RTE3512A Prepare raw materials and compost the feedstocks
RTE3512A Prepare raw materials and compost the feedstocks

Modification History
Not applicable.

Unit Descriptor

Unit descriptor
This unit of competency specifies the outcomes required to prepare and mix raw materials comprising compostable organic materials into a suitable feedstock mixture for commercial-scale composting, and compost feedstock mixtures to manufacture compost products with suitable characteristics for intended use. The unit involves the application of knowledge and skills to a range of processes and technologies.

Application of the Unit

Application of the unit
Composting is used here as a general expression for the processing of organic materials; with this unit being relevant for both aerobic composting and vermiculture technologies. This unit of competency applies to an employee of an enterprise engaged in commercial-scale composting operations. Work is likely to be performed as a part of a team and under the supervision of a site manager or operations manager. Where work requires the use of load-shifting or other equipment, appropriate training/certification must be provided according to state and territory safety and licensing requirements.

Licensing/Regulatory Information

Refer to Application of the Unit

Pre-Requisites
Not applicable.

Employability Skills Information

Employability Skills
The required outcomes described in this unit of competency contain applicable facets of Employability Skills.
Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency. Performance criteria describe the required performance needed to demonstrate achievement of the element. Where **bold italicised** text is used, further information is detailed in the required skills and knowledge and/or the range statement. Assessment of performance is to be consistent with the evidence guide.

## Elements and Performance Criteria

### Elements and Performance Criteria

<table>
<thead>
<tr>
<th>Element</th>
<th>Performance Criteria</th>
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<tbody>
<tr>
<td>1</td>
<td><strong>1 Organise for processing.</strong></td>
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<tr>
<td></td>
<td>1.1 <em>Job sheet</em> is reviewed to clearly identify all processing requirements.</td>
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<td></td>
<td>1.2 <strong>Machinery</strong>, equipment and materials appropriate to the job requirements are selected and checked for serviceability and safe operation.</td>
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<td>1.3 Potential <strong>OHS hazards</strong> are identified and assessed, and appropriate action is taken to minimise risk to self and others.</td>
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<td>1.4 Suitable personal protective equipment (<strong>PPE</strong>) is selected, fitted, used, maintained and stored according to work requirements, manufacturer specifications and <strong>enterprise procedures</strong>.</td>
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<td></td>
<td>1.5 Enterprise OHS guidelines are complied with.</td>
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<tr>
<td>2</td>
<td><strong>2 Prepare raw materials and compost the feedstock mixture.</strong></td>
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<tr>
<td></td>
<td>2.1 <strong>Raw materials</strong> and <strong>additives</strong> for processing are identified, collected and checked to ensure compliance with enterprise procedures, including assessment of physical <strong>contamination</strong> according to enterprise guidelines.</td>
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<td></td>
<td>2.2 <strong>Composting technology and methods</strong> to be used are confirmed as appropriate to raw material types and enterprise product requirements.</td>
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<td>2.3 Raw materials are variously <strong>pre-processed</strong> into suitable forms for composting according to enterprise product requirements.</td>
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<tr>
<td></td>
<td>2.4 Pre-processed raw materials are mixed into suitable feedstock mixtures for composting according to</td>
</tr>
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</table>
documented recipes or batches.

2.5 Feedstock mixtures for composting are handled according to technology, appropriate method, and industry best practice and enterprise procedures.

2.6 Batch numbers or codes are assigned and batch documentation is created to enable tracking of batch through compost production cycle.

3 3 Monitor composting process.

3.1 Composting batch is monitored by observation and use of field testing equipment to maintain effective composting process and efficient compost production schedule according to relevant Australian standards for the product.

3.2 Processing and operations records are maintained for process control and to track batch through the compost production cycle.

3.3 Faults or variations observed at any stage of process are reported to supervisor and remedial action is taken to maintain effective and consistent compost production.

4 4 Conduct quality control inspection.

4.1 Finished compost is inspected and assessed for compliance with enterprise product requirements and relevant Australian standards.

4.2 Faults or variations observed are reported to supervisor.

4.3 Non-compliant product is further processed with necessary adjustments made as directed to processing technique and compost batch management to achieve compliance with product quality requirements.

4.4 Compliance of compost batch with product requirements is confirmed.

4.5 Batch documentation is completed for compliant compost product.

4.6 Sales and operational staff members are informed that product is suitable for sale and/or preparation of value-added products.

4.7 Work outcomes are reported to supervisor, feedback on performance is sought and any
5 Required Skills and Knowledge

This section describes the essential skills and knowledge and their level, required for this unit.

Required skills include:
- establishing and maintaining accurately and promptly appropriate compost batch documentation
- conducting basic field tests according to specified procedures
- operating equipment safely and efficiently
- identifying and handling raw materials and products
- preparing batches for composting according to defined compost recipes
- preparing raw materials in accordance with enterprise product requirements.

Required knowledge includes:
- awareness of compost quality standards
- basic principles of composting science as related to commercial compost production characteristics of a range of raw materials
- fundamental characteristics of compost quality
- key process control stages critical to consistent compost production
- overview of systems and technologies used in compost production, particularly as relevant to candidate's workplace
- range and characteristics of categories of compost product.
Evidence Guide

Overview of assessment
This unit of competency could be assessed on its own or in combination with other units of competency relevant to the job function such as after:
RTC2210A Maintain properties and structures
RTC2701A Follow OHS procedures
RTC2702A Observe environmental work practices
RTE2507A Recognise raw materials, production processes and products on a composting site
RTE2608A Set up, operate and maintain water delivery systems
RTE2709A Recognise and respond to fire emergencies on a composting site.

Critical aspects for assessment and evidence required to demonstrate competency in this unit
The critical requirements for this unit of competency as a whole are listed below.
Assessment must confirm one's ability to:
prepare raw materials for composting according to enterprise product requirements
prepare batches for composting according to defined compost recipes
operate equipment in a safe and efficient manner
conduct all work in a safe and efficient manner
conduct basic field tests according to specified procedures
interpret basic field test results to confirm effective processing and define intervention required to rectify composting processes
establish and maintain appropriate compost batch documentation accurately and promptly.

Context and specific resources for assessment
Assessment for this unit of competency is to be largely practical in nature and must be assessed in a commercial-scale composting facility or in a situation that reproduces and/or simulates operational conditions.
For valid assessment, one must have opportunities to participate in exercises, case studies and other real and simulated practical and knowledge assessments that demonstrate the skills and knowledge specified in this unit.
The candidate must also have access to the following resources:
access to a commercial-scale composting facility
access to a range of load-shifting equipment and a qualified operator if required
PPE
raw materials for recognition and preparation forms (batch recording forms)
water or irrigation system
copies of relevant product quality standards
compost recipe calculators and procedures
compost management procedures
batch documentation systems.

Guidance information for assessment
To ensure consistency in performance, competency should preferably be demonstrated on more than one occasion over a period of time in order to cover a variety of circumstances and operational contexts, and where possible, over a number of assessment activities.
The skills and knowledge required to demonstrate competency must allow for application in a broad industry context, and should be transferable to a range of work environments. For example, this could include work within commercial-scale composting operations of varying scale; range of different raw materials; range of different composts and value-added products manufactured to meet the demands of different markets; located in an urban or rural context with varying environmental constraints; and using various equipment, practices, technologies and management systems.
Range Statement

RANGE STATEMENT
The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. **Bold italicised** wording in the performance criteria is detailed below. Add any essential operating conditions that may be present with training and assessment depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts.

**Job sheet** or work order may include:
- batch number
- compost (batch) recipe
- job number
- product batch order and packaging requirements
- raw materials or product quantity and quality requirements
- raw materials preparation (pre-processing) requirements.

**Machinery** may include:
- particle size screening machinery such as trommel screens, vibrating screens, power screens or screening plants
- size reduction machinery such as tub-grinder, hammer mill, shredder or rotary shear windrow turning machinery and other specialised machinery.

**OHS hazards** may include:
- biological hazards associated with waste
- ergonomic hazards associated with manual handling
- physical hazards such as:
  - compressed air and water
  - dust
  - hammer mills and grinders
  - hot or cold weather conditions
  - noise
  - shredders
  - underfoot conditions
  - vehicles and mobile machinery
  - sharps or other physical contaminants in materials.
PPE may include: dust masks
earmuffs
fire extinguishers
gloves
hard hats
protective clothing
reflector high visibility vests
safety footwear
safety glasses.

Enterprise procedures may include:
forms, work orders and job sheets
hazard, incident and non-conformance reporting processes
management system documents
policies
work practices, procedures and work instructions.

Raw materials or compostable organic materials may include:
animal mortalities
biosolids such as sewage sludge
crop residuals
dairy waste
fats and oils
food organics such as:
food processing waste
food waste
kitchen waste
forestry residuals
manures
organic sludges
other organic waste or by-product of processing
paper mill wastes
paper-based materials
sawdust and wood shavings
sewage facility grit and screenings
wood and timber (non-treated).

**Additives** may include:
- biological inoculants that aid the processing of particular raw materials or manufacture of compost products with particular attributes
- ferrous sulphate or other chemical additives
- lime
- nutrients
- urea.

**Contaminants** may include:
- biological contaminants such as pathogens
- chemical contaminants such as pesticides or heavy metals
- physical contaminants such as:
  - glass
  - metals
  - plastics
  - rubble, stone and soil
  - sharps
  - other non-biodegradable materials.

**Composting and processing technologies and methods** may include:
- in-vessel, such as:
  - aerated turned trough
  - agitated bed
  - rotating drum
  - turned windrow composting
- open, such as:
  - aerated static pile
  - static pile
  - vermiculture.

**Pre-processing** of raw materials commonly involves:
- immediate incorporation with absorbent raw materials
- materials size reduction
- moisture adjustment through such things as addition of water
- particle size screening
physical contaminant removal.

**Batch documentation** may include:
- manual or electronic recording systems that enable tracking of product such as:
- delivery of final product via the assignment of batch numbers
- individual batch preparation and formation production process.

**Equipment** used for **basic field tests** may include:
- oxygen probe
- representative sampling protocol
- sample preparation: sieving, weighing and drying
- spade or fork
- test to assess moisture content
- temperature probe
- water electrical conductivity (EC) meter.

**Processing and operational records** may include:
- manual and electronic tracking systems
- finished product manufacturing work order
- laboratory analysis results and reports
- non-conformance, incident or customer complaint form and records
- product dispatch work order
- raw material receival form and records
- windrow/batch construction and recipe work order
- windrow/batch data form and records
- windrow/batch recipe and work order
- windrow/batch release tags
- windrow/batch tags.

**Remedial action** or adjustments to processing technique and compost batch management required may include:
- action carried out to maintain effective and consistent compost production such as:
- adding water
- adjusting the air flow
- drying out
- turning
action taken in response to problems identified by self or others, or at direction of manager.

**Load-shifting machinery** may include:
- backhoe
- conveyor belts and associated equipment
- excavator
- front-end loader
- skid steer loader
- wheel loader.

**Unit Sector(s)**
Not applicable.