



**Australian Government**

**Department of Education, Employment and Workplace Relations**

# **CUVOPA403A Use a faceting machine**

**Release: 1**

## CUVOPA403A Use a faceting machine

### Modification History

| Version    | Comments                                                                                                 |
|------------|----------------------------------------------------------------------------------------------------------|
| CUVOPA403A | This version first released with <i>CUV11 Visual Arts, Craft and Design Training Package version 1.0</i> |

### Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to use a faceting machine to facet opal, including selecting material, pre-forming, and cutting and polishing a selected stone. The machine may be used to produce a traditional faceted gemstone and also to complete a range of other tasks, such as making cubes from opal material.

### Application of the Unit

Those applying the skills and knowledge in this unit produce individual pieces that comply with commercial standards in a workshop environment where there is access to faceting machines and consumables appropriate for use in faceting opals.

Where appropriate the outcomes of this unit could be contextualised to apply to other gemstones.

### Licensing/Regulatory Information

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

### Pre-Requisites

Not applicable.

### Employability Skills Information

This unit contains employability skills.

## Elements and Performance Criteria Pre-Content

| Element                                                                  | Performance Criteria                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Elements describe the essential outcomes of a unit of competency.</i> | <i>Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.</i> |

## Elements and Performance Criteria

|                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Set up faceting equipment                     | <p>1.1 Set up <b>faceting machines</b> to manufacturers' specifications identifying <b>machine components</b> and <b>laps</b></p> <p>1.2 Complete manufacturers' <b>maintenance checklist</b></p> <p>1.3 Investigate index wheels for quill and identify main and critical angles for opal</p>                                                                                                                                                                                               |
| 2. Select, pre-shape and dop selected opal piece | <p>2.1 Select piece of <b>opal suitable for faceting</b></p> <p>2.2 Pre-shape using faceting machine or bench grinder to establish crown and pavilion</p> <p>2.3 Dop stone and work on pavilion first</p>                                                                                                                                                                                                                                                                                    |
| 3. Grind, sand and polish pavilion               | <p>3.1 Place dopped stone in quill and align to create girdle</p> <p>3.2 Grind girdle to desired shape on medium to fine lap</p> <p>3.3 Grind main facets at main <b>angle</b> on medium to fine lap</p> <p>3.4 Grind girdle break facets at girdle break angle on fine lap</p> <p>3.5 Grind culet facets at culet angle on fine or pre-polish lap</p> <p>3.6 Fine lap, pre-polish and polish all pavilion facets including girdle</p>                                                       |
| 4. Transfer stone                                | <p>4.1 Transfer stone to suitable dop</p> <p>4.2 Remove crown dop and place new dop and stone in faceting quill</p>                                                                                                                                                                                                                                                                                                                                                                          |
| 5. Grind, pre-polish and polish crown            | <p>5.1 Place girdle facet on lap at 90°, index setting 64 or 96 and lock quill</p> <p>5.2 Grind girdle break facets at break angle establishing girdle thickness, on a medium to fine lap</p> <p>5.3 Grind main facets at main angle on fine lap</p> <p>5.4 Cut table facet on fine lap, to 40% of total width of stone</p> <p>5.5 Pre-polish all crown facets</p> <p>5.6 Grind star facets using pre-polish lap</p> <p>5.7 Polish all facets</p> <p>5.8 Remove stone from dop and clean</p> |

## Required Skills and Knowledge

*This section describes the skills and knowledge required for this unit.*

### Required skills

- critical thinking and analytical skills to select appropriate opal pieces
- problem-solving skills to deal with contingencies and OHS issues
- numeracy skills to use numerical features of machinery
- technical skills to:
  - facet, grind and polish stones and maintain equipment
  - set up equipment to manufacturer specifications.

### Required knowledge

- suitability of opal pieces for faceting
- equipment and consumables required for opal faceting process
- industry standards for faceting.

## Evidence Guide

*The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.*

|                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Overview of assessment</b>                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Critical aspects for assessment and evidence required to demonstrate competency in this unit</b> | <p>Evidence of the ability to:</p> <ul style="list-style-type: none"> <li>• select opal pieces suitable for faceting</li> <li>• use faceting equipment to produce and polish a faceted opal that conforms to industry standards</li> <li>• follow all OHS requirements for machinery and equipment procedures.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Context of and specific resources for assessment</b>                                             | <p>Assessment must ensure access to:</p> <ul style="list-style-type: none"> <li>• a faceting machine</li> <li>• appropriate consumables.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Method of assessment</b>                                                                         | <p>A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:</p> <ul style="list-style-type: none"> <li>• observation of processes and procedures</li> <li>• oral and/or written questioning on underpinning knowledge and skills</li> <li>• evaluation of the final product and other methods as required</li> <li>• review of portfolios of evidence</li> <li>• review of third-party workplace reports of on-the-job performance by candidate.</li> </ul> <p>Assessment methods should closely reflect workplace demands (e.g. literacy) and the needs of particular groups (e.g. people with disabilities, and people who may have literacy or numeracy difficulties, such as speakers of languages other than English, remote communities and those with interrupted schooling).</p> |
| <b>Guidance information for assessment</b>                                                          | <p>Holistic assessment with other units relevant to the industry sector workplace and job role is recommended.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## Range Statement

*The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.*

|                                                       |                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><i>Faceting machines</i></b> may include:          | <ul style="list-style-type: none"> <li>• Facetron (USA)</li> <li>• Gemmasta (Aus)</li> <li>• Graves (USA)</li> <li>• jamb peg</li> <li>• Platform</li> <li>• Poly-Metrics (USA)</li> <li>• Post</li> <li>• Raytech (USA)</li> <li>• Ultra Tec (USA).</li> </ul>                                                                                                  |
| <b><i>Machine components</i></b> may include:         | <ul style="list-style-type: none"> <li>• angle vernier (protractor)</li> <li>• coarse and fine height adjuster</li> <li>• coolant tank</li> <li>• forward and reverse switch</li> <li>• handpiece (quill)</li> <li>• index wheel</li> <li>• master lap</li> <li>• radial vernier (cheater)</li> <li>• sliding post</li> <li>• variable speed control.</li> </ul> |
| <b><i>Laps'</i></b> diamond grit size may include:    | <ul style="list-style-type: none"> <li>• coarse #80, #100, #120, #180</li> <li>• fine #800, #1000, #1200</li> <li>• medium #220, #320, #360, #400, #600</li> <li>• polish #14000, #50000, #10000</li> <li>• pre-polish #2400, #3000, #8000.</li> </ul>                                                                                                           |
| <b><i>Maintenance checklist</i></b> may include:      | <ul style="list-style-type: none"> <li>• check electrics regularly for faults and water seepage</li> <li>• cover machine when not in use</li> <li>• keep all laps separate from each other</li> <li>• keep whole machine clean</li> <li>• oil and clean moving parts</li> <li>• read manufacturer manual and keep near machine.</li> </ul>                       |
| <b><i>Opal suitable for faceting</i></b> may include: | <ul style="list-style-type: none"> <li>• Australian clear jelly opal</li> <li>• Australian electric blue opal</li> <li>• contra-luz</li> <li>• Mexican cherry opal</li> </ul>                                                                                                                                                                                    |

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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|                            | <ul style="list-style-type: none"><li>• Mexican fire opal</li><li>• any transparent opal.</li></ul>                                                                                                                                                                                                                                                                                                                                                     |
| <b>Angles</b> may include: | <ul style="list-style-type: none"><li>• critical angle <math>43\frac{1}{2}^{\circ}</math></li><li>• crown main <math>43^{\circ}</math></li><li>• culet angle <math>44^{\circ}</math></li><li>• girdle breaks, main angle plus <math>6^{\circ}</math> to <math>15^{\circ}</math></li><li>• pavilion main <math>45^{\circ}</math></li><li>• star facets, main angle minus <math>15^{\circ}</math></li><li>• table facet <math>0^{\circ}</math>.</li></ul> |

## Unit Sector(s)

Opal cutting and polishing