Title	**Describe the stages, machinery and chemicals used from tanning to finishing in leather manufacture**		
Level	**4**	**Credits**	**10**

Purpose	People credited with this unit standard are able to: identify and describe the tanning, post tanning and finishing stages; describe tanning and dry work machines identify and describe tannery chemicals and their purpose, used from tanning to finishing in leather manufacture.

Classification	Fellmongery and Leather Processing > Leather Processing Knowledge

Available grade	Achieved

Guidance Information

1 Legislation relevant to this unit standard includes but is not limited to:
- Health and Safety at Work Act 2015;
- Hazardous Substances and New Organisms Act 1996;
- Resource Management Act 1991;
  and any subsequent amendments.

2 Definitions
Tanning – the process where raw animal skin and hide protein structures are altered using chemical, plant or mineral products to provide stabilisation and prevent decomposition, converting the material into leather.
Post-tanning – stages after tanning and is made up of further chemical treatments designed to improve the appearance of the leathers and make them suitable for commercial uses.
Finishing – improves the use properties of the leather and protects it from wetting and soiling, to level out patches and grain faults or modify the surface properties.

3 References
The Leather Industry: A Chemistry Insight Part I: an Overview of the Industrial Process. Beghetto, Valentina. (2013). Sciences at Ca' Foscari. 2013. 12-22. 10.7361/SciCF-448. available at https://www.researchgate.net/publication/256494870_The_Leather_Industry_A_Chemistry_Insight_Part_I_an_Overview_of_the_Industrial_Process/.
Mann, B. R., & McMillan, M. M. (2008). *The Chemistry of the Leather Industry*. GL Bowron & Co. Ltd., and Aranui High School available at https://nzic.org.nz/app/uploads/2017/10/5C.pdf.
Yadav, A., Mishra, S., Kaithwas, G., Raj, A., & Bharagava, R. N. *Organic Pollutants and Pathogenic Bacteria in Tannery Wastewater and their Removal Strategies.* Microbes and Environmental Management (2016). Studium Press (India), New Delhi,

101-127 available at https://scholar.google.com/scholar?oi=bibs&cluster=8066946304854169372&btnI=1&hl=en.

Outcomes and performance criteria

Outcome 1

Identify and describe the tanning, post tanning and finishing stages used in leather manufacture.

Performance criteria

1.1 Identify the production stages from tanning to finished leather in the correct sequence.

Range seven production stages in sequence are required.

1.2 Describe the purpose of the stages undertaken during tanning, post tanning and finishing.

Range the purpose for the seven production stages are required.

1.3 Describe chrome and chrome free tanning in terms of the processes used and the differing finished leather characteristics.

Outcome 2

Describe tanning and dry work machines used in the tanning, post tanning and finishing stages in leather manufacture.

Performance criteria

2.1 Describe tannery machines in terms of basic features and principles of operation.

Range may include but is not limited to – splitter, shaver, process vessel, ironer, vacuum dryer, staker, spray finisher;
evidence of three is required.

2.2 Describe dry work machines in terms of their purpose and desired outcomes on the product.

Range may include but is not limited to – staking, milling, buffing, spraying;
evidence of three is required.

Outcome 3

Identify and describe chemicals used and their purpose in tanning, post tanning and finishing stages in leather manufacture.

Performance criteria

3.1 Identify and describe chemicals used in specific stages in tanning, post tanning and finishing and their purpose.

Range evidence of ten chemicals used is required – two from tanning (may include but is not limited to – chromium, sulphate, sodium formate, aldehyde, magnesium oxide, fungicide);
four from post tanning (may include but is not limited to – surfactants, sodium bicarbonate, sodium formate, resins, polymers, dyes, fat liquor);
four from finishing stage (may include but is not limited to – acrylic resins, polyurethane, resins, lacquers, fillers, solvents).

Replacement information	This unit standard and unit standard 32043 replaced unit standard 8386.

Planned review date	31 December 2024

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	27 February 2020	N/A

Consent and Moderation Requirements (CMR) reference	0033

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact the Primary Industry Training Organisation standards@primaryito.ac.nz if you wish to suggest changes to the content of this unit standard.