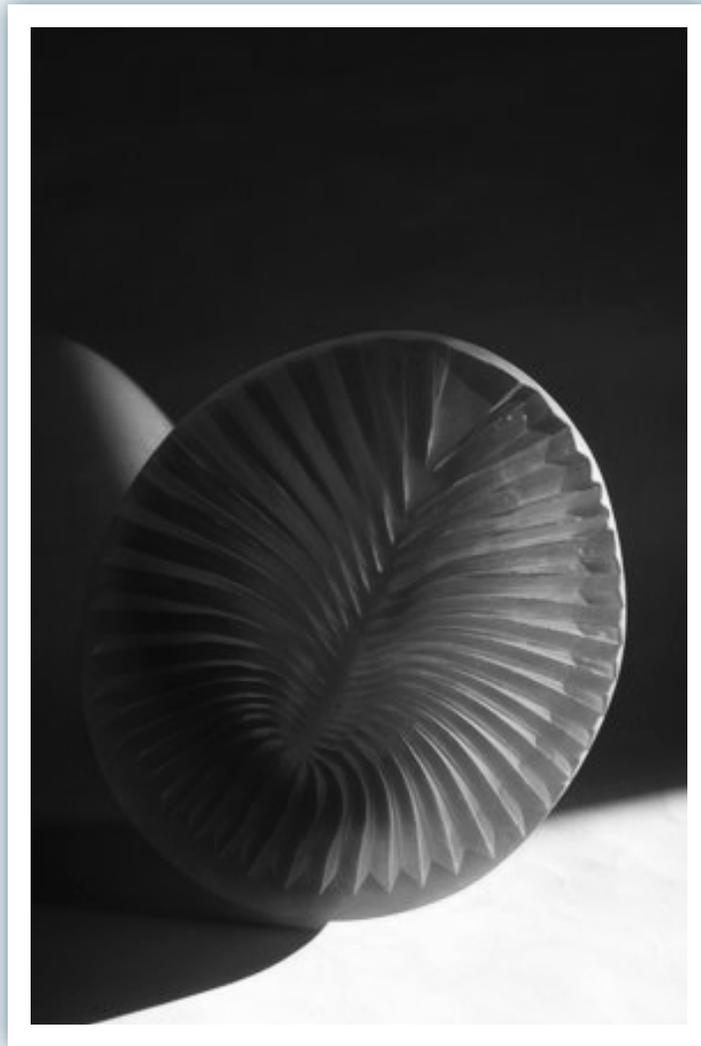




COLDWORKING

Part 3 - Using Affordable Machinery





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Follow health and safety best practice and always consult manufacturers' guides for information on specific tools and materials.

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COLDWORKING

Part 3 - Using Affordable Machinery

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Contents

| | |
|--|----|
| Health and Safety | 5 |
| Tips and Tricks | 6 |
| Using Water | 8 |
| Dremels and Flexidrive Engraving Machines | 9 |
| Power Drills | 12 |
| Saws | 12 |
| Lathes | 13 |
| Flatbed Grinders | 14 |
| Options For Larger Work | 14 |
| A Last Thought | 14 |
| Suppliers and Manufacturers | 15 |

Many coldworking jobs such as shaping, polishing, and cutting off large pieces of glass are virtually impossible without the use of machinery. The good news is that you do not have to spend a fortune to get a basic kit for coldworking pieces that are not too large in scale.

► Health and Safety



1 Essential safety equipment

No discussion of coldworking would be complete without mentioning health and safety. At the very least you should equip yourself with the following:

rubber or plastic apron, safety glasses, ear defenders, safety visor, sturdy waterproof gloves and a dust mask. The dust mask must have a filter specifically for use with fine airborne particles.

Always refer to manufacturers' instructions.

► Tips and Tricks

Machinery should not be automatically regarded as the number one solution in every situation.

Sometimes the slower, more gentle and controllable option of using hand tools is a wise choice as machines can be quick, powerful, unwieldy, and can chip, scratch, or take off more glass than you had intended.

Whatever machine you are using to coldwork, the trick is to not be too heavy handed. It is better to under, rather than over-do processes, with frequent checks as you go along to see how your work is progressing.

Never work when you are fatigued, as a moment's inattention or clumsiness can cause harm to you or your work, especially when using machinery.

Most damage is done to glasswork during coldworking, especially if you are tired or rushing.

A bright intense light source in your working area is very helpful.

Keep your work area, yourself, tools, supports, and everything that may come into contact with the glass immaculate to avoid contamination with grit.

Roll up your sleeves to prevent grit settling in the folds of clothing and be sure your apron is clean.

Always brace and cushion your work. Wood, polystyrene and foam all function as good supports as they will not scratch the glass. You can put your work in a washing up bowl with cushions of firm foam to support and hold the glass whilst you work, or braced with wedges on a wooden slatted shelf.

As in handworking with hand pads, to ensure you have adequately ground the area of glass that you are working on, mark up the surface of the glass with a permanent marker in a crisscross pattern.

When the marker has been removed completely by grinding, dry your work and inspect it, as you cannot see flaws whilst the glass is wet. Mark up any unfinished areas and regrind.

► Using Water



2 Slatted shelf sink with wooden wedges holding the glass, hosepipe water feed, Dremel with flexidrive and intense light source

Coldworking machines must be adapted for use with water to prevent clogging of the tool's working surface, and to prevent the glass from getting too hot and cracking.

In addition, water keeps the glass dust from becoming airborne, which can be a serious health hazard.

If you see a dry white powder when you are working you need to use more water. This is true with hand tools and pads as well.

If the machine you are using does not have an integral water feed you can use a shortened hosepipe connected to your tap with a support wire to introduce water where it is needed. Alternatively, use a sponge saturated in water in one hand, which you slowly squeeze over your work as you use the machines.

You can also make a drip feed by placing a large plastic container with a small plastic tube attached directly above your working area.



3 Plastic washing up bowl with foam cushioning to hold glass in place

For my own practice, I suspend my Dremel above my sink by hooking it over a substantial hook I have screwed above my working area.

I then place my work on the purpose-made slatted shelf, brace it with wedges of wood secured between the slats, and have a hosepipe drip feed attached to the taps.



5 Wooden wedges holding the glass in place

The flexible drive dremel or engraving machine should have variable speeds, and a universal collet for attaching diamond bits, slitters (saws), drill burs, felt polishing pads and polishing diamond discs which often have different shaft sizes.

My personal favourites are a large sintered bevelling bur and a 2 inch diamond slitter from HisGlassworks (USA).

They are excellent for removing flashing, shaping, signing your work, polishing small areas, and bevelling, and cutting thick glass.

DK Holdings electroflex GPS diamond 025 discs come in all the grades you will need, and they supply different profiles, firm or 'spongy'.

The sequence for grinding your glass with polishing discs is:

Green (60) for rough shaping and smoothing

Black (120) (you can skip this grade, but I find it useful)

Red (200)

Yellow (400)

You can go to higher grades, 800, 1800, 12000

Or cork with pumice (you can skip this) and then felt with cerium if you want to achieve a finer finish.

Avoid overheating and cracking your glass by making sure you don't stay in the same area too long.

Remember to bevel the edges of your work often with a hand pad of the same grade as the disc you are using to avoid chipping and scratches.

Rinse your glass thoroughly between different grades of diamond discs and after bevelling.

Protect vulnerable or finished areas with two layers of gaffer tape.

Tiranti offer a kit of about 12 different diamond burs very reasonably. Eternal Tools, B and H, and Dremel all carry a good variety of diamond burs and polishing heads.



6 Gaffer taping a polished surface to protect it

► Power Drills

To scale up to large work, use an electrical variable speed household drill or pillar drill fitted with a flexible shaft for coldworking larger areas. This allows you to use larger equivalents to bits, drums or discs to those you would use with the Dremel, for example the 50mm electroflex GPS diamond glass polishing discs and expanding rubber drums with diamond belts which DK Holdings supply.

A useful tip for the GPS set up is to use a separate mandrel (adaptor) for each grade of disc for any Velcro fittings. This is because the Velcro loses its holding power if discs are changed often.

► Saws



7 Tile cutting machine from DIY store

A cheap table top tile saw from your local DIY (£100 or less) with a diamond blade and a water reservoir makes a handy saw. You can purchase a thin diamond blade from DK Holdings to fit to the saw, which is much more effective and chips glass far less than the one fitted to the tile saw. It is very easy to change the blades.

Nearly all saw blades chip the glass, so keep this in mind as you choose where to cut your glass, preferably cutting a bit further away from the body of your work than where you eventually wish the cut to be.

Bevelling the edges of the glass after cutting often takes care of small chips, and will give a better edge to your finished piece.

► Lathes



8 Wood lathe with cork and brush attachments

Adapt a wood lathe for light use with a cork wheel, a brush with pumice, or a felt wheel with cerium by adding a water feed to polish up your work. You can also use drums with diamond belts or Polpur wheels.

Take care when adapting for use with a water feed (as with all electrical machines) to protect all machinery from water and moisture.

► Flatbed Grinders

An electric pottery wheel, if it has a steel or iron bed, can be adapted as a flatbed grinder for flattening, grinding, and polishing. An engineer can make you a larger iron bed to adapt for more flexible use for larger work.

Add a water feed, magnetised diamond discs, polishing discs, cork disc, felt pad/cerium and you can get from rough shaping to a fine polish. This comes at a price if you are using magnetised diamond discs from HisGlassworks as the diamond discs are very expensive.

You can do without the diamond discs and substitute aluminium oxide or silicone carbide grits. I tend to use only 80-100 grit aluminium oxide on my flatbed grinder, just to flatten my work quickly and efficiently, then utilise other methods to finish the work. I feel the risk of contamination from previous grits if using a variety of grits on the same flatbed would be very high.

► Options For Larger Work

For larger polishing and grinding jobs you can consider buying the Flex Electica 110v wet polisher machine. However, this machine is large and heavy.

I prefer pneumatic options such as the Quick Q-6R, which is much smaller and can be held in one hand, but the downside is that you will need a compressor.

► A Last Thought

Do not take this book as gospel, but as a guide only. There are many ways of coldworking, which you can adapt to your unique way of working, depending on the work you produce.

These methods have been developed by long and hard experimentation by many glass artists to solve the problems of giving their work the finish they wish to achieve.

Experiment with your own solutions. Don't feel that a perfect polished finish is always the best finish for every piece.

What is important is that the finish you choose should enhance and be the right look for your piece, and that the finish should be as well done and professional as possible.

► Suppliers and Manufacturers

USA

His Glassworks
www.hisglassworks.com

Czech Republic

Polpur
<http://en.polpur.cz>

UK

DK Holdings
www.dk-holdings.co.uk

Eternal Tools
www.eternaltools.com

Glassworks Services Limited
www.glassworksservices.co.uk

B and H Services
bandhservices@hotmail.co.uk

Creative Glass
www.creativeglass.co.uk

Creative Glass Guild
www.creativeglassguild.co.uk

Warm Glass
www.warm-glass.co.uk

Studio Glass Supplies
www.studioglasssupplies.co.uk

Glass artist Jacque Pavlosky welcomes glass artists to share her kiln formed glass facilities in her purpose built glass studio in rural Buckinghamshire. www.jacquepavlosky.com