



CONTEST DESCRIPTION

CNC Turning

TEAM CANADA

Table of Contents

1	TECHNOLOGY.....	2
2	CONTEST INTRODUCTION.....	2
3	CONTEST DESCRIPTION.....	3
4	EQUIPMENT, MATERIAL, CLOTHING	4
5	HEALTH AND SAFETY	5
6	SAFETY REQUIREMENTS	6
7	ASSESSMENT	6
8	CONTEST SPECIFIC RULES	6
9	ADDITIONAL INFORMATION.....	7
10	TEAM CANADA EXPERT	8

1 THE SKILLS FOR SUCCESS FOR CAREERS IN THE SKILLED TRADES AND TECHNOLOGY

In response to the evolving labour market and changing skill needs, the Government of Canada has launched the new Skills for Success (*former Essential Skills*) model defining nine key skills needed by Canadians to participate in work, in education and training, and in modern society more broadly. SCC is currently working with Employment and Social Development Canada (ESDC) to bring awareness of the importance of these skills that are absolutely crucial for success in Trade and Technology careers. Part of this ongoing initiative requires the integration and identification of the Skills for Success in contest descriptions, projects, and project documents. The next phase and very important aspect of our Skills for Success (SfS) initiative is to provide a *Skills Report Card* to each competitor at the Skills Canada National Competition. The purpose of the report card is to inform the competitor about their current level of nine identified Skills for Success based on their competition scores. With this knowledge, the competitor will be made aware of which skill may require improvement. Full implementation is expected in the next Skills Canada National Competition.

The following 9 skills have been identified and validated as key skills for success for the workplace in the legend below:

¹Numeracy, ²Communication, ³Collaboration, ⁴Adaptability, ⁵Reading, ⁶Writing, ⁷Problem Solving, ⁸Creativity and Innovation, ⁹Digital

These Skills for Success have been identified in sections 2.4 and/or 3.2 (to be completed by SCC) of your Contest Description and if applicable, in your Project and supporting documents.

2 CONTEST INTRODUCTION

2.1 Description of the associated work role(s) or occupation(s)

https://www.skillscompetencescanada.com/en/skill_area/cnc-machining/

2.2 Purpose of the Challenge

The Competition is a demonstration and assessment of the competencies associated with this skill. The Test Project consists of practical work only. No written exam about theoretical knowledge will be conducted.

The Test Project covers practical work related to modern manufacturing industry tasks, completed on CNC lathes.

Competitors will be given raw material, (ferrous and non-ferrous material) and technical drawings. The desired workpieces shall be worked on all sides so that the Competitor carries out tasks that reflect multiple turning and milling operations taken into consideration run-out, perpendicularity, concentricity and other set-up challenges.

The programming of the CNC lathe must be carried out on commercially available CAM systems (such as MASTERCAM) and Machine Controls (such as HAAS).

2.3 Duration of contest

Maximum 10 hours total time over 2.5 days. Combination of Mastercam programming and machining. Time is divided over two separate projects.

2.4 Skills and Knowledge to be tested.

The contest involves manufacturing a precision component using a CNC turning centre.

- Reading and Interpreting engineering drawings⁵
- Proficient use of CAD-CAM (Mastercam) to program CNC machines.⁹
- May include external and internal turning, taper turning, threading, drilling, boring, face grooving, milling operations and applied metrology.¹

Skills for Success - ¹Numeracy, ⁵Reading, ⁹Digital

3 CONTEST DESCRIPTION

3.1 List of documents produced and the timeline for when competitors have access to the documents on the Skills/Compétences Canada website.

DOCUMENT	DATE OF DISTRIBUTION
Engineering Drawings or Incomplete CAD Models	Day of competition

3.2 Tasks that may be performed during the contest

- ISO E and/or ISO A (European and American) drawing interpretation⁵
- Identify and designate the machining processes to a CNC machine
- Select and apply appropriate cutting technology according to the cutting parameters, material, equipment and cutting tools⁷
- Setup and utilize CAD/CAM software (Mastercam)⁹
- Generate G-Code
- Setup and Operate CNC Equipment

- Select appropriate measuring tools or gauging instruments and use them correctly⁷
- Make accurate measurements using precision measuring tools¹
- Inspect and maintain the accuracy of dimensions within the tolerances¹

Skills for Success - ¹Numeracy, ⁵Reading, ⁷Problem Solving, ⁹Digital

4 EQUIPMENT, MATERIAL, CLOTHING

4.1 Equipment and material provided by Skills/Compétences Canada

- CNC Turning Centre (Haas ST20Y)
- CAD-CAM system (Mastercam)
- Cutting Tools and Holders (Sandvik) - www.sandvik.coromant.com/
- All raw material (one part per competitor)
- Gauges and measuring instruments
- Soft blow hammers/wrenches/deburring files
- Computers with Mastercam software
- Digital Micrometer 0-100 mm
- Digital Caliper 0-200 mm
- Digital Depth Micrometer 0-100 mm
- Digital Thread Micrometer 25-50 mm
- Test Dial indicator and base
- Telescoping Gauges
- Thread pitch gauge (metric)

COMPETITORS WILL BE REQUIRED TO USE THE MATERIAL AND EQUIPMENT PROVIDED BY SCC. ALL OTHER MATERIALS AND EQUIPMENT WILL BE REMOVED FROM THE SKILL AREA.

4.2 Equipment and material provided by the competitor

- Non-programmable calculator/machinist calculator
- Machinery's Handbook/Machine manual (optional)
- No other cutting or non-cutting tools allowed
- No personal computers or other CAD-CAM software allowed

4.3 Required clothing provided by the competitor

- Long pants (no shorts allowed)
- Short sleeve shirt
- Shop coat with rolled-up sleeves (optional)

5 HEALTH AND SAFETY

5.1 Safety program

SCC has implemented a comprehensive safety program as health and safety are an integral part of our competitions. Our safety program includes guidelines and procedures to make the work environment in each skill area safer.

5.1.1 Safety manual

As part of our program, a safety manual has been created in order to monitor and document health and safety within each skill area. It includes a definite plan of action designed to prevent accidents. The safety manual will be provided for every skill and these instructions must be followed and respected by all participants and officials at the SCNC.

5.1.2 Safety workshop

During orientation, Competitors will participate in a Safety workshop and they will be expected to work and maintain a safe working area during the competition. Any Competitor breaking any health, safety, and environmental rules, may be required to undertake a second safety workshop, this will not affect the Competitor's competition time.

5.2 List of required personal protective equipment (PPE) provided by competitors

- Safety glasses
- CSA approved safety footwear

5.3 COVID-19 Protocol

The COVID-19 guidelines will be shared as soon as they are available.

The COVID-19 guidelines will be subject to change based on the BC COVID-19 guidelines in place at the time of the competition.

6 SAFETY REQUIREMENTS

6.1 Safety workshop

Upon arrival at the Skill area, Competitors will participate in a Safety workshop and they will be expected to work and maintain a safe working area during the competition. Any Competitor breaking any health, safety and environmental rules, may be required to undertake a second safety workshop, this will not affect the Competitor's competition time.

6.2 List of required personal protective equipment (PPE) provided by Skills/Compétences Canada

- Hearing protection

6.3 List of required personal protective equipment (PPE) provided by the competitor

- Safety Glasses
- CSA approved safety footwear

Note: Contestants who do not have the required protective gear will not be allowed to participate in the contest.

7 ASSESSMENT

7.1 Point breakdown

Note: This list is subject to change.

TASKS	/100
Compliance with dimensions, tolerances, and surface finish specified in project drawing part #1	45
Compliance with dimensions, tolerances, and surface finish specified in project drawing part #1	45
Compliance with occupational health and safety regulations	10
Total	100

8 CONTEST SPECIFIC RULES

Contest-specific rules cannot contradict or take priority over the Competition Rules. They do provide specific details and clarity in areas that may vary from contest to contest. Any additional contest rules will be reviewed during the competitor orientation.

TOPIC/TASK	CONTEST SPECIFIC RULE
Use of technology – digital memory devices	Competitors are not allowed to bring digital memory devices into the workshop.
Use of technology – personal devices	Competitors are not allowed to bring personal laptops, tablets or cellphones into the workshop.
Drawings – recording information	Competitors are not permitted to take drawings or recorded information out of the workshop.
Tools/infrastructure	Competitors are not allowed to bring their own tools or measuring instruments. Competitors are not allowed to change the machine or computer parameters/settings. No other software other than Mastercam permitted No manual programming is permitted (see additional information)
Equipment failure	If equipment or tools supplied by Skills/Compétences Canada fail, extra time will be allowed only if the Technician of the sponsor or supplying company specifies and proves it is not a “user error”.

9 ADDITIONAL INFORMATION

9.1 Interpreter

If a competitor requires the help of an interpreter once onsite during the competition, the Skills/Compétences Canada Provincial/Territorial offices must advise Skills/Compétences Canada National Secretariat a minimum of 1 month prior to the competition or this service might not be guaranteed.

9.2 Ties

- Tiebreaker #1: In the event of a tie, the competitor with the shorter manufacturing time in the first project will be declared the winner.
- Tiebreaker #2: If a tie still remains, the competitor with the shorter manufacturing time overall will be declared the winner.
- Tiebreaker #3: If a third tie occurs, the competitor with the highest score in the Compliance with occupational health and safety regulations criteria will be declared the winner.

9.3 Test Project change at the Competition

Where the Test Project has been circulated to Competitors in advance, NTC shall change a maximum of 30% of the work content. Please refer to the Competition Rules.

9.4 Competition rules

Refer to the competition rules of the Skills Canada National Competition which can be found on our website.

10 TEAM CANADA EXPERT

Marte Arreola

Contact the Skills/Compétences Canada national secretariat for any questions or concerns: Sophie Courchene at sophie.c@skillscanada.com