

|              |   |                |           |
|--------------|---|----------------|-----------|
| <b>Title</b> | <b>Analyse and develop a process map for a textile manufacturing operation, and make recommendations for improvements</b> |                |           |
| <b>Level</b> | <b>5</b>  | <b>Credits</b> | <b>15</b> |

|                |  |
|----------------|--|
| <b>Purpose</b> | People credited with this unit standard are able to: analyse production process stages and the selection of equipment for a textile manufacturing operation; develop a process map for a multi-stage textile manufacturing operation; and analyse the process map and make recommendations for improvements in the textile production process. |
|----------------|--|

|                       |   |
|-----------------------|---|
| <b>Classification</b> | Textiles Manufacture > Core Yarn Processing |
|-----------------------|---|

|                        |          |
|------------------------|----------|
| <b>Available grade</b> | Achieved |
|------------------------|----------|

### Guidance Information

- Range  
 The process map must cover a minimum of three consecutive production processes or production departments.
- Assessment guidance  
*Process* may be measured in accordance with quality tools such as –  
 3 *Sigma* – a process in which the control limits are at  $\pm 3$  standard deviations from the mean.  
 5S – methodology for waste elimination through workplace organisation, centred around five Japanese concepts, translated as: sort, straighten, shine, standardise, and sustain.  
 6 *Sigma* – quality measurement and improvement programme which focuses on achieving very low failure rates, such as when the process control limits are  $\pm 6$  standard deviations from the mean.  
*Agile manufacturing* – the ability to accomplish rapid changeover between the manufacture of different products.  
*Just in Time* – an inventory strategy for improvement of return on investment by reducing in-process inventory and associated costs.  
*Kaizen* – an approach to productivity, based on continuous incremental process improvements through elimination of waste in machinery, labour, and production methods.  
*Kanban* – a ‘pull’ system at a stock point in which a supply batch is ordered only when a previous batch is withdrawn. Used to implement Just in Time.  
*Lean manufacturing* – a manufacturing methodology emphasizing the minimisation of all resources (including time) used in an enterprise, and typically employing Just in Time, Kaizen, Kanban, TQM, and TPM. Also referred to as Competitive Manufacturing.

*Poka Yoke* – a methodology for preventing errors by imposing limits on an operation which force its correct completion.

*SMED* – Single Minute Exchange of Die, a strategy for rapid changeover of tooling.

*TPM* – Total Productive Maintenance, an approach to maintenance emphasizing preventive and predictive maintenance activities.

*TQM* – Total Quality Management, a management strategy aimed at embedding awareness of quality in all processes of an organisation.

### 3 Recommended skills and knowledge:

Unit 9695, *Examine problem-solving models and explain associated techniques*, Unit 29447, *Use problem-solving models to determine solutions to resolve technical manufacturing processing problems*.

---

## Outcomes and performance criteria

### Outcome 1

Analyse production process stages and the selection of equipment for a textile manufacturing operation.

#### Performance criteria

1.1 The purpose and function of each process stage is analysed in terms of the manufacturing operation and its outcome.

1.2 A rationale for the selection of equipment at each textile processing stage is provided in terms of the organisation and the operation.

Range includes – cost, process capacity and capability, equipment availability, product quality requirements, skill requirements, production construction requirements.

### Outcome 2

Develop a process map for a multi-stage textile manufacturing operation.

#### Performance criteria

2.1 The process map includes and labels textile manufacturing process stages, linear process flows, and sequencing of process stages.

Range examples are – specification for the equipment used at each process stage and flows between stages.

2.2 The process map defines current input and output measurement per 24-hour cycle for each of the textile manufacturing process stages.

Range in units appropriate to the process.

2.3 The process map identifies bottlenecks due to product construction or process selection in the textile manufacturing operation.

- 2.4 The process map identifies raw material, work in progress, and finished product movement systems in the textile manufacturing operation.

### Outcome 3

Analyse the process map and make recommendations for improvements in the textile production process.

#### Performance criteria

- 3.1 The process map is analysed in terms of the potential for higher productivity in each processing stage and recommendations are made for potential improvements.
- 3.2 The process map is analysed to identify alternative means for increasing capacity in a textile manufacturing operation and recommendations are made for potential improvements.
- 3.3 The process map is analysed to identify bottlenecks in the textile manufacturing operation and recommendations are made for their reduction and for potential processing efficiency gains.

**This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.**

#### Status information and last date for assessment for superseded versions

| Process      | Version | Date          | Last Date for Assessment |
|--------------|---------|---------------|--------------------------|
| Registration | 1       | 19 May 2006   | 31 December 2019         |
| Rollover     | 2       | 16 April 2010 | 31 December 2019         |
| Review       | 3       | 19 May 2016   | 31 December 2023         |
| Review       | 4       | 24 March 2022 | 31 December 2023         |

|  |      |
|--|------|
| <b>Consent and Moderation Requirements (CMR) reference</b> | 0030 |
|--|------|

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