

The NAW Position on Fractal Burning

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There is wide scope for creativity in woodworking and it seems an endless supply of new ideas emerging which are applied to form, enhance, or embellish work. Readers who regularly attend symposia or follow woodworking forums on the internet will be well aware how quickly new and interesting ideas are picked up and spread. It seems one day you see a novel design idea in a finished work or a technique is described for the first time, and then in short order you begin to notice it everywhere. Pictures are posted on Facebook or Pinterest, clips appear on YouTube, articles are published in magazines, and reproductions and variations are placed on show tables. This fast pace of generating and disseminating ideas, and openness to share knowledge lends an extraordinary vibrancy to our craft.

The NAW, through its aim of *promoting, fostering and encouraging art and craft in wood*, generally embraces the sharing of ideas and endorses this outcome - but not at any price. We are also active in promoting safe practices for the benefit of our members and those in the wider community who may be exposed to the risks inherent in our activity. From time to time some new concern is brought to our attention and we are asked to advise and make recommendations for members. On these occasions we seek to take a rounded view, balancing the creative up-sides against any risks and potential consequences. It is extremely rare that we encounter a practice requiring such an extraordinary response as to discourage its use. This however is one of those times.

In recent years the reproduction of Lichtenberg figures using the process commonly known as fractal burning has become popular overseas to decorate wood articles. Fractal burning is a pyrographic technique which uses high-voltage electricity to etch branching tree-like patterns into the surface of wood. The essential equipment required, a high voltage (2,000V – 10,000V) power supply and insulated probes, is not readily available off the shelf. Instead, many of the instructional videos and articles available encourage the experimenter to construct their own from re-purposed parts.

In my day job as a practicing electrical engineer in a product design business, I know there are many regulations and standards which must be followed in order to produce an electrical item which is considered safe for regular use. Sadly, what I observed in many of the instructionals was sub-par and exposed the constructor or user of the equipment to risk of lethal electrocution from either mains or high-voltages. Moreover, the burning technique itself requires the operator to manipulate exposed, high voltage electrodes. Some sources, such as the Australian Woodworker magazine in a recent article covering the subject, emphasise what are presented as safer approaches. However, even there they acknowledge the risk of serious harm or death is not eliminated.

The NAW has been approached for views on the subject and within the committee we have held an extensive discussion around aspects of home-constructed electrical equipment, fractal burning processes, the related health and safety risks, and their implications for the NAW. In considering options we looked at regular reviews of the practice undertaken by the American Association of Woodturners (AAW) and their current position on the subject.

An article on the AAW website (<https://www.woodturner.org/page/FractalBurning>) explains the process and how it can be lethal, and states bluntly:

As of January 2019, we know of ten deaths caused using fractal, or Lichtenberg, burning. We only know of those deaths that are reported by the media and show up in internet searches; it is highly likely there are more.

The AAW has banned the use of this process at all of its events and has banned articles about use of a fractal burner in all of its publications:

The reported cases of fractal burning deaths range from hobbyist woodworkers through experienced woodworkers to an electrician with many years of experience working with electricity. It only takes one small mistake and you are dead; not injured, dead. Some of those

who died were experienced at using the process and some were not. What is common to all of them: fractal burning killed them.

High voltage electricity is an invisible killer; the user cannot see the danger. It is easy to see the danger of a spinning saw blade. It is very obvious that coming into contact with a moving blade will cause an injury, but in almost all cases a spinning blade will not kill you. With fractal burning, one small mistake and you are dead.

This is true whether you are using a homemade device or a manufactured one.

There are many ways to express your creativity. Do not use fractal burning. If you have a fractal burner, throw it away. If you are looking into fractal burning, stop right now and move on to something else. This could save your life.

The practice of fractal burning is not a minor health and safety issue – mistakes by the operator or a bystander unaware of the hazards can result in fatalities.

After much discussion the NAW committee has decided to take the same line as the AAW. We cannot issue a blanket ban on the practice or prevent people experimenting in their own workshops, but we can and will take the following steps:

1. The process known as fractal burning is prohibited from being used at any NAW-related events and activities (i.e. any events or activities run by the NAW and any events or activities supported financially by the NAW, including the supply of third party insurance).
2. The NAW will not feature fractal burning in Creative Wood (in editorial content or advertising), other than to warn against its use.
3. The NAW urges member Clubs and Guilds to publicise the dangers of fractal burning and to refrain from demonstrating or featuring the process in their premises (the NAW insurance policy may not cover any adverse consequences resulting from fractal burning). We also strongly suggest that individual clubs running competitions state in their rules that pieces featuring fractal burning are not accepted.