Title	**Describe filling systems in the marine and composite industry**		
Level	**3**	**Credits**	**3**

Purpose	People credited with this unit standard are able to describe filling systems, extenders used in filling systems, surface preparation requirements for filling, and filling techniques.

Classification	Boating Industries > Boatbuilding

Available grade	Achieved

Guidance Information

1 Legislation, regulations, references and/or industry standards relevant to this unit standard include but are not limited to the:

- Health and Safety at Work Act 2015;
- Health and Safety in Employment Act 1992;
- Resource Management Act 1991.

Any new, amended, or replacement Acts, regulations, rules, standards, codes of practice, guidelines, or authority requirements or conditions affecting this unit standard will take precedence for assessment purposes, pending review of this unit standard.

2 Definition
Filling systems refer to the range of materials and techniques used to repair or smooth surfaces by filling holes, gaps, or other imperfections in the vessels structure. These systems typically involve the use of resins, fillers and other compatible materials designed to bond with marine substrates such as wood, metal or composites.

3 Assessment information
Filling systems in the context of this unit standard refers to systems that are resin based.

Outcomes and performance criteria

Outcome 1

Describe filling systems.

Performance criteria

1.1 Pre-extended and extended systems are compared in terms of cost, wastage, efficiency and ease of use.

1.2 Pre-extended and extended systems advantages and disadvantages are described with reference to their properties.

Range systems may include – polyester, vinylester, epoxy;
properties may include – water resistance, heat resistance, compatibility, bonding strength, hardness, stability, shrinkage;
evidence of at least two resin systems is required.

1.3 Filler systems are described in terms of the application methods, tools, application thickness, shape and purpose.

Range tools may include but not limited to – spatulas, tubes, piping bags, putty knives, templates;
evidence of three application methods is required.

Outcome 2

Describe extenders used in filling systems.

Performance criteria

2.1 Extenders advantages and disadvantages are described in terms of their properties when mixed into a filler.

Range extenders may include – talc, silica, micro-balloons;
properties may include – shaping, sanding, density, stability, mixing, cost, application;
evidence of two extenders is required.

Outcome 3

Describe surface preparation requirements for filling.

Performance criteria

3.1 Surface preparation and cleaning requirements prior to application of filler are described.

Range surfaces must include one of the following – steel, aluminium, composite, timber.

Outcome 4

Describe filling techniques.

Performance criteria

4.1 The stages of filler application are described in terms of the progression of the filling process.

Range initial filling application, localised application.

4.2 Uses of shaping and smoothing methods are described in terms of establishing fair and smooth surfaces.

Range may include but not limited to – sanding, filing, grinding.

Planned review date	31 December 2030

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	24 July 2025	N/A

Consent and Moderation Requirements (CMR) reference	0136

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

Comments on this unit standard

Please contact Hanga-Aro-Rau Manufacturing, Engineering and Logistics Workforce Development Council qualifications@hangaarorau.nz if you wish to suggest changes to the content of this unit standard.