



Integrating Companies in a Sustainable Apprenticeship System

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Intellectual Output 3

Train-the-Trainer Manual

Pre-stitching

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1. Introduction

1.1. Aims of the ICSAS Project

The aims of the Erasmus+ project «Integrating Companies in a Sustainable Apprenticeship System» are to

- induce the existing Vocational Education and Training (VET) systems to train skilled workers for footwear manufacturing in Romania and Portugal to develop towards work-based learning (WBL) and improve the sector-specific tutor training in Spain and Germany
- develop a sector qualification framework and the referencing of national qualifications of Germany, Portugal, Romania, and Spain.

1.2. Eleven Manuals to Guide In-Company Tutors

Within this project, the project consortium has committed to editing eleven manuals which are intended to prepare in-company tutors and provide support for the work-based learning phases of the apprenticeship.

The work-place specific know-how (for example in the cutting department) will be imparted by skilled workers from this department. They will take on the role of in-house workplace instructors/trainers.

- demonstrating the operations which the apprentices are supposed to learn to perform
- guiding and supervising the apprentices during their first approaches as their skills are becoming more and more advanced
- leading them towards an independent performance of the task

Furthermore, each company enrolled in work-based learning will appoint a Head of Training who is responsible for

- planning of the order of the overall training of each apprentice (how long each apprentice will be trained at each learning station and in which order)
- assessing and documenting the learning progress of each student at each learning station

The chapters of this document are not meant to replace a textbook. They are meant to provide support to the trainers to plan the work-based learning activities with the trainees. The workplace trainers are invited to gather more information from other sources.

1.3. Take Your Apprentices on a Guided Tour

Before you start the hands-on training in a specific department, please make sure that the apprentice has been given a tour of the entire company including all departments.

For example, you could start with presenting the types of products your company manufactures and their intended use, the different customer segments, the distribution channels etc. Allow the apprentices insight into the product creation and manufacturing

processes, i.e. product design, pattern making, purchasing department, production planning, and all production departments to warehouse and logistics.

Present some shoe models your company produces (as in Fig. 1). Your trainees will better understand the complexity of the product “shoe.



Fig. 1: Views of shoe parts like on this photo can be very helpful for the trainee to understand the complexity of a shoe

2. Pre-stitching operations

The parts of the footwear product support various processes. In the case of flexible parts, the most common are the skiving and folding, but can also be encountered as splitting, lacing, painting, burning. Some rigid markers (for example, insole, insole reinforcement, bum, staph) are subject to thinning. These processing operations are differentiated and are influenced by the following factors: the nature of the materials from which the patterns are made, the seam type and the product quality class.

2.1. Skiving

Scope

The skiving (Fig. 2) is the reduction in thickness of certain edges of upper in order to avoid discomfort in wear and reduce bulkiness. The skiving could be:

- straight, for folded or painted edges;
- oblique lost, for folded or lapped edge;
- oblique, for lapped edge.

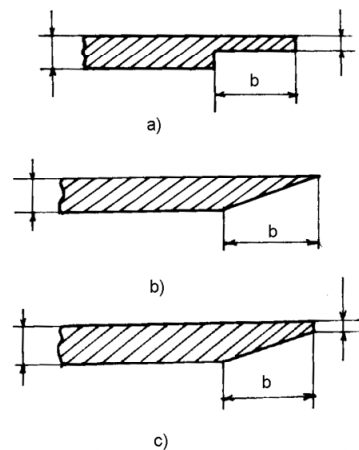
Description of the operation

Skiving can be done manually or mechanically on machines. Dimensional parameters of skiving are (Fig. 2):

- skiving width
- skiving thickness
- material thickness
- the skiving angle.



Fig. 2: Skiving operation



Dimensional parameters of skiving

Possible defects:

- uneven width of the skived edge;
- uneven thickness;
- the type of skiving does not correspond to the technological indications;
- the strength of the material is affected by skiving;
- skived edge is missing or corrugated.

2.2. Splitting

Scope

Splitting (Fig. 3) is done in the purpose of bringing the components of the footwear to a uniform thickness over their entire surface.



Fig. 3: Splitting



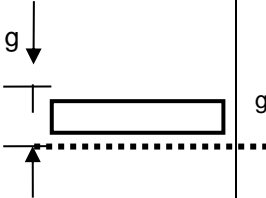
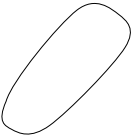
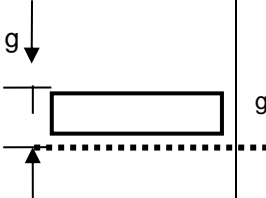
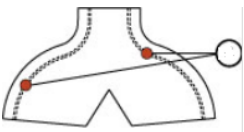
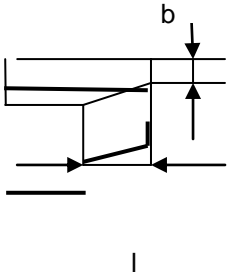
Description of the operation

- The thickness of the parts is reduced by up to 25% and the small parts by up to 70%.
- The splitting of upper components is done using machines with a mobile knife.

Possible defects:

- the thickness is not uniform or does not meet the technological specifications.

Below is an example of a technology sheet for skiving and splitting.

CODE.....				SKETCH			
Technological sheet –Skiving/ splitting							
Code	Component	Type of processing	Scope	The position on the parts	Profile of the edge	Technological parameters	
						Thickness of the edge (mm)	Width of the edge (mm)
001.	collar	splitting	Straightening the thickness			$g = 1,2 \text{ mm}$	All part
002.	tongue	splitting	Straightening the thickness			$g = 0,9 \text{ mm}$	All part
003	counter	skiving	Stitching			$b = 0,9 \text{ mm}$	$l = 10 \text{ mm}$

2.3. Punching

Scope

Punching (Fig. 4) is performed on the edges or on the middle of the parts. Punches can have a decorative or functional / technological role (for example, for lacing, fastening the caps or closures, attaching ornamental accessories, etc).



Fig. 4: Punching

Description of the operation

- The operation is executed manually or mechanically, and the specific tool is called saddler punch.
- Mechanically, the punching is performed on punching machines or by pressing using knives provided with cutting tubes.
- Decorative perforations have different shapes and sizes and are arranged according to previously established drawings.
- The distance between the edges of two adjacent holes must not be less than 3-4 mm. The distance between the centres of holes must be correlated with the diameter of the perforation.

Possible defects

- incomplete, deviated or doubled perforations;
- fibres pulled off the edge of the perforation;
- tearing the material between the perforations

2.4. Marking

Scope

The marking (Fig. 5) is an auxiliary operation which supposed to marking of the position of the holes or stitches. Also, the marking helps to correctly fit the component parts when stitching.



Fig. 5: Marking

Description of the operation

Upper marking is executed manually (using templates) or mechanically, simultaneously with the cutting of the parts (the die are provided with sharp metal tips).

Possible defects

- Deviated signs;
- Visible lines on the surface of the product that are difficult to remove.

2.5. Dyeing

Scope

The dyeing (Fig. 6) is performed on the edges of the upper components where no other machining operations (folding, burning, lacing) are foreseen.



Fig. 6: Dyeing

Description of the operation

- Before dyeing, the leather fibres in the section must be removed by burning.
- The paint must have a low drying period, appropriate for the operation's classification in the technological flow.
- Use solvent-based or water-based paints.

Possible defects:

- Very high hue differences between the part and its section where the paint was applied;
- Paint dries hard or leaves traces of touch.

2.6. Gimping

Scope

The gimping (Fig.7) has decorative role. To achieve great effects, gimping can be combined with punching.



Fig. 7: Gimping

Description of the operation

- It is recommended that the height of the lace should be 1÷3 mm, to prevent the edge from being blown.
- Lace height correlates with material thickness.
- Manual lacing is performed using perforating tools.
- Mechanical lacing is performed with the classic sewing machine, to which the needle has been replaced with a perforating tool.
- The lace edge can also be obtained directly from cutting, if you use die with perforating tools.

Possible defects:

incorrect shape of edge

2.7. Folding

Scope

The folding operation (Fig. 8) is done on the edges of the upper in the scope of their embellishment and reinforcement.



Fig. 8: Folding

Description of the operation

- It can be executed manually or mechanically.
- Prior to manual folding, in areas with sharp curves, the edges of the part are notched to a depth of 3-4mm. The number of nothes is based on the radius of curvature.
- Modern machines allow successive-simultaneous execution of the following phases of the folding operation: gluing of the edges with adhesive; sticking reinforcement - if necessary and pleating or notching the edge.

Possible defects:

- the folded edge does not have a continuous line or uniform appearance;
- the width after bending is uneven;
- the edge has detached or thickened portions.

2.8. Reinforcement

Scope

The upper components, made from thin materials or with large elongations, require reinforcement (Fig. 9). On the inside of the parts, reinforcement parts (intermediate lining) are made of cotton, knit or nonwoven fabrics that have good tear resistance and adequate deformation capacity.

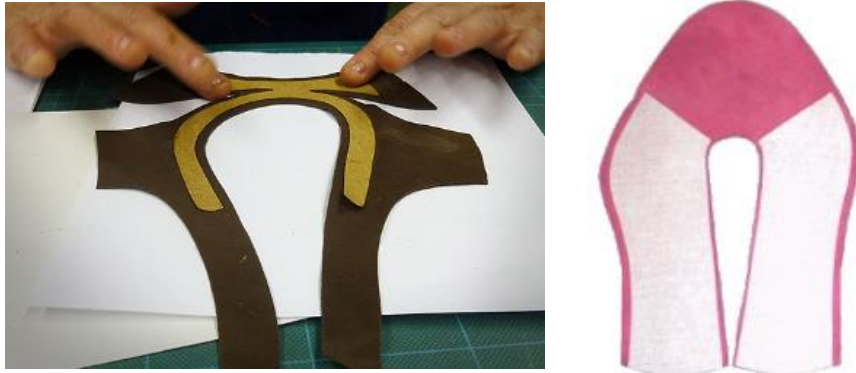


Fig. 9: Reinforcement

Description of the operation

- Upper strengthening can be done manually by applying a self-adhesive lining and pressing both materials.
- If the operation is performed mechanically, the temperature and the pressing time are set accordingly. The top plate, which presses the lining, is heated to about 100 ° C. Pressing takes 6-8 seconds, time required to fluidize the adhesive and adhere to the two layers of material.

Possible defects:

- upper and linings have not been centred;
- the edges of the reinforcement are visible on the upper;
- the lining has not been properly glued, it breaks down on certain portions;
- the material is affected by the pressure plate temperature;
- there are creases or deformations of the upper.

2.9. Introducing reinforcement tape

Scope

The stiffening tape (Fig. 10) is applied to the edge of the quarters of shoe or on the strips of the sandals.



Fig. 10: Reinforcement tape

Description of the operation

The operation is performed before folding the edge (at manual folding) or at the same time (when folding machines are used).

Possible defects:

- inappropriate distance to the edge of the part, which will lead to the notching of the stitch under the folded edge, respectively in the stitch;
- edge stiffening due to the use of an inappropriate adhesive;
- thickening of the edge.

2.10. Smoothing the stitch

Scope

The smoothing of the stitching (Fig. 11) of the quarters is executed if the seam is accomplished by a closed stitch or zig-zag with overlapping parts. This avoids the thickening that would occur along with the stitch.



Fig. 11: Smoothing the stitch



Description of the operation

- The operation can be performed manually by hammering, using the hammer and a marble plate.
- The smoothing machine flattens the seams and allows the simultaneous application of self-adhesive textile tape.

Possible defects:

- the textile tape has not been fastened properly or symmetrically to the seam line;
- after smoothing, the thread used for the joint has cut the upper material.

3. Assessment/ Feedback template

3.1. Introduction to feedback sheet

Unlike learning in formal environments as in classrooms or workshops, learning outcomes (LO) from work-based learning (WBL) in a learning station (LS) depend strongly on the actual equipment of the production line and the models and makes, which a shoe factory manufactures. If the shoe models produced do not require certain work tasks of a whole sphere (in stitching or assembly, for example), then it is simply not possible to acquire skills in this production line related to this method.

A systematic and transparent communication on concrete LOs acquired via WBL by a learner/apprentice between tutors, supporting the learner in the various departments, and the head of training, being responsible for the entire training programme, is of great importance in WBL.

With the intend to provide a concise and handy communication tool, we recommend using the matrices as shown below: They allow tracking the achievements of each trainee in each department in a quick and easy way. The matrices do not refer to any formal assessment; they simply state the degree of autonomy each trainee was able to reach within the given timeframe in each Sphere of Activity.

The matrices list the main work tasks (in bold) and the performance that can be acquired in each department. The work tasks refer to the acquired skills; to indicate that they include key competencies and knowledge the underlying elements for some of the work task are listed.

How to use the matrices: In order to give feedback on the learning progress of each trainee, please tick off the level of autonomy the learner has reached for each work task (choosing between needs assistance / needs instruction / needs supervision / completely independent).

If the work task in the matrix was not part of the training, you can leave it out or erase the work task; if additional work tasks were trained, please feel free to continue the list of work tasks according to your training goals.

In the end, the matrices will document what each learner has been able to acquire and which level of autonomy she/he has reached. And again, although this has already been said: Please bear in mind that you may have to adapt the matrices according to the processes and to the operations in your department.



Sphere of Activity: Pre-stitching

Work task: Skiving

Reading & understanding work ticket;
 Adjusting the skiving machine applying the safety measures;
 Picking the right parts to be skived from the batch box;
 Performing the skiving operation applying the safety measures;
 Controlling own work and identifying possible defects;
 Asking for support if needed.

Evaluation

Needs assistance	Needs instruction	Needs supervision	Completely independent
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Place, Date

Signature

Work task: Splitting

Reading & understanding work ticket;
 Adjusting the splitting machine applying the safety measures;
 Picking the right parts to be split from the batch box;
 Performing the splitting operation applying the safety measures;
 Controlling own work and identifying possible defects.
 Asking for support if needed.

Evaluation

Needs assistance	Needs instruction	Needs supervision	Completely independent
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Place, Date

Signature

Work task:				Other pre-stitching operations: Punching, marking, dying, gimping, folding, applying reinforcements (tape, toe puffs, rubbing down and taping back seam etc.)			
[Please set up the criteria in this section in line with your evaluation needs according to the example given above]							
Evaluation							
Needs assistance		Needs instruction		Needs supervision		Completely independent	
<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>		<input type="checkbox"/>	
Place, Date				Signature			
Final evaluation (in this department)							
Pre-stitching; including all work tasks above							
Evaluation							
Needs further training				Can perform all work tasks (almost) independently			
<input type="checkbox"/>				<input type="checkbox"/>			
Place, Date				Signature			



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