Title	**Classify and name plastics materials**		
Level	**2**	**Credits**	**8**

Purpose	People credited with this unit standard are able to: demonstrate knowledge of the applications for plastics materials; and plastics materials' physical properties and composition; classify plastics materials; and demonstrate knowledge of the effects of moisture on plastics materials.

Classification	Plastics Processing Technology > Plastics Materials

Available grade	Achieved
Recommended skills and knowledge	Unit 23129, *Process and use plastics materials*.

Explanatory notes

1 Definitions

Common plastics materials are:

Thermoplastic materials

polyolefins – low, linear low and high-density polyethylene
– polypropylene
styrenics – general purpose and high impact polystyrene
– acrylonitrile butadiene styrene
vinyls – polyvinyl chloride, plasticised and unplasticised
polyamides – types 6.6, 6, 12
polyacetal
polymethylmethacrylate
polycarbonate
polyesters – polyethylene terephthalate, polybutylene terephthalate
polyurethane
polyphenylene oxide
polysulphone

Thermosetting materials

polyester
epoxy
polyurethane
phenol formaldehyde

Plastic Identification Code is as set out on the Plastics New Zealand website (refer www.plastics.org.nz).

Outcomes and evidence requirements

Outcome 1

Demonstrate knowledge of the applications for plastics materials.

Evidence Requirements

1.1 Advantages and disadvantages of products made from plastics materials compared to traditional materials of metal, wood, and glass are described.

Range advantages and disadvantages include – design flexibility, strength, colour, cost to produce, weight, ease of fabrication, energy use for manufacture, energy use for distribution, waste reduction, recyclability, recycle content, re-use, degradability, disposal, use of renewable resources;
evidence of a total of ten advantages and/or disadvantages compared to its plastic equivalent is required for each of: one metal product; one wooden product; one glass product.

1.2 Typical applications for common plastics materials are identified.

Range evidence is required for one application for ten different common plastics materials.

1.3 The environmental concept of a product life cycle is explained and an example of the opportunities for waste minimisation in each part of a product life cycle is described.

Range parts of a product life cycle – design, development, manufacturing, pre-consumer industrial waste, end-use, industrial and domestic post-consumer waste;
opportunities for waste minimisation – reduced product weight, prototype manufacture and testing, reduced product failure, efficient production, filling or assembly line waste, product or packaging re-use, product or packaging recycling, recovery of materials from products or packaging.

1.4 The purpose of the Plastic Identification Code is described, the materials represented by three examples of the Code are identified using their generic polymeric name, and an example of a product which would carry that Code is identified.

Outcome 2

Demonstrate knowledge of plastics materials' physical properties and composition.

Evidence Requirements

2.1 The prime resources used in the production of polymers are identified.

Range prime resources – crude oil, natural gas, coal, petroleum.

2.2 Common plastics materials used in New Zealand are named.

Range evidence is required for ten common plastics materials.

2.3 Renewable materials and their sources commonly used in the production of polymers are identified, and an example of a plastics material produced from each is named using its generic polymeric name.

Range renewable materials – starch, cellulose, lactic acid, sugar;
evidence is required for two renewable materials.

2.4 The principal purpose of additives used in plastics materials is described.

Range examples of additives are – anti-blocking agents, anti-oxidants, anti-static agents, fillers, flame retardants, impact modifiers, lubricating agents, nucleating agents, pigments, plasticisers, release agents, slip agents, UV stabilisers, cross linking agents, blowing agents, heat stabilisers;
evidence is required for six additives.

2.5 The principles of plastics materials' preparation methods of mixing and compounding are described.

2.6 The physical properties of plastics materials are described, compared and contrasted for two common plastics materials.

Range physical properties – rigidity, clarity, hardness, density, toughness, softening point.

Outcome 3

Classify plastics materials.

Evidence Requirements

3.1 Thermoset and thermoplastic materials are defined.

3.2 Plastic material samples are identified as thermoset or thermoplastic by means of clarity, hardness, flexibility, cutting, flotation, and burning.

Range evidence is required for six samples of different plastics materials, of which at least two are thermoset and two are thermoplastic.

Outcome 4

Demonstrate knowledge of the effects of moisture on plastics materials.

Evidence Requirements

4.1 Common plastics materials are classified as hygroscopic or non-hygroscopic.

Range evidence is required for six common plastics materials.

4.2 The principles of drying techniques for plastics materials are described.

Range drying techniques – oven, refrigerated dehumidifer, desiccant bed dehumidifier.

4.3 Product faults due to moisture are identified.

Range evidence is required for three examples of product faults.

Replacement information	This unit standard replaced unit standard 273.

Planned review date	31 December 2021

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	24 August 2006	31 December 2019
Review	2	15 September 2016	N/A

Consent and Moderation Requirements (CMR) reference	0013

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Please note
Providers must be granted consent to assess against standards (accredited) by NZQA, before they can report credits from assessment against unit standards or deliver courses of study leading to that assessment.

Industry Training Organisations must be granted consent to assess against standards by NZQA before they can register credits from assessment against unit standards.

Providers and Industry Training Organisations, which have been granted consent and which are assessing against unit standards must engage with the moderation system that applies to those standards.

Requirements for consent to assess and an outline of the moderation system that applies to this standard are outlined in the Consent and Moderation Requirements (CMR). The

CMR also includes useful information about special requirements for organisations wishing to develop education and training programmes, such as minimum qualifications for tutors and assessors, and special resource requirements.

Comments on this unit standard

Please contact Competenz qualifications@competenz.org.nz if you wish to suggest changes to the content of this unit standard.