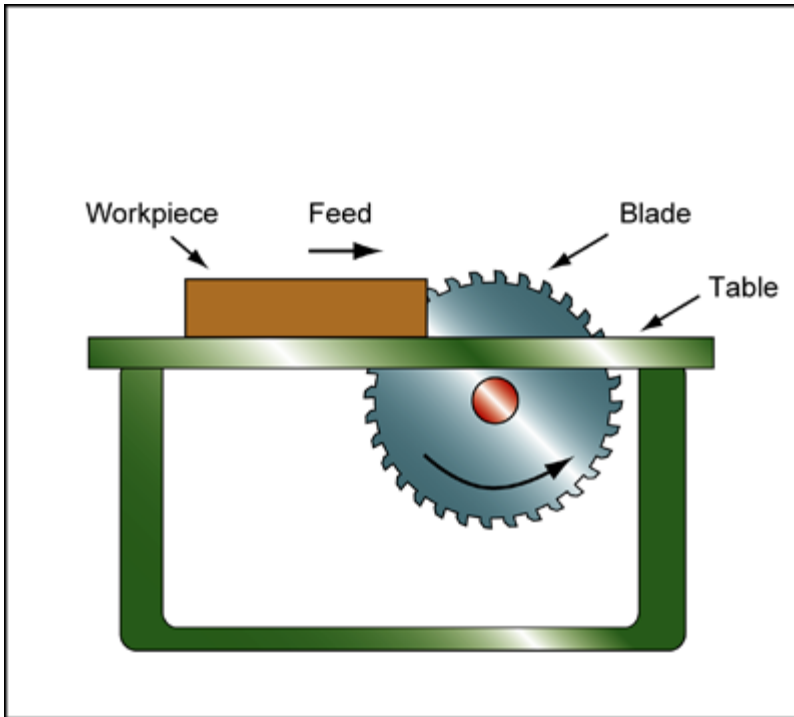


## Description

### Process schematic



### Figure caption

A circular saw.

### The process

In CIRCULAR SAWING a rotating cutting blade is fed horizontally, vertically, or at an angle into the workpiece. The rigidity of the machine allows high precision and the cutting blade can produce burr-free surfaces, reducing the need for further finishing. Circular sawing produces a wider cut than band sawing, although circular saws as thin as 1.5 mm (0.060 in.) are available. Thin blades, however, cannot maintain the tolerances and high cutting forces for which circular sawing is noted.

## Material compatibility

Composites	✓
Foams	✓
Metals - ferrous	✓
Metals - non-ferrous	✓
Natural materials	✓
Polymers - thermoplastics	✓
Polymers - thermosets	✓

## Shape

Flat sheet	✓
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## Economic compatibility

Relative tooling cost	low
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Relative equipment cost	medium
Labor intensity	medium
Economic batch size (units)	1 - 1e7

### Physical and quality attributes

Mass range	0.1 - 1e3 kg
Range of section thickness	3 - 100 mm
Tolerance	0.1 - 2 mm
Roughness	1 - 10 µm
Surface roughness (A=v. smooth)	B
Cutting speed	0.5 - 20 mm/s
Minimum cut width	1 - 5 mm

### Process characteristics

Machining processes	✓
Cutting processes	✓
Discrete	✓
Prototyping	✓

### Supporting information

#### Design guidelines

Circular sawing is most commonly used for stock cutting, but it is possible to create basic prismatic features such as channels, lap joints or tongue and grooves. The cutting depth is determined by the extent to which the blade is exposed.

#### Technical notes

There are many types of circular saw, some hand-held, some with the workpiece fixed while the blade is tracked, others with the reverse.

#### Typical uses

Stock cutting; carpentry; general engineering, creating channels/grooves in metal, wood and plastic.

#### The economics

Circular saws represent a larger capital investment than band saws or hacksaws. They are generally used for high volume cutting of steels, non-ferrous alloys and timber.

#### The environment

Sawing can be extremely noisy. Ear protection should be worn for extended operation.

### Links

MaterialUniverse

Reference