PIABC LEVEL 3 CERTIFICATE IN CLAY TECHNOLOGY

Qualification Number: 603/2440/5

Qualification Specification

Updated: 15 January 2020

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EXECUTIVE SUMMARY

The qualification is a nationally recognised qualification which provides learners with an extended knowledge of clay as a material, clay processing methods and an appreciation of management systems. Those achieving the qualification will benefit from an enlightened mindset towards quality and business and be able to apply extended product knowledge to products and production, 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 together with a basic management appreciation 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, which is divided into five parts. Learners need to pass all parts and gain an overall pass mark 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). 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, workbooks, 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. Learners will be better equipped if they have previously achieved the *PIABC Level 2 Award in Clay Technology (QN: 603/5149/4) or PIABC Level 2 Certificate in Clay Technology (QN: 603/1264/6).*

It is anticipated that courses leading to this level 3 qualification will take approximately 40 hours of guided learning hours (GLH), which is the average hours a learner may require guidance and support from teaching, learning and assessment professional to achieve the qualification. A learner will also be expected to carry out additional self study, reading and other work to prepare for assessment. It is anticipated that the qualification will require a minimum of 155 hours of total qualification time for satisfactory completion for an average learner.

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. Provide and enhance the skills competency, knowledge and job satisfaction of learners - providing them with a means of progression to higher level job roles and qualifications.
2. Provide employers with an open and transparent basis for judging the suitability of learners for employment and promotion.
3. Facilitate job movement throughout the clay sector and other related areas of the clay industry.

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

TARGET GROUP

This level 3 qualification is appropriate for those wanting to enhance their employment and progression opportunities in the clay and related sectors.

There are four broad target groups:

1. People recently employed in the industry who wants 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, Refactories, 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 level 3 qualifications. As a guide those with the following are likely to indicate the potential to succeed: level 2 qualifications, a minimum of 5 GCSEs (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 (e.g. University of Derby's University Diploma in Clay Studies (Level 5) or Foundation Degree in Clay Technology (FdSc)).

QUALIFICATION STRUCTURE

Learners must achieve 15 credits - this equates to achieving all 10 mandatory 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*	Total Unit Time (hrs)	Credit
PART A						
C7	T/616/4763	Clay Technology: Introduction to the Industry	3	4	9	1
C8	A/616/4764	Clay Technology: Clay Science	3	4	20	2
PART B						
C9	J/616/4766	Clay Technology: Extraction	3	4	14	1
C10	R/616/4768	Clay Technology: Clay Preparation	3	4	11	1
PART C						
C11	L/616/4770	Clay Technology: Forming & Setting	3	4	20	2
C12	Y/616/4772	Clay Technology: Packaging & Distribution	3	4	9	1
PART D						
C13	D/616/4773	Clay Technology: Drying	3	4	20	2
C14	H/616/4774	Clay Technology: Kilns & Firing	3	4	20	2
PART E						
C15	M/616/4776	Clay Technology: Control Systems	3	4	10	1
C16	T/616/4777	Clay Technology: Quality, Sustainability & Management Systems	3	4	20	2
Qualification Level			3			
Total GLH				40		
Total Qualification Time (TQT**)					155	
Total Credit						15

GLH* = Guided Learning Hours, which is the average hours a learner may require guidance and support from teaching, learning and assessment professional to achieve the qualification.

TQT** = This is an indication of the minimum length of time it would take the average learner to complete their qualification.

QUALIFICATION LEVEL

This is a level 3 qualification.

Learners may have direct responsibility for others or may have responsibilities within a team.

The assessments for this qualification are based on the learning outcomes and assessment criteria set in a way that demonstrates that the learner can show that they have the knowledge and skills associated with a level 3 qualification.

It will prepare the learner to operate as a competent team member and will greatly assist them in their career development.

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

LEVEL 3 DESCRIPTOR

Summary
The descriptors set out the generic knowledge and skills associated with the typical holder of a qualification at level 3. 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 factual, procedural and theoretical knowledge and understanding of a subject or field of work to complete tasks and address problems that while well-defined, may be complex and non-routine.
- Can interpret and evaluate relevant information and ideas.
- Is aware of the nature of the area of study or work.
- Is aware of different perspectives or approaches within the area of study or work.

Skills descriptor (the holder...)
- Identify, select and use appropriate cognitive and practical skills, methods and procedures to address problems that while well-defined, may be complex and non-routine.
- Use appropriate investigation to inform actions.
- Review how effective methods and 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 courses leading to this level 3 qualification will take approximately 40 hours of guided learning hours (GLH), which is the average hours a learner may require guidance and support from teaching, learning and assessment professional to achieve the qualification. A learner will also be expected to carry out additional self study, reading and other work to prepare for assessment. It is anticipated that the qualification will require a minimum of 155 hours of total qualification time for satisfactory completion for an average learner.

The organisation of the qualification is at the discretion of the centre and will consider 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 ten mandatory 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 learner will be able to understand, know or demonstrate.
    - Assessment Criteria that show what the learner can do or produce in order to show that they have met the Learning Outcome.
- To successfully complete the qualification, the learner needs to successfully pass a written examination based on learning outcomes and assessment criteria, which is divided into five parts. Learners need to pass all parts and gain an overall pass mark of 50%.

UNIT CONTENT

PART A

CLAY TECHNOLOGY: INTRODUCTION TO THE INDUSTRY

PIABC Unit No: C7 | Guided Learning Hours: 4
Ofqual Unit Ref. No: T/616/4763 | Total Unit Time (Hours): 9
Unit Level: 3 | Unit Credits: 1

Learning Outcomes The Learner will:		Assessment Criteria The Learner Can:	
1.	Understand the key aspects of the clay ceramic products industries	1.1	Outline the main sectors of the clay ceramic products industries • Heavy clay • Whitewares • Refractories • High performance ceramics
2.	Understand the clay building products manufacturing processes	2.1	Outline the main processes of the clay building products industries • Quarry • Clay preparation • Forming • Setting • Drying and firing • Packing
3.	Know health and safety legislation applicable to the clay building products sector	3.1	State the benefits of effective health and Safety practice
		3.2	Describe how effective health and safety may be achieved

CLAY TECHNOLOGY: CLAY SCIENCE

PIABC Unit No: C8
Ofqual Unit Ref. No: A/616/4764
Unit Level: 3

Guided Learning Hours: 4
Total Unit Time (Hours): 20
Unit Credits: 2

Learning Outcomes The Learner will:		Assessment Criteria The Learner Can:	
1.	Know the raw materials and additives used in the heavy clay industry	1.1	Explain the origin of clays
		1.2	Describe the different types of clay: • Geology • Location • Mineral content • Properties
		1.3	Explain why different additives are used in the process
2.	Understand the effects of heat on clays	2.1	Outline the effect of heat on clays
3.	Know the tests undertaken to check clay properties	3.1	Outline the tests undertaken to check clay properties

PART B

CLAY TECHNOLOGY: EXTRACTION

PIABC Unit No: C9
Ofqual Unit Ref. No: J/616/4766
Unit Level: 3

Guided Learning Hours: 4
Total Unit Time (Hours): 14
Unit Credits: 1

Learning Outcomes The Learner will:		Assessment Criteria The Learner Can:	
1.	Know the main factors in site assessment and evaluation	1.1	Outline the various elements taken into account when evaluating a site for the extraction of heavy clay materials
2.	Understand the planning application process	2.1	Outline the planning application process: • Planning statement • Environmental impact analysis
3.	Understand how to manage the environmental impacts of operating a heavy clay quarry	3.1	Summarise typical approaches for dealing with environmental impacts of the heavy clay extraction operation
4.	Know how to extract raw materials	4.1	Describe the extraction process and the various factors taken into account when extracting material
5.	Know how to transport raw materials	5.1	State the various transportation methods for extracted material in use in the clay building products sector
6.	Know how to operate a heavy clay quarry efficiently	6.1	Explain the various factors required to ensure the clay quarry runs efficiently

CLAY TECHNOLOGY – CLAY PREPARATION

PIABC Unit No: C10
Ofqual Unit Ref. No: R/616/4768
Unit Level: 3

Guided Learning Hours: 4
Total Unit Time (Hours): 11
Unit Credits:1

Learning Outcomes The Learner will:		Assessment Criteria The Learner Can:	
1.	Know why raw material preparation is carried out	1.1	Explain why raw material preparation activities are carried out
		1.2	Describe the effect of the preparation activities on the properties of the clay
		1.3	Outline the various types of equipment used for raw material preparation

PART C

CLAY TECHNOLOGY: FORMING & SETTING

PIABC Unit No: C11
Ofqual Unit Ref. No: L/616/4770
Unit Level: 3

Guided Learning Hours: 4
Total Unit Time (Hours): 20
Unit Credits: 2

Learning Outcomes The Learner will:		Assessment Criteria The Learner Can:	
1.	Understand the forming processes usedin the manufacture of heavy clay products	1.1	Describe the forming processes used in the manufacture of heavy clay products: • Extrusion • Pressing • Hand making • Moulding
		1.2	Justify the relationship between the raw material, product design and forming method
2.	Understand the decorative finishes used in the manufacture of heavy clay products	2.1	Outline the decorative finishes and the methods of applying them to heavy clay products
3.	Understand the setting processes used in the manufacture of heavy clay products	3.1	Outline the processes used in the manufacture of heavy clay products: • Wet setting • Dry setting

CLAY TECHNOLOGY: PACKAGING & DISTRIBUTION

PIABC Unit No: C12
Ofqual Unit Ref. No: Y/616/4772
Unit Level: 3

Guided Learning Hours: 4
Total Unit Time (Hours): 9
Unit Credits: 1

Learning Outcomes The Learner will:		Assessment Criteria The Learner Can:	
1.	Understand how and why heavy clay products are packaged	1.1	Justify the methods used to pack products • Manual • Automated
		1.2	Describe the different types of packaging available for clay building products
2.	Understand the methods of transport used to distribute products	2.1	Evaluate appropriate methods of transport for: • Product • Transportation method • Customer requirements
3.	Know distribution channels for finished products to customers	3.1	Describe the main distribution channels for heavy clay products

PART D

CLAY TECHNOLOGY: DRYING

PIABC Unit No: C13
Ofqual Unit Ref. No: D/616/4773
Unit Level: 3

Guided Learning Hours: 4
Total Unit Time (Hours): 20
Unit Credits: 2

Learning Outcomes The Learner will:		Assessment Criteria The Learner Can:	
1.	Understand the drying process	1.1	Outline the stages of the drying process
		1.2	Describe the different types of dryers used: • Continuous • Intermittent
2.	Understand the effect of drying on heavy clay products	2.1	Outline the effect of drying on heavy clay products: • Shrinkage • Weight • Strength
		2.2	Describe the faults that can occur during the drying process
3.	Understand what to control during the drying process	3.1	Explain the importance of controlling the following in the drying process: • Temperature • Humidity • Air Flow

CLAY TECHNOLOGY: KILNS & FIRING

PIABC Unit No: C14
Ofqual Unit Ref. No: H/616/4774
Unit Level: 3

Guided Learning Hours: 4
Total Unit Time (Hours): 20
Unit Credits: 2

Learning Outcomes The Learner will:		Assessment Criteria The Learner Can:	
1.	Understand the firing process	1.1	Outline the stages of the firing process
		1.2	Describe the different types of kilns used: • Continuous • Intermittent
2.	Understand the effect of firing on heavy clay products	2.1	Outline the effect of firing on heavy clay products: • Shrinkage • Weight • Strength • Colour
		2.2	Describe the faults that can occur during the firing process
3.	Understand what to control during the firing process	3.1	Explain the importance of controlling the following in the firing process: • Temperature • Atmosphere • Time

PART E

CLAY TECHNOLOGY: CONTROL SYSTEMS

PIABC Unit No: C15
Ofqual Unit Ref. No: M/616/4776
Unit Level: 3

Guided Learning Hours: 4
Total Unit Time (Hours): 10
Unit Credits: 1

Learning Outcomes The Learner will:		Assessment Criteria The Learner Can:	
1.	Understand control systems used in the heavy clay industry	1.1	Explain the purpose of control systems
		1.2	Describe the different control systems used in the heavy clay industry: • Feedback loop • Temperature measurement • Air flow measurement • Machine control systems

CLAY TECHNOLOGY: QUALITY, SUSTAINABILITY & MANAGEMENT SYSTEMS

PIABC Unit No: C16 | Guided Learning Hours: 4
Ofqual Unit Ref. No: T/616/4777 | Total Unit Time (Hours): 20
Unit Level: 3 | Unit Credits: 2

Learning Outcomes The Learner will:		Assessment Criteria The Learner Can:	
1.	Understand the importance of quality	1.1	State key stakeholders in the clay building products industry: • Internal • External
		1.2	Describe the key quality activities: • Inspection • Control • Assurance
2.	Understand the common management systems used in the heavy clay industry	2.1	Explain the purpose of management systems in the heavy clay industry: • Safety • Sustainability/environment • Quality • Energy
3.	Know the typical product testing carried out during the manufacture of heavy clay products	3.1	Describe the typical quality checks used on the production line
		3.2	State the typical finished product tests for: • Brick • Clay pavers • Pipes • Roof tiles
		3.3	Explain how the finished product is graded
4.	Know the data analysis methods used in the Process	4.1	Outline the methods of data analysis used in the process
5.	Understand the importance of sSustainability	5.1	Explain the concept of sustainability
		5.2	Outline the environmental protection activities for: • Land • Air • Water

ASSESSMENT AND GRADING

This qualification is assessed by a written examination of 3 hours consisting of short answer questions covering all ten units.

The examination paper is divided into five parts. A learner must pass **all** parts:

- Part A covers Units C7 and C8
- Part B covers Units C9 and C10
- Part C covers Units C11 and C12
- Part D covers Units C13 and C14
- Part E covers Units C15 and C16

A learner will fail the written examination by achieving less than 50% overall and/or fails one of the five 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 qualification with pass, merit and distinction being available.

The following percentages will determine the overall qualification grade:

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

The pass threshold of Parts A, B, C, D and E and the overall grading structure for the qualification is not subject to change.

QUALIFICATION CERTIFICATION

PIABC Level 3 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.