PIABC Level 2 Award in Tooling Technology Materials and Processes

Qualification Number: 600/8019/X

Qualification Specification

Updated: 21 August 2017

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EXECUTIVE SUMMARY

The PIABC Level 2 Award in Tooling Technology Materials and Processes is a nationally recognised qualification comprising of 2 units. It provides learners with basic knowledge of the different types and characteristics of materials used for tooling, their suitability for use, cutter properties, coolants and lubricants. Those achieving the Award will be able to apply this knowledge to choosing appropriate sharpening and servicing methods for tooling as used in the wood/timber industries in particular. A second unit ensures learners are aware of the major features of the wood industry including Chain of Custody.

The qualification is intended for newcomers to the industry and is designed to provide trade specific knowledge appropriate for the day to day activities in a cutter sharpening/ servicing role. By the end of the qualification, the learner should be familiar with the main materials and cutter properties.

Programmes leading to the qualification 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 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 business world.

AIM

PIABC Level 2 Award in Tooling Technology Materials and Processes is intended as a short course either for those wishing to pursue a career in the timber or related industries, or for those who are already in the industry and who wish to extend their knowledge and expertise. The qualification can also provide a very useful complementary qualification for apprenticeship programmes or the preparation to progress to higher levels of study.

The qualification is designed to provide basic trade specific knowledge appropriate for the day to day activities in a tooling sharpening/service role – either in a tool room or dedicated centre.

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 timber sector and other related areas of the timber industry.

2. Provide *employers* with an open and transparent basis for judging the suitability of candidates for employment and promotion.

TARGET GROUP

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

There are four broad target groups:

1. People recently employed in the industry who want to gain 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 timber and related industries, it is difficult to define the target groups in terms of precise job functions. Typically, learners are likely to be working as operatives in any of the following disciplines:

Job role	**Type of company**
Servicing tooling	Timber products manufacture
Servicing tooling	Sawmill

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 timber industry to a position where they can assume some level of responsibility or gain further qualifications for example, an apprenticeship.

QUALIFICATION STRUCTURE

To achieve the qualification, learners need to successfully gain 10 credits.

Unit	**Title**	**Level**	**Credit Value**
M/504/6331	Tooling technology materials and processes	2	7
A/505/0494	Understanding the wood and timber industry	2	3

This qualification is also the Technical Certificate for the Wood and Timber Processing Apprenticeship, England and Wales

QUALIFICATION LEVEL

The PIABC Level 2 Award in Tooling Technology Materials and Processes is a Level 2 qualification.

This qualification requires the learner to understand the materials, and how these combine in practical operations. 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.

Level 2 Descriptor

Summary

Achievement at Level 2 reflects the ability to select and use relevant knowledge, ideas, skills and procedures to complete well-defined tasks and address straightforward problems. It includes taking responsibility for completing tasks and procedures and exercising autonomy and judgement subject to overall direction or guidance.

Knowledge and understanding

- Use understanding of facts, procedures and ideas to complete well-defined tasks and address straightforward problems.
- Interpret relevant information and ideas.
- Be aware of the types of information that are relevant to the area of study or work

Application and action

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

Autonomy and accountability

- Take responsibility for completing tasks and procedures
- Exercise autonomy and judgement subject to overall direction or guidance

Source: Level descriptors for positioning units in the Qualifications and Credit Framework tests and trials. Version 2: 2006. QCA.

PROGRAMME ORGANISATION

Programmes leading to the qualification 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 moderators to ensure the effective operation of these processes and the maintenance of standards of quality.

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.

This is a two unit qualification and it is anticipated that the qualification will require 100 learning hours for satisfactory completion. Delivery methods are not prescribed and workbooks, practical investigations, and workplace learning may be used to best suit the learner.

Centres are encouraged to choose the most suitable curriculum model for their candidates. 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 learner. 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 candidates. 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

Metal technology is a practical subject, based on theoretical principles. As far as possible, it is important that subject 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 tooling 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 subject matter.

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 associated tooling use. Learners should be encouraged to research this material, always making sure due acknowledgment is given to the source.

3. Practical experience of workplace operations.

Those learners employed in the timber and related industries, will come to the subject with varying levels of existing knowledge and/or practical experience of some parts of the syllabus. This should be utilised in preparing for assessment. 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 follows the QCF principles for designing units and qualifications and contains the features listed as follows:

- Unit QCF reference number, title, level, guided learning hours, credit value, 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 a Unit, learners must meet all the learning outcomes by showing that they have achieved all the assessment criteria.

UNIT CONTENT - LEARNING OUTCOMES & ASSESSMENT CRITERIA

TOOLING TECHNOLOGY MATERIALS AND PROCESSES

Unit Accreditation No: M/504/6331
Unit Level: 2

Guided Learning Hours: 66
Unit Credits: 7

Learning Outcomes and Assessment Criteria

Learning Outcome – The learner will:	**Assessment Criterion - The learner can:**
1. Understand the characteristics of tooling materials	1.1 Describe the properties of materials used in tooling technologies, including steels, tungsten carbide, Polycrystalline Diamond (PCD), brazing materials and coatings
	1.2 Explain the uses of materials used in tooling technologies, including steels, tungsten carbide, Polycrystalline Diamond (PCD), brazing materials and coatings
	1.3 Describe impurities and defects found in metals used in tooling technologies
	1.4 Describe the chemical composition and performance measurement (hardness and tension) of steel
2. Understand annealing and tempering processes	2.1 Explain the annealing process and its application to tooling technology
	2.2 Explain the tempering process and its application to tooling technology
3. Understand the suitability of materials	3.1 Describe the suitability of materials used in tooling technologies, including steels, tungsten carbide, Polycrystalline Diamond (PCD), brazing materials and coatings
4. Understand the cost of materials	4.1 Give relative cost of materials used in tooling technologies, including steels, tungsten carbide, Polycrystalline Diamond (PCD), brazing materials and coatings
	4.2 Compare the relative cost of metals used in tooling technologies, in terms of efficiency, strength
5. Understand the regulations that apply to tooling technology	5.1 Explain the PUWER and other regulations applied to tooling technologies
6. Understand cutter properties	6.1 Describe the cutter properties, in relation to the

Learning Outcome – The learner will:	Assessment Criterion - The learner can:	
		following for different processes and materials: • Cutting angles • Required finishes • Cutter ratios and feed speeds
	6.2	Illustrate the cutter properties, in relation to cutting angles for different processes and materials
	6.3	Describe and illustrate cutter defects
7. Understand lubricants and coolants	7.1	Describe lubricants and coolants used in tooling technologies
	7.2	Explain regulations that apply to lubricants and coolants used in tooling technologies
8. Understand templates	8.1	Explain importance of use of templates and manufacture process
9. Understand wood machining processes and techniques for identified tooling	9.1	Explain the requirements of wood machining processes and techniques in relation to tooling and product finish requirements.

UNDERSTANDING THE WOOD AND TIMBER INDUSTRY

Unit Accreditation No: A/505/0494
Unit Level: 2

Guided Learning Hours: 22
Unit Credits: 3

Learning Outcomes and Assessment Criteria

Learning Outcome – The learner will:	**Assessment Criterion - The learner can:**
1. Know the wood and timber industry	1.1 Describe the wood and timber industry main sectors
	1.2 Explain where your organisation sits within the sector
2. Understand your organisation	2.1 List the main products and services provided by your organisation
	2.2 Describe the main uses of the products and services provided
	2.3 State the common problems associated with the provision of the products and services your organisation provides
3 Understand the Chain of Custody	3.1 Describe the purpose of Chain of Custody and explain why this is important
	3.2 List who needs Chain of Custody Certificates
	3.3 List the different Chain of Custody Schemes and explain the differences between the standards
4 Know the employment opportunities available within the wood and timber industries	4.1 Describe the employment opportunities available within the wood and timber industry
	4.2 Describe the knowledge, skills and attributes required to work in the industry
	4.3 List the professional institutes, development associations and technical associations related to your job role

ASSESSMENT

This unit is assessed by a portfolio of evidence against all the learning outcomes.

QUALIFICATION CERTIFICATION

All learning outcomes and assessment criteria are to be achieved. Whilst there is no grading to this qualification (pass, credit, etc.), the training delivery and feedback should promote the notion of continued improvement and craftsmanship.

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.

SUGGESTED SOURCE MATERIAL

A comprehensive list of source materials and references that may be used to support learning for qualification is available from the PIABC web site (www.piabc.org.uk).