

The NEMES Gazette

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*The Newsletter of the New England Model Engineering Society,
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Our Next Meeting is at 7:00 PM Jan 7, 1999 at the Museum, 154 Moody Street, Waltham Ma.

Annual dues is \$20.00 - Please make checks payable to "NEMES" and send to the NEMES Treasurer: Kay R. Fisher 80 Fryeville Road Orange, MA 01364

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From the Editor's Desk:

I'm getting this issue out a bit early because I'm on vacation for two weeks until January 4th. The plan is to clean the cellar, build some shelves, and get the shop organized. With luck I might even have time to do something in the shop. I was originally planning to hold on to this issue for a couple weeks, then mail it out about the regular time, but then I got Ron's column and he was wishing everyone a happy holiday. So, I'm going to get them out early so I can wish everyone a Merry Christmas and a Happy New Year before it's too late.

Don't forget, the Gazette needs material for upcoming issues.

See you January 7th -- scl.

President's Corner by Ron Ginger January Meeting

Our speaker for this month is one of our members, David Stickler. I'm sure many of you have met him at various meetings, and have seen his excellent beam engines and other model work at our shows. He has done some very interesting work in the rocket field, and will talk about some of his adventures in rocket and other high tech work. When we talked about this David said he could tell us about a rocket engine we should all be able to build in our shops! This should be a most interesting evening.

We will also allow some time for show and tell items. As I noted last month, we have drifted away from this part of the meeting, and I'd like to see a renewal of it. I'm sure some of you are making some interesting parts, so let's bring some along and share with the group.

I should note that our last meeting got a bit disorganized. I like to see the talks get interactive, it

clearly indicates people are interested in the subject, but this one got just a bit too interactive, and I know a lot of fellows missed some of the discussions. I guess I should get a gavel and try to keep things just a bit more on track at future meetings. I don't want to stop the discussions, but we do need to make sure everyone can hear and see all the meeting. And when someone asks the speaker a question we need to be sure everyone else heard the question.

I also think we should return to the small meeting area, even though Bobby's efforts with the sound system were a great improvement. In the small area it should be even better. We do need to get a bigger screen (our small screen got stored away when the museum started construction, I'm sure we will get it back soon). If anyone knows where a larger screen can be had cheap (free!) let me know.

CABIN FEVER EXPO

Ok, we are down to the wire on this one, so here is the final word. We have exactly 20 signed up, so we can make the trip and keep the fare to \$100 each. We still have room for more, and if we get a few more we will adjust everyone's fare to match.

We will need everyone that has signed up to bring a check for the \$100 bus fare, made out to NEMES, to the January meeting. If you are not going to make that meeting please mail the check to our Treasurer, Kay, by meeting date. We need to get all the checks to Kay to deposit in the club treasury so we can write one check to the bus company by January 8.

I should note, that although so far this winter has been easy, it is still possible we could get some snow. The bus contract does provide for cancellation without cost if the weather makes the trip unreasonable, so don't worry about losing your fare.

I will be sending a letter to everyone that had signed up by our last meeting with a summary of all the information- hotels, schedule, etc

If you are still undecided about this trip I encourage you to join us. If you haven't signed up, please call me at 508/877-8217 any evening between 6:00 and 10:00 so I can give you the details on hotel, etc.

NAMES

Now, if the CABIN FEVER show is not enough for you (and I know several guys that like to go to

every show possible) there will be another North American Show in April. I am again willing to arrange for a bus trip if there are enough interested people. If you think you are interested let me know at the January meeting, if there seem to be enough I'll start to make arrangements. Would more of you be interested if this was a train (or plane) trip? The logistics would be more complicated, but anything is possible.

NEMES SHOW- February 20

It is about time again to start talking about our club show. We have reserved the same date, third Saturday in February. I assume we will run it just about like the last shows, I see no reason to tinker with a good thing!, although I'm open to any suggestions for improvements or additional activities we could run.

I will have copies of a flyer printed and available at the January meeting. Everyone take a few copies and spread them around at work, or wherever you think we might find interested people. If any of you are visiting a tool store, or other place that might attract attention, see if they will let you hang a flyer somewhere.

I would like to ask for registration again, just to help us make sure we have a good turn out and enough tables for everyone. I hope Max can again be our registrar, and we will have the sign up sheet for this at the January meeting. For those members that don't get to our meetings but want to make the show, please contact Max or I and let us know how much space you will need.

Steve Cushman is again going to try to encourage some of our favorite vendors to offer some door prizes for our exhibitors. If anyone else has a contact at a business that might be willing to help our group in this way, please let me, or Steve know. The more prizes we can get the better!

Sherline Book

At the last meeting I had a signup sheet for the new book TABLETOP MACHINING by Joe Martin, owner of Sherline Inc. Well, I really screwed up on this one! when I called to place the order I got a couple surprises- the book price was not \$20, rather \$22. But I also discovered that each box of 12 books will cost about \$25-\$30 to ship. So, my offer for \$20 is not possible, it will have to be \$25. Since this was a big change, I wasn't willing to order them until I knew if people were still interested at that price.

I'm very sorry for this screwup, and hope you wont be dissapointed about the delay in getting the book. It is worth waiting for!

Saturday Workshops

I mentioned in another newsletter that I had been thinking about trying to get together for some

small group, workshop type sessions where we could discuss some topics of interest in much more detail. It seems to me Don Strang's work on electric motors and 3 phase convertors might be exactly such a topic. I know some of you are intrested in this, and I think the topic could well benefit from having more time and a better chance to discuss, and look at actual motors, controllers, etc.

I would also be interested in a group to talk about some of the issues of CNC- more aimed at the tinkers building their own, rather than the users of commercial systems. I've had some success with my system, and I'd like to see what some others are doing. I would view this session as a general discussion on any aspect of motion control- motors, computers, software, etc.

So, I propose we pick a Saturday in January, maybe the 9th or the 16th, and plan to try this approach. I'll verify with the Museum staff on the availability of space. We will review this at the next meeting, and if either or both topics have enough interest, we will give it a shot. I would aim for about 9:30 to noon on Saturday, then anyone interested might go over to the Watch City Pub for lunch.

Happy Holidays!

Since this newsletter will be reaching you right in the midst of the Holiday season I would like to add here my wish for everyone to have a wonderful Holiday, and hope the New Year brings you and your family all the best. I look forward to 1999 and the meetings, shows and other sessions I'm sure I will share with many of you. This group has brought me many good friends, and a great deal of enjoyment. Happy New Year!

cheers,
--Ron

Dec-1998 Treasurers Report

| | |
|---------------------------------------|-----------|
| Previous balance ----- | \$2608.36 |
| Interest ----- | 1.06 |
| Steve Lovely News Letter Postage ---- | 71.74 |
| Pat Caruso (Speakers Fee) ----- | 50.00 |
| Dues Deposit ----- | 20.00 |
| New balance ----- | \$2507.68 |
| ===== | |

Respectfully
Kay R. Fisher

Calendar of Events

Jan. 7, 1999 Thur 7PM

NEMES Monthly club meeting
Waltham, Ma.
Charles River Museum of Industry 617-893-5410

Jan. 29 1999, Fri noon to Sun noon

Cabin Fever Show
NEMES bus trip to big east coast model show.
Ron Ginger 508-877-8217

Feb 4, 1999 Thur 7PM

NEMES Monthly club meeting
Waltham, Ma.
Charles River Museum of Industry 617-893-5410

Feb 20, 1999 Sat 10AM to 4PM

New England Model Engineering Show
CRMI Waltham Ma.
Ron Ginger 508-877-8217

For a listing, please send name and brief description of event, time and place, and a person to call for further information to.

Bill Brackett at wbracket@ultranet.com or 508-393-6290

The Meeting, 3 December, 1998

The meeting started out with an announcement by Mike Boucher that NEMES now has an Employer Identification Number from the IRS. So, now the IRS knows that we exist and if our income exceeds \$24000 in a year we will have to file a report. So, from now on the Government thinks of NEMES as EIN-04-3442880.

Don Strang asked if anyone knew if there was anything left in Lynn relating to Elihu Thompson, who died in 1937.

Dave Piper is still not done with his steam engine, and feels the need to finish something. So, he's started a toolpost project. His is set up for his 10" Atlas Lathe. When it's finished and he's convinced it's right he'll make the drawings available.

Kay Fisher missed the November meeting because he was in Hawaii. He had a couple of interesting items he brought back. First was the "gyrating rings" or "chattering rings." This consists of a large ring, about 10" in diameter from 1/4" rod, with 5 small rings about an inch in diameter with a half inch or so hole in them that were around the rod of the larger ring. When the small rings are given a bit of spin, the large ring is rotated slowly with the two hands around it's axis, the axis being kept in a horizontal plane. Done properly the small rings spin faster - up to about 1000 rpm. With the little rings up to speed one can then proceed to do all sorts of neat tricks. I'm a little fuzzy on exactly what the tricks are, but Kay

assures us that all the kids in Hawaii could do lot's of them. The second item he had was a gyrocope in a ball that would fit into your hand. You start it with a pull from a string, then wobble it in your hand and put in energy to speed it up by fighting its precession. You get to exercise your wrist by pushing against the gysrope and it goes faster.

The main presentation for the evening was on Kennametal carbide cutting tools. J&L Supply is our local source for Kennametal products and was represented by Kevin Flanders. The main speaker for the evening was Ralph Lacerte, who is a Metalworking Systems Engineer for Kennametal's Metalworking Systems Division in Windsor Ct. Ralph is part of Kennametal's Distribution Support Team. John Tsolas was the third member of the team. He is a Kennametal employee also and covers the South Shore for them.

Kennametal started in LaTrobe Pa in 1938. Now it is the number one supplier of carbide cutting tools in the US and is second only to Sandvic in the world wide market. Phillip McKenna was the first person to add alloys to carbide cutting tools, producing carbides useful for cutting steel for the first time. These alloyed carbide cutting tools helped win WWII.

The use of carbide tooling is good for productivity in production. It's also useful for individual parts. Horsepower, feed/speed capability, rigidity, and work holding all need to be considered when using carbide tools on a machine tool. Nowadays, with the big emphasis on near net shape, machines tend to need less power.

What insert to use? There are a lot of considerations, with one of the first being what grade of carbide to use. IN general, three different carbides are the ones most used in cutting tools, Tungsten Carbide (WC,) Tantalum Carbide (TaC,) and Titanium Carbide (TiC.) Cobalt (Co) is used as the metallic glue to hold the carbides together. The balance between strength and wear resistance is one where more cobalt binder means more strength, but less wear resistance. So, for Cast Iron and non ferrous applications a grade such as K313 is useful. It consists of 94 part WC and 6 part Co to make 100 parts total in the mix. K420 is for cutting steel and is made from 50 parts WC, 41 parts other Carbides, and 9 parts Co.

Steel chips curl, and the curling chip tends to wear the top surface of the insert, changing the geometry and weakening the edge. Cast iron chips are more abrasive in there action on the insert so wear resistance is more important.

Inserts are made from powders that are mixed together and squeezed into shape with small amounts of organic binder to hold them together. Top

and bottom rams squeeze the powders into dies, producing precisely shaped inserts. These "green" inserts are then placed on graphite trays to go into the sintering oven. Sintering takes place at 2200 to 2600 degrees F, under precisely controlled time and temperature conditions. During the sintering process the individual inserts lose about 50 % of their volume, which is about 17% linearly. The goal is typically 3 thousandths of an inch tolerance. If you are using CNC you will often find that the variation from insert to insert is much less than that (a couple of tenths) within a single batch of inserts, although the variation from batch to batch will be within the industry standard tolerance.

Engineered inserts have coatings that are an inherent part of the tool. If you grind a coated insert that has worn, the result you get will not have the properties of the original insert as the coating will be gone. There are two basic types of coating. PVD coatings are Physical Vapor Deposit coatings. They are typically applied at 900 to 1000 degree F temperatures. CVD coatings are Chemical Vapor Deposit coating. They are applied in the 2200 degree F range and since they come out of the vapor state to deposit on all sides of the insert.

The question came up about silver soldering carbides onto boring bars and such. Does it damage the carbide? The answer is no, although you have to consider the fact that the PVD coatings shouldn't get heated over 900 degrees F and that the CVD coatings deposited at 2200 degrees or so should take nearly as much heat as the carbide itself that was sintered in the 2200 to 2600 degree range.

For interrupted cuts the recommendation was to go faster and use less coolant.

What is a negative positive tool holder? The holder has a 5 degree negative position. The inserts for it can be up to 20 degrees positive. The 20+ insert in the 5- holder gives a net 15+. Hence the name.

High positive inserts are one sided because the cutout material at the top is such that if the insert was two sided there would not be adequate support for the cutting edge. Many of the Kennametal brand tools have a soft carbide seat under the actual insert. This provides a hard base for the insert - with time a steel insert pocke will deform providing less than ideal support. It also provides something less expensive than an entire boring bar or whatever to replace if the tool crashes and the insert breaks.

For threading and grooving you need neutral rake. If you don't use neutral rake the carefully produced 60 degree angle on your threading tool will make a groove with a less than 60 degree angle in it.

A final question was "I'm mostly machining aluminum, and I want to get one type of insert to do

everything with. What do I get?" The answer was a CPMT KC730 3251. It fits into commercially available holders down to a 3/8" square shank. All those letters and numbers mean specific things about the recommended insert, and the stack of literature that they passed out to all of us at the meeting explain it all in detail, but I'm not going to try to explain it here.

If you have questions about your specific application for carbide insert cutting tools, Ralph C. Lacerte's voice mail box is 1-800-367-3713/Box 1963. The customer application support line is 1-800-835-3668. The mailing address is Kennametal Inc., PO Box 800, Windsor, CT 06095.

John Wasser brought in some more of his foundry experiments this meeting, even though he didn't get up and talk about them during the meeting. He had a very nice brass cupcake that he had cast from old 22 shell cases. He melted it in a steel crucible made from half a disposable O2 cylinder from a miniature welding torch, using charcoal for fuel. It was bandsawed apart to check the metal in the middle and looked clean with no voids or bubbles. He also suggests that oil filter cans make good steel cans for melting aluminum and brass. I for one found his stuff inspiring.

TIPS AND TECHNIQUES

by Ed Kingsley

THE LIGHT @ THE END OF THE ... SOCKET?

I missed one! Those Sears guys have another great invention. It's a dark and stormy night. Plitzfup!, your car conks out. "Great, even if I could figure out what's wrong, how will I ever be able to see well enough to get my socket wrench on it?" Funny voice from somewhere: "Why, the Illuminator (TM) SocketLIGHT, you old silly!"

Although it looks like any chrome vanadium, deep socket with a 3/8" drive on the end, that's where the similarity ends. In reality it's a chrome vanadium - looks like a deep socket with a 3/8" square drive on the end - flashlight! A tiny, (but powerful) lithium battery powered bulb shines out the end of that 3/8" square drive, right through the Metric, US or (gulp) Whitworth socket you affix thereupon. Thence, through the swirling steam and snow, down, down there onto that dang loose nut that plitzfupped you into the breakdown lane, with only the sound of screeching brakes, curses, skidding tires and caroming sheet metal to keep you company. Saved!

Snap an actual socket on the SocketLIGHT (TM) - and the light shines on. \$19.99 in fine Malls anywhere. Don't leave the garage without one. God bless you, Sears and Roebuck. Not endorsed by AAA, nor UL Approved.

ANOTHER WAY TO "C"

You know those odd looking, braised Carbide, lathe tool bits, the ones that look a lot like an HSS bit before you do anything to it? They call them Style "C", they have a square end, and you get them, whether or not you want them, when you buy those 5 piece sets? Well, I finally found a use for mine.

Not on the lathe, of course, but they are the nuts for chiseling rust off of tools! Kind of a miniature carbide surface scraper. They're tough and relentless, and because they're more or less flat, they do an excellent job of separating the FeO3 from the work, pretty much flush with the work. Takes paint off, too, and can even clean up the odd "ding" from a tool surface that you'd rather not subject to abrasive residues.

I always thought they were "blanks" for contour tools. But, what do I know? Those little "tags", that close the plastic bags on bread products, also make a dandy, quick and dirty scraper for stuff like labels and old tape. They're stiff enough to be useful, but soft enough not to damage delicate surfaces.

TRY TO FOLLOW MY LEAD

I picked up a Miter Gage for a table saw, the other week, and discovered the screw, serving as the pivot pin for the head, was sticking out too far, so I took it out. This took several minutes, however, and I was beginning to think it was epoxied in, but it was even worse than that. The former owner, whom we shall hereinafter respectfully refer to as "Mr. Moron", had painstakingly crossthreaded a 1/4 x 28 screw into the 1/4 x 20 threaded hole, not only mutilating the hole, but stripping the screw as well!

The Miter head is, of course white metal (a mixture of GI soap and aluminum powder), and the hole was a real mess. Pissed_off_city! Then the thoughts: 'soft', 'easy to push around' and 'roll form tap', appeared like mental "floaters" in my mind's eye, and the rest was like falling off a bicycle.

The roll form tap found the mangled remains of the 20 TPI helix, rearranged the threads like a plow share in a muddy field and, in less time than it took to unscrew the old 1/4 x 28 screw, the new 1/4 x 20 screw was snugly ensconced in its place. The advantage of a roll form over a normal tap was that, instead of removing still more metal, it reorganized all the available metal within reach into the deepest, strongest possible threads.

Assuming your material is suitable, may I suggest that a roll form tap might be the tap of choice for your rethreading needs. Or not, your call.

THEY'LL SHIP IT FOR FREE

In addition to Harbor Freight, you might not be aware that Penn Tool and KBC Tools, will send their

stuff your way, without S&H, under the following conditions.

Penn Tool - Payment is made, upfront, in "cash" or check, no credit cards. penntool@aol.com (800)526-4956

KBC Tools - Your order is for \$50, or more. (800) 521-1740

Both firms offer excellent sales prices on items that may sometimes take several days to arrive.

And J & L ships free, to a local outlet store, for your pickup there.

"My wife said she'd leave me if I didn't stop talking on the ham radio."

- "Over"

***** HAPPY NEW YEAR *****

--Ed

Letters

Dear Stephen,

I'm a member from many miles away. My contact with the Society is primarily thru the Gazette, and driving down to the February Show. You do a great job with the Gazette and even though I'm quite a ways away I gain a lot from the information it contains.

Maybe I'll get to talk with some of you at the Cabin Fever Show. I drove from here (with my brother) last year and intend to do it again this year.

I'm a retired state engineer and have been doing model engineering for around 5 years. I've made a number of steam engine kits (PM Research) and a number of scratch built. Currently woking on an Upshur gas engine. In addition to model engines, I collect and restore old "one-lungers" and spend a lot of time flying radio controlled airplanes.

Any possibility you could include this request in some future issue of the Gazette?

Wanted: Any info regarding a Hamilton Associates lathe/milling machine. Need copies of any operating manual, parts manual, etc. Thanks. costs reimbursed.

I hope to someday get down to one of the monthly meetings and meet everyone.

Keep up the good work, thanks for any help you can be.

Reginald A. LaRosa
32 Terrace St.
Montpelier, Vt 05602

Thank you for the kind words Reginald. Hopefully someone will have some info on your Hamilton Associates machine. -- scl

Hello all: Did not get to telling about some papers available on motors etc. Ed Cowern is the district mgr for BALDOR in Wallingford CT and has published a number of relevant topics. I have permission to reprint them for NEMES. Following is a list of titles that I think apply. Steve said he would also run this in the next newsletter. I would like to hear how many want some or all of these papers.

The final problem will be to find someone who has copy capability for this.

- 1 Glossary of frequently occurring motor terms
- 2 Electric motors and voltage
- 3 The mystery of motor frame sizes
- 4 Motor temperature ratings
- 5 Understanding torque
- 6 Operating motors in wet and damp environments
- 7 Motor code letters
- 8 Amps, watts, power factor and efficiency
- 9 Approximate load data from amperage readings
- 10 Metric motors
- 11 Convenient motor and energy formulas
- 12 Unbalanced currents
- 13 Electric motors and power systems

Relevant to the last speaker, I mentioned several months ago that I read a book published by Harvard Business school, part of a series of studies of American Companies and dynasties.---Charles W. Moore- "Timing a Century- History of the Waltham Watch Co.", 1945. This goes back to the beginning in the last century when it was started by Dennison of the paper Co. family and goes on to the final fiasco after the war. I found it very interesting.

Regards,
Don Strang

I'd like one of each Don, and if the interest is great enough we could put some or all of them into the Gazette over the next few issues. -- scl

**MERRY
CHRISTMAS!!**

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c/o Stephen C. Lovely
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