# E4E Drill Press Fundamentals Workshop

December 7, 2023

Engineers for Exploration, UC San Diego

# Safety Considerations

1. Where is the stored energy?
2. Where is the exposed energy?
3. How can the energy be transferred?

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# What is on a Drill Press?


1

[1] https://canadianwoodworking.com/tools/drill-press/

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# Layout

- Scribes
- Center Punches
- Layout Blacking

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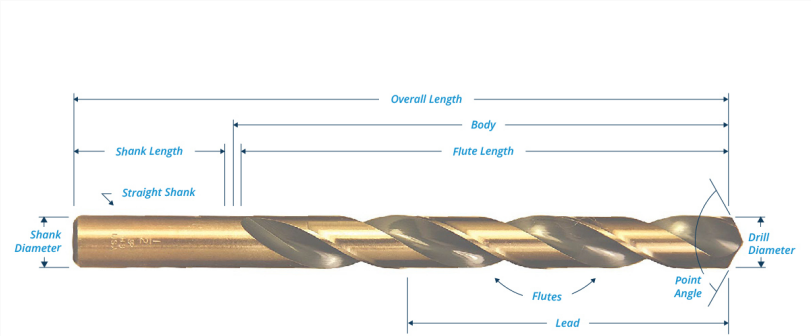
# Drill Bit Anatomy




[2]

[2] https://www.xometry.com/resources/shop-tips/drill-bit-tips-tricks/

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# Other Drill Press Cutters

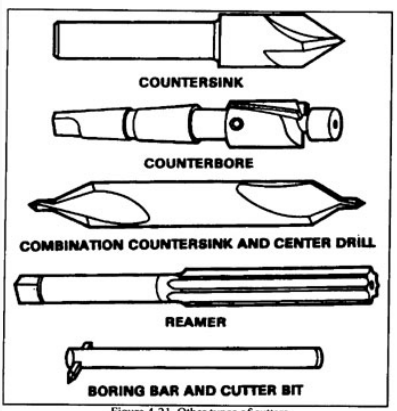

Figure 4-21. Other types of cutters.

[3]

[3] https://www.americanmachinetools.com/how_to_use_a_drill_press.htm

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# Drill Bit Sizes

- How much material to remove?
- How hard is the material?
- Wire/Letter/Fractional/Metric

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# Drill Press Speed

$$RPM = CS \times \frac{4}{D}$$

| Material | Drilling Feet/Minute | Reaming Feet/Minute |
|---|---|---|
| Carbon steels | 100 - 120 | 75 - 80 |
| Carbon steels | 35 - 70 | 20 - 45 |
| Alloy steels (resulfurized) | 30 - 90 | 15 - 60 |
| Stainless steels (Austenitic) | 50 - 55 | 30 - 35 |
| Brass | 160 - 175 | 160 - 175 |
| Bronze | 120 - 140 | 110 - 120 |
| Wrought aluminum | 350 - 400 | 350 - 400 |

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# Drill Chuck Anatomy


[4]

[4] https://www.mscdirect.com/basicsof/drill-chucks

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# Workholding

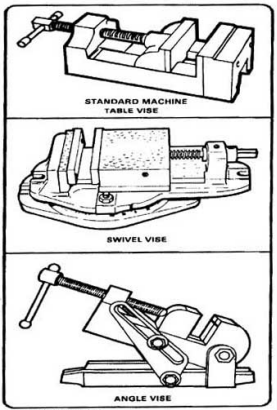

Figure 4-24. Types of vises.

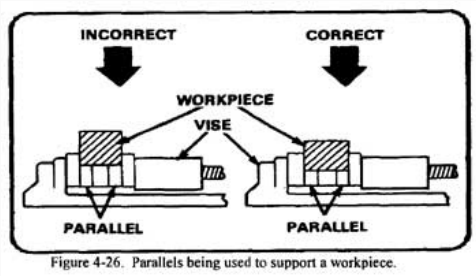

Figure 4-26. Parallels being used to support a workpiece.

[a]

[a] https://www.americanmachinetools.com/how_to_use_a_drill_press.htm

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# Cutting Fluids

1. Cooling
2. Lubrication
3. Chip Evacuation

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# Feed Speed

1. Chip Loading
2. Chip Sizes
3. Machine Power

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# Permissible Materials

1. Plastics
2. Wood
3. Metals

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# Maintenance

1. Powertrain
2. Cleaning
3. Configuration

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# Access Protocol

1. LO/TO
2. Cleanup

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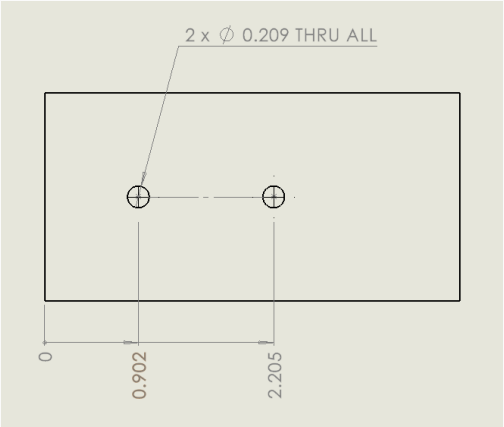
# Practical Exercise

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