

# Participant Handbook

Sector  
**Leather**

Sub-Sector  
**Footwear**

Occupation  
**Pre-Assembly Operations**

Reference ID: **LSS/Q2601, Version 1.0**  
**NSQF Level 4**



**Pre-Assembly Operator**





**Shri Narendra Modi**  
Prime Minister of India

“ Skilling is building a better India.  
If we have to move India towards  
development then Skill Development  
should be our mission. ”



## Certificate

### COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the  
Leather Sector Skill Council

for

### SKILLING CONTENT : PARTICIPANT HANDBOOK

Complying to National Occupational Standards of  
Job Role/ Qualification Pack: “Pre-Assembly Operator” QP No. “LSS/Q2601, NSQF Level 4”

Date of Issuance: April 9<sup>th</sup>, 2016  
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\*Valid up to the next review date of the Qualification Pack or the  
‘Valid up to’ date mentioned above (whichever is earlier)

Authorised Signatory  
(Leather Sector Skill Council )

## Acknowledgements

We thank the following organizations for endorsing the contents of this Participant Handbook, thus contributing towards skilling based on the Qualification Pack (QP) and National Occupational Standards (NOSs).



## About this Book

This Participant handbook is designed to enable training for the Qualification Pack (QP) for “Pre-Assembly Operator” vide Reference ID: LSS/Q2601 published by LSSC.

This course encompasses all 12 National Occupational Standards (NOS) of “Pre-Assembly Operator” Qualification Pack issued by “SSC: Leather Sector Skill Council”. Each NOS is covered across one unit/s.

This book is designed for up-grading the knowledge and skills for working as a 'Pre-Assembly Operator' in Leather Industry. This book will provide the necessary knowledge and skill inputs for an operator to work in an organized and disciplined manner by following safe working practices, good housekeeping, effective communication, documentation and work ethics.

Upon successful completion of this course the participant will be able to:

1. Carry-out Splitting operation in upper footwear
2. Carry-out Gimping operation
3. Carry-out Ironing operation
4. Carry-out Marking activities
5. Carry-out Edge colouring activities
6. Carry-out Pasting activities
7. Carry-out Hand folding activities
8. Carry-out Eyeleting operation
9. Support to achieving product quality in footwear manufacturing
10. Maintain the work area, tools and machines
11. Maintain health, safety and security at workplace
12. Comply with industry, regulatory and organizational requirements

Key Learning Objectives for the specific NOS mark the beginning of each module. The symbols used in this book are described below.

## Symbols Used



Key Learning  
Outcomes



Steps



Time



Tips



Notes



Unit  
Objectives



Summary



Exercise













LEATHER  
SECTOR  
SKILL  
COUNCIL

# 1. Overview on Leather Industry and Generic Skills

Unit 1.1 - Introduction to Leather Industry and Pre-Assembly Operator

Unit 1.2 - Hazards, Safety and Health

Unit 1.3 - Workplace Skills



## Key Learning Outcomes



**At the end of the module, you will be able to:**

1. Gain in-depth knowledge about Leather industry in India
2. Identify the factory/ section you are working and your role in the section
3. Describe manufacturing leather
4. Explain the hazards associated with the pre-assembly operations
5. Comply with SHE guidelines and legal provisions
6. Demonstrate workplace skills
7. Use and Wear PPE Properly

## UNIT 1.1: Introduction to Leather Industry and Pre-Assembly Operator

### Unit Objectives

**At the end of this unit, you will be able to:**

1. Explain the importance of leather industry
2. Describe leather manufacturing process
3. Describe the uses of different types of leather products in India
4. List down different types of leather available
5. Describe role of pre-assembly operator in leather industry

### 1.1.1 Introduction to Leather Industry

India is the fifth-largest exporter of leather goods and accessories in the world. India is the world's second largest producer of footwear; its production is estimated over 700 million pairs per annum. It is one of the traditional Indian industries and is essentially located in certain states of India such as UP, Rajasthan, MP, Punjab, Gujarat, West Bengal and Orissa, but the industry is scattered as cottage industry in rural areas.

- India accounts for 10% of the world's leather production
- The revenue of leather industry is more than INR 81000 crore
- Leather industry employs 2.5 million people
- 24% growth projected in the next five years
- 55% of workforce below 35

The Leather Industry holds a prominent place in the Indian economy. This sector is known for its consistency in high export earnings and it is among the top ten foreign exchange earners for the country. Leather is one of the most widely traded commodities globally. The growth in demand for leather is driven by the fashion industry, especially footwear. Apart from this, furniture and interior design industries, as well as the automotive industry also demand leather. The leather industry has a place of prominence in the Indian economy due to substantial export earnings and growth.

The leather industry is an employment intensive sector, providing job to about 2.5 million people, mostly from the weaker sections of the society. Women employment is predominant in leather products sector with about 30% share. India is the second largest producer of footwear and leather garments in the world.

With 55% of the employees below 35 years of age, we employ almost 2.5 million people in the country. With an annual turnover of over INR 73615 crore, the export of leather and leather products increased manifold over the past decades and touched close to INR 39588 crore during 2013-14, recording a cumulative annual growth rate of about 14.77% (5 years). Fueling up manufacturing will lead to a rise in demand for more skilled hands on the deck. Thus, the leather sector could be one of the many industries that can help solve India's unemployment woes. Though in general, things look good for the industry, there are a number of challenges that still need to be tackled.

As per a report by the National Skill Development Corporation (NSDC), although India has gradually liberalized its cumbersome compliance and documentation policies for global leather trade, it still lags behind most of the developed countries and even similarly placed developing countries. India's cost of logistics, as a share of the GDP, is one of the highest in the world (12-13% of the GDP) compared to the developed markets (below 10% of the GDP). This is reflected in the transportation cost per kilometer, which may hamper the industry's competitiveness as the leather is export-based and has to reach a wide retail market. The slow pace of reforms in the Indian power sector has had a specific detrimental effect on the leather industry in the form of additional cost of power back-up.

The Leather industry is bestowed with an affluence of raw materials as India is endowed with 21% of world cattle and buffalo and 11% of world goat and sheep population. Added to this are the strengths of skilled manpower, innovative technology, increasing industry compliance to international environmental standards, and the dedicated support of the allied industries.

### **Galloping Exports**

India's leather industry has grown drastically, transforming from a mere raw material supplier to a value-added product exporter. Today, around 50% of India's leather business comes from international trade.

At 45.3%, footwear accounted for the lion's share of leather exports, followed by leather goods with 22.2%, and finished leather with 20.6% share in April-Jan 2015. In 2014–15 (up to January 2015), footwear recorded the maximum increase in exports, followed by saddlery and harness, and leather goods.

During 2014–15 (up to January 2015), the major markets for Indian leather products were Germany (12.6%), the US (11.5%), the UK (11.5%), Italy (7.8%), Hong Kong (6.5%), France (5.7%), Spain (5.4%), the UAE (4.2%), the Netherlands (3.6%) and China (3.0%).

### **Indian Leather Industry – Overview, Export Performance and Prospects**

The major production centers for leather and leather products in India are located in Tamil Nadu - Chennai, Ambur, Ranipet, Vaniyambadi, Vellore, Pernambut, Trichy, Dindigul and Erode ; West Bengal – Kolkata ; Uttar Pradesh – Kanpur, Agra, Noida, Saharanpur; Maharashtra – Mumbai ; Punjab – Jalandhar ; Karnataka – Bangalore ; Andhra Pradesh - Hyderabad ; Haryana - Ambala, Gurgaon, Panchkula, Karnal and Faridabad; Delhi; Madhya Pradesh – Dewas ; Kerala – Calicut and Ernakulam / Cochin.

### **Strengths of Indian leather sector**

- Own raw material source – 2 billion sq. ft. of leather produced annually
- Some varieties of goat / calf / sheep skins command premium position
- Strong and eco-sustainable tanning base
- Modernized manufacturing units
- Trained / skilled manpower at competitive wage levels
- World-class institutional support for Design & Product Development, HRD and R & D.
- Presence of support industries like leather chemicals and finishing auxiliaries
- Presence in major markets – Long Europe experience
- Strategic location in the Asian landmass
- Emerging strengths
- Design development initiatives by institutions and individuals
- Continuous modernization and technology up-gradation

- Economic size of manufacturing units
- Constant human resource development programme to enhance productivity
- Increasing use of quality components
- Shorter prototype development time
- Delivery compliance
- Growing domestic market for footwear and leather articles

### Highlights of Leather Product Segments

#### Tanning Sector

Annual production 2 billion Sq. ft. Accounts for 10% of world leather requirement. Indian colors continuously being selected at the MODEUROPE Congress.

#### Footwear Sector

Second largest footwear producer after China. Annual Production 2065 million pairs. Huge domestic retail market 1950 million pairs (95%) are sold in domestic market. Footwear export accounts for 42.83% share in India's total leather & leather products export. The Footwear product mix Gents 54%, Ladies 37% and Children 9%.

#### Leather Garments Sector

Second largest producer with annual production capacity of 16 million pieces. Third largest global exporter. Accounts for 10.09% share of India's total leather export.

Leather Goods & Accessories Sector including Saddlery & Harness – Fifth largest global exporter. Annual production capacity – 63 million pieces of leather articles, 52 million pairs of Industrial gloves & 12.50 million pieces of Harness & Saddlery items. Accounts for 25.34% share of India's total export.

### Current Scenario

Export of Leather and Leather products for the period April to January 2012-13 touched US\$ 4070.21 mn as against the performance of US\$ 4122.17 million in the corresponding period of 2011-12, recording a marginal decline of 1.26%.

### Major Markets

The major markets for Indian Leather & Leather Products are Germany with a share of 12.92%, USA 11.32%, U.K. 11.20%, Italy 8.73%, France 5.99%, Hong Kong 7.98%, Spain 5.21%, Netherlands 3.66%, China 2.60%, Denmark 1.51%, UAE 3.05%, Belgium 1.62%.

These 12 countries together accounts for nearly 76% of India's total leather & leather products export.

European Union accounts for 57% of India's total export of leather and leather products.

India's Export of leather & leather products to different countries – 5 years.

### Future Outlook

The Government of India had identified the Leather Sector as a Focus Sector in the Indian Foreign Trade Policy in view of its immense potential for export growth prospects and employment generation. Accordingly, the Government is also implementing various Special Focus Initiatives under the Foreign Trade Policy for the growth of leather sector. With the implementation of various industrial developmental programmes as well as export promotional activities; and keeping in view the past performance, and industry's inherent strengths of skilled manpower, innovative technology, increasing industry compliance to international environmental standards, and dedicated support of the allied industries, the Indian leather industry aims to augment the production, thereby enhance export, and resultantly create additional employment opportunities.

## 1.1.2 Leather

Leather is a durable and flexible material created by the tanning of animal rawhide and skin, often cattle hide.



Fig 1.1.1 Raw Leather

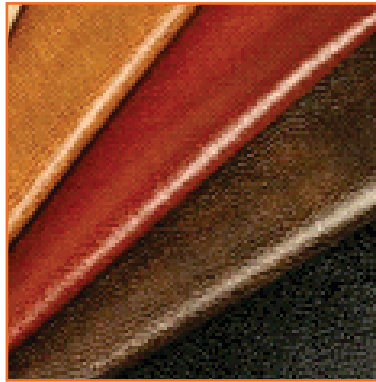


Fig 1.1.2 Top Grain Leather



Fig 1.1.3 Leather Swatches

### 1.1.2.1 Grain Structure

The structure of leather, also known as Grain structure is depicted below:

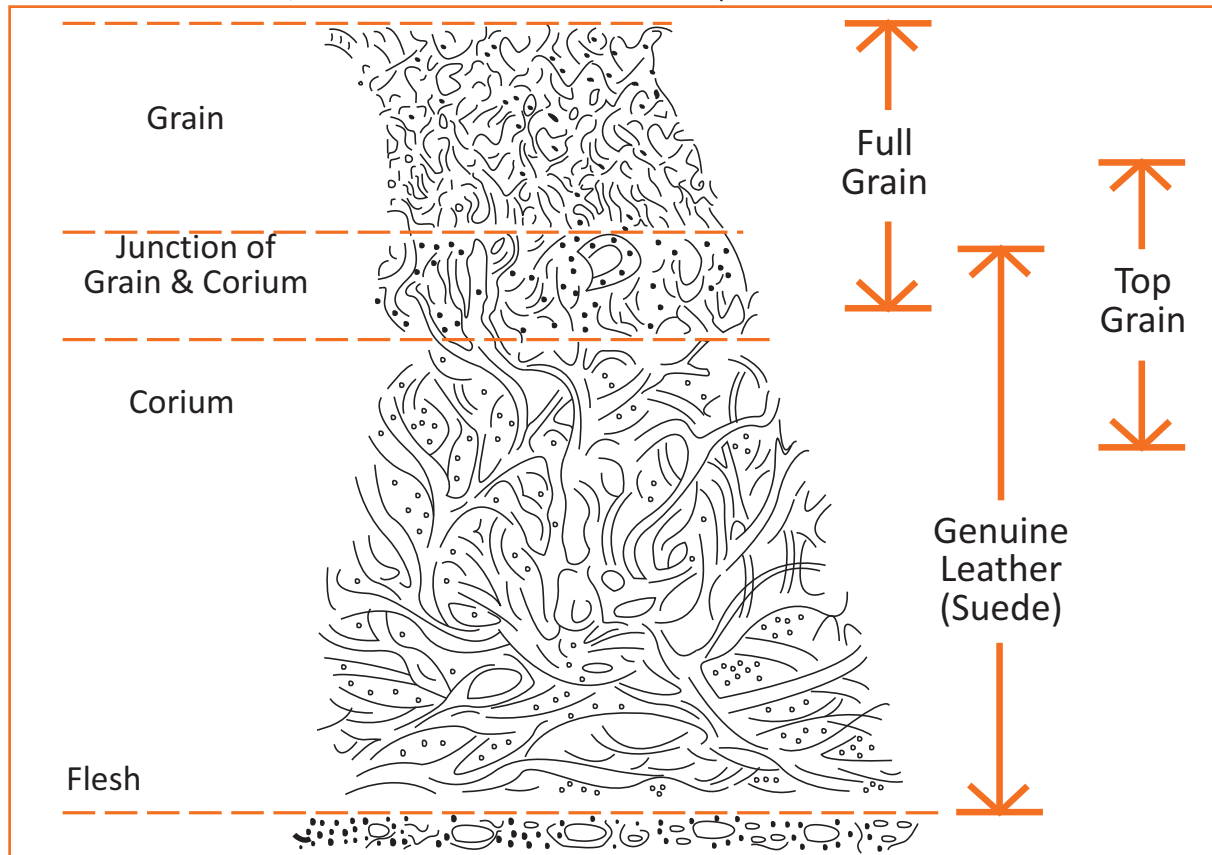


Fig 1.1.4 Grain Structure

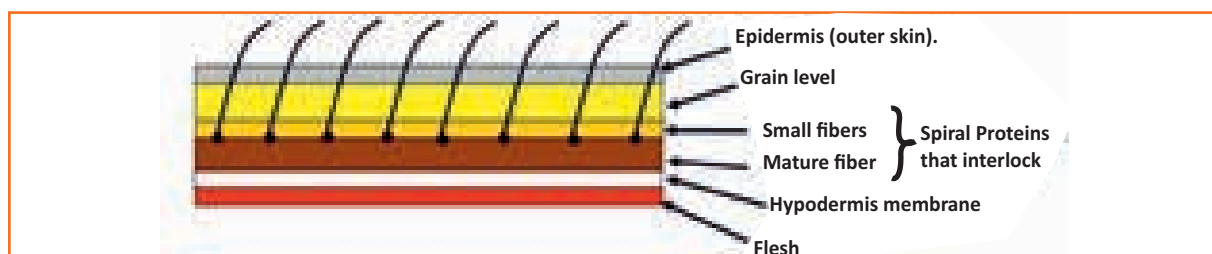


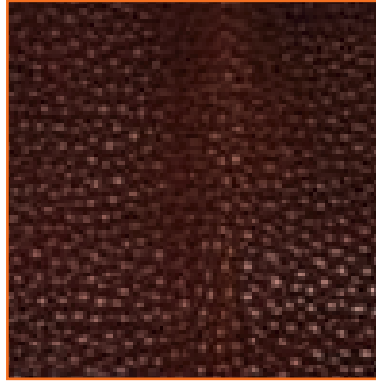
Fig 1.1.5 Skin Structure



Leather is tanned and finished on the grain side to have a smooth rich surface. Leather, which is tanned and finished on the flesh side, is called suede. Various types of finished leathers, which are used for making leather products, are described below:

#### **Natural Grain Finish**

The leathers are finished with grain intact. The leathers should have good grain quality without deep scars or looseness.



*Fig 1.1.6 Natural Grain Finish*

#### **Full Aniline finish**

The leathers are dyed into a colour close to the required colour. Two or three coats of transparent finish with or without dye is applied which serves as a protection to the surface. Binders can be subjected to high temperature by friction to give a brilliant glossy look to the leather surface. These types of finishes enhance the natural appearance of the surface.



*Fig 1.1.7 Full Aniline Finish*

#### **Semi - Aniline Finish**

Semi-aniline leathers contain small amount of pigments along with the dye to give coloured finish. The pigments used in the finish can cover minor scratches and superficial scars. They present a natural grain surface without too much of loading of the grain.



*Fig 1.1.8 Semi Aniline Finish*

**Pigment Finish**

Pigment finished leathers are those types of finished leathers with relatively high amount of covering material. The covering of defects is very good in this finish.



*Fig 1.1.9 Pigment Finish*

**Imitation Grain Finish**

These types of leathers are made from relatively poor quality hides. The hide surface has a number of deep scars and cannot be finished to a uniform look without modifications. So, the grain is removed by snuffing. Special resin binders are used to reduce the looseness of the grain layer and heavy finish coat is applied to get a uniform finished surface, which is embossed.



*Fig 1.1.10 Imitation Grain Finish*

**Corrected Grain Finish**

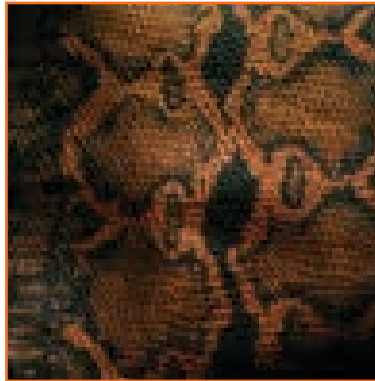
The crust is buffed to remove the top grain pattern and treated with a filling type of resin, which makes the grain layer tight. It is then embossed to stimulate an attractive grain surface. Special effects such as brush off effect can be obtained by using suitable binders and colouring mixes.



*Fig 1.1.11 Corrected Grain Finish*

**Printed Finish**

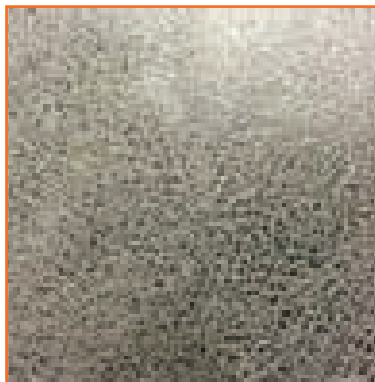
These leathers are finished similar to corrected grain leathers, but with deeper print on the surface by embossing with suitable heat and pressure. A variety of print patterns such as crocodile print, lizard print, etc. can be effected.



*Fig 1.1.12 Printed Finish*

**Split Surface Finish**

Split leathers cannot hold the finish coating well due to its coarse and fibre network. Special techniques can be used to apply finish coatings on the split surface to upgrade the performance similar to finished leathers.



*Fig 1.1.13 Split Surface Finish*

**Nubuck Finish**

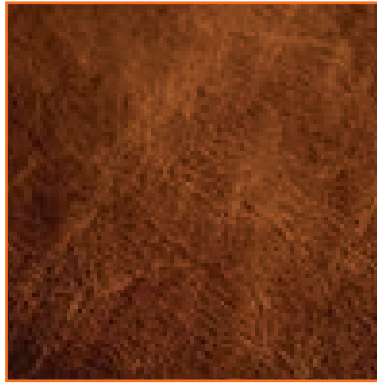
The leathers are finished with velvet like surface on the grain layer. Since the fibres in the grain layer are compact and short, the nap is fine and smooth and the textured surface will show a difference in shading when run by the hand over it.



*Fig 1.1.14 Nubuck Finish*

**Oil Pull-up Finish**

Special oils are applied on the surface of the leather with or without transparent finish coatings. The oils provide protection as well as a unique look to the surface. Oil pull-ups are made from full grain leathers with application of oil. The oil can migrate when pressure is applied on the surface and come back when the pressure is released. Thus, the surface will show two-tone effect when pressed or pulled.



*Fig 1.1.15 Oil Pull-up Finish*

**Antique Finish**

The leathers are applied with special wax to the buffed grain surface. The wax can melt and migrate under frictional heat. Because of this, when the surface is rubbed, the colour of the rubbed portion changes which does not reverse immediately. This shows an antique effect.



*Fig 1.1.16 Antique finish*

**1.1.2.2 Characteristics of Leather**

Each type of leather is suited to a range of uses, according to its unique characteristics. Choosing the right one for the job is easy, once you know what to look for.

**Buff Hides**

Buff hides are thick, strong and durable. Buff uppers and buff softy uppers are finished in a few shades. They are used for making heavy and luggage leather goods.