



*National Skill Competition*



# *Industrial Maintenance*

## *Test Project*



## *Skill Area: Refrigeration*

**National Skills Competition Date: March 2005**

## Skills Jamaica Competition March 30-31, 2005

### General Instructions

- (1) Each competitor will be required to carry out the test project as specified on the schedule to be handed out two days before the competition.
- (2) The time will be specified according to the test project.
- (3) Minor adjustments may be made to the test project on the day of the competition where a new test project will be issued to the competitor.
- (4) Competitors are expected to identify all equipment/ materials/ingredients needed and submit list to the competitions committee no later than January 28, 2004.
- (5) **Please note that all competitors should provide their own small tools and utensils.**
- (6) Competitors will be given a schedule two days before the competition. Debriefings will also be conducted for all competitors on March 28, 2004.
- (7) All competitors will get an opportunity to arrange work areas the day before the competition. Where applicable competitors for the second day will arrange their work areas on the evening of day one. Competitors who fall in the second shift will get an opportunity to do their preparation at offsite locations (to be decided) where necessary.
- (8) All competitors should be present for the opening ceremony along with their instructors/coaches.
- (9) Rehearsal for the opening ceremony will be held on the evening of March 28, 2005 (National Indoor Sport Center at 6 pm).

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**2<sup>nd</sup> National Skills Competition**  
**SKILLS JAMAICA 2005**

**Section 1**

**INTRODUCTION**

TRADE NAME: Refrigeration

# SKILLS JAMAICA 2005

## INTRODUCTION

This Project Proposal is designed to test, over a period of 6 hours, within two (2) days, the range of skills that a Refrigeration or Air Conditioning Technician uses to install and service refrigeration and air conditioning equipment.

There are three (3) tasks in the competition and each task will test different skill areas.

### **1. AIR CONDITIONING SYSTEM INSTALLATION**

This task involves a range of skills including installing the equipment and pipe work, pressure testing and evacuation, connecting the electrical circuit and commissioning the system.

### **2. RECOVER & DISMANTLING INSTALLED UNIT**

This task requires the competitors to recover the refrigerant from an air conditioning system before dismantling it.

### **3. ELECTRICAL FAULT FINDING AND REPAIR**

This task requires the competitor to find an electrical fault, repair or replace the faulty component on a refrigeration or air conditioning systems.

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## Section 2

### CANDIDATE'S INSTRUCTIONS

#### Competition Details

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All competitors will be allocated a competitor number and work stations by the expert/judges using a ballot other wise.

## EQUIPMENT

Adequate materials and refrigerant will be available to each competitor. Please check all materials when they are supplied to you to ensure they are correct and not damaged. Marks will be deducted if more material is required unless it was faulty when supplied.

Replacement parts for any equipment must be requested through an Expert. Recovery units, vacuum pumps and charging stations are available when required by asking an expert.

## Personal Safety Rules

During the competition, all candidates MUST follow the safety rules listed below:

### SHOES

- Fully enclosed work shoes or boots must be worn at all times.

### Clothing:

- Legs must be covered at all times, by either long work trousers or overalls.
- Upper body must be covered all times.
- Arms must be covered with long sleeves, when brazing and using refrigerant.

### Goggles

- Must be worn when necessary to protect your eyes.

## **Electrical**

- Candidates must not switch on (apply power) to any electrical equipment until they receive permission from an expert, except for hand power tools.

**Any candidate, who in the opinion of the experts, is not wearing the correct safety attire or is engaging in any unsafe practice, will be stopped and NOT allowed to continue until the issue is resolved. The candidate will also lose marks.**

# SKILLS JAMAICA 2005

## Section 3

### Materials And Equipment

## **EQUIPMENT TO BE SUPPLIED BY THE CANDIDATE**

The tools listed below are to be supplied by each candidate, for their own use. These are the minimum tools required; candidates may bring other tools that are part of the trade.

Flare tools, up to 18mm  
Tube cutter, up to 28mm  
Tube expanding tools,  
round up to 20mm  
Pressure/temperature chart  
Oil can  
Ratchet key  
Schrader valve key  
Electrician's pliers  
Screw drivers  
Leak detection solution (soap & water)  
Small mirror  
Set of spanners up to 25mm and 1" AF  
Shifting spanners  
Scriber  
Tube bending springs up to 16mm  
Electrical insulation tape  
Tape measure: 5m  
Centre punch

Hammer  
Metal Rules: 300mm  
Files: flat, half round and  
Hacksaw  
Knife  
Try-squares  
Set squares/level  
Side cutting pliers  
  
Wire Strippers  
Steel wool  
Emery cloth  
Allen keys – imperial and metric  
Electrical Crimping Tools  
Set of drills: 1-10mm  
Spirit level  
Long nose pliers  
Pipe reamer  
Writing equipment, including,  
pencils, coloured pens, paper,  
Highlighters

### **❖ Personal Safety clothing and equipment including**

- Clear safety goggles
- Brazing goggles
- Safety shoes
- Overalls or Long Sleeve Shirt and Long Pants
- Hair Net, if your hair can hang over your face

# SKILLS JAMAICA 2005

## EQUIPMENT TO BE PROVIDED BY THE ORGANIZERS

The equipment and tools is be supplied by the organizers.

### CANDIDATE WORK AREA

Each candidate work area should contain the following equipment.

### EQUIPMENT

1 x Oxygen/acetylene brazing equipment  
1 x Oxygen cylinder  
1 x Acetylene cylinder  
1 x Dry Nitrogen cylinder  
1 x Dry Nitrogen regulator, 0-1500 kPa  
1 x Vacuum pump  
1 x Workbench with vice, approximately 600 x 1200 x 800 H  
1 x double 240/120 volt outlet  
1 x Multimeter  
Clampon-ammeer  
Megohmmeter  
Digital Thermometers with at least 2 sensors  
Vacuum gauge, down to 50 Pascal absolute  
Electronic Leak Detector for HFC and HCFC refrigerants  
Gauge manifold set  
Mechanical tube benders, 180°, up to 16mm  
Recovery unit complete  
Fire extinguisher  
Refrigerant 22

### TOOLS

1 x Pistol drill/battery drill  
1 x Extension lead  
1 x Holes-saw sets

### MATERIALS

Heat/Flames resistant cloth  
900 btu Split Air Conditioning Unit (220 volts @ 50 Hz)  
Emery cloth & steel wool  
Silver brazing rods, 15% - 45% silver  
Silver brazing flux

½ " Vascosel Insulation  
2.5 mm 2 and 3 core grey  
flex cable  
20 Amps Isolator

NB. If the 900 btu is not new the following must be purchased:

**¼ inch copper tubing**  
**3/8 inch copper tubing**

# SKILLS JAMAICA 2005

## Section 4

### DRAWING

