



PIABC LEVEL 5 DIPLOMA IN RUBBER SCIENCE AND TECHNOLOGY

Qualification Number: 603/3095/1

Qualification Specification

Updated: 15 January 2020

PURPOSE

PIABC Level 5 Diploma in Rubber Science and Technology is a nationally recognised qualification. Its main purpose is to provide learners with a broad knowledge and understanding of elastomers and additives used in the rubber industry and their applications.

The qualification is specifically designed for people in the rubber and elastomeric industries or materials engineers who need an understanding of elastomers and additives used in the rubber industry and their applications. The qualification covers a range of elastomeric materials and their science. It looks at the physical properties of these materials and how they influence material choice, design, processing methods and performance. The qualification will develop understanding of the relationship between structure, properties and applications. It will also develop your understanding related to the selection and mixing operations of rubber compounds and the manufacture and testing of engineering rubber components.

GENERAL OUTCOMES

The general objectives of the PIABC Level 5 Diploma in Rubber Science and Technology are to:

1. Provide those employed, or who wish to be employed in the rubber and elastomeric industries or related industries with the skills, knowledge and understanding to underpin and enhance job experience.
2. Provide learners with a portable qualification to enable job movement throughout the industry.
3. Provide learners with a means of progression to higher level qualifications, e.g. MSc, MBA.
4. Provide employers throughout the rubber and elastomeric industries or related industries with a firm basis for judging suitability of learners.
5. Raise the status of those employed in the rubber and elastomeric industries.

TARGET GROUP

This Level 5 qualification is appropriate for those learners wanting to enhance their employment and progression opportunities in the rubber and elastomeric industries or related industries.

There are thus two broad target groups:

1. People currently employed in parts of the rubber and elastomeric industries or a materials engineer who want to broaden their knowledge and understanding and take on greater levels of responsibility. Due to the diverse nature of the rubber and related industries, it is difficult to define this target group in terms of precise job functions. Typically, learners are likely to be working at the practitioner or manager level.
2. People who are not currently employed in the industry, who may be following courses in associate subject areas will find that this programme broadens the scope of their studies.

ENTRY REQUIREMENTS

As a guide for entry onto programmes, learners will normally be expected to have a minimum attainment of:

- 1 GCE A level and 5 GCSEs at grade A – C, including one science subject, plus the key skills of numeracy, communication and information technology.

Alternatively, learners should be able to clearly demonstrate, for example through experience in the rubber and elastomeric industries or a materials engineer, which they are likely to succeed in the programme of study.

STAFFING

It is expected that staff involved with the delivery of the course will be appropriately qualified and/or experienced in rubber and elastomeric industries. The PIABC Limited approval process requires prospective centres to provide details of the staff involved in delivery and assessment including their qualifications and relevant training/employment experience, plus staff development arrangements. Whilst these details are passed on to the external moderator appointed by PIABC Limited, it is the centre's responsibility to ensure tutors' qualifications are both bona fide and appropriate to the level of the qualification.

QUALITY ASSURANCE

PIABC Limited requires that each centre has a quality assurance and enhancement procedure in respect of the programme, and a means of monitoring its implementation.

There should be a team that is responsible for preparing an annual self-assessment of the programme and for monitoring the improvement measures resulting from this.

This self-assessment process should use evidence from different sources including:

- Learner self-evaluation
- The views of external individuals and organisations, for example those companies sending learners
- Staff working on the award

In addition, it is also expected that there will be an internal moderation procedure to ensure standardisation of unit delivery. This will include the following elements:

- Classroom observation
- Peer review of award materials
- Moderation of any internally assessed elements

There should be a named and appropriately qualified individual (Centre Co-ordinator) who has the necessary authority, with whom the awarding body can liaise directly on all matters of management, administration and quality assurance.

EXTERNAL MODERATION

PIABC Limited will appoint external centre monitors to visit centres in order to ensure the maintenance of standards of quality. The role of the centre monitor includes:

- Liaison between the centre and PIABC Limited to ensure standardisation in terms of the quality of award delivery
- Providing advice and support for the centre in understanding and implementing the requirements of the units and the PIABC Limited

Centre monitors will carry out at least one visit to each centre per year and will formally report on the outcome of this visit to the centre and PIABC Limited. All items contained in the report will be discussed with the centre during the visit, and any action that the centre needs to take will be agreed at that stage. Any visits in addition to the annual visit may incur an additional fee.

PROGRAMME ORGANISATION

PIABC Level 5 Diploma in Rubber Science and Technology has been designed to allow the learner to develop the understanding and skills of rubber science and technology.

To achieve the qualification, learners need to successfully gain the 37 credits.

It is expected that courses leading to the qualification will take a minimum of 185 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 370 hours of total qualification time for satisfactory completion for an average learner.

The organisation of the award 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 units is a possibility and may provide the most straightforward way of determining completion of individual units, it may be that some degree of integration of units will occur, or that other methods of delivery are more appropriate to meet the needs of learners. It should be noted however that each unit will be individually 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 packaging.

GUIDANCE ON LEARNING AND TEACHING STRATEGY, METHODS AND ASSESSMENT

Rubber science and 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. Two factors which will help in this regard are:

1. The use of lecturers with direct experience in the rubber and elastomeric industries are likely to offer the most appropriate level of practical knowledge. 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. Factory visits should be undertaken where possible to make the link between theoretical principles and practical applications. Familiarity with different rubber and elastomeric industry settings will be assumed in elements of the qualification's assessment. DVD illustrations of processes should 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 rubber manufacture and use. Lecturers should be encouraged to use this material, always making sure due acknowledgment is given to the source.

Whilst all units are designed to be "stand alone" some items appear as common themes across more than one unit. This should be recognised by tutors and links made in those cases where learners are working across more than a single unit.

Those learners employed in the rubber and related industries, will come to the course with varying levels of existing knowledge and/or practical experience of some parts of the syllabus. Lecturers should utilise this, through group work and other structured interactive activities, thus encouraging the sharing of knowledge which has the potential to lead to a high level of understanding.

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

QUALIFICATION DESCRIPTION

This qualification follows the PIABC Limited 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

PIABC Diploma in Rubber Science and Technology has been developed as a Level 5 qualification.

Learners require the skills and knowledge to show competence in applying technical, aesthetic and commercial principles to a range of complex and varying tasks.

Learners are required to analyse problems, determine root cause, and recommend and implement effective solutions, with a substantial degree of personal responsibility and accountability.

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

Level 5 Descriptor

Summary

There is a knowledge descriptor and a skills descriptor for each level within the framework. The descriptors apply to all the vocational qualifications Ofqual regulate and so many of the descriptors have an “and/or” construction to indicate their applicability to the knowledge and skills associated with the study of a subject or in preparation for a job or role.

The descriptors set out the generic knowledge and skills associated with the typical holder of a qualification at that level. 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 practical, theoretical or technological knowledge and understanding of a subject or field of work to find ways forward in broadly defined, complex contexts.
- Can analyse, interpret and evaluate relevant information, concepts and ideas.
- Is aware of the nature and scope of the area of study or work.
- Understands different perspectives, approaches or schools of thought and the reasoning behind them.

Skills descriptor (the holder can...)

- Determine, adapt and use appropriate methods, cognitive and practical skills to address broadly defined, complex problems.
- Use relevant research or development to inform actions.
- Evaluate actions, methods and results.

Source: Qualification and Component Levels - Requirements and Guidance for All Awarding Organisations and All Qualifications. Ofqual. 2015.

QUALIFICATION STRUCTURE

In designing the diploma, the unit design of each unit has an informative title, a level, a credit value, learning outcomes and assessment criteria has been applied. The assessment process is based on those learning outcomes and assessment criteria. The learning and teaching strategy must be designed so that learners have the opportunity to meet the learning outcomes in an effective manner by demonstrating that they can achieve the assessment criteria.

The diploma is divided into three mandatory units as shown below:

Ofqual Unit Reference	Unit Ref.	Unit Title	Guided Learning Hours	Total Unit Hours	Credits	Level
H/616/9474	R01	Understanding rubber mix design and processing	70	140	14	5
M/616/9475	R02	Understanding general purpose elastomers and additives	70	140	14	5
T/616/9476	R03	Understanding high performance elastomers and rubber compounding	45	90	9	5
Total Guided Learning Hours (GLH) Time			185			
Total Qualification Time (TQT)				370		
Total Qualification Credits					37	
Qualification Level						5

ASSESSMENT

PIABC Level 5 Diploma in Rubber Science and Technology will be assessed by completing assignments, projects and examinations which are set, internally assessed and internally quality assured by the centre. The assessments should be designed for a holistic approach to the assessment and confirm learners have a full contextualised understanding of all the assessment criteria. Centre assessments and their management will be externally quality assured by PIABC Limited.

The grading structure for the units is not subject to change.

QUALIFICATION CERTIFICATION

The full award is available at *Pass*, *Merit* or *Distinction* to learners who successfully complete all the units.

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

REGULATORY INFORMATION

Countries offered in:	England
Subject/sector area:	4.2 Manufacturing Technologies
Qualification operational start date:	19 March 2018
Qualification review date:	19 March 2021
Applicable age ranges (years):	19+

FURTHER INFORMATION

Please contact PIABC Limited directly at:

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