



**Australian Government**

# **PMAOPS211 Operate manufacturing extrusion systems**

**Release: 1**

# **PMAOPS211 Operate manufacturing extrusion systems**

## **Modification History**

Release 1. Supersedes and is equivalent to PMAOPS211B Operate manufacturing extruders

## **Application**

This unit of competency covers the skills and knowledge required to operate extruders and related equipment to produce plastic granules/pellets from polymer resin and similar extrusions, e.g. powder coating resin.

This unit of competency applies to operators who are required to start up and shut down the extrusion system, build the extrusion rate up correctly, monitor and adjust the system to maintain the required output rate and quality, and clean and maintain the system according to procedures.

This unit of competency applies to an individual who may work alone although under routine direction and supervision. They may work as part of a team or group and will work in liaison with other shift team members and the control room operator, as appropriate.

This unit of competency applies to all items of equipment and unit operations which form part of the extrusion system. Examples include:

- extruders
- additive (including masterbatch) systems
- input/output feeder systems
- granule/pellet cutting and cooling systems
- barrel/head heating and cooling systems.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

## **Pre-requisite Unit**

Nil

## **Competency Field**

Operations

## **Unit Sector**

## **Elements and Performance Criteria**

Elements describe the      Performance criteria describe the performance needed to

essential outcomes.

demonstrate achievement of the element.

- |   |                                                                                       |     |                                                                                                              |
|---|---------------------------------------------------------------------------------------|-----|--------------------------------------------------------------------------------------------------------------|
| 1 | <b>Prepare for work</b>                                                               | 1.1 | Receive and give shift handover                                                                              |
|   |                                                                                       | 1.2 | Identify work requirements                                                                                   |
|   |                                                                                       | 1.3 | Identify and control hazards                                                                                 |
|   |                                                                                       | 1.4 | Coordinate with appropriate personnel                                                                        |
|   |                                                                                       | 1.5 | Check for recent work undertaken on plant item                                                               |
|   |                                                                                       | 1.6 | Note any outstanding/incomplete work                                                                         |
|   |                                                                                       | 1.7 | Check operational status of extruder system                                                                  |
|   |                                                                                       |     |                                                                                                              |
| 2 | <b>Operate extrusion system in accordance with procedures</b>                         | 2.1 | Identify the type of extruder, the ancillaries and their duty                                                |
|   |                                                                                       | 2.2 | Complete routine checks, logs and paperwork taking appropriate action on unexpected readings                 |
|   |                                                                                       | 2.3 | Adjust extrusion system to achieve required output rate and quality with maximum plant efficiency            |
|   |                                                                                       | 2.4 | Change rate, grade or specification smoothly                                                                 |
|   |                                                                                       |     |                                                                                                              |
| 3 | <b>Recognise and take action on abnormal situations in accordance with procedures</b> | 3.1 | Monitor extrusion system frequently and critically throughout shift using measured/indicated data and senses |
|   |                                                                                       | 3.2 | Inspect pellet/granule properties and recognise and correct problems                                         |
|   |                                                                                       | 3.3 | Identify impacts of any changes upstream and downstream                                                      |
|   |                                                                                       | 3.4 | Recognise situations which may require action                                                                |
|   |                                                                                       | 3.5 | Resolve routine problems                                                                                     |
|   |                                                                                       | 3.6 | Take actions on other abnormal situations to make safe and have the situation resolved                       |

|   |                                                                   |     |                                                                                                          |
|---|-------------------------------------------------------------------|-----|----------------------------------------------------------------------------------------------------------|
| 4 | <b>Isolate and de-isolate extruder system</b>                     | 4.1 | Complete any required pre-start checks.                                                                  |
|   |                                                                   | 4.2 | Start up/shut down extrusion system according to the plant type and duty in liaison with other personnel |
|   |                                                                   | 4.3 | Isolate extrusion system                                                                                 |
|   |                                                                   | 4.4 | Make safe for required work                                                                              |
|   |                                                                   | 4.5 | Check extrusion system is ready to be returned to service                                                |
|   |                                                                   | 4.6 | De-isolate and prepare extrusion system for return to service                                            |
| 5 | <b>Change production rates and/or product grade/specification</b> | 5.1 | Predict from rates and schedule when a transition will be required                                       |
|   |                                                                   | 5.2 | Clean extrusion equipment to requirements according to procedures                                        |
|   |                                                                   | 5.3 | Manage transitions smoothly and in a timely manner                                                       |
|   |                                                                   | 5.4 | Minimise scrap/off grade as a result of a transition                                                     |

## Foundation Skills

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

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

## Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Regulatory framework</b> | <p>The latest version of all legislation, regulations, industry codes of practice and Australian/international standards, or the version specified by the local regulatory authority, must be used, and include one or more of the following:</p> <ul style="list-style-type: none"> <li>• legislative requirements, including work health and safety (WHS)</li> <li>• industry codes of practice and guidelines</li> <li>• environmental regulations and guidelines</li> </ul> |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- Australian and other standards
- licence and certification requirements

All operations to which this unit applies are subject to stringent health, safety and environment (HSE) requirements, which may be imposed through state/territory or federal legislation, and these must not be compromised at any time. Where there is an apparent conflict between performance criteria and HSE requirements, the HSE requirements take precedence.

**Procedures** All operations must be performed in accordance with relevant procedures.

Procedures are written, verbal, visual, computer-based or in some other form, and include one or more of the following:

- emergency procedures
- work instructions
- standard operating procedures (SOPs)
- safe work method statements (SWMS)
- formulas/recipes
- batch sheets
- temporary instructions
- any similar instructions provided for the smooth running of the plant

**Hazards** Hazards include one or more of the following:

- electricity
- gas
- gases and liquids under pressure
- structural hazards
- structural collapse
- equipment failures
- industrial (machinery, equipment and product)
- equipment or product mass
- noise, rotational equipment or vibration
- plant services (steam, condensate and cooling water)
- working at heights, in restricted or confined spaces, or in environments subjected to heat, dusts or vapours
- flammability and explosivity
- hazardous products and materials
- unauthorised personnel
- sharp edges, protrusions or obstructions

- slippery surfaces, spills or leaks
- extreme weather
- other hazards that might arise

**Routine problems**

Routine problems must be resolved by applying known solutions.

Routine problems are predictable and include one or more of the following:

- knife/blade/cutter adjustment
- screen pack preparation and changes
- granule/pellet properties not to specification
- granule/pellet cooling systems

Known solutions are drawn from one or more of the following:

- procedures
- training
- remembered experience

Non-routine problems must be reported according to according to relevant procedures.

**Operate**

Operate is to monitor, adjust/change the plant item/unit/system to meet specifications, by one or more of the following:

- manually in the plant
- using local controller in the plant
- using the process control system in the control room

**Unit Mapping Information**

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**Links**

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=9fc2cf53-e570-4e9f-ad6a-b228ffdb6875>