KPA 1	INSTALL AND MAINTAIN SOLAR THERMAL FACILITIES		
KPA Description	Perform the coordination of the assembly and maintenance of solar thermal systems within the framework of the safety and quality rules in accordance with the regulations	Nº of ECVET credits:	EQF level: 4

Performance Criteria Description:	Criticality / Priority:	Means of verification:

- **Study**
- **Preparation of implementation**
- **Development of a solar thermal system**
- **Setting and commissioning**
- **Maintenance**
- **Communication**

U1. Title :	Description
▪ **Study**	• Check the contents of the file and analyze • Make statements and measures • Check the feasibility
U2. Title : ▪ **Preparation of implementation**	**Description** • Find further technical information • Identify stakeholders and allocate activities within the team • Identify the working environment • Choose accessories, consumables and tools required • Develop site safety and identify potential risks and pollution • Adapt to weather conditions • Verify compliance of the supports • Check the power supplies and networks • Receive materials • Plan tasks taking into account the activities of other trades and the workload of the company

	• Check accreditations and authorizations of stakeholders
U3. Title : • **Development of a solar thermal system**	**Description** • use and make use means of protection, safety devices • Organize, store, supply site • Identify and mark the passage of different networks • Implement and secure equipment and accessories • Shaping networks, assemble and connect components and equipment • Seal all • Provide connections to different networks (electrical, fluidic, ...) • Label, locate and identify circuits and networks • Perform sorting and disposal of waste • Verify compliance of work performed in relation to the work required
U4. Title : • **Setting and commissioning**	**Description** • Perform adjustments and tests • Set up the installation • Inform commissioning documents and retrospective documentation drawings • Prepare the receipt of completed installation
U5. Title : • **Maintenance**	**Description** • Perform preventive maintenance intervention • Perform corrective maintenance intervention • Check the adequacy of the performance achieved vis-à-vis the expected performance
U6. Title : • **Communication**	**Description** • Contribute to the representation of the company • Identify customer complaints and argue with his requests for information • Collect and transmit oral and / or written information • Communicate the results of the intervention with the customer and the hierarchy • Present the operation and use of the facility to the customer

	• Explain the characteristics of a maintenance contract

Title of the LO	INSTALL AND MAINTAIN SOLAR THERMAL FACILITIES			
Title UNIT 1:	**Study**			
LO UNIT Reference info:	Facility implementation file, drawings, diagrams, nomenclature, quotation, order, manufacturers catalogs, standards and specific regulations, organization of site, execution file, workload and resource allocation			
Nº of ECVET credits:		EQF level:	4	
LO UNIT Performance Criteria / Success Indicators	#	Criteria and indicators Description	Critical	Means of verification
Knowledge	**Regulatory, administrative and legal knowledge** • Stakeholders. • Administrative Procedure • Qualifications, warranties and liability • The thermal regulations • The acoustic regulations **Knowledge of building and technical communication** • Tools, standards and representation • Architectural drawings and drawings • Freehand sketch • Descriptive and quantitative documents • Talking/writing technical **Scientific knowledge** • Heat exchange • Identification of a facility • Energy performance of buildings • Solar energy (incident radiation, radiation and irradiance, energy received) • Energy recovery and transfer (conduction, convection, radiation)			

Skills	• Characterize the intervention site • Collect information specific to the intervention • Identify the documents • Identify the values to meet • Analyze the installation environment • Check the feasibility • Identify the risks to people and property • Identify potential risks of pollution • Identify and characterize the fluid and energy networks • Collect additional information on intervention • Identify stakeholders and their function • Identify equipment • Characterize the work environment
Means of verification	• The location of the intervention and the operating characteristics provided for installation are identified. • Parts are listed, their relevance is checked, missing data are reported, the customer is identified. • The surrounding environment is identified; environmental constraints are identified • The power and outlets are located, their characteristics are identified, supplies and evacuations expected comply • The missing technical information is identified, the relevant resource is identified, the information collected is recorded. • Stakeholders, internal and external to the company are identified. • The existing equipment is identified, components and sub-assemblies are identified. • Access is recognized cantonments are located, are marked provisional power, storage locations are located • Deadlines are relevant, human resources are identified, the necessary resources are mobilized, the orders of magnitude are estimated; inconsistencies are reported, the presence of administrative permits is checked. • Risks are identified, actions are proposed

Title of the LO	**INSTALL AND MAINTAIN SOLAR THERMAL FACILITIES**			
Title UNIT 2:	**Preparation of implementation**			
LO UNIT Reference info:	General planning, site data, site installation drawings, available equipment, team composition, timing of intervention, weather report, execution file, drawings, diagrams, nomenclature, quotation, order			
Nº of ECVET credits:		**EQF level**::	4	
LO UNIT Performance Criteria / Success Indicators	#	Criteria and indicators Description	Critical	Means of verification
Knowledge	• Organization, planning and monitoring of a project • Managing the workstation • Time management • Quality Management. • Environmental management and waste			
Skills	**Quantify the needs** • Interpret a work schedule • Identify the risks associated with the intervention • List the hardware requirements and tools **Plan the intervention** • Scheduling Tasks • assign tasks • Take into account the uncertainties • Check the access **Organize activities** • Receive equipment and monitor compliance • Store the equipment			
Means of verification	• Tasks are planned taking into account the activities of other trades and the workload of the company.			

	• The necessary approvals and authorizations are listed. • Tasks are assigned according to qualifications • The timing of intervention is established • The organization of work takes into account the weather conditions to allow a safety intervention • The provided access are acknowledged, any adjustments allow supply and security implementation

Title of the LO	INSTALL AND MAINTAIN SOLAR THERMAL FACILITIES			
Title UNIT 3:	**Development of a solar thermal system**			
LO UNIT Reference info:	Execution drawings, site, measuring and control equipment, site installation drawings, available equipment, personal protective equipment, security utilities, tracing equipment, fixture tooling, equipment and materials to install, tools			
Nº of ECVET credits:		**EQF level**:	3- 4	
LO UNIT Performance Criteria / Success Indicators	#	Criteria and indicators Description	Critical	Means of verification
Knowledge	Types of systems constituents Organization of the workstation Time management Quality Management Environmental management and waste Prevention, knowledge of the principal risks Risk of accidents Methodology for risk management Risks to health Hygiene What to do in case of accident Manual and mechanical handling, workstation Protection of the workstation and the environment Specific risks			
Skills	**Verify data on site** • Measure quantities. Dimensional surveys are made • Identify energy, fluidic and communication networks, and check their characteristics **Install workstations** • Implement safety devices • Use and make use means of protection and safety devices			

	Implement hardware • Identify the passing of different networks. • Locate and secure the equipment and accessories. • Implement additional supports and suitable anchoring • Assemble and connect components and equipment **Sealing the support** • Conduct a seal between the equipment and its support **Connect networks** • Shaping networks on site or prefabrication • Provide connections to different networks (electrical, fluidic, ...) • Label, locate and identify circuits and networks
Means of verification	• Physical quantities required are identified. • The presence of networks, their characteristics and their availability is checked. • The markup is implemented, access and work areas are secure. • Accreditations and authorizations are checked. • The presence and use of safety devices are checked. • The route of networks is consistent with the implementation plan. Their path preserves the characteristics of components using (roof, wall, floor, insulation, ...). • The track layout is consistent with the implementation plan. • Handling means are present, adapted and implemented. • Equipment and accessories are installed in accordance with the implementation plan. • Safety of persons is ensured, the integrity of the equipment is maintained. • The realization is consistent with drawings and adapted to the elements to be put into place. • Equipment and components are assembled and connected in accordance with the implementation plan and / or manufacturers instructions. • For sensors fixed onto rails, the seal is maintained. • For systems for sensors integration, flashings are made either in sheet metal work or devices provided by the system. • Characteristics of crossed elements are preserved. • Networks are shaped in accordance with the implementation plan and the rules of the art. • Private networks are connected in accordance with the drawings. • The network connection of a distributor is prepared according to the regulations. • Circuits and networks are identified legally and in accordance with specifications.

Title of the LO	INSTALL AND MAINTAIN SOLAR THERMAL FACILITIES			
Title UNIT 4:	**Setting and commissioning**			
LO UNIT Reference info:	Individual installation or part of an installation			
Nº of ECVET credits:		EQF level::	3- 4	
LO UNIT Performance Criteria / Success Indicators	#	Criteria and indicators Description	Critical	Means of verification
Knowledge	**Commissioning procedures** • Flushing installation • Filling • Powering • Presets			
Skills	• Perform a preset of a balancing device, control or safety • Perform leak tests and strength • Perform the operations planned in the installation test program • Complete the startup application • Update drawings and plans • Prepare the installation delivery acceptance			
Means of verification	• The work of commissioning be accepted • Checking presets can allow the putting into service • The tests are performed in accordance with protocols • The possibly detected faults are corrected • Equipment testing procedures are applied • The intervention approach is logical, relevant and appropriate to the context. • The settings to optimize system operation • The tests and performances are recorded • DOE folder is completed in accordance with the installation performed			

	• The elements necessary for receiving were held (facility in service, documents, …)

Title of the LO	INSTALL AND MAINTAIN SOLAR THERMAL FACILITIES			
Title UNIT 5:	**Maintenance**			
LO UNIT Reference info:	Installation running Installation malfunctioning Installation failed Necessary equipment and tools Information from the client or user. Technical resources, surveys sheet			
Nº of ECVET credits:		**Niveau du CEC**:	3- 4	
LO UNIT Performance Criteria / Success Indicators	#	Criteria and indicators Description	Critical	Means of verification
Knowledge	**Procedures for preventive and corrective maintenance**			
Skills	• Implement ways to protect people and property • Perform maintenance operations specified in the contract • Record maintenance, measurements and settings in the installation monitoring file • Perform tests, adjustments and corrections • Clean the site, recover sort and store waste • Diagnose the cause of a malfunction • Troubleshoot an installation • Implement remedial or precautionary solutions • Inspect the work • Monitor the performance of the installation • Control work commissioned by a third party			

Means of verification	• Means of protection in place are adequate and allow the realization of the intervention without risk to stakeholders and third parties. • Operations are performed under the contract, the anomalies are corrected and / or recorded. • The various operations are logged and can monitor the installation. • The measurements are carried out safely (temperature, voltage, current, ...). • The settings are adapted for the operation of the installation. • Waste management respects regulations and the environment. • The diagnostic approach is logical and appropriate to the context, it takes into account the operation of the system and information from the client. • The proposed intervention is made wisely. • Troubleshooting allows operation according to the installation. • Remedial and / or precautionary actions allow a degraded mode operation. • Control is methodical, the work conform to the specifications • The anomalies are listed and / or corrected • The expected performance is compared to the performance provided. • Gaps are identified

Title of the LO	**INSTALL AND MAINTAIN SOLAR THERMAL FACILITIES**			
Title UNIT 6:	**Communication**			
LO UNIT Reference info:	Individual installation or part of an installation			
Nº of ECVET credits:		**Niveau du CEC**:	3- 4	
LO UNIT Performance Criteria / Success Indicators	#	Criteria and indicators Description	Critical	Means of verification
Knowledge	**Administrative and legal environment of the company** **Building and technical communication**			
Skills	**Talk with the customer and with the hierarchy** • Present operation and manual installation • Argument with the customer's requests for information • Explain the characteristics of a maintenance contract • Ask the customer dysfunctions observed • Transmit the results of the intervention with the client and its hierarchy **Fill documents** • Fill commissioning documents • Control retrospective documentation			
Means of verification	• The presentation is done with a clear and appropriate, by referring to key points of the manual. The general principle of operation is described. • The description reflects the facility provided. • The answers are relevant. • Presentation of other solutions to improve energy efficiency is correct. • Different types of maintenance contracts, their characteristics and advantages are explained. • Known faults are taken into account. • The written or oral presentation is clear and precise. • The documents are filled and usable.			

	• Traceability of interventions is ensured • Receiving documentation of the installation is completed. • Retrospective documentation drawings are modified in accordance with the schematic