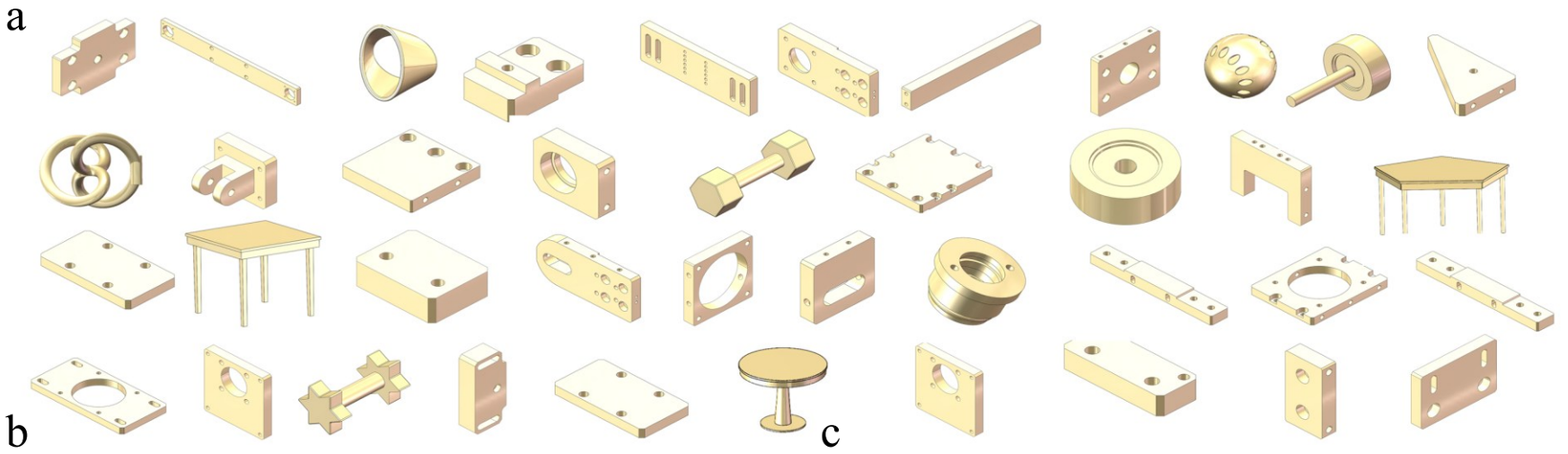


b

Modeling Requirements

Design a four-step shaft. Segment diameters 24, 48, 60, 40 and lengths 25, 45, 35, 40. Both ends chamfer 1.2, shoulder relief width 2.4, shoulder fillet radius 1.0. Rectangular keyway on segment 2 with width 12, depth 6, end margins 6, orientation 90. External retaining ring groove on segment 3 with width 3, depth 2, offset 4 from the segment start.

LLM Modeling

Design - Answer

I have generated the CQ code for the part : import cadquery as cq result = cq. Workplane(\ "XY\").moveTo(-0.61, 0.30). lineTo (0.6096, -0.3048)……

LLM Checker

Check - Result

! Missing keyway feature
! Missing shoulder fillet feature
! Missing external retaining ring groove

Round 1

LLM Modeling

Modify - Answer

I have modified the CQ code for the part : import …… .extrude(0.0381) .close() ……

LLM Checker

Check - Result

! Missing external retaining ring groove
! The parameter values don't match these requirements

Round 2

LLM Modeling

Modify - Answer

I have modified the CQ code for the part : import …… extrude(0.0216).cutBlind(0.3) .close()……

LLM Checker

Check - Result
Perfect!

Round 3

c

3D Modeling by CRP

Generate a spur gear with 70 teeth, a tooth thickness of 37mm, an outer diameter of 200mm, an inner diameter of 70mm, and a keyway 14mm by 5mm.

Generate a flanged reducer bushing with an 80mm flange 10mm thick, body steps 67mm by 40mm 59.9mm by 44.2mm and 51.2mm by 49.7mm, a stepped bore of 40mm 43mm and 45.7mm, and flats across 75mm.

Generate an integral spur gear shaft with 25 teeth, a gear face width of 37mm, stepped shaft diameters of 40mm 57mm 40mm and 32mm with lengths of 25mm 48mm 55mm and 60mm, and a keyseat of 30mm by 10mm by 4mm.

Generate a lugged tubular housing with an outer diameter of 42mm, an inner bore of 36mm, a length of 120mm, two radial lugs 15mm diameter extending 34mm, lug holes 8mm, and body cross holes 6mm.

3D Modeling by CGP

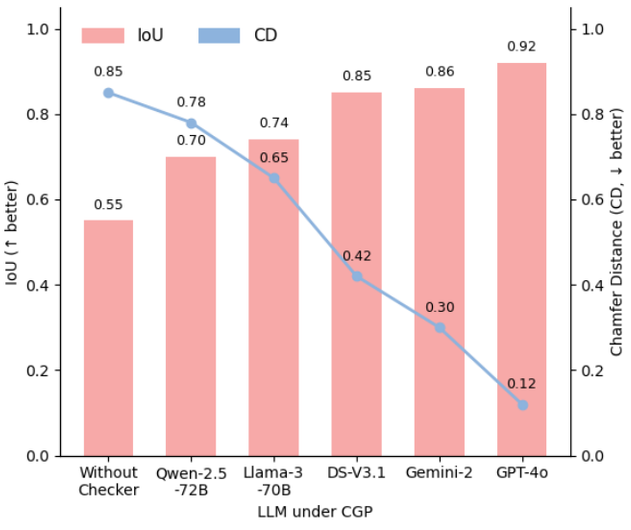
A single smooth tube forming a trefoil knot with three interwoven lobes. Circular cross section throughout with soft blends at the crossings, closed and symmetric along a toroidal path.

A thin walled band that closes into a loop with a single twist. The inner opening reads as softly triangular, and the surfaces flow smoothly with gentle rounded edges.

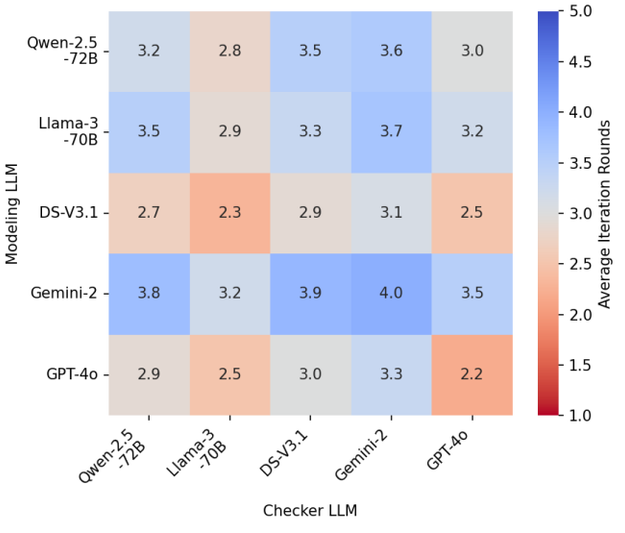
A smooth solid sphere patterned with a band of shallow oval dimples that trace a gentle spiral around the equator. Surface transitions are soft and continuous.

A straight cylindrical handle joins two six point star plates with smooth blends at the junctions.

d



e



f