Router Tooling, Feed Rates and Cutting Speeds

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Tool Geometry

You always want to use the right tool for the job.

Different tool geometries produce different effects and results with the range of materials that can be cut on this machine.

Tool Geometry	
Straight Flute	Will not lift material out of cut.
Spiral Flute	Spiral Flute lifts swarf or pushes it towards cut. depending on geometry
Flute Geometry	
Single Flute	Single Flute cutters only have one cutting edge. These are good for faster feed rates in softer materials.
Double Flute	Double Flute cutter have cutting surfaces and are good for cutting harder materials at slower feed rates.
Upcut Spiral	The geometry of an upcut spiral draws swarf up and out the top surface providing the best finish on the down side of the material
Downcut Spiral	The geometry of an downcut spiral draws swarf down and out the bottom surface providing the best finish on the upper side of the material.
Compression Cutters	Compression Cutter have both upward and downward spiral geometry that forces swarf both upward and down and produces a clean finish on both upper and under sides of the materials and is particularly useful in applications with laminated materials.
O Flute	Identified by the Half moon shape, OFlute cutters have a single flute that ejects swarf effeciently. As such they are suited to cutting timbers and plastics (softer materials) at high speeds.

Suggested Feed Rates - Soft woods/Plywood

Tool Type	Tool Diameter	Spindle Speed	Feed Rate	Plunge Rate	Direction	Attribution
Single Spiral	3.175mm	16,000rpm	2,000mm/min	1,000mm/min	Conventional	
Single Spiral	6.35mm	16,000rpm	4,800mm/min	3,000mm/min	Conventional	
Double Compound Spiral	9.5mm	12,000rpm	11,280mm/min	9,000mm/min	Conventional	
Double Compound Spiral	10mm	12,000rpm	11,280mm/min	7,000mm/min	Conventional	
Triple Compound Spiral	10mm	12,000rpm	16,920/min	12,000mm/min	Conventional	
Triple Compound Spiral	12mm	8,000rpm	13,320/min	11,000mm/min	Conventional	

Suggested Feed Rates - MDF, Particle Board

Tool Type	Tool Diameter	Spindle Speed	Feed Rate	Plunge Rate	Direction	Attribution
Single Spiral	3.175mm	16,000rpm	2,240mm/min	1,200mm/min	Conventional	
Single Spiral	6.35mm	16,000rpm	5,280mm/min	3,500mm/min	Conventional	
Double Compound Spiral	9.5mm	12,000rpm	13,080mm/min	9,500mm/min	Conventional	
Double Compound Spiral	10mm	12,000rpm	13,080mm/min	9,500mm/min	Conventional	
Triple Compound Spiral	10mm	12,000rpm	16,920/min	12,000mm/min	Conventional	
Triple Compound Spiral	12mm	8,000rpm	15,360/min	11,000mm/min	Conventional	

Suggested Feed Rates - Hardwood

Material Size	Tool Diameter	Spindle Speed	Feed Rate	Plunge Rate	Direction	Attribution
Single Spiral	3.175mm	16,000rpm	1,680mm/min	1,000mm/min	Conventional	
Single Spiral	6.35mm	16,000rpm	4,800mm/min	3,000mm/min	Conventional	
Double Compound Spiral	9.5mm	12,000rpm	10,080mm/min	8,500mm/min	Conventional	
Double Compound Spiral	10mm	12,000rpm	10,080mm/min	7,000mm/min	Conventional	
Triple Compound Spiral	10mm	12,000rpm	15,120/min	12,000mm/min	Conventional	
Triple Compound Spiral	12mm	8,000rpm	12,120/min	11,000mm/min	Conventional	

Suggested Feed Rates - Acrylic

Material Size	Tool Diameter	Spindle Speed	Feed Rate	Plunge Rate	Direction	Attribution
Single Spiral	3.175mm	16,000rpm	6,000mm/min	2,000mm/min	Climb	
Single Spiral	6.35mm	16,000rpm	3,200mm/min	1,500mm/min	Climb	

Material Size	Tool Diameter	Spindle Speed	Feed Rate	Plunge Rate	Direction	Attribution
Double Compound Spiral	9.5mm	12,000rpm	6,000mm/min	2,000mm/min	Climb	

NOTES

The above setting are as suggested on page 194 of the Multicam A2MC Machine Installation and Training Manual unless noted in the *ATTRIBUTION* Column in ach Settings Table.

Feeds and Speeds for the Tangential Knife

Suggested Feed Rates - Corrugated Cardboards

Material Size	Tool Length	Feed Rate	Plunge Rate	Direction	Attribution
4mm Single Corrugated	15mm	5000mm/min	2000/min	Conventional	
7mm Single Corrugated	15mm	5000mm/min	2000/min	conventional	

Suggested Feed Rates - Expanded Foam

These feed rates should be adjusted to suit design. Small radius curves should be cut slowly to minimize knife flex.

Material Size	Tool Length	Feed Rate	Plunge Rate	Direction	Attribution
50mm	70mm	2500mm/min	1500mm/min	NA	TheEdge
50mm(radius ⇐10mm)	70mm	1500mm/min	1500mm/min	NA	TheEdge
		5000mm/min	2000/min	NA	TheEdge

LINKS

CNC Router Operations

Other Operations - Staff Only

Multicam CNC Induction