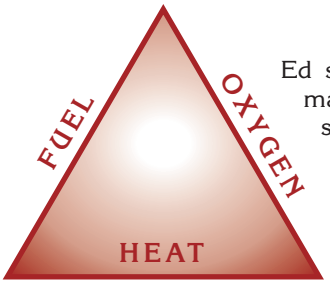
MAY MAIN EVENT #1 - ED PRETTY :-

Fire Safety and Concerns for Woodturners



By: Allan Cusworth

Ed started by defining what makes a fire. This sounds simple, and basically, it is. Fire is a Triangle in which the three sides are: Fuel, Oxygen and Heat.

Take away any one of these three components and the fire goes out.

Classes of Fires

Ed gave us some basic information about the four different classes of fires:

Class A - Normal combustibles: Wood, paper, etc.

Use cooling and quenching to extinguish - an ABC type extinguisher is OK.

Class B - Flammable Liquids: This is a misnomer as liquids, and solids for that matter, do not burn, vapours do. Heat vaporizes the materials to create the vapour that burns.

Do not use water to extinguish; it spreads the fire around. Use a dry powder extinguisher to remove the source of oxygen - an ABC extinguisher is OK. CO2 will work but is not recommended since it dissipates and the fire can restart.

Class C - Energized Electrical: The key word here is "energized". You must shut off the power source first. The fire then becomes A or B Class and can be dealt with as above.

Class D - Flammable Metals: Metals such as Sodium, Magnesium, and Lithium will ignite and burn and are almost impossible to extinguish. Do not use water as it will cause a major explosion and spread the fire rapidly. The fire must be encapsulated and allowed to burn itself out. Use carbon to encase to fire ball.

Ed brought thirty six years of experience in the fire service to our meeting and it certainly showed. His presentation was not only informative, but also dramatic and even humorous.

Shop Fire

The best class of fire extinguisher to have in your shop is an ABC since most of the materials are either

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How to Choose, Maintain and Place an ABC Fire Extinguisher

The best type of ABC class fire extinguisher has a metal head. It should also have a hose and nozzle to direct the powder discharge at the base of the fire easier.

DO NOT TEST it! If you do, the pressure will bleed down and the extinguisher will be useless.

Over time, the powder will settle and become hard. It should slosh when you shake the extinguisher. To check it, use a RUBBER mallet to tap the bottom and sides to release the powder till it sloshes. Also, check the pressure gauge.

A fire extinguisher should be located near the exits of the room. You should always be able to keep yourself between the fire and the door so you will not get trapped by the fire.

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normal combustibles, or flammable liquids. A water hose is good only for small fires.

Call the Fire Department.

Spontaneous Combustion

Ed spent some time discussing spontaneous combustion which is of particular interest to woodturners since we do use materials that can self-ignite under certain conditions. He emphasized that rags and paper towels used with flammable liquids should be placed in air-tight metal containers to exclude oxygen. Do not crumple them up. It is a good idea to dry the rags out before disposing of them.

An interesting fact about spontaneous combustion is that is caused by bacteria in the product. They create heat and when that heat is concentrated, it can self-ignite.

Ed stated that Watco Danish Oil is a major fire hazard and should be treated accordingly. Raw linseed oil also contains bacteria.

Other Fire Hazards

1) The plastic coverings on Cabtire electrical cable can break down and crack creating an opportunity for electrical shorts and arcing which can cause a fire.

2) Dust can explode when mixed in the correct proportions with air. Ed dramatized this with wood dust, a rubber hose, and a torch. These explosions and fires can occur in a shop dust collector with the ever present static electricity being the source of ignition. These systems should be grounded according to the manufacturer's instructions.

Marco Berera - Pyromaniac?

3) Ed re-emphasized the danger associated with liquids/vapours by demonstrating that flammable vapours are heavier that air and collect in low areas creating and explosion waiting for an ignition source. He noted that furnace and water heater pilot lights are a notorious ignition source in the home and home workshop. Ed put a small amount of lighter fluid in a plastic bottle, allowed it to vaporize and asked for a volunteer, Marco Berera, to hold the ignition source below the open mouth of the bottle. The accompanying picture shows the results.

Ed also noted that the mixture of vapour and oxygen has to be optimum for an explosion. The correct mixture percentage varies from material to material, but a general rule is that 0% is too lean, 100% is too rich, but from between 5% to 9% is a general explosion mixture range.

MSDS

A good source of information about fire and explosion hazards for a material is in its Material Safety Data Sheet (MSDS). These documents are available wherever you buy the material. However, they are quite detailed so you may want to read the part you are particularly concerned about.

Check for the SADT; the Self Accelerated

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Alarms & Detectors

There is a basic difference between a fire alarm, and a fire detector.

A fire alarm alerts you that a fire has ignited while you are in the room.

A fire detector senses a fire and sends a signal to an alarm panel in a central location which, in turn, does whatever it is programmed to do; sound an alarm, call the fire department, call you, etc.

Do not mount a smoke alarm in a damp or dusty location like a bathroom or kitchen. Water vapour or dust can set them off.

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Marco Magic

B OILING
L IQUID
E XPANDING
V APOUR
E XPLOSION

Sometimes when a gas container such as a propane tank is involved with a fire it can have a unique reaction causing a **BLEVE**. This occurs when the liquid inside the vessel starts to boil. The quantity of vapour increases and expands rapidly and explodes

This is a very dangerous situation; Ed suggested the "NIKE" defense system to deal with it; "Run as fast as you can away from the area!!!"

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Decomposition Temperature at which the vapour of the material inside with explode.

Housekeeping

Ed advised that a clean shop is a safe shop. Good housekeeping is paramount. (Editor's note: My Industrial Arts teacher in High School always said, "The project is not finished until the floor is swept.". That statement certainly holds true here.)

Ed advised that if you have done any "hot work", you should keep a fire watch. Check back to the area frequently four at least two hours.

An interesting note to woodturners; wood's basic ignition temperature is 350° F, however, it can vary.

Ed's presentation opened a few people's minds as to the potential of a fire or explosion in our home workshops. With some focus on prevention and preparedness, we can minimize the chance of a dangerous situation. As we have said many times at our meetings and demonstrations, "Safety is Paramount".

Depth Measuring Gauge

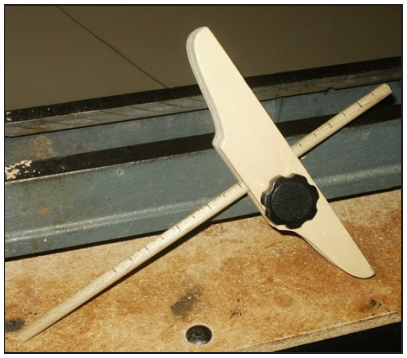
By Allan Cusworth

When I turn hollow vessels, bowls or jewellery boxes I often need to check the depth distance from the top edge to the inside bottom while I'm making them. The depth gauges that you buy are usually too small to measure anything bigger than a small ring box. I needed to make a larger one. To do this I created a depth gauge based on a compilation of ideas from various designs I found on the internet. The design that I came up with can be made in various sizes to measure different sized vessels. The one shown in the attached picture is 12" long by 8 1/2" wide.

I started with a piece of 3/8" hardwood dowel and marked it off in 1/2" increments for depth measuring.

I then used my band saw to cut a piece of 1 1/2" x 8 1/2" scrap softwood (pine) to the flat shape shown in the picture. The next step was to drill a 3/8" hole through centre of the edge for the dowel to pass through. This hole needs to be relaxed a little by running the drill bit through it a few times. Then I drilled a 1/4" hole through the flat side, just off to one side of centre. Next I cut a 1 1/8" deep groove in the edge of the flat piece on my table saw. This slot was made to so the flexible softwood flat piece would clamp onto the dowel.

The next step was to insert a 1/4" 20 tpi T-nut fastener into the 1/4" hole on one side to the flat piece. I then placed a 1/4" flat washer on a 1/4" x 1" male Jig knob, placed it through the 1/4" hole from the other side and slightly threaded it into the T-nut. After putting a little paste wax on the dowel I inserted it through the 3/8" hole. To use the gauge I merely placed the flat part on the edge of the vessel, pushed the dowel to the bottom of the vessel and snugged up the Jig knob. And, there you have it; a very inexpensive yet accurate depth measuring gauge.



Depth Gauge compiled from many ideas and designs