Australian Government

PMBTECH401E Predict polymer properties and characteristics

Release: 1

PMBTECH401E Predict polymer properties and characteristics

Modification History

Release 1. Unit code changed. Application changed. Elements and Performance Criteria changed. Range of Conditions removed. Assessment Requirements changed. Supersedes and is equivalent to PMBTECH401 Predict polymer properties and characteristics.

Application

This unit describes the skills and knowledge required to apply thermoplastic polymer properties and characteristics to product and process improvement.

This unit applies to an experienced technician working alone or as part of a team.

The unit principally refers to the connection between the behaviour in processing polymers and in product performance, and the physical and chemical make-up of the polymers.

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

Technical – Extrusion, Injection Moulding, Masterbatch, Rotational Moulding, Thermoforming

Elements and Performance Criteria

Elements Elements describe the essential outcomes.	**Performance Criteria** Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Predict impact of processing conditions on polymer properties	1.1 Predict property changes caused by molecular weight and temperature to inform process specifications 1.2 Identify glass transition temperature and melting point relative to ambient temperature to inform process specifications 1.3 Use knowledge of morphological changes that occur to polymers as temperature is raised to typical moulding conditions to inform process specifications 1.4 Use knowledge of effect of cooling rate on polymer morphology to inform process specifications 1.5 Predict potential product dimension or shape changes caused by

Elements Elements describe the essential outcomes.	**Performance Criteria** Performance criteria describe the performance needed to demonstrate achievement of the element.
	internal stresses resulting from molecular orientation to inform process specifications 1.6 Determine effect of post-mould annealing on degree of crystallisation and crystal size to inform process specifications
2. Predict physical properties of polymers from their morphology	2.1 Predict effects that temperature, crystal size, degree of crystallisation and molecular orientation have on physical properties using resources including phase diagrams 2.2 Predict shrinkage from morphology to inform process specifications
3. Assess likely physical failures of polymers	3.1 Assess impact physical usage conditions have on physical failures 3.2 Assess impact various polymer characteristics have on physical failures
4. Plan for and interpret polymer tests	4.1 Infer melt flow properties from flow data to inform process specifications 4.2 Select test type and method that will validly measure results against desired criteria 4.3 Interpret test results, taking account of variables and impact of variances

Foundation Skills

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

- Numeracy skills to write and interpret technical information and specifications and perform calculations.

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

Unit Mapping Information

Supersedes and is equivalent to PMBTECH401 Predict polymer properties and characteristics.

Links

Companion Volume implementation guides are found in VETNet – - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=932aacef-7947-4c80-acc6-593719fe4090