

## PROJECTX N° 014

# “HANDLING FLUORINATED GASES AND OZONE DEPLETING SUBSTANCES”

## PRESENTATION



Promoting school:

South & City College Birmingham  
Birmingham. United Kingdom



## A. GENERAL DESCRIPTION

### Title of the ProjectX

**HANDLING FLUORINATED GASES AND OZONE-DEPLETING SUBSTANCES  
(CATEGORY 1 PERSONNEL)**

### Core area

GENERAL / KNOWLEDGE      **THERMODYNAMICS**

PARTICULAR / ACTIVITY:      **HANDLING FLUORINATED GASES**

### Promoting school

SCCB

### Schools participants in the revision of the ProjectX

LYSEE ISAAC NEWTON  
SCCB

### Reference to ECVET Credit System and EQF / NQF

ECVET	EQF	REFERENCE TO NATIONAL QUALIFICATIONS (NQF)						
		Spain	Finland	Romania	Portugal	UK	Turkey	France
2	3	3	3	2	3	2	3	3

### Learning Outcomes achieved (to be developed in the future related with ECVET credit system)

1. HTNMT06 (TopMost): Testing air conditioning and ventilation installations
2. HTNMT07 (TopMost): To carry out the corrective maintenance of an air conditioning and ventilation installation
3. PLMAS01 (TopMost): Installing pipes for plumbing heating and air conditioning systems

### Time that is necessary to do the ProjectX (in hours)

Theory:      16 hours  
Practice:      24 hours

### Link to real companies in your region (it is just informative)

- |   |                       |
|---|-----------------------|
| 1. NAME: J & M REFRIGERATION                  | WORKPLACE: TECHNICIAN |
| 2. NAME: I C REFRIGERATION & AIR CONDITIONING | WORKPLACE: TECHNICIAN |



## B. THEORY

### Objectives of the theoretical Knowledge

1. Handling fluorinated gases
2. Brazing when installing pipes
3. Basic tasks handling fluorinated gases
4. Checking a Split system

### List of activities

1. Multiple option test
2. Technical discussion

## C. PRACTICE

### Brief description of the Practice

Learners will be required to use the standard schematic diagram and modify it to meet the unit criteria. The learners then need to translate the diagram to the requirement of tools and equipment. Using the tools and equipment, the learners will then set the equipment up to visually inspect, test and install the system. As part of the qualification the learners will have to complete the course documentation relevant to the unit and to the Summit Skills Standards

### Steps or activities to be performed by the student

- |         |   |
|---------|---|
| First:  | Recovery of refrigerant and mending a pipe  |
| Second: | Leak test                                   |
| Third:  | Charge the refrigerant and check the system |



#### D. DETAILED DESCRIPTION OF LEARNING OUTCOMES.

<b>Learning Outcome:</b>	<b>HTNMT06 (TopMost)</b> <b>Testing air conditioning and ventilation installations</b>
<b>Knowledge</b>	
<ul style="list-style-type: none"> <li>- The student knows the safety rules in buildingservices engineering</li> <li>- The student knows the environmental protectionmeasures within building services engineering</li> <li>- The student knows the physics' principles of Pressure, flow, etc...</li> <li>- The student knows the testing plan for an airconditioning installation</li> <li>- The student knows the components of an air-conditioning installation: pipes, Outdoor andIndoor units, electrical connection, etc...</li> <li>- The student knows the instruments formeasuring and testing the components of anair-conditioning installation</li> </ul>	
<b>Skills</b>	
<ul style="list-style-type: none"> <li>- The student is able to use all the protection equipment according to the safety rules</li> <li>- The student is able to tests according to the legal requirements: strength integrity test, pressure tightness test, leak test, evacuations, Vacuum rise test, etc...</li> <li>- The student is able to carry out basic electrical tests: continuity, insulation, polarity, resistance earth and visual check</li> <li>- The student is able to open system valves and run systems</li> <li>- The student is able to complete checks to confirm system is leak free</li> <li>- The student is able to record temperature differences</li> <li>- The student is able to remove analysers/gauges from systems without refrigerant loss</li> </ul>	
<b>Competences</b>	
<ul style="list-style-type: none"> <li>- The student is able to communicate with others within building services engineering</li> <li>- The student selects the proper test methods based on the technical documentation (drawings and schemes)</li> <li>- The student is able to plan the necessary steps to carry out the test method</li> <li>- The student interprets the results of the test method and initiates the following steps</li> <li>- The student asks questions for clarification appropriate and reasonable and listens carefully to the instructor</li> <li>- The student assesses the work continuously during the work process and at the end of the performed maintenance</li> </ul>	



<b>Learning Outcome:</b>	<b>HTNMT07 (TopMost)</b> <b>To carry out the corrective maintenance of an air conditioning and ventilation installation</b>
<b>Knowledge</b>	
<ul style="list-style-type: none"> <li>- The student knows the safety rules in building services engineering</li> <li>- The student knows the environmental protection measures within building services engineering</li> <li>- The student knows the physics' principles of Pressure, flow, etc...</li> <li>- The student knows the maintenance plan for an air conditioning/ventilation installation</li> <li>- The student knows the components of an air conditioning/ventilation installation: pipes, outdoor and indoor units, electrical connection, etc...</li> <li>- The student knows the instruments for measuring and testing the components of air conditioning/ ventilation installation</li> </ul>	
<b>Skills</b>	
<ul style="list-style-type: none"> <li>- The student is able to use all the protection equipment according to the safety rules</li> <li>- The student is able to clean and check the condition of condensers, filters, indoor units and evaporators</li> <li>- The student is able to check the condition of pipework (insulation) and electrical wiring and connections</li> <li>- The student is able to check system operating conditions against control settings</li> <li>- The student is able to measure on/off temperature to check comfort conditions</li> <li>- The student is able to re-install system after maintenance and then carry out the test plan: tightness testing, evacuation and dehydration, and electrical testing</li> <li>- The student is able to re-charge refrigerant to correct quantity and check for leakage</li> <li>- The student is able to complete system performance test</li> <li>- The student is able to complete appropriate maintenance documentation</li> </ul>	
<b>Competences</b>	
<ul style="list-style-type: none"> <li>- The student is able to communicate with others within building services engineering</li> <li>- The student plans the steps based on the information from the service manuals</li> <li>- The student brings the work steps in a sensible order</li> <li>- The student performs the repair by himself</li> <li>- The student takes care of the completeness of the work steps during planning the work steps</li> <li>- The student continuously assesses the work process and at the end of the performed repair action</li> <li>- The student reports the performed repair</li> <li>- The student asks questions for clarification appropriate and reasonable and listens carefully to the instructor</li> </ul>	



<b>Learning Outcome:</b>	<b>PLMAS01 (TopMost): Installing pipes for plumbing heating and air conditioning systems</b>
<b>Knowledge</b>	
<ul style="list-style-type: none"> <li>- The student knows the necessary occupational safety regulations, accident prevention regulations and environmental protection regulations</li> <li>- The student knows the special health and safety regulations when handling refrigerants</li> <li>- The student is aware of the characteristics of supply pipes, such as type of pipes, nominal pressures, nominal diameters, operating temperatures</li> <li>- The student knows the special provisions that apply when installing gas lines</li> </ul>	
<b>Skills</b>	
<ul style="list-style-type: none"> <li>- The student is able to read and apply technical drawings</li> <li>- The student is able to prepare pipes for installation</li> <li>- The student is able to install fastening elements</li> <li>- The student is able to produce breakthroughs in masonry, with various tools</li> <li>- The student is able to assemble pipelines</li> <li>- The student is able to install protective devices, claddings, insulations</li> <li>- The student is able to set up, connect and check the function of air conditioning systems</li> </ul>	
<b>Competences</b>	
<ul style="list-style-type: none"> <li>- The student is responsible for ensuring that the necessary tools and materials are available</li> <li>- The student is responsible for ensuring that fire safety regulations are complied during soldering and welding</li> <li>- The student is responsible to bring various assemblies correctly into service</li> <li>- The student is responsible for ensuring that screw connections, press fittings and solder connections are made durable and error free</li> <li>- The student is responsible for ensuring that thermal and acoustic insulation complies with the normative rules</li> <li>- The student asks appropriate and reasonable questions for clarification and listens carefully to the instructor</li> </ul>	

