

LatheCity

Safely Working with Benchtop Systems – Booklet IV

Artwork Projects on Your Tabletop Lathe & Mill

by Uwe Burghaus

www.LatheCity.com

LatheCity
Safely Working with Benchtop Systems – Booklet IV
Booklet 4 – Artwork Projects on Your Tabletop Lathe & Mill

ISBN-13: 978-0-9851360-6-2

ISBN-10: 0985136065

Publisher and author:

Dr. Uwe Burghaus (LatheCity)

4465 47th St S

Fargo, ND 58104

USA

www.LatheCity.com

sales@lathecity.com

Copyright © 2012 Uwe Burghaus, Fargo, North Dakota, USA

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means except as permitted by the United States Copyright Act, without prior written permission of the author. Drawings are included for private and non-commercial use only.

Disclaimer

The book has been written carefully and all projects and procedures have been tested thoroughly. However, as always, the author and publisher cannot guarantee that the procedures are perfect and without any mistakes. In addition, it is impossible to predict and prevent all the possible problems someone may possibly run into when working with a lathe or lathe. **Using a power tool can be dangerous and the proper use is the responsibility of the one who is using the tool. Neither the author nor publisher shall be liable for damage arising herefrom.** If you are not perfectly comfortable with working with power tools, then don't do it! In this case, take a metal working class rather than following a do-it-yourself outline. Or, find a different hobby. I cannot jump in if you make a mistake which results in harming yourself or damaging the tools you use. Don't use half broken or damaged tools, perhaps purchased for cheap at a secondhand store or who knows where. This would be overwhelming to handle in the beginning. Thoughtful work will be your responsibility.

The author makes no representations or warranties with respect to the accuracy or completeness of the contents.

The author is not a professional machinist or engineer. He is a hobby machinist as you probably are. In fact, the author holds a PhD in physics and teaches physical chemistry at a college. Therefore, **no information provided herein represents professional advice or best practices in machining. All information is provided to help hobbyists and other non-professionals gain a better understanding of using a miniature benchtop (tabletop) lathe and mill for hobby type work.**

This book features in particular the Sherline metal shop. However, none of the statements or procedures may coincide with Sherline Inc.'s opinion or interests.

The author is not an employee of, or agent for any of the vendors referenced in the text and does not sell or represent any of the third party products discussed.

Web addresses are given without any warranty or guarantee, web sites may be infected by a computer virus and/or may not provide the best service. Web sites and their content may have changed between the time the author described them in this book and when this book is read. Neither the author nor publisher shall be liable for damage arising herefrom.

You will perform all operations herein described at your own risk in any regard. This disclaimer information is given on our website and it is available before and without purchasing any of our products.

Booklet 4

Brief introductory note

This booklet of the LatheCity book series outlines briefly standard machining techniques on a metal lathe and mill. The object is to introduce these tools to reader interested in artwork project which may not necessarily have prior skills in the use of these metal working techniques. However, this booklet is not a detailed metal working tutorial. The newcomer will see what can be done with these tools and may become interested to start learning machining. Guidance is offered in regard of selecting the right lathe and mill for such works. For the expert, the outline of machining techniques may be sufficient to refresh prior knowledge. The booklet includes a section about materials used for jewelry and miniature machining as well as tips and tricks. In addition, a large number of technical drawings and photos together with short descriptions about how to machine these pieces are included. My perspective is the one of a hobby machinist and not of an artist. One may just browse through this book rather than reading it Chapter by Chapter.

Featured, in particular, are the Sherline lathes and mills. However, basic lathe /mill operations are very similar on all tabletop systems. Differences among lathes are evident when it comes to thread cutting or taper turning, as briefly discussed in this booklet. Nearly all tabletop mills are column type vertical mills in their design similar to a drill press.

If you did read a LatheCity book before, you may recognize a few text sections and images. Yes, I did use revised “old” images and “old” text sections. However, reader who are interested in self-made artwork and purchase this “artwork machining cook book” unlikely have all LatheCity books on the shelf. Therefore, I thought that rewriting basically the same story again would not be very efficient and ultimately would just increase the price of this book. Basic notes about lathe/mill work are simply the same independent of whether you machine an engineering work piece or an earring. However, this text is assembled and tuned for readers who are particularly interested in self-made artwork such as lathe/mill jewelry and miniatures.

I would not like to guide you in the wrong direction with this booklet, therefore, a word of caution. (You can download a free pre-view which includes these notes.)

I hope your intention is NOT to startup a small artwork business of some kind; an online jewelry store. Very popular! Don't. I did try. This doesn't work. Earrings and artwork stuff sells badly online. It doesn't matter if you are an artist with a nice degree or not, in my opinion. The only guys making money in this genre, in my opinion, are those who sell over-priced artwork supply with sometimes the underlining wink in the eye that you could possibly make millions with artwork. You won't, I promise, unless you are a new Rembrandt or da Vinci. You can easily find thousands of quite cool looking e.g. earrings at various on-line stores, often sold for a dollar the pair. Christmas markets or boutiques may work somewhat better, "playing the local artist" ..., but the competition is brutal, also in this area. LatheCity makes money with engineering and information products. We never made any significant penny with artwork – I am afraid, that's not just me ... I hope your object of reading this book is rather the joy of creative work and perhaps curiosity to learn handling new tools. Making pieces for yourself or a friend: that will work. With a little effort you can learn how to use a tabletop lathe and milling machine. Have fun.

Pictograms used in the LatheCity books



Object of a given Chapter / brief introduction.
Start of a project.



Internet addresses of potentially useful sites.
However, web sites may be infected by computer viruses. Use them at your own risk.



Safety notes. It is not my intention to bother you and this book is meant for adults, not for children. Therefore, it's your decision whether you read the safety notes or not. However, don't blame me if you did not take the few minutes to do this and end up in hospital. **All procedures are performed at your own risk.**



Engineering terms or topics are described here. You may skip these if you are only interested in the operation of the tool. Remember, though, that knowledge also always provides protection (safety), if you know what you are doing... right.



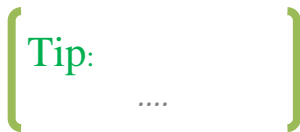
Projects: engineering / artwork projects.



Comparison of lathe and mill operations. Most of us started with lathe work, i.e., these comparisons can help gaining a deeper understanding (even of lathe work).



Summary of the Chapters or subChapters.



Tips and tricks.

The idea of using pictograms is allowing for fast browsing through the book as well as making it more appealing to read. Only text is hard to digest and boring after a while.

Table of Contents

BOOKLET 4

COPYRIGHT

Disclaimer

Brief introductory note

Pictograms used in the LatheCity books

Table of contents

Abbreviations

1. Required safety notes	15
2. Standard metal lathe operation	
2.1 Basic working principle of a lathe.....	28
2.2 Basic lathe cutting tools	30
2.3 Standard lathe operations illustrated	32
3. Standard milling operations	
3.1 Work holding – clamping work safely for milling operations	37
3.2 Tool holding.....	40
3.3 Tooling for a mill.....	42
3.4 Basic operations on a mill	44
4. Notes about artwork projects on tabletop lathes and mills	
4.1 What lathe should I purchase? – understanding machinist jargon	45
4.2 What milling machine should I purchase?	51
4.3 The in the hobby sector commonly for jewelry used materials.....	57
4.4 Where to purchase materials?	68
4.5 Surface finishing	70
4.6 Jewelry and chemistry.....	73
4.7 Ear wiring for earrings	74
4.8 Selling your artwork?	76
4.9 Notes about the included drawings – how to machine the pieces.....	77
5. Drawings of artwork projects for lathe work.....	83
6. Drawings of artwork projects for mill and lathe work.....	99

About the author

Acknowledgements

Abbreviations

DRO	Digital readout
CNC	Computer Numeric Control
O.D.	Outer diameter
I.D.	Inner diameter
RH	Right-hand cutter
LH	Left-hand cutter
HSS	High-speed steel
Al	Aluminum
CAD	Computer-aided design
CAM	Computer-aided manufacturing
MSDS	Materials safety data sheet
SFM	Surface feed per minute
IPR	Inches per revolution
RPM	Revolutions per minute
BSPP	British Standard Pipe Parallel
BSPT	British Standard Pipe Taper
NC	National Coarse
NEF	National Extra Fine
NF	National Fine
NPS	National Pipe Straight
NPSF	National Pipe Straight Dryseal
NPT	National Pipe Taper
NPTF	National Pipe Taper Dryseal
NS	National Special
N/UN	Unified Inch Screw Thread



Booklet 4

1. Required safety notes



Fig. 4.1: Safety glasses. Use versions with ANSI Z87 label. ANSI is short for American National Standards Institute. Chemistry goggles, as also shown here, are not recommended for metal work, since they may block the vision too much

Please note that **initially you may be at a higher risk** than folks doing this for living since you will be on your own. Typically hobbyists do not attend safety classes or safety briefings. Therefore, at least read the following.

When it comes to safety the “**buddy system**” is essential. Actually, nobody should work alone with motor tools. This is obviously difficult to organize for a hobbyist. Therefore, you are at a higher risk and have to manage that risk yourself. However, everyone can learn how to work safely with motor tools. Otherwise I would not offer this type of textbook.

In one of the safety briefings I attended, the instructor, a professional machinist, outlined almost proudly how many accidents he had throughout his career ... well ... I still have all my fingers and would like to keep it that way. What



about you? **Therefore, READ the following general safety notes and hints about how to prepare yourself before switching on your lathe or mill. PLEASE, take this seriously it only takes 20 minutes.**

Specific safety notes for every procedure are part of every subChapter. Naturally the notes in the beginning are more extensive and become shorter towards the end of the book since I assume that you learn safe working practice along with the operation of your motor tools. (In addition, safety concerns are often similar for different procedures.) This is one of the main goals and part of the title of this hobby machinist book series: “Safe working ...”

Working at a public university myself, I have to participate regularly in safety classes and I am at present (2011) in fact the safety liaison for our chemistry department. However, again I am a hobbyist myself when it comes to metal work. I still have all 10 fingers and two eyes, but there is no legal guarantee that the following notes are complete or even correct. **Read the disclaimer note.**

- **Use safety glasses (see Fig. 4.1).** Chemistry goggles, which are also shown here, have the disadvantage that they may block your vision too much which again can generate a safety hazard. You need comfortable glasses and perfect vision. You need to look around. Glasses approved for metal would need to be closed all around the face (at the top, sides, and bottom) and in the U.S. they have the label **ANSI Z87** on them. Some versions additionally

block UV light which was interesting to me, since I also work with glass pieces, using glue hardened by a UV lamp. In any case, a UV filter is better for our eyes, I believe.

- At most safety briefings you may come across the term “**situation awareness**”, as a general strategy to reduce risks. Knocking over a leg of a storage rack when walking through a metal shop, which carries 500 pounds of steel, would not be it. Heavy footwear is unfortunately very uncommon except in an industrial setting. (We also don’t want to overdo it in a hobby shop.)
- Let someone know that you are working in your garage and/or basement. Why? First, you are setting up “a buddy system” in doing so. Second, you are making sure that nobody disturbs you at a critical moment, startling you from behind.
- Have a working phone in reach. Check if your cell phone is working properly in your basement. Where is the closest hospital/emergency room? Emergency number in the U.S. is? Right, **911**. At some locations the number may be different.
- **Make your shop kid safe.** Talk to your kids about the risks. Make sure that they do not sneak around a corner and surprise you when the lathe is running, etc. They often don’t see the difference between “playing” and “safe working practices.”
- Read the application notes and manuals that came with the tools and/or accessories before starting to use them. Learn the applications and limitations as well as the specific potential hazards of every tool.
- Don’t use a tool for a purpose it was not designed for.
- Don’t modify a tool yourself.



- Don't push a tool beyond the limits it was designed for. A mini metal lathe/mill is designed to work on small metal stock.
- Don't modify the electrical connections of your tools. Electrically ground all tools. If a tool is equipped with a three-prong plug, then it should be plugged into a three-hole receptacle. If an adapter is used to accommodate a two-prong receptacle, the adapter wire must be attached to a ground connection.
- Don't remove safety guards. Keep guards in working order. (I could tell you stories where a student did exactly that to "save time" and lost several fingers in the process. This is not a joke, but I will spare you the details. Fortunately, I was not involved in this accident, in this case, at a chemistry lab abroad ...) Don't remove safety guards. However, the little safety shields that sometimes come with a lathe/mill provide only very limited protection. Use always goggles, in any case.
- Make it a habit of checking to see that keys and adjusting wrenches are removed from the chuck before turning on any machine. In the case of a lathe, turn the spindle by hand before turning on the lathe making sure that it runs freely. Don't underestimate the power and torque generated even by a benchtop system. A key left behind in a chuck can easily fly off traveling at a significant speed for 10 ft (3 meters) or more. Full size lathes used to train students professionally are often equipped with **spring lock chuck keys (self-ejecting keys)**. These pop out of the chuck when not pushed down, i.e., it's impossible to leave them in the chuck unintentionally. Typically the chuck key would hit the instructor rather than the student running the lathe

I did read the safety notes.

I did understand them.

I did read and accept the disclaimer statement.

which may explain why this feature is eagerly installed in training metal shops. (Don't put your nose over the spindle anyhow.) In any case, just kidding I do like all instructors, safety first. Unfortunately, this type of system is typically not available for benchtop lathes, as far as I know.

- Cluttered work areas and benches are a safety hazard. This is indeed true.
- Do not use power tools in damp or wet locations. This can be an issue for garage or basement shops. Solve the problem if it exists at your location.
- Keep work area well illuminated. This is extremely important for safety issues and any proper work. Do you need new glasses?
- All visitors should be kept at a safe distance from the work area.
- Again make your workshop kid proof. Use padlocks, master switches, remove starter keys. This is of particular concern for hobby work, correct (?) I would in principle encourage you to awaken the interests of young adults for practical and creative work. Fortunately, perhaps in this case, many of them prefer to play dull computer games instead. However, teaching young adults to work with metal tools is particularly difficult and a major safety hazard for everyone involved in this process. At least don't do this in the very beginning. You must be very confident yourself, first. Make sure that they are old enough and have no access to the tools alone.
- Again, do not force tools or attachments to do a job for which they were not designed. Use the proper tool for the job.



- Avoid loose clothing, necklaces, gloves, or jewelry that could become caught in moving parts. We all know this, but taking care of it every day is another thing.
- By the same token, fluffy cloth appears to attract small cut off metal pieces like a magnet. They stick deep in the fabric and can scratch you fingers and skin.
- **Wear protective head gear to keep long hair styles away from moving parts!** If you would like to see a sad story in this regard, go to:

Internet

<http://blog.makezine.com/archive/2011/04/yale-student-killed-in-lathe-accident.html>

<http://www.nature.com/nature/journal/v472/n7343/full/472259a.html>

It takes milliseconds to pull you into the running chuck if something gets caught in the chuck. A benchtop system is safer in this regard than a full size system, I guess, but ... (A lathe running at 1600 RPM makes 26 RPsec or ~40 milli seconds for one revolution.)

- Use safety glasses i.e. goggles designed for metal work. Yes, this is on the list more than once.
- Use a face or dust mask if cutting operation is dusty.



Fig. 4.2: Full face shield with plastic foil that need to be peeled off

- When using a metal grinder you will generate **sparks**. Use a full face shield and goggles for these operations. Make sure not to have lots of cardboard boxes, gas containers for you snow blower / lawnmower, paint, solvents, etc. in your basement or garage hobby shop. The sparks generated by grinders or metal saws can ignite a fire. It may start to burn long after you left the shop ... Full

face shields often have a plastic foil on the shield which needs to be peeled off. Otherwise the shield may not be transparent (Fig. 4.2) – just a note in case you didn't realize. (I have seen students running around ...)

- Use clamps or a vise to hold work. It is much safer than using your hand and frees both hands to operate the tool. This is more of an issue for the use of a drill press, milling machine, or saws than for a lathe, but it must be included here.
- Keep your proper footing and balance at all times. Wet floor? Cable? This is dangerous.
- Keep tools sharp and clean for best and safest performance. Follow instructions for lubrication and changing accessories.
- Use only recommended accessories. Read the manual carefully and completely. Use of improper accessories may be hazardous.
- Unplug tool before servicing and when changing accessories such as blades, bits or cutters. Definitely.
- Make sure switch is "OFF" before plugging in a power cord. Double check.
- Again turn spindle by hand before switching the motor of the lathe on. This ensures that the work piece or chuck jaws will not hit the lathe bed, saddle or cross-slide, and also ensures that they clear the cutting tool.
- It is not recommended that the lathe/mill be used for grinding. The fine dust that results from the grinding operation is hard on bearings and other moving parts of your tool. For the same reason, if the lathe or any other precision tool is kept near an operating grinder, it should be kept covered when not in use. I do

This is a long list, but don't blame me if you did not read it and end up in a hospital – most likely on a weekend.

occasionally use a polishing sponge (safer than sandpaper) to polish pieces, but I don't overdo it.

- Make sure that all locking and driving attachments are tightened. However, also be careful not to over tighten these adjustments. They should be just tight enough. Over tightening may damage threads or warp parts, thereby reducing accuracy and effectiveness.
- Don't allow long stock pieces to stick out far in back of the spindle of the lathe. Long, thin stock that is unsupported and turned at high RPM can suddenly bend and loop around.
- **Wear proper safety glasses.** All folks working for living in metal shops can unfortunately tell you stories such as this one: a piece of metal hit the backside of glasses (somehow) and the reflected piece hit the eye of the machinist. They had to pull the piece out of his eye in a hospital. This is not a joke. You need safety glasses specified for metal work, even if you wear optical glasses. You need glasses fully closed at the sides, the top, and bottom. Goggles that fit over optical glasses are often not very comfortable and restrict the vision. These are better than nothing, but you can purchase goggles with optical lenses. If you work every day in your shop, then invest the money to purchase really comfortable and safe glasses. Your eyes are worth the investment.
- **This may sound as a talk to a teenage girl/boy, but ... you need proper eye protection before you switch on the lathe/mill for the first time.** Safety glasses are perhaps the most important safety feature in a metal shop. Don't start without them with any work on a lathe/mill. Any home improvement store carries them.
- Don't work when you are tired. Rushing home, having a heavy dinner and a few beers, and then going down to the basement

shop in your house ... obviously not a good idea. Don't do it. Metal work requires your full attention, even if it is a hobby.

- You may realize that the fingers of the machinist are really close to the spindle when cutting certain shapes, in particular when you eventually polish pieces. The edges of the chuck are sharp and turn at perhaps 1800 RPM. It would cause very serious injuries when hitting the rotating chuck with your fingertips. Sherline also offers a tool post for polishing (P/N 8976) which I did not, however, use myself. Polishing operations on the Sherline lathe are, by the way, not recommended by Sherline, mostly due to issues of metal dust which may end up in the motor controller box causing shorts. In addition, a dust mask is generally required for all sanding/polishing operations. Using a sanding sponge is somewhat safer than using sand paper for polishing since you can even touch the chuck with the sponge and the fingertips are still at an o.k. distance. Sanding sponges are available in any home improvement store.
- Mill cutters are not like lathe tools, they are indeed sharp. End mills are more like a knife or sharp saw blade. Thus, be careful. Recommended is typically not to touch mill cutters directly with your hands. Instead use a rag.
- Never leave a machine running while unattended.
- By the same token, if you experience a power failure switch off the machine (and/or set RPM to zero) since when power is restored the machine may start up unintentionally. Considering the rather unstable power lines in the U.S. this does indeed happen.
- If you experience unexpected and/or unusual difficulties using the machine. Stop and get advice (call customer service etc.). Don't ignore difficulties, solve the problem.

- One last thing. Please be aware of that you will carry chips (small cut off metal pieces) with you all over your house. Don't ask how – chips stick to everything, somehow. Aluminum chips are rather soft and mostly "harmless", but steel chips are sharp as razor blades. Never clean up chips with your bare fingers, never.
- This kind of list can never be complete. Read the disclaimer statement.

Milling specific

L/M

- In simple terms, lathe cutting tools cut even metal because of the pressure generated when pushing the turning tool into steel. Therefore, lathe cutters are actually not that sharp. Mill cutters work more like a saw (in simple terms): they are very sharp. Don't touch mill cutters with your bare hands, use a rag.
- The cutting tool and not the work turns on a mill. Therefore, a mill will generate metal-chip-shrapnel to a much larger extent than a lathe. This is most evident when using a so-called fly-cutter. Long sleeve shirts and safety glasses provide some protection, assuming that the sleeves don't end up in the rotating machinery.
- I did read the following in manuals which I pass along here. Feed work against the rotation direction of blades or cutters or you may pull your hands into the cut (seen in Grizzly's manuals).

CAUTION – LASER operation

A number of even hobby type tools come in the meanwhile with strong light sources or LASER pointers build in. Also LatheCity has these accessories.

- Read and obey the operation instructions from the manufacturer of the LASER pointer that came with



the LASER pointer. See the label printed on the LASER pointer and the instructions card. In addition, consider the following.

- A LASER pointer is not a toy. Keep out of reach of children and mentally handicapped people as well as pets.
- Do not stare into LASER light beam. This will cause damage to your eyes.
- Do not direct the LASER light beam towards the eyes of another person or animal.
- Remember that a LASER light beam reflected from an object will be as dangerous as the primary LASER beam.
- Remove batteries if the LASER is not in use for an extended period of time in order to prevent corrosion.
- Do not disassemble or try to repair the LASER pointer. The LASER pointer does not contain replaceable parts.
- Protect against water, dust, heat, and sunlight.
- Do not direct the LASER pointer towards the sky or streets. This can interfere with traffic, airplanes, etc.

Safety notes can also be found on various web sites, a few links are given here:

Internet

http://www.mini-lathe.com/Mini_lathe/lathe_safety.htm

<http://www.zeraware.com/>

http://www.americanmachinetools.com/how_to_use_a_lathe.htm

http://www.fricknet.com/lp/safety_posters.php?gclid=CPTW6ZfFhaYCFQTNKgodFQoIpA

Safety products can also be purchased on-line, for example, perhaps look at:

http://www.envirosafetyproducts.com/product/magnifying_safety_glasses_magnifying_safety_glasses

[ass](#)

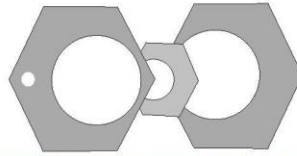
PA

Booklet 4

5. Drawings of “artwork” projects on a lathe



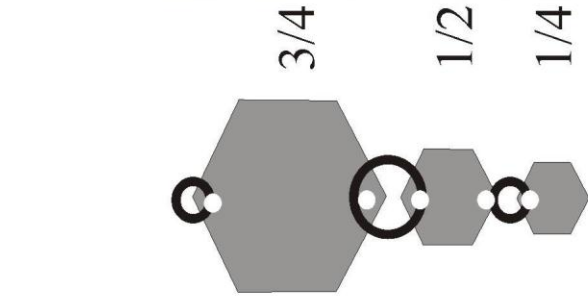
Farrings
page 1



3/4
1/2
3/4



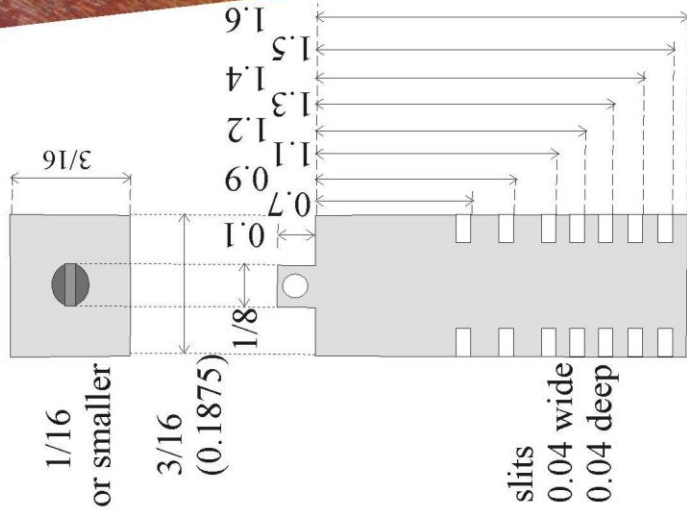
Lathe city - earrings
© U. Burghaus, 2011



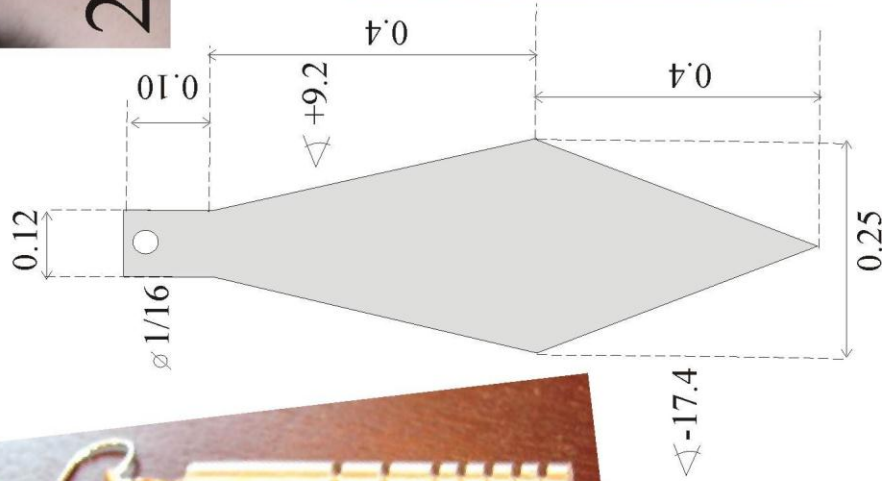
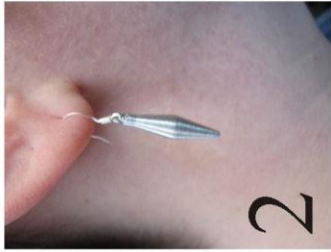
3/4
1/2
1/4



Earrings page 2



steel or brass square stock
3/16 O.D. and 2" long
RPM 600
use carbide RH cutter
polish first
work from top end



Lathe city - earrings
© U. Burghaus, 2011



Uwe Burghaus, born in West Berlin, Germany, obtained his education in Physics and Physical Chemistry at the Free University of Berlin. He obtained a PhD in 1995, after conducting his graduate studies in surface science at the Fritz-Haber Institute of the Max Planck Society in Berlin. After postdoctoral positions in Genoa (Italy) and Santa Barbara (USA), he went back to Germany to complete a habilitation/tenure in Physical Chemistry. Now at North Dakota State University, he started to establish a surface chemistry group in 2003 and obtained tenure in 2009. His group is currently focusing on studies about nanostructured

catalysts.

His hobbies include machining furniture from metal and glass. He is not a professional machinist by training. However, his hobby developed into a small part-time business in 2012. **LatheCity** currently sells books about metal working, software tools, and accessories as well as affordable jewelry: everything that's fun to make and may find customers. The strength of the business is custom-designed/customized tools.



Acknowledgements

Parts of this booklet were proofread by Scribendi (Canada) and by William D. Gardner (CA). I met Bill as a customer and got to know him somewhat via e-mail. He is also a hobby machinist and owns a small part-time business. His suggestions are highly appreciated, and the number of typos was further reduced thanks to him.

I will continue to update and improve on the texts over time. These updates will be made available to our customers as a free newsletter – assuming that one of the textbooks was purchased from LatheCity. Go to the customer’s corner and use the password provided with your purchase. We will not bother you with e-mails, but the updates can be downloaded from our website.

Writing a book about metal working typically does not improve the reputation of a scientist (some prefer not to get dirty fingers...) and chemistry college teacher. Therefore, many thanks in advance to open-minded colleagues. However, in the UK, there is apparently a “tradition” to write your own book about “gardening” – the LatheCity books would be my version of this, I guess.

Other LatheCity books are available:

Vol. 1: Basic Lathe Operations^S

Vol. 2: Working with Lathe Accessories^S

Vol. 3: Poor Man's CNC Lathe*

Vol. 4: Tabletop Milling^{S,G}

Booklet 1: Thread Cutting on a Lathe^S

Booklet 2: Working with Exotic Materials on a Lathe and Mill*

Booklet 3: Summary of Basic Metal Lathe Operations*

Booklet 4: *Artwork Projects on Benchtop Lathes and Mills**

Some project booklets/manuals are also available.

Volumes in preparation:

Vol. 5: *Learning Turning with the Harbor Freight Lathe*

Vol. 6: *The CNC Benchtop Lathe – an Introduction*^S

Booklet 5: *Using a Rotary Table on a Tabletop Mill**

^S: Featuring Sherline systems

^G: Featuring Grizzly systems

*: Model independent

For free previews go to: www.LatheCity.com

Our book products are also available at Amazon and Ebay.

Tools are also up at Ebay.

Factory direct: www.LatheCity.com (PayPal, mailed in Checks)

LatheCity is a small business registered with the North Dakota Secretary of State.

Uwe Burghaus
4465 47th St S
Fargo, ND 58104
USA
sales@lathecity.com

LatheCity

*Offers a secure shopping experience with the **PayPal** system (exactly the same e.g. E-bay uses). Be smart and avoid covering commission fees. **Why paying the middleman?***

Factory direct sales.

PayPal and your credit card company offer a seller's protection, as far as we know. LatheCity offers a 30-day-money back guarantee.

Synopsis. This booklet of the LatheCity book series outlines briefly standard machining techniques on a metal lathe and mill. The object is to introduce these tools to reader interested in artwork project which may not necessarily have prior skills in the use of these metal working techniques. However, this booklet is not a detailed metal working tutorial. The newcomer will see what can be done with these tools and may become interested to start learning machining. Some guidance is offered in regard of selecting the right lathe and mill for such works. For the expert, the outline of machining techniques may be sufficient to refresh prior knowledge. The booklet includes a section about materials used for jewelry and miniature machining as well as tips and tricks. In addition, a large number of drawings and photos together with short descriptions about how to machine these pieces are included. My perspective is the one of a hobby machinist and not of an artist. A number of pages are printed in full color.

LatheCity

Safely Working with Benchtop Lathes – Booklet IV

Booklet 4 – **Artwork Projects on Your Tabletop Lathe & Mill**

Uwe Burghaus

ISBN-13: 978-0-9851360-6-2

ISBN-10: 0985136065

Copyright © 2012 Uwe Burghaus, Fargo, North Dakota, USA

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means except as permitted by the United States Copyright Act, without prior written permission of the author. Drawings are included for private and non-commercial use only.