



Integrating Companies in a Sustainable Apprenticeship System

Project 2017-1-DE02-KA202-004174

Intellectual Output 3A

Learning-Teaching Activities - Quality Assurance -

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Version: Final



Erasmus+

This project has been funded with support from the European Commission.

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Contents

1. WORK-BASED QUALITY ASSURANCE TRAINING.....	3
1.1. What to prepare	3
2. FOOTWEAR INSPECTION EXERCISES	6
Exercise 1:.....	6
Exercise 2.....	8
Exercise 3.....	9
Exercise 4.....	9
3. LIST OF TABLES	10

1. Work-Based Quality Assurance Training

1.1. What to prepare

In order to start the work-based training, there is a list of things to prepare:

- Working table
- Ruler and measuring tape.
- Grey scale for evaluating colour variation.
- Photo camera.
- Model pair of shoes for inspection.
- Copy of standard ISO 2859-1 for preparing the sampling plans.
- Arrow-shaped stickers to mark the defect found.
- Printed copy of the inspection report template to fill it out.



Fig. 1: Work-based learning / working table



Fig. 2: Graduated ruler to measure distances



Fig. 3: Measuring tape to measure curves and girths



Fig. 4: Grey scale to check colour variations between the confirmation sample and the manufactured samples



Fig. 5: Photo camera to document the samples and the defects found



Fig. 6: Confirmation pair and packaged shoe pairs to perform the inspection

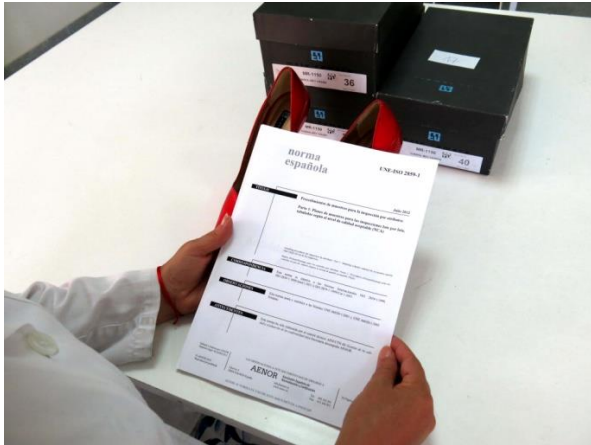


Fig. 7: Copy of standard ISO 2859-1 to establish a sampling plan

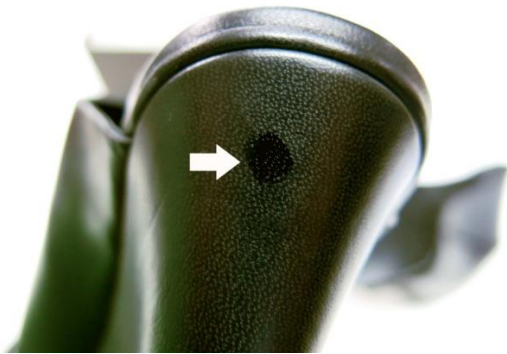


Fig. 8: Arrow-shaped white sticker to mark the defects

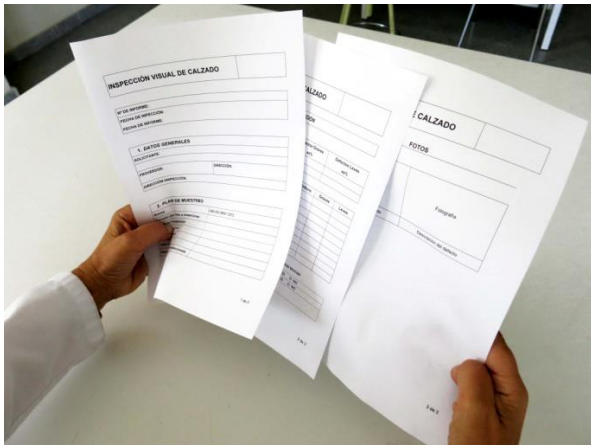


Fig. 9: Inspection report template

2. Footwear inspection exercises

Exercise 1:

The apprentice is expected to become familiar with the use of the tables to prepare the sampling plans.

Taking the following parameters:

- Level of inspection: II
- Type of sampling: Single
- Type of inspection: Normal

The apprentice must prepare the sampling plan according to the tables of Figure 10 and 11 for different lot sizes and Acceptance Quality Limits (AQL).

Lot size		Special inspection levels				General inspection levels		
		S-1	S-2	S-3	S-4	I	II	III
2 to	8	A	A	A	A	A	A	B
9 to	15	A	A	A	A	A	B	C
16 to	25	A	A	B	B	B	C	D
26 to	50	A	B	B	C	C	D	E
51 to	90	B	B	C	C	C	E	F
91 to	150	B	B	C	D	D	F	G
151 to	280	B	C	D	E	E	G	H
281 to	500	B	C	D	E	F	H	J
501 to	1 200	C	C	E	F	G	J	K
1 201 to	3 200	C	D	E	G	H	K	L
3 201 to	10 000	C	D	F	G	J	L	M
10 001 to	35 000	C	D	F	H	K	M	N
35 001 to	150 000	D	E	H	J	L	N	P
150 001 to	500 000	D	E	H	J	M	P	Q
500 001	and over	D	E	G	K	N	Q	R

Fig.10. Table 1 of standard ISO 2859-1

Table 2-A — Single sampling plans for normal inspection (Master table)

Sample size code letter	Sample size	Acceptance quality limit, AQL, in percent (nonconforming items) and number for sizes per 100 items (normal inspection)																											
		0,010	0,015	0,025	0,040	0,065	0,10	0,15	0,25	0,40	0,65	1,0	1,5	2,5	4,0	6,5	10	15	25	40	65	100	150	250	400	650	1 000		
A	2	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	Ac Re	
B	3																												
C	5																												
D	8																												
E	13																												
F	20																												
G	32																												
H	50																												
J	80																												
K	125																												
L	200																												
M	315																												
N	500																												
P	800																												
Q	1 250																												
R	2 000																												

↓ Use the first sampling plan below the arrow. If sample size equals, or exceeds, lot size, carry out 100 % inspection.
 ↑ Use the first sampling plan above the arrow.
 Ac = Acceptance number
 Re = Rejection number

Fig.11. Table 2.A of standard ISO 2859-1

The gaps of the following table must be filled on with the code letters of the sample size, the simple sizes, the acceptance values (Ac) and the rejection values (Re).

Lot size	92	200	720	1.203	3201
Acceptance Quality Limit (AQL)					
Critical defects (%)	0	0	0	0.65	1
Major defects (%)	0.65	1.5	2.5	2.5	2.5
Minor defects (%)	2.5	4.0	6.5	4.0	6.5
Code letter					
Sample size					
Critical defects					
Major defects					
Minor defects					
Acceptance value (Ac)					
Critical defects					
Major defects					
Minor defects					
Rejection value (Re)					
Critical defects					
Major defects					
Minor defects					

Exercise 2.

The apprentice is expected to identify the defects present in the pairs of shoes delivered compared to the confirmation pair of shoes.

10 shoe pairs are delivered to the apprentices, numbered from 1 to 10 for them to correlate the defects found with each pair.

Afterwards, the results will be shared and gathered.



Fig. 12: Ten pairs of shoes numbered from 1 to 10

Exercise 3.

The apprentice is expected to know how to classify the type of defect as critical, major or minor.

With the results obtained in the previous exercise the apprentice will be asked to classify the defects found in every pair.

Then the results will be shared to agree on the type of defect.

Exercise 4.

With the knowledge acquired, the apprentice shall create a sampling plan on a production lot and shall prepare an inspection report based on the following acceptance quality level:

- 0 % critical defects
- 2,5% major defects
- 4% minor defects



Fig. 13: Example of a production lot arrangement

A report template similar to that of Figure 9 will be handed out as a guide.



3. List of tables

Fig. 1: Work-based learning / working table	3
Fig. 2: Graduated ruler to measure distances	3
Fig. 3: Measuring tape to measure curves and girths	4
Fig. 4: Grey scale to check colour variations between the confirmation sample and the manufactured samples.....	4
Fig. 5: Photo camera to document the samples and the defects found	4
Fig. 6: Confirmation pair and packaged shoe pairs to perform the inspection	4
Fig. 7: Copy of standard ISO 2859-1 to establish a sampling plan	5
Fig. 8: Arrow-shaped white sticker to mark the defects	5
Fig. 9: Inspection report template.....	5
Fig.10. Table 1 of standard ISO 2859-1	6
Fig.11. Table 2.A of standard ISO 2859-1	7
Fig. 12: Ten pairs of shoes numbered from 1 to 10	8
Fig. 13: Example of a production lot arrangement	9