



**Established 1987**

**First Woodturning Club in New England, AAW #26**

**Next Meeting  
February 1, 2018  
6:30 PM**

**Learn N Turn  
Rick Angus**

**Demonstration  
Frank White  
Hollow forms**

### *President's Message March, 2017*

Presidents Message



2018 has gotten off to a slow start for the Central New England Woodturners due to the blizzard that forced the cancellation of the January 4<sup>th</sup> meeting. The Learn and Turn demonstration (Rick Angus) and the main meeting demonstration (Frank White) have been rescheduled for a later meeting.

The challenge that CNEW faced at that point was that we needed to plan, organize, set up and staff the CNEW booth at the Woodworking Show in Springfield for the following weekend (January 12-14). Rick Angus did a tremendous job of organizing the show, thanks to the CNEW website that allowed messages from Rick and myself to go out to the membership to ask for volunteers to move lathes, the grinder and other club equipment out to Springfield. There were at least 14 CNEW members that helped staff the booth during the three-day show, doing demos and educating the public about woodturning. Hopefully, some of the contacts we made will result in visitors at a future CNEW meeting.

Our Woodworking Show booth was a success due to the efforts of many CNEW members. The first customers had not even walked up to the ticket booth when Rick discovered that the Ricon club lathe, which is only a few years old, was inoperable. After calling the manufacturer, it was clear that the problem could be the motor, or it could be the electronics board. In either case, the Ricon lathe was not going to be repaired in time for the show. Thanks to Eric White, who brought in his mini-lathe on Saturday and Bob Kennedy, who brought in his mini-lathe for Sunday, we still had two lathes for the demonstrations. Once again, thanks to CNEW members for coming through to make the show a success. Ricon is sending repair parts to Rick, so we will hopefully have the Ricon lathe back in operation in time for Learn and Turn at the February meeting.

When I was at the show on Woodworking on Sunday, a gentleman from the "Stainless Bottle Stoppers" booth stopped by to donate two 5-packs of bottle stoppers for the next club meeting. Each of these 5-packs are worth about \$20, so these will be nice additions to the next wood swap.

The next club event that we will need to plan for is the Arnold Arboretum Wood pickup, which will occur on Tuesday, February 13, 2018, probably in the morning. Joe McGill indicated that in past years, Arnold Arboretum wood collections have been done using three trucks or large vans. At the February meeting we will organize a group to do the wood pickup. As in past years, CNEW members are encouraged to use the Arnold Arboretum wood to make a turning that can be displayed in the Arnold Arboretum "Woodturners Show" which is tentatively scheduled for either the 1<sup>st</sup> or 2<sup>nd</sup> weekend in October.

The final point I want to make in my first President's message is to comment on the Turning Extravaganza, potluck dinner and gift exchange for the December meeting. I felt the evening was very successful due to the great food brought by CNEW members and the informative demonstrations at the various lathes. I was also very impressed by the high quality of woodturnings that were in the gift exchange. I'd like to encourage all CNEW members to bring in their work for the Show and Tell sessions at the club meetings this year.

Be Well,  
Reid

### **Inside this issue:**

<b>Meeting Minutes And show'n tell</b>	<b>2</b>
<b>The Woodworking Show in Springfield</b>	<b>2-3</b>
<b>Upcoming Symposia</b>	<b>4</b>
<b>Learn to turn in NE</b>	<b>5</b>
<b>High gloss finishes</b>	<b>6-9</b>
<b>Officers Membership Application</b>	<b>8</b>



**January meeting cancelled due to snowstorm  
No CNEW meeting minutes**

**See you in February**

**The Woodworking Show 2018.**

**Springfield, MA**

**January 12—14**

Despite early arrival of CNEW members to set-up our booth, we had an inauspicious start upon finding that the new Rikon lathe would not function. A call to Rikon had us troubleshooting a bit with rudimentary tools which resulted in the conclusion that the electrical motor controller and possibly the motor had failed. With a promise of new parts to arrive in mid-February, we rallied the troops attending on Saturday and Sunday to bring lathes for the show. Thanks to Eric White and Bob Kennedy, who contributed lathes, the show continued.

On Saturday morning, some tools were missing but reappeared and many chips were made. Attendance at the show and the diversity of vendors seemed a bit light but there are tools for sale, money was spent—wisely, of course.

Jim Brennan brought in a remarkably hard bowl blank and Richard Hunt plowed through it. Bowls and vessels were made and visitors to the booth asked many questions. A few may visit our upcoming meetings. I returned with a few tops and mushrooms in my bag as few children were present to receive them. Ralph Viscomi made his first ever top and did quite a good job. Tool tips and ideas were traded amongst CNEW members and we had a great time even during the lulls in the crowd.

**Rick Angus**

**External VP**

# *Photos from the Woodworking Show*



## Upcoming Woodturning Symposiums

Saturday & Sunday, March 24 & 25, 2018 , Totally Turning 2018

[totallyturning.com](http://totallyturning.com)

**Saratoga Springs City Center, Saratoga Springs, NY**

**Featured Presenters:**

*Nick Agar, Mark Baker, Nick Cook, John Jordan, and Barbara Dill, Paul Petrie, Ralph Mosher, Donna Zils Banfield, John Franklin, and David Gilbert*

May 10–12 , Utah Woodturning Symposium

[Utahwoodturning.com](http://Utahwoodturning.com)

**Provo, Utah**

Featured presenters: Richard findley, Eli Avisera, Stuart Mortimer, Anthony Harris, Benoit Averly, Kelly Dunn, Tom Edwards, Bob Fehlau, Doug Schneiter, Dennis Paullus, Pat and Peggy Bookey, Kevin Hicks, Dave Best, Mike Mahoney, Kip Christensen, ...

June 14-17, 2018 American Association of Woodturners National Symposium

<http://www.woodturner.org/page/2018Portland>

**Portland, Oregon**



## ***New England Woodturning Education***

Brookfield Craft Center, [brookfieldcraft.org](http://brookfieldcraft.org)

Brookfield, Connecticut

American Eliot School,

Jamaica Plain, Massachusetts

The Workbench, Woodworking and Craft School, [workbenchschoo.com](http://workbenchschoo.com)

Easthampton, Massachusetts

Connecticut Valley School of Woodworking, [schoolofwoodworking.com](http://schoolofwoodworking.com)

Manchester, Connecticut

The Furniture Institute of Massachusetts (spindle turning), [furnituremakingclasses.com](http://furnituremakingclasses.com)

Beverly, Massachusetts

North Bennet Street School, [nbss.edu/uploaded/\\_Continuing\\_Education\\_Content](http://nbss.edu/uploaded/_Continuing_Education_Content)

Boston, Massachusetts

Snow Farm, The New England Craft Program, [snowfarm.org](http://snowfarm.org)

Williamsburg, Massachusetts

Center for Furniture Craftsmanship, [woodschoo.org](http://woodschoo.org)

Rockport, Maine

Homestead Woodworking School, [woodschoo.nh.com](http://woodschoo.nh.com)

Newmarket, New Hampshire

Epic Woodworking, [epicwoodworking.com](http://epicwoodworking.com)

Canterbury, New Hampshire

Shelburne Craft School, [theshelburnecraftschoo.org](http://theshelburnecraftschoo.org)

Shelburne, Vermont

Vermont Woodworking School, [vermontwoodworkingschoo.com](http://vermontwoodworkingschoo.com)

Cambridge, Vermont

Quality Imported  
& Domestic Hardwoods and Softwoods

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## Some more thoughts on high gloss finishes

By Steven Reznik

High gloss finishes have a number of disadvantages. They take a lot of time. And I mean a **lot** of time. Our recent demo'ers used friction polish and completed their sanding **and** finishing in about five minutes. Forget that!! Another problem is that high gloss finishes lose their gloss over time. Like any piece of fine furniture, turned pieces require touch ups every once in a while. I guess you should think about pieces with high gloss finishes as art, and not as anything useful. So do you warn your customer or assume that the fading will be so slow that she or he won't notice? Of course you could assume that the customers would have the good sense to wax the thing every year or so.

One more thing and it is perhaps the important point. If you want to show all, and I mean **all**, the scratches in your sanding job, use high gloss finish. As Will Hunt says, "The first one or two coats are just to show you what you missed". And as Frank White said, "Finishing takes three times as long as turning". He must have been thinking of high gloss.

OK. So why bother? There are a couple of possible answers. Perhaps your spouse thinks you do not spend enough time on our hobby. Perhaps you are a driven perfectionist. Perhaps you are a sucker for a challenge. Or perhaps you really do like the look of beautiful wood.

This article is not meant just as a "how to" in high gloss finishing. Rather it is a discussion on the principles (physics if you will) behind what it takes to make a good high gloss finish.

A high gloss finishes have two important characteristics. The first is how sharp a reflected image is. And the second is how bright it is.



The image of a light bulb or a lamp should be sharp although distorted by the curvature. And it should be bright. How sharp it is is determined by "how smooth" things are. And how bright it is determined by what is called the index of refraction of the coating.

## Save the Date

*Next meetings:*

Thursday, February 1, 2018

Thursday, March 1, 2018

At the Seventh Day Adventist Church, 1 Airport Drive, Worcester, MA

If you shine a beam of light on a smooth surface between two clear materials, some of the light will be transmitted and some reflected. The bigger the difference between the two indices of refraction, the more light is reflected. The index of refraction of air is 1 and that of water is 1.33. Diamond has the highest index of refraction of any material at 2.42. Urethanes have about 1.5 and lacquers about 1.6. So the only control you have over how bright your finish will be is which coating you choose. And there is not much difference in commercial products. (Water based finishes have a lower index of refraction than solvent based.) Things like hardness, ease of application, order in drying and lack of "yellowing" are usually more important than the small differences in the index of refraction. I usually use polyurethane since lacquers require extremely good ventilation and things like explosion proof fan motors. Musical instrument makers use lacquers.

So brightness is simple, i.e. for the most part determined by the molecular structure of the coating material. Sharpness is not at all that simple.

Your coated turning has two surfaces. The first is the boundary between air and the coating material. The second is the boundary between the coating and the wood – boundary #1 and boundary #2. When light hits a smooth surface some is reflected back and some goes into the coating. The light going into the coating hits boundary #2 and some goes into the wood and some is reflected back into the coating. The light that is reflected back into the coating then hits boundary #1 "from the bottom". Some of that light goes into the air and some is reflected back. So the light goes bouncing back and forth each time either sending some back into the air or sending some into the wood. Luckily all that complication is not needed for understanding what is really happening. The only things that count are: 1) what happens the first time at the boundary between the air and the coating and 2) what is happening the first time at the boundary between the coating and the wood.

You know what happens (more or less) at the boundary between the coating and the wood. Just look at the bare wood before you start coating. What you see is the returning light. And it is not all that glossy even if you got carried away and used micro-mesh to go to 12,000 grit.

Now we need to talk physics. Light is a wave and its wavelength is between 400 and 700 nanometers. Red is the 700 end and blue is the 400 end. Or in more familiar terms – between 16 and 28 micro-inches, or .016 and .028 mils. I said some light is reflected from a **smooth** surface. How smooth is smooth? Think of a surface as having ripples of various sizes and wavelengths, just like the sea's surface on a windy day. If the ripples are a mil or two or longer, that is 100 times as long as the wavelength of light, you will see them as a feature. A feature like grain or, heaven forbid, a scratch. If the features are very much smaller than the wavelength of light, nothing much happens. Imagine posts sticking up the ocean on a reasonably calm day. The post is one inch in diameter and the rollers are eight feet apart. Nothing much happens.

So what is left is a pretty wide range from ten times larger than the wavelength of red light to ten times smaller than the wavelength of blue. One way to think about this is to imagine a particle instead of a surface. A particle scatters some but not all of the light that hits it. Think of dust specks in a narrow beam of sun light. You see them as bright dots because they scatter light out of the beam toward you. If the particle is very much larger than the wavelength of light, the scattered light is mostly backwards or almost backwards. If the particle is smaller (or even very much smaller) than the wavelength of light the scattered light is pretty much forward or at least at a small angle from the beam. At a size more or less comparable to the wavelength of light the scattered light comes out with comparable intensity at all angles. Thinking of the surface as a bunch of particles of various sizes leads to the idea that light impinges, some is reflected, some is transmitted and some is scattered at a variety of angles. If the intensity of the back scattered light is very much smaller than the reflected light, the image of a light bulb is sharp and the finish looks like a mirror. If the intensity of the scattered light is comparable to the reflected, you get blurring and a semi-gloss or matte finish. And if the scattered is greater than the reflected intensity you get no image, just a blur.

So to make a long story short: We want the smooth surface of be smooth compared with the wavelength of light – which is pretty darn smooth, about 0.016 mils. Large ripples, larger than a mil or two, are not too bad. They show up as grain or scratches, but don't really change gloss. But we need to eliminate the ripples from all the middle range.

One final word. There are two surfaces. The one between the coating and the wood will always be pretty rough. 1000 grit is about one mil. What you will see is the reflection off the top surface plus the reflection off the wood surface. What saves you is that the reflection off the top surface is many times brighter than the reflection off the wood. This is mostly because the index of refraction of the coating and of the wood are not all that different, so not much light is reflected. Additionally the light coming back from the wood hits the top surface from below and a good portion is reflected rather than transmitted out into the air.

Ah ha!! What the coating does is fix the top surface, eliminating all the ripples than are longer than a small fraction of the wave length of light but shorter than many times the wavelength of light. They fill all these ripples with a clear uniform material than has a high index of refraction.

A small digression. Some finishes are not high gloss; they are semi-gloss or matte. These finishes have small particles, comparable to the wavelength of light, dispersed in them. They give you a “smooth” surface, but it has two different types of materials – organic polymers and small inorganic particles. And so while the physical surface might be smooth, the variation of the index of refraction is not.

Let me summarize. A high gloss or bright finish has to have a high index of refraction so as to reflect light. The index is fixed by the molecular composition. The finish must also have a smooth surface. The surface between the finish coat and air is the important one. Little light is reflected from the surface between the coating and the wood. How smooth is smooth? The wavelength of light is around 0.016 to 0.027 mils. That is smooth! The grit of 1000 mesh sand paper is very large, i.e. 1.0 mil.

So at last we come to what a high gloss coating does. It fills in all the nooks and crannies of the surface of the wood. (You undoubtedly knew that without going through the physics mumbo jumbo. But you now know the sizes of the crannies that are important.) Commercial finishes have a property call “flow and leveling”. You tend to think the science of the liquid flow is simple. The more you push on a liquid the faster it flows - in the jargon, “the viscosity is a constant”. However commercial finishes have the property that the viscosity (or ratio between stress and flow) decreases as the stress increases. Think of painting a wall. When the paint is on the wall the stress is to flow down, but the viscosity is high and it doesn’t. However if the viscosity was always high, pushing the paint brush would be a hugely difficult. The stress of the brush reduces the viscosity and the paint flows. Also when you finish a brush stroke, there are brush marks, but quite quickly they disappear. What is going on?

How a coating achieves shear thinning always involves two or more phases. In the simplest case with no shear, the polymer molecules in the solvent absorb onto each other and form a network. Shear breaks up the network and disperses the polymer molecules in the solvent.

One last bit of physics – surface tension. Think about a particle or a drop of a material. What holds it together? The atoms attract each other. An atom in the middle of the drop is attracted evenly in all directions. But what about an atom on the surface. It is only pulled inward. This means the surface is like a stretched “skin” holding the drop together. The strength of the stretch is called the surface tension. The smaller the radius of curvature of the surface the greater will be the effect of the surface tension. So this is what happens to the brush marks on the painted wall or, in our case, the small voids on the wood surface. The radius of curvature is small, the effect of the surface tension is high and the paint/finish flows to fill the void. The smallest features are filled first and fastest.

I lied. There is one really last bit of physics. Another effect of surface tension is that it causes a fluid to flow into the pores or grains of the wood.

Below is a list of members willing to spend time with other members to promote education and skill building by sharing their knowledge. Anyone interested in being “mentored” by a more advanced or seasoned turner please contact on of the members below:

Rick Angus	Moosup, CT	rick.angus@gmail.com
Joe McGill	Sudbury, MA	joemcgill96@gmail.com
Kevin Nee	West Boylston, MA	kpni@charter.net

OK, we are more or less home. How do you get a high gloss finish?

- 1) Sand to a high grit number. Around 400 is OK before the first coat. After every sanding dry wipe or vacuum off the dust; or both. Dust removal is always important and gets more important in the later steps. Matte is dust in the finish.
- 2) Use a grain sealer or really slop on the first coat and let it dry. Surface tension sucks this into the grain and therefore you have to wait to it is really dry. A day will be enough under the correct conditions of low humidity and 70 degrees or higher. Two days is better. (In the summer I use my mobile, solar powered drying oven. Sometime known as a Honda parked outside.)
- 3) Slop on a second coat and let it really dry. Don't worry about sanding before this coat unless you want to. Depending on the wood and whether you used a sealer, this coat too will get sucked into the pores. The surface is now just nooks and crannies, but too many of them are the wrong size.
- 4) Sand the second coat. You can use one grit higher than the last one, i.e you can use either 400 or 600 if you started with 400. Remove the dust.
- 5) Using as lint free a rag, carefully apply a thin third coat and let dry. Flow and leveling starts to smooth the surface.
- 6) Sand with 600 grit and remove the dust.
- 7) Use a lint free rag and apply what you hope is the last coat. Let it dry.
- 8) If you have used a really lint free rag and have been careful about wiping or vacuuming the dust you could be finished. If you haven't removed the haze either repeater #6 and #7) or even just #7) without sanding.
- 9) If your rag was not too good and you can feel particles of lint, you should use the Beall buffing system. In any case, waxing always improves the feel of the object and customers like that.

Four final things:

First, if your wood has large open grains. You need to use a grain filler (not a sealer) after the first one or two coats. I use the product from CrystaLac.

Second, if you are trying to finish an oily wood, like rosewood or my favorite bloodwood, the finish and the oil may not be entirely compatible. Domains of an oil rich phase can scatter light. Oily wood can require several extra coats more than dry woods like maple or mahogany.

Third, if you have an open grain wood and haven't used a grain sealer you can get small bubbles in the finish coat as it is drawn into the pores and air is forced out. Thinning the finish with a compatible solvent can help it seal the pores and prevent the bubbles.

And forth, it seems as if when you think you have done enough one more coat always surprises you and improves the gloss.

Central New England Woodturners

A Chapter of the American Association of Woodturners



### Officers for 2018

- President:** Reid Gilmore , Upton, MA 508-603-1248, reid.gilmore@umassmed.edu
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- Videographer:** Fraser MacMannis, Mendon, MA 508-309-0754, fmacmannis@gmail.com
- Club Store Manager:** Kevin Nee, W. Boylston MA 508-835-4301, kpni@charter.net
- Big Name Demo Coord:** Rick Angus, Moosup, CT 860-564-3660, rick.angus@gmail.com
- Club Project Coord:** Steve Reznek, Concord MA 978-287-4821, stevenreznek@gmail.com
- Membership:** Ralph Viscomi, Boylston, MA. 617-513-1680, rviscomi1@verizon.net
- Webmaster:** Dominic Ryan, Littleton, Ma. 617-347-1383, m.dominic.ryan@gmail.com



### Membership

To join or renew membership, please complete the form below and a check made payable to CNEW and bring it to a CNEW meeting, or pay online at the CNEW website under "join/renew" or mail to: Treasurer, Central New England Woodturners  
c/o Rob Pacini, 28 Skyview Terr, Holliston, MA 01746

### Membership Application

To join or renew membership, please complete this form and a check made payable to CNEW and bring it to a CNEW meeting or mail it to:

Treasurer, Central New England Woodturners

c/o Rob Pacini  
28 Skyview Terrace  
Holliston, MA 01746

Annual dues: \$40 including e-mail delivery of newsletter

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e-Mail: \_\_\_\_\_

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Please check appropriately below

New Member

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Please let us know of your interests:

How long have you been turning? \_\_\_\_\_

What programs would you like to see at meetings? \_\_\_\_\_

Would you like to demonstrate at a meeting? Yes/No If so, what topics do you offer? \_\_\_\_\_