



# **LEVEL 2 CERTIFICATE IN CLAY TECHNOLOGY**

**Qualification Accredited Number: 603/1264/6**

## **Qualification Specification**

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## **EXECUTIVE SUMMARY**

The qualification is a nationally recognised qualification which provides Learners with basic knowledge of clay as a material and clay processing methods. Those achieving the qualification will be able to apply this knowledge to choosing appropriate products, advising others and suggesting correct applications for particular functions.

The qualification is intended for those already employed or newcomers to the industry and is designed to provide trade specific knowledge appropriate for the day to day activities in a clay processing environment, retail outlet or office.

Learners need to successfully pass a written examination based on learning outcomes and assessment criteria. Learners need to gain an overall pass of 50%.

Programmes leading to the qualification can be organised and delivered by providers who have gained centre and qualification approval from PIABC Limited. To achieve this they need to complete the PIABC Limited centre and qualification approval procedures available from the PIABC Limited website ([www.piabc.org.uk](http://www.piabc.org.uk)). In completing the documentation and the approval visit, centres need to demonstrate their ability to deliver high quality education leading to the qualification. The actual style of delivery is up to the centre but could include taught sessions, tutor support, distance learning, work books, mentor support or any other method that the centre considers appropriate. In choosing their delivery method centres are expected to employ robust quality assurance processes. PIABC Limited will appoint its own moderators to ensure the effective operation of these processes and the maintenance of standards of quality.

There is no necessity for any formal entry requirement to this course beyond the basic literacy and numeracy expected from anyone entering the work environment

Overall, it is expected that courses leading to the qualification will take approximately 50 taught or guided learning hours (GLH). Learners will also be expected to carry out additional reading and other work to complete each unit and prepare for assessment, up to a total learning time of approximately 129 hours.

Success in this qualification prepares Learners to progress to higher level qualifications, for example the PIABC Level 3 in Clay Technology.

## AIM

This national qualification is knowledge based and aims to provide trade specific knowledge appropriate for the day to day activities in a clay processing environment developing a sound understanding of the different types of clay and clay products and how they are processed and their uses. Those achieving the qualification will be able to apply this knowledge to identifying products and communicating technically with others.

The qualification is intended as a course either for those wishing to pursue a career in the clay or related industries, or for those who are already in the industry and who wish to extend their knowledge and expertise.

## OUTCOMES

In setting out a clearly-defined level of Learner achievement, this qualification will:

1. Enhance the knowledge and job satisfaction of *Learners* and provide them with a means of progression to higher level qualifications, as well as job movement throughout the clay sector and other related areas of the clay industry.
2. Provide *employers* with an open and transparent basis for judging the suitability of Learners for employment and promotion.

Specific outcomes for the qualification are listed under the individual unit description.

## TARGET GROUP

This Level 2 qualification is appropriate for those wanting to enhance their employment and progression opportunities in the clay and related industries.

There are four broad target groups:

1. People recently employed in the industry who want to gain a sound foundation to the material that is central to the sector, to enable them to operate more effectively.
2. People who have been in the industry for some time who want to extend their knowledge and gain a recognised qualification.
3. Those pursuing a competence based qualification that requires underpinning knowledge.
4. Finally, the qualification will appeal to people who are not currently employed in the industry, but who wish to gain a basic qualification as a step towards getting a job and progressing in the sector.

Due to the diverse nature of the clay and related industries, it is difficult to define the target groups in terms of precise job functions; however Learners are likely to be working as operatives or sales personnel in any of the following disciplines:

Job role	Type of company
Includes for example: Production Operatives, Sales, Office and Yard Operatives, Maker, Caster, Fettler, Dipper, Printer, Extruder, Former, Sprayer, Kiln Operator, Packer.	Producers of domestic, commercial, industrial goods in Heavy Clay, Whitewares, Refractories, Ceramics

## ENTRY REQUIREMENTS

There are no entry qualifications or age limits required for this qualification.

Assessment for this qualification is open to any Learner who has the potential to reach the standards laid down for these qualifications. As a guide those with the following are likely to indicate the potential to succeed: Level 1 qualifications, a minimum of 5 GCSEs at Grade D-G (or equivalent), or experience that indicates ability to succeed. An initial assessment of past experience and current skills, knowledge and understanding should be carried out prior to commencement, to determine suitability for this qualification.

Aids or appliances, which are designed to alleviate disability, may be used during assessment, providing they do not compromise the standard required.

## PROGRESSION

Success in this qualification prepares Learners for progression in the clay industry to a position where they can assume some level of responsibility or gain further qualifications for example the PIABC Level 3 in Clay Technology.

## QUALIFICATION STRUCTURE

Learners must achieve a minimum of 14 Credits - this equates to achieving all 6 units. Indicative learning hours are shown below; however these will vary for each individual.

PIABC Unit Ref.	Ofqual Unit Ref.	Unit Title	Level	Unit GLH*	Self Study Hours	Total Unit Time (hrs)	Credit
C1	J/615/5937	Clay Technology – Introduction to the Industry	2	5	2	7	1
C2	L/615/5938	Clay Technology - Raw Materials & Clay Preparation	2	10	29	39	4
C3	R/615/5939	Clay Technology – Forming & Setting	2	10	21	31	3
C4	J/615/5940	Clay Technology – Drying & Firing	2	10	20	30	3
C5	L/615/5941	Clay Technology - Packaging & Distribution	2	5	2	7	1
C6	R615/5942	Clay Technology - Management & Quality Systems	2	10	5	15	2
		Total Qualification Time				129	
		Total Self Study Time			79		
		Total Credit					14
		Total GLH		50			
		Qualification Level	2				

GLH\* = Guided Learning Hours

## QUALIFICATION LEVEL

This is a Level 2 qualification.

Learners require the knowledge and show understanding in applying technical and commercial principles to a range of tasks.

This qualification requires the Learner to understand the raw materials, and how these are processed and quality controlled so that they may better contribute to the production of quality assured products. It will prepare the Learner to operate as a competent team member and will greatly assist them in their career development.

The examination for this qualification is based on the learning outcomes and assessment criteria set in a way that demonstrates the features above.

When work for this qualification is assessed, it is important to realise that evidence will be sought which demonstrates these features.

### Level 2 Descriptor

#### Summary

The descriptors set out the generic knowledge and skills associated with the typical holder of a qualification at Level 2. The level descriptors are framed as outcomes and each category starts with a stem statement (“the holder can...”) which then links into the outcomes associated with each level of the framework.

#### Knowledge descriptor (the holder...)

- Has knowledge and understanding of facts, procedures and ideas in an area of study or field of work to complete well-defined tasks and address straightforward problems.
- Can interpret relevant information and ideas.
- Is aware of a range of information that is relevant to the area of study or work.

#### Skills descriptor (the holder...)

- Select and use relevant cognitive and practical skills to complete well-defined, generally routine tasks and address straightforward problems.
- Identify, gather and use relevant information to inform actions.
- Identify how effective actions have been.

*Source: Qualification and Component Levels - Requirements and Guidance for All Awarding Organisations and All Qualifications. Version: Ofqual/15/5774. Ofqual 2015.*

## **PROGRAMME ORGANISATION**

It is anticipated that the qualification will require 129 learning hours for satisfactory completion. These will be made up of up to 50 taught hours, the use of workbooks, etc. along with workplace learning.

The organisation of the qualification is at the discretion of the centre and will take into account the aims, aspirations and experience of the Learners.

Centres are encouraged to choose the most suitable curriculum model for their Learners. Whilst the sequential delivery of parts of the unit is a possibility and may provide the most straightforward way of determining completion, it may be that some degree of integration of elements will occur, or that other methods of delivery are more appropriate to meet the needs of Learners. It should be noted however that the whole unit and all the learning outcomes will be assessed.

Centres must ensure that adequate arrangements are in place for supporting Learners. This could be either through separate tutorial sessions or through the use of time within structured study sessions. Centres using on-line or other forms of open learning must ensure that appropriate tutorial support is provided for Learners.

In relevant circumstances, centres are recommended to provide information and guidance to their Learners on the availability and type of employment the programme may lead to and on the progression routes available for further education and training in wood technology.

## **GUIDANCE ON LEARNING AND TEACHING STRATEGY, METHODS AND ASSESSMENT**

As clay technology is a practical subject, based on theoretical principles, as far as possible, it is important that the course is taught by relating the underlying theory to practical examples and applications. Three factors which will help in this regard are:

1. The use of staff with direct experience in the clay and related industries. This must, of course, be balanced against a sound understanding of the theoretical principles, as anecdotal experience alone is unlikely to meet the requirements of the course.
2. Practical and commercial examples that underpin a more theoretical understanding should be used to show the link between theory and practice. DVD illustrations of processes could also be used as part of the teaching regime. A further and invaluable source of information is the Internet and there are web sites which demonstrate important aspects of clay processing and use. Learners should be encouraged to research this material.
3. Practical experience of workplace operations working and handling clay.

Those Learners employed in the clay and related industries, will come to the course with varying levels of existing knowledge and/or practical experience of some parts of the syllabus. This should be utilised in preparing for the examination. The sharing of knowledge which has the potential to lead to a high level of understanding should be encouraged.

The relation of theory and practice is a theme that will be reflected in the assessments for the programme. Therefore in structured learning and individual work, Learners should be aware of the requirement to develop a practical dimension to their understanding.

Those developing learning programmes should expect to achieve all the learning outcomes. It may be useful to have workbooks for use either at home or in the workplace. The addition of diagrams and photographs may enhance learning.

## QUALIFICATION DESCRIPTION

The qualification comprises six units and follows PIABC Limited's principles for designing units and qualifications and contains the features listed as follows;

- Unit reference number, title, guided learning hours, grading structure and assessment guidance.
- Each unit consist of:
  - Learning Outcomes that show what the Learners will be able to understand, know or demonstrate.
  - Assessment Criteria that show what the Learners can do or produce in order to show that they have met the Learning Outcome.
- To successfully complete the qualification, an overall pass mark of 50% is required.

## UNIT CONTENT

### CLAY TECHNOLOGY – INTRODUCTION TO THE INDUSTRY

PIABC Unit No: C1

Guided Learning Hours: 5

Qualification Accreditation No: J/615/5937

Total Unit Time (Hours): 7

Unit Level: 2

Unit Credits: 1

<b>Learning Outcomes</b> The Learner will:		<b>Assessment Criteria</b> The Learner can:	
1.	Understand the key aspects of the clay building products industries	1.1	Outline the main sectors of the clay building products industries: <ul style="list-style-type: none"> <li>• Heavy Clay</li> <li>• Whitewares</li> <li>• Refractories</li> <li>• High Performance Ceramics</li> </ul>
2.	Understand the clay building products manufacturing processes	2.1	Outline the main processes of the clay building products industries: <ul style="list-style-type: none"> <li>• Quarry</li> <li>• Clay Preparation</li> <li>• Forming</li> <li>• Setting</li> <li>• Drying and Firing</li> <li>• Packing</li> </ul>

## CLAY TECHNOLOGY - RAW MATERIALS AND CLAY PREPARATION

PIABC Unit No: C2

Guided Learning Hours: 10

Qualification Accreditation No: L/615/5938

Total Unit Time (Hours): 39

Unit Level: 2

Unit Credits: 4

<b>Learning Outcomes</b> The Learner will:		<b>Assessment Criteria</b> The Learner can:	
1.	Understand the raw material processes involved in the manufacture of clay building products	1.1	List the data required when conducting assessment and evaluation of a potential extraction site
		1.2	Describe how raw materials are extracted from reserves
		1.3	List the methods used for raw material transportation
2.	Understand the key functional properties of Clay used in the clay building products industries	2.1	Outline the functional properties of raw materials : <ul style="list-style-type: none"> <li>• Plasticity</li> <li>• Shrinkage</li> <li>• Strength</li> <li>• Durability</li> <li>• Colour</li> <li>• Soluble salts</li> <li>• Absorption</li> </ul>
3.	Understand the types of Clay used in the clay building products industries	3.1	List types and properties of clay from geographical locations: <ul style="list-style-type: none"> <li>• Weald Clay</li> <li>• Lower Oxford Clay</li> <li>• Mercia Mud Stone</li> <li>• Etruria Marl</li> <li>• Coal Measure Shale</li> <li>• Fireclays</li> </ul>
4.	Understand the additives used in the manufacture of building products	4.1	List additives used in the manufacturing process
		4.2	Outline how additives affect the production process
5.	Understand how the raw materials are prepared for use in the manufacturing process	5.1	Outline how raw materials are affected by: <ul style="list-style-type: none"> <li>• Stockpiling</li> <li>• Blending</li> <li>• Weathering</li> </ul>
		5.2	Outline how raw materials are prepared for forming: <ul style="list-style-type: none"> <li>• Crushing</li> <li>• Grinding</li> <li>• Sizing</li> <li>• Tempering</li> </ul>

## CLAY TECHNOLOGY – FORMING AND SETTING

PIABC Unit No: C3

Qualification Accreditation No: R/615/5939

Unit Level: 2

Guided Learning Hours: 10

Total Unit Time (Hours): 31

Unit Credits: 3

<b>Learning Outcomes</b> The Learner will:		<b>Assessment Criteria</b> The Learner can:	
1.	Understand the forming processes used in the manufacture of Clay Building Products	1.1	Outline the forming processes used in the manufacture of clay products: <ul style="list-style-type: none"><li>• Extrusion</li><li>• Pressing</li><li>• Hand making</li><li>• Moulding</li></ul>
		1.2	Outline how product design influences the forming method
2.	Understand the decorative finishes used in the manufacture of bricks	2.1	Outline methods of applying decorative finishes methods
3.	Understand the setting processes used in the manufacture of Clay Building Products	3.1	Outline the processes used in the manufacture of clay building products: <ul style="list-style-type: none"><li>• Wet Setting</li><li>• Dry Setting</li></ul>

## CLAY TECHNOLOGY – DRYING AND FIRING

PIABC Unit No: C4

Qualification Accreditation No: J/615/5940

Unit Level: 2

Guided Learning Hours: 10

Total Unit Time (Hours): 30

Unit Credits: 3

<b>Learning Outcomes</b> The Learner will:		<b>Assessment Criteria</b> The Learner can:	
1.	Understand the drying process	1.1	State the effects of drying clay
		1.2	Outline how the drying process is controlled
		1.3	State the types of dryers used in the clay building products industries
2.	Understand the firing process	2.1	Outline the effects of firing on clay building products
		2.2	Outline how the firing variables are controlled
		2.3	State the types of kilns used in the clay building products industries

## CLAY TECHNOLOGY – PACKAGING AND DISTRIBUTION

PIABC Unit No: C5

Qualification Accreditation No: L/615/5941

Unit Level: 2

Guided Learning Hours: 5

Total Unit Time (Hours): 7

Unit Credits: 1

<b>Learning Outcomes</b> The Learner will:		<b>Assessment Criteria</b> The Learner can:	
1.	Understand how clay building products are packaged	1.1	Outline the methods used to pack products <ul style="list-style-type: none"> <li>• Manual</li> <li>• Automated</li> </ul>
		1.2	Outline the different types of packaging available for Clay Building Products.
2.	Understand the methods of transport used to distribute products	2.1	State appropriate methods of transport for a range of product, transportation method and customer requirements.

## CLAY TECHNOLOGY - MANAGEMENT AND QUALITY SYSTEMS

PIABC Unit No: C6

Qualification Accreditation No: R/615/5942

Unit Level: 2

Guided Learning Hours: 10

Total Unit Time (Hours): 15

Unit Credits: 2

<b>Learning Outcomes</b> The Learner will:		<b>Assessment Criteria</b> The Learner can:	
1.	Understand the common management systems used in the clay building products industry	1.1	Outline the principle elements of management systems: <ul style="list-style-type: none"> <li>• Safety</li> <li>• Environment</li> <li>• Quality</li> <li>• Energy</li> </ul>
2.	Know the main stakeholders in the clay building products industry	2.1	Suggest key stakeholders in the clay building products industry <ul style="list-style-type: none"> <li>• Internal</li> <li>• External</li> </ul>
3.	Know the factors involved in controlling quality during the manufacture of Clay Building Products	3.1	Differentiate between quality control and quality assurance
		3.2	Describe the factors that influence the quality of clay building products
4.	Know the typical quality checks carried out during the manufacture of Clay Building Products	4.1	Outline the typical quality checks used on the production line
		4.2	Outline the typical finished product tests for: <ul style="list-style-type: none"> <li>• Brick</li> <li>• Clay Pavers</li> <li>• Pipes</li> <li>• Roof Tiles</li> </ul>

## ASSESSMENT AND GRADING

This qualification is assessed by a written examination of 2 hours consisting of short answer questions covering all six units. Learners must pass both Part A and Part B of the written examination paper.

The examination paper is divided into two parts, which a Learner must pass both:

- Part A covers Units C1, C2 & C6
- Part B covers Units C3, C4 & C5

A Learner will fail the written examination by achieving less than 50% overall and/or fails one of the two parts of the written examination paper. A Learner can re-sit a different written examination paper at the next examination series.

Examinations are offered twice a year in June and November.

This is a graded unit with pass, merit and distinction being available.

The following percentages will determine the overall qualification grade:

- Pass 50 – 59%
- Merit 60 – 69%
- Distinction 70%+

## QUALIFICATION CERTIFICATION

### PIABC Level 2 Certificate in Clay Technology

The qualification is available at *Pass*, *Merit* or *Distinction*.

## GLOSSARY

Term	Definition
Learning Outcome	This describes what a Learner needs to know, understand or do as a result of the process of learning.
Assessment Criteria	These are the requirements Learners are expected to meet to demonstrate that a learning outcome has been achieved.
Centre	The organisation that is approved by PIABC Limited for the purposes of preparing Learners for assessment.