

PROJECTX Nº 001

“BALANCING A DIRECT DRIVE FAN”

PRESENTATION



Promoting school:

XABEC, Vocational Training Centre
Spain



A. GENERAL DESCRIPTION

Title of the ProjectX

BALANCING A DIRECT DRIVE FAN

Core area

GENERAL / KNOWLEDGE **MECHANICAL**

PARTICULAR / ACTIVITIES: **MEASUREMENT, CALCULATION AND BALANCING**

Promoting school

XABEC – VOCATIONAL TRAINING CENTRE

Schools participants in the revision of the ProjectX

I. NEWTON
SCCB
SAVO

Reference to ECVET Credit System and EQF / NQF

ECVET	EQF	REFERENCE TO NATIONAL QUALIFICATIONS (NQF)						
		Spain	Finland	Romania	Portugal	UK	Turkey	France
1	4	4	4	3	4	3	4	4

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

1. MCHMS01 (TopMost). Measuring equipment for mechanical systems, compliance with dimensional tolerances, avoiding measuring errors
2. MCHMT02 (TopMost). Maintenance and repair of machines and mechanical functional units
3. MCHMT03 (TopMost). Applying preventive maintenance on machines, according to instructions of the manufacturer
4. MCHQL02 (TopMost). Applying non-destructive testing of materials

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

Theory: 7 hours
Practice: 8 hours

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

1. **NAME:** Rochina (Valencia, Spain) **WORKPLACE:** Client facilities
2. **NAME:** Descals (Valencia, Spain) **WORKPLACE:** Client facilities



B. THEORY

Objectives of the theoretical Knowledge

1. Handle of the vibrometer
2. Vibration measurement of a direct drive fan
3. Analysis of the measured vibration
4. Balancing a direct drive fan

List of activities

1. Evaluation Questionnaire
2. Scheme drawing of the fan to balance
3. TEST multiple-choice

C. PRACTICE

Brief description of the Practice

The student has to balance a direct drive fan, previously unbalanced. To achieve that, he must find out the reference value of vibration and after several measurements, calculations and placing the test and balance weights, he will check the final balance under the reference value

Steps or activities to be performed by the student

- | | |
|----------|--|
| First: | Find out the reference values and the points where to measure, according to the instructions of the manufacturer |
| Second: | Make measurement of vibration |
| Third: | Check the need to balance |
| Fourth: | Determine the test weight and place it |
| Fifth: | Measure second time |
| Sixth: | Replace the test weight until the displacement angle |
| Seventh: | Measure third time |
| Eighth: | Calculate the balance weight and its placement and place it |
| Ninth: | Measure fourth time and check the correct operation of the fan |
| Tenth: | Report all the task and its result |



D. DETAILED DESCRIPTION OF LEARNING OUTCOMES.

Learning Outcome:	MCHMS01 (TopMost) Measuring equipment for mechanical systems, compliance with dimensional tolerances, avoiding measuring errors
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 various measuring instruments and their intended purpose - The student can explain the different measurement errors - The student can explain the measurement process of the different instruments and their proper storage - The student knows the verification of measuring instruments - The student recognizes tolerance and surface information from technical drawings - The student can explain the symbols of tolerance and surface details - The student can name the deviations of tolerance and surface details 	
Skills	
<ul style="list-style-type: none"> - The student checks the measuring instruments on their function and accuracy - The student prepares the work pieces for measuring - The student carries out technical measurements on work pieces - The student logs the results to a matrix 	
Competences	
<ul style="list-style-type: none"> - The student must be able to select the right instruments - The student checks the dimensions in terms of the tolerance - The student avoids measurement errors - The student initiate appropriate activities to comply with the dimensional tolerance - The student asks questions for clarification appropriate and reasonable and listens carefully to the instructor 	



Learning Outcome:	MCHMT02 (TopMost) Maintenance and repair of machines and mechanical functional units
Knowledge	
<ul style="list-style-type: none"> - The student knows the necessary occupational safety regulations, accident prevention, regulations and environmental protection regulations - The student is able to describe the causes of malfunctions of machine tools - The student knows the components of machine tools - The student knows the tools to remedy faults on machine tools - The student knows the procedure and the most important steps - The student knows the safety rules when working on machine tools - The student knows the relevant measures of protection for the work task 	
Skills	
<ul style="list-style-type: none"> - The student can detect faults on machines and take appropriate action - The student can identify defective components and assemblies - The student uses the specified tool - The student performs functional testing - The student can dispose defective components and assemblies professionally - The student cleans thoroughly the working environment in accordance with the principles of health work and environmental protection as well as the workshop regulations - The student applies the relevant work task safety regulations - The student applies the relevant work task protective measures 	
Competences	
<ul style="list-style-type: none"> - 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 him / herself - 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 documented the performed repair - The student asks questions for clarification appropriate and reasonable and listens carefully to the instructor 	



Learning Outcome:	MCHMT03 (TopMost) Applying preventive maintenance on machines, according to instructions of the manufacturer
Knowledge	
<ul style="list-style-type: none"> - The student knows the necessary occupational safety regulations, accident prevention, regulations and environmental protection regulations - The student can rename the maintenance required by the manufacturer - The student can rename the icons relating to maintenance and lubricants - The student renames different maintenance intervals specified by the manufacturer of machine tools - The student renames different lubricants - or maintenance points on machine tools - The student renames the regulations for the safe and environmentally sound disposal - The student renames the organizational system of the workshop 	
Skills	
<ul style="list-style-type: none"> - The student can extract information from manufacturer's operating instructions - The student performs maintenance work according to the manufacturer's instructions - The student performs a functional test according to manufacturer's instructions - The student cleans tools, materials, products, according to the order system on in the workshop. - The student applies the relevant safety regulations and protective measures for the tasks 	
Competences	
<ul style="list-style-type: none"> - The student is able to plan the steps based on the information from the maintenance instructions and lubrication charts - The student is able to pay attention to the completeness of the work steps - The student is able to check reliable the equipment during maintenance, possible signs of wear, damage and corrosion of the machine tool - The student assesses the work continuously during the work process and at the end of the performed maintenance - The student is able to document the maintenance - The student asks questions for clarification appropriate and reasonable and listens carefully to the instructor 	



Learning Outcome:	MCHQL02 (TopMost) Applying non-destructive testing of materials
Knowledge	
<ul style="list-style-type: none"> - The student knows the necessary occupational safety regulations, accident prevention, regulations and environmental protection regulations - The student can name non-destructive testing - The student can explain the scope of the test method - The student can describe the sequence of test procedures - The student can evaluate the results of the tests 	
Skills	
<ul style="list-style-type: none"> - The student applies the measuring tools correctly - The student performs the test procedure by him / herself - The student documents the test methods 	
Competences	
<ul style="list-style-type: none"> - The student selects the proper test methods based on the technical documentation (drawings) - 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 	

