



Australian Government

MSMBIO301 Process biomass using pyrolyser

Release: 1

MSMBIO301 Process biomass using pyrolyser

Modification History

Release 1. New unit

Application

This unit describes the skills and knowledge required to operate a pyrolyser to process biomass to produce a range of products. This includes pre-treatment of biomass, feeding and pyrolysis process.

This unit applies to operators who are required to operate all components of the pyrolysis process, identify and rectify operational problems, predict the potential impact of feed changes and facilitate feed changes to meet requirements.

No licensing or certification requirements exist at the time of publication. Relevant legislation, industry standards and codes of practice within Australia must be applied.

Pre-requisite Unit

Nil.

Competency Field

Bioprocessing

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Prepare for work	1.1 Identify and follow work and safety requirements 1.2 Identify and control hazards 1.3 Check operational status of pyrolyser 1.4 Complete required pre-start checks 1.5 Start up pyrolyser and ancillary equipment in accordance with standard operating procedures
2. Maintain production	2.1 Complete routine checks, logs and paperwork taking appropriate action on unexpected readings 2.2 Check biomass is pre-treated and dried for pyrolyser requirements for production

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
	2.3 Check particle size of biomass is correct for pyrolyser requirements for production 2.4 Feed biomass feedstock into pyrolyser in accordance with standard operating procedures 2.5 Monitor and adjust feed to maintain consistent and stable feed conditions for production 2.6 Monitor additives in accordance with production requirements 2.7 Operate pyrolyser to maintain continuity and production through-put
3. Monitor pyrolyser	3.1 Monitor pyrolyser throughout process 3.2 Identify and act on changes upstream and downstream impacting on process 3.3 Resolve routine problems and maintain safe operating environment 3.4 Shut down pyrolyser in an emergency 3.5 Identify and rectify impact of shut down on process and production
4. Isolate and de-isolate pyrolyser	4.1 Shut down pyrolyser and ancillary equipment in accordance with standard operating procedures 4.2 Isolate pyrolyser and components 4.3 Make safe for required work 4.4 Check pyrolyser is ready to be returned to service 4.5 De-isolate and prepare pyrolyser and components for return to service

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

- Reading skills to interpret standards operating procedures.
- Writing skills to complete workplace documentation.

Other foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Unit Mapping Information

Release 1. New unit.

Links

Companion Volume implementation guides are found in VETNet: -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=d1287d36-dff4-4e9f-ad2c-9d6270054027>

Assessment Requirements for MSMBIO301 Process biomass using pyrolyser

Modification History

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Performance Evidence

There must be evidence the candidate has completed the tasks outlined in the elements and performance criteria of this unit, and:

- processed at least 1 type of biomass to specified requirements using pyrolyser.

Knowledge Evidence

There must be evidence the candidate has knowledge of:

- principles and processes of pyrolysis, including:
 - standard operating procedures
 - biomass pre-treatment
 - thermal cracking of biomass
 - operating condensing unit/chillers to collect bio-oil
 - managing oxygen free environment in pyrolyser
- pyrolysis equipment including:
 - biomass storage and drying
 - pyrolyser and its components
 - ancillary equipment
 - feed system (auger, belt or cart)
 - air lock
 - condensing system
- advantages and disadvantages of pyrolysis
- biomass types, including:
 - solid (greenwaste, bagasse, woodwaste, construction and domestic waste, plastics, tyres)
 - key variables
 - dewatering requirements
 - particle size requirements
 - yields
- the nature and condition of materials entering and leaving each stage of the process, the changes which have occurred in that stage and why they have occurred
- methods of ramping up and down in response to feed changes and the advantages and disadvantages of each

- hierarchy of control
- start up, operation and shut down of equipment including emergency shut down, isolation and de-isolation procedures
- work health safety (WHS) procedures including personal protective equipment (PPE) requirements
- pyrolysis hazards, and:
 - their possible causes
 - potential consequences
 - appropriate risk controls.

Assessment Conditions

Skills must have been demonstrated in the workplace or in a simulated environment that reflects workplace conditions and contingencies. The following conditions must be met for this unit:

- use of suitable facilities, equipment and resources, including:
 - biomass, pyrolyser, PPE
- modelling of industry operating conditions, including:
 - routine and non-routine problems.

Assessors must satisfy the NVR/AQTF mandatory competency requirements for assessors.

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