

## Description

### Image



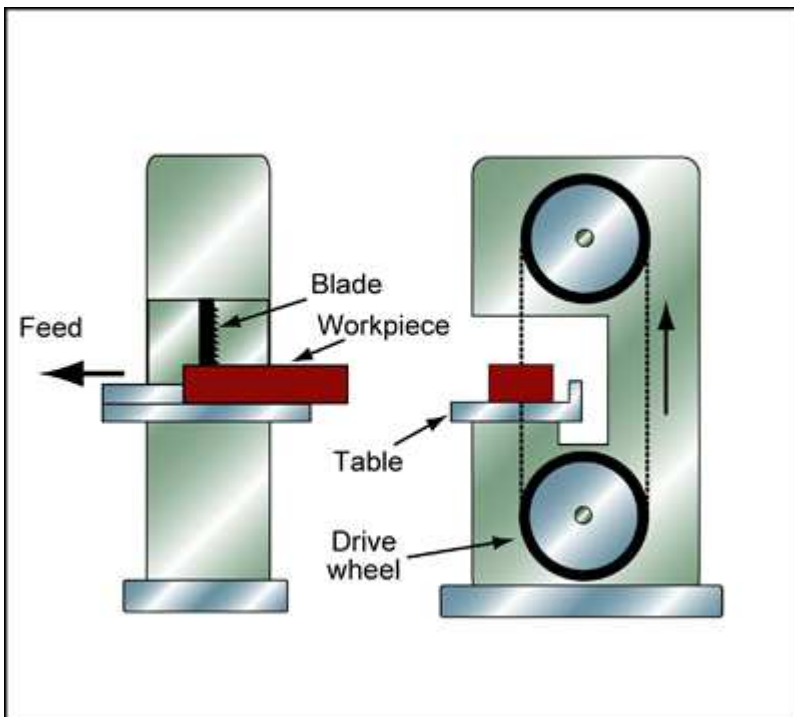
### Image caption

(1) Band Saw © Skeeze at Pixabay [Public domain] (2) Saw band © Skitterphoto at pixabay [Public domain] (3) Wooden kitchen table and chairs © Sundae2Sundae at Wikimedia Commons [Public domain]

### The process

BAND SAWING uses a continuous flexible blade that is cycled in one direction around pulley wheels. The blade has to be sufficiently thin to bend around the pulley wheels. It is possible to cut curved contours, but the minimum curvature depends on the cross-section of the blade. Cutting fluids are used for lubrication and cooling when cutting metals.

### Process schematic



### Figure caption

A vertical band saw. There are also circular and jig saws.

### 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
Relative equipment cost	medium
Labor intensity	medium
Economic batch size (units)	1 - 1e4

### Physical and quality attributes

Mass range	0.01 - 50	kg
Range of section thickness	3 - 20	mm
Tolerance	0.25 - 3	mm
Roughness	5 - 45	μm
Surface roughness (A=v. smooth)	B	
Cutting speed	0.5 - 7	mm/s
Minimum cut width	0.8 - 3	mm

### Process characteristics

Primary shaping processes	✗
Machining processes	✓
Cutting processes	✓
Discrete	✓
Continuous	✓
Prototyping	✓

### Supporting information

#### Design guidelines

Curved profiles can be cut, but the minimum radius depends on the width of the blade. Internal contours made by welding the ends of the blade together after it has been passed through a hole in the workpiece.

#### Technical notes

There are three main tooth forms for blades: regular (contour cutting), skip (deep cuts in soft metals) and hook (fast cutting rates). Pitch is defined as the number of teeth/inch. There must be at least two teeth for the thickness of the workpiece (three is preferable). Thicknesses of saw blades (gage) are standardized: 0.64mm, 0.81mm, 1.1mm, 1.3mm and 1.6mm. Saw teeth are offset to provide clearance for the back of the band. Bands are made of carbon steel or are bimetallic (high-speed steel) cutting edges electron beam welded to a steel back. Teeth can be hardened, or tipped with tungsten carbide, alumina or diamond.

**Typical uses**

Band sawing is widely used for stock cutting and profile cutting of metal, plastic and wood.

**The economics**

Wear is evenly distributed over the entire blade, making blade changes less frequent. Simple fixtures are required as the downward force of the blade holds the workpiece to the table.

**The environment**

Can be extremely noisy. Ear protection should be worn for extended operation.

**Links**

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MaterialUniverse

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Reference

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