PIABC LEVEL 3 DIPLOMA IN POLYMER PROCESSING

Qualification Number: 603/2403/X

Qualification Specification

Updated: 15 January 2020

PURPOSE

This regulated qualification PIABC Level 3 Diploma in Polymer Processing (QN: 603/2403/X) has been designed for learners working in the polymer processing and related sectors. Its main purpose is to provide industry specific knowledge and skills appropriate for the day to day activities in a polymer processing environment, an understanding of the different types of processes as well as how they are processed and their uses.

The qualification covers knowledge of thermoplastic processing; technologies, methods and processes; polymer materials and their processing behaviour; engineering principles; health and safety; the environment; and quality and process management.

Learners then may choose one of five pathways which focus on specific processes within polymer processing (e.g. thermoplastic extrusion, injection moulding, preform blow moulding, parison blow moulding and thermoplastic materials processing).

To achieve the qualification, learners need to successfully gain the 85 credits.

Programmes leading to the qualification can be organised and delivered by providers who have gained centre and qualification approval from PIABC Limited (PIABC). To achieve this they need to complete the PIABC centre and qualification approval procedures available from PIABC's 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, 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 will appoint its own External Quality Assurers to ensure the effective operation of these processes and the maintenance of standards of quality.

It is expected that courses leading to the qualification will take a minimum of 418 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. Learners will also be expected to carry out additional reading and other work to complete each unit and prepare for assessment. It is anticipated that the qualification will require a minimum of 859 hours of total qualification time for satisfactory completion for an average learner.

The PIABC Level 3 Diploma in Polymer Processing (QN: 603/2403/X) can be used to provide the theoretical knowledge as required by the Apprenticeship Standard – Science Manufacturing Technician. This qualification does not contribute to the grading of the apprenticeship award.

OUTCOMES

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 polymer processing industry and related sectors.

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 polymer processing industry and relates sectors:

There are two broad target groups:

1. People within the polymer processing industry who want to extend their knowledge and skills to gain a recognised qualification.

2. People within the polymer processing industry who want to operate more professionally and effectively.

Due to the diverse nature of the polymer processing industry, it is difficult to define the target groups in terms of precise job functions. Typically, learners are likely to be in positions were they are responsible for functions such as setting up and troubleshooting a new product or process.

Job role	Type of company
Process/Condition Setter	Polymer Processing
Production Technician	Polymer Processing
Process Team Leader	Polymer Processing
Product Development Technician	Polymer Processing
Production/Technical Manager	Polymer Processing
Polymer Engineer	Polymer Processing
Process Trouble-shooter	Polymer Processing

ENTRY REQUIREMENTS

There are no entry qualifications or age limits required for this qualification. But the PIABC Level 3 Diploma in Polymer Processing (QN: 603/2403/X) is intended for those learners who will have worked in a polymer processing environment for approximately 3 to 9 months prior to starting.

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 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

The PIABC Level 3 Diploma in Polymer Processing (QN: 603/2403/X) can be used to provide the theoretical knowledge as required by the Apprenticeship Standard – Science Manufacturing Technician. The qualification does not contribute to the grading of the apprenticeship award.

Success in this qualification prepares learners for progression within the polymer processing industry to a position where they can assume some level of responsibility.

PROGRAMME ORGANISATION

Programmes leading to the PIABC Level 3 Diploma in Polymer Processing can be organised and delivered by providers who have gained centre and qualification approval from PIABC. To achieve this they need to complete the PIABC centre and qualification approval procedures available from ***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. Centres are expected to employ robust quality assurance processes. PIABC will appoint its own External Quality Assurers to ensure the effective operation of these processes and the maintenance of standards of quality.

It is anticipated that the qualification will require a total qualification time of 859 hours. This includes assessment, self study and taught hours for satisfactory completion.

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.

The employer's engagement in learning and assessment opportunities will be paramount in securing timely achievement and a participative role should be encouraged.

In relevant circumstances, centres are recommended to provide information and guidance to their learners on the availability and type of employment the qualification may lead to and on the progression routes available for further education and training in polymer process industry and associate sectors.

GUIDANCE ON LEARNING AND TEACHING STRATEGY, METHODS AND ASSESSMENT

As far as possible, it is important that the course is taught by relating the underlying theory to practical examples and applications. Two factors which will help in this regard are:

1. The use of staff with direct experience in the polymer processing industry. 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 many web sites which demonstrate important aspects of timber processing and use. Learners should be encouraged to research this material.

3. Practical experience of workplace operations dealing with polymer processing and the individual learner's chosen pathway. It is essential that Learners are able to, and can demonstrate their skills and knowledge in their own work environment with its production pressures

Learners employed in the polymer processing industry will come to the qualification with varying levels of existing knowledge and/or practical experience of some parts of the Learning Outcomes. Training needs should be identified and gaps in knowledge and competency should be filled with a planned delivery of an individual learning plan. This should be utilised in preparing for teaching and assessment. The sharing of knowledge which has the potential to lead to a high level of understanding should be encouraged by the use of staff with direct experience in the polymer process industry - particularly in the individual learner's chosen pathway. This must, of course, be balanced against a sound understanding of the theoretical understanding.

Where the skills assessment is to be carried out in a "production environment" this environment must not be simulated. The assessment should take account of production pressure within a natural work place.

The relationship between theory and practice is a theme that should 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 theoretical understanding to their practical work and a practical application to their theoretical 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.

QUALIFICATION DESCRIPTION

This qualification follows the PIABC 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, learners must meet all the learning outcomes and gain an overall pass for each unit.

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.

QUALIFICATION STRUCTURE

Six mandatory units, plus 2 optional units from 1 of the 5 pathways is required: 58 credits from the mandatory group and 26 credits from 1 of the 5 optional pathways. The Total Qualification Time (TQT) for an average learner to complete this qualification is 859 hours.

PIABC Unit Ref.	Ofqual Unit Ref.	Unit Title	Level	Credit
MANDATORY UNITS (58 Credits Required)				
PM1	T/616/4116	Polymer Processing - Health and Safety and the Environment	2	6
PM2	A/616/4117	Polymer Processing - Engineering Principles	3	12
PM3	F/616/4118	Principles of Polymer Materials and their Processing Behaviour	3	12
PM4	J/616/4119	Polymer Processing - Technologies, Methods and Processes	3	11
PM5	A/616/4120	Principles of Quality and Process Management used in Polymer Processing	3	8
PM6	F/616/4121	Personnel Employment, Communications and People Skills	2	10
OPTIONAL UNITS (26 Credits Required)				
Pathway 1 – Thermoplastic Extrusion				
PA1	J/616/4122	Principles of Thermoplastic Extrusion	3	13
PA2	L/616/4123	Processing Thermoplastics by Extrusion	3	13
Pathway 2 – Injection Moulding				
PB1	R/616/4124	Principles of Thermoplastic Injection Moulding	3	13
PB2	Y/616/4125	Processing Thermoplastics by Injection Moulding	3	13
Pathway 3 – Preform Blow Moulding				
PC1	D/616/4126	Principles of Thermoplastic Preform Blow Moulding	3	13
PC2	H/616/4127	Processing Thermoplastics by Preform Blow Moulding	3	13
Pathway 4 – Parison Blow Moulding				
PD1	K/616/4128	Principles of Thermoplastic Parison Blow Moulding	3	13
PD2	M/616/4129	Processing Thermoplastics by Parison Blow Moulding	3	13
Pathway 5 – Thermoplastic Materials Processing				
PE1	H/616/4130	Principles of Thermoplastic Materials Processing	3	13
PE2	K/616/4131	Processing of Thermoplastics by a Production Technique	3	13
Qualification Level			**3**	
Total Credit				**85**

ASSESSMENT AND GRADING

MANDATORY UNITS (PM1, PM2, PM3, PM4, PM5 and PM6)

These units are assessed by completing assignments which are set, internally assessed and internally quality assured by the centre.

The assignments should be designed for a holistic approach to the assessment and confirm learners have a full contextualised understanding of all the assessment criteria.

Centre assignments and their management will be externally quality assured by PIABC.

All units are graded pass or fail only; learners need to pass all the assessment criteria.

The pass threshold of these mandatory units is not subject to change.

OPTIONAL UNITS (PA1, PB1, PC1, PD1 & PE1)

These units are assessed by learners completing a centre devised and managed multi-choice end tests that addresses all the criteria. Test papers must sample each assessment criteria.

The question bank should contain at least three questions for each assessment criteria; each of which should cover a feature of the specific assessment criteria. The question bank will be monitored and evaluated to ensure a consistent standard is maintained across all assessment criteria and test papers.

The tests will be internally assessed and internally quality assured by the centre.

Centre multi-choice end tests and their management will be externally quality assured by PIABC.

All units are graded pass or fail only; learners need to pass all the assessment criteria and achieve a pass mark of 80%.

The pass threshold of these optional units is not subject to change.

OPTIONAL UNITS (PA2, PB2, PC2, PD2 & PE2)

These units are assessed by both the following methods to confirm competence over time and to ensure a consistent skills standard is achieved across all the centre's assessment sites:

A. The assessor will observe the learner, over time, successfully completing all the assessment criteria within a production environment.

B. The learners complete a final centre devised practical skills end test in a production environment. The test will cover the configuring, commissioning, optimising and product/process fault-finding; all the assessment criteria will be addressed.

The end tests must be monitored and evaluated by the centre to ensure a consistent skills standard is maintained across all assessment sites, irrespective of the types of equipment, processes and materials used.

The production environment in both methods of assessment must not be simulated. Both the observation and skill tests are assessed and internally quality assured by the centre.

The ongoing observations and the centre practical skills end test and their management will be externally quality assured by PIABC.

This unit is graded pass or fail only; learners need to successfully achieve both methods of assessment.

The pass threshold of these optional units is not subject to change.

QUALIFICATION GRADING

This is qualification is graded pass or fail only.

The overall grading structure for the qualification is not subject to change.

QUALIFICATION CERTIFICATION

To achieve the full qualification, PIABC Level 3 Diploma in Polymer Processing (QN: 603/2403/X), learners need to successfully gain the 85 credits by completing the six mandatory units, plus two optional units from 1 of the 5 pathways.

REGULATORY INFORMATION

Countries offered in:	England
Subject/sector area:	4.2 Manufacturing Technologies
Qualification operational start date:	18 September 2017
Qualification review date:	31 December 2021
Applicable age ranges (years):	16-18, 18+

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 for the purposes of preparing learners for assessment.

FURTHER INFORMATION

Please contact PIABC Limited directly at:
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