

PROJECTX Nº 002

“SPLIT SYSTEM: PIPE REPAIR, F-GAS CHARGING AND TEST”

PRESENTATION



Promoting school:

XABEC, Vocational Training Centre
Spain



A. GENERAL DESCRIPTION

Title of the ProjectX

SPLIT SYSTEM: PIPE REPAIR, F-GAS CHARGING AND TESTING

Core area

GENERAL / KNOWLEDGE **THERMAL HEAT AND COLD / PLUMBING**

PARTICULAR / ACTIVITIES: **PIPE WORKING, F-GAS CHARGING AND TESTING AC SYSTEMS**

Promoting school

XABEC – VOCATIONAL TRAINING CENTRE

Schools participants in the revision of the ProjectX

SCCB

Reference to ECVET Credit System and EQF / NQF

ECVET	EQF	REFERENCE TO NATIONAL QUALIFICATIONS (NQF)						
		Spain	Finland	Romania	Portugal	UK	Turkey	France
2	4	4	4	3	4	3	4	4

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: 7 hours
Practice: 23 hours

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

1. **NAME:** Descals(Spain) **WORKPLACE:** refrigeration systems maintenance
2. **NAME:** CEMEX (Buñol. Spain) **WORKPLACE:** Mechanical maintenance



B. THEORY

Objectives of the theoretical Knowledge

1. Handling fluorinated gases
2. Pipe work and assembly
3. Test the air conditioning system
4. Quality Control

List of activities

1. Evaluation Questionnaire
2. Measure in situ and draw the piece to be performed
3. Multiple choice test

C. PRACTICE

Brief description of the Practice

According to rules on fluorinated gases and air conditioning systems, fabricate a broken piece, assembly it, make the pressure and vacuum test, charge F- Gas and test the Air Conditioning system, including the records of the system checking and charging F-Gas tasks

Steps or activities to be performed by the student

- | | |
|---------|--|
| First: | Measurement of the damaged part |
| Second: | Fabrication of another just like that to be replaced |
| Third: | Assembling the new part in the system |
| Fourth: | Pressure and vacuum test |
| Fifth: | Charge F-Gas |
| Sixth: | Test the system |
| Seven: | Complete the records of the tests and the F-Gas charge |



D. DETAILED DESCRIPTION OF LEARNING OUTCOMES.

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



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



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

