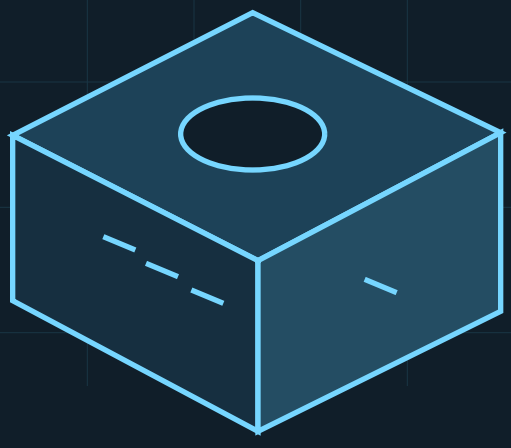
FROM CONCEPT TO FINISHED PART.

A practical project planning guide for CNC machining, design, fabrication, and better requests for quote.



DEFINE DESIGN SELECT QUOTE

Prepared for engineers, buyers, inventors and industrial teams.

READ THIS FIRST

Better inputs make better projects.

The goal is not to become a machinist. The goal is to give your manufacturing partner the right information, early enough to make practical decisions.

01 / DEFINE

Purpose + quantity

Describe the function, mating parts, environment, desired number of parts and your highest priority.

02 / DESIGN

Requirements + files

Collect drawings or CAD, specify critical fit and tolerance requirements, and identify material and finish preferences.

03 / SELECT

Process + feasibility

Compare machining, turning, cutting, forming, welding and assembly based on geometry and requirements.

04 / QUOTE

Packet + conversation

Send the latest files with quantity, requirements and a target date. Ask the shop to validate feasibility and timing.

A SIMPLE RULE

A complete RFQ does not guarantee cost or lead time. It reduces ambiguity and helps the shop ask better questions sooner.

01 / DEFINE

Start with the job, not the machine.

Tell CNC4 what the part needs to accomplish before deciding how it should be manufactured.

FUNCTION

What is it?

A bracket, shaft, enclosure, replacement part, one-off prototype, or a complete mechanism?

INTERFACE

What does it fit?

Identify adjacent components, mounting patterns, bearings, seals, forces, and installation space.

VOLUME

How many?

Give both initial quantity and future annual demand, if known. Volume can affect the manufacturing plan.

CONSTRAINTS

What is critical?

Identify safety, loads, corrosion exposure, inspection expectations, deadlines, and cost priorities.

PROJECT DEFINITION CHECKLIST

- [ ] Purpose and operating environment are described
- [ ] Part quantity and possible repeat demand are estimated
- [ ] Interfaces, mounting points, and must-fit features are noted
- [ ] Critical priorities and target completion date are identified

TIP • Photos, sketches and an existing part can help explain the problem when formal CAD is not ready.

02 / DESIGN

The drawing carries the requirements.

Clear design intent reduces rework. A model describes geometry; the supporting notes explain which details really matter.

FILE CONTROL

Units + revision

Confirm millimeters or inches, drawing revision and which source of truth controls the job.

CRITICAL FEATURES

Fit + tolerance

Call out features that affect function: holes, threads, bearing seats, sealing surfaces and mating faces.

MATERIAL

Grade + condition

Specify the grade if required, or ask for a material recommendation based on use and environment.

FINISH & QUALITY

What is acceptable?

Clarify finish, deburring, inspection documentation and functional or cosmetic criteria.

DESIGN-FOR-MANUFACTURING QUESTIONS

- [ ] Can the design be reached with standard cutting tools?
- [ ] Are ultra-tight tolerances required on every surface, or only a few?
- [ ] Could deep pockets, thin walls or difficult fixturing complicate setups?
- [ ] Are there opportunities to simplify geometry without compromising function?

03 / SELECT A PROCESS

Match the process to the geometry.

CNC4 lists multiple machining and fabrication services. The examples below are starting points, not automatic production approvals.

CNC MILLING

Flats, pockets + slots

Often a starting point for prismatic blocks, precise hole patterns, milled faces and tool-accessible contours.

CNC TURNING

Round components

Often a starting point for shafts, sleeves, bushings and other parts built around a rotational axis.

PLASMA + SHEET

Flat profiles + forming

Cutting can make 2D metal profiles; bending, rolling, deburring and finishing may need additional operations.

FABRICATION

Structures + assembly

Welding, custom fabrication, design and final assembly may be combined in a single manufacturing scope.

PROCESS SELECTION CHECK

Confirm material, overall dimensions, features, quantity, tolerances, finishes and tooling access with the shop before choosing a process. Some parts require more than one operation.

Use the interactive process finder on CNC4.com for an educational starting point.

MATERIAL DECISIONS

Material is an engineering decision.

CNC4 describes experience machining aluminum, mild and stainless steel, cast iron, brass and bronze, and engineering plastics. Confirm specific grade availability.

ALUMINUM

Weight + machinability

Common for fixtures, housings and structural parts when reduced mass is valuable.

MILD STEEL

General industrial use

Can serve brackets, frames and parts needing strength and easy fabrication.

STAINLESS STEEL

Corrosion resistance

Consider alloy, corrosion environment, appearance and machining needs.

BRASS / BRONZE

Application-specific

Often selected for fittings or wear-related designs; alloy selection is critical.

CAST IRON

Machine components

Grade and cast condition matter for industrial component machining.

ENGINEERING PLASTICS

Specific functional needs

Consider heat, wear, moisture absorption and dimensional stability.

ASK BEFORE SPECIFYING

What matters most: loads, corrosion, wear, weight, conductivity, temperature, cost—or approval for a regulated use?

GOOD MANUFACTURING PRACTICE

Specify what matters—and no more.

Engineering detail matters, but unnecessary constraints can create extra machining time, setup complexity or inspection work.

DESIGN FOR MANUFACTURING

01 **Identify critical features**
Separate must-fit dimensions from noncritical measurements.

02 **Consider cutting access**
Deep narrow pockets and internal corners may limit tool access.

03 **Review the datum strategy**
Explain which surfaces establish orientation and assembly location.

04 **Specify surface needs**
Ask for an appropriate finish; not every surface needs the same result.

USE THE DRAWING TO DEFINE

- [ ] Fit and assembly interfaces
- [ ] Hole, thread and bore requirements
- [ ] Dimensional or geometric tolerance on critical features
- [ ] Cosmetic, deburr, material and inspection requirements

Do not assume any particular tolerance, surface finish, machine travel, inspection level or certification is included. CNC4 must confirm the achievable specification for your specific job.

REQUEST FOR QUOTATION

A clear RFQ gets the conversation moving.

CNC4 accepts several project file types, including STEP / STP, IGES / IGS, SLDPRT, STL, OBJ, images and other formats listed on its site.

SEND YOUR PART FILES

Most recent revision only

Attach CAD, a 2D print, a sketch or relevant photographs. State the revision and measurement units.

THE SEVEN ESSENTIAL RFQ DETAILS

- [ ] Part or project name and what it needs to do
- [ ] Quantity now, plus likely future quantities
- [ ] Material grade or openness to alternatives
- [ ] Drawings, revision, units and critical tolerances
- [ ] Finish, assembly and inspection expectations
- [ ] Desired timeline and shipping / delivery location

ASK THE SHOP TO CONFIRM

Feasibility, final process, price, inspection scope and realistic lead time before the project is approved.

PRINT-AND-FILL WORKSHEET

Your project brief.

Use these fields before submitting an online quote or emailing CNC4. Include your technical files separately.

PROJECT / PART NAME

QUANTITY & REPEAT VOLUME

MATERIAL / GRADE

DRAWING REVISION + UNITS

TARGET COMPLETION DATE

FINISH / COATING

CRITICAL DIMENSIONS, FITS OR REQUIREMENTS

PRIMARY CONTACT / EMAIL

WHAT TO ATTACH

Latest CAD or drawing / sketches or photos / assembly overview / inspection notes (if applicable)

FROM INQUIRY TO DELIVERY

Know the handoffs.

Timelines depend on design maturity, materials, quantity, machine availability, finishing, outside processing and acceptance requirements.

01

QUOTE REVIEW

Share files and scope. Resolve missing details and confirm requirements.

02

ENGINEERING / DFM

Discuss manufacturability, tool access, material and tolerance decisions.

03

PLAN & APPROVE

Confirm final quote, revision, schedule and acceptance criteria.

04

MAKE & INSPECT

Machine or fabricate, complete requested finishing, verify as agreed.

05

DELIVER & REPEAT

Receive the parts, capture feedback and control future revisions.

Note: This is an illustrative workflow. CNC4 will set the actual manufacturing sequence and schedule for each project.

ABOUT CNC4

A practical partner for custom work.

CNC4 is based in Cambridge, Minnesota, with a website describing one-off parts through production runs, design and fabrication, and service across the Upper Midwest.

MACHINING

CNC milling + turning

CNC machining, milling, lathe work and general machining for custom industrial components.

METALWORK

Cutting + fabrication

CNC plasma cutting, precision sheet metal fabricating, steel rolling, and steel/stainless/aluminum welding.

ENGINEERING

Part and machine design

CAD-related design and prototyping to help develop concepts into manufacturable work.

INTEGRATED BUILD

Assembly + automation

Complete product assembly, product power, controls and automation, and industrial painting listed among services.

EQUIPMENT HIGHLIGHT / COMPANY-PUBLISHED

The CNC4 Midwest service page lists a Haas VF-3SSYT and Tormach 1100MX. Published specifications, machine availability and suitability should always be confirmed during quoting.

HAVE A PART IN MIND?

Use your completed project brief and upload your most recent technical files. CNC4 can review feasibility, scope and quote details.

REQUEST A QUOTE

cnc4.com/pages/get-a-quote

team@cnc4.com | (612) 423-9049

34064 Hwy 47 NW • Cambridge, MN 55008

SOURCE NOTES

Company service information and contact details: cnc4.com | Design / fabrication: cnc4.com/pages/design-fabrication | Equipment and materials: cnc4.com/blogs/news/mid-west-service | RFQ file formats: cnc4.com/pages/get-a-quote. Accessed October 2026.

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