**BEM Micro-credential **

**Training and Methodical Center of Vocational Education and Training in Donetsk Region**

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| **BEM content****(for all partners)** | Title / name of the credential | **Insulation of facades using mineral wool.** |
| Function of the micro-credentials / purpose  | Development and deepening of professional competences and practical skills in facade insulation in various ways using mineral wool. |
| Possible target groups | Employees of construction companies, graduates and students of vocational education, socially vulnerable groups, the unemployed, and adults. |
| Branch / sector of application | Construction industry / installer of insulation systems. |
| Fields of application / work environment | Private and industrial construction. |
| Typical work / professional tasks | Performing bonded thermal insulation of facades with mineral wool. Repair of facade insulation systems using the bonded mineral wool insulation method. |
| Learning outcomes (personal and job related) | **Knowledge**- basics of energy efficiency and energy-saving technologies;- organisational and technical measures to create safe working conditions at height; - basics of using material selection programmes and automated calculation software;- types and types of facade insulation systems; - requirements for the quality of work performed;- schemes for the placement of fixing dowels;- technological sequence of fixing insulation boards to external wall structures with dowels; - modern tools and devices for marking$- the procedure for installing support and safety ropes; - regulatory and permitting documentation for working at height;- types of angles and profiles for strengthening building corners;- technological sequence of strengthening building corners, window and door openings, expansion joints with perforated metal angles;- rules for safe work performance;- technical properties of glass mesh- types of adhesive mortar mixtures;- the technological sequence of the main reinforced waterproofing layer;- rules for safe work performance;- types of sealed materials for sealing the joints of window and door balcony blocks;- the technological sequence of work on the insulation of the seams of window and door balcony blocks; - a diagram of the installation seam to create a vapour barrier;- rules for safe work performance;- technologies for additional reinforcement of the waterproof layer of the corners of window and door openings with glass mesh reinforcing elements; - technologies for strengthening the walls of the first floor with an additional protective mesh layer;- the purpose of expansion joints and their dimensions;- rules for safe work performance;- technical parameters and optimal operating conditions of building insulation; - causes of destruction of the thermal insulation system; - main types of thermal insulation defects and ways to eliminate them;- conditions for ensuring the rational operation of facilities with external bonded thermal insulation;- stages of inspection of the technical condition of the thermal insulation system;- materials for repairing or replacing damaged and destroyed building elements.  | **Skills**- read and use regulatory and technical documentation;- use material selection programs and automated programs to perform calculations;- mark holes for the first row of fixing dowels according to the scheme;- drill holes for dowels;- clean the holes with a vacuum cleaner from dust generated during drilling;- install the dowels in the holes;- screw in the fixing rods;- hammer in the spacer (pin) until it stops;- calculate the area and the required amount of materials;- prepare the adhesive mortar mixture depending on the material of the insulation boards;- fasten corner profiles;- use corner profiles made of plastic; - use corner profiles with a steeple on the upper window slopes;- cut fiberglass mesh from rolls to specified section sizes;- Prepare adhesive mortar mixtures for polystyrene/mineral wool boards;- apply the mortar mixture with a steel grater (half grater);- lay the fiberglass mesh on the levelled mortar and sink it into the layer;- duplicate the protective additional layer of fiberglass mesh on the walls of the first floor;- determine the basic horizontal and vertical lines of the mounted unit;- prepare the opening;- remove excess foam from the seams of the built-in unit;- apply a layer of acrylic sealant;- Prepare adhesive mortar mixtures for polystyrene/mineral wool boards;- apply and level the mortar mixture with a steel grater (half-grater);- form and strengthen the corners of the expansion joint with metal corners and a layer of glass mesh;- install an elastic sealing gasket made of polyethylene foam;- apply a layer of elastic sealant;- conduct a phased inspection of the technical condition of the thermal insulation system;- test the system and its individual layers using non-destructive testing methods;- timely eliminate defects arising during the operation of the thermal insulation system. | **Competences (autonomy / responsibility)**- calculates the area and the required amount of materials;- drills holes for fixing dowels, depending on the material of the external wall structure;- installs dowels in the holes using fastening sheared and spacers;- controls the quality of work performed;- fix corner profiles to the corners of the building at the ends of the insulation;- fixes corner profiles on the slopes of window and door openings;- Controls the quality of work performed;- Apply the mortar mixture to the surface of the building;- Lays the glass mesh on the levelled mortar;- Controls the quality of the work performed;- prepares the surface for sealed materials;- forms a protective film of acrylic sealant over the insulation layer;- controls the quality of the work performed;- Fills expansion joints using polyethylene jute of round cross-section; - reinforces the corners of the expansion joint with metal corners and a layer of glass mesh;- controls the quality of the work performed;- assesses the condition of the insulation system;- detects defects in the thermal insulation;- eliminates defects in thermal insulation;- Controls the quality of the work performed. |
| Validation  | **Criteria** | **Procedures** |
| Conformity;Flexibility and target orientation;Reliability | Creation of an examinationcommission (EC);The student performs the exam task;Decision of the EC;Delivery of a certificate or digital badge |
| Recognised / accepted (documented by MoU) | Documented by MoU:Limited Liability Company "Construction Enterprise "VIX". |
| Provider(s) | Kurakhovo Professional Lyceum. Vocational education institutions, and enterprises, private and public sector. |
| **Additional information****(if needed)** | Entry level / prerequisites | Duration of study in weeks 4 weeks / 150 hours / 5 ECTS. |
| Possible duration (recommendation) |
| **Specific content (national)** | Position in the chain of educational programmes | Technology of operation of the building insulation system. Labour protection in the organisation of climbing operations. Basics of materials science, basics of electrical engineering.Industrial sanitation and hygiene.Airless spray painting units. |
| Reference to NQF |
| Credits |