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| CARVEY CNC machine Safe Operating Process |
| This Safe Operating Process (SOP) is to be used in conjunction with any legislation, operating manuals, Australian or International Standards or task relevant training. |
| **Description of the Work:** |
| Operate the Carvey CNC machine in the Library MakerSpace to complete projects. |
| **Personal Protective Equipment Required:** *remove any which are not relevant* |
|  | Safety glasses may be required for some operations. |  | Safety gloves may be required for some operations. |
|  | Safety guard / Carvey Lid must be used at all times. |  | Hearing protection may be required for some operations. |
|  | Face masks must be used at when opening the device. |  | Long and loose hair must be contained. |
| **Potential Hazards** |
| * Wet surfaces and electricity
 | * Fine particles when lid is opened after a project
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| * Using non approved materials could cause toxic fumes or damage the CNC machine - Absolutely no PVC (including vinyl), metal (including aluminium, or circuit boards), foam, treated or glued wood, ceramics,
 | * Cuts from sharp tool bits
* Pinching hazard and finger jams form lid
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| **Pre-Operational Safety Checks:** |
| * Make sure you have completed the CARVEY induction.
* Only use approved materials on the CARVEY. Obtain approval from a MakerSpace technician for use of any material not supplied by the MakerSpace.
* Never attempt to cut magnesium or any other flammable material. Sparks or fire may occur if used.
* Do not use Carvey with liquid materials or any materials containing liquid.
* Do not attempt to cut anything bigger than the cutting bed - width (X-axis): 11.3 inches / 30 cm, Depth (Y-axis): 8 inches / 20 cm, Height (Z-access): 1.5 inches (3,81 cm) .
* Ensure the material is clamped securely under the smart clamp and AT LEAST 2 other Carvey clamps. If you have trouble fastening your project ask a makerspace technician.
* In Easel, ensure that there are no collisions with your model and clamps. The “step over height” machine setting under advanced can aid with this.
* Use the ‘tab’ feature in easel to keep pieces secured during a cut-through operation.
* Check that the cutting tool is in good condition (not burned, blunt or snapped).
* Ensure that the collet is tightly secured and the correct cutting bit is installed.
* Check that no tools are present in the Carvey cabinet.
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| **Operational Safety Checks:** |
| * Ensure the lid is closed (carvey should not operate if lid is is open)
* Do not move the material or print bed during cutting operations.
* Do not initiate movement of the cutting head whilst any foreign objects are close to or in machine (clothing, fingers hair).
* Do not place fingers or tools inside the router while parts are cutting.
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| **Post-Operational Safety Checks:** |
| * Enrue you are wearing a face mask and glasses when you open the Carvey lid. Particles may be floating in the air.
* Vacuum dust and debris BEFORE removing your part.
* Do not move print bed or print head by hand.
* Exercise caution when handling material around sharp cutting tools - especially when removing your project from CARVEY
* Never touch tools immediately after cutting operations as they may be hot.
* Do not use liquid or aerosol cleaners to clean the inside of Carvey’s work area.
* Remove the tool/drill bit, clamps and leave the cabinet clean before leaving the MakerSpace.
* Return any tools used in the project to the appropriate storage.
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| **Housekeeping:** |
| * Return PPE equipment to PPE storage
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| * Clear residue and debris from the workspace and place waste in appropriate bins
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| **Maintenance & Cleaning** |
| Daily / after each project* Vacuum inside the carvey
* Clear carvey and workspace of any residue or debris and place waste in appropriate bins

Weekly* Inspect and replace carving bits when necessary. (MS Technician)
* Dust / wipe down the Carvey cabinet (MS Technician)

Quarterly or as required* Clean under metal skid plates when necessary ( MS Technician )
* Replace waste board when necessary. (MS Technician )
* Tension or replace Carvey’s X and Y-Axis belts when they stretch or break. (MS Technician )
* Clean and service the smart clamp or replace if necessary. ( MS Technician )
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| **Assessed by:** | Charles Barnett |
| **Date of Assessment:** | **18 July 2018** |