HERITAGE CRAFTS

MASTERCRAFT
SKILLS TRANSMISSION

Metal Polishing: tools, materials and techniques

A companion guide to the Mastercraft Skills Transmission film with master craftsperson Stephen M Goldsmith

This guide goes with our film on metal polishing, made with master polisher Stephen M Goldsmith and Freya Bletsoe, a jeweller and polisher who learned from Stephen through a Heritage Crafts training bursary. It lists the tools and materials you see in the film, explains the main terms, summarises Stephen's three-stage method and key tips, and points you to the film's main moments, courses, bursaries and the Red List. **This guide is a starting point, not a substitute for in-person training.** As Stephen says, you do not learn polishing in five minutes: it takes a lot of practice, and some things you simply learn by doing.

> **Before you start**
> Polishing machines are dangerous. Mops and felts can snatch a piece out of your hands, edges can be "lethal", and pieces and tools get hot. Learn on a machine with proper training and supervision first. See the safety notes at the end of this guide.

About the craft

Polishing, also called artistic polishing, is the craft of bringing metalwork to a perfect finish. In the film, Stephen polishes silver, gilding metal, copper and gold pieces, from rings to large bowls and trophies. His method has three stages: removing marks, creating the shine, and finishing. He stresses that the foundation matters most: if scratches are not removed early on, the later stages will not remove them.

Polishing is classified under the Silversmithing Allied Trades (skilled trades & manufacture) listing on the Red List.

Red List status: Endangered

The three stages at a glance

Stage	Purpose	In the film
By hand first	Remove deeper scratches and marks	A water of Ayre stone with plenty of water, worked across the lines (not along them) until the scratches are gone.
Stage 1	Cut: get rid of file marks, buff stick marks and fire stain	Brushing emery compound on a brush at an angle to the existing lines. It should cut and look dull, not shiny.
Stage 2	Make the shine	A mop with an all-rounder compound such as the blue bar Menzerna 164, used little and often. Remove any remaining scratches.
Stage 3	Finish: an extra shine, with no cutting	Rouge or a finishing compound (Menzerna 175- M5 on a soft mop. It will not remove scratches, so they must be gone before this stage.

Key terms

Term	Meaning
Compound	An abrasive or polishing bar or paste applied to a mop, brush or felt. Different compounds cut or polish in different ways.
Cut	How much metal a compound removes. Stage 1 compounds cut; finishing compounds have no cut.
Mop	A calico wheel on the lathe machine spindle that carries the compound. Mops come in many sizes and softness's.
Raking a mop	Breaking up a new mop or one that has compacted together with a rake so it becomes fluffy and takes the compound more easily.
Felt	A compressed wool tool used instead of a mop for edges and flat surfaces. Felts can be cut to the shape of the work, with a sharp chisel or lump pumice .
Spindle	The shaft on the machine that holds the mop. Keep an eye on where it is and how far it comes out the other side.

Term	Meaning
Firescale and Firestain	**Firestain – Understanding the Removal Process** This is one of two types of oxide common when heating precious metal and is known as “firescale”. firescale is a surface layer, is not permanent and is easily removed. The second type of oxide is most common in sterling silver as this is a more permeable metal which allows oxygen to penetrate deeper into its surface. The oxidised copper atoms here leave a permanent red / purple tarnish or “firestain” within the metal. Unlike fire scale, firestain is subtle in colour and is only truly noticeable when seen next to untarnished metal. A technical distinction worth keeping: Pickling can remove surface copper oxides, but it does not necessarily remove deeper firestain. That requires removing the affected metal mechanically. The amount depends on the depth of the firestain, so avoiding excessive metal removal is important. Firestain occurs when sterling silver is heated during soldering or other hot-working processes. The copper in the alloy oxidises, and copper oxides can penetrate below the surface, creating a grey, purple or dark stain. **Stage 1 – Remove the Firestain** Using the correct abrasive and polishing sequence, remove sufficient metal to eliminate the Firestain. Simply brightening the surface will not necessarily remove it, as the affected area can extend below the surface. Once the Firestain has been completely removed, the clean silver beneath can be revealed.
Lapping	Polishing with the side of a felt rather than its face, to avoid wearing a groove.
Thrumming	Polishing by hand with a cord loaded with compound, for tight spots a mop cannot reach.
Gilding metal	A copper and zinc alloy used for practice and with the same personality or feel as silver when being polished.

Tools and materials

Everything below is taken from the film. Product names are as spoken in the film; suppliers and prices are not given. See “Where to buy” at the end of this section.

1. Practice metal and hand tools

Item	What it is for	Notes from the film
Gilding metal (a copper and zinc alloy)	Learning and practice	Same “personality” as silver when polishing. Stephen was trained on it before being allowed on silver.
A water of Ayr stone, used with plenty of water	Removing deeper scratches before the machine	Work across the existing lines, using your weight. Lines in the direction you are working will not come out. [Confirm the type of stone.]
A pumice block	Warming a felt	Used to heat a felt so that it picks up compound.

2. Machine and set-up

Item	What it is for	Notes from the film
A polishing machine with a spindle	Driving brushes, mops and felts	Stephen runs it at just under 3,000 rpm for silver, and slower (about 2,000) for brushing with Vienna lime. Too slow and the metal will not polish due to a lack of heat and force.
Brushes (bristle, goat's hair, horsehair)	Brushing emery at stage 1; gentler work on detail	Goat's hair is a lighter touch. A worn "stubby" brush gives more control on texture than a new one. A horsehair brush is used by hand on antiques.
Mops of different sizes and softness's	Stage 2 and 3 polishing	A soft calico mop folds in as you go into a bowl. A "flyaway" mop can polish inside a narrow opening. A firmer mop will try to take the work out of your hands.
A rake and a blade	Preparing a mop	Rake a new mop so it becomes fluffy and holds compound. Nip off any long ends with a blade, because flyaway strands scratch the metal.
Felts, including a ring felt	Edges, flat surfaces, rings	Traditionally one felt per shape. A ring felt with a wood core stays steady on the spindle and can act as a jig.
A clean workspace and good light	Dust free	Keep checking the surface for scratches.

3. Compounds

Compound	Used for	Notes from the film
Brushing emery	Stage 1: removing marks and fire stain	Emery powder with vegetable oil. Add more when the surface goes shiny, because it is no longer cutting. If the brush looks fluffy, press harder.
Pumice bar	Heavy cutting	An aggressive pumice powder in a bar.
Tripoli (brown bar)	Rough surfaces with file marks; crisping edges	Softer than the blue bar. Warmed felt soaks it up.
Menzerna 164	Stage 2: the all-rounder	Use a little dab, little and often. Too much makes a greasy mop.
Vienna lime and water	Silver polish; degreasing; removing tarnish	Crushed chalk (calcium carbonate). Mix with water to a yoghurt consistency. It will not scratch. Apply with a brush and work quickly before it dries.
Rouge (Burns rouge)	Stage 3: finishing	Keep the bar in cotton wool soaked in paraffin and touch it lightly to the mop. Not used on antiques, because it makes them too bright.

Compound	Used for	Notes from the film
Menzerna 175 (yellow bar)	Finishing yellow metals such as gold and brass	Abrasive-free. Stephen uses the same mop for rouge and Menzerna 175.
Menzerna M5 (“ultra finish”)	Final, brightest finish	No cut at all, so it cannot remove a scratch. Stephen counts rouge as 8, Menzerna 175 as 9 and M5 as 10 on his scale of no-cut compounds.

4. Hand polishing and burnishing

Item	What it is for	Notes from the film
Thrumming cord, or gardener’s string	Reaching tight corners by hand	Normally waxed. Use one cord for each compound. Keep it moving around the piece to avoid wearing a groove. Needs a lot of pressure and takes about 30 seconds.
A burnisher with a hematite tip	Shining an edge without removing metal	Press very hard on a firm surface. Hematite is a hard black stone. Stephen’s burnisher is at least 100 years old and traditionally used with beer
Pleated cotton wool	Polishing the inside of a ring	Part it in the middle, where it is cleanest. Spin it onto the spindle.

Where to buy

[Add suppliers for compounds, mops, felts, brushes, thrumming cord and burnishers, once confirmed with Stephen Goldsmith.]

Polishing Tools, Equipment and Resources

Over the years, people often ask me where I source my polishing tools, mops and compounds. So, for Heritage Crafts, I’ve put together a list of companies that I have found useful throughout my journey as a professional gold polisher.

Although these suppliers might seem like a bit of a random collection, there is a reason for that: they are companies that have supported my journey, helped me discover tools and materials, and contributed to the knowledge I pass on to my students.

This is **my personal resource list**, not a ranking of suppliers or an endorsement of every product they sell. Prices, ranges and suitability vary, so do your homework and choose what works for your workshop and the finish you want to achieve.

UK Suppliers

Betts Metal Sales – Polishing Equipment and Extraction

bettsmetalsales.com

Betts Metal Sales supplies tools and equipment for professional jewellers, goldsmiths and silversmiths.

Their polishing and extraction range includes polishing machines, motors, mops, compounds, dust extraction equipment and accessories.

For those setting up or upgrading a workshop, Betts is a useful resource for exploring polishing machinery and extraction solutions.

Remember: a professional polishing setup is about more than achieving a brilliant finish. Suitable machinery, effective dust extraction and appropriate personal protective equipment are essential considerations for a safe workshop.

Cooksongold – Jewellery Tools and Polishing Supplies

cooksongold.com

Cooksongold is a useful resource for jewellers, silversmiths, apprentices and students looking to source jewellery-making tools, equipment and finishing materials.

Their range covers polishing equipment, mops, compounds, abrasives and a wide variety of workshop essentials.

Whether you are setting up your first bench or replenishing supplies in an established workshop, it is a useful starting point for exploring the tools available.

Cousins UK – Jewellery Tools, Polishing and Finishing Supplies

cousinsuk.com

Cousins UK offers a broad catalogue of tools, equipment and consumables for jewellers, goldsmiths, silversmiths and watchmakers.

Their range includes polishing mops and wheels, abrasive papers and films, polishing compounds, finishing tools and workshop equipment.

It is worth exploring when you need to compare different products and source everyday workshop consumables.

H.S. Walsh – My Recommended Starting Point

H.S. Walsh – Gold Polishing Guru search

For anyone wanting to discover the tools I use and recommend, **this is one of the most useful places to start**.

H.S. Walsh has supported my students, and its website is a great starting point for exploring my favourite tools and discovering the products I use in my teaching.

It might not always be the cheapest option, but price isn't the only consideration when you are trying to find the right tool for a particular job. Knowing what to look for can save you money, time and frustration in the long run.

If you are one of my students, or simply want to understand my approach to polishing, have a look at the products listed under my Guru search.

Kernowcraft – Tools and Supplies for Jewellers and Silversmiths

kernowcraft.com

Kernowcraft supplies tools and materials for jewellery makers and silversmiths, catering for beginners, hobbyists, students and professional makers.

Their range includes hand tools, files, abrasives, bench equipment and other jewellery-making essentials.

It is a useful resource for those starting out, building up their workshop equipment or looking for general jewellery-making supplies.

Moleroda – Specialist Polishing Mops and Abrasives

moleroda.com

For the serious trade polisher!

Moleroda manufactures polishing mops here in the UK, including calico mops, and supplies a wide range of products for polishing and surface finishing.

Choosing the right mop and compound is an important part of the polishing process. Different stages require different approaches, and trying to achieve everything with one mop is not the answer.

Polishing by numbers: get each stage right, and the shine will follow.

Polishing Jewellery – Specialist Tools for Jewellery Finishing

polishingjewellery.co.uk

Polishing Jewellery is a specialist online resource from Moleroda, with products for jewellery making, polishing and finishing.

The range includes polishing mops, mounted abrasives, radial discs, felt tools, polishing compounds, micromotors, bench polishers and workshop accessories.

It caters for a range of experience levels, from hobbyists and students to professional jewellers.

It is particularly useful for exploring different tools and consumables for surface preparation and finishing. Polishing Jewellery and Moleroda are related resources, rather than two entirely separate manufacturers.

The Polishing Shop – Compounds and Calico Mops for Starting Out

Menzerna Mini Bars and Calico Mops

If you are just starting to learn polishing, buying large bars of compound and a full selection of mops can become expensive.

The Polishing Shop offers smaller Menzerna sample bars of polishing compound, alongside calico mops. These smaller bars are a practical way to try different compounds without immediately investing in larger quantities.

For students and small workshops, this can be a useful way to begin exploring the materials needed for the different stages of polishing.

My advice is always to understand what each compound and mop is intended to do before buying a whole collection.

SAIC UK – Industrial Abrasives and Surface Finishing

saic-uk.co.uk

SAIC supplies industrial abrasives, tooling and finishing products. Its range includes sanding abrasives, mounted points, polishing products, surface-conditioning discs, abrasive belts and specialist power tools.

Although it is not exclusively a jewellery supplier, it is worth exploring for professional goldsmiths, silversmiths and other craftspeople looking for specialist abrasive solutions.

Technical advice can also help when selecting suitable products for particular materials and finishing applications.

USA Suppliers

Gesswein – Precision Polishing and Finishing Tools

gesswein.com

Gesswein is a specialist supplier of precision tools and equipment for jewellery manufacturing, metal finishing and industrial applications.

Its range includes polishing mops and buffs, compounds, mounted points, abrasive stones, rubber abrasives, micromotors, polishing machines and dust extraction equipment.

It is a useful resource for professional jewellers, silversmiths and students seeking specialist tools for precision work and detailed finishing.

Rio Grande – Polishing and Finishing Supplies

Polishing and Finishing Tools – Rio Grande

Rio Grande is a major US supplier serving professional jewellers, goldsmiths, silversmiths, students and jewellery-making businesses.

Its extensive catalogue includes polishing buffs, compounds, abrasive wheels and discs, finishing papers, polishing motors, mass-finishing equipment and other workshop supplies.

For Heritage Crafts readers in the United States, Rio Grande is a useful starting point for sourcing polishing tools and consumables, from everyday bench supplies to specialist finishing equipment.

A Final Word from the Gold Polishing Guru

These suppliers offer a starting point, but buying the tools is only part of the story.

Good polishing begins with preparation. You need to understand the surface, choose the correct abrasive, follow the stages in sequence and know when to move on to the next one.

I have spent a lifetime learning this craft, and one of my biggest motivations now is helping the next generation understand it properly.

The right tools help, but knowledge, patience and practice are what make the difference.

Keep polishing, keep learning, and keep the craft alive!

Stephen M. Goldsmith
Gold Polishing Guru

Stephen's Key Tips for Polishing

Gold Polishing Guru — practical advice from a lifetime at the polishing bench

1. Get the foundation right

Stage 1 is the foundation of the entire polishing process. If you leave a scratch at this stage, you will struggle to remove it later. Stage 3 is for refining the finish, not correcting mistakes left behind.

2. Change direction between stages

Work across the scratches left by the previous stage, changing direction at an angle. This makes it easier to see whether the previous scratches have been removed. Following the same lines simply risks polishing along them rather than removing them.

3. Let Stage 1 cut

Stage 1 should leave a dull, even surface, not a shiny one. If the surface becomes shiny when it should still be cutting, check that you have enough compound on the mop. If the mop starts to fluff or the surface is not cutting as expected, review your pressure and technique. Keep the workpiece moving and supported evenly to avoid creating hollows.

4. Let the machine do the work

Work steadily, using controlled pressure rather than forcing the piece against the mop. Pay attention to the heat building up in both the workpiece and the tool. A little warmth can help the compound work effectively, but avoid excessive heat, particularly on delicate pieces or near soldered joints.

5. Use compound little and often

More compound does not mean a better finish. An overloaded, greasy mop will not work efficiently. Dress a new mop appropriately, apply compound sparingly and regularly, and trim stray threads where necessary, with the machine safely stopped.

6. Never be afraid to go back

If you discover a groove, scratch or low spot after polishing, return to the appropriate abrasive stage and correct it. Do not keep polishing in the hope that the defect will disappear.

You cannot outrun a groove!

7. Work the edges and corners carefully

Deal with corners and edges first, then work across the main surface, much as you would when painting. Keep the piece under control and be aware of the direction of rotation and the risk of snagging. Always keep your fingers clear of the spindle and follow safe polishing practice.

8. Use a light touch for the final finish

The finishing stage needs a lighter touch than many people expect. You are refining the surface, not trying to remove significant amounts of metal. Stephen spent approximately a year of his apprenticeship concentrating on finishing alone. That tells you just how important this skill is.

9. Crisp the edge after polishing

A carefully finished edge can transform the appearance of a piece. Using a suitable felt tool at the correct angle can help restore a crisp edge after polishing, without

introducing unwanted lines. Choose the tool and method to suit the work, and take particular care around delicate details.

10. Match the method to the piece

Not every object should go through the same polishing sequence. Delicate, engraved or textured work may require a gentler approach, avoiding aggressive early-stage polishing. Small, worn brushes, goat's hair and Vienna lime can help clean and highlight detail while preserving the surrounding surface.

11. Respect antiques and their history

An antique does not need to look newly made. Over-polishing can destroy patina, soften detail and remove evidence of age and craftsmanship.

For appropriate historic pieces, Stephen avoids rouge, chooses a gentler compound and finishes by hand with a horsehair brush. The aim is to respect the object, not erase its history. Always assess the material, condition and conservation needs before treatment.

12. Work inside first, then outside

Where the design and construction allow, work on the internal areas first, beginning with the centre where appropriate, before moving to the exterior. This helps you inspect and correct any marks or bruises created during the process before completing the more visible surfaces.

13. Practise on gilding metal

You do not need to learn every technique on precious metal. Gilding metal provides a useful practice material for developing control, understanding abrasives and learning how different mops and compounds behave.

Be patient. Polishing is a skill developed through repetition, observation and touch. As Stephen often reminds his students, another twenty pieces can make a real difference.

Keep practising, trust the process, and learn to read the surface.

Stephen M. Goldsmith — Gold Polishing Guru

Key moments in the film

Timestamps are minutes and seconds, or hours, minutes and seconds. [Check against the final edited film before publishing.]

Time	What happens
00:33	Meet Stephen M Goldsmith and Freya Bledsoe

Time	What happens
02:12	Removing scratches by hand with a stone, working across the lines
04:22	Why Stephen practises on gilding metal
05:07	The three stages, and stage 1 with brushing emery
09:11	Vienna lime
09:47	Raking a mop
10:35	Stage 2 with the blue compound
13:35	Going back: grooves must be removed first
14:11	What stage 3 does and does not do
16:44	Finishing with rouge, and doing corners first
18:57	Menzerna 175 for the ultimate finish
20:58	Warming a felt and crisping the edge
24:46	Stephen's apprenticeship at C J Vander
25:31	Polishing a Tudor Rose dish he first polished in 1971
31:45	Antiques: keeping the patina
33:32	How few master polishers remain
34:05	A detailed, textured piece: bringing out the pattern
36:17	Using a worn "stubby" brush
37:49	Menzerna M5, and the scale of finishing compounds
39:35	Vienna lime paste, and the 3D effect
42:29	A flyaway mop for narrow openings
48:52	Polishing a ring with M5
50:57	The ring felt as a jig
56:37	Lapping the edge of a felt
1:00:46	Thrumming cord for tight corners
1:03:56	Burnishing with hematite
1:05:31	Polishing a spun copper bowl against the lines
1:08:20	Stephen's rules: inside first, centre first
1:14:38	Soft mops for the inside of a bowl
1:17:28	Closing reflections on looking after the skill

Safety and good practice

Please Read: Polishing Safety

A polishing machine can be dangerous if used incorrectly. Please read these precautions before using the equipment.

- **Risk of being snatched:** A spinning mop or felt can catch a workpiece and pull it from your hands, potentially throwing it with considerable force. Hold the work securely, keep your fingers clear of the spindle, and take particular care with edges, rings and small or awkwardly shaped pieces.
- **Heat:** Workpieces, mops, felts and compounds can become hot during polishing. A ring may become too hot to hold comfortably. Use an appropriate ring-holding tool, such as a ring felt mounted on a stick, where suitable, and allow hot items to cool safely.
- **Dust and fibres:** Polishing generates fine dust and airborne fibres. Use suitable dust extraction and appropriate eye and respiratory protection. Tie back long hair, secure loose clothing and remove hanging jewellery before operating machinery.
- **Chemicals and flammable materials:** Paraffin is flammable, and polishing compounds and cleaning products may present additional hazards. Read and follow the relevant safety data sheets and manufacturers' instructions. Keep flammable materials away from ignition sources.
- **Training and supervision:** Learn to operate polishing machinery through appropriate training and supervision. Follow the machine manufacturer's instructions and use suitable guards and protective equipment.

This guide accompanies the Heritage Crafts film and summarises Stephen Goldsmith's practical advice. It is intended for educational purposes and does not replace appropriate training, risk assessment, manufacturer instructions or professional safety advice.

Please work safely and never take unnecessary risks at the polishing bench.

Heritage Crafts to confirm this wording with Stephen Goldsmith before publication.

Take the next step

Watch and learn

- Watch the film: [add film link]

Courses

- Sappho Rocks in Essex occasionally runs courses on polishing with Stephen
- Goldsmiths' Centre – Skills Training Programmes
- Workshop 925 https://www.workshop925.com
- Siop iard Caernarfon https://www.siopiard.com

Bursaries and funding

- Heritage Crafts training bursaries: heritagecrafts.org.uk/opportunities/training-bursaries
- Endangered Crafts Fund: heritagecrafts.org.uk/ecf
- matchMAKER jobs and training: heritagecrafts.org.uk/matchmaker

The Red List

- Polishing on the Red List: heritagecrafts.org.uk/craft/silversmithing-allied-trades-skilled-trades-manufacture/
- The Red List of Endangered Crafts: heritagecrafts.org.uk/skills/redlist
- Browse all crafts: heritagecrafts.org.uk/skills/crafts

Credits

Produced, directed and edited by Dylan Howitt

Featuring Stephen M Goldsmith with Freya Bletsoe

Production coordinator - Finn Arschavir

Camera operators - Simon Mitchell, Dylan Howitt

Original music composed by Alex Munslow

Title sequence featuring Nick Hand

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