

# Skills Canada National Competition

SCOPE DOCUMENT	
<b>Competition Year</b>	2012
<b>Competition location</b>	Edmonton, AB
<b>Trade Number</b>	38
<b>Trade Name</b>	Refrigeration and Air Conditioning
<b>Level</b>	Post-Secondary

## 1. INTRODUCTION

### 1.1 Purpose of the Challenge.

To assess the contestant's skills relating to the installation, operation, maintenance and repair of mechanical and electrical components and equipment for a refrigeration and/or air conditioning systems.

### 1.2 Duration of contest.

13 hours

### 1.3 Skills and Knowledge to be tested.

The goal of the contest is to encourage students to learn more about refrigeration and air-conditioning.

Refrigerant handling is an important component, and contestants must be aware of current regulations.

## 2. CONTEST DESCRIPTION

### 2.1 List of documents produced and timeline for when competitors have access to the documents.

DOCUMENT	DATE OF DISTRIBUTION VIA WEBSITE
All documents will be given out on the day of the competition.	N/A

### 2.2 Tasks that may be performed during the contest

- Applying basic and advanced control circuit concepts (electrical and, or electronic).
- From a written functional description prepare an electrical schematic/ladder diagram and wire a control circuit and its components.
- Troubleshoot refrigeration and/or a/c system component(s) electrical and mechanical if required.

- Diagnose electrical and mechanical fault(s) in an operating system if required.
- Perform brazing procedures.
- Project: Install refrigeration tubing, mechanical components and indicated accessories, on a split refrigeration and/or a/c system. Test, evacuate, charge and commission the system.
- Comply with all Provincial and Federal codes and regulations.
- Applying health and safety regulations.
- Pre-requisites :
  - Thorough knowledge of the refrigeration cycle.
  - The ability to use refrigeration tools and specialized equipment.
  - The ability to use tools required for working with copper tubing.
  - Knowledge of and compliance with current industry codes and safety regulations.
  - The ability to use precision electrical test equipment.
  - The ability to develop and draw electrical diagrams.
  - A good operating knowledge of typical controls used in refrigeration and air-conditioning systems. (To include: mechanical, electrical and electronic )

### 3. EQUIPMENT, MATERIAL, CLOTHING

#### 3.1 Equipment and material provided by Skills/Compétences Canada

- All consumables will be provided by the organization.
- Any additional safety equipment, testing equipment or special tools will be supplied.

#### 3.2 Equipment and material provided by the competitor

- 1 – Set of common screwdrivers
- 1 – Set of phillips screwdrivers
- 1 – Set of robertson screwdrivers
- 1 – Set of nut-drivers
- 1 – Set of combination wrenches  $\frac{1}{4}$  to  $\frac{15}{16}$  in.
- 1 – 6in, 10in and 12in adjustable wrench
- 1 – linesman pliers
- 1 – electrical side cutters
- 1 – needle nose pliers
- 1 – slip joint pliers
- 1 – combination wire crimpers
- 1 – Set of imperial allen keys
- 1 – combination ratchet valve wrench
- 1 – flaring/swedging kit
- 1 – tubing cutter  $\frac{1}{4}$  to  $1\text{-}\frac{1}{8}$ in.
- 1 – tube reaming tool

- 1 – Mirror
- 1 – Multimeter
- 1 – Clamp-on ampmeter
- 1 – Thermometer
- 1 – Leak detector
- 1 – Tape measure
- 1 – Micron vacuum gauge
- 1– Set of refrigeration manifold gauges (complete with: environmental hoses, must come with new hoses)
- Pencils, pens, notepad
- Pressure / saturation temperature chart
- Calculator
- # 3 shaded welding glasses
- Additional tools may be added

**3.3 Required clothing (Provided by competitor)**

- Contestants must wear the appropriate clothing and standard safety gear

**4. SAFETY REQUIREMENTS**

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

- |  |   |  |
|--|---|--|
| <input checked="" type="checkbox"/> Safety Glasses | <input checked="" type="checkbox"/> CSA approved Safety shoes | <input type="checkbox"/> Latex gloves              |
| <input type="checkbox"/> Safety Gloves             | <input type="checkbox"/> Welding helmet                       | <input type="checkbox"/> Dust Mask                 |
| <input type="checkbox"/> Hard Hat                  | <input checked="" type="checkbox"/> Welding gloves            | <input checked="" type="checkbox"/> Leather gloves |
| <input type="checkbox"/> Hearing protection        | <input type="checkbox"/> Respiratory protection               | <input type="checkbox"/> No PPE required           |

**4.2 List of required personal protective equipment(PPE) provided by Skills/Compétences Canada (SCC)**

- No additional PPE will be supplied by SCC

**5. ASSESSMENT**

**5.1 Point breakdown**

POINT BREAKDOWN	/1000
Install and commissioning	700
Brazing	150
Trouble shooting	150

## 6. ADDITIONAL INFORMATION

### 6.1 Consecutive translation

If consecutive translation is required on site, 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.

### 6.2 Software requirements

If French software is required 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 software might not be guaranteed.

### 6.3 Computer keyboard requirements

English Keyboards will be provided, if a French keyboard is required 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 keyboard might not be guaranteed.

### 6.4 Tie (No ties are allowed)

In case of a tie, the competitor with the highest score in the troubleshooting category will win.

### 6.5 Competition rules

Please refer to the competition rules for all general SCNC information.

## 7. NATIONAL TECHNICAL COMMITTEE MEMBERS

Region	Name	Email address
Pacific Region	Todd Matsuba	tmatsuba@nait.ca
Western Region	Greg Siemens	jgsiemens@rrc.mb.ca
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