Integrating Companies in a Sustainable Apprenticeship System

Project 2017-1-DE02-KA202-004174

Intellectual Output 3

Train-the-Trainer Manual

Pre-lasting

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Contents

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-LASTING OPERATIONS

The lasting process is anticipated by a series of operations with a preparatory role named pre-lasting operations: applying the toe puff, applying the stiffener, back-part pre-moulding, dressing the insoles, preparation of the lasts, conditioning the uppers, applying the insole on the last, forepart pre-moulding.

2.1. Applying the toe puff

Scope

The forepart area of the shoe may be stiffened or not, depending on the type of construction and the purpose of the shoe.

When thicker fabrics or thicker materials are used, the edge of the toe puff is previously skived.

Description of the operation

This operation can be done in the stitching or in lasting room. When a thermoplastic toe is applied, proceed in the same way as with the application of the hot pressing cushions (Fig. 2). A centralized and even distancing of the toe against the uppers should be ensured and the folds should be avoided.

Fig. 2: Applying the toe puff; Source: www.olympicltd.gr/gr/tpa-11-2

Possible defects:

- the toe isn't properly fixed;
- it is not centred;
- the distance to the edge of the margins is not even;
- the uppers are thermally affected by the hot pressing;
- presence of creases.

2.2. Applying the stiffener

Scope

This operation supposed to inserting the stiffener between the uppers and lining (Fig. 3).

Fig. 3: Applying the stiffener; Source: http://denishoe.blogspot.com/2013/07/lasting-7-wrapping-last-with-upper.html

Description of the operation

Artificial materials, leather or thermoplastic materials are used.

Possible defects:

- deformation;
- improper fixing of the stiffener;
- creases and folds.

2.3. Back-part pre-moulding

Scope

When the stiffener is applied, it should be pre-moulded in order to create an initial shape for the uppers (Fig. 4).

Fig. 4: Back-part pre-moulding, Source: https://www.olympicltd.gr/en/multiform4

Description of the operation

The technological parameters of the machine (pressure, temperature, time) must be adjusted according to the type of stiffener used.

Back part moulding machines must be properly equipped and adjusted (source: Fit2Com). The possible adjustments are:

- selection of appropriate moulds
- adjusting the closing pressure of the moulds
- adjusting the wipers according to the material thickness
- adjusting the holding pressure of the pincers
- adjusting the pulling force
- temperature setting for aluminium moulds and for “soft” moulds (such as silicone moulds).
- setting the correct activation temperature and time
- setting the correct cooling (moulding) time; thereby the temperature is mostly the lowest possible sub-zero temperature
- use a peripheral pre-heating and/or cooling device for optimum shape fixing after moulding in case the machine activation and/or cooling does not suffice

Possible defects:

- deformation;
- improper fixing of the stiffener;
- creases and folds.

2.4. Dressing the insole

Scope

The operation is performed for some models opened in the back and/or back regions (Fig. 5).

Fig. 5: Dressing the insole; Source: Papucei

Description of the operation

The preparation and the dressing of the insoles is made according to the technical sheet of the model. The operation is done manually and involves applying the adhesive on the insole and strip surfaces.

Possible defects:

- folds;
- improper application of the strip.

2.5. Check and prepare the lasts

Scope

The needed number of lasts (Fig. 6) is dimensioned and prepared for the entire series of sizes in order to achieve the planned production according to the required timetable.

Fig. 6: Preparation of the lasts; Source: www.fagus-grecon.com/

Description of the operation

The lasts are checked against the following criteria: the appearance of the surfaces, the dimensional correspondence, the strength characteristics, the integrity of the metal elements (metal sole, bushings, gripping devices).

The dimensional verification of the lasts is done by using the controlling templates.

Possible defects:

- damaged plantar or dorsal surface;
- deformation or dimensional change;
- damaged metal items.

2.6. Conditioning the uppers

Scope

By conditioning the uppers, the lasting process is more easily done, the stresses on the materials that structure the shoe are reduced, and the stitch resistance increases (Fig. 7).

Fig. 7: Conditioning the uppers; Source: www.olympicltd.gr/gr/x-treme-soft-48-2

Description of the operation

Before forepart lasting the uppers are damp or thermo-activated. During lasting, by keeping uppers under load, the relaxation phenomenon manifests, which leads to the increase of the remaining component of the deformations.

Setting the activation time and temperature, just as other adjustments that require heat for a certain duration of time, should be done according to proven adjustments of similar models and materials. The first approach to set the temperature should target a lower value than the expected value. The temperature is then gradually increased if it is not sufficient. The activation time is often pre-fixed.

Formula: Heating time = cycle time – manipulation time – time reserve

There are two basic activation machines types with regard to how heat and water vapour are generated:

- Open system: Water vapour at 100°C; danger of rapid condensation on cold surfaces. This system could be improved by spraying the water vapour against an hot air blower (the hot air stream reaches up to 400°C).
- Closed system: water vapour is created in a pressurised container. The overheated steam penetrates the leather in a very homogenous way and does not leave water stains (which can be a problem, notably on sensitive leathers such as nubuck). (Source: Step2Sustainability)

Possible defects:

- too strong or insufficient wetting;
- uppers blot.

2.7. Applying the insole to the last

Scope

Temporarily fixing the insole on the plantar surface of the last with tacks or tap.

Fig. 8: Applying the insole to the last using tacks; Source: www.sogorbmac.com

Fig. 9 Applying the insole to the last using tape; Source: www.tapepeel.com/en/tapepeel/

Description of the operation

This operation can be executed manually or mechanically and mean a provisional fixing of the insole on the last using nails, tacks or frames.

The gripping elements pass through the insole and penetrate the last on a depth of 4-10 mm. In some cases, the insole is fixed with tape.

Possible defects:

- incorrect centring of the insole;
- long or short insole.

2.8. Forepart pre-moulding

Scope

The aim of this operation is to pre-tensioning the uppers in order to prepare the lasting allowance for gripping in the pliers of the forepart lasting machine.

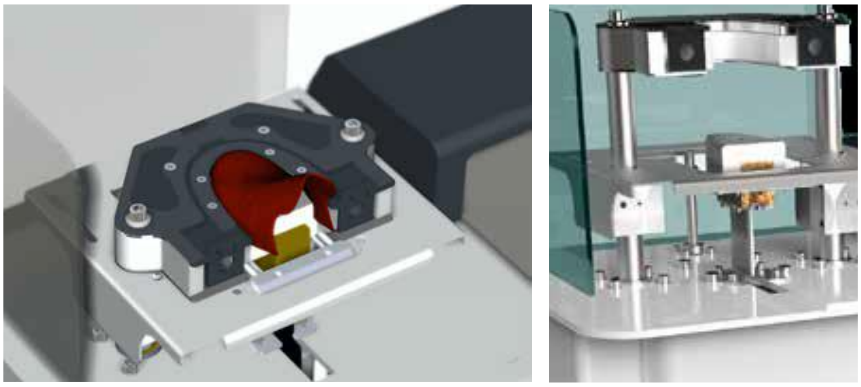

Fig. 10: Forepart pre-moulding; Source: www.olympicltd.gr/gr/tm-17-toe-molding-machine

Description of the operation

Lasting machines are provided with a static device located on the left or right of the machine's working area. This device is in the form of a clamp that allows to grip the toe area and pre-tension the uppers.

The uppers are held for several minutes in tense state in this device before the actual lasting operation has taken place.

Possible defects:

- the toe is not properly centred;
- lasting allowance is too big or small.

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-lasting

Work task:	Incoming batch boxes / trolleys

Receiving and controlling lasts (using last profiles), materials, uppers and bottom components (insole, toe puffs, stiffener etc.);

Asking for help if needed.

Evaluation

Needs assistance	Needs instruction	Needs supervision	Completely independent
☐	☐	☐	☐

Place, Date Signature

Work task:	Toe puff application

Reading & understanding work ticket;

Adjusting the ironing machine;

Performing the task applying the safety measures;

Controlling the work result and identifying possible defects;

Asking for help if needed.

Evaluation

Needs assistance	Needs instruction	Needs supervision	Completely independent
☐	☐	☐	☐

Place, Date Signature

Work task:	Backpart pre-moulding

Reading & understanding work ticket;
Selecting the appropriate moulds and adjusting the settings of the pre-moulding machine;
Performing the pre-moulding operation applying the safety measures;
Controlling the work result and identifying possible defects;
Asking for help if needed.

Evaluation

Needs assistance	Needs instruction	Needs supervision	Completely independent
☐	☐	☐	☐

Place, Date Signature

Work task:	Other pre-lasting operations, e.g. upper pre-conditioning, attaching insole to the last, forepart pre-moulding, etc.

[Please set up the criteria in this section in line with your evaluation needs according to the examples given above]

Evaluation

Needs assistance	Needs instruction	Needs supervision	Completely independent
☐	☐	☐	☐

Place, Date Signature

Final evaluation (in this department)

Pre-lasting; including all work tasks above

Evaluation

Needs further training	Can perform all work tasks (almost) independently
☐	☐

Place, Date Signature

4. List of tables