

Introduction

To improve production efficiency, the goal isn't to work faster, but to work smarter. The smartest way to work is to eliminate all non-productive time. It's like typing. The way to type faster isn't to move your fingers quicker, but to reduce the spaces between finger movements so your fingers are moving in a constant smooth rhythm.

Attitude

Don't be discouraged about doing repetitious work, instead be encouraged because it's often what pays the bills and covers all your basic expenses so you're free to explore and experiment. Perhaps that's why much of the most innovative and creative work isn't coming from artisans that do only one of a kind work, but from small production studios. It's the production work that justifies and pays for the expensive equipment that can be used to do that unique work.

The attitude you take to your work will determine how efficiently you work. Don't let anybody denigrate your work because it's production. It's easy to do good one of a kind work. Much of the time it's just good luck that it came out well. It takes a lot more skill to repeat something than to make one. The skill required to make 10 (or 100) is much greater than that to make one. Also, doing repetitious work builds skills. Professional guitar or piano players regularly do chord and finger exercises and will practice by playing the same piece of music repeatedly. Repetitious work builds fundamental skills that will help you with everything you do.

I've always been proud of the work my studios produces. I take the greatest pride in being able to produce it at prices that a great many people are willing to buy it. It was easy to learn to make attractive work, but a lot harder to learn to make it efficiently enough to make a living selling it.

Planning

Plan ahead for what will be needed. Don't get in the middle of a job and discover that you don't have enough material to complete it. The most efficient shops are those that maintain a stock of supplies instead of just buying for each project. Finish your plan before you start the job. You can save a lot of time making mistakes by taking the time to mentally walk through the entire process before you start.

Skills

Learning to make your own patterns and jigs is probably the most important skill in improving work efficiency. When you want to make something, you can't expect to dash off to your local supplier and buy some gadget to help you. Most often, it takes less time to make what you need than to search for where to buy it. Working smart includes investing the time to learn to make your own patterns and jigs.

The way to maximize efficiency is by using the most efficient techniques. There's a time and place for different methods. The more methods you've mastered, the more likely you'll be able to draw on the specific skill that is best suited for what you're doing. For example, when cutting and fitting stained glass, to avoid using a grinder it's often more efficient to just wipe the glass edge on a carborundum stone or groze it as needed. Mastering grozing can save you considerable time. Probably the single most important skill for stained glass work is trace cutting. It eliminates the need to produce templates. However, if you're doing multiple copies of a piece, investing the time to make a template can save a lot of time. If your production will involve cutting numerous identical pieces, making wood or glass cutting guides can save even more time. To improve work efficiency, start by improving your personal skills.

Shop Set Up

A well organized shop where all materials and tools can be reached quickly is also very effective at saving time. The more time you spend reaching for or looking for something, the less time you'll be getting paid for making something. A production shop should be set up so that all work moves in a continuous line. Wherever possible, every element of work should have its own work stations. A place to cut, a place to grind, a place to foil, and a place to solder. It's more efficient to move your work to a different place then to change where you work to do something different.

And adequate sized work area is critical to working efficiently. If your work area is too small, you'll be spending too much time moving stuff around just to provide a place to work.

Tools

When you buy tools, select ones that are the most efficient and the most versatile. I think the most versatile tool in a glass shop is a miter saw. By simply changing the blade, the same tool can be used to cut wood and all metals. The little hobby saws will do the job, but a large miter saw will do the job so much better and so much faster, they save you money. The next most efficient tool would be a Wet Belt Sander. This tool can finish and resize glass edges enormously faster than any rotary grinder. Once you've become proficient with a Wet Belt Sander, you'll very rarely use a grinder.

Buying small equipment is a poor investment unless you're pretty sure it's something you'll use very little. If you expect to use a tool on a steady basis, usually the cheapest tool is the one that originally costs the most. Good tools last longer and reduce time. If all you want a kiln for is to fuse or slump a few pieces to add to your work, then a small kiln is all you'll need. But, if you hope to make and sell a quantity of kiln formed glass, you'll be smarter to buy the largest kiln you can find space and money for.

Production Methods

Huge volume production isn't necessary to improve production efficiency.

Doing as few as 10 at a time will often be 4 times as fast per piece as doing just one. Increasing production to 100 at a time will reduce the per piece time still further, but not as dramatically. Each artisan has to make their own choice as to what production volume they're comfortable with. Sometimes doing 100 can be so mind numbing you'll just end up hating what you do.

Improving production efficiency is usually as simple as completing a stage of work on a number of pieces before moving to the next stage. Instead of making 10 items by completing them one a time, do each stage on all 10. Cut out 10, grind 10, foil 10, solder 10, clean 10. You should try to do everything in the most efficient way. If you're soldering a foiled panel, instead of fluxing part then soldering, then fluxing some more then soldering – flux the entire project, then solder the entire project. Instead of using a brush to apply the flux, use a sponge. Pour out a pool of flux and use the sponge to wipe the entire project. Use the same method for applying patina.

Special Considerations

◆ **Design**

You can dramatically improve efficiency by intentionally designing for production efficiency. If you've paid attention to costing, you've learned that the number of pieces is more likely to affect costs than the size of what you make. Every piece you eliminate from a design will improve efficiency.

◆ **Labour vs material**

When you first start doing work as a hobby, you don't worry much about how long it takes to make something but instead worry about how much all the materials cost. The longer you've enjoyed this as a hobby, the more this becomes a habit. Then, if you start trying to sell your work, you have difficulty breaking this habit – but you MUST break it.

You want to be compensated for the materials you bought, but you also want to be paid for your time. Almost always, your time is worth a lot more than the materials. You now have to start thinking the opposite of the way you did as a hobbyist. You'll make the most money for your time if you try to make things that take more material but require less time.

◆ **Amateur vs pro**

There's nothing wrong with being an amateur any more than there's anything wrong with being a professional. Each has different goals and each works in different ways. Some of the very best work is done by amateurs that make stained glass as a hobby. They enjoy the luxury of time and use it to good advantage. Amateurs don't care how long it takes to complete a project, but take pleasure in doing it. They have no reason to rush and can take however long is needed. The result is often work that's superior to that done by professionals.

The pro expects to be paid for his or her time, so must learn to work quickly. It's the speed at which they work that determines how well they are paid. They know that there is a limit to what a customer is willing to pay. If you demand too high a price, the customer will refuse to buy it. If they take too long to produce that work, they'll be poorly paid for their time. It's not that either the amateur or professional is superior to the other, but that each has a different goal. The amateur might often produce better work, but takes so long it would be impossible to make a living doing it. The professional tries to produce work to a set standard and work quickly enough to produce it at a price customers are willing to pay.

The greatest difference between amateurs and professionals is not in the quality of their work, but in how long it takes them to produce it.

◆ **Quality vs cost – good enough?**

Because a professional must worry about how long it takes to produce something, they must have a clearly defined goal as to what level of quality is required. It doesn't need to be perfect, but to be done to an acceptable professional standard. The amateur doing it as a hobby will often chase an elusive goal of perfection. The problem with trying for perfection, is that it's an unreachable goal. No matter how good it was done, it could have been better. Perfectionism can easily become a compulsive obsession.

When you make something, you might ask yourself, "Who am I trying to please?" If it's for yourself, you'll probably never be satisfied with the quality and be forever unable to overlook it's imperfections. Most of us have the same problem that whenever we look at our work, we see only the flaws and the "could have done betters". If you make something as a gift for a friend or for sale, the standard is different. It should be their opinion, and not yours, that determines acceptability. If they're satisfied with it, it's good enough.

◆ **Size:**

The size of what you make is less important than the number of pieces required to make it. The most efficient way to reduce costs is to reduce the number of pieces. Plan your designs for efficient production. Also, if you decide to increase the size of something you make without increasing the number of pieces, you cost won't increase by as much as the size does. For most work, the materials cost is between 10 & 15% of your cost. The rest is labor. A larger item is usually perceived by a prospective customer as being worth more money. If you double the size, the perceived value has doubled. Your materials cost have double, but your labor hasn't. You'll have increase your selling price by a higher percentage than you've increased your costs. What could be more efficient than that?

◆ **Pre-made**

Sometimes it's cheaper to buy partly or completely made components than to make them. There are no fixed rules as to when it's better to buy than to make. You should make no assumptions but consider and compare all factors for everything you make.

◆ **Foil vs lead**

The most efficient way to do anything is the way that takes the least time. With cutting glass, that's trace cutting. For flat stained glass work, lead is almost always more efficient than foil.

◆ **Needless work**

If it doesn't need to be done, don't do it. Anything that doesn't add to the work, therefore subtracts from it. A perfect example of this is stretching lead. It does nothing to add to the work except consume time.

The same applies for putty. There are times when it should be done, but it's not universally required any more than reinforcement is universally required. Add it when it's needed. Skip it when it's not needed.

Sales

Doing one a kind work can provide personal artistic satisfaction, but won't necessarily help you sell more work. Often it'll do the opposite. If you're expecting to sell to a retailer, the last thing they want to hear is that you do one of a kind. They want to hear that if they buy something from you and it sells, they can order another one just like the one they sold. If you make 10 of an item, you don't have to offer all 10 to one shop. You can offer one to 10 different places.

Pricing Considerations

Our experience has consistently shown that however long it takes to make the first prototype, when as few as 10 at a time are done in production, the cost will drop to about 25% of that for the original prototype. We frequently have other glass artisans tell us our prices are much too low. I don't bother telling them that although we charge less than they do, I'm sure our hourly income is higher than theirs. The more efficiently you work, the more money you make. Knowing that we can expect to reduce our production time is a key factor in determining the feasibility of trying a new design. We don't select a selling price based on what it costs for the original prototype, but instead on what we expect to reduce the cost to in production.

Conclusion

It doesn't matter whether you're making fused glass earrings, slumped sushi dishes, or large stained glass panels, production efficiencies apply to everything and will reduce costs for everybody. It's important to remember that the people that buy your work are usually indifferent to how long it took you to make it. They don't care. They care only whether or not the price you ask for it is a price they're willing to pay. Efficient production methods allow you to sell at lower prices. Lower prices increase sales. The critical difference between work done by a professional and that done by an amateur, isn't quality – it's time. Professional artisans are able to work efficiently enough to be able to sell their work and make a living doing it. The more efficiently they work, the more money they make.