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# EQF-Based Model VET Curriculum for Plastics Production Line Conductor

VOCATIONAL EDUCATION AND TRAINING PROGRAM

Deliverable D2.1

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## VERSION RECORD

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V1	20/05/2019	VPM	Document created (first draft) and shared with partners
V2	06/06/2019	LINPRA	Part of partners comments adapted
V3	02/08/2019	ISPA	Last correction
V4	07/10/2019	ISPA	Decision (October 2 <sup>nd</sup> 2019 Steering Committee) of merging of the 2 units dedicated to composites manufacturing
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## EXECUTIVE SUMMARY

As it is described in the document “Detailed project description” for the UPSKILL project, this document is part of the expected results of the work package 2 (Task 2.1. of WP2) of which the main aim is to design EQF based model VET curriculum for plastics machine operators’ professional profile and to adapt it to national requirements and industry environment.

The present curriculum provides adequate information about the modules and studies included in the qualification, assessment and arrangements concerning completion of the studies.

This VET curriculum states:

- objectives set for the qualification and study program or specialisation,
- qualification structure,
- module-specific skills requirements or objectives,
- targets of assessment and assessment criteria for core subjects,
- ways of demonstrating vocational skills in the case of vocational qualification modules.

It is based on the outcome of work package 1 (“Qualifications & curricula research”) which stipulates recommendations for the development process for a common curriculum designed for VET level European plastic product processing workers.

The present VET program content meets the requirements of ECVET and facilitate recognition and certification of the learning outcomes by implementing ECVET principles, as well as the quality assurance framework in VET.

Therefore, the development of innovative VET curriculum within the project will help to achieve an appropriate match between skills and labor market needs in the plastics industry.

The curriculum covers EQF defined competencies emphasising the necessary knowledge and the technical, organisational and relational skills needed for plastics production line conductor’s position. The program structured in training units. Its contents take into account ECVET based methodology for evaluation and certification.

The VET curriculum defines the modules to be included in qualification and any possible specialisations (depending on production processes). made up of different units, the qualification contents, the vocational skills required in each unit, the guidelines for assessment (targets and criteria of assessment) as well as ways of demonstrating vocational competence.

The VET program includes the following units: Basic and common skills on manufacturing of plastic products; Special skills on injection moulding/ blow moulding/ pipe-profile-sheet-film extrusion/ thermoforming/ manufacturing of composite plastic/ manufacturing of rubber compounds; Use of digital technologies and robotics; Green skills (circular economy); Lean manufacturing; Entrepreneurial skills; Quality, health, safety and environment at work.

This EQF-based modular VET curriculum will be flexible to apply for IVET and CVET and for incorporating in WBL system.

Finally, this document constitutes the working base to produce 3 translated versions into the 3 national languages of the partners ( Task 2.1. of WP2) and aligned to each country's legal framework and industrial environment.

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## OVERVIEW OF THE DELIVERABLE

WP:	2
Task:	2.1 To design a model modular VET programme including WBL plan
Title:	EQF-Based Model VET Curriculum for Plastics Production Line Conductor

This document is structured in 3 main sections.

The first one describes the specifications of the plastics production line conductor qualification such as elaborated by the Upskill partners. It locates it in each partner's national educational system and in the EQF levels table. After defining and classifying different categories of skills, it establishes the qualification framework of the plastics production line conductor. An ECVET table presents the dispatching of European credit within the framework with a system of potential options for the specific technical themes. This section concludes on a very important element: the table of correspondence between the "competencies" such as identified in the recommendations of the WP1 "QUALIFICATIONS CURRICULA RESEARCH REPORTS" and the "units" constituting the qualification framework.

The different units of the qualification framework are detailed in the second section of the document: the "training curriculum". The units are classified in 3 categories: Units referring to the basic competencies (involving cross-cutting skills), units referring to common competencies (involving peripheral technical skills) and units referring to core competencies (involving specific high level technical skills). Each unit is presented in 4 sections:

1. a description of the unit
2. the performance criteria related to the unit
3. the recommended content required to deliver results in competency.
4. a table stipulating in a precise manner the critical aspects of competency, the underpinning knowledge, technical, organisational and relational skills, the resources implications, the method and context of assessment

The third part of the document details the assessment scheme. In this part, we draw the attention of the reader to the fact that this assessment scheme has been largely inspired by the French assessment process defined in the "Technicien de production en plasturgie" certification repository. This can only be seen as an example since the certification regulation may vary from one partner's country to the other. As indicated in the objectives of the Upskill project, this certification relies mainly on competency demonstrations in front of a jury composed of professionals in activity.



## LIST OF ABBREVIATIONS AND ACRONYMS

WP	Work Package
RNCP	National Register of vocational certifications (France)
VET	Vocational education and training which aims to equip people with knowledge, know-how, skills and/or competencies required in particular occupations or more broadly on the labour market. Source: adapted from European Training Foundation, 1997.
EQF	Reference tool for describing and comparing qualification levels in qualifications systems developed at national, international or sectoral levels. <i>Comment:</i> the EQF's main components are a set of eight reference levels described in terms of learning outcomes (a combination of knowledge, skills and/or competencies) and mechanisms and principles for voluntary cooperation. The eight levels cover the entire span of qualifications from those recognising basic knowledge, skills and competencies, to those awarded at the highest level of academic, professional and vocational education and training. EQF is a translation device for qualification systems. Source: based on European Parliament and Council of the European Union, 2008.
IVET	Initial vocational and education training. General or vocational education and training carried out in the initial education system, usually before entering working life. Comments: 1. some training undertaken after entry into working life may be considered as initial training (such as retraining); 2. initial education and training can be carried out at any level in general or vocational education (full-time school-based or alternance training) or apprenticeship pathways. Source: Cedefop, 2008.
CVET	Continuing Education and Training. Education or training after initial education and training – or after entry into working life aimed at helping individuals to improve or update their knowledge and/or skills, acquire new skills for a career move or retraining, continue their personal or professional development. Continuing education and training is part of lifelong learning and may encompass any kind of education (general, specialised or vocational, formal or non-formal, etc.). It is crucial for the employability of individuals.
ECVET	The European Credit System for Vocational Education and Training. It is a technical framework which supports the transfer, recognition and accumulation of learning outcomes. ECVET provides a set of principles and tools that facilitate the process of learner recognition, with a view to achieving a qualification. Source: Erasmus plus, UK National agency.
WBL	Work Based Learning
QHSE	Quality Health Safety Environment
ECTS	European Credits Transfer System
ICT	Information and Communication Technology
TLV	Threshold Limit Values
OHS	Occupational Health and Safety
PPE	Personal Protective Equipment
IoT	Internet of Things

## 1. PLASTICS PRODUCTION LINE CONDUCTOR QUALIFICATION

The main objective of the training program is to properly prepare machine conductors for plastic injection moulding, blow moulding, pipe and profile extrusion, thermoforming, manufacturing of plastic composite and manufacturing of rubber compounds. The conductors should be capable to work as part of production in order to prepare equipment, set the right parameters, control the process, react to unforeseen problems in the process and to solve them in a real work environment.

The qualification consists of different competencies that include preparing moulds for composites production, setting parameters for production, operating injection moulding equipment, blowing moulding equipment, plastic extrusion equipment, manufacturing plastic composite equipment and rubber compounds equipment. It also includes competency to monitor process operations and finish products and components.

During the training, students are familiarised with the company's activities and specificity of the production, process technology, work instructions. Under this curriculum, students will also learn about quality, health, safety and environmental rules and regulations at work, Green skills, Lean manufacturing, Entrepreneurial skills. The student must comply with workplace practices and occupational safety requirements relevant to manufacturing. As it is indicated in the document "Detailed project description", this curriculum emphasises a Work Based Learning process (WBL) as it is a fundamental aspect of vocational training. This is why the competency evaluation is at the heart of the assessment system that is described in this document.

The students, after the full theoretical training course and after completing the tasks provided for the practical training program, take the final qualification exam. The assessment process that is fully described in the "Assessment" section of this document. However, depending on the national regulation of each partner's country, it could be adapted. After successful qualification exam the student is awarded a diploma certifying the qualification of a plastic production line conductor.

The minimum and necessary education level to enter this program is lower secondary education plus a basic vocational program. Depending on the country of each partner, this level corresponds to:

- First 2-years "vocational program" ( 16 years old) in Belgium
- "Lower secondary program" (15 years old) in France
- "Basic education" (16 years old) in Finland
- "Lower secondary education" (16 years old) in Lithuania

The duration of the learning program is variable according to the specificities of each partner's state regulation. However it is based on a 1 year session, on a full-time or a part-time basis. The program includes practical training in the form of a company internship for the full-time basis and a part-time

work contract with a company for the part-time basis. The WBL principle is then preserved since, in each case, the learning process is activated in the training center and in the company.

Successful training path provides 60 ECVET credits. Student weekly workload – 40 academic hours. Practical training consists of around 70 percent training time. For the integrity of learning, theoretical training is integrated with practical training.

**The level IV of Qualification level by EQF (European Qualifications Framework) is targeted through this program:**

- **Knowledge:** Factual and theoretical knowledge in broad contexts within a field of work or study
- **Skills:** A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study
- **Responsibility and autonomy:** Exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change; supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities

**The program includes these supplementary competencies in addition to the core subjects:**

- **Digital skills** for the digital economy - the ICT contribution to the plastics factories of the future will improve the efficiency, adaptability and sustainability of plastics manufacturing systems.
- Innovative approach to developing **transversal skills** (ability to think critically, planning and organisation, problem solving and team-working skills): Vocational Education And Training program will include a module on lean manufacturing that will provide tools and processes to eliminate waste from the plastics manufacturing process resulting in improved efficiency, effectiveness, and profitability. Lean aims to shorten the time of order execution, reduce costs and improve work safety and quality.
- **Green skills** - developing specific skills required to move ahead in the circular economy, analysing plastics value chain, resource and energy efficiency, "greening" manufacturing, products, consumption and end-of-life, resource management within the circular economy.

## 1.1. QUALIFICATION FRAMEWORK

The Qualification consists of the following units of competency:

### 1. BASIC COMPETENCIES<sup>1</sup>

- 1.1. Participating in workplace communication
- 1.2. Contributing to team work

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<sup>1</sup> The competencies of the basic modules can be acquired by integrating them into the core modules

- 1.3. Applying entrepreneurial skill at the workplace
- 1.4. Applying green skills at the workplace
- 1.5. Applying Lean manufacturing principles at the workplace
- 1.6. Applying quality, health, safety and environmental procedures
- 1.7. Diagnosing and helping solve a dysfunction on a plastic production line
- 1.8. Monitoring, checking, sorting, recording around the process

## **2. COMMON COMPETENCIES**

- 2.1. Reading, interpreting and applying engineering drawings
- 2.2. Conducting a digitally operated system
- 2.3. Knowing main characteristics of plastic materials

## **3. CORE COMPETENCIES**

- 3.1. Operating equipment for manufacturing of plastic composite
- 3.2. Operating injection moulding equipment
- 3.3. Operating blow moulding equipment
- 3.4. Operating plastic extrusion equipment
- 3.5. Operating thermoforming equipment
- 3.6. Operating equipment for manufacturing of rubber compounds
- 3.7. Finishing products and components

### Layout of module credits

N°	COMPETENCIES	UNIT	MODULES		ECVET CREDITS
1	COMMON COMPETENCIES	9	READING, INTERPRETING AND APPLYING ENGINEERING DRAWINGS		4
		10	CONDUCTING A DIGITALLY OPERATED SYSTEM		4
		11	KNOWING MAIN CHARACTERISTICS OF PLASTIC MATERIALS		4
2	CORE COMPETENCIES	12	Optional (3 out of 6)	OPERATING EQUIPMENT FOR MANUFACTURING OF PLASTIC COMPOSITES	15
		13		OPERATING INJECTION MOULDING EQUIPMENT	15
		14		OPERATING BLOW MOULDING EQUIPMENT	15
		15		OPERATING PLASTIC EXTRUSION EQUIPMENT	15
		16		OPERATING THERMOFORMING EQUIPMENT	15
		17		OPERATING EQUIPMENT FOR MANUFACTURING OF RUBBER COMPOUNDS	15
		18	FINISHING PRODUCTS AND COMPONENTS		3
<b>TOTAL ECVET CREDITS</b>					<b>60</b>

## 1.2. TABLE OF CORRESPONDENCE: COMPETENCIES (SEE DOCUMENT “Qualifications curricula research reports”) – UNITS

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10	Unit 11	Unit 12	Unit 13	Unit 14	Unit 15	Unit 16	Unit 17	Unit 18
 <p><b>UNITS</b></p> <p><b>COMPETENCIES</b></p>	Participating in workplace communication	Contributing to team work	Applying entrepreneurial ing skills at the workplace	Applying green skills at the workplace	Applying Lean manufacturing principles at the workplace	Applying quality, health, safety and environmental procedures	Diagnosing and helping solve a dysfunction on a plastic production line	Monitoring, checking, sorting, recording around the process	Reading, Interpreting and Applying Engineering	Conducting a digitally operated system	Knowing main characteristics of plastic materials	Operating equipment for manufacturing of plastic composites	Operating injection moulding equipment	Operating blow moulding equipment	Operating plastic extrusion equipment	Operating thermoforming equipment	Operating equipment for manufacturing of rubber compounds	Finishing products and components
Performing general plastic processing skills																		
Performing general tasks of plastic processing operator according to the listed processing technologies																		
Performing general plastic injection moulding operator occupation tasks																		
Identifying companies that want to integrate circular economy concepts (5 steps)																		
Creating product life-cycles																		
Knowing how to develop and implement sustainable product and service ideas																		

Applying the principles of quality management systems																		
Evaluating production efficiency, profitability indicators																		
Performing general tasks of the plastic processing operator according to the principles of Lean applied to the above-mentioned plastic processing technologies																		
Explaining the areas of business creation, organisation, specifics and legal regulation, evaluating differences and understanding the importance of theory for practical business organisation																		
Responding to questions, illustrating and interpreting them in an unusual way, developing creative thinking, offering innovative ways to																		

solve problems, to communicate and collaborate																		
Becoming at your own level, an actor in your company's development																		
Getting to know yourself, your way of life and career, developing the attitude to continual improvement, to achieve goals																		
Performing plastic product manufacturing safely (internal need for safe working)																		
Assessing the conditions of the workplace and the state of the work environment in terms of existing and potential occupational risk factors, applying protective measures against their effects																		



## **2. TRAINING CURRICULUM**

### **2.1. UNITS RELATED TO BASIC COMPETENCIES**

#### **2.1.1.1. Unit 1 - PARTICIPATING IN WORKPLACE COMMUNICATION**

**Description:** This unit covers the knowledge, skills and attitudes required to gather, interpret and convey information in response to workplace culture requirements

#### **Performance criteria**

##### **1 Obtain and convey workplace information**

- 1.1 Specific and relevant information is accessed from appropriate sources
- 1.2 Effective questioning, active listening and speaking skills are used to gather and convey information
- 1.3 Appropriate medium is used to transfer information and ideas
- 1.4 Appropriate non- verbal communication is used
- 1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed
- 1.6 Defined workplace procedures for the location and storage of information are used
- 1.7 Personal interaction is carried out clearly and concisely

##### **2 Participate in workplace meetings and discussions**

- 2.1 Team meetings are attended on time
- 2.2 Own opinions are clearly expressed and those of others are listened to without interruption
- 2.3 Meeting inputs are consistent with the meeting purpose and established protocols
- 2.4 Workplace interactions are conducted in a courteous manner
- 2.5 Questions about simple routine workplace procedures and matters concerning working conditions of employment are asked and responded to
- 2.6 Meetings outcomes are interpreted and implemented

##### **3 Complete relevant work related documents**

- 3.1 Range of forms relating to conditions of employment are completed accurately and legibly
- 3.2 Workplace data are recorded on standard workplace forms and documents
- 3.3 Basic mathematical processes are used for routine calculations
- 3.4 Errors in recording information on forms/ documents are identified and properly acted upon
- 3.5 Reporting requirements to supervisor are completed

**Recommended content required to deliver results in competency:**

<b><i>Critical aspects of competency</i></b>		<b><i>Comments</i></b>
1	Prepare written communication following Standard format of the organisation	
2	Access information on using communication equipment	
3	Make use of relevant terms as an aid to transfer information on effectively	
4	Convey information on effectively adopting the formal or informal communication	
<b><i>Underpinning knowledge</i></b>		
1	Effective communication	
2	Different modes of communication	
3	Written communication	
4	Organisational policies	
5	Communication procedures and systems	
6	Technology relevant to the enterprise and the individual's work responsibilities	
<b><i>Underpinning technical skills</i></b>		
1	Following simple spoken language	
2	Performing routine workplace duties following simple written notices	
4	Completing work related documents	
5	Estimating, calculating and recording routine workplace measures	
6	Performing the four fundamental operations (addition, subtraction, division and multiplication)	
<b><i>Underpinning organisational skills</i></b>		
8	Gathering and providing information in response to workplace requirements	
<b><i>Underpinning relational skills</i></b>		
3	Taking part to workplace meetings and discussions	
7	Being able to relate to people of diverse social backgrounds in the workplace	
<b><i>Resource implications</i></b>		
1	Personal computer with Internet and Multimedia	
2	Writing materials	
3	Telephone	

<b>Method of assessment</b>		
1	Direct observation	
2	Oral interview and written test	
<b>Context of assessment</b>		
1	Competency may be assessed individually in the actual workplace or through accredited institution	

### 2.1.1.2. Unit 2 - CONTRIBUTING TO TEAMWORK

**Description:** This unit covers the skills, knowledge and attitudes to identify role and responsibility as a member of a team.

#### Performance criteria

##### 1 Describe the team's role and scope

- 1.1 The role and objective of the team is identified from available sources of information
- 1.2 Team parameters, reporting relationships and responsibilities are identified from team discussions and appropriate external sources

##### 2 Identify own role and responsibility within the team

- 2.1 Individual role and responsibilities within the team environment are identified
- 2.2 Roles and responsibility of other team members are identified and recognised
- 2.3 Reporting relationships within team and external to team are identified

##### 3 Work as a team member

- 3.1 Effective and appropriate forms of communications used and interactions undertaken with team members who contribute to known team activities and objectives
- 3.2 Effective and appropriate contributions made to complement team activities and objectives, based on individual skills and competencies and workplace context
- 3.3 Observed protocols in reporting using standard operating procedures
- 3.4 Contribute to the development of team work plans based on an understanding of team's role and objectives and individual competencies of the members.

#### Recommended content required to deliver results in competency:

<b>Critical aspects of competency</b>		<i>Comments</i>
1	Operate in a team to complete workplace activity	

2	Work effectively with others	
3	Convey information in written or oral form	
4	Select and use appropriate workplace language	
5	Follow designated work plan for the job	
6	Report outcomes	
<b><i>Underpinning knowledge</i></b>		
1	Communication process	
2	Team structure	
3	Team roles	
4	Group planning and decision making	
<b><i>Underpinning technical skills</i></b>		
1	Communicating in a manner which is consistent with the workplace culture	
2	Giving instructions	
<b><i>Underpinning organisational skills</i></b>		
1	Ensuring that the proper information is available in the proper place	
<b><i>Underpinning relational skills</i></b>		
1	Working with teams in order to improve and optimise the production processes	
2	Accompanying other operators in order to follow the manufacturing program	
3	Lending technical support	
<b><i>Resource implications</i></b>		
1	Access to relevant workplace or appropriately simulated environment where assessment can take place	
2	Materials relevant to the proposed activity or tasks	
<b><i>Method of assessment</i></b>		
1	Observation of the individual member in relation to the work activities of the group	
2	Observation of simulation and or role play involving the participation of individual member to the attainment of organisational goal	
3	Case studies and scenarios as a basis for discussion of issues and strategies in teamwork	
<b><i>Context of assessment</i></b>		
1	Competency may be assessed in the workplace or in a simulated workplace setting	
2	Assessment shall be observed while task are being undertaken whether individually or in group	

### 2.1.1.3. Unit 3 – APPLYING ENTREPRENEURIAL SKILLS AT THE WORKPLACE

**Description:** This unit includes knowledge, skills and attitudes to promote career growth and progress and entrepreneurial attitude.

#### Performance criteria

##### 1 Integrate personal objectives with organisational goals

- 1.1 Personal growth and work plans are pursued towards improving the qualifications set for the profession
- 1.2 Intra- and interpersonal relationships are maintained in the course of managing oneself based on performance evaluation
- 1.3 Commitment to the organisation and its goals is demonstrated in the performance of duties

##### 2 Set and meet work priorities

- 2.1 Competing demands are prioritised to achieve personal, team and organisational goals and objectives
- 2.2 Resources are utilised efficiently and effectively to manage work priorities and commitments
- 2.3 Practices along economic use and maintenance of equipment and facilities are followed as per established procedures
- 2.4 The principles of entrepreneurial skills are applied at the work station

#### Recommended content required to deliver results in competency:

<i>Critical aspects of competency</i>		<i>Comments</i>
1	Attain job targets within key result areas	
2	Maintain intra and interpersonal relationship in the course of managing oneself based on performance evaluation	
3	Complete trainings and career opportunities which are based on the requirements of the industries	
4	Acquire and maintain licenses and/or certifications according to the requirement of the qualification	
<b><i>Underpinning knowledge</i></b>		
1	Work values and ethics	
2	Company policies	
3	Company operations, procedures and standards	

4	Basic employment including gender and diversity awareness	
5	Interpersonal skills, motivation, communication, teamwork, adaptability, planning, problem solving	
<b>Underpinning technical skills</b>		
1	Identifying company production problems and choosing the appropriate tool to increase production efficiency	
2	Evaluating estimated and real production costs, analysing other current financial ratios	
3	Evaluating the external and internal business environment	
4	Comparing and evaluating different forms of business organisation, distinguishing their advantages and disadvantages	
5	Evaluating and validating new business ideas	
<b>Underpinning organisational skills</b>		
1	Demonstrating proficient sustainability skills (economic, social and environmentally sustainable products and services)	
2	Analysing new technologies installations	
3	Becoming proactive in the company in order to contribute to its development	
4	Developing a strong sense of curiosity leading to opportunities for improvement in the manufacturing processes and the organisation	
5	Being proactive in making real contributions to innovative projects	
6	Gaining the skills to become project leader at your own level of responsibility	
7	Preparing a career portfolio	
<b>Underpinning relational skills</b>		
1	Publishing results in short meetings	
2	Bringing out the entrepreneurial skills and abilities of the group and its members	
3	Becoming a teamwork facilitator	
4	Becoming a source of proposals in the company	
<b>Resource implications</b>		
1	Workplace or assessment location	
2	Case studies/scenarios	
<b>Method of assessment</b>		
1	Portfolio Assessment	
2	Interview	
3	Simulation/Role-plays	

4	Observation	
5	Exams and Tests	
<b>Context of assessment</b>		
1	Competency may be assessed in the workplace or in a simulated workplace setting	

#### **2.1.1.4. Unit 4 – APPLYING GREEN SKILLS AT THE WORKPLACE**

**Description:** This unit includes knowledge, skills and attitudes that must be implemented around the workplace to promote and contribute to the development of a sustainable and resource-efficient industry.

#### **Performance criteria**

##### **1 Integrate personal objectives with organisational goals (Interpersonal skills)**

- 1.1 Integration into a complex organisation is demonstrated
- 1.2 Communication, participation and collective involvement are maintained in the course of managing oneself based on performance evaluation
- 1.3 Deal with interrelated and complex systemic problems, at one's own position is assumed and effective
- 1.4 Commitment to the organisation and its goals are demonstrated in the performance of duties

##### **2 Set and meet work priorities (On the job skills)**

- 2.1 Competing demands are prioritised to achieve personal, team and organisational goals and objectives
- 2.2 Resources are utilised efficiently and effectively to manage sustainability priorities and commitments
- 2.3 Principles of circular economy, recycling and sustainability are applied at the work station
- 2.4 Creativity, risk-taking, analysis, problem solving, methodological rigour and critical spirit are implemented within the limit of the position requirements and to the benefit of the organisation performance.

##### **3 Maintain professional growth and development (Personal development skills)**

- 3.1 Adaptation to a changing environment, particularly through the use of ITC, is demonstrated
- 3.2 Trainings and career opportunities are identified and applied on job requirements in a lifelong approach.
- 3.3 Recognitions are sought/received and demonstrated as proof of career advancement

## 3.4 Licenses and/or certifications relevant to job and career are obtained and renewed

**Recommended content required to deliver results in competency:**

<b><i>Critical aspects of competency</i></b>		<b><i>Comments</i></b>
1	Bring one's contribution within a complex professional organisation with efficient communication and participation	
2	Implement personal skills that are required by sustainability at the workplace	
3	Apply lifelong learning principles	
4	Implement Green Skills, the type of Green Skills demanded by Green Industry	
<b><i>Underpinning knowledge</i></b>		
1	Company operations, procedures and standards	
2	Tools and processes to eliminate waste from the plastics manufacturing process resulting in improved efficiency, effectiveness, and profitability	
3	Asking how green industrial skills can be defined and how they can help to move the products, processes, and systems developed by society towards sustainability	
4	Key elements of the Circular Economy, policy issues, life-cycle thinking, theoretical and practice approaches to implementing changes, renewable energies and energy efficiency, environmental impact and energy costs of business activity, respect for nature, shared responsibility	
<b><i>Underpinning technical skills</i></b>		
1	Implementing all the technical know-how related to the job of production line operator in plastics in compliance with the principles of sustainable development	
2	Acting with efficiency, cleanliness and rigour and in compliance with general and local regulations	
<b><i>Underpinning organisational skills</i></b>		
1	Demonstrating proficient sustainability skills (economic, social and environmentally sustainable products and services)	
2	Developing a strong sense of curiosity leading to opportunities for improvement in the manufacturing processes and the organisation in the field of green economy	
3	Being proactive and making real contributions to innovative projects, especially in the green economy	



4	Organising work and space to ensure a high level of efficiency, anticipation and coordination of tasks, including waste and waste sorting	
<b>Underpinning relational skills</b>		
1	Making proposals, in the context of the green economy in the company, at the workplace level.	
2	Being responsive, responsive and adaptable within your team	
3	Ensuring the correct transmission (on delivery or on receipt) of information and instructions around the process	
<b>Resource implications</b>		
1	Workplace or assessment location	
2	Case studies/scenarios	
<b>Method of assessment</b>		
1	Portfolio Assessment	
2	Interview	
3	Simulation/Role-plays	
4	Observation	
5	Exams and Tests	
<b>Context of assessment</b>		
1	Competency may be assessed in the workplace or in a simulated workplace setting	

### **2.1.1.5. Unit 5 – APPLYING LEAN MANUFACTURING PRINCIPLES AT THE WORKPLACE**

**Description:** This unit includes knowledge, skills and attitudes to promote and contribute to the implementation of LEAN principles and organisation at the workplace

#### **Performance criteria**

#### **1 Understand and participate to a LEAN manufacturing approach in the company**

- 1.1 The principles of LEAN manufacturing are known
- 1.2 The active participation to the company LEAN manufacturing project is effective
- 1.3 Commitment to the organisation and its goals is demonstrated in the performance of duties

## 2 Apply LEAN manufacturing principles at the workplace on a permanent and pro-active basis

- 2.1 The concept of LEAN Manufacturing is obviously applied at the work station
- 2.2 The tools of LEAN manufacturing that are implemented in the company are used efficiently at the workplace
- 2.3 Minimising the waste is a permanent concern
- 2.4 Resources are used efficiently and effectively to manage work priorities and commitments

### Recommended content required to deliver results in competency:

<b><i>Critical aspects of competency</i></b>		<b><i>Comments</i></b>
1	Understanding and participation to a LEAN manufacturing approach in the company	
2	Application of LEAN manufacturing principles at the workplace on a permanent and pro-active basis.	
<b><i>Underpinning knowledge</i></b>		
1	Origins of LEAN manufacturing	
2	The 7 sources of waste	
3	LEAN Principles	
4	LEAN tools and approach	
5	Improved efficiency, effectiveness and profitability in an injection moulding facility	
<b><i>Underpinning technical skills</i></b>		
1	Participating in the implementation of the LEAN production efficiency improvement methodology	
2	Identifying production company problems and choose the right tool to increase production efficiency at your workstation	
3	Performing general tasks of the plastic production line operator in accordance with LEAN principles	
<b><i>Underpinning organisational skills</i></b>		
1	Being proactive in the company to contribute to its development	
2	Developing a keen sense of curiosity and opportunities to improve manufacturing processes and organisation	
3	Being proactive and contribute concretely to innovative projects	
4	Developing the skills needed to become a project leader at your own level of responsibility	

<b><i>Underpinning relational skills</i></b>		
1	Helping reveal the LEAN manufacturing skills and capabilities of the group and its members	
2	Becoming a team facilitator	
3	Becoming a source of proposals in the company	
<b><i>Resource implications</i></b>		
1	Workplace or assessment location	
2	Case studies/scenarios	
<b><i>Method of assessment</i></b>		
1	Portfolio Assessment	
2	Interview	
3	Simulation/Role-plays	
4	Observation	
5	Exams and Tests	
<b><i>Context of assessment</i></b>		
1	Competency may be assessed in the workplace or in a simulated workplace setting	

### **2.1.1.6. Unit 6 - APPLYING Q.H.S.E. RULES AND PROCEDURES**

**Description:** This unit covers the outcomes required to comply with regulatory and organisational requirements for quality, health, safety and environment at work.

#### **Performance criteria**

##### **1 Identify hazards and risks**

- 1.1 Safety regulations and workplace safety and hazard control practices and procedures are clarified and explained based on organisation procedures
- 1.2 Hazards/risks in the workplace and their corresponding indicators are identified to minimise or eliminate risk to coworkers and the line conductor himself, workplace and environment in accordance with organisation procedures
- 1.3 Contingency measures during workplace accidents, fire and other emergencies are recognised and established in accordance with organisation procedures

##### **2 Evaluate hazards and risks**

- 2.1 Terms of maximum tolerable limits which when exceeded will result in harm or damage are identified based on threshold limit values (TLV)
- 2.2 Effects of the hazards are determined
- 2.3 OHS issues and/or concerns and identified safety hazards are reported to designated personnel in accordance with workplace requirements and relevant workplace OHS legislation

### 3 Control hazards and risks

- 3.1 Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace are consistently followed
- 3.2 Procedures for dealing with workplace accidents, fire and emergencies are followed in accordance with organisation OHS policies
- 3.3 Personal protective equipment (PPE) is correctly used in accordance with organisation OHS procedures and practices
- 3.4 Appropriate assistance is provided in the event of a workplace emergency in accordance with established organisation protocol

### 4 Maintain OHS awareness

- 4.1 Emergency-related drills and trainings are participated in as per established organisation guidelines and procedures
- 4.2 OHS personal records are completed and updated in accordance with workplace requirements

#### Recommended content required to deliver results in competency:

<b><i>Critical aspects of competency</i></b>		<b><i>Comments</i></b>
1	Explain clearly established workplace safety and hazard control practices and procedures	
2	Identify hazards/risks in the workplace and its corresponding indicators in accordance with company procedures	
3	Recognise contingency measures during workplace accidents, fire and other emergencies	
4	Identify terms of maximum tolerable limits based on threshold limit value	
5	Follow Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace	
6	Use Personal Protective Equipment (PPE) in accordance with company OHS procedures and practices	
7	Complete and update OHS personal records in accordance with workplace requirements	
<b><i>Underpinning knowledge</i></b>		
1	OHS procedures and practices and regulations	

2	PPE types and uses	
3	Personal hygiene practices	
4	Hazards/risks identification and control	
5	Threshold limit value	
6	OHS indicators	
7	Organisation safety and health protocol	
8	Safety consciousness	
9	Health consciousness	
10	Quality management standard ISO9000/9001	
11	Environmental management standard ISO 14000/140001	
12	Interpretation of technical data sheets (TDS) and safety data sheets (SDS)	
<b><i>Underpinning technical skills</i></b>		
1	Practicing personal and occupational hygiene	
2	Identifying the electrical, mechanical and thermal hazards on the production facility	
3	Familiarising with existing manufacture general standards	
<b><i>Underpinning organisational skills</i></b>		
1	Prioritising the hygiene, safety, environment and health elements of all actions for oneself and other persons and for the environment.	
2	Following rules towards hygiene, safety, environment and health at work applicable in the environment in question	
<b><i>Underpinning relational skills</i></b>		
1	Enforcing rules towards hygiene, safety, environment and health at work applicable in the environment in question	
<b><i>Resource implications</i></b>		
1	Workplace or assessment location	
2	OHS personal records	
3	Personal Protective Equipment	
4	Health records	
<b><i>Method of assessment</i></b>		
1	Portfolio Assessment	
2	Interview	
3	Case Study/Situation	
<b><i>Context of assessment</i></b>		
1	Competency may be assessed in the workplace or in a simulated workplace	

	setting	
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### **2.1.1.7. Unit 7 - DIAGNOSING AND HELPING SOLVE A DYSFUNCTION ON A PLASTIC PRODUCTION LINE**

**Description:** From the alerts noticed on the installation, from an oral request of an operator of production and with the help of the technical information of the installation, the manufacturing file, the history of production and known problems, react according to the alarm of the installation, configure the installation for the intervention, diagnose the origin of the dysfunction, estimate its incidence over the delivery deadline, repair the installation if the curative operation is short and simple, or appeal to the maintenance department and help it in its task, in order to pursue the production.

Suggest and argue, if necessary and in dialogue with the quality department and one's manager, the starting up and the functioning in degraded mode of the production line.

Fill in the documents of production monitoring. Report the intervention to the manager.

#### **Performance criteria**

##### **1 Actual causes are identified and analysed.**

- 1.1 HSE modus operandi, procedures and rules are applied and followed.
- 1.2 Technical manufacturing documents are analysed and exploited.
- 1.3 The failing function, on the machine, the tools or the equipment, is identified with method.

##### **2 The proposed solutions are realistic and relevant.**

- 2.1 The work is carried out in a time compatible with the delivery time.
- 2.2 Decisions and precautionary measures are taken appropriately.
- 2.3 Simple malfunctions are solved.

##### **3 The effectiveness of the solution is measured and the gaps are processed.**

- 3.1 The production monitoring documents and the instructions booklets are filled in, legible and usable.
- 3.2 Information transmitted on production tracking documents, computer terminal, touch screen are reliable.
- 3.3 Any incident or significant event is analysed and reported to the line manager; the impact on the production is analysed and measured.

##### **4 The return to normal operation is carried out.**

- 4.1 The workstation is cleared, tidy and cleaned.

**Recommended content required to deliver results in competency:**

<b><i>Critical aspects of competency</i></b>		<b><i>Comments</i></b>
1	Identify and analyse the causes of dysfunction	
2	Elaborate realistic and relevant solutions	
3	Report orally and by writing precise and pertinent information about the dysfunction	
4	Assure the return to normal operation in proper conditions	
<b><i>Underpinning knowledge</i></b>		
1	Rules relating to gestures and postures at work environment	
2	Safety systems and main components of the means of production	
3	Knowledge of the plastic processing machine technology	
4	Technologies and their risks: mechanics, pneumatics, hydraulics, electricity, automatic and robotic systems	
5	Different energies and their dangers	
6	Various electrical and mechanical clearances	
7	Organisation of a maintenance department	
8	Different types and levels of maintenance	
9	Maintenance response documents	
10	Industrial cleaning products and their use	
11	Different intervention tools, their use and hazards	
12	Machine control console	
13	Lubrication and lubrication techniques	
14	Temperature and pressure measuring equipment technology and operation	
15	TPM (Total productive maintenance)	
16	Operating modes of production means such as "automatic", "setup"	
17	Production management software and ERP	
18	Customer-supplier relationship	
<b><i>Underpinning technical skills</i></b>		
1	Applying a modus operandi, procedure and HSE rule	
2	Using personal protective equipment	
3	Positioning the installation in the recommended state	
4	Identifying overall the faulty function of a machine	
5	Detecting manufacturing anomaly related to tooling	

6	Analysing a risk due to the nature of a defective item	
7	Reading and comparing energy indication results against a given data: pressure, temperature	
8	Cleaning and lubricating a mechanical element	
9	Warning on electrical, mechanical, pneumatic, hydraulic and thermal hazards	
10	Entering a result or indication on a production tracking document, on a computer terminal or on a touch screen	
11	Maintaining order and cleanliness at the workplace	
12	Sorting the waste	
<b><i>Underpinning organisational skills</i></b>		
1	Organising the workspace	
2	Following rigorous methodological processes	
<b><i>Underpinning relational skills</i></b>		
1	Communicating orally and in writing with the environment	
2	Working with a team spirit	
3	Taking into account the information transmitted	
4	Adapting to different situations	
5	Making decisions and being responsive	
6	Assuring reporting	
<b><i>Resource implications</i></b>		
1	Procedures	
2	Manufacturing file	
3	Tools, peripherals and means of product	
4	Manufacturing monitoring documents or terminal	
<b><i>Method of assessment</i></b>		
1	Portfolio Assessment	
2	Interview	
3	Case Study/Situation	
<b><i>Context of assessment</i></b>		
1	Competency may be assessed in the workplace or in a simulated workplace setting	



### **2.1.1.8. Unit 8 - MONITORING, CHECKING, SORTING, RECORDING AROUND THE PROCESS**

**Description:** In order to achieve a high level of performance, all along his activity of production, the plastics production line conductor is constantly in charge of monitoring, checking, sorting and recording tasks .

The objective of this unit is to allow the trainee to develop regular skill in each one of these activities all along a continuous process.

#### **Performance criteria**

##### **1 Monitoring**

- 1.1 The monitoring of a process is assured in a preventive manner
- 1.2 Conditions which may affect product quality standards are monitored
- 1.3 Any hazards connected with materials and process are identified and appropriate safety procedures are readied in accordance with equipment operating instruction, workplace reference materials including materials safety data sheets and equipment instructions

##### **2 Checking**

- 2.1 Operating procedures and controls are checked and approved adjustments are made based on company operating parameters
- 2.2 Basic measurement tools are properly used
- 2.3 Hazards and environmental issue that might surround the operation are identified and dealt with according to company standard operating procedures on safety and emergency, provision on European Union Countries and other existing environmental legislations
- 2.4 Readouts are checked against standard statistical process information and production data is entered into the control system

##### **3 Sorting**

- 3.1 Materials which can be reprocessed and reused are collected, and procedure for waste and scrap management is undertaken in accordance with workplace procedures (where applicable)
- 3.2 Parts with defects are properly identified and put aside

##### **4 Recording**

- 4.1 Critical information is correctly recorded by writing or on a digital terminal
- 4.2 Deviations (dimension, aspect, shape, value,...) are detected and reported orally or by writing

**Recommended content required to deliver results in competency:**

<b><i>Critical aspects of competency</i></b>		<b><i>Comments</i></b>
1	Maintain a high level of vigilance for a predefined period of time	
2	Perform simple and practical tasks rigorously and accurately	
3	Maintain operations and recognise potential faulty situations requiring action and implement appropriate action	
4	Identify product quality requirements and ensure that production standards are met consistently	
5	Express thoughts clearly and succinctly orally and in writing	
<b><i>Underpinning knowledge</i></b>		
1	Units of measurement and the calculation of unit conversions	
2	Procedures, modus operandi	
3	Production documents (Control cards, control screen)	
4	Impact of incorrect or faulty materials	
5	Production workflow sequences and materials demand	
6	Operation of work systems and equipment	
7	Selection and use of equipment, materials, processes and procedures	
8	Materials and process hazards and appropriate hazard control procedures	
9	Safety and emergency procedures and OHS and use of personal protective equipment	
10	Honesty, perseverance and being alert: 3 fundamental values in the workplace	
<b><i>Underpinning technical skills</i></b>		
1	Reading and understanding typical product specifications, job sheets, procedures, material labels and safety information as provided to operators	
2	Using a standard measuring tool	
3	Sorting parts according to different criteria	
4	Handling the input screens of a control console	
5	Entering a result on a tracking document or on a computer terminal	
6	Verifying and controlling the reference of a component	
7	Checking the proper condition and operation of a device	
8	Filling out an incident report sheet	
9	Differentiating root causes of faults such as: <ul style="list-style-type: none"> <li>• wrong raw materials/additives</li> <li>• incorrect quantity of materials/additives</li> <li>• contaminated materials/additives</li> </ul>	

	<ul style="list-style-type: none"> <li>product variations from specification</li> </ul>	
<b>Underpinning organisational skills</b>		
1	Taking into account information received	
2	Applying a procedure	
3	Responding to incidents	
4	Prioritising operations	
5	Completing work related documents	
6	Gathering and providing information in response to workplace requirements	
<b>Underpinning relational skills</b>		
1	ensuring reporting	
2	Taking part in workplace meetings and discussions	
<b>Resource implications</b>		
1	Measurement tools	
2	Suitable access to an operating plant or equipment that allows for appropriate and realistic simulation	
3	Production documents	
4	Monitoring tools	
5	Supplies and consumable materials	
6	A bank of case studies/scenarios and questions	
<b>Method of assessment</b>		
1	Direct Observation with questioning	
2	Oral interview and written test	
3	Portfolio assessment	
<b>Context of assessment</b>		
1	Competency may be assessed in the workplace or in a simulated workplace setting	

## 2.2. UNITS RELATED TO COMMON COMPETENCIES

### 2.2.1.1. Unit 9 - READING, INTERPRETING AND APPLYING ENGINEERING DRAWINGS

**Description:** This unit deals with identifying, interpreting and applying specifications from engineering prints or drawings that provide measurements of the product and pattern that is to be produced.

## Performance criteria

### 1 Identify and access engineering drawings/specification

- 1.1 Appropriate engineering drawings are identified and accessed as per job requirements
- 1.2 Version and date of drawing is checked to ensure correct specification and procedure are identified

### 2 Interpret drawings

- 2.1 Relevant dimensions and sections of the drawings/ specifications are located in relation to the work to be conducted
- 2.2 Information in the manual is interpreted in accordance to industry practices
- 2.3 Drawings are read and compiled using computer technology

### 3 Apply information in the drawings & specifications

- 3.1 Engineering drawing is interpreted according to job requirements
- 3.2 Work steps are correctly identified in accordance with the specifications in the drawings
- 3.3 Dimensional data and shape are applied according to the given task

### 4 Store drawings

- 4.1 The drawings and specification are stored properly to ensure prevention of damage, ready access and updating of information when required in accordance with company requirements

## Recommended content required to deliver results in competency:

<i>Critical aspects of competency</i>		<i>Comments</i>
1	Identify and accessed drawings/specification	
2	Interpret drawings	
3	Apply information in drawings	
4	Store drawings	
<b><i>Underpinning knowledge</i></b>		
1	Types of drawings used in plastic manufacturing industry	
2	Identification of symbols used in the drawings	
3	Identification of units of measurements	

4	Unit conversion	
<b>Underpinning technical skills</b>		
1	Reading, identifying and interpreting engineering drawings and specifications	
2	Exploiting records of technical manufacturing documents	
3	Evaluating a result visually or tactilely against a reference	
4	Using properly the computer technology	
<b>Underpinning organisational skills</b>		
1	Accessing information and data	
2	Following rigorous methodological processes	
3	Analysing, synthesising and memorising information from a variety of sources	
<b>Underpinning relational skills</b>		
1	Communicating orally and in writing with the environment	
<b>Resource implications</b>		
1	All drawings/engineering specifications relative to plastic manufacturing	
2	Job order, requisitions	
3	Product sample	
4	Computer with special software	
<b>Method of assessment</b>		
1	Observation with questioning	
2	Interview	
3	Practical work with a computer	
<b>Context of assessment</b>		
1	Assessment must be undertaken in accordance with the endorsed assessment guidelines	
2	Assessment may be conducted in the workplace or a simulated environment	

### 2.2.1.2. Unit 10 - CONDUCTING A DIGITALLY OPERATED SYSTEM

**Description:** The plastics production line incorporates various technologies to help the line conductor in his daily tasks. Thanks to the connected tools, the line conductor can now monitor his line remotely. Thus, with the internet of things (IoT), he will no longer need to carry out certain maintenance operations because he will be directly alerted by the machine in case of malfunction via internet connection.

This unit covers identification and use of the automated system and its individual parts. The conductor will be able to understand the consequences of his actions on a console either on the plastic manufacturing machine or on the eventually associated robot, through the digital / analog interfaces.

### Performance criteria

#### 1 Understand the principles of an automated system

- 1.1 Principles of a programmable digital system
- 1.2 Principles of operation, devices, schemes of automated production system
- 1.3 Principles of measurement acquisition and information treatment
- 1.4 Elements of automation systems are known

#### 2 Perform process parameters adjustments with a console

- 2.1 The proper parameters are identified and displayed on the console
- 2.2 Process parameters are correctly adjusted
- 2.3 The effect of the modification is controlled

#### 3 Detect defects of automatic system with a console

- 3.1 The defect is identified through the console and reported to the appropriate services

### Recommended content required to deliver results in competency:

<i>Critical aspects of competency</i>		<i>Comments</i>
1	Interact with a programmed device	
2	Exploit the information available on a console	
3	Adjust parameters on a console	
4	Identify defective parts from the information of the console	
<b><i>Underpinning knowledge</i></b>		
1	Principles of a digitally programmed system	
2	Principles of operation, devices, schemes of automated production system	
3	Principles of measurement acquisition and information treatment	
4	Elements of automation systems	
5	Sensor types, constructions, operating principles and technical characteristics	
<b><i>Underpinning technical skills</i></b>		
1	Navigating through the console pages in order to find the proper parameter	

2	Monitoring equipment operation and reading process parameters from a console	
3	Adjusting process parameters on a console	
4	Adjusting, starting and stopping a robot in accordance with the process	
<b>Underpinning organisational skills</b>		
1	Planning own work including predicting consequences and identifying improvements	
2	Completing work related digital documents	
3	Gathering and providing information in response to workplace requirements	
<b>Underpinning relational skills</b>		
1	Reporting all incidents detected through the console	
<b>Resource implications</b>		
1	Access to a range of automatic system and equipment	
2	Tools, equipment and workplace relevant with the requirements for the job	
3	Consoles	
4	Modus operandi and procedures manuals	
<b>Method of assessment</b>		
1	Direct observation with questioning	
2	Written assessment	
<b>Context of assessment</b>		
1	Competency may be assessed individually in the actual workplace or in a simulated workplace environment	
2	Practical skills must take place only after a period of supervised practice and repetitive experience	
3	Prescribed outcome must be achieved without direct supervision	

### **2.2.1.3. Unit 11 - KNOWING MAIN CHARACTERISTICS OF PLASTIC MATERIALS**

**Description:** This unit deals with the understanding of the history of plastics, the different categories and application fields, their structure and main characteristics, and the recycling issue.

It also addresses the behavior of plastic materials and the usual defects that can occur during a transformation process.

#### **Performance criteria**

## 1 Identify general used plastic material (Characterisation)

- 1.1 Origin and composition of plastics (History, method of production, thermoplastics, thermosets) are known
- 1.2 General chemical and physical characteristics of plastic materials can be described
- 1.3 The principles of chemical transformation of plastic materials are known
- 1.4 Properties of polymers (physic-chemical characteristics of a polymer, relationship between structure and properties, consequences of the presence of additives) can be explained

## 2 Detect and report usual defects of plastic part during production

- 2.1 Behavior of plastics during process (Injection, extrusion, blow, thermoforming) is known
- 2.2 Defect on a plastic part is detected (based on manufacturing specifications) and reported

### Recommended content required to deliver results in competency:

<b>Critical aspects of competency</b>		<i>Comments</i>
1	Identify a plastic material in a production context	
2	Detect and report a usual defect of a plastic part during production	
<b>Underpinning knowledge</b>		
1	Composition of thermoplastics and thermosetting materials	
2	Properties of polymers (Physic-chemical characteristics, relation between structure and properties, presence of additives, transformation conditions)	
3	Identification of plastic materials	
4	Recycling and biodegradability	
<b>Underpinning technical skills</b>		
1	Identifying a plastic material on package bags	
2	Identifying a usual defect on a plastic part	
<b>Underpinning organisational skills</b>		
1	None	
<b>Underpinning relational skills</b>		
1	Participating to discussions about plastic materials in the context of production team of plastic parts	
<b>Resource implications</b>		
1	Access to a documentation	



2	Access to technical data sheets	
<b>Method of assessment</b>		
1	Written assessment	
2	Direct Observation with questioning	
<b>Context of assessment</b>		
1	Competency may be assessed in group (written test) and individually in the actual workplace or a simulated workplace environment	
2	Practical skills must take place only after a period of supervised practice and repetitive experience	
3	Prescribe outcome must be able to achieve without direct supervision	

## 2.3. UNITS RELATED TO CORE COMPETENCIES

### 2.3.1.1. Unit 12 - OPERATING EQUIPMENT FOR MANUFACTURING OF PLASTIC COMPOSITES

**Description:** This unit covers two important phases composing the process of manufacturing of composite parts:

- 1) the preparation of the moulds, materials and equipments for composite production. This phase includes the inspection and repair of defects in the mould surface.
- 2) The operations of manufacturing of composite parts, for different processes: injection moulding (short fiber thermoplastics, long fiber thermoplastics), hand lay-up, spray lay-up, infusion, resin transfer moulding, compression moulding. This phase covers also the resolution of routine problems during the manufacturing process.

This competency is typically performed by line conductors working either independently or as a part of a work team.

#### Performance criteria

##### 1 Check work requirements

- 1.1 Work requirements are identified based on the procedures
- 1.2 Product, materials and equipment requirements are identified based on the job requirements.
- 1.3 Hazards are recognised and precautionary steps are adopted to ensure workers safety

1.4 Requirements are checked with supervisor/appropriate person if they do not comply with best practice

**2 Conduct pre start checks as required**

2.1 Safety gates and guards are checked if in position and in working condition

2.2 Raw materials are checked for correctness based on product specifications.

2.3 Other pre-start checks are undertaken in accordance with procedures

**3 Operate equipment**

3.1 Surfaces are prepared according to industry standard procedures

3.2 Mould release system is applied to mould surfaces as per manufacturer’s specifications

3.3 Masking tape and other materials are applied to mould according to standard operating procedures.

3.4 Machine is started safely and correctly when required based on equipment operating instruction

3.5 Process is implemented within the required limits in order to meet product specifications

3.6 Composite plastic products are collected and stored as required

3.7 Product/process are checked if within specification/ as to required quality standard

3.8 Supply of materials is maintained as required

3.9 Logs and records are completed according to the requirements

3.10 Collection and reprocessing/discarding scrapping/trimming of materials are undertaken in accordance with procedures

3.11 Equipment and work area are cleaned up in accordance with company procedures

3.12 Equipment is stopped/paused in an emergency, following workplace and emergency procedures

**4 Resolve routine problems**

4.1 Routine problems/ faults likely to occur are identified during the operation and appropriate precautionary measures are readied according to company standard operating procedures.

4.2 Appropriate records and log books of equipment operations are ensured and maintained according to company procedures

4.3 Non-routine problems are identified and reported to designated person

**Recommended content required to deliver results in competency:**

<i>Critical aspects of competency</i>	<i>Comments</i>
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1	Check work requirements	
2	Conduct pre-start checks as required	
3	Operate equipment	
4	Take appropriate action to resolve faults or report faults to appropriate personnel	
5	Follow all safety procedures (process and materials)	
<b><i>Underpinning knowledge</i></b>		
1	Effects of contamination on surface quality	
2	Types of equipment, tools and consumables required to deliver the specified mould surface	
3	Different types of mould release systems	
4	Different application techniques for the mould release systems used	
5	Typical problems with each mould release system	
6	Faults caused by materials, contaminants and equipment	
7	Operation of manufacturing of composite plastic and components	
8	Use of equipment, materials, processes and procedures	
9	Production workflow sequences and materials demand	
10	Reasons for checking process control panels and reporting readings which do not conform to the work instructions	
11	Potential effects of variations in raw materials and equipment operation in relation to quality of product	
12	Waste management and importance of reusing nonconforming products wherever possible	
13	Factors which may affect product quality or production output are identified	
14	Causes of routine production faults	
15	Approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup	
<b><i>Underpinning technical skills</i></b>		
1	Preparing the surfaces	
2	Identifying repairs and taking appropriate action	
3	Applying mould release system	
4	Masking-up the mould	
5	Explaining and implementing emergency shutdown procedures	

6	Ensuring Composite Plastic standards are met consistently	
7	Identifying materials (Matrix, reinforcement, additives)	
8	Identifying problems and take appropriate action	
9	Monitoring equipment operation and product quality	
10	Handling safely products and materials, reading relevant safety information and applying safety precautions appropriate to the task	
11	Pausing equipment, or shutting down equipment in abnormal circumstances	
12	Monitoring equipment operation and surface quality	
13	Selecting and using correctly equipment, materials, processes and procedures	
14	Using PPE, safely handling products and materials, reading relevant safety information and applying safety precautions appropriate to the task	
15	Performing routine workplace duties following simple written notices	
<b><i>Underpinning organisational skills</i></b>		
1	Planning own work including predicting consequences and identifying improvements	
2	Completing work related documents	
3	Gathering and providing information in response to workplace requirements	
4	Reading and interpreting correctly the operating procedures and work instructions	
<b><i>Underpinning relational skills</i></b>		
1	Participating to workplace meetings and discussions	
2	Ensuring upstream and downstream communication is timely and effective	
<b><i>Resource implications</i></b>		
1	Access to a range of mould release system and equipment	
2	A bank of scenarios and questions	
3	Tools, equipment and workplace relevant with the requirements for the job	
4	Supplies and consumable materials	
5	Engineering manuals	
<b><i>Method of assessment</i></b>		
1	Direct Observation with questioning	

2	Oral interview and written test	
3	Portfolio assessment	
<b>Context of assessment</b>		
1	Competency may be assessed individually in the actual workplace or a simulated workplace environment	
2	Practical skills must take place only after a period of supervised practice and repetitive experience	
3	Prescribe outcome must be able to achieve without direct supervision.	

### 2.3.1.2. Unit 13 - OPERATING INJECTION MOULDING EQUIPMENT

**Description:** This unit covers the operation of injection moulding equipment and resolving routine problems to produce plastic products.

This competency is typically performed by operators working either independently or as a part of a team

#### Performance criteria

##### 1 Check work requirements

- 1.1 Work requirements are identified based on procedures
- 1.2 Product, materials and equipment requirements are identified based on the job requirements.
- 1.3 Hazards are recognised and precautionary steps are adopted to ensure safety
- 1.4 Requirements are checked with supervisor/appropriate person if found not in accordance with normal practice

##### 2 Conduct pre-start checks as required

- 2.1 Safety gates and guards are checked if in position and in working condition
- 2.2 Raw materials are checked for correctness based on product specifications.
- 2.3 Other pre-start checks are undertaken in accordance with procedures

##### 3 Operate equipment

- 3.1 Machine is started safely and correctly when required based on equipment operating instruction
- 3.2 Process is check if within the required limits based on product specifications

- 3.3 Moulded products are collected and stored as required
- 3.4 Product/process are checked if within specification/ as to required quality standard
- 3.5 Supply of materials is maintained as required
- 3.6 Logs and records are completed when required
- 3.7 Collection and reprocessing/discarding scrapping/trimming of materials are undertaken in accordance with procedures
- 3.8 Equipment and work area are cleaned up in accordance with company procedures
- 3.9 Equipment is stopped/paused in an emergency, following workplace and emergency procedures

#### 4 Resolve routine problems

- 4.1 Routine problems/ faults likely to occur are identified during the operation and appropriate precautionary measures are prepared according to company standard operating procedures.
- 4.2 Appropriate records and log books of equipment operations are up to date and maintained according to company procedures
- 4.3 Non-routine problems are identified and reported to the person in charge in order to get them solved quickly

#### Recommended content required to deliver results in competency:

<i><b>Critical aspects of competency</b></i>		<i>Comments</i>
1	Check work requirements	
2	Conduct pre-start checks as required	
3	Operate equipment	
4	Resolve routine problems	
5	Take appropriate action to resolve faults or report faults to appropriate personnel	
6	Explain and implement emergency shutdown procedures	
7	Ensure Injection moulding production standards are met consistently	
8	Ensure upstream and downstream communication is timely and effective	
9	Read and interpret correctly the operating procedures and work instructions	
10	Identify problems and take appropriate action	
11	Follow all safety procedures	
<i><b>Underpinning knowledge</b></i>		
1	Operation of injection moulding equipment and components	

2	Production workflow sequences and materials requests	
3	Different reasons for checking process control panels and reporting readings which do not conform to the work instructions	
4	Waste management and importance of reusing nonconforming products wherever possible	
5	Potential effects of variations in raw materials and equipment operation in relation to quality of product	
6	Correct selection and use of equipment, materials, processes and procedures	
7	Factors which may affect product quality or production output and appropriate actions	
8	Possible causes of routine injection moulding faults	
9	Approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup	
<b><i>Underpinning technical skills</i></b>		
1	Monitoring equipment operation and product quality	
2	Handling safely products and materials, reading relevant safety information and applying safety precautions appropriate to the task	
3	Pausing equipment, or shutting down equipment in abnormal circumstances	
<b><i>Underpinning organisational skills</i></b>		
1	Planning own work including predicting consequences and identifying improvements	
2	Completing work related documents	
3	Gathering and providing information in response to workplace Requirements	
<b><i>Underpinning relational skills</i></b>		
1	Taking part to workplace meetings and discussions	
<b><i>Resource implications</i></b>		
1	A bank of scenarios and questions	
2	Tools, equipment and workplace relevant with the requirements for the job	
3	Supplies and consumable materials	
4	Engineering manuals	
<b><i>Method of assessment</i></b>		
1	Direct Observation with questioning	
2	Oral interview and written test	
3	Portfolio assessment	
<b><i>Context of assessment</i></b>		
1	Competency may be assessed individually in the actual workplace or a	

	simulated workplace environment	
2	Practical skills must take place only after a period of supervised practice and repetitive experience	
3	Prescribe outcome must be able to achieve without direct supervision	

### **2.3.1.3. Unit 14 - OPERATING BLOW MOULDING EQUIPMENT**

**Description:** This unit covers the operation of blow moulding equipment and the resolving of routine problems to procedure.

The competency is typically performed by operators working either independently or as part of a team

#### **Performance criteria**

##### **1 Check work requirements**

- 1.1 Work requirements are identified based on procedures
- 1.2 Product, materials, tools and equipment are identified based on job requirements
- 1.3 Hazards are recognised and steps required to ensure safety are considered and adopted.
- 1.4 Requirements are checked with supervisor/appropriate person if found not to be in accordance with normal practice

##### **2 Conduct required pre-start checks**

- 2.1 Safety gates and guards are checked if in position and in working condition
- 2.2 Raw materials are check based on listed specification
- 2.3 Other pre-start checks are undertaken in accordance with procedures

##### **3 Operation equipment**

- 3.1 Condition of equipment is checked and raw materials are introduced as required by procedures
- 3.2 Product/process is checked if within required limits based on work instruction
- 3.3 Moulded products are collected and stored as required
- 3.4 Product/process is checked if within specification/ as to required quality standard
- 3.5 Supply of materials is maintained as required



- 3.6 Logs and records are completed as required and in accordance with company standard operating procedures
- 3.7 Materials are collected, reprocessed/discarded, scraped/trimmed in accordance with procedures
- 3.8 Equipment and work area is clean up in accordance with procedures
- 3.9 Equipment operation is stopped/paused in an emergency, following workplace and emergency procedures

#### 4 Resolve routine problems

- 4.1 Faults that likely to occur are identified during the operation
- 4.2 Causes of routine problems/faults are identified and actions are taken on in accordance with procedures
- 4.3 Appropriate records and log books of equipment operations are maintained to meet procedures
- 4.4 Non-routine problems and report are identified including persons designated to respond to problems.

#### Recommended content required to deliver results in competency:

<b><i>Critical aspects of competency</i></b>		<i>Comments</i>
1	Check work requirements and recognise the importance of material properties and qualities	
2	Apply approved procedures	
3	Take appropriate action to resolve faults or report faults to appropriate personnel	
4	Explain and implement emergency shutdown procedures	
5	Ensure blow moulding production standards are met consistently	
6	Ensure upstream and downstream communication is timely and effective	
7	Read and interpret correctly the operating procedures and work instructions	
8	Identify problems and take appropriate action	
9	Follow all safety procedures	
<b><i>Underpinning knowledge</i></b>		
1	Blow moulding process and ancillary equipment used in process	
2	Blow moulding component design	
3	The mould design	
4	Correct selection and use of equipment, materials, processes and procedures	
5	Procedure in operation of blow moulding equipment and components	

6	Production workflow sequences and materials	
7	Reasons for checking process control panels and reporting readings which do not conform to the work instructions	
8	Approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and clean-up, interpretation of TDS and MSDS	
9	Potential effects of variations in raw materials and equipment operation in relation to quality of product	
10	Waste management and importance of reusing non-conforming products wherever possible	
11	Different factors which may affect product quality or production output and appropriate – blow moulding troubleshooting	
<b><i>Underpinning technical skills</i></b>		
1	Monitoring equipment operation and product quality	
2	Handling safely products and materials, reading relevant safety information and apply safety precautions appropriate to the task	
3	Pausing equipment, or shutting down equipment in abnormal circumstances	
<b><i>Underpinning organisational skills</i></b>		
1	Planning own work including predicting consequences and identifying improvements	
2	Completing work related documents	
3	Gathering and providing information in response to workplace requirements	
<b><i>Underpinning relational skills</i></b>		
1	Taking part to workplace meetings and discussions	
<b><i>Resource implications</i></b>		
1	A bank of scenarios and questions	
2	Tools, equipment and workplace relevant with the requirements for the job	
3	Supplies and consumable materials	
4	Engineering manuals	
<b><i>Method of assessment</i></b>		
1	Direct Observation with questioning	
2	Written examination	
3	Portfolio	
<b><i>Context of assessment</i></b>		
1	Competency may be assessed individually in the actual workplace or a simulated workplace environment.	
2	Practical skills must take place only after a period of supervised practice and	

	repetitive experience	
3	Prescribe outcome must be able to achieve without direct supervision	

#### **2.3.1.4. Unit 15 - OPERATING PLASTIC EXTRUSION EQUIPMENT**

**Description:** This unit covers the operation of plastic sheet and profile extrusion equipment and the resolving routine problems to produce plastic products.

The competency is typically performed by operators working either independently or as a part of a work team

#### **Performance criteria**

##### **1 Check work requirements**

- 1.1 Work requirements are identified based on procedures
- 1.2 Product, materials and equipment requirements are identified based on the job requirements.
- 1.3 Hazards are recognised and precautionary steps are adopted to ensure safety
- 1.4 Requirements are checked with supervisor/appropriate person if found not in accordance with normal practice

##### **2 Conduct required pre-start checks**

- 2.1 Safety gates and guards are checked if in position and in working condition
- 2.2 Raw materials are checked for correctness based on product specifications.
- 2.3 Other pre-start checks are undertaken in accordance with appropriate procedures

##### **3 Operate equipment**

- 3.1 Machine is started safely and correctly when required based on equipment operating instruction
- 3.2 The process is checked for required limits within product specifications
- 3.3 Extruded products are collected and stored as required
- 3.4 Product/process are checked if within specification/ as to required quality standard
- 3.5 Supply of materials is maintained as required
- 3.6 Logs and records are completed when required

- 3.7 Collection and reprocessing/discarding scrapping/trimming of materials are undertaken in accordance with procedures
- 3.8 Equipment and work area are cleaned up in accordance with company procedures
- 3.9 Equipment is stopped/paused in an emergency, following workplace and emergency procedures

#### 4 Resolve routine problems

- 4.1 Routine problems/ faults are identified during the operation and appropriate precautionary measures are readied according to company standard operating procedures.
- 4.2 Appropriate records and log books of equipment operations are ensured and maintained according to company procedures
- 4.3 Non-routine problems are identified and reported to designated person

#### Recommended content required to deliver results in competency:

<b><i>Critical aspects of competency</i></b>		<i>Comments</i>
1	Check work requirements	
2	Conduct pre-start checks as required	
3	Operate equipment	
4	Resolve routine problems	
5	Take appropriate action to resolve faults or report faults to appropriate personnel	
6	Explain and implement emergency shutdown procedures	
7	Ensure Extrusion production standards are met consistently	
8	Ensure upstream and downstream communication is timely and effective	
9	Read and interpret correctly the operating procedures and work instructions	
10	Identify problems and take appropriate action	
11	Follow all safety procedures	
<b><i>Underpinning knowledge</i></b>		
1	Definition of the process	
2	Different types of extruders (single-screw, multi-stage)	
3	Architecture of the extruder and the different components	
4	Behaviour of the material during gelling	
5	Description of the elements (Die, Conformer, Sawing, Peripherals)	
6	Architecture of single-screw and twin-screw extruders	

7	Study of the screw/sheath assembly	
8	Behaviour of the material in the extruder	
9	Study of the extrusion line	
10	Conformation, cooling, cutting and receiving	
11	The conformers	
12	The peripherals	
13	The basic settings	
14	Investigation of defects in extrusion of tubes and profiles	
15	Influence of setting parameters	
<b>Underpinning technical skills</b>		
1	Starting and stopping the extrusion line	
2	Monitoring equipment operation and product quality	
3	Ensuring compliance with contractual specifications	
4	Handling safely products and materials, reading relevant safety information and applying safety precautions appropriate to the task	
5	Pausing or shutting down the equipment in abnormal circumstances	
<b>Underpinning organisational skills</b>		
1	Planning own work including predicting consequences and identifying improvements	
2	Completing work related documents	
3	Gathering and providing information in response to workplace Requirements	
<b>Underpinning relational skills</b>		
1	Taking part to workplace meetings and discussions	
<b>Resource implications</b>		
1	A bank of scenarios and questions	
2	Tools, equipment and workplace relevant with the requirements for the job	
3	Supplies and consumable materials	
4	Engineering manuals	
<b>Method of assessment</b>		
1	Direct Observation with questioning	
2	Oral interview and written test	
3	Portfolio assessment	
<b>Context of assessment</b>		
1	Competency may be assessed individually in the actual workplace or a simulated workplace environment	

2	Practical skills must take place only after a period of supervised practice and repetitive experience	
3	Prescribe outcome must be able to achieve without direct supervision	

### **2.3.1.5. Unit 16 - OPERATING THERMOFORMING EQUIPMENT**

**Description:** This unit covers the operation of Thermoforming equipment and resolving routine problems to produce plastic products.

The competency is typically performed by operators working either independently or as a member of a team.

#### **Performance criteria**

##### **1 Check work requirements**

- 1.1 Work requirements are identified based on procedures
- 1.2 Product, materials and equipment requirements are identified based on the job requirements.
- 1.3 Hazards are recognise and precautionary steps are adopted to ensure safety
- 1.4 Requirements are checked with supervisor/appropriate person if found not in accordance with normal practice

##### **2 Conduct pre-start checks as required**

- 2.1 Safety gates and guards are checked if in position and in working condition
- 2.2 Raw materials are checked for correctness based on product specifications.
- 2.3 Other pre-start checks are undertaken in accordance with Procedures

##### **3 Operate equipment**

- 3.1 Machine is started safely and correctly when required based on equipment operating instruction
- 3.2 Thermoforming products are collected and stored as required
- 3.3 Products are checked if within specification/ as required by quality standard
- 3.4 Supply of materials is maintained as required
- 3.5 Logs and records are completed when required
- 3.6 Collection and reprocessing/discarding scrapping/trimming of materials are undertaken in accordance with procedures

3.7 Equipment and work area are cleaned up in accordance with company procedures

3.8 Equipment is stopped/paused in an emergency, following workplace and emergency procedures

#### 4 Resolve routine problems

4.1 Routine problems/ faults likely to occur are identified during the operation and appropriate precautionary measures are readied according to company standard operating procedures.

4.2 Appropriate records and log books of equipment operations are ensured and maintained according to company procedures

4.3 Non-routine problems are identified and reported to designated person

#### Recommended content required to deliver results in competency:

<i><b>Critical aspects of competency</b></i>		<i>Comments</i>
1	Check work requirements	
2	Conduct pre-start checks as required	
3	Operate equipment	
4	Resolve routine problems	
5	Take appropriate action to resolve faults or report faults to appropriate personnel	
6	Explain and apply emergency shutdown procedures	
7	Ensure upstream and downstream communication is timely and effective	
8	Read and interpret correctly the operating procedures and work instructions	
9	Identify problems and take appropriate action	
10	Follow all safety procedures	
<i><b>Underpinning knowledge</b></i>		
1	Thermoforming operations and components	
2	Production workflow sequences and materials demand	
3	Different reasons for checking process control panels and reporting readings which do not comply with the work instructions	
4	Potential effects of variations in raw materials and equipment operation in relation to quality of product	
5	Waste management and importance of reusing nonconforming products wherever possible	
6	Correct selection and use of equipment, materials, processes and procedures	
7	Factors which may affect product quality or production output and appropriate	

	actions	
8	Possible causes of routine thermoforming defects	
9	Approved hazard control and safety procedures and the use of PPE in relation to handling materials, equipment operation and cleanup	
<b>Underpinning technical skills</b>		
1	Monitoring equipment operation and product quality	
2	Handling safely products and materials, reading relevant safety information and applying safety precautions appropriate to the task	
3	Pausing equipment, or shutting down equipment in abnormal circumstances	
<b>Underpinning organisational skills</b>		
1	Planning own work including predicting consequences and identifying improvements	
2	Completing work related documents	
3	Gathering and providing information in response to workplace Requirements	
<b>Underpinning relational skills</b>		
1	Taking part to workplace meetings and discussions	
<b>Resource implications</b>		
1	A bank of scenarios and questions	
2	Tools, equipment and workplace relevant with the requirements for the job	
3	Supplies and consumable materials	
4	Modus operandi and procedures	
<b>Method of assessment</b>		
1	Direct Observation with questioning	
2	Oral interview and written test	
3	Portfolio assessment	
<b>Context of assessment</b>		
1	Competency may be assessed individually in the actual workplace or a simulated workplace environment	
2	Practical skills must take place only after a period of supervised practice and repetitive experience	
3	Prescribe outcome must be able to achieve without direct supervision.	

**2.3.1.6. Unit 17 - OPERATING EQUIPMENT FOR MANUFACTURING OF RUBBER COMPOUNDS**



**Description:** This unit covers the operation of manufacturing equipment for rubber compounds and the resolving routine problems to produce rubber products.

The competency is typically performed by operators working either independently or as a member of a team.

## **Performance criteria**

### **1 Check work requirements**

- 1.1 Work requirements are identified based on procedures
- 1.2 Product, materials and equipment requirements are identified based on the job requirements.
- 1.3 Hazards are recognised and precautionary steps are adopted to ensure safety
- 1.4 Requirements are checked with supervisor/appropriate person if found not in accordance with normal practice

### **2 Conduct required pre-start checks**

- 2.1 Safety gates and guards are checked if in position and in working condition
- 2.2 Raw materials are checked for correctness based on product specifications.
- 2.3 Other pre-start checks are undertaken in accordance with procedures

### **3 Operate equipment**

- 3.1 Machine is started safely and correctly based on equipment operating instruction
- 3.2 Process is checked if within the required limits based on product specifications
- 3.3 Rubber Compounds products are collected and stored as required
- 3.4 Product/process are checked if within specification/ as to required quality standard
- 3.5 Supply of materials is maintained as required
- 3.6 Logs and records are completed according to a timetable
- 3.7 Collection and reprocessing/discarding scrapping/trimming of materials are undertaken in accordance with procedures
- 3.8 Equipment and work area are cleaned up in accordance with company procedures
- 3.9 Equipment is stopped/paused in an emergency, following workplace and emergency procedures

### **4 Resolve routine problems**

- 4.1 Routine problems/ faults likely to occur are identified during the operation and appropriate precautionary measures are taken according to company standard operating procedures.
- 4.2 Appropriate records and log books of equipment operations are ensured and maintained according to company procedures
- 4.3 Non-routine problems are identified and reported to designated person

**Recommended content required to deliver results in competency:**

<b><i>Critical aspects of competency</i></b>		<i>Comments</i>
1	Check work requirements	
2	Conduct pre-start checks as required	
3	Operate equipment	
4	Resolve routine problems	
5	Take appropriate action to resolve faults or report faults to appropriate personnel	
6	Explain and implement emergency shutdown procedures	
7	Ensure rubber compounds standards are met consistently	
8	Ensure upstream and downstream communication is timely and effective	
9	Read and interpret correctly the operating procedures and work instructions	
10	Identify problems and take appropriate action	
11	Follow all safety procedures	
<b><i>Underpinning knowledge</i></b>		
1	Manufacture of rubber compounds and components	
2	Production workflow sequences and materials demand	
3	Process control panels and readings which do not conform to the work instructions	
4	Potential effects of variations in raw materials and equipment operation in relation to quality of product	
5	Waste and recycling management wherever possible	
6	Selection and use of equipment, materials, processes and procedures	
7	Factors that affect product quality or production output and appropriate actions	
8	Possible causes of routine of production defects	
9	Hazard control and safety procedures in material handling, equipment operation and maintenance	
<b><i>Underpinning technical skills</i></b>		

1	Monitoring equipment operation and product quality	
2	Handling safely products and materials, reading relevant safety information and applying safety precautions appropriate to the task	
3	Pausing or shutting down equipment in abnormal circumstances	
<b>Underpinning organisational skills</b>		
1	Planning own work including predicting consequences and identifying improvements	
2	Completing work related documents	
3	Gathering and providing information in response to workplace requirements	
<b>Underpinning relational skills</b>		
1	Taking part to workplace meetings and discussions	
<b>Resource implications</b>		
1	A bank of scenarios and questions	
2	Tools, equipment and workplace relevant with the requirements for the job	
3	Supplies and consumable materials	
4	Engineering manuals	
<b>Method of assessment</b>		
1	Direct Observation with questioning	
2	Oral interview and written test	
3	Portfolio assessment	
<b>Context of assessment</b>		
1	Competency may be assessed individually in the actual workplace or a simulated workplace environment	
2	Practical skills must take place only after a period of supervised practice and repetitive experience	
3	Prescribe outcome must be able to achieve without direct supervision.	

### 2.3.1.7. Unit 18 - FINISHING PRODUCTS AND COMPONENTS

**Description:** This unit covers a range of processes subsequent to the actual making of the product which have been grouped together under the heading of “finishing”. It applies to the finishing of products for customer use and the finishing components for use by a subsequent process or organisation which may then further process or assemble these components into a finished product, and similar activities. It applies across all sectors of the industry.

The competency is typically performed by personnel working either independently or as part of a work team.

### **Performance criteria**

#### **1 Establish requirements for the finishing process**

- 1.1 Work requirements are identified from procedures
- 1.2 Equipment and consumables for the finishing process are assemble
- 1.3 Workplace procedures and materials safety data sheets are consulted to confirm the work planning process
- 1.4 Safety equipment are checked and ensured to be available and in sound condition
- 1.5 Products are removed from equipment if required using enterprise standard handling methods
- 1.6 End-of-product run are recognised

#### **2 Check quality of product**

- 2.1 Products are inspected to identify for routine or non-routine finishing requirements.
- 2.2 Significant finishing, flash or other quality problems are identified and reported to appropriate person for investigation of mould/die closure/alignment.
- 2.3 Modifications are check with appropriate personnel regarding to finishing process.
- 2.4 Non-conforming products are identified and processed in accordance with workplace procedures.

#### **3 Undertake the finishing operation**

- 3.1 Products are trimmed as required
- 3.2 Other secondary process operations are undertaken as required
- 3.3 Waste and recycling procedures are followed according to company standard operating procedures
- 3.4 Finished products are inspected and compared to specifications for suitability for further processing or for customer delivery
- 3.5 Finished products are assembled and sorted in accordance with procedures
- 3.6 Products are packed as required and according to packaging/stacking specifications
- 3.7 Product data are recorded as required
- 3.8 Work area are cleaned up and housekeeping is performed

#### **4 Identify and rectify routine product imperfections**

- 4.1 Range of routine imperfections that can occur during the production process are identified
- 4.2 Routine product imperfections are determined and rectified in accordance with procedures
- 4.3 Appropriate records and log books are maintained and ensure to meet procedures/work instructions.
- 4.4 Non-routine product imperfections are identified and reported to designated person.

**Recommended content required to deliver results in competency:**

<b><i>Critical aspects of competency</i></b>		<i>Comments</i>
1	Establish requirements for the finishing process and recognise the importance of critical material properties and quantities to the finishing process	
2	Check quality of product	
3	Undertake the finishing operation	
4	Identify and rectify routine product imperfections and ensure production standards are met consistently	
5	Follow safety procedures	
<b><i>Underpinning knowledge</i></b>		
1	Selection and application of finishing process	
2	Tools and equipment for the process	
3	Safe handling of products	
4	Procedure in waste and recycling management	
5	Causes of faults such as: <ul style="list-style-type: none"> <li>○ flashing, distortion, stress marks, sinks, voids, short shot, poor color distribution, moisture marks, gassing, burn marks</li> <li>○ inappropriate selection and use of finishing equipment/processes</li> <li>○ poor surface finish</li> <li>○ polishing and grinding</li> <li>○ variations in section thickness</li> </ul>	
<b><i>Underpinning technical skills</i></b>		
1	Understanding typical product specifications, job sheets and material labels as provided to operators	
2	Performing routine workplace duties following simple written notices	
<b><i>Underpinning organisational skills</i></b>		
1	Completing work related documents	
2	Gathering and providing information in response to workplace requirements	

<b><i>Underpinning relational skills</i></b>		
1	Taking part to workplace meetings and discussions	
<b><i>Resource implications</i></b>		
1	Suitable access to an operating plant or equipment for simulation.	
2	Tools, equipment and workplace relevant with the requirements for the job	
3	Supplies and consumable materials	
4	Engineering manuals and drawings	
<b><i>Method of assessment</i></b>		
1	Direct Observation with questioning	
2	Written examination	
<b><i>Context of assessment</i></b>		
1	Competency may be assessed individually in the actual workplace or a simulated workplace environment	
2	Practical skills must take place only after a period of supervised practice and repetitive experience	
3	Prescribe outcome must be able to achieve without direct supervision	

### 3. ASSESSMENT

#### 3.1. ELEMENTS OF EVALUATION

The skills of the candidates for the access to the professional certification are evaluated by a jury composed of two professionals, in the view of:

- a professional role-play or a presentation of a project realised upstream to the session, possibly completed by other methods of evaluation: technical interview, professional questionnaire, questioning from production.
- the professional record of the candidate and its possible appendices
- the results of the evaluations passed by the candidates during their training.
- an interview with the jury intended to verify the level of control by the candidate of the skills required for the exercise of the activities composing the position

#### 3.2. EVALUATION PROCESS

##### 3.2.1.1. *Assessment procedures and organisation of the test*

MODALITY	ASSESSED COMPETENCY	DURATION	DETAIL OF THE ORGANISATION OF THE TEST
<b>Professional role-play</b>	Assemble the tools and prepare the manufacture of a plastic production Start and stop a plastic production line Check the conformity of the produced parts and stabilise the plastic production process Diagnose and help solve a malfunction on a line of plastic production Suggest technical or organisational improvements to a plastic production line	<b>3 h 30 min</b>	This professional role-play, composed of two phases, is carried out individually on the production plant, in the presence of the jury. The candidate produces a series of plastic parts on a plastics installation, then he optimises an adjustment. <b>Phase 1 (2 h 30 min):</b> From a manufacturing order and the technical file of the parts to be produced, the candidate assembles the tools, connects the energy and makes adjustments. He starts the installation, produces the first parts, then stabilises the manufacturing process. He produces and checks the required series of parts, solves a malfunction, then fills in the

			<p>manufacturing tracking document.</p> <p><b>Phase 2 (1 h):</b></p> <p>the candidate optimises a setting based on an improvement axis given by the jury. He dismantles the tooling.</p>
<b>Other evaluation modalities:</b>			
<b>Technical interview</b>	<p>Check the conformity of the parts produced and stabilise the plastic production process</p> <p>Diagnose and help solve a malfunction on a plastic production line</p> <p>Coordinate the activities of production operators</p> <p>Support the adaptation of production operators to the workplace</p>	<b>20 min</b>	<p>This technical interview takes place individually in the presence of the jury after the professional role-play and the professional questionnaire.</p> <p>The jury questions the candidate on his answers to the professional questionnaire and his ability to coordinate training and adaptation of operators to the workplace</p>
<b>Professional questionnaire</b>	<p>Check the conformity of the produced parts and stabilise the plastic production process</p> <p>Diagnose and help solve a malfunction on a plastic production line</p>	<b>20 min</b>	<p>All candidates respond individually and simultaneously to the professional questionnaire in the presence of an examination supervisor.</p>
<b>Questioning from production</b>	<p>Propose technical or organisational improvements to a plastic production line</p>	<b>30 min</b>	<p>This questioning takes place in two successive phases, in the presence of the jury:</p> <p><b>Phase 1 (15 min):</b></p> <p>Candidate presents individually and orally his report on professional activities.</p> <p><b>Phase 2 (15 min):</b></p> <p>Jury questions candidate on report of professional activities.</p>
<b>Final interview</b>		<b>20 min</b>	<p>Including exchange time with the candidate on his professional record.</p>



	<b>Total test duration for the candidate:</b>	<b>5 h 00 min</b>	
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**Further information on professional role-play:**

Tooling or processed material has a major technical difficulty in its implementation. The machine and the material/tooling couple are in the candidate's area of knowledge.

**Additional information on questioning from production:**

The written professional activity report deals with the resolution of one or more common production issues, such as, for example, the study of problems of quality on a part, safety, productivity at the workplace, production flow.

**3.2.1.2. Criteria for the assessment of professional competencies**

Professional competencies	Assessment criteria	Professional role-play	Other evaluation modalities		
			Technical interview	Professional questionnaire	Questioning from production
<b>Adjust and launch an automated plastic production line and monitor its operation</b>					
<b>Assemble the tools and prepare the manufacture of a plastic parts production</b>	<ul style="list-style-type: none"> <li>○ QHSE procedures, modus operandi and rules are applied and respected.</li> <li>○ The tools and peripheral equipment are prepared, attached and connected in accordance with the manufacturing file.</li> <li>○ Actions on programs and control devices are carried out.</li> <li>○ Supply of materials, consumables, containers, components and small equipment are made.</li> <li>○ Procurement references are verified against the</li> </ul>	<b>X</b>	N/A	N/A	N/A

	<p>manufacturing file.</p> <ul style="list-style-type: none"> <li>○ The material is prepared in accordance with the manufacturing file.</li> <li>○ The operations are carried out within the allotted time.</li> <li>○ The workstation is cleaned up and cleared in accordance with the implantation scheme.</li> <li>○ The production follow-up documents and the instruction booklet are filled in, legible and usable.</li> <li>○ The information transmitted on the production monitoring documents, computer terminal, touch screen are reliable. Any incident or significant event is analysed and reported.</li> </ul>				
<b>Start and stop a plastic production line</b>	<ul style="list-style-type: none"> <li>○ QHSE procedures, modus operandi and rules are applied and respected.</li> <li>○ The operations are carried out within the allotted time.</li> <li>○ The manufactured parts comply with the technical documents.</li> <li>○ The workstation is cleaned up and cleared in accordance with the implantation scheme.</li> <li>○ The production follow-up documents and the instruction booklet are filled in, legible and usable.</li> <li>○ The information transmitted on the production monitoring documents, computer terminal, touch screen are reliable.</li> <li>○ Any incident or significant event is analysed and reported</li> </ul>	<b>X</b>	N/A	N/A	N/A

<p><b>Check the conformity of the produced parts and stabilise the process of plastic production</b></p>	<ul style="list-style-type: none"> <li>○ The control procedure is followed.</li> <li>○ The calibration validity date of the measuring instruments is verified.</li> <li>○ Measuring instruments are used in accordance with their instructions of use.</li> <li>○ Reading the measurements is correct.</li> <li>○ The manufacturing process is stabilised.</li> <li>○ Production controls are carried out at the frequency and with the measuring instruments as recommended in the manufacturing file.</li> <li>○ Defects are analysed and if necessary compared to reference parts.</li> <li>○ Non-compliant parts are isolated and identified according to the appropriate procedure.</li> <li>○ Process drifts are identified.</li> <li>○ The assumptions of adjustment changes are related to the identified anomalies.</li> <li>○ Adjustment changes are carried out with method and rigorous validation of results.</li> <li>○ The control station is cleaned up.</li> <li>○ The production follow-up documents and the instruction booklet are filled in, legible and usable.</li> <li>○ The information transmitted on the production monitoring documents, computer terminal, touch screen are reliable.</li> <li>○ Any incident or significant event is analysed and reported.</li> </ul>	<p><b>X</b></p>	<p><b>X</b></p>	<p><b>X</b></p>	<p>N/A</p>
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<b>Diagnose and help solve a malfunction on a plastic production line</b>	<ul style="list-style-type: none"> <li>○ QHSE procedures, modus operandi and rules are applied and respected.</li> <li>○ The malfunction on the machine, tooling or equipment is identified with method.</li> <li>○ Simple malfunctions are solved.</li> <li>○ The work is completed within the allotted time.</li> <li>○ The workstation is cleaned up.</li> <li>○ The production follow-up documents and the instruction booklet are filled in, legible and usable.</li> <li>○ The information transmitted on the production monitoring documents, computer terminal, touch screen are reliable.</li> <li>○ Any incident or significant event is analysed and reported</li> </ul>	<b>X</b>	<b>X</b>	<b>X</b>	N/A
<b>Organise production and optimise the manufacturing process on an automated plastic production line</b>					
<b>Coordinate the activities of production operators</b>	<ul style="list-style-type: none"> <li>○ The language used is taken into account in the communication with the operators.</li> <li>○ The various stages of information appropriation by operators are taken into account.</li> <li>○ Appropriate monitoring is envisaged.</li> </ul>	N/A	<b>X</b>	N/A	N/A

<b>Support the adaptation of production operators to the workplace</b>	<ul style="list-style-type: none"> <li>○ Intake documents are explained.</li> <li>○ The language used is taken into account in communication with operators.</li> <li>○ The functions of a newcomer are envisaged.</li> <li>○ Appropriate monitoring is envisaged and takes into account the potential difficulties of the persons to be trained.</li> </ul>	N/A	<b>X</b>	N/A	N/A
<b>Propose technical or organisational improvements to a plastic production line</b>	<ul style="list-style-type: none"> <li>○ Problem data are analysed and exploited using appropriate analysis tools.</li> <li>○ Potential points of improvement are identified and achievable.</li> <li>○ The proposals are expressed in a concise and argued manner.</li> <li>○ The potential cost of the modifications and effects are estimated.</li> <li>○ The results obtained are the subject of a clear and exploitable written report</li> </ul>	<b>X</b>	N/A	N/A	<b>X</b>

### 3.2.1.3. Assessment of cross-cutting competencies

Cross-cutting skills are assessed through professional skills.

Cross-cutting competencies	Concerned professional competencies
<b>Working with a team spirit</b>	Propose technical or organisational improvements to a plastic production line
<b>Diagnosing and solving a problem</b>	Check the conformity of the produced parts and stabilise the process of a plastic parts production
	Diagnose and help solve a malfunction on a plastic production

	line
	Propose technical or organisational improvements to a plastic production line
<b>Apply quality, health, safety, environmental rules</b>	Assemble the tools and prepare the manufacture of a plastic production

#### **3.2.1.4. Conditions for the presence and intervention of the jury**

Total length of presence of the jury during the candidate evaluation: 4h 40 min

##### ***Jury intervention protocol:***

The jury is present for the entire duration of the professional situation, the technical interview and the questioning from production.

When setting up a professional situation, one of the members of the jury can play the role of technical referent.

A jury composed of two members can observe and evaluate six candidates simultaneously if their safety is guaranteed: simultaneous visibility of these six candidates ensured by a sufficient proximity to their workstations.

The person responsible for the session must allow extra time for the jury to review the tests and the candidates records as well as the consideration of correction and deliberation times.

#### **3.2.1.5. Monitoring and confidentiality conditions during the assessment session**

The person responsible for the session designates an examination supervisor to pass the professional questionnaire.

A technical reference person familiar with the operation of the production facility is required during the professional role-play. He intervenes occasionally in case of technical difficulty during the professional role-play.

## Bibliography/References

1. French labour Ministry. *Référentiel de Certification du titre professionnel “Technicien de production en plasturgie”*, 2018. Available from internet: <http://travail-emploi.gouv.fr> - 2019
2. Finnish National Agency for Education. *Vocational Qualification in Mechanical Engineering and Production Technology* <https://eperusteet.opintopolku.fi/#/en/kooste/3855075> - 2019

## Annexes

No annexes