

Performance Standards CNC Turning

Material

Aluminum or mild steel.

Duty

- Set up, program and operate a CNC lathe or turning center and manufacture a part within tolerance.
- Work from a process sheet.
- Understand the x, z Cartesian coordinate system.
- Create a tool set up sheet.
- Understand fundamental machine processing, feeds and speed, and select simple part.

Performance Standard

Write a program at the machine or off line. Setup the machining operation and perform all standards given on lathe operations (2.9) to develop a simple part (with linear and circular interpolations).

Accuracy Level: Match the requirements of the part print.

Assessment Equipment and Material:

Workstation: A standard workbench, a CNC mill with continuous path capability on 2½ axes.

Tooling: CNC lathe or turning center and computer workstation
Material as per print
Tooling as appropriate
Measuring instruments as needed
Reference: Operation process sheet

Measuring Inst: Required micrometers, combination set, dial indicator, 6" rule, a 6" vernier, dial, or electronic caliper, adjustable parallels, edge finder, appropriate tools for determining squareness, and surface finish comparison standards.

Reference: Machinery's Handbook, operator's manual of the machine tool.

Performance Assessment Worksheet CNC Turning

INSTRUCTIONS: Rate the candidate's performance for the CNC Turning job according to the criteria below. The checklist below represents only a listing of criteria to be evaluated. It is not a sequence of process steps or a process plan for making the part. For each item, check the box under Pass or Fail accordingly.

Remember, NIMS requires that all specifications must be met within the allowable tolerance limits. If the part does not meet all specifications, the candidate/trainee must correct or redo the project.

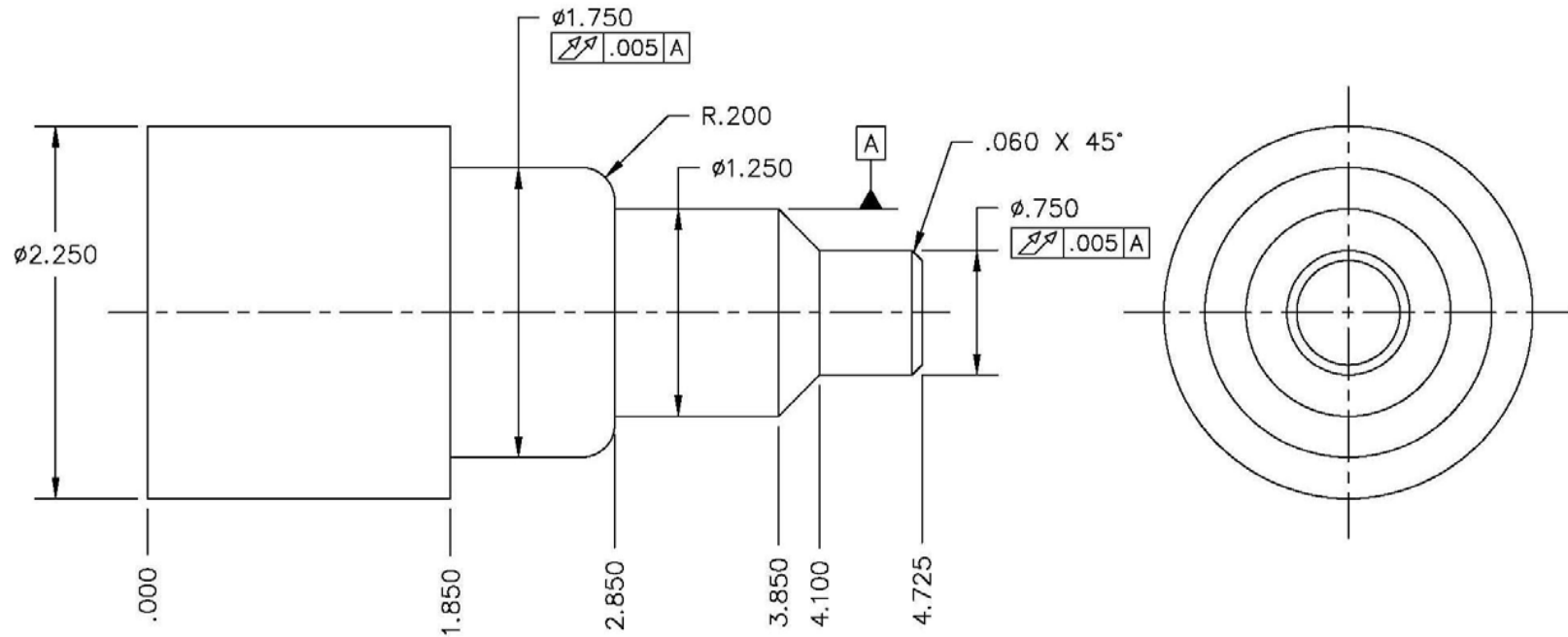
Candidate Name _____ Evaluation Date _____

Performance Project – CNC Turning		Pass	Fail
Evaluation Criteria			
1. 1.850 Length	Pass = within tolerance Fail = out of tolerance	<input type="checkbox"/>	<input type="checkbox"/>
2. 2.850 Length	Pass = within tolerance Fail = out of tolerance	<input type="checkbox"/>	<input type="checkbox"/>
3. 3.850 Length	Pass = within tolerance Fail = out of tolerance	<input type="checkbox"/>	<input type="checkbox"/>
4. 4.100 Length	Pass = within tolerance Fail = out of tolerance	<input type="checkbox"/>	<input type="checkbox"/>
5. 4.725 Length	Pass = within tolerance Fail = out of tolerance	<input type="checkbox"/>	<input type="checkbox"/>
6. \varnothing .750	Pass = within tolerance Fail = out of tolerance	<input type="checkbox"/>	<input type="checkbox"/>
7. \varnothing 1.250	Pass = within tolerance Fail = out of tolerance	<input type="checkbox"/>	<input type="checkbox"/>

Performance Project – CNC Turning			
Evaluation Criteria		Pass	Fail
8. \varnothing 1.750	Pass = within tolerance Fail = out of tolerance	<input type="checkbox"/>	<input type="checkbox"/>
9. \varnothing 2.250	Pass = within tolerance Fail = out of tolerance	<input type="checkbox"/>	<input type="checkbox"/>
10. Runnouts .005	Pass = within tolerance Fail = out of tolerance	<input type="checkbox"/>	<input type="checkbox"/>
11. Surface finish 63 Ra microinches min.	Pass = within tolerance Fail = out of tolerance	<input type="checkbox"/>	<input type="checkbox"/>
12. Unless otherwise specified, all coaxial diameters .010	Pass = within tolerance Fail = out of tolerance	<input type="checkbox"/>	<input type="checkbox"/>
13. Radius .200	Pass = within tolerance Fail = out of tolerance	<input type="checkbox"/>	<input type="checkbox"/>
14. Chamfer .06 X 45°	Pass = within tolerance Fail = out of tolerance	<input type="checkbox"/>	<input type="checkbox"/>
END OF CNC TURNING EVALUATION			

It is important to note that the part must be 100% within the tolerances listed on the print. The criteria listed here are a guide for instructors and supervisors. Not every dimension is included in this guide. Nonetheless, the completed part must be 100% within the specifications of the print. The print takes precedence over this guide when the parts are inspected by the MET-TEC committee. The part print and the Performance Affidavit should be sent along with the part to the MET-TEC for evaluation. Send to NIMS only the completed Performance Affidavit, signed by the MET-TEC members. A copy of the Performance Affidavit should be retained in the candidate's file documenting completed performance for this credential.

REVISIONS			
REV	DESCRIPTION	DATE	APPROVED
A	UPDATED DRAWING AND TITLE BLOCK	3/7/05	LW



NOTES:

1. CENTER PERMISSIBLE (ϕ .750 END)
2. ALL FILLETS AND RADII .015 INCHES MAXIMUM
3. SURFACE FINISH ALL OVER 63 MICROINCHES MAXIMUM
4. UNLESS OTHERWISE SPECIFIED, ALL COAXIAL DIAMETERS

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UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
INTERPRET DIMENSIONS AND
TOLERANCES PER ASME Y14.5M-1994

TOLERANCES
.X \pm .020 .XXX \pm .003
.XX \pm .010 ANGLES \pm 1 DEG.
FRACTIONS \pm 1/64

MACHINING SKILLS LEVEL I

Job Duty 2.11
CNC: Turning

DESIGNER	CLC	02/23/02	MATERIAL ALUMINUM OR MILD STEEL
DWG CHK			
DWG APPD			

SCALE FULL DWG.#98441 I SHEET 1 OF 1

DO NOT SCALE DRAWING

NIMS PROCEDURAL REQUIREMENTS

1. PROGRAM MUST BE WRITTEN IN LONG HAND – NO CAM
2. COORDINATE CALCULATIONS CAN BE FOUND WITH GEOMETRY OR TRIG
3. SUBMIT THE CALCULATIONS WITH THE PROGRAM
4. SUBMIT THIS PRINT, COPY OF PROGRAM CODE (LONGHAND), AND WORKPIECE ALONG WITH THE PERFORMANCE AFFIDAVIT FOR EVALUATION