Australian Government

Department of Education, Employment and Workplace Relations

RTE3512A Prepare raw materials and compost the feedstocks

Release: 1

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

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

		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

		required improvements are noted for future action.
5	**5 Clean up area.**	5.1 **Loading-shifting machinery** and other processing equipment are cleared and cleaned as required to avoid contamination between batches.
		5.2 Raw materials and finished compost products are cleared away to designated areas, and processing site is cleaned to ensure safe and effective future operation according to enterprise procedures.

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.