BASIC FOOTWEAR PRODUCTION LEVEL I

Based on Nov, 2019 V5 OS and Feb, 2020 V1 Curriculum

Module Title: Performing Leather Grading

LG Code: IND BFP1 M06 LO (1-7) LG (23-29)

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Table content

LG #23	LO #1- Identify, prepare and use hand tools and equipment

Instruction sheet

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This learning guide is developed to provide you the necessary information regarding the following content coverage and topic

- Identifying hand tools and equipment
- Checking tools for serviceability and safety
- Clearing work area
- Cleaning, checking, maintaining and storing hand tools and equipment

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to:

- Hand tools and equipment which are consistent with grading operations are identified.
- Tools are checked for serviceability and safety and faults.
- Work area is cleared following workplace standard procedures.
- Hand tools and equipment are cleaned, checked, maintained and stored in accordance with manufacturers' specifications and standard work practices

Learning Activities

1. Read the specific objectives of this Learning Guide #1.
2. Read the information written in the "Information Sheets 1- 3". Try to understand and familiarize what are being shown and discussed. Ask your teacher for assistance if you

have hard time understanding them.

3. Accomplish the “Self-check-1” .
4. Submit your accomplished Self-check-1. This form will be part of your training portfolio.
5. Read the information written in the “Information Sheets 3”. Try to understand and familiarize what are being shown and discussed.
6. Accomplish the “Self-check-2” .
7. Submit your accomplished Self-check-2.
8. Read the information written in the “Information sheet ”. Try to understand and familiarize what are being shown and discussed.
9. Accomplish the “Self-check-3”.
10. Submit your accomplished Self-check-3.

Information Sheet-1 Identifying hand tools and equipment

1.1, Identifying hand tools and equipment

The object or the building he is creating is the ultimate goal and his drawing techniques are not the structure but a scaffold, vary necessary to be sure but certainly not to be elevated to a position of importance equal to that of the finished structure or drawn object.

regions using grading tool (grid plate***)*** and put the exact size in dm.sq.

Technical grading instruments allow drafters to produce precise drawings and student how to know leather area

Technical drawing instruments are the tools used by professional and student drafters to render the precision leather graphics needed to manufacture a product or structure.

- ✓ calculator(simple)
- ✓ grid (leather measuring)
- ✓ white pencil(glass marking)
- ✓ markers/ sketch pen)
- ✓ hand cutting knife white cloth
- ✓ thickness gauge

1.2. White pencil (glass marking)

These instruments take many forms because of the variety of lines and graphics needed for

designs.

Some instruments are manual, while others are computer-based.

All professional quality drafting instruments are manufactured with precision because the drawings they're used to make must be precise.The following information assumes a right-handed drafter.

Wherever "left" or "right" is written, the opposite direction may be substituted to apply to a left-handed drafter.

Figs 1, hands drafter

Then sum up the exact size of defected region in dm.sq on the leather, and convert the decimeter square into feet square by dividing the result by 9.29.At this point the exact value/size of defects on the leather is known by sq.ft. From this it is possible to calculate the percentage of wastage

$$\text{Percentage of wastage} = \left(\frac{\text{Total defect area of leather}}{\text{Total area of leather}}\right) * 100$$

After we calculate the percentage of wastage the grade of leather.

While categorizing leather according to the calculated value it may came new grade that is different from formally described by the tannery. Or the new calculated grade is the same as that of the previous one.If the regarded value is different, Purchase cost variance calculation will come after. This used to show the loss of cuttable leather value and how much money we

lost by paying for the wrong grade. Based on the result of regarding and purchase cost variance calculation the foot wear factories can appeal to the tannery on the losses.

1.1.3,Grid (leather measuring

Use grading tool (grid plate which is commonly 10 sq. dm size)

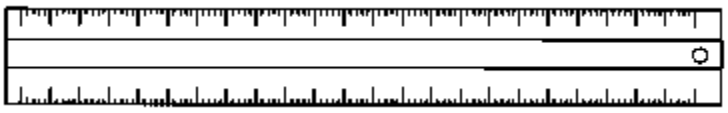
1	**2**	**5**	**7**	**9**
2	**4**	**6**	**8**	**10**

= 10 sq.dm

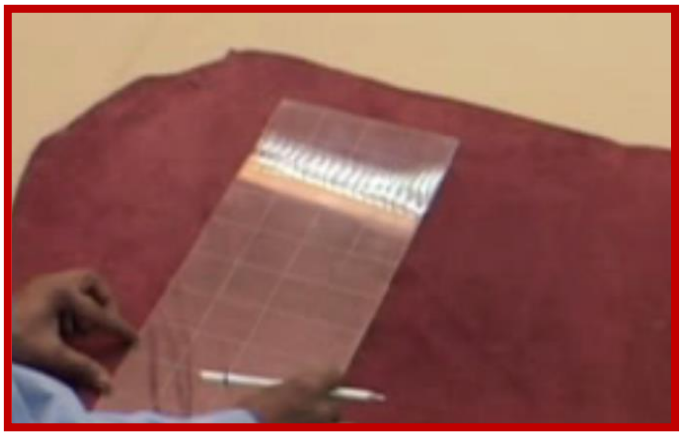
1	**2**	**3**	**4**
5	**6**	**7**	
8	**9**		
10			

Table leather leather measuring

Ruler



- ✓ Using area measuring grid tool (commonly used in footwear factory for the purpose of regarding and very close to the actual and accurate size.)



Figs 2, area measuring grid leather

The Common leather defect measuring methods are:

By necked eyes (observation and judgment) –it required experience but not an accurate method.

By using hand-fist (resemble/close to accuracy.)

By using measuring grid tool (widely used and the most accepted one. Still it is not 100% accurate)

In addition to the above method, there are other method used in different countries and institutes. Now a day, digital computerized leather defect sensor instrument also innovated. Who knows in the near future this instrument might be one of the commonly used leather defect measurement method.

$$\text{Percentage of wastage} = \frac{\text{Total defect area of leather}}{\text{Total area of leather}} * 100$$

Self-Check -1 Written Test

Name: _____ Date: _____

Time started: _____ Time finished: _____

Directions: Answer all the questions listed below.(4point)

Short answer questions

1. What is the formula of calculating the percentage wastage area of leather (1 points)
2. What are the objectives of leather grading? (2 points)

Choose the correct answer

1. What are the common leather defect area measuring methods?

   A) necked eyes (observation and judgment) b) using hand-fist

   c) Using measuring grid tool d) digital computerized leather defect sensor e) all

Total mark (4)

Note: **Satisfactory rating - 4points Unsatisfactory - below 4points**

You can ask you teacher for the copy of the correct answers

Information Sheet 2 Checking tools for serviceability and safety

1.2 ,Checking tools for serviceability and safe

Leather is a very complex material, which there are, however, a few crude and quick tests, which can help the buyer in taking correct decision.

These tests will give a danger signal, regarding the whole consignment. so before buying and simply receiving the whole ordered leather depending only on the tanneries' leather grading system, while receiving the order by using random tests method reassessing is very crucial. Then, after receiving the whole order before using it directly for production, conducting reassessment/re-grading of the whole consignment is important.

Once all machinery and plant have been identified, the hazards associated with them can be identified.

Physical hazards ;are such as noise, heat/cold, radiation, microwaves, etc.

Chemical hazards; are derived from chemical used in the work place including toxic gases, noxious fumes and flammable/ corrosive liquids.

Ergonomic hazards; are related to physical dimensions of equipment, the placement of equipment and accessibility of a storage area, the weight of equipment or the support of furniture.

Movement hazards ;are caused by a manual handling such as lifting or moving loads and repetitive movement**.**

Heat ; Wear heat resistant gloves when carrying hot parts and equipment.

Avoid working conditions with poor ventilation may lead to heat stress.

Electricity; Electricity is a serious hazard because electric shock can be fatal.

2.3.Safety requirements

- In using a Cutting machine/clicking machine the following safety rules must be followed.
- Do not operate the machine without prior approval
- Do not work without written job order card

- Only one person is allowed to work on the machine at one time
- Before the start of the cutting, check the die for the Article, Size, and Upper/lining/interlining.
- Before starting cutting, set the pressure and adjust the aluminum plate 10mm above the die
- Check the die for deformation of shape before proceeding for cutting
- Do not keep the Dies on top of the other
- Switch off the machine when not in use
- Use only one die on the Nylon board while cutting material

Knives:

Use the right knife for the task.

- Keep knives sharp
- Always cut on a stable surface, like a cutting board.
- Always cut away from your body.
- Store knives safely in a rack or knife block.
- Don't leave knives in washing –up water.
- Always carry knives with the blade pointing downwards.

Splitting machine

- ✓ Do not operate the machine without prior approval
- ✓ Switch off the machine when not in use
- ✓ Only one person is allowed to work on the machine at one time
- ✓ Do not work without written job order card

Grinder

In using a grinder especially for blade making; the following safety points must be followed.

- Hair must be tied back
- Wear tight clothes
- Shoe must be protective
- Do not operate the machine without prior approval.
- Do not work without safety glass.
- Only one person is allowed to work on the machine at one time.
- Switch off the machine when not in use.
- Do not spill the water on the machine.
- Break the hack saw blade on the vice.
- Do not wear loose cloth while sharpening the blade,
- Clean your work place after completing your work.
- Do not walk around carrying the knife with the cutting blade exposed. It can cause injury.
- Do not try and catch a falling knife instead when it is not in use put your knife in a secure place
- Strap cutting machine
- Do not operate the machine without prior approval
- Switch off the machine when not in use
- Only one person is allowed to work on the machine at one time
- Do not work without written job order car

Skiving machine

In using a skiving machine the following safety rules must be followed.

- Set and check the rotary parts of the machine before switch on the machine.
- Belt guard should be in place.
- While sharpening the knife care should be taken so that scraps do not catch fire due to

sparkles.

- Work area must be kept tidy.
- Never use hand to remove jammed material, use a brush or stick.
- Wear specified mask during skiving.
- Wear specified glass during dressing and sharpening.
- Use finger guard during skiving.
- Use appropriate footwear and apron.
- Know your fire drill.
- Inform your superior in case of any events.
- Keep your tools and accessories in reachable place.

Stamping machine

Do not operate the machine without prior approval.

- Only one person is allowed to work on the machine at one time.
- Switch off the machine when not in use.
- do not spill the water on the machine
- do not wear loose cloth while working,
- place the component on machine platform carefully
- keep the hands away from the heated number plate/die
- Clean your work place after completing your work and empty the leather waste in to waste bin only.

Self-Check 2	**Written Test**

Test I: say True if the statement are correct or False if the statement are incorrect:

(Total points: 6)

1. Belt guard should be in place.
2. While sharpening the knife care should be taken so that scraps do not catch fire due to sparkles.
3. Work area do not must be kept tidy.
4. Never use hand to remove jammed material, use a brush or stick.
5. Wear specified mask before skiving.
6. Wear specified glass during dressing and sharpening.

Total mark (6)

Note: **Satisfactory rating - 6points** **Unsatisfactory - below 6points**

You can ask you teacher for the copy of the correct answers

Information Sheet 3 Clearing work area

3.1. Clearing work area

Products that are manufactured from leather are directly and indirectly influenced by the quality of leather.

Generally, defect on leather prominently affects the quality of products, production quantity and productivity of the workers.

Identify different types of defects on the leather Clearing work area
Generally products that are manufactured from defected leathers have degraded value in front of the customer.

3.2. Affect Quality of product /shoes/

Even though defect of leather are group in to closed and open and from this some of the defects are less visible and have less effect on production, commonly defected leather affect the quality of products.
If we use those defected leather for footwear purpose, it affects the quality of the shoe (products) and reduced the appearance.

Identify different types of defects on the leather are one of the reason that enforced the major footwear producers to use materials other than leather(synthetic, textile, canvas etc…)
In addition to this, it incurs additional costs for leather manufacturing tanneries to avoid or hid those defects. So that using these synthetic or corrected leather materials in footwear production directly reduce the quality of products.

Reduce Price of leather and leather products/shoe:

When the percentage area of defect is being going more as compare to the percentage cuttable area of leather, thus directly affect and reduced the grade of leather which in turn reduce the value /price of the leather. And those products/shoes that are manufactured from defect leathers, the price will be lower as compare to product from high quality genuine leather.

Affect production and productivity: If cutter uses and tries to cut defected leather, they will take more time. The more the defected the leather the efficiency of cutter's reduced. This

affects the productivity of the cutter and the cutting section/department. On other hands, while using loose leather and leather that easily tear in stitching and lasting section also affect the production and productivity of the section and workers. On this, leather defect indirectly affects the manufacturing cost of a product and leads to rise/ increase it.

Quantity Check : Upper leather is sold by area, either by sq.ft. Or sq.dm with each batch of leather the tannery should supply a printed list of the No. of skins and their individual area.

It is important to check each delivery for Qty.

The skins in each bundle should be counted to ensure that the No. corresponds to that on the delivery list. The addition of the delivery list should be checked and a total addition made for each leather grade and for the total delivery.

Self-Check 3 Written Test

Name: _____ Date: _____

Time started: _____ Time finished: _____

Short answer (5point)

1, Maine Objective of Clearing work area(2.5)

2,describe Quantity Check (2.5)

Total mark (5)

Note: **Satisfactory rating - 5points Unsatisfactory - below 5points**

You can ask you teacher for the copy of the correct answers

Information Sheet 4 Cleaning, checking, maintaining and storing hand tools and equipment

1.4, Cleaning, checking, maintaining and storing hand tools and equipment

While checking, it is not just simply inspecting the quality of leather instead sorting and identifying the leather as per the shade, grade and types for the required shoe model is very important. common steps to identified and evaluate the leather suitability for cutting are starts before received or buying the whole leather from the tanneries and the inspection shall be continued in the store while receiving from the supplier and before dispatch it to the cutters.

Random testing:

These are conducted in the tanneries before shipping or sign the agreement. Randomly the sample is inspected and the whole batch may be pass or fall.

Incoming leather inspection.After received the whole consignment and before it used in production the following

should be carried out:

The main difference between random sampling testing method from that of reassessment/regrading, in random sampling method only one or two leather from the lot/batch are tested if this tested sample pass the *whole batch* will pass.

But while conducting regrading/reassessment of the consignment the whole /piece/ or each of the leather in the batch should be evaluated and checked.

- ✓ As per the sample quality and quantity should be checked.

Selection of samples

Substance/thickness

Finish appearance

Feel/softness and stretch

Adhesion of finish

Cracking

Wet and dry rub

Strength

Fading

Water repellency

Chemical resistance

Based on the above criteria's, tried to check the quality of the products of the lot/batch.

Based on this the lot will be accepted or reject before the shipment is conducted.

- ✓ Re-grading and purchase cost variance shall be conducted.

Reassessing the grade and sorting into a new grade group if required. Re-grading is sorting the leathers in a new grade. Because the received leathers may not have the quality as written grade on the leather so that grouping as per the actual cuttable area of the leather into a new

4.2.Reason for leather sorting:

Leather is a natural product and is subject to variation from one skin to another, even though most tanneries try to ensure uniformity within batch. In some batches variation may be slight, in order they may be more noticeable.

Even variation of leather not only might happened on the same batch of different leathers, variation of grain, color and shade may also happen on the same(one) leather.

4.3. Variation in leather may include the following:

Color: different skin can show color variation which is a very normal phenomenon with aniline dyed leather.

Substance: skin of the same area and from the same type of animal can often considerably in substance,(thickness) correct leather sorting will ensure that the various substance can be selected and allocated for different styles.

Amount of stretch: the direction of stretch does not very but the amount of stretch does zoning the tanning process the leather can be made finer or softer, which influence the amount of stretch but it is impossible to make the amount of stretch totally uniform.

Grain: the grain of the leather can vary from skin to skin even within single skins; changes in grain structure can also affect color and dyer glass.

Defect and marks: these one caused by numerous natural and man-made sources and

vary widely in degree.

The material is put on the leather horse according to the following rules

At first he can put thinner leather and thicker ones are put up.

Color shades are put from the darkest to the lightest ones step by step (for an easier pairing).

Whole leather is over loaded at the longitudinal axis by grain up and shifted out slightly.

Self-Check 4 Written Test

Name: _____ Date: _____

Time started: _____ Time finished: _____

Choose the correct one: (Mark 3)

1, which one of the leather normal phenomenon with dyed leather.

A ,aniline b ,softer c ,Grain: d , all

2,Which one of the following is the common variation that may happen on the leathers? (2point)

a) Color b) grain C) substance D) amount of stretch E) all

Total mark (3)

Note: **Satisfactory rating - 3points** **Unsatisfactory - below 3points**

You can ask you teacher for the copy of the correct answers

LG #24	**LO #2 Describe principles, and concepts of leather grading**
Instruction sheet	

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to:

- ✓ Understand and describe the principle and concepts of leather grading.
- ✓ Identify and explain the methods of leather grading.
- ✓ Understand and describe the objective of the leather grading.

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to:

- The principle and concepts of leather grading is described.
- The methods of leather grading are explained.
- The objective of the leather grading is described

Learning Activities

1. Read the specific objectives of this Learning Guide.
2. Read the information written in the “Information Sheets 1”.
3. Accomplish the “Self-check 1” Request the key answer / key to correction from your teacher or you can request your teacher to check it for you.
4. If you earned a satisfactory evaluation proceed to “Information Sheet 2”.
5. However, if your rating is unsatisfactory, see your teacher for further instructions or go back

to Learning information sheet

6. Read the information written in the “Information Sheet 2”.
7. Accomplish the “Self-check 2” Again you can request the key answer / key to correction from your teacher or you can request your teacher to check it for you.
8. If you earned a satisfactory evaluation proceed to “Information Sheet 3”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity

11. Read the information written in the “Information Sheet 3”.
12. Accomplish the “Self-check 3” Request the key answer / key to correction from your teacher or you can request your teacher to check it for you.
13. If your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity

Information Sheet-1 describing the principle and concepts of leather grading.

2.1. Describing the principle and concepts of leather grading

Leather grading is the process of sorting out of finished leather into different groups e.g. A, B, C or I, II, III etc., as per the quality and cutting value.

Cutting value is defined as the % usable area i.e. the % area of leather which is free of any defect.

Leather Grading is allocating different type of leather into different group as per the quality and cuttable area of leather.

In other words

Cutting value (C.V.) = 100 – % defective area

% defective area = (Total defective area / area of leather) $\times$ 100.

Example

Net detective area = 5 sdm,

Leather area = 110 sdm.

Defective area $= \frac{5}{110} \times 100 = \frac{50}{11} = 4.54\%$

Cutting volume (100 – 4.5) % = 95.5%

Upper leather varies in nature; no two skins are the same. Because of this a method of sorting for cutting value is recommended. Skin of similar cutting value can be group together and

allocated a grade or point value e.g. the skin of cutting value between 100 to 97% are grouped in grade A 0r 1. Similarly skims of cutting value between 96% to 92% are grouped in grade B or 2 etc. Each tanner has his own standards. Some tanners grade by A.B.C. etc. and some by 1.2.3. Etc.

1.2:The purpose of leather grading can be dividing into two areas:

1. Financial implications, and
2. Quality implications.

Financial Implications:

By this we are establishing whether the company has brought the consignment of leather at correct price or not i.e. if the company has paid 20,000/- birr for purchasing 500 sq.ft of leather whether they have received the material worth 60,000 or not.

Quality Implications: This is the grading of the leather into various grades to allow the cutting room to issue certain grades of leather for certain styles.

Examples: Ladies single cut court shoe would be cut from 1st and 2nd grade leather whereas Ladies strap sandal could be cut from 3rd and 4th grade.

In strap sandals we can utilize the defective area of leather too in certain portion. We can also establish true profit and loss figure's for each clicker.

This will be discussed in detail in cutting corrected grain.

1.3, Percentage of defects:

Calculation of Cutting Value and percentage of defects

As we have seen earlier, the cutting value is calculated as a percentage on 1st grade skin we have an allowance of up to 3% defected area.

The following table shows the various grading allowances. (Note: This will be discussed in detail in cutting technique handout).

The grades after 1st grade all vary by 5%.

Grade	Cutting Value	%Wastage(defects)
A or 1	100% to 97%	Up to 3%
B or 2	96% to 92%	*8%*
C or 3	91% to 87%	13%
D or 4	86% to 82%	18%
E or 5	81% to 77%	23% etc.

1.4.Units of measurements

The common units of leather measurement in footwear factories and leather manufacturing tanneries are:-

- Square feet (sq.ft): the most commonly used measuring unit as compare to the other units.
- Square decimeter(sq.dm)
- Square meter(sq.m)
- Square centimeter (sq.cm)

1.5 Conversions of units of measurements

As described above, the most commonly used leather measuring unit as compare to the other units in different leather measurement in footwear factories and leather manufacturing tanneries is Square feet (sq.ft).the following table shows how to convert from one leather measuring unit to the others.

1 feet = 0.3048 meter = 30.48 centimeter = 3.048 decimeter
1 Square feet (sq.ft) = 9.29 Square decimeter(sq.dm)

1 Square feet (sq.ft) = 929 Square centimeter (sq.cm)
1 Square feet (sq.ft) = 0.0929 Square meter(sq.m)

Self-Check -1 Written Test

Name: _____ Date: _____

Time started: _____ Time finished: _____

Short answer (10point)

Write the common units of leather measurement in footwear factories and leather (5point)

1,_____

2,_____

3,_____

4;_____

Total mark (4)

Note: **Satisfactory rating - 4points Unsatisfactory - below 4points**

You can ask you teacher for the copy of the correct answers

Information Sheet-2 Explaining the methods of leather grading

2.2:Explaining the methods of leather grading

The leather grading system employed by leather upholstery manufacturers and suppliers is used as a means of differentiating and marketing individual types of leather by price, based on quality or style.

The grading system is the method manufacturers use to present their pricing structures to retail dealers.

Leather suppliers also use a grading system to distinguish their leathers and prices to manufacturers.

2 .3.This classification works efficiently

This classification works efficiently and is simple to understand within the context of each individual leather line, but problems crop up if one attempts to compare or contrast leathers from line to line or from manufacturer to manufacturer.

With lower grades typically beginning at "A" or "1", one producer's "C" may be another's "5" or "6". Problems arise because the system is far from uniform.

"The thing about grades that makes it confusing is there is no industry standard," said Bruce Schronce, Century's manager of merchandising and product development for leather. "Everyone has a different grade. Basically each grading system serves the company's own standards. It would be too difficult to organize a standard for everyone."design. Additionally other might use different from the above four leather grading system.

2.4.Selected Grade (S.G.)

In this method the buyer orders the grade of leather required for a particular shoe style. Although the buyer has ordered a particular grade, it is still recommended that the leather be graded to check for grade variation. In this way, accurate evaluation of the price will be obtained and any price variation can be claimed from the tannery.

Remember there is no standard for tanners grading and these standards vary between tanneries. When regarding has been completed it is recommended that a price variance account be kept to monitor the gains or losses, resulting from such regarding.

A. Table run(T.R): table run of leather is a mixed selection of various grades. The buyer and the tannery normally agree on a price which is on the middle grade.

Example: If grade 1, 2,3,4,5 was to be accepted then the buying price they would be based on third grade. The leather received from the tannery would also be expected to contain reasonable % of all grades. When buying T. R. leather it is essential to regarded the leather into the individual grades, to assess, if the company has received value for money.

B. Grading with respect to design: In this method the leather grader takes into account the design of the shoe to be cut, and grades the leather to those requirements. For example a shoe with 20 per/pair, it is profitable to cut this from a lower grade leather may be 4th grade leather as per the tanneries method of grading. But, when we issue that leather to a cutter we upgrade the leather we may issue it as 2nd grade leather as in this case the total defective (waste) area of leather is reduced since we are in a position to utilize the defective area too due to so many small components. This method is called grading with reference to design.

C.Grading Without Reference to Design: In many factories grading is done similarly to the method used in tanner's that is the leather is graded on area defects only.

The design is not considered at all while doing leather grading.

Self-Check -2 Written Test

Name: _____ Date: _____

Time started: _____ Time finished: _____

Directions: Answer all the questions listed below. (3point)

1, Selected Grade

2, Grading Without Reference to Design(2point)

a) ----------.----------

Total mark (5)

Note: **Satisfactory rating - 5points** **Unsatisfactory - below 5points**

You can ask you teacher for the copy of the correct answers

Information Sheet-3 Describing the objective of the leather grading

2.3 ,Describing the objective of the leather grading

Leather grading is done to assess the financial implications and quality implications after purchasing.

As afoot wear factory, results from grading of leather helps the management to make decision at which grade of leather the shoes or the product would be suitable to produce with respect to the product quality.

In leather grading, normally the price is fixed on the middle grade and the rates of other grades vary by 5%.

The buying price, that is the price paid by the factory for the shipment would be the middle grade price (40 birr) per material.

3.2. Basically the propose and importance of leathers grading are:

- ✓ As afoot wear factory, In order to calculate and know the area discrepancy
- ✓ It is the difference in area received end area marked on leather
- ✓ After buying the leather and to have tangible reason for complain.
- ✓ As afoot wear factory, instead of categorizing the leather by SC or TR, leather grading helps to know the actual cuttable area of the leather (i.e.: A,B,C,D,E).
- ✓ While conducting grading of leather, defected areas will be identified and this helps the cutters to increase the productivity.
- ✓ As afoot wear factory, purchase variance account be kept to monitor the gains and losses resulting from regarding of leather.
- ✓ These records may help to obtain refunds from tanneries or may influence decision to change tanneries or accept a price increase.
- ✓ In leather grading, normally the price is fixed on the middle grade and the rates of other grades vary by 5%.

The buying price, that is the price paid by the factory for the shipment would be the middle grade price (40 birr) per material.

All grades above this middle grade would increase by 5% in price and all grades below the middle grade would reduce by 5% in price e.g. in the above example, the rate i.e. 40 br prs./sq.ft., is fixed on 3rd or C grade which is the middle grade and the rate of 2nd grade will be 5% more than the middle rate., i.e. (40 + (5% of 40)) = 42 prs./sft., and the rate of 4th grade will be 5% less than 3rd grade i.e., the middle grade i.e., (40 – (5% of 40)) = 40 – 2 = 38br prs./sq.ft.

Self-Check -3 Written Test

Name: _____ Date: _____

Time started: _____ Time finished: _____

Some explanations /answers

1,Maine objective of leather grading (3 points)

Fill in the blanks (2 points)

In leather grading, normally the price is fixed on the middle grade and the rates of other grades vary by _____ %

Total mark (5)

Note: **Satisfactory rating - 5points** **Unsatisfactory - below 5points**

You can ask you teacher for the copy of the correct answers

LG #25	LO #3 Determine defects of leather
Instruction sheet	

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- ✓ Describing the types and Identifying defects on leather
- ✓ Describing the effect of defects on the footwear

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to:

- The types of defects on leather are described.
- The defects on the leather are identified.
- Effect of defects on the footwear is described

Learning Activities

1. Read the specific objectives of this Learning Guide.
2. Read the information written in the “Information Sheets 3 included
3. Accomplish the “Self-check 1” Request the key answer / key to correction from your teacher or you can request your teacher to check it for you.
4. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity
5. Read the information written in the “Information Sheet 2”.

6. Accomplish the “Self-check 2” Again you can request the key answer / key to correction from your teacher or you can request your teacher to check it for you.

7. if you earned a satisfactory evaluation proceed to “Information Sheet 3”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity

8. Read the information written in the “Information Sheet 3”.

Accomplish the “Self-check 3” Request the key answer / key to correction from your teacher or you can request your teacher to check it for you. If your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity .

Information Sheet-1 Describing the types and Identifying defects on leather

3.1, Describe the types and Identifying defects on leather

There are various defects, which may finally appear on finished leather. These defects on the leather imposes different problem on footwear production. So that in order to reduce the cost and to be effective and efficient in utilizing the leather, every skin/hide for upper leather shall be examined.

On this module some of the common type of leather defect, major cause and identifications and impact of defect on the footwear production are tried to explain below.

3.2. Types of leather grading on defect

The common types of defects on leather can be classified in to closed and open defects.

A.Closed defect: usually small and does not show clearly or boldly.

Can be easily cover by using different finishing mechanism and it is possible to reduce and eradicate the effect. So that this kind of defect does not able to affect the production of shoes highly.

B.Open defect: relatively this may affect the utility of the leather.

It is clearly and boldly seen.

C. Scratches or Blemishes: One of the most common damages of hide and skins is the grain scratches and tears.

The main causes are barbed wire, nails, thorns, horns, etc. which encounter the animals during their grazing time, fighting each other or rubbing of the animal to get relief from insect bites, sores, etc.

D. Brand Marks: It is burning of the hide/skin protein with a red hot iron. The animals are normally burned so deep that the scar tissue forms through the skin and the brands are visible on the flash side. Brands are made:

- As a sign of ownership.
- As a cure from disease.

E. Growth Marks: It is a wrinkle on the neck and shoulder area of the leather which is naturally occurs when the cattle get older (aged).

F. Warble hole, pock mark and Tick Marks These are small pricing or holes, ugly white spot

and dots and bad stain marks on leather. These are due to the blood sacking bird/insect and fungus/bacterial infections.

G. Vein Marks Usually results from the use of skins of animals found dead of natural causes, from improper or delayed curing after flaying, or for some reason wherein the blood is not drained from the animal immediately after laughter. Here the branching lines of the blood can be seen on the flesh side.

H. Coarse finish

This is poor/ uneven leather finishing while in manufacturing process. Leather has not uniform finish.

I. Flay Cuts

These flaying defects reduce considerably the value of a hide (skin). The damages can all be avoided since they are caused by carelessness or flaying by inexperienced person or by using improper tool. Are Coarse finish and Loose Fibers:

J. Tick Marks Leave scars or pits on the hide (skin) or on the finished or semi-finished leather. While rubbed to get relief from the itching leads to grain scratching or tearing and secondary infection. Ticks usually attack the tender part of the skin/hide (bellies). Grain correction cannot remove all damages.

K. Warble Holes ;The larvae of the warble fly known as grab live in the flesh and lower depths of the corium makes holes through the hide for breathing and later on for escaping from the animal. Warble flies are found in hot countries.

L. Loose Fibers: This looseness on leather is due to less compacted fiber structure on the flesh side.

Self-Check -1 Written Test

Name: _____ Date: _____

Time started: _____ Time finished: _____

Directions: Answer all the questions listed below.

Short answer questions

1. What are the two classifications of defects on leather? Briefly explain (2 points)

2, Define the following: (6 points)

A. Scratches,

B. Brand mark

C. Growth Marks

D. Vein marks

Total mark (8)

Note: **Satisfactory rating - 8points** **Unsatisfactory - below 8points**

You can ask you teacher for the copy of the correct answers

Information Sheet-2 Describing the effect of defects on the footwear

2.1.Cause of defects

Defects that can be found in the finished leather can be classified into two basic groups. These are natural and man-made defects.

a) **Natural defects:** Some of the natural defects are vein marks, growth marks, tick marks, warble-fly marks and etc.

b) **Man-made defects:** are brand marks, barbed wire marks, flay cuts, flesh cuts and etc. mostly the man- made defects affects the quality and cutting value of the leather

2.2 .Looseness

The leather becomes abnormally soft, weak and fragile. Commonly looseness happened on belly and flank region. We can say that pipe ness is the looseness on the gain surface.

These might be due to nature, looseness seen on the butt and shoulder where the

concentrations of fat are more in flash side. Other the side tanning process can be the cause for looseness due to the concentration of different chemical and finishing problem.

In order to check whether the leather is loose and pipe ness or not, by putting the palm of on the flash of the leather and by pressing the palm area down from the grain side using the other hand. While pressing down, if the looseness or pipe ness comes that area of leather is defected.

Thickness: Since the leather is a natural substance it is difficult to expect uniform /the same/thickness without some variation. But in pre-tanning operation while removing flash by the blade, thickness might vary. On certain level, the evenness problem can be improved by using shaving machine. So this is happen when the skin is below the expected thickness.

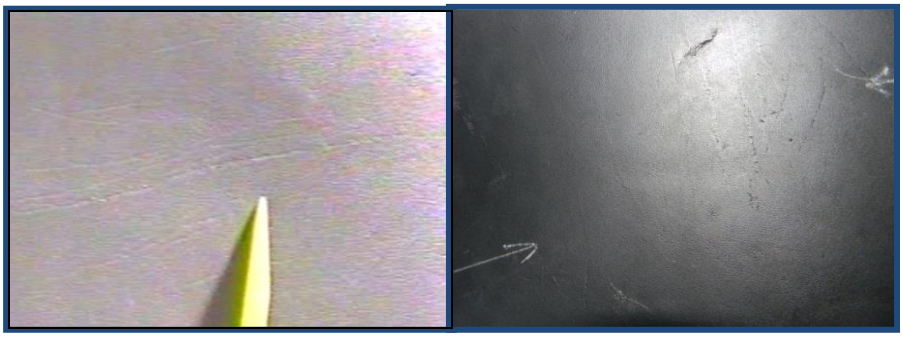
Figs 2, thickness leather

So for the thickness of the leather it is to use on the range (like: 1.2 – 1.4 mm) by taking 0.2 mm tolerance. Check the thickness of the leather using the thickness gauge at different point of the leather.

Scratch and Scar marks : It happens when the cow grassing though bush different tree branch and other sharp materials grazes the animal.

This kind of defect is open and it became more visible while the leather stretched during lasting. Also Scratch defect may be happened when the animals fight by horn and scratch by horns commonly closed, it is not seen clearly.

Figs 3 animals fight by horn and scratch by horns



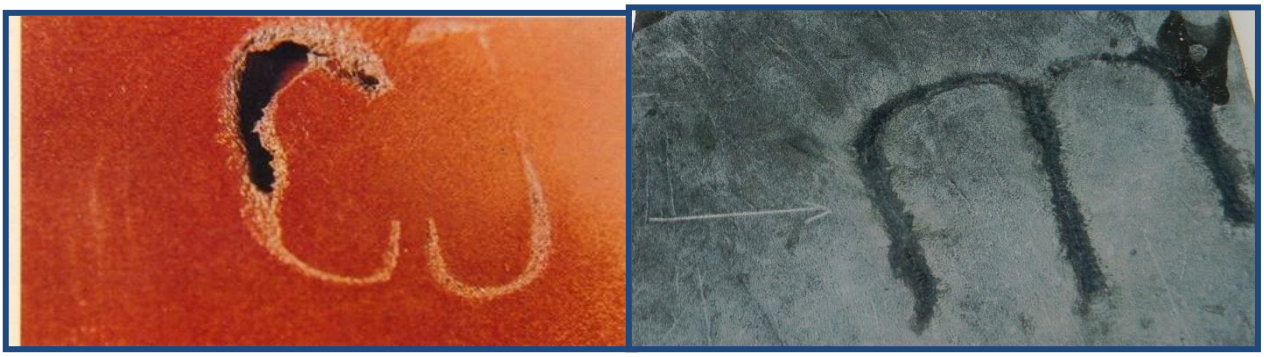
Figs 3 animals fight by horn and scratch by hor

Usually this defect seen on the gain side of the leather lined as long or short scratch. And by pulling the leather it become more visible.

Brand marks; Commonly rural farmers/ pastoral/ have and rare a lot of cattle, goat and sheep. In order to manage and differentiate one's from another's, they used different identification mechanism/ brand marks/. The brand marks might be numbers, name or different symbols/stamp/ using paints and hot materials.

Even though the pastorals use it as an identification the leather has been damaged.

figure, 4, the brand mark defects are easily identified.



figure, 4, the brand mark defects are easily identified.

shown in the figure, the brand mark defects are easily identified.

Flay cuts. The damages are caused by carelessness of flayer person or when flaying is cried out by inexperienced person or by using improper tool. Prominent Flay cut highly affect and damage the quality of leather.

figure, 4, Flay cut highly affect and damage the quality of leather

Figs 5 Flay cut (on the grain side and flesh side)

It is easy identified on the flesh side of the leather like a long groove and the effect made poor impression on the grain side.

Cracking: The leather loose/lack/ its humidity, flexibilities and natural smoothness. By this the leather becomes hard, ridged and stiff. One of the reasons for such problem is poor leather manufacturing process. On other hand, keeping/storing/ the leather in suffocation for a long period of time and when it exposed to direct sun light grain crack ness occur.

figure, 5, direct sun light grain crack ness

Four fold and key test are used to check leather crack ness.

Bleeding : It is the diffusion of uncombined materials from the interior of leather to the grain surface where they may contaminate other materials or mar the appearance of the leather. This usually occurs at elevated temperatures and is commonly designated as staining.

Tearing: The common causes for leather tearing problem are when the thickness of the leather and fiber strength is below the normal and if the tanning process have a problem tearing might be happened. Normally suede and split leather have weak grain fiber strength so that the tendency to be tearing is more.

Figure 6, leather tearing

To check the whether the leather is weak and easily tear able or not, first select one or two points at any region of the leather and cut the leather at 90° as show in the figure. Then gently

try to tear the leather, if the leather starts to tear easily, then it is possible to decide the quality of leather is poor.

Warble hole, pock mark and Tick mark;these defect leave scars or pits on the hide (skin), grain scratching, holes and secondary infection and bad white spot due to fungus/bacteria.
These are due to when the cattle rubbing to get relief from the itching, blood sacking birds or insects and due to sanitary problem. Ticks usually attack the tender part of the skin/hide (bellies).

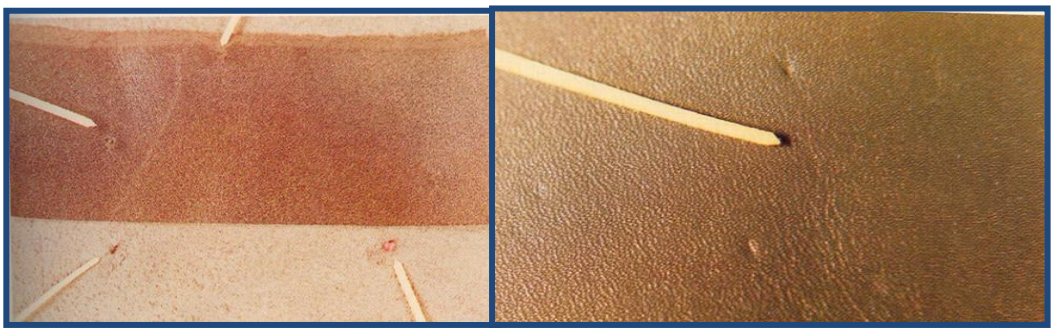


Figure 6, leather tearing tender part of the skin/hide

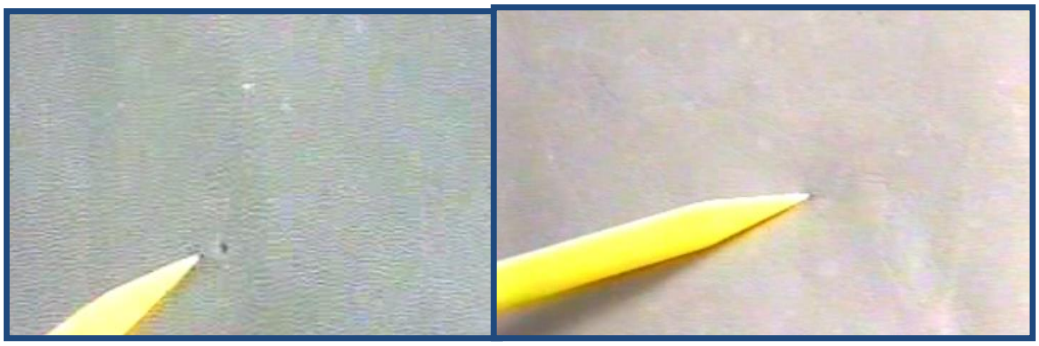


Figure 7, Infection leather visible by neck eyes while we stretched

Tick mark, warble hole by birds and insects and white spot due to infection on the leather are visible by neck eyes while we stretched it.

Growth marks: This defect where naturally happened on the neck and shoulder region of the leather when the cattle get older. These defects seem as a wrinkle which lined

Figure 7, leather defect parallel around neck and shoulder.

Vein marks – blood vessel on both side of the leather;This is when the cattle had been stressed and frazzled for a long period of time or affected by the disease. By this, the steam mark of blood vessel and

LAP Test	Practical Demonstration

Describing the effect of defects on the footwear

Name: _____ **Date:** _____

Time started: _____ **Time finished:** _____

Given necessary templates, workshop, tools and materials you are required to effect of defects on the footwear

1.30 hours.

Task 1: make sure the leather defect

Task 2:Looseness leather

Task 3: start leather defect formation look like

Instructions:

1.Paper Exercises

1,Paper Exercises 1. 1^{st}. ---11^{th}.

2 Paper Exercises2. 1^{st}. ---8^{th}.

3, Paper Exercises3 1^{st} . --14^{th}.

2. Synthetic Exercises stitch

1. You are required to stitch SE 1-6 exercises without thread with standard
2. You are required to stitch SPE 1-7exercises without thread with standard time.

Request your teacher for evaluation and feedback of your work

Now. to guide you in the adjusting, take a look at the stitching the machine makes. Set stitch-

length control for a medium length of stitch. Fold a 6- or 8-inch square of medium weight cloth and stitch diagonally across it at an angle of about 45 degrees.

Now, inspect the stitching. A perfect stitch will have threads locked midway

between the two layers of cloth, with no loops on the top or bottom of the seam and

no puckers in the cloth.

Note: **Satisfactory rating - 100points Unsatisfactory - 100below 4points**

Operation sheet 2

Operation title: - performing basic stitching machine operation.

Purpose	To acquire the trainees with sew operation and maintenance practice

Equipment ,tools and materials	Supplies and equipment needed or useful for machine sewing include these: • Paper exercise • Scissors • Machine needle • Cutter • Synthetic • Thread • Adhesive
Conditions or situations for the operations	• All tools, equipment's and materials should be available on time when required. • Appropriate table, working area/ workshop to sewing paper exersise
Procedures	1. Clean sewing machine 2. Do Pre operation 3. Thread gaid 4. Check needle position 5. Bobbin wending 6. Insert bobbin with bobbin case 7. Cutting paper by d\t shape 8. Sew paper on straight line
Precautions	• Care should be taken while connecting with electric power, sewing , machine • Preparing materials, tools and equipment are according to inseminator command.
Quality criteria	• Did personal protective equipment worn while performing basic stitching sew machine • Did trainees the component of the performing basic stitching machine proper without leakage • The machine functional for sew separation

Self-Check -2 Written Test

Name: _____ Date: _____

Time started: _____ Time finished: _____

Directions: Answer all the questions listed below.

Short answer questions

1. What are the two causes of leather defects? Briefly explain (4 points)
2. Define effect on leather and how to identify the following common types of defects:- (6 points)

a) Looseness and Pipe ness
b) Thickness
c) Cracking
d) Tearing
e) Brand marks
f) Flay cuts

Total mark (9)

Note: **Satisfactory rating - 9points** **Unsatisfactory - below 9points**

You can ask you teacher for the copy of the correct answers

LG #26	LO #4 Determine and perform measurement of defective area
Instruction sheet	

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- ✓ Identifying the method of determining the area using different techniques
- ✓ Describing the method of determination of the area by grid method
- ✓ Describing and performing the method of measuring by fist method
- ✓ Describing the method of measuring of leather
- ✓ Performing the defect area measurement on leather through grid system

Performing the defect area measurement on leather through grid system

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to:

- The method of determination of the area of using different *techniques* is identified.
- The method of determination of the area by grid method is described and performed on paper.
- The method of measuring by fist method is described and performed.

- The method of measuring of leather is described.
- The defect area measurement on leather through grid system is performed.

Learning Activities

1. Read the specific objectives of this Learning Guide.
2. Read the information written in the “Information Sheets 5
3. Accomplish the “Self-check 1” Request the key answer / key to correction from your teacher or you can request your teacher to check it for you.
4. If you earned a satisfactory evaluation proceed to “Information Sheet 2”.
5. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity
6. Read the information written in the “Information Sheet 2”.
7. Accomplish the “Self-check 2” Again you can request the key answer / key to correction from your teacher or you can request your teacher to check it for you.
8. If you earned a satisfactory evaluation proceed to “Information Sheet 3”.
9. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity
10. If you earned a satisfactory evaluation proceed to “Information Sheet 3.
11. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity
14. Read the information written in the “Information Sheet 4.
15. Accomplish the “Self-check 4 Request the key answer / key to correction from your teacher or you can request your teacher to check it for you.

16. If your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity .

17. Read the information written in the “Information Sheet 5.

18. Accomplish the “Self-check 5 ,Request the key answer / key to correction from your teacher or you can request your teacher to check it for you.

19. If your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity .

Information Sheet-1 Identifying the method of determining the area using different techniques

4.1.Identifying the method of determining the area using different techniques

A shoe factory must measure and check all the incoming material immediately upon arrival against supplier’s delivery notes. So far leather area is concerned; there should not be more than 5% discrepancy from the supplier and the factory

Large discrepancy must be notified to the supplier as the material should not be used before the difference are not agreed because leather cost constitute about 60 to 70% cost of the shoe and even a slight variation can cause to suffer a heavy loss by the shoe factory.

1.3.method of determining the area using different techniques

Uppers material especially “Leather” are purchased/sold by area (in sq.ft. sq. dm.) is the smallest unit while sq.ft. is the largest area.

9.29 sq.dm. = 1 sq.ft.

Area of leather is measured generally by the tannery using electronic area measuring machine which gives rapid and accurate result. The accuracy can be checked time to time with the

measuring device supplied by the manufacturer.

Generally, the accuracy is checked using a piece of material of known area but even plastic grids can be used for this purpose. Unfortunately, this machine is too expensive to be installed in small scale footwear units.

Some of the other methods for measuring area are mentioned below

Measurement by large plastic grid (the most effective area)

These all are time consuming and cannot be used for bulk checking.

Here the only practical method of bulk checking is by machine. The area is stamped on the flesh side of each skin mainly in the butt area by the backbone.

To measure the area on random basis we may use a plastic grid called area measuring grid manufactured from a transparent plastic material. A gauge of ***10 sq.dm.*** Graduated in square decimeters ***either of two shapes*** will prove suitable.

Main steps for leather area measuring by grid method:

1. Collect the leather from the bundle.

2. Keep and prepare the leather on the flat table and it should be suitable to measure the total area of the leather.

There are systems to calculate Materials allowance as shoe manufacture need to predetermine the consumption of upper and lining leather required for a particular design and

type of leather

The main objective of upper materials estimation is:-

To establish the initial cost of a style

To control the consumption of material by the clicker,

3. It is necessary to calculate the amount of material required for each style and leather type used.

Any system for predetermine the material consumption allowance need the following attributes

consistency between style and shoe size

4. Consistency between materials types Sufficient accuracy to be used as a standard against which cutting result can be compared

5. so that steps can be taken to eliminated excessive wastage

The profitability of the company depends on accurate costing

The consumption allowance related to a batch for clicker to cut is called clickers allowance and can be as a basis for payment for result on Leather saved against allowance by the clicker

1.4.Unit of measurement's

The most common units of measurement used to estimate upper materials are :-

Square feet(sqf^2)

square Decimeter(Dm^2)

Square meter(m^2)

The area of leather measured in two units of measurements;

Square feet

square Decimeter

Conversions of units of measurements: Since different unit of measurement used in different organization it is very important to have conversion factors.

1sq.ft = 9.29 DM^2

1 square meter = 10.76 sq.ft

Self-Check 1 Written Test

name: _____ Date: _____

Time started: _____ Time finished: _____

Directions:

1. Cutting value is…(3POINT)

A,_____

Test II: Multiple Choice

2,The most common unit of measurement of area of leather are?(2POINT)

Short Answer Questions

A. Square feet.
B. Square decimeter.
C. Meter D, A and B

Total mark (5)

Note: **Satisfactory rating - 5points** **Unsatisfactory - below 5points**

You can ask you teacher for the copy of the correct answers

Information Sheet-2 Describing the method of determination of the area by grid method

4.2. Describing the method of determination of the area by grid method

In Euclidean geometry,a parallelogram is a simple (non self-intersecting) quadrilateral with two pairs of parallel sides. The opposite or facing sides of a parallelogram are of equal length and the opposite angles of a parallelogram are of equal measure.

The congruence of opposite sides and opposite angles is a direct consequence of the Euclidean Parallel Postulate and neither condition can be proven without appealing to the Euclidean Parallel Postulate or one of its equivalent formulations. The three-dimensional counterpart of a parallelogram is a parallelepiped

2.2.Fundamental of parallelogram

Characterizations of parallelogram

- A simple (non self-intersecting) quadrilateral is a parallelogram if and only if any one of the

following statements is true:

- Two pairs of opposite sides are equal in length.
- Two pairs of opposite angles are equal in measure.
- The diagonals bisect each other.
- One pair of opposite sides are parallel and equal in length.
- Adjacent angles are supplementary.

Each diagonal divides the quadrilateral into two congruent triangles with the same orientation.

The sum of the squares of the sides equals the sum of the squares of the diagonals. (This is the parallelogram law.)

It possesses rotational symmetry.

Properties:

- ✓ Opposite sides of a parallelogram are parallel (by definition) and so will never intersect.
- ✓ The area of a parallelogram is twice the area of a triangle created by one of its diagonals.
- ✓ The area of a parallelogram is also equal to the magnitude of the vector cross product of two adjacent sides.
- ✓ Any line through the midpoint of a parallelogram bisects the area.
- ✓ A parallelogram has rotational symmetry of order 2 (through 180°). If it also has two lines of reflectional symmetry then it must be a rhombus or an oblong.
- ✓ The perimeter of a parallelogram is $2(a + b)$ where a and b are the lengths of adjacent sides.
- ✓ The sum of the distances from any interior point of a parallelogram to the sides is independent of the location of the point. (This is an extension of Viviane's theorem). The converse also holds: If the sum of the distances from a point in the interior of a

quadrilateral to the sides is independent of the location of the point, then the quadrilateral is a parallelogram.

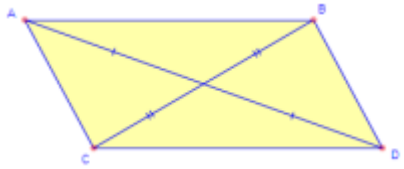
Any side can be considered a base. Choose any one you like.

If used to calculate the area (see below) the corresponding altitude must be used. In the figure below, one of the four possible bases and its corresponding altitude has been chosen.

Altitude (height)	The altitude (or height) of a parallelogram is the perpendicular distance from the base to the opposite side (which may have to be extended).
Area	The area of a parallelogram can be found by multiplying a base by the corresponding altitude. See also Area of a Parallelogram
Perimeter	The distance around the parallelogram. The sum of its sides. See also Perimeter of a Parallelogram
Opposite sides	Opposite sides are congruent (equal in length). As you reshape the parallelogram at the top of the page, note how the opposite sides are always the same length.

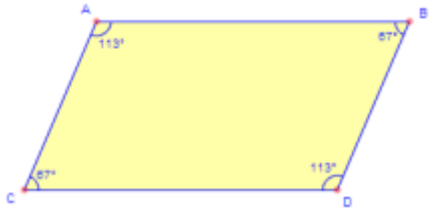
Diagonals

Each diagonal cuts the other diagonal into two equal parts, as in the diagram below. See Diagonals of a parallelogram for an interactive demonstration of this.



Interior angles

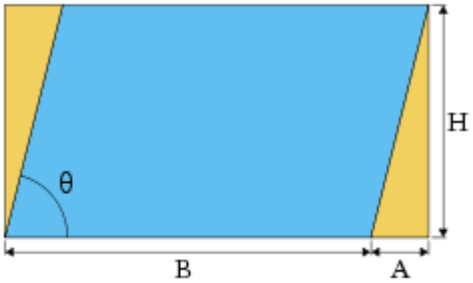
1. Opposite angles are equal as can be seen below.
2. Consecutive angles are always supplementary (add to 180°)



Types of parallelogram

- Rhomboid – A quadrilateral whose opposite sides are parallel and adjacent sides are unequal, and whose angles are not right angles
- Rectangle – A parallelogram with four angles of equal size
- Rhombus – A parallelogram with four sides of equal length.
- Square – A parallelogram with four sides of equal length and four angles of equal size (right angles).

Area formulas



The area of the parallelogram is the area of the blue region, which is the interior of the parallelogram

- The area *K* of the parallelogram to the right (the blue area) is the total area of the rectangle less the area of the two orange triangles.

The area of the rectangle is

$$A_{\text{rect}} = (B + A) \times H$$

and the area of a single orange triangle is

$$A_{\text{tri}} = \frac{1}{2} A \times H.$$

Therefore, the area of the parallelogram is

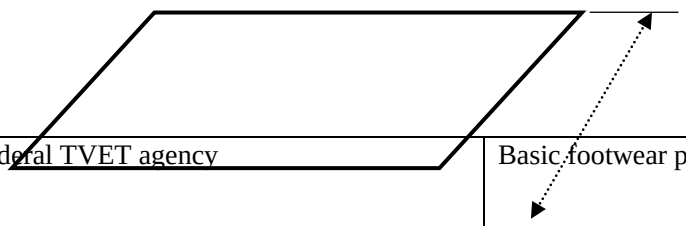
$K=A_{rect}-2*A_{tri}$

$=((B+A)*H)-(A*H)$

$=B*H$

Area of parallelogram

Simply The formula used to calculate the area of parallelogram



H

B

Area of parallelogram (pattern scale area) (K) = B*H

H= perpendicular height of parallelogram to base (Cm)

B = base of parallelogram (Cm)

Self-Check 2 Written Test

name: _____ Date: _____

Time started: _____ Time finished: _____

Test I Matching

Directions:

- Match the column A and B, write only the letter that corresponds to your answer in the provided answer sheet.
- A correct answer scores 1 point and an incorrect answer scores 0 point. No marks will be given for a question if more than one answer is supplied.

A	B
1. Base	a. equal in length
2. Altitude	b. sum of all sides
3. Perimeter	c. any side of parallelogram
4. Opposite sides	d. perpendicular distance from base to opposite side

Total mark (5)

Note: **Satisfactory rating - 5points** **Unsatisfactory - below 5points**

You can ask you teacher for the copy of the correct answers

Information Sheet-3 Describing and performing the method of measuring by fist method

3.1. Describing and performing the method of measuring by fist method

Upper materials determination of the area is critical in footwear manufacturing industries so,

It is very important to know the quantity of materials required to make a pair of shoe and their costs, as based on these information, we do Product Costing Material, Requirement, Planning, Production Planning etc.

This unit describes about different methods available for calculation or estimation of upper materials, advantage and disadvantage of available system, and factors to be considered while using the different methods.

3.2 .method of upper material allowance calculation systems

The following is a list of material allowance calculation systems that are stated in approximately historical order.

a. Marking up

b. Graphical

c. RSM

d. SLM

e. SATRA Sum

A. Marking up

Methods listed above from no. 1- 5 are used for leather materials allowance calculation and the last two methods 6 and 7 are used for estimation of textile and synthetic materials.m

The Cutting Room Supervisor or a similarly skilled cutting

selects a skin or hide from a bundle of leather that is to be used for the style. The skin is then marked by drawing the patterns onto its surface with due regard to cutting principles and quality requirements. Complete pairs are drawn, as far as possible and an allowance is calculated by dividing the area of the skin by the number of pairs obtained from the mark-up. Sometimes, the skin is marked on the reverse side so that it can be subsequently used without having to clean off the marks from the surface. In this case a percentage is usually added that

reflects the amount of waste that would be encountered on the grain side because of flows and blemishes not seen on the reverse.

Fig1. Marking up

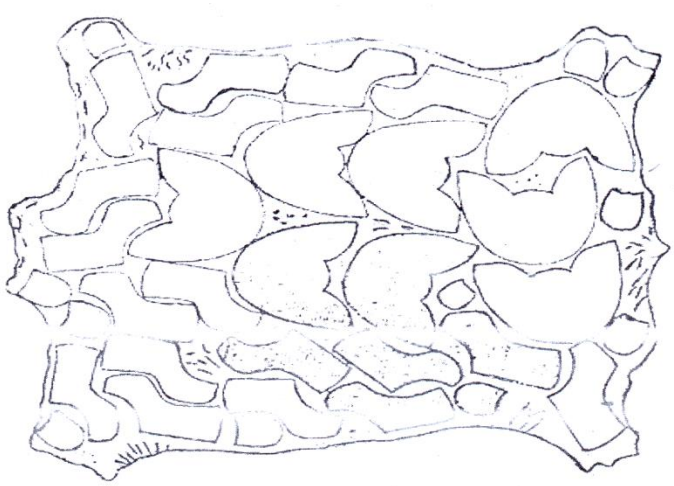


Fig1. Marking up

ADVANTAGES:

There is a permanent record of the cutting method and quality standard

Takes into account cutting principles and unavoidable waste

The allowance calculation can be justified to cutters.

Provided the person who marks the skin is skilled and the skin of the leather is truly representative, then this should be very accurate method.

DISADVANTAGES:

A skilled trustworthy cutter is required to do the mark-up.

It can be time consuming particularly if there are many pattern items in the shoe set.

It may not truly emulate cutting practice (e.g. a cutter would probably cut more vamps or more quarters from an individual skin rather than cut a complete number of pairs.)

It is usually not linked to a leather grading system or shoe size adjustment system so individual

cutting jobs may yield significantly different results to the calculated allowance.

B. Graphical

The complete patterns for one pair are laid out in the most compact and economical arrangement onto graph paper. A rectangle is then drawn around the patterns that enclose the set. Sometimes, the lines cut across the patterns to a degree as in the example. This assumes that the parts that protrude could be accommodated in the gaps within the rectangle.

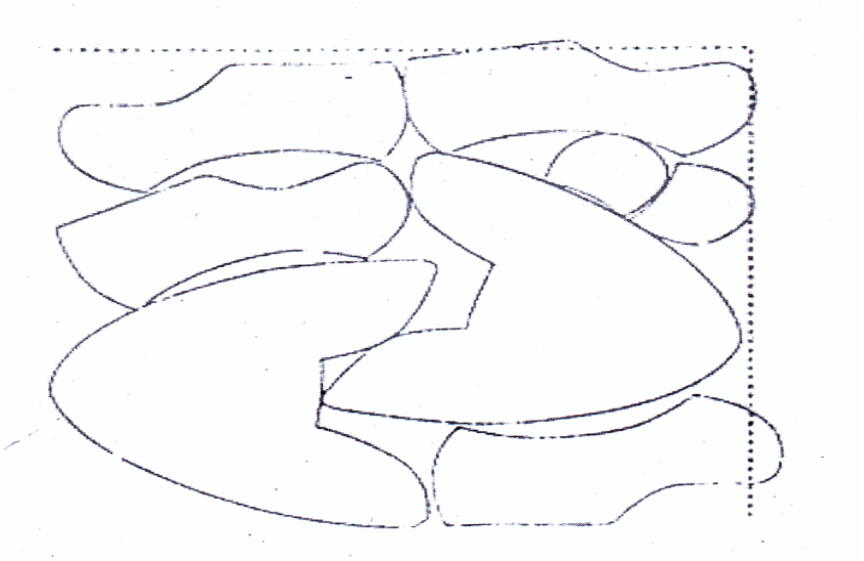


Fig.2. Graphical methods

The area of the rectangle is calculated by multiplying the length by the width or counting up the number of squares covered. A percentage is applied to this area to calculate an allowance for the pair. The percentage will usually vary according to:

- ✓ Material type

Material quality

Average pattern area in relation to average material area

Variations in size and width fitting

These percentages are usually based on previous experience and some companies apply the same percentage for all styles and materials.

ADVANTAGES:

- Reasonably quick and easy to use.
- Permanent record of the calculation method
- The same base area can be used to calculate allowances for different materials, qualities, and sizes (provided previous experience has allowed a build up of appropriate percentage additions).
- Less skill is required than the marking-up method.

DISADVANTAGES:

- It is subjective because the original rectangle area could vary significantly depending on the interlocking skill of the assessor.
- The percentages applied are based on previous cutting history which may reflect uneconomical cutting.
- There may be no previous experience of particular materials so an estimate has to be made.

The lay-up does not reflect usual cutting practice i.e. vamps tend to be cut together from the butt and backbone areas, quarters from belly, legs, neck area etc.

C. RSM

The first serious attempts at establishing a scientific method of arriving at leather consumption allowance resulted in the of a system by masers W.W. RUSS and F.L. **D. SMALL**

A more scientific approach can give adequately accurate results and it is considered that a system of this type posses have many

The factors which affect the cutting results i.e. the factor to be considered for calculating material consumption

E. SLM

SLM or Scientific leather Measurement was introduced to the shoe industry in the early 1950s. It established very clearly two separate components for allowance calculation pattern assessment and leather assessment.

Each pattern in the shoe set is measured separately.

The pattern is drawn carefully onto paper and then “blocked off” by drawing straight lines connecting highest points on the pattern perimeter. This gross area is measured and then the most economical interlocks are chosen and drawn into position.

The interlocking pattern must be kept parallel or at 180 – to the original.

Fig.3. SLM

The area of interlocks falling within the gross area is measured, plus any shared waste. And a proportion of this area subtracted from the gross area. The result is known as the “Slim area” and this is used as a basis for allowance calculation.

F. SATRA Sum;

SATRA Sum has replaced SLM as an industry standard system for material allowance calculation.

3.3. Pattern area

This is the net area of the individual pattern item comprising the upper and the first or interlocking waste.

The first waste: is declined as the space left b/n two pattern pieces, when interlocked together due to irregularities in shape.

This is also called “scale area” and used as a base for further phase in the system.

Second waste: This waste is additional to the waste .It depends on the following factors

The shaped of the skin to be used ,because the shape however fitted together will not coincide in outline with that of a skin which result in edge waste

The size (or area) of the shoe in relation to the size of the individual pattern shapes.

The large the area, smaller the wastage, smaller the area, larger the wastage.

General shoe making consideration in which certain Portion of the skin or in certain

direction according to the direction of stretch or shade matching and colour matching in individual pieces as a result of which the interlocking arrangement may be destroyed.

Pattern scale area when added with the second waste allowance is called GROSS AREA (G) this depends on different kinds of leather also. For calculating G we use certain empirical formulas as:-

For Full Grain Leather /corrected Grain Leather:

$$G = S (1.205 + S/A)$$

Where:

S= Pattern Scale area

A = Area of the Skin

1.205 = This is an area addition that pair of the mathematical equation. This is constant for a particular kind of skin

I S/A>0.185 i.e. if the pattern item sized is bigger than the skin size

e.g ladies ¾ cut court shoe vamp to be cut from goat leather then

$$G=S (1.02+2S/A)$$

In the case of split /suede leather

G2=S (1.098+S/A)

Third waste

It related of the curability grades of leather. On first grade leather, normally an Allowance of 3% is given while on the other grade % allowance may vary by 5%

Method of measuring defected area by fist method

This method of measuring defected area of leather is better than measuring/guessing by eye but it is not more accurate as grid method very small deviation may be there. But if we used the one that have almost the same as one sq.dm hand fist, the result become almost accurate and it also save measuring time

Fig. 4, hand fist

Operation sheet 1 Describing and performing the method of measuring by fist method

Name: _____ Date: _____

Time started: _____ Time finished: _____

Directions: Answer all the questions listed below.

1. What is the method of measuring the leather by fist method? (marks 5)

Steps on LO4

You can ask you teacher for the copy of the correct answers

Information Sheet-4 Describing the method of measuring of leather

4.4 Describing the method of measuring of leather

There are systems to calculate materials allowance as shoe manufacture need to predetermine the consumption of upper and lining leather required for a particular design.

Tracing method is the common method used for calculating synthetic material consumption in footwear industry.

With the objective to calculate the cutting allowance for the given set of synthetic upper patterns, participant should know:

4.1. cowhide leather by the side

Finally how to add up the individual pattern areas to establish the cutting allowance for leather

Here is an example of an average yard, laid over a single side. Because of the variations in the natural edges, you cannot get a full square yard out of this piece. However, you can see there is plenty of leather to cut your pieces out of that will more than equal a yard.
Typically, a standard cowhide is going to be somewhere around 90" at its longest point and 72" at its widest point, however, they can run slightly larger or smaller.

If you prefer to work with lamb, pig, or even exotic leather (like ostrich), those are going to be much smaller.

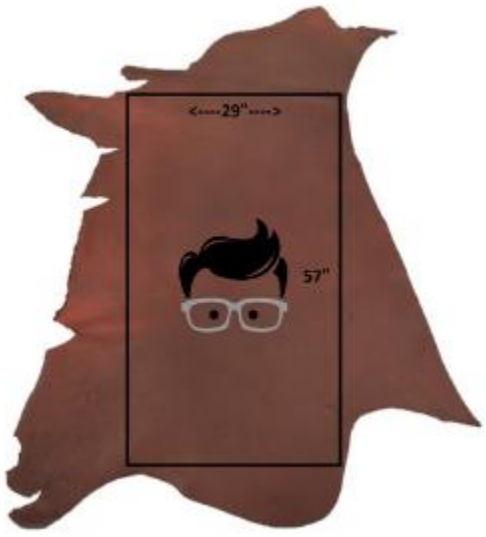
The hides can only be as large as the animal they came from.

We sell much of our cowhide leather by the side, which would be a half of a hide.

Because of the variances in size and width, it is often best to work with the exact sizing of your patterns or furniture, as opposed to yards.

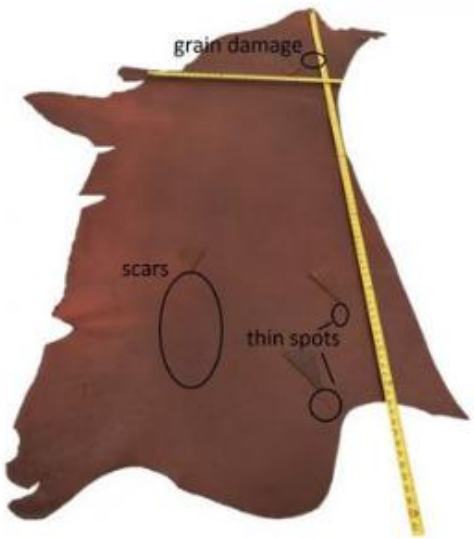
Knowing you need four 20" x 30" pieces, as opposed to 3 yards, is going to help you find suitable hides or sides much easier.

To help you shop for your leather, in all our side listings on The Leather Guy, we give you a "largest square" measurement as well as a photo of the hide with measuring tapes to show the full width and length of the side!



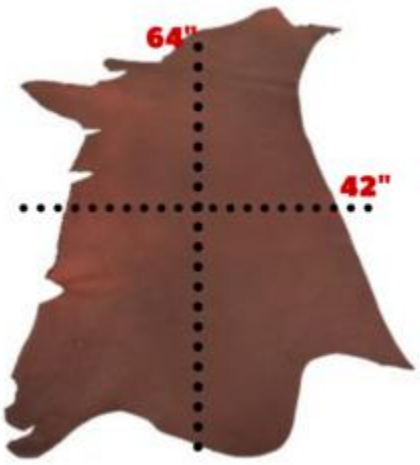
When we list the "Largest Square" in the description, this is what we are measuring on the side or hide. As you can see, there is still plenty of leather to use.

This measurement is simply to show the cleanest, largest cut you can get out of the hide without using the natural edges.



In the photos here you will find a photo that includes not only any defects that may affect your project, but also measuring tapes so you can judge the true size of the piece against your needs.

Hides are measured from top to bottom, side to side. Rough edges are accounted for when making the measurements, meaning that the leather outside the dotted line gets counted towards the empty spaces inside the lines.



The equation for figuring out Square Feet is simple!
Length (in inches) X Width (in inches) = A A divided by 144 = SF
Example: 64X42 = 2688
2688/144 = 18.7 SF

If you come across leather sold by the yard, be sure to double-check that it is genuine and not faux leather.

Faux leather will usually be on a ream or spool and listed in yards.

We hope this clears up a little of the mystery when it comes to shopping for leather and measuring leather!

Self-Check 4 Written Test

Name: _____ Date: _____

Time started: _____ Time finished: _____

Short answer

1, Explain about yard leather measurement (3point)

2, exotic leather

Fill in the black space (2point)

1, when we sell cow hide _____

2, Faux leather will usually be on a ream or spool and listed in_____

Total mark (5)

Note: **Satisfactory rating - 5points** **Unsatisfactory - below 5points**

Information Sheet-5 Performing the defect area measurement on leather through grid system

4.5 . Performing the defect area measurement on leather through grid system

The difference for an item or service between the amount per unit actually paid and the budgeted amount per unit multiplied by the number of units bought.

The purchase price variance of input materials can significantly affect production costs for a manufacturing business that does not have control over the cost of its production inputs.

In cost accounting it's the difference between the standard cost and actual purchase cost. If your standard cost for a component is $1.00 and you buy it at $1.10 then the purchase price

variance is $0.10.

5.1 .A positive variance

A positive variance means you are paying more for production and therefore less profitable than plan or simply show loss. If you have a negative variance you are paying less than plan and will be more profitable or show the profit. It's used to get a quick gauge of status so that management can address cost of goods quickly.

The main objective of defect area measurement on leather through grid system When regarding is completed it is recommended that a purchase variance account be kept to monitor the gains and losses resulting from such regrading.

These records may help to obtain refunds from tanneries or may influence decision to change tanneries or accept a price increase.

Remember: sometimes the cheapest price leather is not the best value for money.

5.2. Financial Influence of Leather Grading

To give an ***example*** of how leather grading may influence the profit or loss of a clicking room of factory

Example:

A complete delivery of locally tanned leather has been delivered to your factory of the following quantity and price.

Quantity = 2750 sq.ft.

Price = 40 birr per sq.ft.

Total Value of Leather = 110,000 birr

On receipt of the leather, the leather grader regraded and while regrading a discrepancy obtained which is different from the expected grade and quantity of leather as shown below:

- **Expected grade with respect to price:**

Grade	Quantity ratio	Expected quantity
1st Grade	0.1	275 sq.ft
2nd Grade	0.2	550 sq.ft
3rd Grade	0.4	1100sq.ft
4th Grade	0.2	550 sq.ft
5th Grade	0.1	275 sq.ft

Regraded quantity with price

Grade	Actual regraded quantity
1st Grade	170 sq.ft.
2nd Grade	500 sq.ft.
3rd Grade	1050 sq.ft.
4th Grade	530 sq.ft.
5th Grade	500 sq.ft.

The buying price, that is the price paid by the factory for the shipment would be the middle grade price (40 birr) per material. All grades above this middle grade would increase by 5% in price and all grades below the middle grade would reduce by 5% in price e.g. in the above example, the rate i.e. 40 br prs./sq.ft., is fixed on 3rd or C grade which is the middle grade and

the rate of 2nd grade will be 5% more than the middle rate., i.e. (40 + (5% of 40)) = 42 prs./sft., and the rate of 4th grade will be 5% less than 3rd grade i.e., the middle grade i.e., (40 – (5% of 40)) = 40 – 2 = 38br prs./sq.ft.

- The rates of different grades in the above mentioned examples are :

Grade	rate	Price per Sq. ft.
1st Grade	+ 10%	44 birr
2nd Grade	+ 5%	42 birr
3rd Grade	Avg. price	40 birr
4th Grade	- 5%	38 birr
5th Grade	- 10%	36 birr

- To calculate the value of the leather shipment multiply the graded amount by the price per grade then subtract the total graded price from the actual price paid to the tannery, this would show a buying loss.

Grade	Quantity/sq. ft.	Price per sq. ft.	Value (birr)
1st Grade	170 sq.ft.	44 birr	7,480
2nd Grade	500 sq.ft.	42 birr	21,000
3rd Grade	1050 sq.ft.	40 birr	42000
4th Grade	530 sq.ft.	38 birr	20140
5th Grade	500 sq.ft.	36 birr	18000
		Regraded total value = 108,620 birr	

Regraded value is the value or the price worth which the leather is received.

- Subtract the regraded value from the actual price paid ***110,000 birr*** paid to tannery.
- **108,620 birr** actual values after regarding.

Result = ***110,000 birr*** **- 108,620 birr**

= **1380 birr** which is a ***loss on purchase***

since; we have received the material of lesser value (**1380 birr**) than what we have paid to the tannery (***110,000 birr***.)

If the actual piece paid was lower than the graded price then this would show a purchasing profit.

Self-Check 5	**Written Test**

Name: _____ Date: _____

Time started: _____ Time finished: _____

***Instructions*:** Write all your answers in the provided answer sheet

Fill in the black

1. _____ means you are paying more for production or purchase and therefore less profitable than plan or simply show loss. 3 points)
2. If you have a _____you are paying less than plan and will be more profitable or show the profit

Total mark (5)

Note: **Satisfactory rating - 5points** **Unsatisfactory - below 5points**

The entire steps used to measure the defect area of leather by fist method are al

Fist method

The only different is in fist method instead of using grid tool hand fist is substitutable used.

1. Select the leather from the sample
2. Prepare the leather on the flat surface to measure the total area
3. Use grading tool (grid plate which is commonly 10 sq. dm size)
4. white pencil to sketch/mark the plate
5. Then drawing the grading plate on the leather using the white pencil.
6. Then measure the leather size by counting the sketched grading plate on the leather.
7. After sum up all the measurement, convert the decimeter square into feet square by dividing the result by 9.29. At this point the exact value/size of the leather in sq.ft is known which might be the same as or different from the written size on leather by the tannery.
8. Then compare the final result with the written size on leather by this it is possible to check the area discrepancies or whether the written size on the leather is correct or not.
9. After this it is possible to move to check the defect area of leather by assessing the major and minor defect on the leather.
10. All defects on the leather which aren't used for footwear production should be identified. (The possible types of defect on the leather are Looseness and Pipeness, Thickness,

Scratch and Scar marks, Brand marks, Flay cuts, Cracking, Bleeding, Tearing, Warble hole, pock mark and Tick mark, Growth marks, Vein marks, etc.)

11. If any types of defect are detected while in assessing on the leather, mark/circle the defected region using white pencil. If the space between two marked/circled defected region cannot allow to insert in between one derby quarter (number 8 size by English sizing system or 42 size by French sizing system), then should consider those two defected region as one

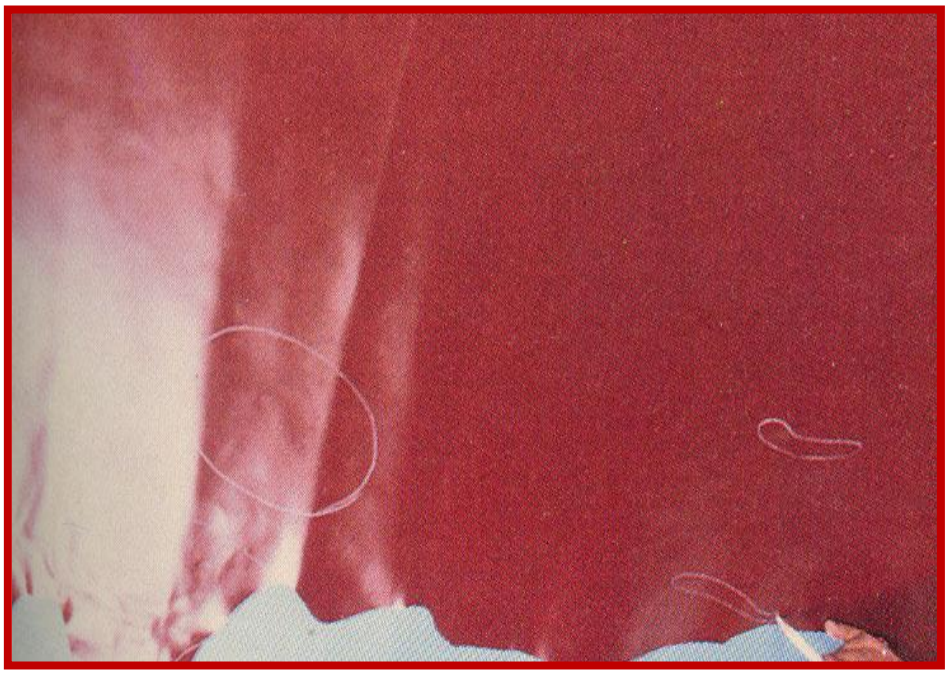


Fig.5 , marked/circled as one defect region.

12, After complete marking all the defected area, measure each of the identified defected regions using and put the exact size in dm.sq.

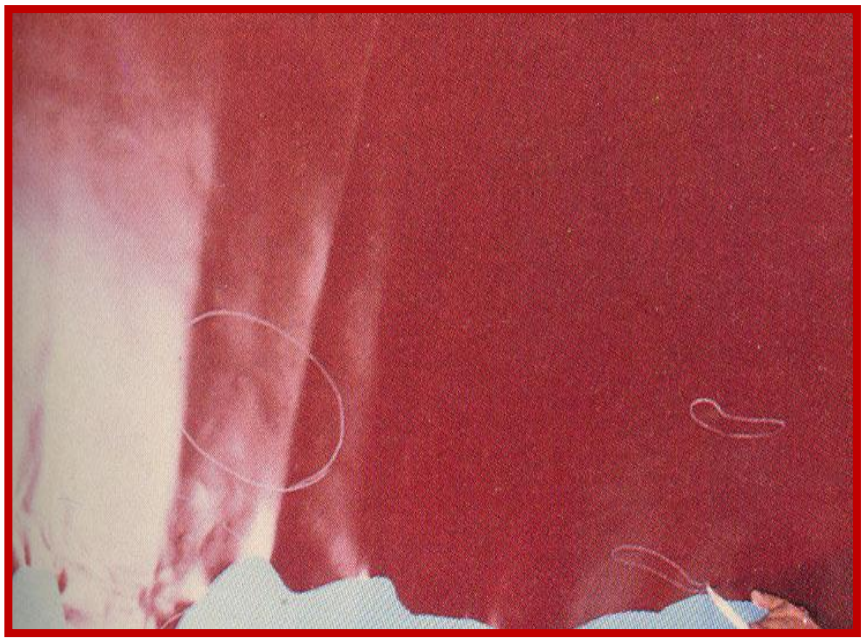


Fig.6 defected hand-fist

LG #27	LO #5 Perform quality check on leather
Instruction sheet	

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- ✓ Describing and performing various physical tests (non-laboratory) on the leather
- ✓ Performing method of physical testing
- ✓ Describing and demonstrating method of sample selection
- ✓ Checking characteristics of the leather

This Learning Guide, you will be able to the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, you will be able to:

- Various physical tests (non-laboratory) on the leather are described and performed.
- Method of physical testing is performed.
- Method of sample selection is described and demonstrated.
- Characteristics of the leather are checked

Learning Activities

1. Read the specific objectives of this Learning Guide.
2. Read the information written in the “Information Sheets 1-4
3. Accomplish the “Self-check 1-Request the key answer / key to correction from your teacher or you can request your teacher to check it for you.
4. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity
5. Read the information written in the “Information Sheet 2” and “Information Sheet 3”.
6. If your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity

Information Sheet-1 Describing and performing various physical tests (non-laboratory) on the leather

5.1, Describing and performing various physical tests (non-laboratory) on the leather

Leather is a very complex material, which must be subjected to laboratory tests for accurate assessment. This may not always be possible as most tanneries do not have adequate testing facilitating and some of the tests are very lengthy for any buyer to wait

There are,physical tests (non-laboratory) on the leather

however, a few crude and quick tests, which can help the buyer in taking correct decision. These tests will give a danger signal, regarding the whole consignment.

Selection of leather in tannery consists of two stages i.e., random tests and selection of whole consignment. Samples are selected on random basis.

It is difficult to assess for quality.

1.2. Random test

In random test the following activities are carried out.

a) Selection of samples

At least one sample leather is picked up from each bundle or from each sub-variety of batch. This sample leather is used as a reference for comparing the hides to be tested with it.

b) Substance/thickness

The thickness of the leather is measured comparing with the reference sample leather and with the help of thickness gauge.

c) Finish appearance

The finish appearance of the leather is checked by comparing with the reference sample leather.

d) Feel/softness and stretch

Feel/softness of the leather is checked by filling up with palm with it at different places and comparing with the reference sample leather.

e) Adhesion of finish

The leather surface is checked for its good finishing by using scotch tape and stick four inches on leather grain comparing with the reference sample leather. .

f) Cracking

Any tendency of pigment or grain cracking of the leather is checked comparing with the reference sample leather. .

g) **Wet and dry rub**

Any transfer of finish or any removal of finish of is checked by using dry and wet white fabric around your finger comparing with the reference sample leather.

h) Strength

Strength of the leather is checked by tearing it and comparing with the reference sample leather.

i) Fading

Any fading or change in color of the leather is checked by keeping a cut piece in the sun and comparing with the reference sample leather.

j) Water repellency

Physical deterioration of leather is checked by dipping a small piece in water and rubbing the grain with fabrics.

k) Chemical resistance

Damage of the finish is checked by applying chemicals to the grain side of the leather.

1.3. Leather defects

Leather is a natural animal. There are various defects, which may finally appear on finished leather. Every skin of an incoming shipment of upper leather is examined for possible defects. Some of the common leather defects are listed below:

a) Scratches

b) Brand marks

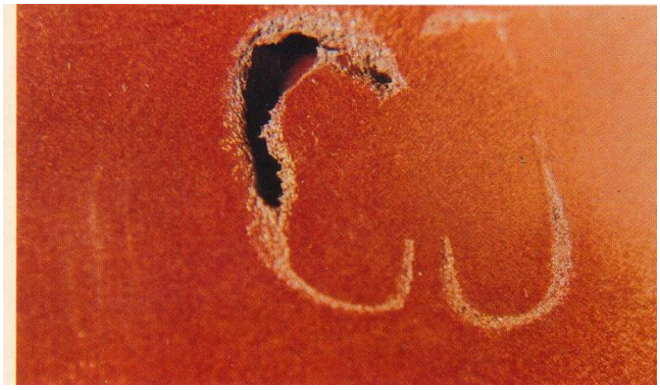


Fig: brand marks in butt area

c) Growth marks

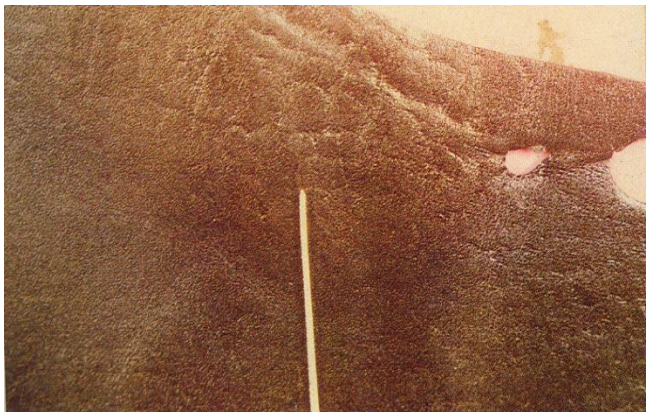
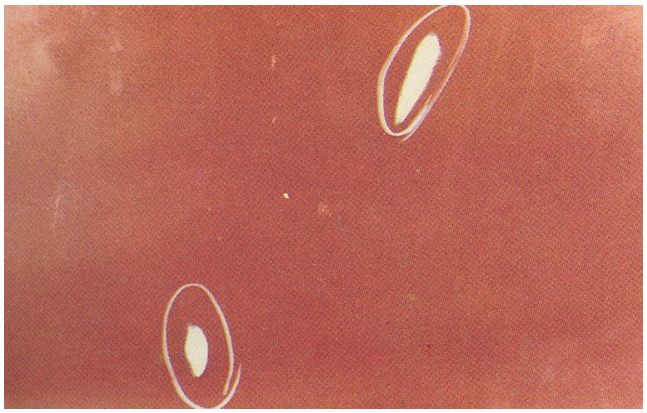
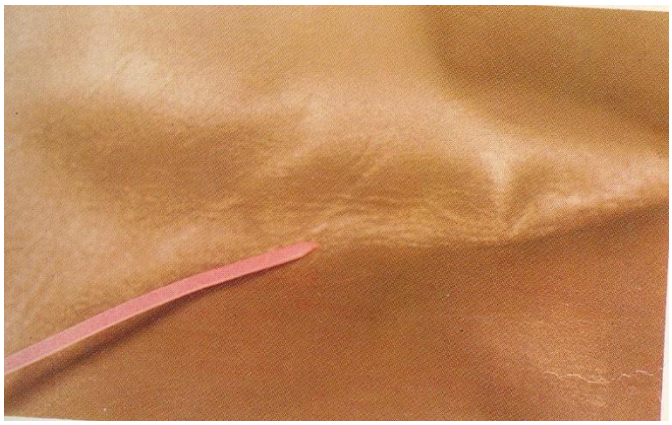


Fig: Growth Marks in the Neck

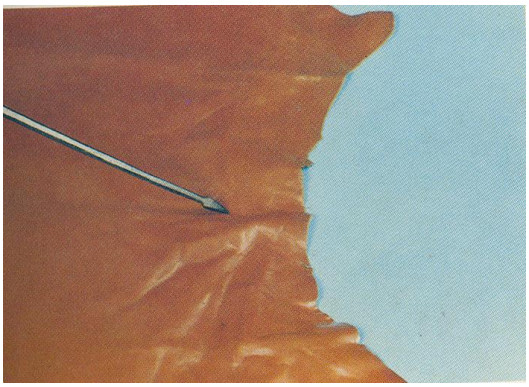
d) Warble and tick marks



e) Grain cracking



f) Loose leather



g) Stain marks on flesh for un lined shoes

Self-Check 1 Written Test

Name: _____ Date: _____

Time started: _____ Time finished: _____

Short answer questions

1. How do you check strength of leather?(1 points)
2. How do we measure the thickness of leather?(1 points)
3. Why most leather manufacturing bodies prefer physical leather testing relative to laboratory tests even though laboratory test is accurate relative to physical testing? (2 points)

Choose the correct answer

1. Which one of the following is not included in random leather sample tests? (1 points)
   A) Substance/thickness B) Cracking C) PH value D) Fading E) all
2. Which of the following is not defect of leather? (1 points)
   A) Scratches B) Brand marks C) Growth marks D) Warble and tick marks E)

all

Total mark (5)

Note: **Satisfactory rating - 5points** **Unsatisfactory - below 5points**

Information Sheet-2 Performing method of physical testing

Performing method of physical testing

Leather is a very complex material, which must be subjected to laboratory tests for accurate assessment.

This may not always be possible as most tanneries do not have adequate testing facilitating and some of the tests are very lengthy for any buyer to wait.

The way the sample reference leather taken is very important test since the other leather quality is measured relative to this sample.

2.1 Selection of test samples

physical testing is to ensure that the selected hides consist of full spectrum and are true representative of the consignment. If these are good, then the consignment should also be good. The assessment of these hides should indicate troubled areas for thorough screening.

The following methods of physical testing are applied for checking the quality of given leather.

Pick up at least one hide from each bundle of 50 or from each sub-variety of batch. This is to ensure that the selected hides consist of full spectrum and are true representative of the

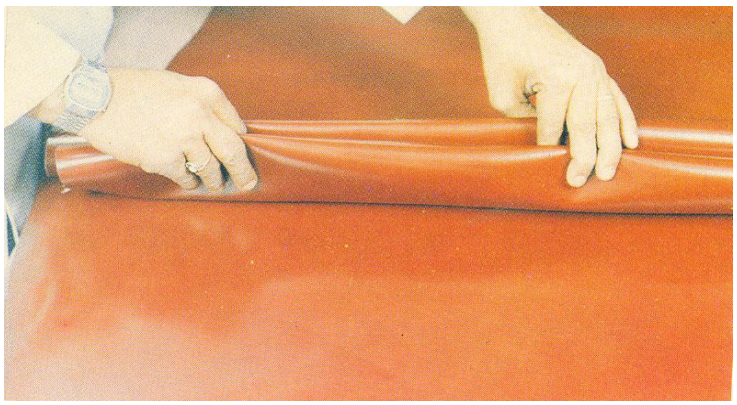
consignment. If these are good, then the consignment should also be good. The assessment of these hides should indicate troubled areas for thorough screening.

1. Substance/thickness

Measure substances at various locations. The substance in butt region should be within the specified range.

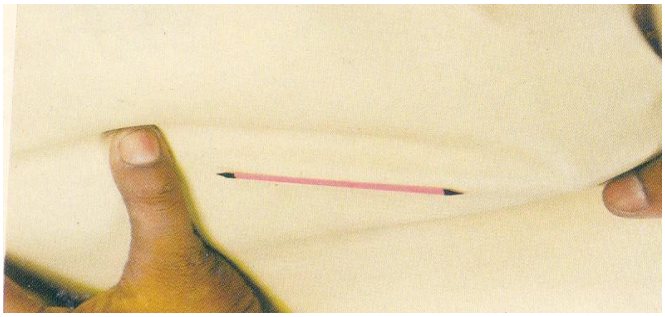
2. Finish appearance

Closely look at the top surface and compare with the reference sample. Is the material (i.e. cow, buff etc.) as ordered? Is the color and finish as ordered? If there is some marginal variation, will this leather produce shoes of acceptable variation?



3. Feel/softness and stretch

Feel the leather by filling up your palm with it at different places. Is it same as your reference sample? Stretch the hides along the width. Are you able to stretch approximately 5cm with 75% of your total strength? If the leather is very soft and hardly requires any effort to stretch, it is likely to be weak and cause lasting problems.

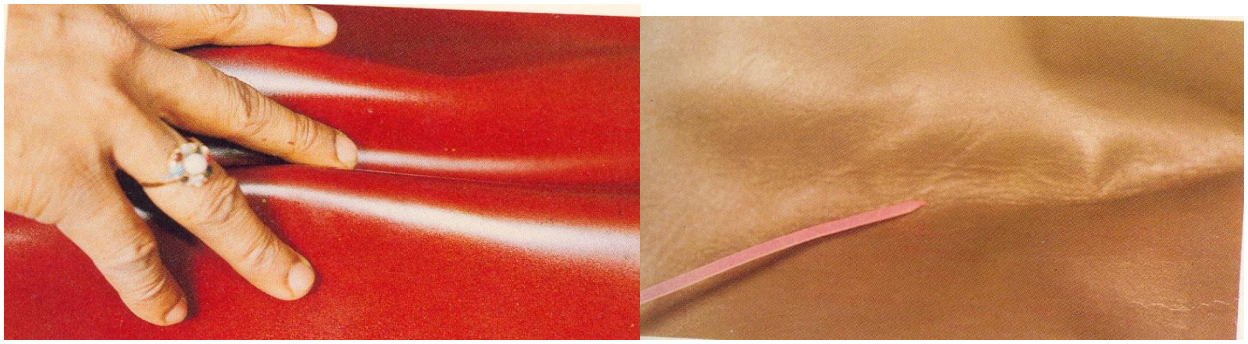


2.2. Adhesion of finish

Take five inches of scotch tape and stick four inches on leather grain. Press as best you can. Pick the loose end and rip the tape off leather in one quick motion. Check the tape and leather to see if any finish is sticking to the tape and found removed from the leather surface.

a) Cracking

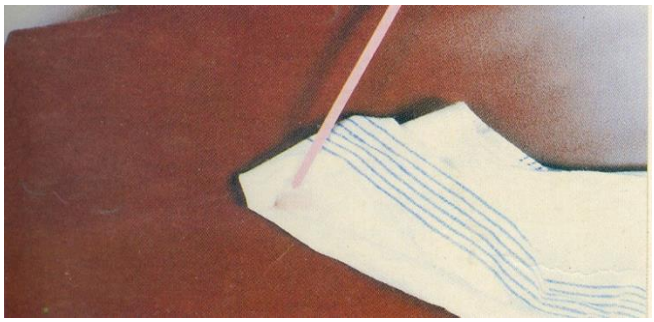
Double fold leather at least 4 places per hide to see whether there is any tendency of pigment and or grain cracking.



b) Wet and dry rub

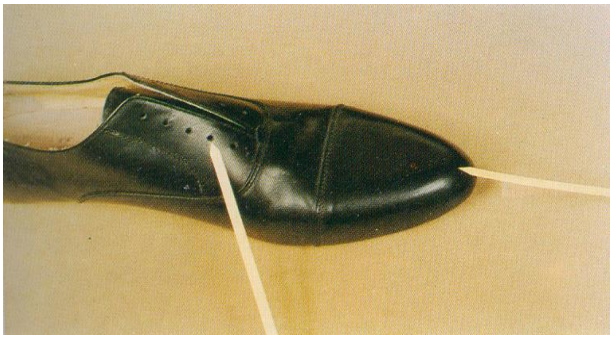
Rub the grain side 25 times approximately 5 inches with a white fabric around your finger (as if you are trying to erase a pencil mark on paper with an eraser). Examine the cloth for any transfer of finish. Wet the cloth (and squeeze) and rub 5 times at some other location. Examine the cloth for any transfer of finish and leather for any removal of finish. This test can be done

for suede and flesh side also.



C, Strength

In the butt region, make a half inch cut from an edge with a scissor. Hold leather on two sides of cut with thumb and a finger. Try your best to tear it further. It must take lot of your effort to tear. Compare your effort with that required for reference sample.



D ,Fading

In case of white or very light leathers, keep a cut piece in the sum for three hours and then compare with the other piece for any fading, yellow and change in color.

F ,Water repellency

Dip a small piece in water for 5 minutes. Observe amount of water absorbed by it; rub the grain with fabric to see physical deterioration of leather.

G ,Chemical resistance

Drop some water on grain and allow drying. See it there is any stain. Apply some latex, Neoprene and PU; allow drying and then rubbing off with crape. Does it damage the finish?

Self-Check 2 Written Test

Name: _____ Date: _____

Time started: _____ Time finished: _____

Short answer questions

1. Explain how to check the following parameters leather. (7point each)
    (a) Finish appearance
    (b) Thickness
    (c) Feel/softness
    (d) Adhesion of finish
    (e) Cracking
    (f) Fading
    (g) Water repellency

Total mark (7)

Note: **Satisfactory rating - 7points** **Unsatisfactory - below 7point**

Lap test:- Practical demonstration

Name: _____ Date: _____

Time started: _____ Time finished: _____

Information Sheet-3 Describing and demonstrating method of sample selection

Describing and demonstrating method of sample selection

Products that are manufactured from leather are directly and indirectly influenced by the quality of leather.

Generally, defect on leather prominently affects the quality of products, production quantity and productivity of the workers.

3.1 Objective Method of sample selection:

The way the sample reference leather taken is very important since the other leather quality is

measured relative to this sample. Therefore, at least one hide is picked up from each bundle of 50 or from each sub-variety of batch and used as a reference. This is to ensure that the selected hides consist of full spectrum and are true representative of the consignment. If these are good, then the consignment should also be good. The assessment of these hides should indicate troubled areas for thorough screen

Main objective Sample is selected according to established principles are:

- The sample must be representative of the entire population/batch.
- One must be able to extrapolate inferences, within known and acceptable margins of error, from the sample to the wider population.
-

3.2 .Common steps and words in sampling:

Why sampling?

- ✓ Get information about large populations.
- ✓ When it's impossible to study the whole population
- ✓ To be cost effective, to be accurate and time saving.
- ✓ Define Target Population: Target Population: is the population to be studied/ to which the investigator wants to generalize his results
- ✓ Selection of a sampling frame: Sampling frame is the list of all the sampling units from which sample is drawn.
- ✓ Sampling scheme/method for sampling/: Method of selecting sampling units from sampling frame. (Probability or Non-probability sampling)
- ✓ Sampling Unit: smallest unit from which sample can be selected.
- ✓ Calculate error/chance of fluctuation/:

1. **Probability samples** are sometimes known as random samples.

They are the most accurate of the sample selection methods. When using a probability sample, each element in the population has a known and non-zero chance of being selected into the sample. Usually, each member of the population has the same chance of being included in the probability sample. With a probability sample, the first step is usually to try to find a sampling frame. Using this frame, individuals or households are numbered, and some numbers are chosen at random to determine who is surveyed. If no frame is available, other methods are used to ensure that every population member has an equal, or known, chance of inclusion in the survey.

2. **Random Sampling:** the purest form of probability sampling. Assures each element in the population has an equal chance of being included in the sample.

3. **Stratified Sampling:** Sub-samples are randomly drawn from samples within different strata that are more or less equal on some characteristic
4. **Cluster Sampling:** The primary sampling unit is not the individual element, but a large cluster of elements. Either the cluster is randomly selected or the elements within are randomly selected
5. **Systematic sampling:** relies on arranging the target population according to some ordering scheme and then selecting elements at regular intervals through that ordered list.

6. **Non probability sampling:** Any sampling method where some elements of population have no chance of selection (these are sometimes referred to as 'out of coverage'/'under covered'), or where the probability of selection can't be accurately determined. It involves the selection of elements based on assumptions regarding the population of interest, which forms the criteria for selection. Hence, because the selection of elements is nonrandom, non probability sampling not allows the estimation of sampling errors.

7. **Quota sampling:** The population is first segmented into mutually exclusive sub-groups,

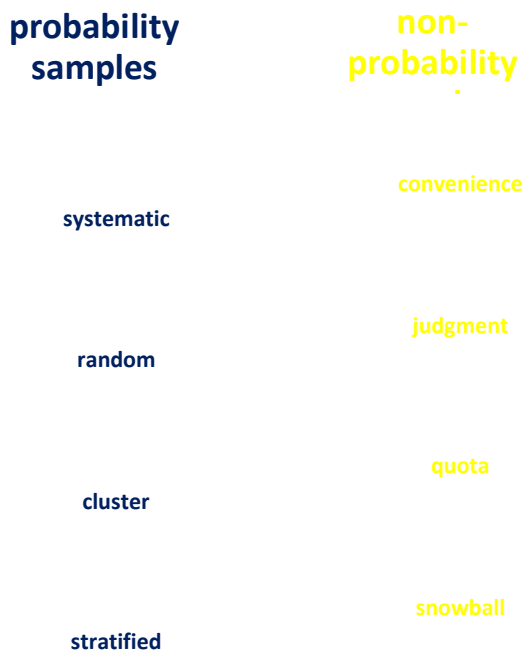
just as in stratified sampling. Then judgment used to select subjects or units from each segment based on a specified proportion. For example, an interviewer may be told to sample 200 females and 300 males between the age of 45 and 60.It is this second step which makes the technique one of non-probability sampling.

8. **Convenience sampling:** Sometimes known as grab or opportunity sampling or accidental or haphazard sampling. A type of non probability sampling which involves the sample being drawn from that part of the population which is close to hand. That is, readily available and convenient.

The researcher using such a sample cannot scientifically make generalizations about the total population from this sample because it would not be representative enough. For example, if the interviewer was to conduct a survey at a shopping center early in the morning on a given day, the people that he/she could interview would be limited to those given there at that given time, which would not represent the views of other members of society in such an area, if the survey was to be conducted at different times of day and several times per week. This type of sampling is most useful for pilot testing.

9. **Judgmental sampling:** - The researcher chooses the sample based on who they think would be appropriate for the study. This is used primarily when there is a limited number of people that have expertise in the area being researched.
10. **Snowball samples:** In some communities (especially those in developing countries), the only feasible way to find its members is by asking other members.
11. The first step in this procedure is to find a few members of the population using any method. This step is denoted as the first round.

sampling method



Since probability samplings are the most accurate and commonly used sample selection methods as compare to the non - probability samplings. While using a probability sample; each element in the population has a known and non-zero chance of being selected into the sample. Usually, each member of the population has the same chance of being included in the probability sample. so in order to conduct random leather inspection random sampling method is applicable.

While fixing sample frame/size: the whole batch/population will be discarded or rejected if the sample results are not accepted as per the required parameters. The quantity of leather used for sampling/sample size/ should fixed in considering that will give accurate, precise and liable to pass or reject the whole consignment/batch/population.

To get the right results, for skin leather, the minimum sample sizes are 10 – 15 skin shall be

randomly selected from the batch/population.
For hide leather, the minimum sample sizes are 5-10 hide shall be randomly selected from the batch/population. it can be applicable for full or half size hide.

Additional sample can be added more than the above mentioned quantity based on the result found after the inspection of the sample. Sometimes the variation may be occurred among the sample. So as much as possible fluctuation/variation shall be reduced. so that additional sample (5-10 skin/hide) can be taken from the batch based on the results in order to reduce the variation and to increase the liability of the test.

Self-Check -3 Written Test

Name_____ Date: _____

Time started: _____ Time finished: _____

Say true or false (3 points)

1. Commonly products that are manufactured from defected leathers have degraded value in front of the customer. (1 point)

2. Those products/shoes that are manufactured from defect leathers, the price will be increased as compare to product from high quality genuine leather. (1 point)

3,The more the defected the leather the efficiency of cutter's reduced. (1 point)

Using synthetic or corrected leather materials in footwear production directly could not affect the quality of products. (1 point)

Total mark (3)

Note: **Satisfactory rating - 5points** **Unsatisfactory - below 3points**

Information Sheet-4 Checking characteristics of the leather

4 .1. Checking characteristics of the leather

leather is the most natural looking leather with the unique surface characteristics of the hide

remaining visible.

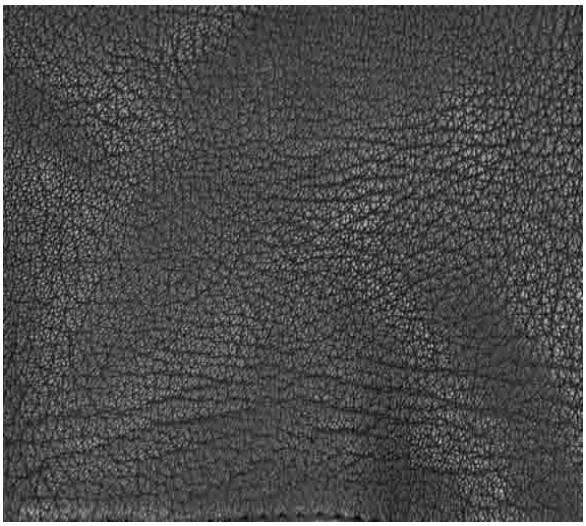
Aniline leather is colored only with dye and not with a surface coating of polymer and pigment.

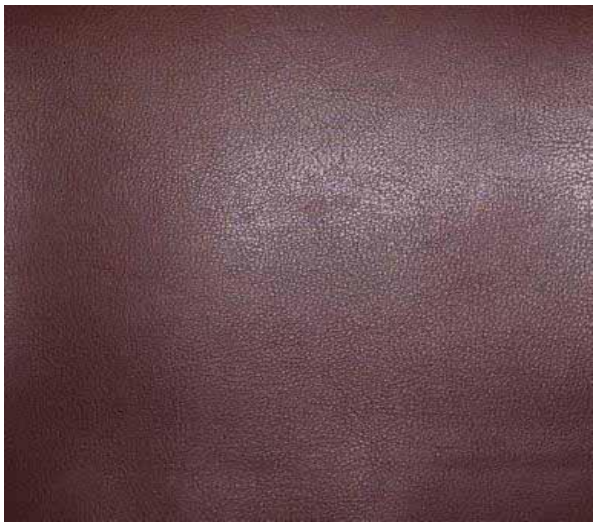
A light surface coating may be applied to enhance its appearance and offer slight protection against spillages and soiling.

Checking characteristics of the leather When producing this type of leather, the skin hide is sanded (corrected) gently and lightly, then a light and thin layer of chemical (polymer and pigment) is applied to make it coated on the surface .

4.2.Checking surface of leather

The coating is to make the surface smooth and soft, friendly to human use like making handbags and upholstery.smooth and soft





Figs 1 , smooth and soft

Semi-aniline leather is more durable than aniline whilst still retaining a natural appearance. The increased durability is provided by the application of a light surface coating which contains a small amount of pigment.

This ensures consistent color and imparts some stain resistance.

“Leather which has been aniline dyed or stained, incorporating a small quantity of pigment, not so much as to conceal the natural characteristics of the hide.

Figs 2, Semi-aniline leather

Nappa leather

Originally, only sheep skin was referred to as Nappa cowhide. A Nappa leather, or sheep skin, is naturally one of the softest leathers in the market today.

Nubuck aniline leather

It is full aniline leather that has been sanded or buffed in order to create a nap. This is top grain leather and considered a split or suede. It is Nubuck aniline leather on which the surface has been brushed to create a texture similar to that of velvet. It is often mistaken for suede, but suede is the flesh side of a piece of leather while nubuck is an effect that is done to the grain side, making it considerably stronger.

Pull-up leather

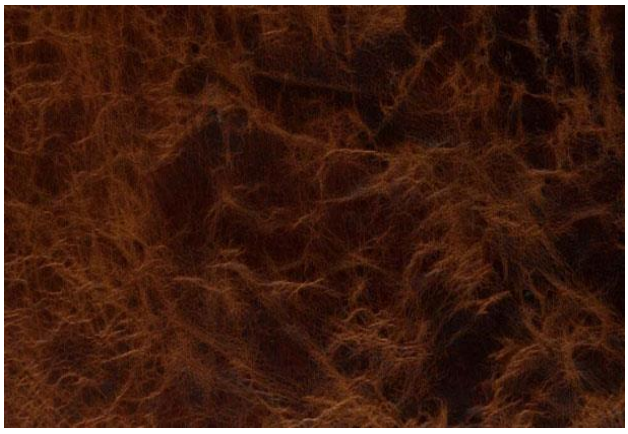
It produces a burst color when the leather is pulled tight. This leather uses a full aniline dye and in addition has oil and/or wax application, which separates causing the color to become lighter as the leather is pulled.

Pull-up is a very rugged leather finish. It is named "pull-up" because any scuffs or scratches can be rubbed out of the material by pulling it between the fingers. This redistributes the finish on the leather, which is usually oil or wax, so that the blemish is no longer visible. Pull-up leather is often used for upholstery.

Figs 3 Pull-up leather

Oiled leather

Oiled leather is another rugged material. The heavily oiled surface allows for scratches and scuffs to be pulled out. The oil also protects the leather from moisture. Applying a lanolin or beeswax-based conditioner will make this material nearly waterproof. Because of this, oiled leather is a popular material for hiking boots and other shoes that will be exposed to extreme weather conditions.



Figs 4 Oiled leather

Dry Milled leather

Very high quality Natural Dry Milled leather refers to the high end vegetable tanning process of bovine (cow) leather. softer leather finish which contains the natural texture of a top grain cowhide. Inside leather is durable cowhide leather. United States Canadian Mexican and E.U. currency fits just like it should.

Figs 6 Dry milled leather

Refer types

Self-Check 4 Written Test

Name: _____ Date: _____

Time started: _____ Time finished: _____

1. **Fill in the blanks: (5 marks)**

    1. ---------- leather is colored only with dye and not with a surface coating of polymer and pigment.

    2. When producing ---------- leather, the skin hide is sanded (corrected) gently and lightly, and then a light and thin layer of chemical (polymer and pigment) is applied to make it coated on the surface.

    3. Leather that is finished by buffing the flesh side (opposite the grain side) to produce a nap is called ----------.

    4. It is full aniline leather that has been ---------- in order to create a nap.

    5. ---------- leather is similar to an aniline finish except that the leather surface is polished to a high luster by the action of glass on steel rollers under tremendous pressure.

total mark (5)

Note: **Satisfactory rating - 5points** **Unsatisfactory - below 5points**

LG #28	**LO #6 Assess the grade of the leather**
Instruction sheet	

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- ✓ Determining the average grade of the leather lot
- ✓ Evaluating leather cutting value
- ✓ Performing storage and bundling of the leather

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, you will be able to:

- The average grade of the leather lot is determined.
- The leather is evaluated for the cutting value and suitability for the footwear manufacturing.
- Storage and bundling of the leather is performed

Learning Activities

1. Read the specific objectives of this Learning Guide.
2. Read the information written in the “Information Sheets 1”.
3. Accomplish the “Self-check 1” Request the key answer / key to correction from your teacher or you can request your teacher to check it for you.
4. If you Learned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity and lecture
5. Accomplish the “Self-check 2” Again you can request the key answer / key to correction from your teacher or you can request your teacher to check it for you.
6. If you earned a satisfactory evaluation proceed to “Information Sheet 3”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity
7. Accomplish the “Self-check 3” . Again you can request the key answer / key to correction from your teacher or you can request your teacher to check it for you.
8. If your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity .

Information Sheet-1 Determining the average grade of the leather lot

1.1 Determining the average grade of the leather lot

Leather is a very complex material, which there are, however, a few crude and quick tests, which can help the buyer in taking correct decision.

These tests will give a danger signal, regarding the whole consignment. so before buying and simply receiving the whole ordered leather depending only on the tanneries' leather grading system, while receiving the order by using random tests method reassessing is very crucial.

Then, after receiving the whole order before using it directly for production, conducting reassessment/re-grading of the whole consignment is important.

This enables the footwear factories to re-appeal and give feedback regards of the quality of the leather as well they can able to complain on the price based on purchase cost variance calculation. In addition to this, assessing the leather before using it in productions enables the footwear factories to identifies whether the received leathers are suitable for production (for required design or model).

how to assess the average grade of leather, on how to assess the cutting value of the leather(suitability of leather for footwear production) and on the method of storage and bundling of leather in the store.

While dispatching the leather to cutters issuing system is shall be or preferably uses average system. If leathers are issued to the cutters based on the average grade, the optimal usage of leather will be achieved and wastage will be reduced.

1.2 .Average grade of leather grade

While dispatching leather from store to the cutters, Average grade of leather shall be issued.

That means it is the combination of the entire grade types, if the leather is TR leathers. (From grade A to grade E).

If leathers are issued to the cutters based on the average grade, the optimal usage of leather will be achieved and wastage will be reduced. The cutters can able to cut the front part and the quality area of the shoes (vamps, aprons, quarters, toecaps and other visible part of the shoes) from A, B & C grade leathers.

For the other parts of the shoes like counters, destinies, straps, collars, tongues, zip guards, and other small and less visible part of the shoes possibly can cut from E and F grade leathers. so that leather wastage will be minimized and maximize the optimal usage of leathers.

Leather selectors in the store, unless there is a special order, they should deliver mixed leather (Grade A to grade E) to all cutters in considering the average grade to be c grade.

Sometimes the leather may be SC (selected grade: a combination of F, G &H grade leather) OR SG leathers(selected grade: may be a combination of leather having the same grade i.e. all A grade only OR B only etc) so whether the leather are TR,SC OR SG, the leather selectors Should issue the leather on the average grade basis.

Example: if the daily production order for two cutters are:

Cutter A: 367.5 sq.ft. Cow full grain, TR leather to produces 150 pair of shoes per day of XXM model.

Cutter B: 374 sq.ft cows corrected SC leather to produces 170 pair of shoes per day of RRN model.

SO, the leather selector should be issued the **TR** leather by keeping **C grade** as average grade for cutter **A**.

And for SC leathers, (if F, G &H), issued the leather by keeping **G** grade as average leather for cutter **B.**

- There may be different types rating in issuing the 367.5 SQ.FT of leather by

keeping grade c as average grade, the following can be one option for cutter A.

LEATHER GRADE	QUANTITY	REMARK
F	89.1 SQ.FT	
G	189.3	**AVERAGE**
H	89.1 SQ.FT	
TOTAL	367.5 SQ.FT	

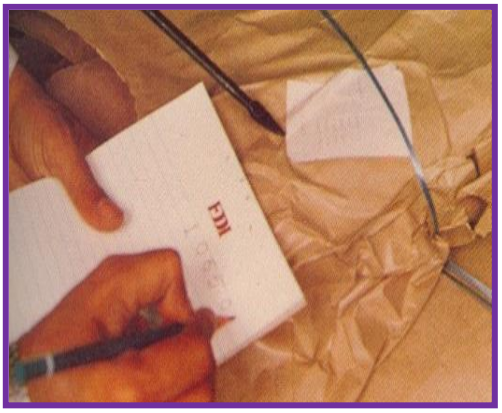
- There may be different types rating in issuing the 374 SQ.FT of leather by keeping grade c as average grade, the following can be one option for cutter **B.**

LEATHER GRADE	QUANTITY	REMARK
A	33 SQ.FT	
B	88 SQ.FT	
C	132 SQ.FT	**AVERAGE**
D	88 SQ.FT	
E	33 SQ.FT	
TOTAL	374 SQ.FT	

Preparation for Leather Grading

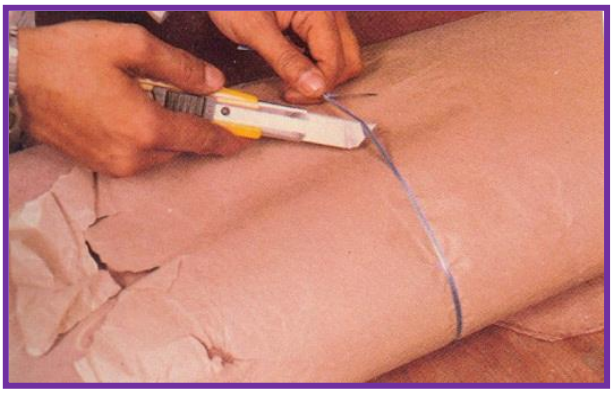
(i) Receive Leather

(ii) Check Leather Received against Delivery Documents



(iii) Store Bundle of Leathers in Preparation for Grading

(iv) Un-wrap Leather



(v) Keep the wrapping paper to rue.

(vi) Lay the leather out on the bench. Put all the butts at one end and necks to the other end.

(vii) Continue to un-wrap all the leather.

Incoming Inspection

It is the responsibility of the leather storeroom to inspect, sort, administer, store and distribute upper leather. All incoming materials must be examined to insure that they meet the requirement quality standard. Owing to the high cost of leather a general quality and quantity inspection can save considerable amount of money. Any shortage or discrepancy can be reported to the tannery without delay.

1.3. System of Leather Grade

Necessary to assess the actual value of the skin.

To assess accurately the utilization and quantity of upper to be issued to each Individual cutters.

To control the leather quality based on cutting value arrived at by grading as adjust the section from the suppliers.

At time to check by the grid method, the sorting concept of the class limits as feedback to the sorters.

It is recommended to resort the tanners sorting of each incoming shipments to shoe factories own grades e.g. A/B/C etc. For that the shoe factory has to decide on its class limits in terms of

cut ability coefficient for each grade e.g.

(A) Grade 97%

(B) Grade 92%

They are used same of the ways leather can be graded and there are variations used within the methods described here. However, it is important that the following operating procedures and standards should be adhered to:

The grading table should be at contactable height and be well lit, preferably next window with no sunshine. The light source should be different mounted so that is causing no shadows and imparts no color fare to the material. Additional light should be situated so that they cost light access the material thus highlighting light swatches as indentations.

Self-Check 1	**Written Test**

Name: _____ Date: _____

Time started: _____ Time finished: _____

Fill in the blanks

1,_____is the average grade of TR leather.(Mark 1)

2,_____is the average grade of SG leather.(Mark 1)

3, Check Leather Received against ----------.(Mark 1)

4,Store Bundle of Leathers in Preparation for ----------.(Mark 1)

total mark (4)

Note: **Satisfactory rating - 4points** **Unsatisfactory - below 4points**

Information Sheet-2	**Evaluating leather cutting value**

2 .1. Evaluating leather cutting value

The workstation is the place a worker occupies when performing a job.

A well designed workstation is important for preventing disease related to poor working conditions, as well as for ensuring work is productive.

Every workstation should be designed with both the worker and the task in mind.

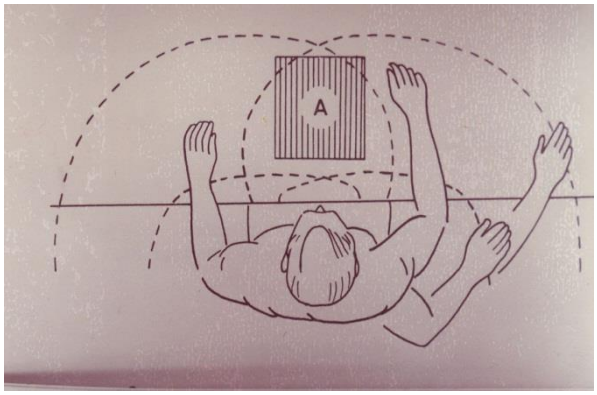
A properly designed workstation should allow the worker to maintain a correct and comfortable body posture

2.2. Pre-Operation Procedures

Work Place Layout

- ✓ Always keep your work in front of you in an orderly manner. This will also help in minimizing the possibility of over cutting an order.

- ✓ Keep your tools and equipment within easy reach.



- ✓ Work at height that is comfortable. Either raises you by standing on a platform. (Old

cutting boards can also be used.)

- ✓ Or raise your cutting board.

Remember: That the strain on your back/today could affect you in later life.

- ✓ Keep your tools equipment in a fixed place.

Safety points for hand cutting:

- ✓ Hold your knife correctly for cutting.

  (Right handed cutter)

  Hold the handle with your 2^{nd}, 3^{rd} and 4^{th} fingers.

- ✓ Place your 1st finger across the clamping jaws so that it will just touch the material being cut.

  This finger helps guide you.

- ✓ Place the thumb on the side of the clamping jaws.

- ✓ A left handed person does the same with the left hand.

Self-Check 2	**Written Test**

Name: _____**Date:** _____

(Total marks:-6)

Instructions: Write all your answers in the provided answer sheet on page

Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Test I: Fill in the blank:

1. The ---------- is the place a worker occupies when performing a job. (Mark 1)

2. A well designed workstation is important for preventing ---------- related to poor working conditions, as well as for ensuring work is ----------. (Mark 1)

3. Keep your tools equipment in a ----------. (Mark 1)

4. Always keep your work in front of you in an ----------. (Mark 1)

5. Hold the handle with your ---------- fingers. (Mark 1)

Total mark (5)

Note: **Satisfactory rating - 5points Unsatisfactory - below 5 points**

Information Sheet-3 Performing storage and bundling of the leather

3 .1 Performing storage and bundling of the leather

Roll bundling of the leather method are preferable to utilize the space than stack on method .because once it is rolled/bundled it is possible to keep it on the rack so that more leather can store within the small area/space.

But when we tried to store leather using roll/bundle form, we have to be take cure for the leather because grain crack and damaging might happen due to improper rolling, excess bundling of leather together and over lapping of one roll over the other

bundling of the leather method crack and damaging might happen due to improper rolling, excess bundling of leather together and over lapping of one roll over the other

3.2 .Leather storage

After grading operation is completed, the skin should be stored properly. The leather received in bundles and plastic bags of max of 10 skin of the same grade should be re-bundle for storage attaching each bundle a ticket showing:

- Tannery or supplier name
- Types of leather
- Color
- Thickness
- Quantity
- Grade of leather

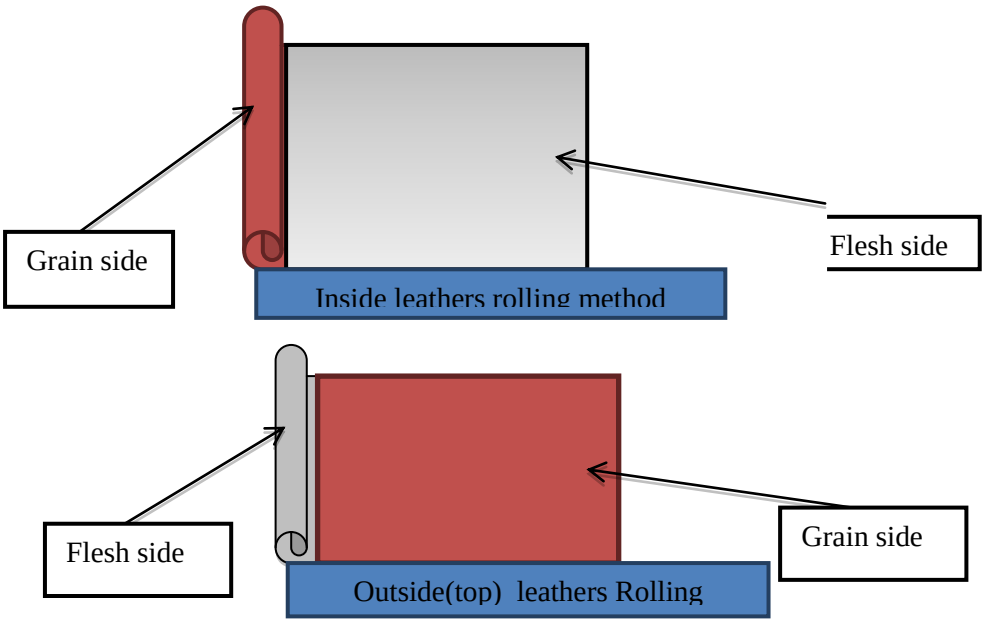
3.3.Roll/bundle method of leather storage:

commonly leathers are stored in the roll/bundle form and 8 to 12 leathers are included in one roll/bundle. Roll method are preferable to utilize the space than stack on method .because once it is rolled/bundled it is possible to keep it on the rack so that more leather can store within the small area/space.

But when we tried to store leather using roll/bundle form, we have to be take cure for the leather because grain crack and damaging might happen due to improper rolling, excess bundling of leather together and over lapping of one roll over the others. While bundling, if we use the 10 leather in one bundle, 9 leather roll inside by keeping the grain side of the leather outside and visible and the flesh side inside.

The remaining one leather will be on the top of the other nine leathers and rolled in opposite

form (flesh side outside and grain side by keep inside.). This leather used as a cover / wrapping leather for the other nine leathers.



Figs 3, Roll/bundle method of leather storage:

Figs 4 Roll/bundle method of leather storage

Stack on method of leather storage

this kind of leather storage system commonly applicable if the quantity of leather are few or if there is wide and enough space in the store. Stack on or flat method of leather storage is

better to keep the leather safely without any kind of damage as compare to roll/bundle method. Usually sheep /goat skin are stored by this method.

But if we have the space it also applicable to cow and other big types of leather.

Even though there is no standard that have been set before about the number of quantity that have to be stored in stack on/flat form at a time, most footwear factories and even tanneries used to stored 120 – 150 skin/hide once.

Figs 4, Stack on method: laying one over the other

Stack on method: laying one over the other.

Avoid various factors that can affect the performance/usage of leathers and its natural property. Proper storage and handling are also including below:

Temperature:

most leather best stored should not be more than 10°c -20 °c temperature.

Very high storage temperature may cause finish blocking and finish cracking caused by the finish adhering itself or taking the imprint of the flesh side of the text skin. Rapid decrease in temperature normally during winter nights may cause space formation.

Room with external wall area the most susceptible to such temperature fluctuation and should not be used as leather store.

If this is unavoidable some heating in the leather store during the winter months. This reduces the risks of finish cracking, a potential problem when unwrapping bundles of leather which have been stored at low temperature.

Humidity:

the ideal atmospheric humidity level is between 50 – 60% RH. Above this there likely to be an increased risks of mold growth whilst below it grain in cracking can be a problem. In addition since the grain crack resistances of the

leathers are relative to its moisture content, prolonged storage in the low humidity environment tends to increase the risk of grain crankiness in lasting.

Lighting:

avoid strong light or direct sunlight. Prolonged exposure of leather to strong light, whether natural or artificial often leads to color changes or fading. in extreme cases it may even cause un-brittleness and loss of suppleness. As a general rule the best types of lighting to use in the skin room defuse day light or some form of relatively weak artificial light source.

Method of storage:

in order to minimize the risk of cracking all leather should be ideally stored flat or hung over a horse. Unfortunately, flat storage more space than is available therefore, they are stored in rolls. It is good practice to restrict the number of rolls that are stacked one on top of other. Particularly if wire storage racks are available since these can inflict pressure marks on the bottom roll if overloaded. Also there should not be excess overlap of leather and suffocation in the store.

Duration of storage: if leathers are not used immediately, it is not preferable to maintain long time stock.

Leather storage: Different types of leather (in color, in types, in grain and in size) should not be stored together. Similar types of leather are preferable to keep together.

Proper labeling: in order to easily identified each types of leather and to distinguish one types of leather from the others proper labeling is required. The label should include the required

Problem due to improper storage and handling

Grain crack

Finish crack

Fungal growth

Color fades.

Leather labeling : include:-

a. Color
b. Leather grade
c. Leather types
d. Number of leather in the bundle(quantity)
e. Total area in the bundle or shelf(total area/quantity)

The following data should be record in the store regarding the leather:

- ✓ Stock number
- ✓ Delivery date
- ✓ Invoice number
- ✓ Area
- ✓ Number of skin/hide
- ✓ Grade
- ✓ Supplier name
- ✓ Rate
- ✓ Issued quantity
- ✓ Received quantity
- ✓ Balance/stock quantity, etc…

Self-Check 3	**Written Test**

Name: _____ Date: _____

Time started: _____ Time finished: _____

Match the words:

1. Which one of the following is not happen due to improper storage and bundling of leather.(1points)

   A) Grain crack B) finish crack C) brand mark and scratch D) all

2. Leather labeling include:- (1 point)

   A) Color B) Leather grade C) Leather type D) All

3. The following data should be record in the store regarding the leather: (1 point)

   A) Stock number B) Delivery Date C) Invoice number

True and false:

4. Stack on/flat method of leather storage is more preferable to utilize the space. (1 point).
5. Roll method of leather storage is more preferable to keep lather safely and utilize the space. (1 point).

Total mark (5)

Note: **Satisfactory rating - 5points** **Unsatisfactory - below 5 points**

LG #29	LO #7 Determine financial implication on procurement of leather
Instruction sheet	

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

. Performing the reassessment on the value of received consignment

Determining the purchase cost variance from the consignment.

Checking accessories and equipment

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to:

- The reassessment on the value of received consignment is performed.
- Determine the purchase cost variance from the consignment.
- Accessories and equipment to be used are checked.

Reports and documentation work is performed.

Learning Activities

1. Read the specific objectives of this Learning Guide.
2. Read the information written in the “Information Sheets 1”.
3. Accomplish the “Self-check 1. Request the key answer / key to correction from your teacher or you can request your teacher to check it for you.
4. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity
5. Accomplish the “Self-check 2” Again you can request the key answer / key to correction

from your teacher or you can request your teacher to check it for you.

6. If your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity

7. If you earned a satisfactory evaluation proceed to “Information Sheet 3 However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity

Information Sheet-1 Performing the reassessment on the value of received consignment

7.1 Performing the reassessment on the value of received consignment

There are, however, a few crude and quick tests, which can help the buyer in taking correct decision. These tests will give a danger signal, regarding the whole consignment.so before buying and simply receiving the whole ordered leather depending only on the tanneries’ leather grading system, while receiving the order by using random tests method reassessing is very crucial. Then, after receiving the whole order before using it directly for production, conducting reassessment/re-grading of the whole consignment is important. This enables the footwear factories to re-appeal and give feedback regards of the quality of the leather as well they can able to complain on the price based on purchase cost variance calculation.

1.1 Random test

In random test the following activities are carried out.

- Selection of samples
- Substance/thickness
- Finish appearance
- Feel/softness and stretch
- Adhesion of finish

- Cracking
- Wet and dry rub
- Strength
- Fading
- Water repellency
- Chemical resistance

Based on the above criteria's tried to check the quality of the products of the lot/batch. Based on this the lot will be accepted or reject before the shipment is conducted.

1.2. Importance of reassessment and purchase cost variance calculation:

The one of the main importance's of making reassessment and calculating purchase cost variance for the whole consignment before we start production are tried to explain below:
Some of the tanneries would not sell their product as per the agreement. They might try to cheat after the agreement while before shipping.

Especially such kind of discrepancy/cheating is commonly happen on the quantity and grade of leather.so that Conducting the Reassessment on whole consignment enables us to know whether we are cheated by our supplier or not.
Conducing the reassessment and purchase cost variance calculation can able the footwear factories to complain on the tanneries if area discrepancy and grade variance seen after the regarding.

As we said above, reassessment and purchase cost variance calculation help us (footwear factories) to know whether we are cheated by the quantity and by the grade and the data used as a confidential facts and by this we complain, also help us so as to make decision in order to see for the new customer/supplier for the new order.
Although, if a big deviation of quality happen on the whole consignment as compare to the sample and from what we expected, this regraded value help us the make decision by this leather we model/article of shoes shall/should be produced.so that we can't just simply discard the whole leather instead we can make decision on to use it for other model or to sell it to

others.

Sometimes the order quantity and grade of the leather and the actual quantity and grade may be varied. For example if we order 1500 sq.ft of leather on the TR grade (average grade) on the price of 40 br for the 3rd grade. But after we reassessed the whole consignment, the actual value becomes 1440 sq.ft. So we lost 60sq.ft of leather and expect grade value .from this discrepancy on average we loss 1800birr.by regrading and performing the purchase cost variance calculation we able to know the loss and gain of the consignment.so that the management can able to accommodate and redistribute the loss while cost of a product is calculated in preparation of the price. Generally we can say that reassessment and purchase cost variance calculation help (footwear factories) to readjusting the profit margin.

After received the whole consignment and before it used in production the following should be carried out:

The main difference between random sampling testing method from that of reassessment/regrading, in random sampling method only one or two leather from the lot/batch are tested if this tested sample pass the whole batch will pass. But while conducting regrading/reassessment of the consignment the whole /piece/ or each of the leather in the batch should be evaluated and checked.

As per the sample quality and quantity should be checked.

Reassessing the grade and sort into a new grade group if required. Regrading is sorting the leathers in a new grade. Because the received leathers may not have the quality as written grade on the leather so that grouping as per the actual cuttable area of the leather into a new grade (1st to 5th grade) is very important.

While conducting the area measurement and the reassessment of the whole consignment at list the following results shall be recorded:

- Consignment number
- Date checked
- Date of receipt

- Name of supplier
- Total area ordered
- Total area received
- name of leather/material
- Grade/types of leather or quality level
- Average price
- Reassessed/regraded quantity
- Checking result as per the sample(new grade quantity)
- Amount/percentage of area discrepancy
- Purchase cost variance result

Self-Check 1	**Written Test**

Name: _____ Date: _____

Time started: _____ Time finished: _____

Total mark (10 points)

Say true or false

1;Reassessment and purchase cost variance calculation help (footwear factories) to readjusting the profit margin.(2 points)

2, One of the main difference between random checking and reassessing the whole consignment is number of piece and sample that should be taken for measurement.(2 points)

Fill in the blank

1. ---------- enables the footwear factories to re-appeal and give feedback regards of the quality of the leather as well to complain on the price. (2points)

2. _____is sorting the leathers in a new grade. Because the received leathers may not have the quality as written grade on the leather. (2 points

Choose the correct answer

1;While in conducting the reassessment/regrading of the whole consignment which of the main results that has to be documented? (2points)

A) Consignment number B) Date checked C) Name of supplier

D) Date of receipt E) all

Note: **Satisfactory rating (10points) Unsatisfactory - below (10points)**

Information Sheet-2 Determining the purchase cost variance from the consignment.

2 .1 Determining the purchase cost variance from the consignment.

Purchase cost variance is just what the name would imply. The difference for an item or service between the amount per unit actually paid and the budgeted amount per unit multiplied by the number of units bought. The purchase price variance of input materials can significantly affect production costs for a manufacturing business that does not have control over the cost of its production inputs.

2.2 Purchase cost variance

In cost accounting it's the difference between the standard cost and actual purchase cost. If your standard cost for a component is $1.00 and you buy it at $1.10 then the purchase price variance is $0.10.
A positive variance means you are paying more for production and therefore less profitable than plan or simply show loss.

If you have a negative variance you are paying less than plan and will be more profitable or show the profit. It's used to get a quick gauge of status so that management can address cost of goods quickly.

The purchase price variance is the operational result, it is not a cost before that decision/buying

When regarding is completed it is recommended that a purchase variance account be kept to monitor the gains and losses resulting from such regrading.

These records may help to obtain refunds from tanneries or may influence decision to change

tanneries or accept a price increase.

Remember: sometimes the cheapest price leather is not the best value for money.

Self-Check 2	**Written Test**

Name: _____ Date: _____

Time started: _____ Time finished: _____

Fill in the blank Total mark (6 points)

1------_-----means you are paying more for production or purchase and therefore less profitable than plan or simply show loss. (3 points)

2, If you have a _____you are paying less than plan and will be more profitable or show the profit.(3 points)

Note: **Satisfactory rating (6points) Unsatisfactory - below (6points)**

Information Sheet-3 Checking accessories and equipment

3 .1 Describe and perform Checking accessories and equipment

Footwear are formerly created from one piece of material, later was made by attaching a few accordingly cut pieces combined together with strap and later sewed with needle and thread and other parts like sole as separate components is attached with footwear.

Materials used for construction of footwear are classified as upper materials, lining materials, reinforcement materials, accessories and fittings.

Leather is the most suitable material to be used as upper, lining and socks making because of its physical properties, elasticity, flexibility, ease of working, availability in varieties of colour and finish, thermal conductivity and Checking accessories and equipment

All textiles used in shoe production must be backed with another material, usually cotton sheeting or drill, or double-woven in such a way to provide the necessary weight or thickness required of shoe upper and lining.
Generally, textiles are used as upper, lining, inter-lining, socks and re-enforcement in shoe making industry

A. Equipment shoe making industry.

- Equipment is defined as a set of tools, devices, kit, etc, assembled for a specific purpose.
- The difference between hand tool and equipment is usually that hand-tools usually refer to manual tools.
- Equipment is usually referring to anything that is powered by either electricity or by a motor

off some sort.

3.4. Accessories

Rivets

Eye-lets

D-ring

Rivets are used in footwear manufacturing

Main parts of rivets are:

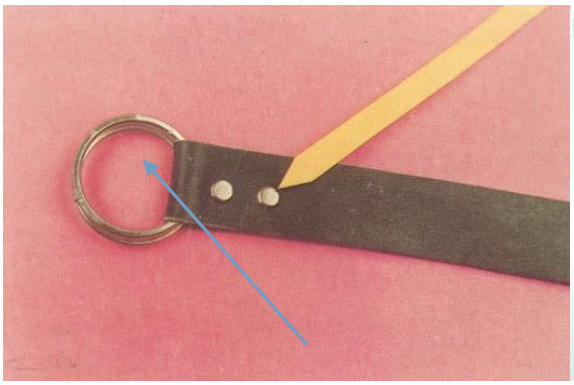
- **Head.** this can be in silver, gunmetal, bronze etc.
- **Base.** this is a shaft with flat base. The shaft must be just 1mm longer than the thickness of the material to be riveted.

Figure: Base of rivets

Figure: Head of rivet

Metho Pre punched holes are required to fix the rivets.

- The hole must be large enough for the base shaft
- The shaft is placed through the holes
- The head is then pushed firmly in to place by hand.
- When pressure is applied to the head, the shaft and head collapse around each other, locking them together. Thus holding the piece together.
- Single thickness material can also be riveted for decoration.



Eye-lets

When a designer selects the eyelets to be used, he must ensure the eyelet dimension is suitable for the material being used no matter which shape of eyelet he chooses, whether it is round, oblong, oval or square.

The size of the eyelet is measured as inside diameter or opening of eyelet and depends on the material and choice.

Eyelet parts consist of:

- ✓ Width of the Head and
- ✓ Opening of eyelet
- ✓ Barrel length

Opening .is usually measured in millimeters across the internal diameter.

Width of the head.depends on the designer choice and material to be eyeleted. Technically, the eyelets having wider head is found most suitable for softer the material

The barrel length.is measured in millimeters along the barrel. The length required would be decided by the thickness of material the eyelet will hold onto. Barrel must go through the material and flange over approximately the same width as head.

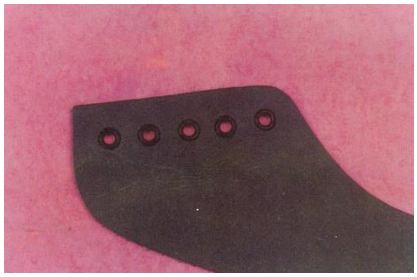
When eyeleting synthetic, fabrics and canvas a washer is normally used, it is placed over the barrel and locked in place by roll spreader. The washer should fit tightly over the barrel and should be slightly wider than the eyelet head. Now days plastic or other similar material kind of

eyelets are in use for delicate and sifter kind of materials.

Types of eye-lets

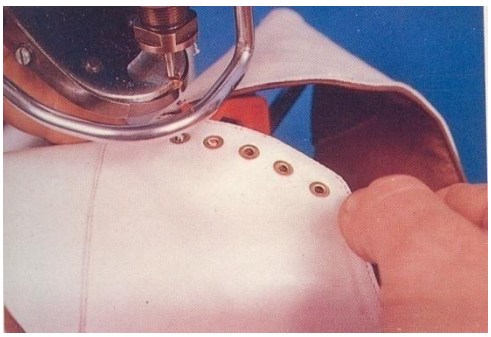
A. Visible eye-lets

Visible eyelets are ornamental and shown on the surface. The eyelet must clench to the material being worked on, whether the shoe may be lined or unlined, if shoe is lined, then the eyelet must clench on the lining firmly enough to hold the two pieces together. Visible eyelet is also known as ordinary eyelet. Eyelet holes should be reinforced with suitable reinforcement material. These eyelets can be fixed manually or by machine.



B. Invisible eye-lets

Invisible eyelets are not seen from the surface. And they clench only to the lining. They are also known as blind eyelets. A hole is made in the lining and upper and eyelet is inserted from the lining side. Then it is curled by roll spreader for invisible eyelets.



Tools and accessories required for invisible eyeleting is same as for visible eyeleting, but care should be taken during selection of punch and star spreader.

As it has already been made clear that the eyelets are fixed over the lining quarter during invisible eyeleting. When shoe is made and wear, the eyelets fixed on the upper are not visible

that is why they are called invisible or blind eyelets. The lining material used in upper making is always soft and thin as compared to the upper leather.

If any kind of metal fixing (eyeleting) is done on lining, it is obvious that the size of the eyelets should be smaller than the visible eyelets as per the amount of strain and stress lies on the material. A small eyelet refers to the diameter of head and length and width of the barrel.

To meet such requirements, punch and star spreader tools are used during blind eyeleting is selected as per the dimensions of the punch and spreader.

Ring. is an item used for lacing footwear, usually a metal ring shaped

Types of ring

D-ring

Hooks

D-ring . is an item used for lacing footwear, usually a metal ring shaped like the letter D. It may be secured to a surface with a metal or fabric strap. D-rings are used in place of eyelets as per the design or fashion requirements.

D-rings

Hooks. Many shoes, sneakers and boots come with lugs instead of eyelets. These are usually flat loops made of cloth or leather, though they can also be rings, hooks or tubes made of metal or nylon. The shoelaces run through these lugs along the surface of the shoe rather than

between the inside and outside of the shoe, resulting in somewhat different lacing.

Laces

Laces are used to secure shoes, boots and other footwear. They typically consist of a pair of strings or cords, one for each shoe, finished off at both ends with stiff sections, known as aglets.

Each shoelace typically passes through a series of holes, eyelets, loops or hooks on either side of the shoe.

How to keep your shoelaces tied is a question asked many times. It is a chronic problem everyone has that wears shoes with shoelaces.

One reason shoelaces come untied is caused by worn and stretched shoelaces.
With normal use, the location of the shoelaces knot (bow) wears and stretches the fibers of the shoelace. These worn and stretched shoelaces will come untied more easily than shoelaces that are not worn and stretched. The main reason shoelaces come untied is because they are not properly tied.

Self-Check 3 Written Test

Name: _____ Date: _____

Time started: _____ Time finished: _____

explanations/answers. Total mark (4 points)

Types of eye-lets(2 points)

Types of ring(2 points)

Note: **Satisfactory rating - 4points** **Unsatisfactory - below 4 points**

KEY ANSWER SHEET

Module Title: Performing Leather Grading Operations(LO7)LG23-29)

/LO#1/self check 1___4

self check 1 (5point)

Short answer

1,_____

2,_____

Choose

1,_____

self check 2(9point)

true and false

1,_____3,_____5_____7____ 9_____

2,_____4,____ 6_____8,_____

self check 3(5point)

Short answer

1,_____

2,_____

self check 4

Choose

1,____,2_____

Answer sheet /LO#2/self check 1___3

self check 1

Short answer(5poin)

1,----------

---

self check 2(6point)

Short answer

1,

a) ----------

b) ----------

c) ----------

2,

d) ----------

e) ----------

f) ----------

self check 3(5point)

Explain

1,----------

2,fill in the black space

Answer sheet /LO#3/self check 1___3

self check 1

Short answer

1, ----------

2,Define

A,----------

B,----------

C,----------

D,----------

self check 2

Short answer

1, ----------

2,----------

Answer sheet /LO#4/self check 1___5

self check 1

Short answer

1, ----------

choose

2,----------

self check 2 M aching

1. ---------
2. ---------
3. ---- -----
4. --------

self check 3 M aching operation sheet ends of LO4

self check 4 Short answer

1, ----------

2,----------

Fil in the Black space

1, ----------

2,----------

self check 5

Fil in the Black space

1, ----------

2,----------

Answer sheet /LO#5/self check 1___3

self check 1

Choose

1,_____

2,----------

self check2

1, ----------

self check3

true and false 1,_____2____3_____

Answer sheet /LO#6/self check 1___3

self check 1

1, ----------3,----------

2,----------4.----------

self check2

1, ----------3,----------

2,----------4.----------

5,----------

self check3

Choose

1,____

2,--------

3,----------

true and false 1,_____2____3_____

Answer sheet /LO#5/self check 1___3

Explanation

self check1

True and false

1, --------

2,--------

Fill in the Black space

1, ----------

2,----------

self check2

Fill in the Black space

1, ----------

2,----------

self check3

Explanation

1, ----------

2,----------

Reference Materials

Book:

Note: **Satisfactory rating - 4points** **Unsatisfactory - below 4 points**

TTLM of footwear level one Performing Leather Grading Operations

TLM of footwear level two on (OS) Version 4January 2012 **IND FP2 TTLM 0212v1**

Webs

www.geine leather

Galen leather.com/bog

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experts of Oromia Regional TVET bureau and Federal TVET bureau in Bishofitu city BIN INTERNATIONAL HOTEL

This Teaching, Training and Learning Materials (TTLM) was developed on December, 2020 Bishoftu

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