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CNC Router Bits.com.au

Router bits for: timber - laminates - plastics - aluminium - foam - composite materials

How to get the best from your Router Cutters



ONE OF THE MOST IMPORTANT COMPONENTS OF YOUR CNC ROUTER IS THE CUTTING TOOL, OR ROUTER BIT. AFTER ALL, THIS IS THE PART THAT ACTUALLY CUTS OR ENGRAVES YOUR MATERIAL TO GIVE YOU A FINISHED PRODUCT.

If you use incorrectly selected or poor quality tools you can't expect to get good quality, reliable results from your cutting or engraving process. In this flyer the team at CNCRouterBits.com.au will provide you with information that will enable you to get the most from your CNC router or engraving machine.

Cutting Tool Selection

Choosing the right router bit for the product you are cutting is paramount. Choose the wrong one and you end up with poor edge finish, slow production rates, tool breakages and wasted time and money. There are a number of factors you need to consider when choosing the right bit for the job. In this flyer we will only discuss solid carbide router bits as they are best suited for use on CNC routing machines.

Material to cut. Different materials require different router bits manufactured with geometries

specific to that material. For instance, a router bit designed for cutting veneered board will not cut aluminium. Similarly a router bit designed for cutting acrylic will not successfully cut composite panel. If you don't know what router bit to choose ask your supplier, or do some research online. Our online store allows you to choose the right tool by selecting the material you want to cut or you can choose to shop by cutter type if you already know what type of bit you want.

Depth of cut. The depth to which you need to cut will determine the diameter of the router bit required. As a general rule you should not cut deeper than 3 times the diameter of the bit. So with a 6mm diameter bit you should not cut deeper than 18mm. You should always opt to use the shortest possible bit for the job. This will reduce the likelihood of premature tool wear and breakage, improve edge finish, reduce vibration and allow you to run at higher feed

rates since the bit will not be subject to unnecessary flexing.

Bit diameter. The diameter of the router bit you choose is influenced by a number of factors.

- smallest required internal radius of the job.
- depth of cut
- required edge finish

Rigidity. As well as the above you need to consider the overall rigidity of the system since this has a direct bearing on vibration, edge finish, cutting rate and router bit life. You need to consider;

- machine construction. Is the machine solidly constructed with heavy duty materials? A welded frame and gantry is always going to be more rigid than a bolted construction as it has the ability to absorb vibration.
- work holding. Is the piece being cut held securely? Ensure that flat sheets are not buckled resulting in space between the

- machine bed and the work piece.
- is the router spindle in good condition? Worn bearings will introduce resonance in to the cutting process.
- are tool holders, collets and cover nuts well maintained and not worn? Contrary to popular belief these are consumable items that become worn through use. If any of these become excessively worn they will become a source of vibration.



The correct selection of router bit is always a trade off between the above factors. Sometimes one factor will have more bearing than the other, for example edge finish over speed of cut, or cutter radius over tool length. You need to decide what is most important and focus on that when making your choice.

Just as importantly you should always choose quality router bits. All router bits available on CNCRouterBits.com.au have been tested for performance and suitability in real world applications on Australian CNC routing machines.

How to avoid bit breakage

Router bits will break for a number of reasons, however the vast majority of CNC tool breakages are caused by incorrect or faulty colleting?

A router bit spinning at 18,000rpm is at risk if it is as little as 5 microns off centre. That is about how thick a

deposit of resin or dust is when it's squashed inside your collet.

Collets are manufactured to exacting tolerances and when they are 5 microns out of round both the collet and the router bit are strained because the distorted collet cannot grip the tool shank perfectly.

The result -

- Poor component edge finish.
- Less than optimum tool life.
- Metal fatigue and eventual breakage of the tool.
- Increased noise.

Other factors that can cause tool breakage are surprisingly obvious.

- replace chipped or worn bits before they break
- use the shortest possible bit for the job
- use the largest possible diameter bit for the job
- don't drop the bit

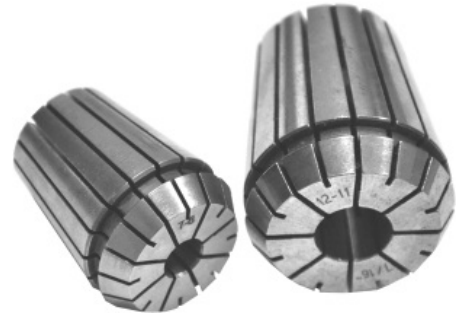
Colleting and Collet life Span

Collets have a life span of 3 months if used 8 hours a day. Replacing the collets will ensure that your operation runs consistently and prevents tool breakage. When inserting a tool into the collet, make sure the flute fade out does not enter the collet. If the collet is gripping on the fadeout, it will cause runout and potentially tool breakage. To ensure proper clamping the tool shank should fill, at a minimum, 80% of the depth of the collet.

Collet Maintenance

Cleaning is an essential part of collet maintenance. As material is cut, extremely fine dirt and resin migrates up the tool shaft into the collet, causing the collet, collet nut, toolholder and spindle interface to become dirty. This causes your tool to cut in an elliptical fashion which will decrease tool life and cause inconsistency in your operation.

Keeping collets and tool holders clean is as essential as it is easy.



Here are some simple pointers -

- do not allow dirt to build up in the collet, cover nut or tool holder.
- always clean mating surfaces prior to fitting.
- do not use damaged collets, tools or tool holders.
- do not leave tools or tool holders in spindles for extended periods of time.
- replace collets and tool holders if they show any signs of damage.

In Summary

Using quality router bits from a reputable supplier with real world experience will ensure that you have every chance of getting the best performance from your routing bits and machinery.



CNCRouterBits.com.au can provide all your tooling requirements, with new products being added constantly. We can also offer advice if you have a special requirement.