

# Operating the Ryobi Model DP 100 Drill Press

## STANDARD OPERATING PROCEDURE (SOP)

Type of SOP:    Process       Hazardous Chemical       Hazardous Class

All personnel who are subject to these SOP requirements must review a completed SOP and sign the associated signature page. Completed SOPs will be kept in the laboratory or otherwise be readily available to all personnel. Electronic access is acceptable. SOPs will be reviewed as revised as necessary.

SOP Prepared By:	Russell Evans	Date:	01/25/2016
SOP Reviewed and Approved By:	Robert Vitale	Date:	XX/XX/XXXX

Department:	Baskin Engineering Lab Support (BELS)		
Faculty Supervisor/PI:	Robert Vitale	Work:	831-459-3794
Laboratory Supervisor:	Robert Vitale	Work:	831-459-3794
Laboratory Safety Coordinator:	Russell Evans	Work:	831-459-2812

Locations covered by this SOP:	Jack Baskin School of Engineering Room BE-138
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Emergency Contacts	
In a medical emergency or an incident that poses an imminent threat to persons or property	CALL 911
Robert Vitale	Work: 831-459-3794 Cell: 831-596-5360
Russell Evans	Work: 831-459-2812 Cell: 408-657-7877
Christian Monnet	Work: 831-459-3103 Cell: 831-332-4879

### 1. OVERVIEW

The Ryobi Model 100 Drill Press (see Figures 1 and 2) is a bench-top variable-speed drill press that is used when more location accuracy is necessary in drilling a hole than a hand power drill can be expected to provide.



Figure 1: Ryobi DP 100 Drill Press




Figure 2: Drill Press (side view)




Figure 3: Foot pedal to power drill press

**2. POTENTIAL HAZARDS**


**Flying Debris**


	What Could Happen	Mitigation Steps
	<p>The operation of this drill press can result in debris to be thrown into the eyes, which could result in a serious injury.</p>	<p>The user and others in the immediate vicinity of the drill press must wear safety glasses compliant with the ANSI Z87.1-2010 standard.</p>

**Contact with Point of Operation**

	What Could Happen	Mitigation Steps
	<p>Contact with the moving drill bit can result in a serious injury.</p>	<p>Keep fingers and hands at least 3 inches away from the moving drill bit at all times.</p> <p>Be careful not to place fingers and hands at awkward angles or positions that could cause a sudden loss of position resulting with contact with the moving drill bit.</p>

**Entanglement**

	What Could Happen	Mitigation Steps
	<p>Loose clothing, long hair, and jewelry could potentially get caught in the moving parts of the drill press and pull the user into the moving parts of the drill press resulting in a serious injury.</p>	<p>All long hair, loose clothing and jewelry should be tied back or removed to avoid contact with all moving parts.</p>

Entanglement		
	What Could Happen	Mitigation Steps
	<p>A cutting tool seizes in the material and the material being drilled becomes separated from its restraint and spins out of control which could collide with or entangle the user resulting in a serious injury.</p>	<p>Always securely clamp any material being drilled. Do not attempt to hold the material securely with just your hands.</p> <p>If material escapes restraint, immediately step off the foot pedestal (Figure 3) and step away from the drill press.</p>

### 3. ENGINEERING CONTROLS

A foot activated power pedal (Figure 3) is in place that requires continuous pressure in order for the drill press to operate. This ensures that the drill press cannot be in use unattended and can be easily stopped in an emergency without having to use your hands.

### 4. ADMINISTRATIVE CONTROLS

Do not use any materials or thicknesses in the drill press unless they are listed in this table below. **ONLY USE THE SETTING RANGES SHOWN. ANY deviation from this approved list (including equipment settings) must be approved in writing by the PI or BELS Staff PRIOR to use. IF NOT ON THE LIST DO NOT USE.**

#### Approved Materials Matrix.

Material	Max Thickness	Use	Settings	Hazards
Steel	1/8 inch	cutting fluid is mandatory to keep drill bits from binding	Speed: low Cutting Rate: conservative, using cutting fluid	Binding
Aluminum	1/4 inch		Speed: medium Cutting Rate: conservative	Binding
Plastics	1/4 inch		Speed: medium Cutting Rate: conservative	
MDF	1/4 inch		Speed: medium Cutting Rate: conservative	


Acrylic	1/4 inch		Speed: medium Cutting Rate: conservative	Remove plastic wrap before beginning to drill/cut to avoid it causing a binding hazard
Plywood	3/4 inch		Speed: high Cutting Rate: consistent	
Hardwood	3/4 inch		Speed: medium Cutting Rate: conservative	



**A detailed list of operational safety rules can be found on page 4 and page 5 of the attached Ryobi Drill Press manual. These rules must be followed. The user must carefully read these pages of the manual before signing this SOP. Additionally, the following elements listed below are required.**

1. Complete EH&S online “Laboratory Safety Fundamentals” class available through the UC Learning Center (<http://learningcenter.ucsc.edu/>);
2. Review and sign BE-138 Training Checklist with the PI, Lab Safety Representative, or other designated person.
3. Each proposed user of the drill press will receive individualized or small group training from the Faculty Instructor/Principal Investigator/BELS Staff. Trainers will supervise all individuals using the drill press until they are satisfied that the proposed user is skilled enough to use the drill press unsupervised. IT IS ONLY AFTER THIS QUALIFICATION HAS BEEN MET THAT THIS INDIVIDUAL WILL BE APPROVED FOR UNSUPERVISED USE OF THE DRILL PRESS.
4. Hours of operation: Undergrads should only operate drill press when TA, instructor, or staff are available.
5. Implement good laboratory practices, including good workspace hygiene;
6. Inspect all equipment and experimental setups prior to use;
7. Ensure drill bit is securely in place;
8. KEEP FINGERS AND HANDS AWAY FROM ALL MOVING PARTS;
9. Clamp the work firmly against the table;

10. The drill press has a foot pedal requiring pressure to initiate and continue operation. The user is to never disable this safety feature.
11. DO NOT under any circumstances attempt to use the drill press without following essential procedures as described on the right. Attempting to do so will result in an immediate and permanent ban from BE138. The drill press has significant torque that can cause serious physical trauma to operators.
12. DO NOT OPERATE the drill press while SLEEPY or INTOXICATED. It is essential to your safety and that of others that you are awake, coherent and alert while operating the equipment. Operating while sleepy or intoxicated will result in an immediate ban from the fabrication lab. Treat operating the drill press as if you were driving a vehicle.
13. If anything odd happens during your use of the drill press, immediately notify the authors of this SOP of the details and PUT A NOTE on the drill press, over the power switch. Do not attempt to fix it yourself.
14. Only one person should be in close proximity to the drill press when it is operating.
15. DO NOT use any materials other than those documented in this SOP. Do not cut these materials using settings outside of the given ranges.
16. Do not deviate from the instructions described in this SOP without prior discussion and approval from the PI, Laboratory Supervisor, or Laboratory Safety Coordinator;
17. Notify the PI, Laboratory Supervisor or Laboratory Safety Coordinator of any accidents, incidents, or near-misses;

**5. PERSONAL PROTECTIVE EQUIPEMENT (PPE)**

Eye Protection	
	<p>The user and others in the immediate vicinity of the drill press must wear safety glasses compliant with ANSI Z87.1-2010.</p>

Body Protection	
	All individuals must wear closed toed shoes and long pants.
	Lab coats are made available for those wearing loose fitting clothing.

## 6. SPILL AND EMERGENCY PROCEDURES

### In an emergency CALL 9-1-1.

UCSC Emergency dispatch will take your call and get you the appropriate immediate assistance.

Report all serious injuries to EH&S as soon as possible.

For minor cuts & scrapes, a first aid kit has been installed in the lab near the door. There should be first aid cleaning supplies and small bandages and gloves in the kit. Due to possibility of blood borne pathogens, if you are helping someone who is bleeding, use gloves or have the injured party clean themselves.

For larger cuts, have injured party apply pressure with large bandage, towel or clean cloth to the wound and a second person should call **9-1-1** on the lab phone.

For all burns, injured party should seek medical attention. Burns can quickly become infected.

If smoke is inhaled, stop what you are doing, secure the equipment and move into fresh air outside immediately.

If the material being drilled/cut moves at all from its restraint, STOP THE DRILL PRESS using the ON/OFF switch. Immediately use the chuck key to disconnect the cutting tool from the chuck. Stow the chuck key in its keeper. Lower the work holding table to distance the material from the chuck.

If a cutting tool seizes in the material and the material being drilled/cut becomes separated from its restraint and spins out of control, immediately and quickly move away from the drill press. In



this condition, staying close to the drill press or attempting to approach it could result in serious injury. Contact your TA, instructor or BELS staff for assistance.

If during operation, material debris impacts anyone, stop the equipment at once and address the injury if any. Notify TA's and PI.

All users must be informed on the nearest fire alarm pulls and first aid kit.

Use of the drill press is not expected to result in any type of hazardous spills.

## 7. WASTE MANAGEMENT

It is not expected that use of the drill press will result in hazardous waste products.

## 8. DESIGNATED AREA

The Ryobi Drill Press is located in the Baskin School of Engineering room BE-138. This room has an Omnilock security system that limits access to only approved individuals. There are other power tools in the vicinity of the drill press and the user is expected to be constantly aware of his/her surroundings and the impact that he/she may have on other users.

## 9. DETAILED PROTOCOL

All users must be trained and certified before attempting to use the drill press. This document must be displayed and the binder containing the current list of authorized users must be available in the laboratory where the drill press is located. Below is an outline of the use of the drill press.

**Detail operational instructions can be found pages 10 to 14 in the Ryobi Drill Press manual attached to this SOP. The operational overview outlined below is not meant as a substitute to the detailed instructions found in the attached manual. The user should always consult the manual with any question about the safe operation of the Ryobi Drill Press.**

1. Always inspect cutting edges of drills/tools for reflections/nicks/fractures. Edges that reflect light are an indication of a dull tool which can cause binding hazards.
2. The belt/pulley ratios must be selected to adjust the speed to the material being cut.
3. All material being cut must be securely restrained in the vise. The vise must be securely restrained to the work table.
4. The work table height adjustment must be tightened so the table does not slide on the post.
5. Always remove the chuck key from the chuck. Cut using guidelines specific to materials outlined above (Section 4).



6. The chuck key should be stored in its keeper, the drill/cutting tool should be firmly held by the chuck and there should be no contact between the drill/cutting tool and the material or interference between the path of the cutting tool and the material when turning on the drill press.
7. Once you are no longer using the drill press, ensure the chuck key is stored in its keeper, be sure all cutting tools have been removed from the chuck and any materials from the work holding table. Clean up debris.

## 10. SOP APPROVAL

As the SOP Approver/Principal Investigator, it is your responsibility to ensure that all individuals conducting this protocol are taught the correct procedures for safe handling of the hazardous materials involved. It is also your responsibility to ensure that your personnel complete Laboratory Safety Training and other applicable safety training courses.

- Prior to conducting any work with, the SOP Approver/Principal Investigator or designee must provide training to his/her laboratory personnel regarding the specific hazards involved in working with this substance, work area decontamination, and emergency procedures.
- The SOP Approver/Principal Investigator must provide his/her laboratory personnel with a copy of this SOP.
- The SOP Approver/Principal Investigator must ensure that his/her laboratory personnel have attended appropriate laboratory safety training or refresher training within the last year.

*I have reviewed and approve this Standard Operating Procedure.*

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SOP Approver Signature

Date

*I have reviewed and approve this Standard Operating Procedure.*

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PI Signature

Date