

## CNC Plasma Cutting Equipment - Steps for selection

The CNC Plasma cutting machine has evolved into an irreplaceable part of a fabrication workshop's basic set of equipments. It provides great versatility and speed to the cutting operation.

CNC systems allow a computer to control the torch head producing clean sharp cuts. Modern CNC plasma equipment is capable of multi-axis cutting of thick material, allowing opportunities for complex welding seams that are not possible otherwise. A specialized use of CNC Plasma Cutters has been in the HVAC industry. The Software processes information on ductwork and creates flat patterns to be cut on the plate / sheet by the plasma torch. This technology has enormously increased productivity within the industry since its introduction in the early 1980s.

CNC Plasma Cutters are also used in many workshops to create decorative metalwork. For instance, commercial and residential signage, wall art, addresses signs, and outdoor garden art.

Therefore, the selection of the right machine with the correct specifications becomes extremely important in achieving an efficient and cost effective cutting operation.

This article attempts to cover some important considerations that help in the selection of the right machine.

### What you need to know before purchasing a CNC plasma cutting machine.

#### Step 1: Sheet size

Start with figuring out what you need to cut. The most important question is the maximum plate size - do you cut 4' x 8' sheets, 8' x 10', 10' x 40'? Plate size is where we start when deciding which model machine you will need. Every machine model is designed to cover a range of different plate sizes, but once you go beyond a certain point, you automatically get bumped up to a larger machine model. That's just the reality of the machine structure and the 'beam' size. Nobody wants a 4 x 8 machine with a beam design that's big enough to go 30' wide - it wouldn't be economical.

Maximum plate thickness is also used to determine which machine model you'll need, because some models are limited by the size of plasma they can carry, or the maximum thickness they can clear.

The next part of the equation is how many sheets you need to cover. Most cutting machines are sized to cover a single plate width. But some high production shops or steel service centres may want a machine wide enough to cut two plates side-by-side. That will quickly bump you up into a larger model gantry. Likewise, most machines can have rails long enough to cover one or more plates end-to-end. But the machine width is the more important question to answer - here's why: you can almost always add more rails, but you can't make the machine wider once it's built.



A small CNC cutting machine for smaller plate sizes  
Portable CNC flame and plasma cutting machine-King Cut Smarty from Ador Welding

#### Step 2: Working Areas

Another factor that affects machine size is the arrangement of working areas. The simplest machine only has one working area, which means the cutting table is big enough for one plate at a time. But that means that once you finish cutting the plate, the machine sits idle while you unload the cut parts and scrap, and then load a fresh plate. That's fine for small shops or low-production environments, but many companies want to increase the machine's efficiency by being able to load & unload while the machine is cutting. Here's the trick though: do you get one big table, or two separate cutting tables? Whether it's a water table or downdraft table, you could go either way.

Sometimes, having an open zone between tables is nice for service access. Extra space between cutting zones also helps avoid smacking the machine with a plate swinging from a crane while trying to load the table.

So the distance between one plate and the next needs to be at least the parking distance of the machine, plus a little extra. The more space you leave, the safer you'll be. The problem is that every foot of additional rail length equals some additional cost and floor space used, so it's always a trade-off.



A large CNC machine with bigger working area for higher plate size.  
CNC flame and plasma cutting machine-King Cut Pro from Ador Welding



Motorized torch lifter allows torch adjustment from controller

#### Step 3: Process Tools

Having a good idea of what type of cutting process tools you need will also help narrow down which machine model you'll need. Do you only need one plasma station, or two? Do you need an oxy-fuel torch, or maybe four, or eight of them? The more tools you need, the wider the machine gets. And that's not only because of the space each tool takes up on the gantry, but also because of the 'cross-cut' requirement.

Let's think about a machine with one plasma torch and four oxy-fuel torches, where you need to cut 10' wide plate. You are going to need that plasma torch to be able to cross-cut the entire 10' wide plate. And you'll probably want at least one of the four oxy-fuel torches to be able to cross-cut the entire plate as well. That means you'll need room on the gantry for all four oxy-fuel torches to park off to the side while that plasma torch covers the plate. Likewise, you'll need room on the other side of the gantry for the plasma station to park while one of the oxy-fuel stations covers the plate. As you can see, if you start adding more tools, like a 2nd plasma, a marker tool, more oxy-fuel torches, etc, the machine can get really big in a hurry. And a bevelling station makes it even worse, because most bevel stations take up 24 - 36 inches of cross cut on the machine!

#### Step 4: Don't Forget About Software

There is importance of programming and nesting software. Even for a small shop where nesting capabilities are not needed, still there should be ability to generate program code for the CNC to run. Many new CNCs today have built-in programming capability, such as shape libraries or manual program editors. A lot of them also have the ability to take in a DXF file or DWG file and "post-process" it into M- and G-Code for the CNC to run. But even then it is necessary to know about creating and editing those CAD files for the CNC to import. There are lots of possibilities, but the point is that the machine is worthless if there is no ability of operator to generate programs to run it. So do not forget about the software when planning the purchase of a CNC plasma cutting machine.

#### Step 5: Options

There are many options available. There may be optional features on the CNC of , the plasma system, the oxy-fuel stations, the gantry, the software, the table, dust collectors etc and many. The best thing to do is educate yourself on some of them ahead of time, so you can be sure to get the ones you need to make your business as profitable as possible. That might mean getting the high-end options to improve your productivity, or it might mean knowing that your business can get away without all the bells & whistles so you can keep the investment cost low. Either way, knowing what is available or knowing the cost & benefit of each option will help you make a better buying decision.

All the best! Do look at the world class options that Ador Welding offers;

- a) King Cut Pro
- b) King Cut Smarty.

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