

The Beginners
Guide to Engraving
for
Profit

Your comprehensive guide to getting started in engraving

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Introduction

This guide is designed to answer the typical questions you ask yourself when approaching a new business venture. It has been written in the order you probably would ask those questions. Whether you're just starting out on your own, or adding on to an existing business, the main questions you should be asking are these:

- How much can I earn?
- Can I do it?
- What's it going to cost?
- What's involved?

It is neither a complete explanation of the intricacies of the engraving business nor an operation manual for computerized engraving. Our goal is to help you make an informed decision whether engraving offers a viable business opportunity for you.

How much can I earn?

Let's cut to the chase. Whether you're starting out on your own, or adding an engraving service to your business, it is going to cost you, and you are only going to do it if you can see it is going to make you money.

There are two ways in which adding engraving to your business will increase your profits and increase your customer base:

1. *By increasing your services to existing customers.*
2. *By diversifying your markets.*

In order to explore the potential of these two areas, it is important to understand the different categories of engraving:

- *General signs*
- *Industrial engraving*
- *Corporate gifts/awards*

General signs include architectural signs, information panels, slat systems and brass plaques.

Industrial engraving is the production of labels or panels attached to machinery and equipment, such as product ID labels and control panels.

Corporate gifts/awards is a growing industry and the profit potential is large due to the fact that you make money on both providing *and* engraving the item.

Examples of job charges – general signs

Example one: modular signs



A professional modular sign system is constructed from satin anodized aluminium. It can accept individually engraved strips or can be engraved directly. The strips are available in a wide range of surface colors. Once engraved, the core color is exposed. When engraving the aluminium slats directly, the lettering can be easily color-filled.

<u>Description</u>	<u>Cost</u>
Total raw material cost	\$12.00
Time to engrave and assemble plus add blue fill	30 mins
Total selling price	\$92.00

Examples of job charges – **general signs**

Example two: **brass plaques**



There are two reasons to select an engraved sign over any other process:

1. Longevity
2. Perceived value

Solid brass plaques ooze quality, prestige and durability, bestowing on the owner kudos, respectability and stability.

<u>Description</u>	<u>Cost</u>
Total raw material cost	\$15.00
Time to engrave (unattended)	1 hour – including profile
Total selling price	\$259.00

Examples of job charges – general signs

Example three: lapel badges



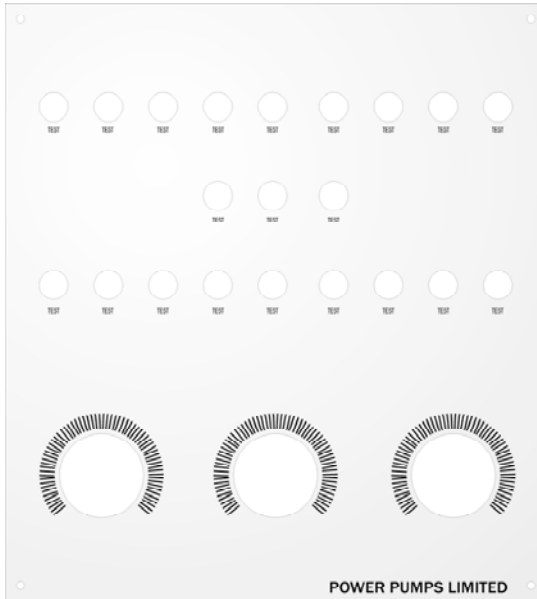
They may be small, but there are many successful businesses built on selling *just* name badges. And the great thing about badges is that you get regular orders from each customer for new staff, lost and damaged badges, exhibitions, etc.

Example prices based on typical order of 100 badges.

<u>Description</u>	<u>Cost per 100 badges incl. materials</u>
Total raw material cost	\$47.00
Time taken to engrave (unattended)	1 hour
Total selling price	\$334.00

Examples of typical charges – industrial engraving

Example four: control panels



Industrial engraving is a big business and will reward you by increasing your customer base. The same customer that buys control panels will also buy warning, hazard, and directional signs and machine labels.

<u>Description</u>	<u>Cost</u>
Total raw material cost	\$8.00
Time to engrave (unattended)	30 mins – <i>incl. profiling</i>
Total selling price	\$142.00

Examples of job charges – corporate gifts

Example five: gifts



The promotions market is a thriving and expanding business dominated by companies who 'farm out' the work by acting as go-betweens for the client and the producer. A competitive edge is easily attained by producing and selling the work yourself. This example is based on a typical order of 100 business card holders, all identically engraved.

<u>Description</u>	<u>Cost per 100</u>
Total raw material cost	\$583.00
Time taken to engrave (attended to feed machine)	90 mins
Total selling price	\$1,582.90

This is the 'double-whammy,' as you profit from both the product and the engraving. Engraving can be the means to sell a quantity of gifts.

Pricing matrix

Engraving can be a minefield when it comes to pricing. Most companies look at the material, then the amount of work required, then the size of the customer's wallet. They then think of a number, double it, feel guilty, knock a bit off and then toss it to the client.

There is a better way.

Most jobs can be calculated using a relatively simple formula:

- **Minimum charge** – *to cover the time to set up the job.*
- **Origination charge** – *to cover the time required for creating any logos or artwork.*
- **The size of the job** – *to account for material costs.*
- **The amount to be engraved** – *to calculate the time required for completing the job.*

The following matrixes show how you can calculate your own pricing. However, it is always good to do your own localized research/comparison shopping to find out the average 'street price.'

Lead Time Policy

It is also important to have a lead time policy. This gives you the opportunity to advise the customer of a realistic delivery time. It also gives you the chance to offer a premium service at an added cost. Being upfront with your customer before promising price and delivery will help cement a trusting relationship. Here is an example:

H.A. Signs – Lead time policy.

Please ensure you give us as much time as possible to complete your engraving order. We attempt to turn work around in 5 to 10 working days (Monday to Friday). For work required in less time, a rush charge may be charged during busy times. This charge is relative to the increased cost incurred with respect to overtime, etc. For 3 to 5 days add 25%, for 2 days add 50% and for next day jobs add 75%

These delivery times can only be guaranteed by us prior to the work taking place.

Pricing Matrix – Brass Plaques

Minimum charge \$17.00

Origination charge \$50.00 per hour

The following chart is based on the amount of brass required. It includes engraving up to 50 characters, bevelled, drilled and color-filled:

Area in square inches	Engravers Brass			
	<i>Material thickness</i>			
	1mm	1.5mm	2mm	3mm
up to 15	\$1.83	\$2.00	\$2.17	\$2.67
16 to 30	\$1.67	\$1.83	\$2.00	\$2.33
31 to 50	\$1.50	\$1.67	\$1.83	\$2.17
51 to 75	---	\$1.50	\$1.67	\$2.00
76 to 100	---	\$1.42	\$1.58	\$1.92
101 to 200	---	---	\$1.50	\$1.83
201 +	---	---	\$1.42	\$1.75

--- *Material thickness not suitable*

- Add 35 cents per character over the initial 50.
- If more than one color is required in the filling, add \$16.66 per color.

Brass plaques also often require wooden backing boards or decorative panel supports. These should be additional charges.

Many brass plaques are used in unveiling ceremonies. You can also benefit from offering a curtain rental service. This can be a simple short-drop velvet curtain, mounted onto a wooden rod.

Pricing Matrix – Laminate Signs

Minimum charge \$16.50 (for total order)

Origination charge \$50.00 per hour

The following chart is based on the amount of laminate required. It includes engraving up to 50 characters and bevelled edges:

Area in square inches	Plastic Laminate	
	<i>Material thickness</i>	
	1.5mm	3mm
up to 15	\$1.50	\$1.75
16 to 30	\$1.33	\$1.58
31 to 50	\$1.16	\$1.42
51 to 75	\$1.00	\$1.25
76 to 100	\$0.92	\$1.17
101 to 200	\$0.83	\$1.08
201 +	---	\$1.00

--- *Material thickness not suitable*

- Add 20 cents per character over the initial 50.
- For control panels, \$2.50 per profiled hole.
- \$5.00 per basic symbol (arrow/line).
- Drilling holes 26 cents each.

Engraving laminate is a 2 or 3-ply laminate. Engraving through the top coating exposes the core color, eliminating the need for color-filling. Laminates are available in many formats, including micro surfaces for fine detail, exterior UV stable and rigid. There are

many different colors and finishes available. They can be supplied in sheet form or cut to size.

Pricing Matrix – Lapel Badges

Minimum charge \$5.00

Origination charge \$50.00 per hour

The following charge per badge is based on quantity of badges required. It includes engraving up to 50 characters and bevelled edges. It also includes a basic self-adhesive pin attachment:

Quantity			
1	2 to 5	6 to 10	11 to 30
\$8.33	\$6.67	\$5.84	\$5.00

Quantity			
31 to 50	51 to 100	101 to 200	201 +
\$4.58	\$4.16	\$3.75	\$3.33

There are many types of attachments available, including pins, clips, swivels and magnets. Prices would have to be adjusted to accommodate more expensive attachments.

Most commercial engraving programs include text merge tools for entering multiple names in one process.

Badges can be produced in any engraving laminate, however, most people use the micro laminate, engraving minimal depth for fine detail. Badges can be engraved from a sheet and profiled to any shape

or size, ensuring complete unattended mass production.

Pricing Matrix – Corporate Gifts

Minimum charge \$8.00

Origination charge \$50.00 per hour

The following chart does not include the price of the item. It relates to the engraving cost only, based on the price per item for a logo or text up to 50 characters. These gifts are engraved by non-rotating diamonds (also known as diamond scribing) – the fastest, cleanest, simplest way to engrave.

Quantity			
1 (proof)	2 to 5	6 to 10	11 to 30
\$8.33	\$6.66	\$5.83	\$5.00

Quantity			
31 to 50	51 to 100	101 to 200	201 to 500
\$4.58	\$4.16	\$3.75	\$3.30

Quantity			
501 to 1000	1001 to 5000	5001 to 10,000	10,000 +
\$2.92	\$2.50	\$2.08	\$1.67

The larger quantities are broad guidelines only. Often, the time to unpack and repack items takes longer than the engraving itself. Most companies will ‘trial-time’ the project and charge accordingly, based on a minimum of \$75.00 per hour.

However, the largest profit potential is in the sale of the product. Sensible sourcing of the items is key to profitability.

Your customers

The simplest way to become profitable with engraving is to market to your existing customers. The chances are they already have a need which is being met elsewhere. And if they don't have a need, it can be cultivated.

Before you start promoting your business, your first engraving work should be samples for your showroom. Choose these carefully. Make sure you select items that are relatively simple to engrave, but also appropriate to your target market. Modular or slatted wall systems are essential for displaying your work. Door and desk nameplate holders are great ways in which your customers can enhance the appearance of their offices -- brass plaques are a must. You only need a couple -- one on a mahogany board, the other on stand-offs, fixed to a wall. Key fobs and badges are also essential. Corporate gifts will always attract attention -- so long as the lighting is adequate. Clever use of lighting will make the difference between success and failure. Edge-lit signage is a fantastic display product for engraving.

Once you have produced your own samples and understand engraving, it's time to shout about it.

Every customer that comes to your showroom should go away with an engraved sample. This could be a business card holder, key ring, badge -- anything that they will use and not lose in a drawer.

You should then send your customers a mailer.

INVESTING IN THE FUTURE TO SERVE YOU BETTER

We've recently invested in the latest computerized engraving technology from Roland. Now we can offer you the highest quality engraving service for:

- Brass Plaques
- Edge-lit Signs
- Lapel Badges
- Industrial labels
- Corporate gifts

For a free personalized sample and a comprehensive catalog of services, call our sales office today.



Company name
Address
City/State/Zip

COMPANY
LOGO

Samples are the key to success. Most customers will only recognize a good idea when they see it.

Finding new customers - Industrial

One of the greatest benefits of expanding your business with engraving is the opening up of new markets to increase your customer base. For instance, if you're a sign maker, successfully expanding your engraving business into new markets will inevitably allow you to extend your existing services into these new territories. Once you start supplying the local control panel manufacturer with fascia panels, you will also find he needs warning labels, factory signs, machine labels and office signs. The benefits are real and deserve serious attention.

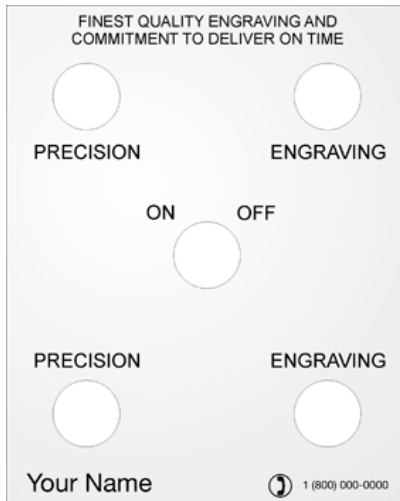
So, how do you find these people?

Yellow Pages.

How do you get them interested?

*Prove you can do the job – **send a sample.***

There is a very standard control label. Sizes vary, but the general layout is always the same:



The sample should be sent with a cover letter and a sales brochure.

**INVESTING IN THE FUTURE
TO SERVE YOU BETTER**

We've recently upgraded our engraving facilities by investing in the latest computerized engraving technology from Roland. Now we can offer you unrivalled accuracy and the very highest quality - and promise to deliver when you need it.

For a free personalized sample and a comprehensive catalog of services, call our sales office today.



Company name
Address
City/State/Zip

**COMPANY
LOGO**

You are likely to receive volume orders from control panel manufacturers. The biggest complaint they have is late deliveries. You may also find that some labels get damaged, so be prepared with rapid turn-around of individual pieces. Remember, your \$16 label could hold up a \$1 million installation.

Finding new customers – Corporate Gifts

There are two options open to you. You need to make the decision whether you want to supply promotional companies or pursue the clients directly.

There are several organizations and magazines in the North American market:

Canadian Professional Engravers Association

The Canadian Professional Engravers Association exists to bring together both engravers and engraving suppliers. Through this association, engraving professionals can gain insight to the engraving industry, through a Canadian perspective.

www.cpeassoc.com

Custom Gift Retailer Magazine - Custom Gift Retailer is the only trade magazine for retail gift shops offering personalized gifts, souvenirs, novelties and apparel, with in-depth information about the customization processes used.

www.nbm.com

Recognition Review Magazine - Edited for the awards and recognition industry. Editorial content focuses on the products, technology and business issues relevant to both retailers and manufacturers in the awards, engraving, giftware and related markets. Monthly articles include product and equipment features, company profiles, industry news and events, and market analyses.

www.ara.org/recognition_review

Awards & Engraving is a trade magazine for the awards, engraving and recognition professional,

covering trophies, sublimation, laser and rotary engraving, sandblasting, CorelDraw and other related markets. A&E regularly focuses on a number of related horizontal markets, including gifts, promotional products, and signage.

www.nbm.com

The Awards and Recognition Association (ARA) is a membership organization of 4,000 companies dedicated to increasing the professionalism of recognition specialists and advancing the awards and engraving industry. ARA is:

- Awards professionals who can offer expert advice in designing recognition programs and provide quality awards and recognition products to consumers.
- Manufacturers and suppliers that provide products, technology and equipment to awards retailers.
- Many companies with a common purpose to promote the public awareness of the use and benefits of quality recognition products and to educate its members in the areas of business skills and ethics, technical competence, product knowledge and marketing.

If you are looking to sell your services to a promotional company, approaching these organizations is a good start. Be aware, however, that these companies are strict on price, quality and delivery times. This route is only worth considering if you are happy to provide large volume output and can guarantee rapid turn-around. This means having a machine on standby and access to flexible labor. Many companies use contract labor. They have a

database of retired and part-time people who are happy to drop what they are doing on short notice to run the engraving machines.

Alternatively set yourself up on the web and begin a campaign to promote yourself as a corporate gift supplier. The rewards are high, but it does require effort to establish yourself. You need to decide whether you want to operate nationally or regionally. If you go national, there are some exhibitions to consider:

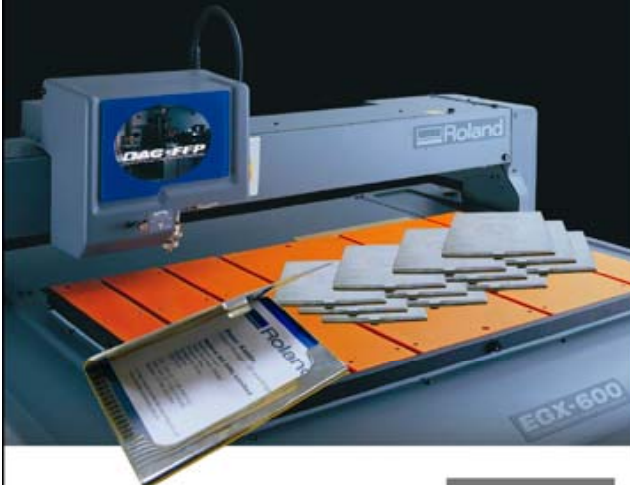
- ARA Las Vegas Award Market
www.ara.org
- Awards & Custom Gift Shows
www.nbmsshows.com

If you decide to work locally, it's back to samples and a brochure like the following:

INVESTING IN THE FUTURE TO SERVE YOU BETTER

Your name has recently upgraded their engraving facilities by investing in the latest computerized engraving technology from Roland. Now we can offer you unrivalled accuracy and the very highest quality - and promise to deliver when you need it.

For a free personalized sample and a comprehensive catalog of services, call our sales office today.



Company name
Address
City/State/Zip

COMPANY
LOGO

The Engraving Markets

The engraving market is extremely diverse.

Examples from A to Z:

- A** **Accountants**
Brass plates
- B** **Banks & Financial Institutions**
Brass plates and badges, door/desk signs
- C** **Control Panel Manufacturers**
Control panel fronts, labels
- D** **Drama Schools**
Awards and certificates
- E** **Electrical Contractors**
Switch plates, labels, warning signs
- F** **Food Processing Equipment & Machinery**
Food grade stainless steel plates
- G** **Garden Centers**
House nameplates
- H** **Hotels & Inns**
Reception signs, brass plates, door numbers/names, restaurant table numbers, direction signs, information boards, key tags
- I** **Incentives**
Promotional gifts
- J** **Jewellers**
Gift engraving service
- K** **Kennels**
Pet tags, kennel name plates, signs
- L** **Legal Services**
Brass plates, door/desk signs
- M** **Mortgage Brokers**
Brass plates, door/desk signs
- N** **Nature & Wildlife Parks**
Plant and display labels, direction signs
- O** **Organ Builders**

- P** Manufacturer's plates
Promotional Items & Incentives
Promotional Gifts
- Q** **Quarries**
Durable signage
- R** **Restaurant Supplies**
Table numbers, door nameplates
- S** **Shop Fitting Suppliers**
Brass plaques, edge-lit signs, acrylic, modular signs
- T** **Trophies, Medals & Rosettes**
Most trophy retailers have only manual engravers and cannot handle more complex work. They would welcome a local trade source.
- U** **Universities**
The property management office requires enormous amounts of signage and labels
- V** **Veterinary Surgeons**
Vets offer pet tags which they buy in quantity. They would welcome a local supplier.
- W** **Wrought Ironwork**
House nameplates, manufacturer's plates
- X** **X-Ray Apparatus**
Manufacturer labels for traceability, control panels
- Y** **Yacht Sellers**
Brass boat registration plates, control panels
- Z** **Zoos**
Directional signs, exhibit labels, warning signs

Perhaps not the top 26 markets to try, but a good exercise showing how almost any industry has a requirement for engraving.

So, which are the top markets to try? Always begin by capitalizing on your existing customer base. These are the easiest customers for you to approach

because they know you and the quality of service you provide.

The next page shows some good examples:

1 Hotels. Hotels can be particularly rewarding. A good contract for a hotel refurbishment could pay for your machine. They will need reception signs, event boards, directional signs, door numbers and names, restaurant table numbers, floor level indicators and key tags.

2 Control Panel Manufacturers. Any manufacturing company that produces equipment with any form of controller will require a control panel. These, of course, are not always engraved, but there are enough out there that are. These could be small, single labels or large panels.

3 Professionals. This would include accountants, lawyers, doctors, dentists, consultants and financial institutions. They all need brass plates. Surprisingly few engravers have ever targeted these professionals directly. They all have magazines for their professions. Many have several partners who can change or be added. Why not design a generic plaque with separate partner strips screwed underneath, all mounted on a single backing board? You could offer the company a fixed-rate annual contract to maintain and update.

4 Corporate Gifts. Corporate gifts/incentive awards is a very lucrative sector. The items are generally inexpensive, but benefit from a high-perceived value. What costs you \$5.00 will be in the stores for \$17.00 and, of course, your customer will recognize the value of engraving. So they'll expect to pay at least \$20.00. This is usually a medium-to-high volume product, with orders ranging from 100 to 10,000 pieces. Pick your target market locally or

nationally, depending on the speed of service you are prepared to offer.

Can I do it?

A lot of people are put off by engraving because they feel engraving is too technical, too skilled. You've got all sorts of cutters to contend with, material knowledge, not forgetting the mess.

Let me put your mind at rest. Like anything else, you can make engraving as simple or as complicated as you like.

Just like cutting vinyl

We use vector images and text to design our work – similar to signmaking – but with the additional need to apply tool paths, but that is an automatic function within the software. As for cutters, you can get away with using the same type of cutter on practically any material. So, all you need to do is keep a range of tip sizes. Like felt-tip pens, cutters can be ground to any size -- the bigger the letter, the bigger the required cutter. You can't use a big cutter on little letters, because you'll lose the inside of the letters.

What about material knowledge?

All you need to know is that you engrave harder materials slowly. Some materials, such as aluminium and steel, require a cutting oil to lubricate the cut.

And the mess?

You can extract the swarf directly from the surface with a vacuum.

Software

Whatever software you are using, chances are it will also run your engraving machine. Here is a list of popular programs that support engravers. In most cases, an engraving module may be required. Contact your software supplier to confirm your needs.

- CorelDRAW!
- EZ-Engrave
- Signlab/Engravelab
- Vistool
- Letter Art

Sharing the workshop

Although you can extract the debris created during the engraving process, inevitably some dust/debris will remain. Therefore, it is not wise to position your engraver directly next to your computer, printer or copier. However, it will comfortably share the workshop. Noise level on Roland machines is relatively low, with a maximum no-load level of 75dB.

The learning curve

Under instruction, you will be engraving within 30 minutes.

You will need to learn about:

- Tool-path generation, an automated software function
- How fast to engrave different materials
- How deep to engrave
- What size cutter to use
- Choosing to engrave with/without a nose cone

After the first day, you will have a good understanding. But the best way to learn is with experience. Use the samples you need for your showroom as test jobs. If you can afford the luxury, don't tell anyone about your new business until you have successfully completed your own samples. There are two reasons for this:

1. You'll be too busy to do samples once you go 'live'
2. Your samples will probably represent your customer's own requirements

Two weeks is my guess. Two hours a day for two weeks. You won't know everything, but you'll be competent. But, just like any craft, you'll spend the rest of your working life refining and improving the process.

What's it going to cost me?

The first thing you'll need is an engraving machine. Roland offers a family of engraving machines that have been specifically developed for signmakers. Our professional models are the EGX-400 and EGX-600. Both machines benefit from the same features, the only difference being the engraving area. The EGX-400 has an engraving area of 16" x 12" (407mm x 305mm) whereas the EGX-600 can engrave up to 24" x 16" (610mm x 407mm)

Once you have the machine, you'll need to ensure you have adequate software. All Roland machines are supplied with a suite of 2D and 3D engraving software. However, if you want to use your existing software, please contact your supplier.

You may want to invest in ancillary machines, such as saws, bevellers and cutter grinders. These are essential tools when looking to develop a self-contained engraving business.

From then on, your investment will be in stocking materials. Most suppliers offer next day delivery for engravable products, apart from corporate gifts.

This section includes a supplier list for all the items shown in this guide. Please contact them to get a full price list.

Machinery

Roland **EGX-400** and **600** engravers offer extraordinary performance and value for the professional engraver.



The EGX-400 and 600 both benefit from Feed Forward Processing – an advanced controller technology that anticipates tool movement. Coupled with the digital AC servo motors on all axes, the EGX 400/600 range is unmatched in precision, speed, reliability and energy efficiency. The variable speed spindle can be adjusted from 8000 rpm to 30,000 rpm. In addition to faster cutting, the high-speed spindle and brushless DC motor produce increased torque with less vibration. This means longer cutter life and a professional finish on all metal work – including stainless steel.

For ease of use, the EGX 400/600 range is fitted with an automatic surface sensor to track variance in material height. Also, for production environments, the EGX 400/600 range can be operated with a programmable media card – eliminating the need for a connected PC. Multiple machines can be linked together.

The EGX 400/600 offer an extremely competitive price and are sure to become the benchmark for other machine manufacturers.

Set up cost

EGX-400 professional engraver \$9995.00

Approximate financial terms:

- Lease an EGX-400: Just \$199 a month

EGX-600 professional engraver \$11,995.00

Approximate financial terms:

- Lease an EGX-600: Just \$283.00 a month

All prices exclude delivery, tax and training are subject to change.

Return on Investment

Based on leasing an EGX-600, the monthly cost to set up would be \$283.00

So, let's take a look at what your activities might be in your first month. The following description assumes the only promotion you do is to produce samples for the showroom and announce it to your regular customers:

<u>Description</u>	<u>Cost</u>	<u>Retail</u>
Slate 14" x 8" house plaque	\$29.15	\$108.29
Brass plaque and board 12" x 9"	\$49.98	\$192.00
100 lapel badges	\$46.65	\$416.65
2 desk nameplates	\$19.99	\$ 93.12
Aluminium plaque 16" x 12"	<u>\$13.33</u>	<u>\$325.00</u>
Total cost of materials	\$159.10	
Monthly leasing on EGX-600	<u>\$283.00</u>	
Total cost of first month's engraving	\$442.10	
Total return on first month's engraving		\$1084.06
Profit in first month		\$692.00
Gross profit margin		66%

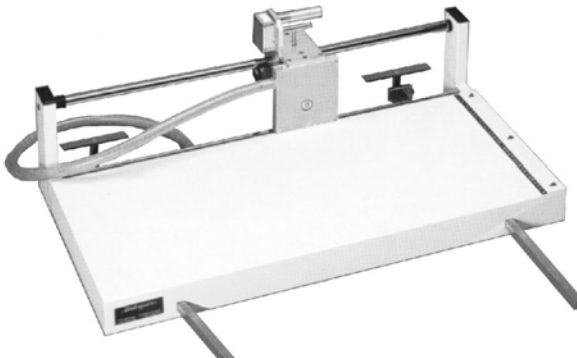
Not bad for just 5 hours work!

Accessories

Now that you've bought the machine, what else will you need?

You'll need to get yourself a good stock of different sized cutters. 10 is a good start and will set you back about \$200.00. These can be re-ground for very little cost when worn. You'll also need some paint to color-fill the engraving and some material to engrave. Most suppliers offer a next-day service, so you don't need to go overboard. Perhaps \$300.00 would be enough for your samples. That's it really. Some double-sided tape and a good ruler and you're in business.

Once you recognize the full potential of engraving, you will need to look at some finishing equipment to benefit from buying material in sheet form, rather than relying on a cutting service from the suppliers.



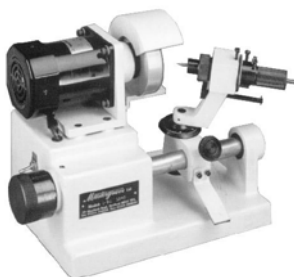
Getting started in engraving

The **Monosaw** is a typical safety table saw, capable of cutting flexible and rigid plastics, acrylic, foam board, brass and aluminium. \$1250.00



The **Beveller** gives a chamfered edge to the engraving material. This can make an enormous difference to the appearance of the end product. It is capable of working with the same material as the Monosaw. \$658.00

The **Cutter Grinder** gives you the freedom of ensuring you have the perfect fit every time. It reduces your required stock of cutters. \$1540.00



To get a head start, there are some learning aids available. A great place to start learning is www.antaresinc.net. This Web site has information about tooling, terminology, a basic overview and facts.

Materials

There is a wide range of engraving materials available today.





The most popular materials are:

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What's it all about?

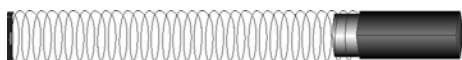
By now, you know how much you can earn from engraving; you know what it takes to get involved and how much it's going to cost you. You also know where to buy everything you need to start engraving. Now you need to know a bit about the engraving world:

Terms and parts description

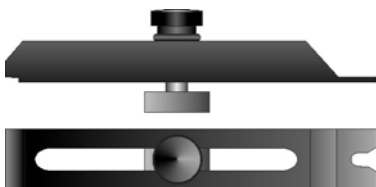
Question: Should I put my dogs on the table?

Answer: Of course.

Knowing a few names is important. You don't have to be a genius, but you will find life is a little easier when you can tell whether your knob is fixed or floating. You may be asked whether you use your nose to engrave and, if so, does it ghost? You may also be asked if you carry spare grubs. Is Collette right for your shaft, and should you let Deborah give your rough edges a good going over? Welcome to the crazy world of engraving.



Brushes are not good for the skirting board, but they are essential in the spindle motor of the EGX-300. The machine comes with a spare set of brushes.



300/400/600 tables.

Clamps. Also known as dogs, clamps have a block underneath that slides into the T-slots of the EGX-



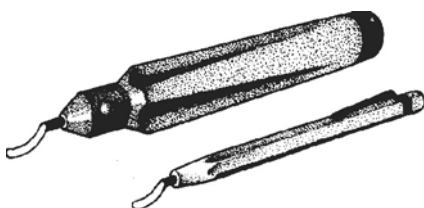
Collets. The collet is the part at the base of the spindle that either grips or

guides the cutter shaft, depending on the type. Solid collets do not have the splits and merely guide the cutter, centring it within the spindle body. The EGX-300 comes with a solid collet, so the cutter is only gripped at the top. Split collets come in a wide range of sizes and grip the cutter at the tip. The advantage of this is they reduce cutter 'chatter' (vibration), giving a better finish and longer cutter-life on hard materials. The disadvantage is they are harder to swap over than top-loading cutters. As a standard feature, the EGX-400/600 is fitted with a stepped solid collet. This means the cutters are top-loading, but the flat face of the cutter rests on the step of the collet. This increases the grip on the cutter and acts like a slotted collet. This is really important when working the EGX-400/600 at the full 30,000 rpm. Any vibration at this speed can cause increased wear on the spindle.



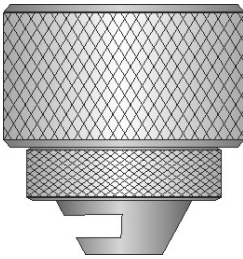
Cutter wrench. The hexagonal cutter wrench is also known as an allen key. It tightens the screw (grub screw) in the cutter knob, which

locks the cutter into the spindle. Allen keys come in a variety of sizes and are used on other parts of the machines for tightening/loosening assorted screws.



De-burrer. This is a hand tool that is used to scrape the

edges of material to be engraved. When material, such as stainless steel, is guillotined (stainless steel cannot be sawn), the guillotine tends to fold the edges down slightly, leaving a lower lip. When the material is stuck to the engraving table, the lip is the only part making contact. This will result in vibration, reducing cutter-life and giving a rough engraved cut. It is also likely to cause the engraving depth to vary. With V-bit standard tools, the deeper you go, the engraved line becomes wider.



The depth regulator is used when engraving with a nose cone. It is screwed to the base of the spindle, allowing the cutter to protrude through the nose cone. The more the cutter sticks out, the deeper the engraving.



Fixed cutter knob. The fixed cutter knob screws into the top of the spindle with a **left-hand thread**. Novice engravers are apt to forget this and use pliers to remove it. This will result in the threaded tube shearing off and sticking in the spindle, which then has to be drilled out. The grub screw locks the

cutter in place.

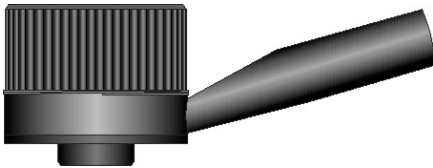


The nose cone is either plastic (nylon) or metal. It acts as a physical depth stop for the cutter protruding from its base. Particularly on metal surfaces, the nose cone can

scratch or 'ghost' on the surface. It is called ghosting, because the scratches will mimic the engraved letters like a shadow. Nylon nose cones are less likely to ghost. However, it is the engraving waste (swarf) which causes the scratches, so keep your nose clean.



Precision Burnishing Adaptor. This is used for diamond engraving only, when the engraving needs to be very light. Best suited for hollow objects, such as lockets and hip flasks.



Vacuum adaptor. Also known as pan handle, the vacuum adapter helps

to remove the engraving waste created during engraving. It minimizes the risk of scratching and keeps the machine and material clean. However, for your extractor to be connected, you need an adaptor. There are several styles available, either replacing or mounting to the depth regulator.

Different Ways to Engrave with the EGX-600

Getting started in engraving



The EGX-600 is an extremely versatile engraving machine. It can engrave all types of plastic, aluminium, brass, glass, wood and even stainless steel. But, before you engrave, you have to decide what cutter to use and how to set up the machine. Following are quick reference notes on the different ways to engrave.

Diamond Drag



Diamond drag merely scratches the surface.

Diamonds are used on thin metals, such as jewelers brass, trophy aluminum, gift items, trophy plates and jewelry. They cannot be used on plastic or wood. For diamond engraving, a solid collet must be fitted. Please note that the spindle must 'float', therefore, the lock nut must be loose.

Nose Cone Engraving



Nose cones are generally used for plastic engraving when only one depth is required and there is no risk of the nose cone scratching the material surface. Again the spindle is floating, with the lock nut loose.

No Nose Cone



Engraving without a nose cone means that the depth of engraving will be taken directly from the settings in the software, so it is vital you check these thoroughly. You must also ensure the **AUTO Z CONTROL is**

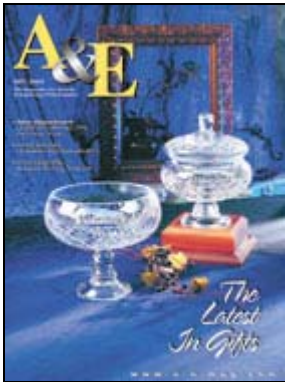
set to OFF. The spindle must be locked, therefore, the lock nut is tightened. Nose cones are not used if there is a risk of damaging the material, such as with deep engraving on metals.

Trade Publications

There are a few magazines dedicated to the trade:

Awards & Engraving: www.NBM.com

Engravers Journal: www.engraversjournal.com



Cutter Knowledge

Engraving can be used on most materials including wood, plastic, metal and glass. In simplistic terms, there are two types of cutting tools:

- Diamond cutting
- Deep engraving

Diamonds scratch the surface, leaving a shallow indentation on metal and glass surfaces. They are used predominantly for jewelry, gift and award engraving.

Diamonds can again be divided into two types:

- Static
- Rotary



Static diamonds are used to drag across the surface of metal. This technique is also known as 'diamond scribing'. They leave a shallow, brightly polished finish and are by far the most popular form of engraving. The diamonds are conical with smooth sides. The point makes the

impression on the metal. The angle of the cone is usually stamped on the shaft. Acute angles, such as 90° dig deeper and are, therefore, best suited to harder metals. Broader angles, such as 150°, give a wide, shallow cut ideal for soft metals, such as pewter.

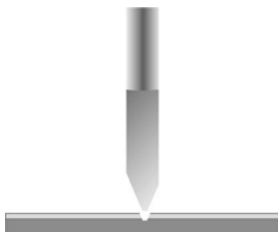
Rotary diamonds are faceted diamonds, which rub away the surface of both metal and glass. They are spun by the spindle motor. This technique is also known as 'burnishing'. The width of the tip facet is usually marked on the shaft and denotes the resulting engraving width.



Deep engraving uses a spinning cutter to 'drill' into all types of plastic, metal and wood. The cutters are either made of **High Speed Steel (HSS)** or **Tungsten Carbide**. HSS cutters are shiny silver in color and weigh less than their dull grey carbide counterparts. HSS use has become less popular. Purists prefer to use them for Stainless Steel and where extreme sharpness of the cutting edge is required. HSS cutters cost less than carbide, but will blunt more easily. Softer plastics are not easy to engrave with HSS cutters. When HSS cutters are spinning, they generate a lot of heat and melt the edge of the plastic. They are also harder to re-grind, because the heat generated 'burns' the cutter. This is easily spotted, as it discolors the cutter's tip. Burning a cutter reduces its hardness, causing it to be useless on hard metals and drastically reduces the cutter life between re-grinds. Carbide cutters come in a range of compound hardness, but a good general tool is the micrograin tungsten carbide cutter. This cutter can be ground very smoothly with a fine sharp edge. It is tough, but like all carbide, it is brittle. Working a carbide cutter too hard will chip its edges, giving poor engraving

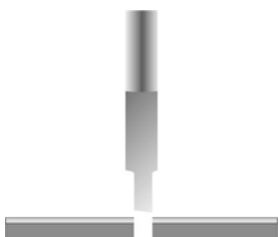
quality. However, with the right speed/depth settings, carbide cutters easily outlive HSS, are simpler to use and easier to grind.

Carbide cutters come in a variety of styles:



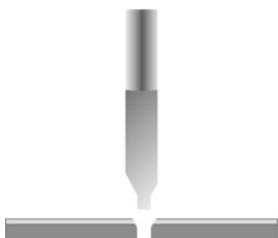
The V-bit standard cutter is the most commonly used cutter for engraving all types of plastics, metals and wood. The tip size can be ground from 0.1mm upwards. Sometimes the cutting angle is altered to

change the appearance of the cut or to improve the quality of cut on certain materials.



The parallel cutter is used to profile (cut right through) material. It gives a straight edge to the cut and is generally used for control panel engraving. Because of the lack of a taper on the tip, the parallel cutter becomes

too weak when ground too thin. Consequently, the minimum width is 1mm. Most engravers, however, would not grind a width less than 1_mm.

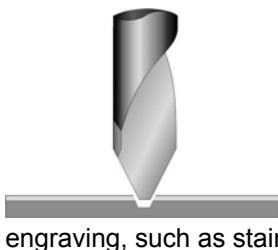


The beveller cutter is also used for profiling. It is especially useful for cutting out badges and other plates, as it provides a bevelled edge to the cut.

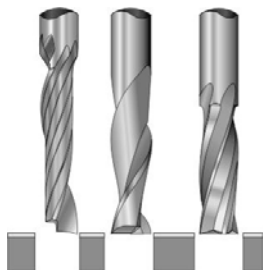


All of the above cutters are ground from the same shaft where half of the cross-section of cutter is ground away leaving a flat face. These cutters are known as half-ground D-bits (the semicircle of cutter left is D-shaped).

Other specialist cutters are now available with specific characteristics that increase their durability or increase their engraving speed:



The spiral flute cutter has all the cut characteristics of a V-bit standard cutter, but because it is spirally ground, (like a standard drill bit) they are much stronger. It is ideally suited for hard engraving, such as stainless steel.



Router mills are available with varying numbers of flutes or cutting edges. Like the spiral flute cutter, they have greater strength and can profile cut faster than a standard parallel cutter. The resulting cut is always straight sided.

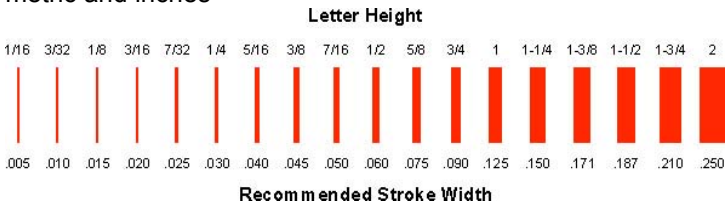
For the rest of these notes, we shall focus on the V-bit standard tools.

When engraving, the tip size of the cutter denotes the resultant width of engraving. It is just like using marker pens -- the thicker the nib, the wider the line drawn. Using a fat marker pen on small lettering is hopeless. You lose the centers of letters, such as e,a,o, etc. It is exactly the same for engraving. You must choose your cutter tip to suit the required engraving.

A simple rule of thumb is: for single line engraving, the cutter tip should be 10% of the letter height. So, for .020" or 5mm high letters, use a .020" or 0.5mm tip.

This is OK when your cutters are clearly marked, but inevitably, cutters do get mixed up, and it will be a while before your eyes can discern between a .010", .020" or .030" tips. Some will use a microscope to check cutters. Others a graduated eye glass. The quickest way to check your tip width is with an engraved scale. However, this simple guide should be close enough:

Cutters come in a wide variety of shapes and sizes ranging from 1.18" (30mm) long to 6.5" (165mm). You will also find that they are described with a mixture of metric and inches



In the Roland range, we use two sizes:

- 1/8" x 4 1/2 " for EGX-20 and EGX-300
- 11/64" x 6 1/2" for EGX-300/400/600

You'll see that the EGX-300 takes both sizes. Other collets are available for the EGX-400/600, but these sizes are industry standard, which means all styles of cutters are readily available.

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