

The WORKSHOP

When Matthew Platt of Workshop Heaven asked the editor to test a new Rust Remover, he was so impressed he asked for the whole story...

AND THE RUST, AS THEY SAY, IS HISTORY

All metals which occur in nature as oxides, including iron, have to be processed in order to isolate and extract the element in a useable form. Nature being what it is, the material will then spend the rest of its 'life' persistently trying to revert to its natural state as a lump of oxide. Iron has a number of oxide forms but the most familiar is the orange/red form we call rust. Perhaps less familiar is the black 'rust' Magnetite, which in its natural state is also called Lodestone and being a ferromagnetic material, formed the basis of the early navigational compass.

For the surface of our tools to corrode, we need a 'bare' unprotected surface and an electrolyte, the most common electrolyte being water in the form of vapour. Below a Relative Humidity – RH – of 50%, the electrolytic corrosion process is very slow. However, when the RH rises above 70% the rate of corrosion increases significantly. The Met Office website has some interesting information on average RH levels in the UK. The minimum RH in the UK during July averages around 60%; in January it averages 80%. The maxima are nearer 90% to 95% RH. Clearly, corrosion is going to be a potential problem throughout the year. The RH will be higher within 5-10 miles of the sea, where there may be the additional problem of wind-blown salt spray; the chloride ions in salt accelerate the corrosion process significantly.

To stop corrosion is literally a physical impossibility; it is far more realistic to talk about reducing it to an acceptable level. There are various methods of slowing the process down, some more effective than others. Traditional barriers like grease and paint work by simply keeping the metal separate from the water vapour in the atmosphere but as soon as the surface is broken, the corrosion process starts. However, the latest products developed for protecting tools work by actively interfering with the electrochemical process.

One firm leading the way is Shield Technology run by Paul Prince, a highly qualified aircraft engineer. With 17 years manufacturing aircraft components under his belt, Paul first developed his corrosion inhibiting products during a stint as Technical Director of a firm called Enginewise. Though the firm closed its doors in 2005, Paul continued to receive calls from former customers asking where they could get his corrosion inhibitors. So, in September 2007, he set up Shield Technology and started making them again, this time focusing specifically on developing highly effective, straightforward to use and economical products to protect hand tools, wood and metalworking machines and accessories. In the brief time that the new company has been going, Paul has developed a suite of products to cover a variety of applications.

His most popular and widely used product is ToolGuard VCI – Vapour Phase Corrosion Inhibitor. ToolGuard VCI is a small plastic pot approx 1 1/2" diameter by 1/2" deep (35 x 12mm).. It contains a tightly fitting felt pad which is saturated in a unique VCI compound. To use it, you simply remove the lid, place it in a toolbox or chest, even a plastic power tool case and let the vapour get to work. Each pot can protect a 2 cubic feet (50 litre) volume for up to 12 months.

The great benefit of VCI technology is that it is completely non-contact. No grease or oil is involved, and the vapour will find its way onto every surface that water vapour can get to. As well as tool cabinets, I also have them tucked away inside the cabinets of my stationary machines to protect the electric motors and the inner workings.

For protecting bare metal surfaces of machinery and components, there's MetalGuard Ultra which dries to form a soft, clear, thin-film coating, 2 microns thick, that will give up to 2 years protection in a typical workshop environment. Like all the Shield products, it is silicone free, so there is no danger



First, retrieve rusty tools from behind the editorial workbench... Then mix 1 part Rust Remover with 19 parts tapwater – it's that economical – and put in the tools. Two hours later, this was the result. The mixture, which also works on steel engine parts, continues working until the liquid turns black, when it can be safely disposed of down the drain.

of contaminating surfaces that are to be painted later.

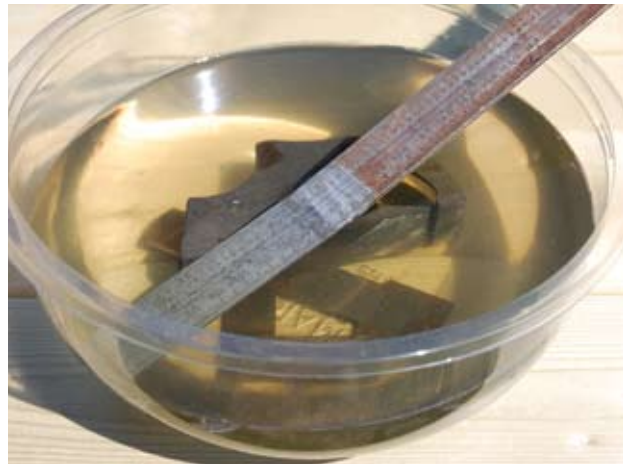
HoneRite Gold is a water additive designed to make water non-corrosive and is intended for use with the powered water stone grinders such as the well-known Tormek machines, Japanese water stones and diamond honing plates. By treating the water itself, HoneRite Gold protects the machine and anything in the vicinity that may get splashed.

For oilstones there is HoneRite #1, an ultra-low viscosity honing fluid with added corrosion inhibitors. As well as being a highly effective lubricant, it can also be used to rejuvenate old oilstones, which have become clogged with oil and metal debris. Once sharpened, the tools can also be wiped with a little HoneRite #1 and stored safely for another day.

For long term protection in very harsh environments, the company produces GreaseXtra, a highly refined, gelled mineral oil, with, in Paul's words, "a huge percentage of contact corrosion inhibitors". Originally developed for use on the exposed tailwheels of light aircraft, it's ideal for the wheel bearings of boat trailers and launching trollies, as well as a multitude of uses in the workshop. Due to its high melting point, approx 200°C and the fact that it is virtually impossible to emulsify, it has also proved popular amongst the steam boat fraternity.

One of the latest products is ProtecTool, a soft paste-type wax polish with the addition of a contact corrosion-inhibiting package to protect both ferrous and non-ferrous alloys. Designed to protect and lubricate woodworking machine tables, machine beds, handsaw blades and the soles and sides of metal-bodied hand planes, it is applied sparingly with a soft cloth, allowed to dry for a minute or two and then buffed to a shine. It gives a nice slippery surface over which timber slides easily and protects against corrosion – including staining from 'rusty' fingers.

All the products mentioned so far are about preventing rust and corrosion but 'prevention is better than cure' is the last thing you want to hear when you have just discovered that your favourite chisel had rolled under the sole and has now turned orange. There are commercial rust removers on the market, most of which are based on preparations that include phosphoric acid. They do remove rust but they can



also cause flash rusting once the part has been removed from the de-rusting solution. There is also a more serious drawback to acid based de-rusting fluids; they react with both the rust and the sound metal.

Paul's latest product and one of which he is justifiably proud, is a biodegradable, non-toxic, water-based, Ph neutral, de-rusting solution called Restore Rust Remover. The really clever bit is that it only reacts with rust, leaving the good metal completely untouched. It also contains a mild corrosion inhibitor to prevent post-treatment rusting, giving plenty of time for the surfaces to be re-painted, re-plated, or treated with any of the other products.

The contents of the 500ml bottle, which you simply dilute with tap water, makes 10 litres of solution. Having tested the product myself I can honestly say the results are absolutely astonishing: even on very heavily rusted items, it removes every trace of rust. The solution is re-usable several times over and because it is biodegradable, once you have finished with it, you can simply pour it down the drain without harming the environment. Brilliant!

A highly concentrated de-greasing fluid, also water based, is available to treat heavily contaminated items prior to de-rusting. It's similar in use to a paraffin bath but less damaging to skin and again you can dispose of it down the drain.

I have been so impressed with how effective, easy to use and economical Paul's products are, I have taken the plunge and Workshop Heaven has become the first company to stock his entire range. It's great to be able to support a new and enthusiastic British firm with world class products.

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