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TO WILD TRADE
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NY architect to
Colorado craftsman

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for a more efficient
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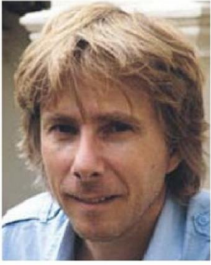
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Welcome

... to getting more

Marking and cutting joints by hand is, let's face it, a labour of love and one that we like to take our time over so we can enjoy the full cycle of the process. But what if I said there are ways to get the same result in less time, would this defeat the whole object? For some of us it's fine-tuning the process that's the hook and in this issue we've got some tips from John Bullar that will help you hone your technique for the holy grail of joints; dovetails.

If there's a theme this month it has to be spending less and getting more. How so? By going green of course. February is an odd month, still in the clutch of winter and not nearly close enough to spring for the sap to be rising. But don't fear, help is at hand as we follow Michael Huntley's steps to achieving a warm workshop without breaking the bank. We've also travelled to Calgary and the home of Andy Lockhart to learn how his solar powered kiln operates in temperatures as low as -45°C.

Andy produced this rocking chair which we will be looking at in greater detail in a future issue but for now here's a taster. Chairs tend to present us with more challenges than any other piece of furniture and even more so rockers. Add a sprinkling of dovetails and I think you'll agree this piece is a tour de force in every respect.

Given that there's very little room for manoeuvre with regards to the height of the seat and angle of the back, for a chair to function

as a comfortable platform it's quite staggering that we manage to come up with so many variations. There are elements of great makers in every great piece of furniture and I'll leave you to reach your own conclusion as to where Andy found inspiration for his rocker but do you know what tickles my fancy? It's purely visual, but the pins are sometimes where the sockets should be. What was that I said about room for manoeuvre?

Elsewhere in the magazine this month we'll be showing you how to prolong the life of your bandsaw blades by sharpening them yourself. Sounds like a lot of work but I kid you not, you'll be done in 20 minutes tops. So, let's get down to business.

Derek Jones

Derek Jones

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Woodworking is an inherently dangerous
pursuit. Readers should not attempt the
procedures described herein without
seeking training and information on the
safe use of tools and machines, and all readers should
observe current safety legislation.

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Image: John Bullar

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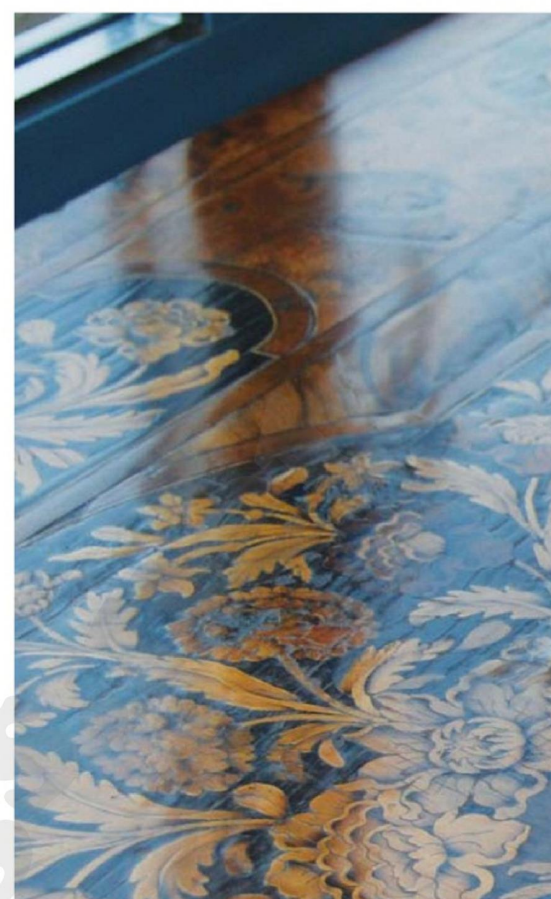
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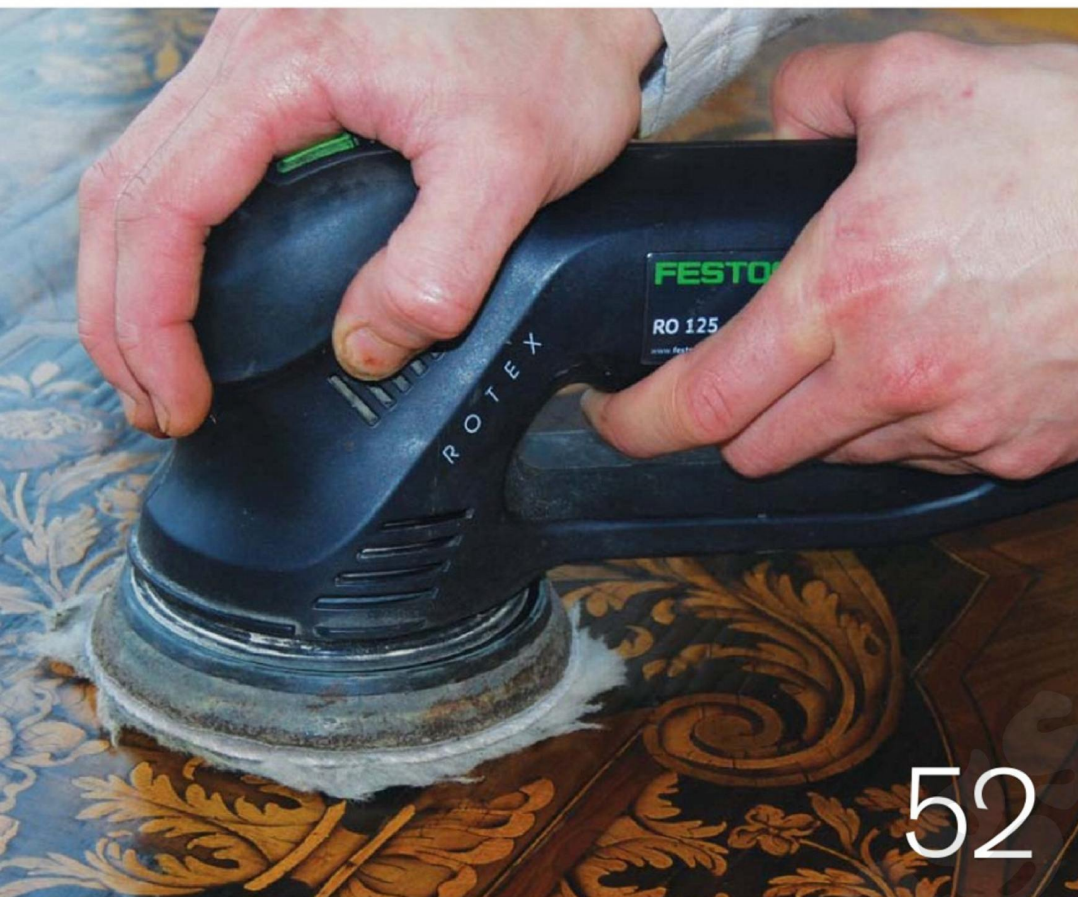
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Don't forget there are plenty more articles and discussion to be found on the Woodworkers Institute website –
www.woodworkersinstitute.com



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Contribute to these pages by telling Vanessa Austin Locke about matters of interest to furniture makers. Call her on 01273 402858 or email vanessaal@thegmcgroup.com. Please accompany information with relevant, hi-res images wherever possible.

News&Events

The Peroni Collaborazioni Talks: with Fabio Novembre

Fabio Novembre is an Italian designer of considerable note. Vanessa Austin Locke went up to the V&A where he was speaking as part of The Peroni Collaborazioni Talks. He was being interviewed by Editor-in-Chief of Dezeen Screen, Marcus Fairs, in front of a live audience with

a Q&A coming from Twitter.

Italian design has given us some real innovation over the years, not always in the best possible taste in many opinions. Fabio is no stranger to criticism on this front after his famous "Bum Chair" was voted worst design of the year by

Wallpaper Magazine. Novembre's work has played a pivotal role in the development of Italian design and in the past he has worked with leading Italian design brands from Cappellini to Casamania. His first commissioned architectural project was the Anna Molinari Blumarine shop in Hong Kong in 1994 and previous projects also include the unique design and architecture of the SHU bar in Milan and the Stuart Weitzman shoe store in Rome.

He began his talk with the quote, "Italians: people good for nothing but capable of everything." (Leo Longanesi, 1955). Far be it from us to be the judges of that Signor Berlusconi, and leaving the potential for political comedy out of it, let's talk about inspiration.

For Novembre, as for many, inspiration lies in the female form and his slideshow was an homage to various muses, headed up by his wife. While I know there is at least one maker who will beg to differ here, Novembre sees female form as being entirely about curves, softness and fluidity, while men, in his opinion, are hard and square.

His magnanimous and friendly demeanour included the audience in what was essentially a mutual conversation. He described everything with enthusiastic gesticulation, which is apparently typical of his direction style. He doesn't actually draw architecturally and renders his work by 'conducting' the craftsmen to erect it. Dutifully diligent students of architecture looked on astounded, wondering if they too could get away with ditching their pencils/computer programmes.

What's lovely about this designer/architect/visionary/intellectual is that he is his work and his work is part of him. Everything he makes relates very personally to him, his world, his perception and the people around him. One could almost describe his work as autobiographical. This might be seen as large-scale vanity, but I'd like to look at vanity, not in terms of flaw of personality, but as a



Known in the industry as 'The Bum Chair', this piece was voted 'Worst Design of the Year' by *Wallpaper Magazine*



Fabio directs his work with enthusiastic gesticulation rather than architectural drawings

legitimate way to digest the world we live in and our experience of it.

He draws the comparison between creativity and a flower; outwardly beautiful and with no obvious purpose but we all know that the pollen is passed around and actually supports our entire ecosystem. This comparison makes me think of the great curator Hans-Ulrich Obrist who was quoted as saying that artists are the most important people in the world.

I'd love to take you through this talk almost word for word, but sadly there's just not space here. I would encourage you to go to www.dezeenscreen.com where you can watch the entire talk and even get a transcript I believe. So go and make friends with this expressive designer for yourself and hear his thoughts on apples, apprenticeships and why trees are the real-life angels among us.

Celebrating 40 years in the trade

Axminster Tool Centre is set to celebrate 40 years in the business this year.

Axminster Tool Centre will link up with a local ale festival to celebrate and plans to host its own mini show within the festival. A line-up of top notch, professional demonstrators will include furniture maker, Tom Kealy. Visitors will have the opportunity to try a range of woodworking products and tools from the top power tool manufacturers Bosch, Makita and Festool.

This show has the potential to be a really enjoyable day out for those who love tools or just want to experience an old-fashioned country show.

When 23-24 June, 2012
Where Axe Vale Festival Showground, Axminster
Web www.axminster.co.uk

Bucks MA Restoration, Conservation and Decorative Arts End of Year Show

– Anthony Bailey reports

I must confess a personal interest as my daughter Amber Bailey is on the BA course having seen the previous MA show and been inspired to study at Bucks New Uni. You can read her blogs on the F&C section of the WWI website.

It was good to meet several of the students that Michael Huntley and I had previously met on our trip to Wilton House when the MA students were hard at work on a week's conservation there. This show represents their final work as the course runs January to December except for those students who are part time, in which case it runs for two years.

The course leader Dr Campbell Norman-Smith expects all MA students to have previous 'life experience' of some sort rather than transferring directly from the BA course. Typical of this was Hannah Weston-Smith who had previously studied 3D design and done practical restoration work but she was keen to develop a better understanding of the construction and development of antique furniture. In fact Hannah was showing several pieces, which she had upholstered in the correct fashion for each piece.

Steve Metzler who moved to Germany and then the UK from America 15 years ago working in IT, wanted to return to his early interest in furniture and restoration. He runs his own business while having taken his MA. Once finished he'll finally return to the USA to start a new restoration business there. He was showing several pieces including the restored sled pram from his childhood and a vase, which was glued and required careful deconstruction and reassembly, but the vase neck had 'sprung'. Steve unbelievably, forced the porcelain into shape by clamping while the epoxy resin dried.

Dr Bryony Gray had a carved panel on display, which originally had a thick lime render coating, she tried conventional safe stripping methods but then resorted to laser treatment and finally a special sonic cleaner which was an uncomfortable experience for fellow students. She also repaired the floral carved detail and punch patterned the background.



Hannah Weston-Smith and a chair she has re-upholstered in the correct style

Malcolm Bevan, another mature student showed me a highly ornate gilt framed painting from Birmingham Museum and Art Gallery. The frame had various holes in it and the thin timber backing required repair before rebuilding the compo mouldings and gilding over, before finally toning it back to the correct finish.

My abiding impression is the amount of research involved and the use and understanding of chemistry and modern science to aid difficult conservation work which in each case has to be a reversible process so future conservators can carry out further work if needed. If you're interested in joining such a highly specialised course then contact Julie Catlow for further information on julie.catlow@bucks.ac.uk.

News *in* brief

Chippendale School team inspired by restoring a Swiss chalet

Creativity, Money, Love

Creativity, Money, Love is a collection of responses to the question asked by Creative & Cultural Skills and A New Direction. "What does the education and skills system need to look like in order for people to lead fulfilled creative lives, and in order for the creative and cultural industries in the UK to thrive?" Those at the forefront of their fields have been asked to consider education in the broadest sense, from the school curriculum to vocational training, from university teaching to informal learning and to think about how the education system could and should be changing. It's a fascinating and inspiring read, just bursting with, well... creativity, money and love. Download a PDF and have your say here www.creativitymoneylove.co.uk.

Holtey winner

Congratulations to Jim Ryan of Putnam Valley, NY, winner of the Centre for Furniture Craftsmanship's coveted Holtey plane. The raffle drawing was streamed live and Jim happened to be watching when he was named the lucky winner. Jim commented, "It's hard to describe the feeling of winning. I just intended to donate money to the school; I never imagined that I'd win." A very grand total of \$5,900 was raised for the Centre.

The Viking Rocker



The beautiful Viking Rocker

Chippendale School of Furniture student Quentin Dimmer was delighted when his chair was chosen to take centre stage in the Scottish International Storytelling Festival based on Edinburgh's Royal Mile at the Storytelling Centre. His storytellers' chair, The Viking Rocker, was created earlier this year while learning the art of furniture making on an intensive, nine-month course at the Chippendale School of Furniture near Edinburgh. Made in cherry yew and sycamore with laburnum details, Quentin's remarkable rocking chair also won the Best Design Award 2011 from the Chippendale School of Furniture.



COURTESY ALI EASTON

The offer came from my woodworking teacher and now mentor, Anselm Fraser. He stuck his head round the door and said why don't I join him in Switzerland for a week or so, working on the restoration of some very old farmhouse chalets in the glorious mountains south of Lake Geneva.

My new life has centred completely around bespoke furniture, but as a woodworker it's impossible not to be seduced by almost all forms of the craft. Buildings and the process of building with wood had begun to fascinate, and anyway, who's not a sucker for a beautiful Swiss chalet? The chance to work on one, in fact, to save it from ruin, to savour the rustic elegance of its lines, and feel the weathered Alpine pine on the blade, was an offer I couldn't refuse.

Robert Louis Stevenson famously said, "to travel hopefully is a better thing than to arrive, and the true success is to labour." I travelled hopeful of learning, hopeful of broadening my woodworking experience.

It turned out to be a hugely enriching experience. I was inundated with new ideas, new ways of working, and new techniques in wood. But of course these ideas were as old as the hills and had been known to the Swiss farmers who have lived for generations in these mountains.

Staircases, consisting of two straight beams, laid across with great wedges of pine to form the treads, cut from sections of the round log, quartered along its length. Simple and quick to make, requiring so few tools. Massive roof rafters, simply felled trees, de-barked and

hefted into place with manpower alone. Huge door hinges made entirely of wood, the vertical pins formed by carving away timber from the thick doorjamb. And the matching barrel, a hole drilled in the horizontal rails on the door. The door simply drops into place, the barrels falling down over the pins. No metal work required, no screws to buy, so few tools required to make it. So elegant!

These ancient solutions to everyday problems of living and shelter on a high Swiss mountainside have lots to say to us today. The locality of the materials was a lesson.

Even today there's no road into these upper houses. If you wanted to bring materials in then you'd have to carry them on your back. It made sense to use what was around you, and in turn to manage the landscape carefully to ensure those materials were always going to be available. The forest is fuel, building materials and avalanche

protection. Waste is easily dealt with because almost everything was wood and left in the open uncovered it will quickly rot back into the ground. Nutrients return to the soil and no landfill problems to worry about.

So having returned to my own furniture workshop, with the Lammermuirs again on the horizon, I reflect on the trip and what it means for woodcraft here in modern Scotland. While the ancient Caledonian forest is largely gone, Scotland does have forests of both conifer and broadleaf, and the old rule still applies: if managed well, nature will provide infinitely.

Ali Easton – Organic Geometry



Workshop library

This month we review *Treasure Chests* and *The Workbench Design Book*, plus a few dates for your diary over the next few months

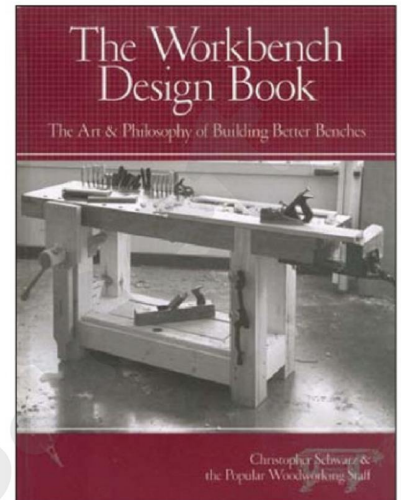
The Workbench Design Book: The Art & Philosophy of Building Better Benches

Published by Popular Woodworking Books US \$34.99 hardback 254 pages
ISBN 978-1-4403-1040-9

This book addresses the question: Which workbench should I build? We all know how important the workbench is, but which one is right for you? This book is brought to you by Popular Woodworking Magazine, headed up by Christopher Schwarz. It's a solid book, nicely laid out with nine complete plans for tried and tested workbenches that you can build. The benches are also reviewed, critiqued and given pluses and minuses so you can really narrow down what's going to work the hardest for you. It's shot in black and white, which gives it a beautiful, classic feel and the illustrations and diagrams are clear. Schwarz

also wrote *The Anarchist's Tool Chest*, which has been a firm favourite with you lot this year according to the number of enquiries we received on it. And it's true that he does manage to make the subject very readable, with a light, humorous tone. There's a chapter on workbench makeovers with before and after illustrations if you don't want to go the whole nine yards and another with all the latest information on wood holding devices. All in all, another lovely addition to your workshop library from this charismatic woodworker and author.

Vanessa Austin Locke



Treasure Chests: The Legacy of Extraordinary Boxes

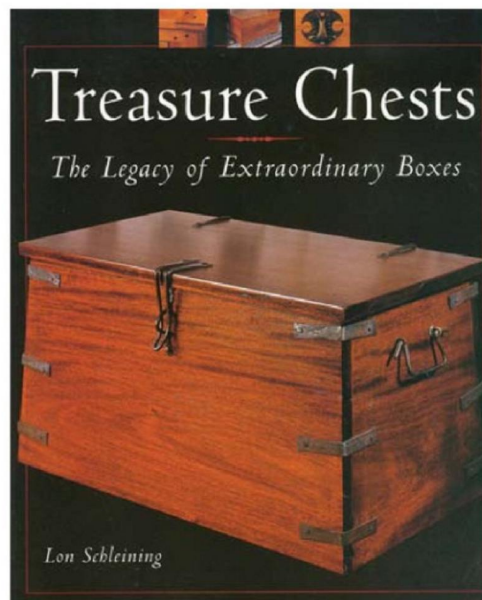
Published by The Taunton Press US \$24.95 paperback 200 pages ISBN 978-1-5615-8651-6

I just loved this book. Chests are most certainly my favourite item of furniture, closely followed by wardrobes – complete with lions and witches of course. From my mother's tantalising jewellery box to the blanket chest my pirate-clad brother used to shut me in to Pandora's box, chests to me hold secrets and stories and, of course, treasure.

And that's exactly what Lon Schleining manages to encapsulate in this book. Treasure. It's a collection of stories of different chests, illustrated with beautiful, bright pictures that really bring the pieces off the page. As I write it's deadline day just before Christmas and I've been absorbed in this book for nearly an hour, which I think demonstrates just how enchanting it is. I wish it were hardback, with a padlock and key, designed up like a chest, but I suppose that would make it rather more expensive. My particular favourite was Henry Studley's incredibly compact and intricate tool chest on page 67. I just can't imagine the level of design ingenuity that went into that. Another favourite was the miniature rolltop desk in the Sea Chest chapter on page 129. Just thinking about the correspondence written on it and the journeys it's taken threatened to send me into another hour-long daydream. And finally the folding cot-in-a-suitcase on page 136, custom designed by Louis Vuitton for explorer Pierre

Savorgnan de Brazza when he was off to the Congo in 1876. And still entirely chic! I'm going to go as far as saying that this is my favourite book I've ever reviewed for F&C. I hope you enjoy it as much as I have, it's truly magical.

Vanessa Austin Locke



Diary

March



Chair Making Course – Mark Ripley

When 2–6 March 2012
Where Boat Building Academy,
Lyme Regis
Web www.boatbuildingacademy.com

South East Woodworking Show

When 9–10 March 2012
Where Kent Event Centre,
Maidstone
Web www.nelton.co.uk

April Yandles Spring & Autumn Shows

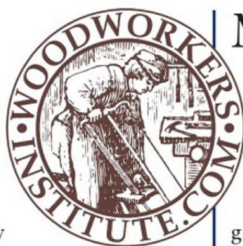
When 13–14 April 2012
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What's online

A little taste of what's happening on the all-new Woodworkers Institute

Welcome to the new website

Our Web Editor, Tegan Foley, is online each day bringing you fresh, original content in easy, free formats. With an extensive archive of over 1000 woodworking articles, daily features and press releases, plus the fun and active forums and social media plug-ins, it's the place to go when you've devoured your magazine, but still want to learn more. If you've got anything that you think should be featured on the Woodworkers Institute please get in touch with Tegan at teganf@thegmcgroup.com.



Maker of the week

Sylvie Rosenthal started building at age six at the Eli Whitney Museum where she made circuses, catapults, rockets, and robots and was introduced to the work of great inventors and artists such as Alexander Calder, Leonardo DaVinci, and AC Gilbert. Her formal study of traditional European woodworking at the Rochester Institute of Technology's School for American Crafts (BFA '03) tempered these explorations and instilled a dedication to craftsmanship. Read more about Sylvie, one of our Makers of the Week, on the Woodworkers Institute.



From the forum

User Wheels is looking for tips on his Trend T11: "For bit changing, should the table top hinge up, is it better done from under the table, or can it be done from above? Haven't bought my router yet so any advice for or against would be very welcome." User Daveo replied: "It's always a good idea to hinge the table, however be careful of what's above the table i.e. shelves etc if room is limited then hinge on the back of the bench. If it's clear then you can hinge end to end if you get my drift. However definitely hinge one way." Do you have any thoughts to add? Go to the Furniture and Cabinetmaking forum and join the conversation.



Special features

Some time ago Kevin Ley spotted a half butt of very interesting-looking walnut in a wood yard, while purchasing some elm for another project. He bought it, had it planked, sticked, air-dried, kilned and delivered to his workshop. There was burr and a lot of wild grain, though with a fair amount of soft sapwood waste; it was an exciting find and he went ahead and made a chest of drawers in burr walnut. His step-by-step guide with images is now available for free at www.thewoodworkersinstitute.com.

Tree of the week



Did you know that elm is virtually indestructible under water? In the past it has been used for piles, water pipes, ships' pumps and keels. When it is alternately wet and dry, however, it is prone to rot and decay, making it ideal for coffins. For more facts on elm go to the Woodworkers Institute.

Weblogs

Amber Bailey and Sam Bradley are our brand new student bloggers. Amber is at Bucks and Sam is at Rycotewood and they're going to be telling you all about their journey into making and training. Keep up with them at www.woodworkersinstitute.com



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Meet the makers: Scott Friedman

The Colorado Craftsman

Scott Friedman talks to Vanessa Austin Locke about his journey from architect in New York working on the World Trade Center to woodsman in the Rocky Mountains to craftsman in Colorado



Scott Friedman in his workshop

Scott Friedman is currently designing a 100ft² + built-in storage system for a couple in Boulder, Colorado. They need two armoires, the equivalent of a chest of drawers and as much additional storage as the space will allow without appearing excessive.

The piece will be solid hardwood and may incorporate glass and laser cut steel with cut-in pattern work. He's also working with several local micro-breweries in the area. The micro-brew scene has been growing very quickly in Colorado so he's been getting to know "those folks" by marketing beer sampler flights and tap handles to them.

His earliest exposure to actually designing and building furniture was in the design 'shop at the University of Kentucky, College of Architecture.

"I recall feeling a bit frustrated that all of my architecture projects ended with the construction of a 1/8 scale chipboard model." Furniture allowed him to take an idea from conception to absolute completion. When he moved on to architecture at some of the larger firms in Colorado his experience was that of a small cog in a big machine. "I wanted to be involved in the early stages of design, structural engineering and of course construction."

Following eight years in architecture, which included a stint in NYC working for Studio Daniel Libeskind on the World Trade Center redesign, along came the 2008 economic downturn.

With the construction and architecture industries tanking, he went to live on a ranch in the beautiful Rocky Mountains, spending his days alone, felling trees. "A touch of simplicity amidst the red tape and code reviews of my previous job." When winter came and the snow was too deep to work he headed to Central America. Four months, eight countries and a lot of soul searching later he returned to the States with the idea of starting a furniture studio. His love of travel is the inspiration for his studio's name, Gitane (pronounced zhee-tahn "zh" like the "s" in treasure) which is French for 'gypsy'. "Part of the fun that I get to have is naming each piece within my collection after a place that I've travelled to and gained some inspiration from."

Inspiration

Aside from nature, which will always be his greatest inspiration, Scott describes how the materials themselves are an inspiration to him.

He tends to find his inspiration for the design of each individual piece within the program or function itself, however, "a love of the materials and finding a way to express their qualities and beauty has always been a starting point for me."

Growing up Scott used to see his father build furniture, which was very inspiring for him. He describes how his father would cut a cherry tree and create an entire bedroom suite that would impress any woodworker. "I saw that this hobby of his was art and sculpture while also being functional and personally rewarding."





The Coban Buffet
in oak

more than one piece at a time. When it comes to collaborating with clients he has a similar outlook to many designer/makers, "I find that at times the design can become a bit diluted. If I'm the only person involved in the design process it can be easier to maintain the purity of the end product."

That's something that a lot of furniture makers seem to relate to; design is often the most important part of the process. "I'd like to think that design comes first in my process. I'm very technique driven in the 'shop but most of my projects start in the sketchbook. Having said that, I find myself designing at times with a high degree of technique. I tend to be structurally driven when approaching a design. I consider the program and function first of course, but once I have the rough considerations for function established I almost always jump to questions such as 'what kind of structural forces are at work here?'"

If I'm designing a piece of casework for instance, I give a great deal of thought to how the case will be elevated off of the ground and allow that solution to inform the entire piece. The Coban Buffet is an example of this process. ➤

With regards to contemporary inspiration a client recently showed Scott some images of built-in projects by a studio in Seattle, Washington by the name of Kerf Design. They design and build beautiful shelving and cabinetry from high-end plywood, plastic laminates and hardwood veneers. "I normally work in solid hardwoods and don't give much consideration to the potential beauty of plywood, but these guys have taken it to the next level."

Design and process

Approximately half of Scott's work is speculative or designed and built for his line of furnishings. He also enjoys working on commissions as well, but finds that designing for his collection has the potential to be more efficient. He tends to build a lot of jigs and fixtures in the fabrication process, which are often project specific so if he has the opportunity he'll build

The Coban Buffet

The Coban Buffet twists the eye with its apparent a-symmetry. It's a combination of new and found materials. The base is constructed from entirely found objects, on a farm in fact. The rusted plough heads, mounted on heavy, weathered timber beams are set in sharp juxtaposition, old against new and Scott describes it as, "a unique response to the dining room buffet casework type." The casework is constructed from bent laminated corners, oak hardwood, sliding glass doors and custom fabricated metal drawer pulls. Traditional wood joinery – blind splines and dowelled connections – are used in order to maintain the craftsman's integrity in this piece. Mid-century modern meets mid-western farm perhaps? "My work is often referred to as mid-century which I can't say I am necessarily happy about, because I'd prefer not to be categorised in a style that's decades old. Having said that I have a huge appreciation for that style, in how it moves away from revivalism and towards a more pure response to what it was they were designing and the materials with which they were working." Whatever, it's entirely delicious and tres chic.



Monarch Coffee Table in walnut

- When making, after the programme's been established he begins with a series of loose sketches. Once he's established an idea, which he'd like to explore in depth he models it in the computer with SketchUp.

He used to build lots of scaled physical models but finds that playing with the proportions is so much quicker on the computer. He typically goes back and forth from sketching to modelling at this point until the design is finalised. Since the computer model ends up being precise he doesn't

do construction drawings any more. Instead he builds directly from the model. At this point he builds any necessary jigs and/or fixtures, gathers the materials and, "starts making dust."

When it comes to the ever-elusive creative process, while being highly responsive to the program and structural forces that act upon it, Scott admits that he's at his best when he's sketching very loosely. He finds that the subtle imperfections in a quick, loose sketch often give way to new ideas. Although he's had a formal education in architecture which included a lot of artistic drawing and sculpture, it seems that he has the

intrinsic and overriding instinct that's often channelled through the hands of a born craftsman rather than the cerebral, ethereal thought process of an artist. "The craft side of me seems to run a bit more deeply."

Exhibiting

In the past Scott's exhibited his work alongside other architects, showing a variety of mediums such as painting, sculpture, jewellery and textiles. He likes showing in this set-up because of the diverse crowd it draws as well as the non-competitive environment. He's exhibited at the International Woodworking Fair design competition in Atlanta with his Ton Sai Coffee Table. That was very exciting but a bit larger than would normally suite his personality. He's hoping to get involved in more competitions in the near future though.

When asked what he thinks about the future of furniture making he's philosophical. "Perhaps the current and previous modes of fine furniture making may go away. It isn't something that concerns me



Beer sampler flights for the growing micro-brew scene in Colorado



The Coban Coffee Table in red oak

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though. I think of it more as evolving but I suppose that's more of a stylistic response. If the question was, "will the art of working with one's hands in a skilled, artistic and highly crafted manner disappear?" then my answer would be no. I think that working with our hands is an innate faculty, which won't easily be left behind. There are so many contemporary designers out there doing amazing things with modelling software. Some are working with materials other than wood but some are merging contemporary means, with traditional materials and methods, which creates beautiful results.

Yes, sometimes the envelope gets pushed too far but one can always come back to a good place of balance." And balance, like the Coban Buffet, seems to be the key word here for this thoroughly modern, diversely experienced, but ultimately old-school maker. If that's not too much of a contradiction in terms... Well, luckily for us two opposing truths can exist at the same time. *F&C*

Biscayne Bay Coffee Table in walnut





A single smoother for any type of grain... surely not?

Michael Bloomstein takes delivery of the new Veritas bevel up smoother from Lee Valley and gets more than he bargained for

All tools are effectively attachments, either to an inanimate power source, such as a machine or to ourselves, the animated users. Like all attachments, in order to perform their function well they have to lock on to the machine efficiently and this plane fits my hand very well. Not only does it feel comfortable it looks good.

I mention this because appearance, to me at least, adds a little bit of extra pleasure whilst giving impetus to the making process of a beautiful object.

This bevel up smoother (BUS) from Lee Valley is of a very robust construction, it's well balanced and heavy for its size. I believe the design to be based on the low angle Stanley No.164 produced in 1926 but around

40% heavier. Personally I like heavy planes, a high body mass helping to avoid chatter is very desirable in a smoother. Although a touch of candle grease will certainly help, Lee Valley have built the BUS so it can be set up to run cleanly across the most demanding of timbers.

Blade choice

This version came with a $\frac{3}{16}$ in A2 tool steel blade (Rc60-62) with a 25° bevel that required only a little extra work to prepare it for use.

It is perhaps rather unusual to have a plane of this size fitted with a bevel up blade, the most common being a block plane. However, the generous width of a smoother combined with the adjustable mouth makes a good combination. The mouth can be set to reveal a very small aperture; an invaluable feature when working on wild grain as it prevents break-out.

The blade is fitted in position in a very effective manner on to a 12° bed. The cap piece is of a good thickness, which allows plenty of thread for the lever cap knob to engage thoroughly. The owner's manual warns against over-tightening as this could introduce



The adjustable mouth closes to a very fine aperture



It also produced virtually transparent ribbons of lacy shavings

unnecessary stress to the casting, which is perhaps testament to the quality of the mechanism.

The Norris style adjuster is very well engineered and a pleasure to adjust with approximately 1/4 of a turn to compensate for any backlash in the system.

Benefits

One of the main benefits of a BUS plane is being able to switch between low and high angled blades to suit the task in hand. I must say I'm not all that keen on honing blades in order to adjust the angle of the bevel. It's a tricky operation and I'm sure that no sooner had I accomplished this task than I'd wish to revert to the former angle. I think it would be a good thing if the manufacturer supplied this plane with a range of different blades from the outset, so that we can immediately enjoy the versatility of working with different angled bevels. These are of course available on request and amount to 38° and 50°.

With the sides being square to the sole I tried this plane on my shooting board, initially for small work. The weight gives a certain momentum to allow it to be used to good effect on things like the side edges of small drawers. To further test its capabilities I found little resistance when it came to trimming the ends of some 12mm thick ash backboards.

Mouth adjustment

The mouth adjustment works very well. There's a little stop-screw to control the extent of travel to avoid contact with the blade; something that's sure to occur immediately post sharpening. Two screws located in the sides behind the mouth allow for the blade to be held square to the sole and permit you to reseal it precisely where it was if further sharpening is required before a task is complete. The manual also states that these obviate the need to grind a bevel perfectly at 90° to the side of the blade. It's easy to get carried away with the need to close the mouth, but being able to adjust for optimum chip clearance is also beneficial.

As with all wooden plane handles I worry about the possibility of them breaking as the direction of grain renders them vulnerable to damage. However, the handle on this plane is made from a close grain hard wood, Bubinga, which is both reassuring and easy on the eye. *F&C*

The Veritas bevel up smoothing plane



F&C verdict

This is a well-engineered, robust plane. The body is of a heavy gauge metal and all of its component parts perform their respective functions well. The sum of which makes for a satisfying experience gliding over the surface of the work.

To get the most out of this I'd recommend buying the full range of blades when you place your order. Just to add to the mix I should point out that they're also available in O1 tool steel. A toothed option for rapid removal of material is also available but one would surely have gone past this stage by the time you reach for the smoother?

Bevel up smoothers eh? Wait a lifetime for one and then they all turn up at once.

Pros

*A smoother for every type of timber
Quick to set up
Excellent quality
Good weight*

Cons

None

The numbers

*Length 225mm
Width 59mm
Bed angle 12°
Weight 1.25kg*

*Price £149.94
From www.brimarc.com*



Set screws in the side of the body help to guide the blade and maintain settings



A stop screw prevents the toe sole from colliding with the blade



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- Plunge base
- Carry bag



Trimmer base assembly.

- Enlarged opening section of base assembly for excellent bit visibility.
- Round base assembly for smooth and fast cutting.



Tilt base.

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- Tilting capacity: -30° to 45°



Plunge base assembly.

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Troubleshooting the bandsaw

Alan Holtham continues his series and this time he's maximising the performance of your bandsaw blades

So far in this series, I've looked at bandsaw blades and then how to set them up to maximise their performance. In this feature I'll concentrate on actually using the saw and troubleshoot some of the common problems.

Sometimes, no matter how steadily you feed the wood, or how good the blade is, the timber always tries to pull away from the rip fence as the cut progresses, and no amount of side pressure will keep it there. This effect was always characteristic of small, three-wheeled machines that had to be fitted with thin gauge blades so they could flex round the tiny wheels. For this reason the recommendation is always to buy a two-wheel machine that will take thicker gauge blades.

This advice now needs to be qualified, as there's a new generation of budget-priced two wheelers that have taken over from the three-wheeled machines. But these still have very small wheels and so also need the thin gauge blades, and again they will nearly always cut off to one side when ripping. For accurate cutting you need a two-wheel machine with wheels of at least 250mm diameter, preferably 300mm that can take blades up to 0.025in.

However, you can still get the same frustrating problem of 'lead' even with bigger machines and thicker blades.

Stop wandering

There are several factors causing this wandering, but it's usually a combination of blade stiffness and more often, blade set. Many cheaper blades are poorly manufactured with more set on one side than the other and there's nothing you can do to get these to cut straight, the only remedy is to take it off and bin it. Winding on more tension or setting the guides tighter will have no effect whatsoever on correcting lead. You'll often get a cheap, poorly set blade like this on a new machine so don't be afraid to change it straightaway.



► Knocked off

Sometimes you can actually damage the set on one side of the blade by, for instance touching a nail, or as a woodturner you may have been using a blade to cut lots of discs, in which case the set is knocked off more on one side than the other. If the blade is otherwise in good condition you can compensate for the lead in one of two ways.

The rip fence on most machines has some sort of adjustment, which allows you to off-set the face so that it's parallel with the lead on the blade. This is usually in the form of locking screws that allow the fence to twist on its main casting.

If you have plenty of budget you can actually buy a replacement fence like the Driftmaster, which has built-in micro adjustments for lead, but this alone will cost you as much as a small bandsaw. Alternatively you can set up a single point fence, which can be a very simple, temporary affair, or for more regular use make yourself a proper adjustable jig. This allows you to feed the wood in at whatever angle is necessary



Repeatedly cutting turning blanks will knock the set off one side of your blade

to compensate for the lead, but still keep a constant thickness as with a normal rip fence. This is a very simple answer to a problem that often

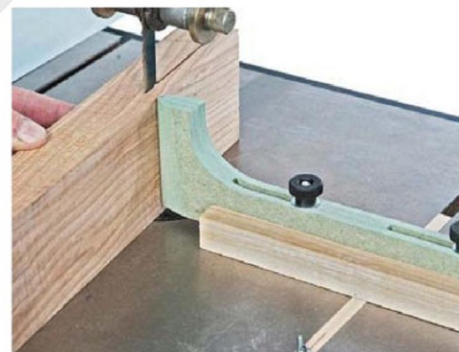
plagues bandsaw users and usually has them scrapping blades, which might otherwise have hours of life left in them.



The Driftmaster fence has built-in micro adjustments



A temporary single point fence is a quick solution



An adjustable single point fence will afford greater control while setting up

Barrelling



Barrelling is more pronounced on deeper cuts and can be caused by under tension as well as a blunt blade

Sometimes a cut starts well, but then the blade starts to lead and then bend off vertically. This phenomenon is known as barrelling, and if you continue forcing the cut, the distortion becomes more and more pronounced, and may eventually trap the blade and bring it to a halt. What is actually happening here is a combination of factors, but the main cause is that the blade has become blunt. You then press harder to try and make it cut, which forces the blade to take the line of least resistance and it tries to turn sideways. You can see this clearly where the back of the blade has twisted in the cut and put in a

burn line. In addition, the braking action of the wood pressed on to the blunt blade causes changes in the tension distribution through the blade and it starts bellying out, producing the characteristic bowed cut. This is always more pronounced in deep cuts or when ripping. The only answer is to fit a new, sharp blade. They never last as long as you think and demanding cuts like this will soon highlight a dull edge. If you're sure your blade is in good shape and you're still getting barrelling it probably means that the blade is under tensioned or you're feeding too hard. Check both these and the problem should disappear.

Where to pitch it

For much of my bandsaw work I use a $\frac{3}{16}$ in x 6-skip blade, which leaves a relatively poor finish on rip cuts, but this rarely matters with a bandsaw as it's only normally a roughing cut prior to some other operation. Surprisingly, a finer tooth pattern does not necessarily leave a better finish. The top piece was cut with a $\frac{3}{16}$ in x 6 blade, but compare the finish with the piece below cut with a coarser $\frac{3}{16}$ in x 4, which has left a much finer finish. There are all sorts of interactions going on here depending on the hardness of the timber, grain

direction, depth of cut, feed speed, etc. As I discussed last month you must constantly weigh up the relative advantages of different blade patterns for different cuts, versus the amount of time and effort involved in changing over blades. I suspect many bandsaw users are like me and can never be bothered to keep changing blades and so try and find one that covers virtually all situations. However, remember that your bandsaw will only cut as well as the quality of blade you put in it, so do buy good ones and replace them regularly.



$\frac{3}{16}$ in x 6-skip

$\frac{3}{16}$ in x 4-skip

A fine pitch blade won't necessarily result in a smoother finish. This has more to do with tooth set

Resawing

For resawing I generally do make the effort and switch to a wider blade. Resawing cuts by definition are usually deep, and have to be accurate, so put in the widest blade your saw will take. A $\frac{5}{16}$ in x 4-skip blade is an excellent choice for this job. I find that $\frac{3}{4}$ in wide blades tend to be at least a gauge thicker, which makes them harder to tension sufficiently unless your machine is a heavy duty one. The new style thin gauge blades from TuffSaws are much easier to tension, so try these if you have to use a wide blade on a small machine. However, I know that some users swear by narrower blades for resawing and there are some new 2 and 3 tooth versions available, which seem to perform very well.

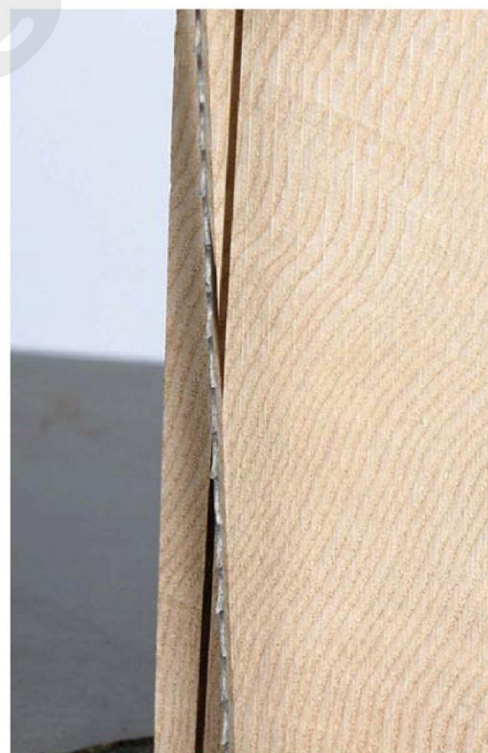
Before you start the cut, it's as well to check that the blade is at 90° to the table. You can do this with a square, but a quicker way is to just make a very shallow cut in the end of the board, then turn it round and offer it up to the back of the blade to magnify any error. If the blade fits in the kerf, the table is square. If not, as in this case, you'll have to tilt the table slightly to get it right.

Once the table is set perfectly, adjust the tilt stop so you can return it to this position without having to check it each time. On better saws there is provision to zero the scale, so with the table perfectly square take this chance to reset the pointer.

Take your time with deep resawing and feed firmly but evenly. There's a lot of material to be removed, so give the blade time to work and clear itself.



Wide thin gauge blades like these from TuffSaws are easier to tension on smaller machines



A test cut is the quickest way to establish whether your table is set square to the blade

This is where the coarser tooth blades are an advantage. If you start forcing the cut it will lead to one side and/or barrel. Coming out of the end of the cut is potentially the most dangerous part, because a large area of blade will suddenly become exposed very close to your fingers. So always use a push stick, and it goes without saying that for maximum accuracy and safety, always drop the blade guides down as

close to the timber as possible. With a sharp blade there's no reason why you can't rip off thin veneers in deep stock without a trace of the blade wandering or barrelling.

Be aware that resawing logs can be hard on the blades as the bark often contains grit and other abrasive nasties which will soon dull the edge, so Bimetal blades are often better in this situation.

► Washboarding

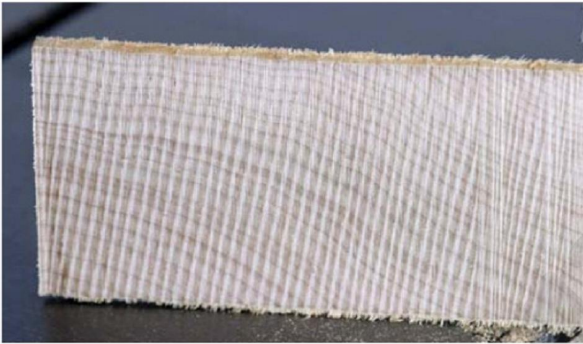


One effect you might come across is 'washboarding'. This very apt term perfectly describes the effect you get when the blade suddenly starts vibrating, leaving a heavily ridged surface rather like ripples on a sandy beach. As well as vibrating, the blade starts emitting a high-pitched screech, particularly when cutting hard timbers. The effect is usually put down to a blunt blade or insufficient tension. In fact it's rarely anything to do with either of these factors but is more likely due to the amount of support, or lack of it, for the workpiece.

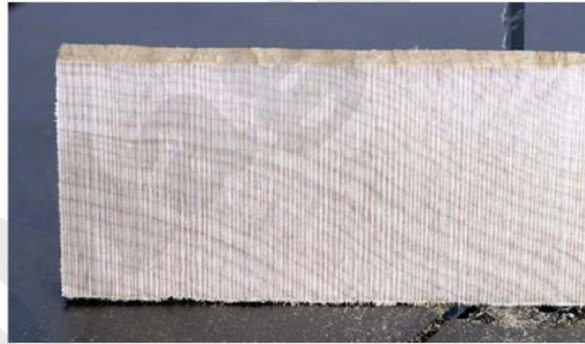
If you need proof look at the following pictures. Picture A was cut with the timber held very loosely, running with a rough sawn face against the table.

I planed the bearing surface smooth and guided the same timber much more firmly; the results speak for themselves. Washboarding is often more apparent at the ends of the cut and the reasons are demonstrated in picture C. Many bandsaws have table inserts that do not line up properly with the surface of the table. Whilst the timber is passing over this lowered insert it effectively has no support and washboarding occurs. As soon as the timber starts to rest on the table again as it gets past the insert, support is restored and the rippling disappears. So if you're plagued by washboarding reset the insert flush with the table and think about how you support the timber as you feed it into the blade.

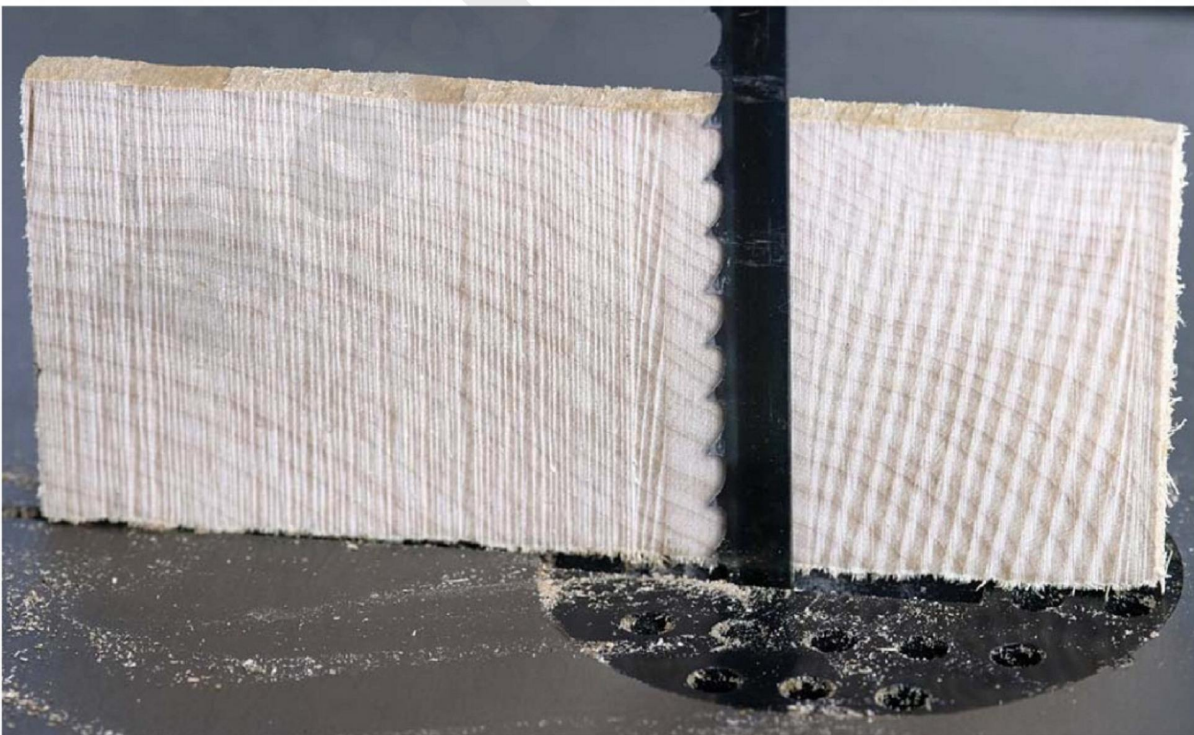
Deep grooves are the tell-tale signs of washboarding



Picture A. The coarse underside of the board allows vibration as it passes through the saw



Picture B. The same board now has a flat bottom surface and the washboarding has been eliminated



Picture C. Table inserts must be fitted flush with the table to avoid washboarding at the end of the cut

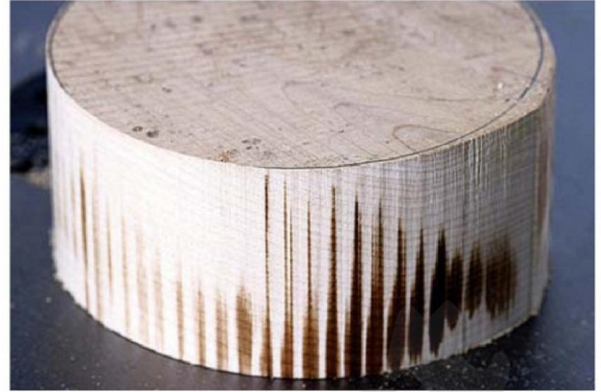
Stance

Taking up the correct stance at the machine is also important, as you need to be able to feed as smoothly as possible and preferably without stopping during the cut. Every time you do stop to change the position of your feet or hands the blade will leave a definite burn mark. Whilst this may not matter as regards the surface finish, any burning means the blade is wearing and overheating which will reduce its cutting life.

If you try and cut profiles with a blade that is too wide for the radius, even in thin material, the back edge of the blade will rub and burn the timber. A $\frac{3}{8}$ in general purpose blade will cut diameters down to about 2in, anything smaller than this will require a $\frac{1}{4}$ in blade. If you're cutting really deep in wet timber it's often difficult

to negotiate tight curves, but there are some new blades just appearing which have extra wide set for just this type of work, the wide kerf making it much easier to make small radius cuts. Look at the difference compared to a standard blade pictured.

Whilst on the subject of clearing swarf, a lot of manufacturers are now supplying table inserts that are drilled with a series of holes. This allows a lot of the fine dust that normally accumulates on the table to drop through, and if you connect up to a suitable dust extractor as well, the working environment becomes very much cleaner. This is particularly useful if you're using the rip fence, as accumulations of dust may prevent you getting the wood back tight against the fence.



Burn marks on circular cuts may well be as a result of using too wide a blade for the radius of cut



A blade with a wide set (left) will allow you to perform tighter cuts



Perforated inserts reduce swarf build-up between the board and the table

Release cuts

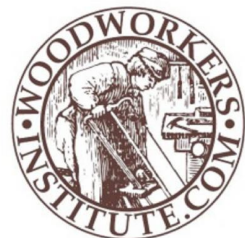
If you can't, or don't want to fit a narrower blade, try making release cuts at various points around the curve, as this will free the blade and allow you to turn it a bit sharper as the waste falls away. Even with a narrow blade, there are situations where you can't complete the cut in one go and if you try and backtrack out of it you end up pulling the blade off the wheels. At best the resulting bang just frightens the life out of you, but often it buckles or twists the blade irreparably. So plan the work carefully and put in release cuts to save this issue.

If you're having problems with the blade-tracking going out of adjustment during use, check that the tyres are clean as sawdust will drop down between the blade and the wheel and get pressed on to the tyre, changing the surface geometry.



Release cuts are a must for intricate shapes and tight curves

Particularly if you cut a lot of wet or resinous wood, make sure the wheel brush is set up correctly. This gently cleans the bottom wheel as it rotates and prevents any serious build-up of resin on the tyre.



If you've enjoyed this article on bandsaws, you'll find related articles on the Woodworkers Institute website – www.woodworkersinstitute.com

► Sharpening blades

I'm often asked whether you can sharpen blades and the answer is always, "it depends." The main problem with sharpening bandsaw blades is that the teeth are hardened so if you grind them too hard or if too much heat goes into the hardened part of the tooth then it alters the temper of the steel and softens the teeth. They'll still feel sharp to the touch but will go blunt a lot faster than a new blade. If you're cutting softwood then it's not such a problem but if you're cutting hardwood then they don't tend to last very long before going blunt again.

Second wind

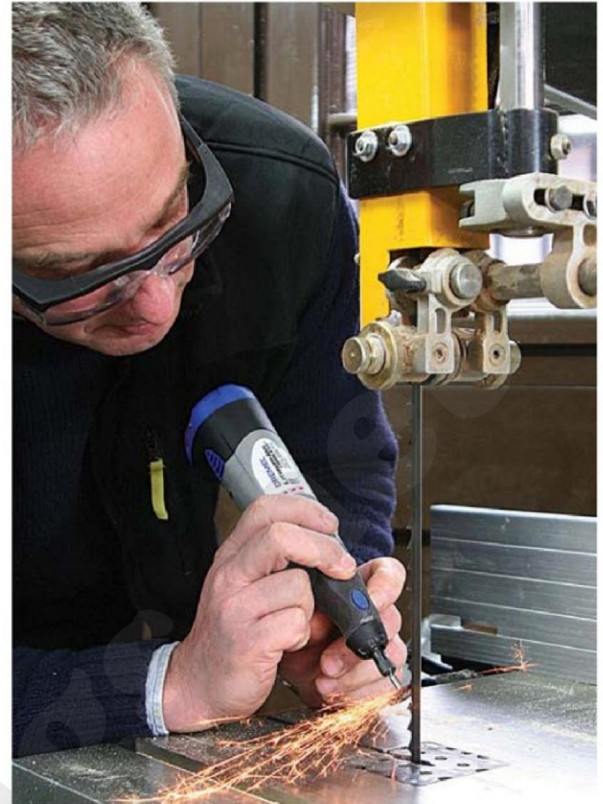
The next problem with home sharpening is that once a blade has been sharpened, or ideally just before sharpening, the teeth really need to be set. You can probably get away with one or two sharpenings without the set on the teeth becoming a problem, but every time a blade is sharpened, the teeth should really be set as well. I often get people telling me that this is nonsense and they can sharpen a blade 10 times without any problems, but it all depends on what you use your bandsaw for. If you want accuracy and a decent cut then the set is very important; if you're only cutting bits of scrap or firewood then it's not so significant.

Generally it's easier to sharpen 3 and 4tpi blades than the finer tooth pitch blades and using a mini grinder

is probably the easiest and fastest way of doing it; just lightly touch the back edge of the tooth with a flat grinding wheel. I leave the blade in the machine for this as it's the best way of holding it. Only sharpen the tooth back and clearance angle. Grinding into the gullets can cause stress fractures in the body which then develop further as the blade flexes and eventually snaps. After a bit of practice it's surprising how fast you can touch the teeth up on a blade and knowing the technique can get you out of trouble if your blade is blunt and it's the weekend with no way of getting a new blade. 10-20 minutes can get it sharp enough to do some cutting and carry on with the job.

However, in my experience, most people know the bandsaw as a serious machine and appreciate how accurate and effective it can be, so will fit a new blade which they know will cut perfectly rather than gamble on having blades sharpened. I suppose it also depends on what you're doing and how much time you have to spare.

If the blade itself becomes clogged with resin, it soon stops cutting properly and produces all the symptoms of being blunt. Resist the temptation to give it a good wire brushing, which just ruins the sharpness. Instead take it off the machine, fold it up and give it a good spray with cheap oven cleaner in an old bowl. This softens the resin,



Lightly touch the back of the teeth with a mini grinder to give the blade a new lease of life

which either dissolves or can be wiped off after just a few minutes. You'll be amazed what a difference it makes and oven cleaner is very much cheaper than new blades. *F&C*



Avoid working into the gullet



Oven cleaner can be used to soften resin build-up on your blade

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Short cuts: dovetails

In the first of a new series John Bullar demonstrates some quick cheats for better joint making

There's plenty already written about the standard ways of cutting dovetail joints in books and magazines, so I'll try

not to repeat too much of it here except for comparison. In this article I'm going to stick to making regular through-dovetails

while at the same time exploring some ultra-simple workshop jigs and alternative methods that make the job more efficient.

Shoulder lines

Shoulder lines mark the bases of the sockets between tails or the sockets between pins to guide the maker. They are removed with a plane when cleaning up the finished joint.

Marking shoulder lines can be a fiddly process and is prone to causing errors. The standard tool

used for shoulder lines is a marking gauge with a pin, or more effectively a cutting gauge with a knife-edge or disc. The depth of the gauge is set to the thickness of one piece then used to mark the other. The two pieces of wood are swapped and the gauge re-adjusted for the second piece.

Instead of using a gauge, try this direct marking method. It cuts out the adjustment stage of the process completely, not only saving time but also eliminating a source of inaccuracy.

Place one piece of wood flat on a clear bench – say the one destined to carry the tails. Lay the flat back of a chisel on it with a sharp corner just overhanging the end. Stand the other wood on end, gripping it safely above the level of the chisel. Slide the face of the vertical wood across the chisel corner so as to score a shoulder line for the sockets between pins. Turn this wood around to mark the other side.

Swap the two pieces of wood over



Swap the components over for the corresponding shoulder line

and repeat the technique to score a shoulder line for the sockets between tails. Again be careful to keep your grip well above the chisel.

If you want to see this method in action I put a video of it on YouTube – to find it put 'easy dovetails' into Google.



Save time marking shoulders for your dovetails by registering them directly off the material.

Bandsawn tails

The bandsaw is the ideal machine for so many jobs, and this includes cutting dovetails. With a normal blade the tails won't be quite as fine as you could accomplish with a high quality dovetail saw but the process is much quicker. It's also more flexible and allows finer joints than a proprietary dovetailing jig can achieve.

The 'jig', if I can call it that, is simply a large wedge sawn to match the taper angle of the tails. It needs to have high friction on one angled face so it grips the tails and low friction on the other so it slides along the fence. To achieve this glue a strip of medium grade sandpaper to one face and rub furniture wax on the other.

Set the ripping fence on the bandsaw table alongside the blade and place the waxed side of the wedge against it. Press the timber

firmly against the sandpaper side of the wedge. Adjust the fence position so that the blade roughly aligns with a tail mark then slide the wedge in or out to fine-tune the position.

Cut each tail up to the shoulder line, ensuring that the wedge moves with the tail in both directions. This is important to avoid distorting the cut or jamming the blade.

Turn the wedge over to cut the other sides of the tails. The second kerf may start a millimetre or two away from the first if you want to make coarse tails. Alternatively start in the same kerf entry to make fine tails.

By nibbling out the centre of each tail with the bandsaw blade, the removal of waste is made much easier. Be careful to saw just up to the shoulder line, or for security, stop a hair's breadth short of it.



Hardly a jig but a wedge of timber will save you time cutting dovetails on the bandsaw



Wax the edge of the wedge that meets the fence



Apply some fine abrasive paper to the opposite edge

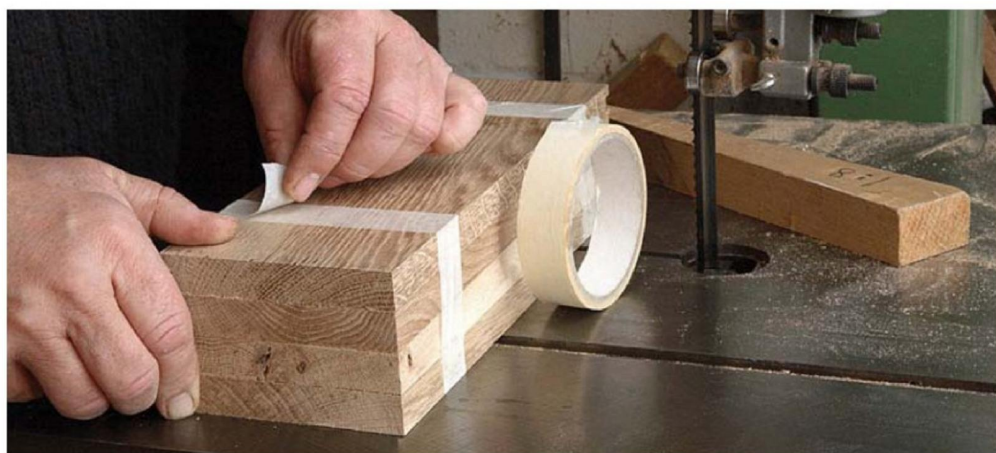


Use the blade to nibble away at the waste

Stacking tails

We normally make furniture dovetails in sets of two, four or more and the bandsaw has plenty of capacity so it makes sense to stack the wood up then saw the sides of the tails all at once. Tape the stack securely so the pieces can't accidentally move out of line.

As well as saving time on cutting, this method saves time on marking out – only the top piece needs to be marked – and ensures that all the tails match. Disadvantages to look out for are the risk of misalignment in the stack or in the blade itself.

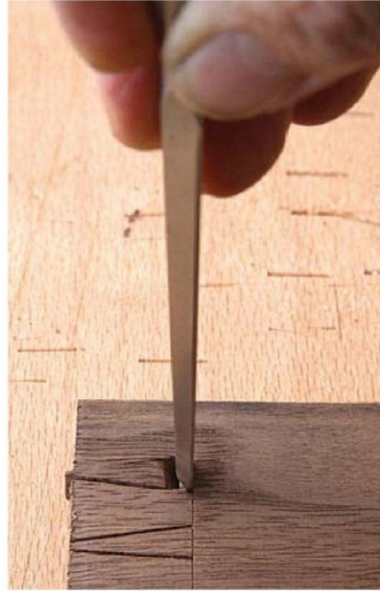


For batch work try stacking identical components together to make repeat cuts in one go

► Chopping sockets



Make an initial cut a millimetre or more away from the shoulder line from both sides



A second cut on the line will clear the waste



Maintain vertical alignment throughout the process

For finer joints that are hand-cut rather than using a bandsaw, the bulk of waste from the sockets between tails is normally sawn out with a coping saw. This leaves a ragged shoulder line, which can then be chopped and pared straight with a chisel.

If the wood is reasonably thin and well behaved like this walnut, the socket waste can be chopped out directly with a chisel. Make sure the chisel is narrow enough to fit the

socket a few millimetres in front of the shoulder line because deep chopping will indent the wood. Chop halfway through in this position.

Make a second cut on the shoulder line with the chisel resting in the mark. This second cut is removing a thin chip so there shouldn't be any indentation. If the wood is harder you may need to make several chops and finally pare down to the line.

Sometimes the sockets between

tails require extra paring to allow the tails to fit and there is a danger that if overworked the shoulder line becomes gappy.

The chisel back must be held vertical for chopping sockets, otherwise the shoulders will not be flat. To ensure this is the case, stand edge-on to the chisel and position the wood so you're sighting along the shoulder line. That way you can see that the chisel back is vertical.

Guide block

Another way to ensure the shoulders end up straight and flat is to use a guide block to steer the chisel. This is a decent chunk of square section hardwood

clamped directly on the shoulder line. With the chisel back pressed flat against this block it can't possibly leave a humpy shoulder or undercut the line.



Marking pins for bandsaw



Transfer the dovetail positions from the pins on the mating piece

The traditional way to mark out pins is to use the ready-cut tails as a kind of template, marking all around the inside of each socket. This is an awkward stage requiring a very thin knife and it's unnecessary if you intend to cut the pins on a bandsaw.

Press the wood with the pins end to end against the wood that's destined to have the mating tails. Make sure the edges of both pieces are aligned.

Use a sharp knife to mark the positions of the tail corners on to the end of the adjacent wood. There's no need to mark the angles of the tails as these are taken care of automatically by the cutting process.

Bandsaw pins

Bandsawing dovetail pins is quite a different process from the tails but equally straightforward once you're set up and have conducted a few tests.

The 'Jig' for sawing pins is also a wedge cut to the taper angle of the joint, but this time it's a wide flat wedge that will form a sloping platform. The wedge has a batten glued along its narrow side forming a raised fence to guide the wood.

The wedged platform is laid on the bandsaw table behind the blade. Clamp a batten across the back edge of the table, or wedge it between the table and guide rail, to act as a fence that locates the platform.

The platform must first be slid sideways to align the knife marked position with the blade. To cut one side of each pin, the wood is laid on the platform and run along the battened edge into the bandsaw blade. The platform is then slid sideways to align with the next mark.

The platform is then turned around to slope the other way so that the second side of each pin can be sawn.

The thickness of the bandsaw blade is significant so the cut is always made on the waste side of the knife line. When the joint is fitted the resulting pins should fit cleanly without any fettling. This is probably the trickiest stage and can take a bit of practise to get right.

The end shoulders are sawn off on the bandsaw using a 9° sliding fence. Because the blade is vertical and the pin side is angled it's not possible to cut the waste away completely on the bandsaw. A couple of strokes with a tenon saw will finish the job.



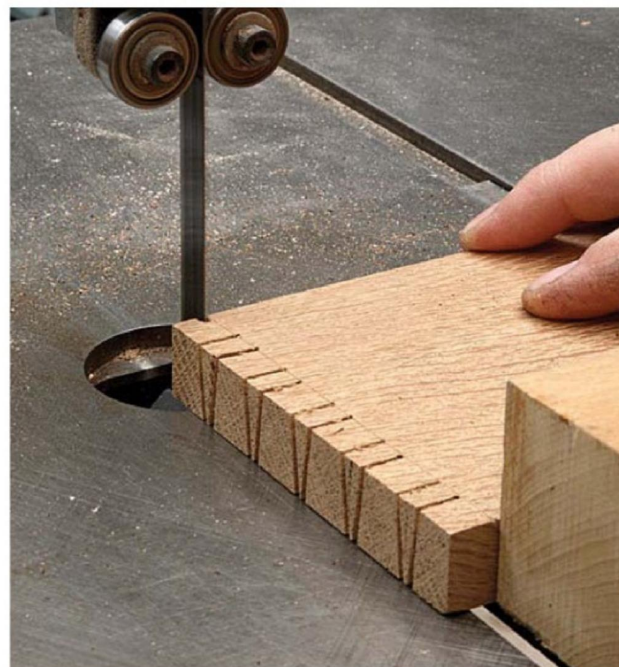
A sloping platform cut to the same angle as the dovetails



Begin the sequence by cutting all the same sides of the pins



Turn the wedge over and complete the remaining cuts



The end shoulders can be trimmed up to the widest part of the dovetail

► Nibbling sockets

The sockets between pins are relatively wide, particularly if the joint is fine with narrow pins. To make it easier to remove the waste I simply make a number of freehand cuts with the bandsaw blade dividing the waste up into thin chips, again being careful not to saw into the shoulder line.

The finely divided waste between pins chops out easily with a wide bevel edge chisel. The chisel needs to be slanted when chopping deeper into the sides of a socket, but it starts off upright so that the blade sits just ahead of the shoulder line.



Divide the waste up into thin sections on the bandsaw before continuing to chop out with a bevel edged chisel

Stacking pins



Stacking boards to cut a small batch of pins at once is less obvious than stacking tails, but it can be done with care. A modified wedge platform is used with a high vertical fence attached to one side. As with stacked tails the cut is made according to marks on the top board. Piling the sloping boards against the vertical fence automatically staggers all the lower boards to the correct position to cut each pin.

The wedge platform can also be adapted to cut pins

Final fit

Having made a set of matching pins and tails, it can be disheartening to find that they don't fit together. If they have been carefully marked and sawn the reason may simply be that the inner edges of the pins are catching on the insides of the sockets.

We can't lubricate the joint, so the way to reduce friction is to chamfer the leading edges of the tails. In practice this means paring a splinter from the inside of each tail on its underside, starting just below the tip then chopping across its base. Removing this sliver of material has negligible effect on the finished joint and can't be seen, but eliminates the risk of loosening the joint by shaving its sides.

There's certainly more than one way to tackle any joint and which is best on any occasion depends on many factors. I hope this article suggests a few ideas worth checking out to broaden your range of dovetailing techniques.



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Photo shows multiple pairs of mortises kept opposite each other and of equal length.

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Sanding, sealed

Alan Holtham is impressed by the quality of the results produced by the Senior Drum Sander from Axminster



Unless you've used a drum sander, it's difficult to describe how efficient they are in producing perfectly flat and smooth panels. Many seasoned cabinetmakers still rely on laboriously planing and scraping panels and doors, when a quick pass through a sander like the Axminster Senior will accurately thickness them in seconds, saving hours of work and probably producing a better result.

I know that the purists will now be throwing up their hands in horror as anything less than a hand scraped finish is not 'proper' cabinetmaking. In which case why not do the bulk of the flattening work on the sander and then finish off by scraping? From a commercial point of view, if you have a lot of panel work to do, a drum sander is a no-brainer; I just wish I had room for one in my workshop.

I think the reason why they aren't more widely used is a hangover from the past when they were massive and horrendously expensive machines only seen in industrial workshops.

Thankfully things have changed and they're now more readily available; you can get drum sanders for less than £500, although for anything other than occasional use on narrow pieces you'll need to open your wallet a bit wider.

The Axminster Senior Drum Sander sits in the middle of their trade range and reading the spec it looked as if this was a machine suitable for some serious work but not at a bank busting price. I couldn't wait to put it through its paces.

Ready assembled

The machine is supplied ready assembled on a pallet and the first impression is the sheer size of it; this is a lot of machine for the money. The bed is 630mm wide, covered by a rubberised feed belt, so you can comfortably accommodate kitchen doors and the like without any risk of marking them. The machine is fabricated from sheet steel and alloy with a healthy sprinkling of cast iron and weighs in at a substantial 210kg

so you won't want to move it around too much.

One problem I've experienced before on these sanders is getting the feed belt to track correctly, but this is no problem on the Senior with two simple adjustments for tracking mounted either side of the table.

Power for the feed is provided via a small DC drive motor which proved to



At 630mm wide the bed will take standard kitchen doors comfortably



Controls either side of the belt are used to adjust the belt tracking



The drive for the belt is in a slightly vulnerable location

be more than competent, though I felt its position sticking out to the side of the machine left it rather vulnerable. But then perhaps not everyone is as clumsy moving big planks about the workshop as me.

A simple selector dial on the control panel allows you to vary this feed although I'm still not quite sure exactly what the speed range is. The graduations on the dial go from 3 to 20 but the handbook states 150mm to 9.5m/min, which I'm pretty sure is wrong, the top speed is normally about 3m/min. Whatever it is, the range is from very slow to a bit quicker, and you'll soon find a speed to suit the job in hand. If you are a first time user to drum sanders you will initially be taken aback by the slow feed speed, but this is how they work; they are considerably slower than a conventional thicknesser.

Height adjustment

The rise and fall for the bed is achieved with a large handle on the top of the machine, and this was remarkably smooth considering the

weight it has to lift. If you delve into the inner workings, the reason for this ease of movement soon becomes apparent with heavy duty spindles and bevel gears on either side providing the smooth and accurate lift.

The maximum thickness is a healthy 125mm, so you are not restricted to thin panels. Quite a bit of standard joinery work, such as sashes, will pass through as well so long as it's not too wide. Minimum thickness is 6.4mm though you could probably make up spacers if you need to go thinner.

Changing belts

The twin aluminium sanding drums are accessed by lifting the hinged top cover, though in today's crazy world of health and safety I was surprised that there was no electrical interlock on this and you could open the cover with the machine running. The drums themselves are 125mm in diameter so are pretty substantial, and having two of them gives you options for the loading (abrasive) you fit. You can either fit the same grit to both drums

for heavy sanding where the finish isn't too critical, or fit a coarse loading on the in-feed drum and a finer one on the out-feed one where the final surface is more critical. Ready cut loadings are quite expensive at £11 each, so I think I would buy standard rolls of abrasive and cut my own using the original as a template.

Tuning the drums

The in-feed drum is factory set to be parallel to the bed but the out-feed one can be tuned at either end via a scaled adjuster, should you ever find that panels are not even across their width.

Drive to the drums is provided by twin V-belts that look pretty chunky, but the main motor is 3hp so you need this sort of strength to maintain the speed when you start feeding ➤



The bed is raised and lowered by a single wheel



On, off and speed controls are mounted together on the top of the machine

TESTS & EQUIPMENT

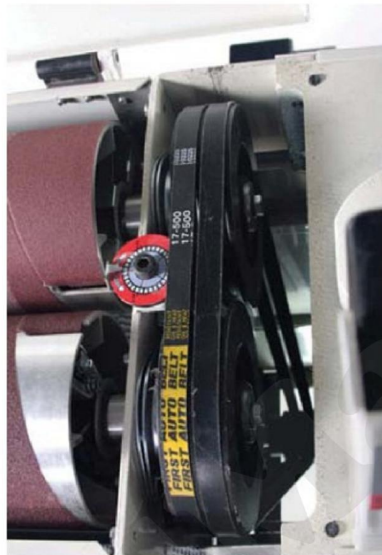
Axminster Senior Drum Sander



Abrasives are wound round the cast aluminium drums



Bevel gears on each side of the bed ensure smooth and accurate raising of the bed



Drive to the drums is via a pair of V-belts

- through 600mm wide panels. By its very nature the sanding process is a power hungry business. The motor is 2.2kW running at 1600rpm so you'll need a 16amp electrical connection.

The loadings simply wind diagonally around the drums, with very simple-to-operate clamps at either end. These are self-tightening as well so the whole changeover process is toolless, calm and easy.

Extraction

Dust extraction is well catered for with twin 100mm outlets on the

top casing, but you'll need a pretty powerful extractor with fine filtration to suck efficiently over the full width, a small cloth bag model will just not do. You'll also have to route the pipes carefully to stop them fouling on the moving bed.

Switching the machine on I was surprised at the low level of noise. I registered 77.1dB at the loudest point, pretty impressive for a machine of this size and capacity, no doubt helped a lot by the deadening effect of the heavy construction. *F&C*



Self tightening clamps hold the abrasive sheet in place on the drum



For a big machine the Senior runs at 77.1dB; a lot less than you'd expect

F&C verdict



In use, the sander performs well. My only real criticism is that it took some time getting the hang of the rise and fall; even a tiny movement of the handle moves the bed significantly so you have to take care if you only want to take a very light skim. The depth scale is not a lot of help for very fine adjustment; you are better measuring the finished result.

For one of my tests of the machine I fed through a 600mm veneered panel that wasn't over-flat, taking off the veneer on both sides, and measuring the finished thickness with a vernier. Amazingly the difference across the width was just 0.07mm which is good enough for me. Narrower solid timber stock finished to within 0.02mm, again mightily impressive.

This is a very competent machine, well suited for some serious trade use but not at a price that will make your eyes water. Some minor niggles, and that feed motor sticking out still worries me, but you can't fault the performance.

Pros

Performance and build quality
Capacity
Ease of change of loadings
Excellent belt feed

Cons

Feed motor sticking out
Tricky depth control

The numbers

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Choosing the right hardware

Part 4: drawer runners

In the last of this series on hardware Peter Sefton considers the options when conventional methods give way to new technology

For most craftsman there's nothing more satisfying than making and fitting a handmade drawer that runs smoothly and fits perfectly. This is a skill in its own right and one that has changed little over time, apart from nuances in dovetail configuration and fine constructional details, like flush or quadrant slips.

They all have the same common issues; making something accurate that will operate in all room conditions, will stand the test of time on wearing surfaces, all the while being affordable to make. These problems have largely been overcome with the advances in affordable metal drawer runners, when a handmade drawer is not within the budget.

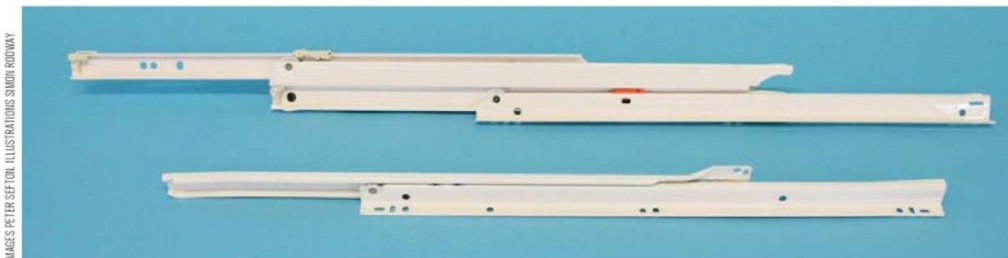
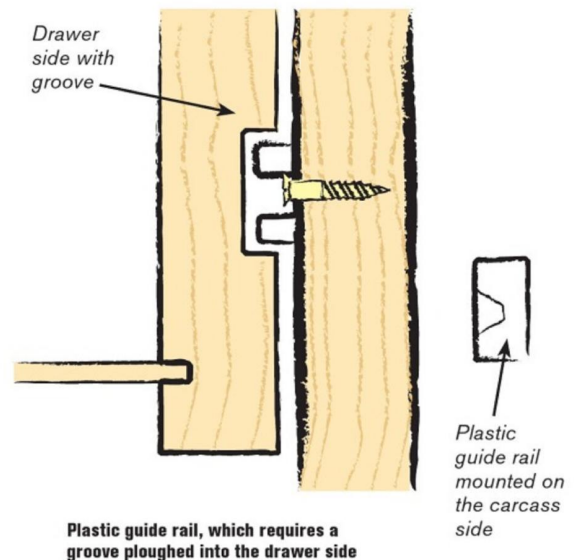
Drawer runner systems can be broken down into various groups: full or part extension, side or under drawer mounted, soft or self-close and push to open – all of which come in various weight loadings. Drawer runners as with all things, have become more complicated as the years have gone on,

so I'll start with the simplest forms and move towards what's happening now and the advances made along the way.

Blum are considered to be one of the best quality runner makers along with their neighbours Grass, and both companies reside in the same Austrian village. Grass, a smaller company but a real innovator, has recently been bought out by Würth who have great financial backing, so expect many advances over the next few years as the professional rivalry pushes the products forward.

The German group, Hettich, is the largest supplier of quality drawer runners in Europe but are still gaining ground in the UK. Hettich, evolved from a small company founded in the 1930s and they develop, manufacture and sell fittings for furniture.

The cheapest and simplest drawer runner is just a plastic guide rail, which is screwed on to the cabinet side and requires a corresponding groove, which is ploughed into the drawer side, in the same way as we may have historically done this in timber.



At the rear is the full extension under-mounted runner, below is the single extension under-mounted runner

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Reference

www.blum.com

www.grass.at

www.hettich.com/uk

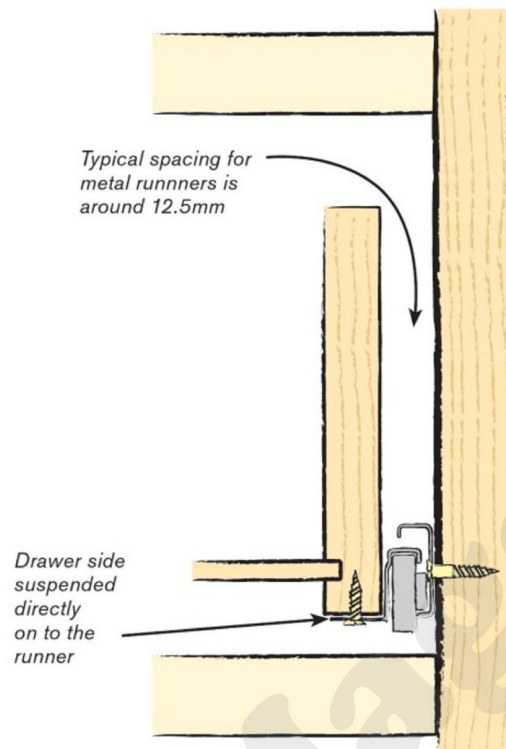
Single extension runners – under-mounted

Single extension drawer runners made by Blum incorporate a pair of nylon running wheels and are of a cream or brown powder coated finish. One part screws to the cabinet side and the other screws into the bottom edge of the drawer side. They're quite utilitarian but do still have their place in the market. Being a single extension runner, this means we will always have a portion of the drawer that remains within the cabinet; typically, around one quarter – which you may hear referred to as extension loss. These have a maximum loading of 25kg.

Suppliers

230 Single Extension Drawer Runners
www.isaacclord.co.uk
Product No. 230M45C
Price £3.98 per pair inc. VAT

A section through the single under-mounted drawer runner



Full extension runners – under-mounted

The slightly more advanced runner to the single extension, is the full extension drawer runner which as the name implies, allows the drawer to fully extend so that the back of the drawer is level with the front of the cabinet. This makes more of the drawer usable and this runner has three parts to it; one which fixes to the cabinet, one which fixes to the drawer and one which runs between those two components. However, although this runner is more advanced and is an improvement on the single extension runner, it's still rather unsightly. These have a max loading of 30kg.

Suppliers

430 Full Extension Drawer Runners
www.isaacclord.co.uk
Product No. 430E45C
Price £14.06 per pair inc. VAT

Concealed runners

As the name implies concealed drawer runners are under mounted which means they're hardly visible, they're available in 30 or 50kg loading. They're much more advanced than the previous runner systems, both in engineering quality and aesthetics. They cost more than their predecessors but are well worth the investment.

Blum Tandem

These are named tandem as they use two sets of concealed roller systems working together in a very smooth operation. They have a self-close feature that works within the final stage of the closing drawer. The drawer box requires the drawer side to form a skirt below the drawer bottom to cover the runners. The runner requires a drilled hole in the back of the drawer for location of a fixing tab, and the runner is attached to the drawer front with a clever locking device that quickly releases the drawer from the runner by pinching it with your fingers. These are Blum's entry-level Tandem runners.



At the rear is the Blum Tandem Plus runner, and at the front is the Quadro Concealed Drawer Runner; it requires a hole in the back of the drawer, and a plate to be screwed on to the bottom of the drawer

Hettich Quadro

These are very similar to the Blum Tandem range, but have four sets of rollers that make them very stable and strong. As well as having a self-closing feature, they have a loading of 25kg. These are also Hettich's entry-

level runners and are used mainly in the contract furniture market.

It's worth noting that all drawer runners can be supplied with fixing jigs although you may prefer to make your own.

The Hettich Quadro V6 is a full ➤

Concealed runners



At the rear is Tandem Plus Blumotion 50kg, second from back is the 30kg runner. At the front is the Quadro V6 Push to Open (P2O) Runner; second from front is the Quadro V6 with dampened closure

- extension runner with a 30kg or 50kg loading and their brand of soft closing – dampened closure. 30kg runners have white cap ends and 50kg runners have grey cap ends on the running assembly.

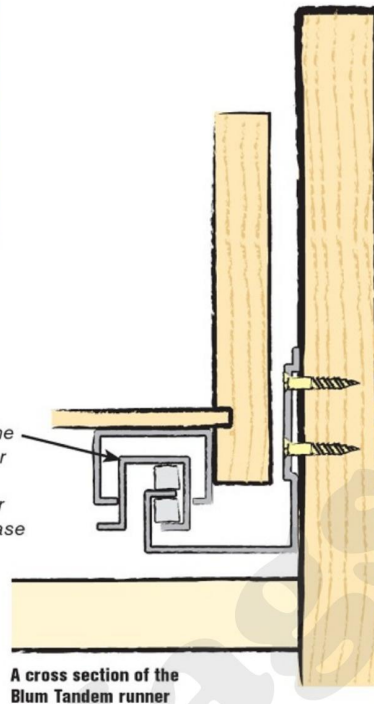
Hettich also have their own locking device, which is a catch for wooden drawers in black plastic for connecting the Quadro extension and wooden drawer using slide-on assembly – without tools.

Blumotion

The tandem drawer runner is also available in a soft close version, which looks almost identical to the tandem version but has a piston within the runner system that dampens the drawer as it closes. Blum's trade name for this is Blumotion, and

Blumotion also refers to their soft-close kitchen cabinet hinges. All other features and fixing requirements are the same as the tandem runners. The 30kg has a grey piston, whereas the 50kg version is orange.

The bulk of the drawer runner mechanism located under the drawer base



Miscellaneous

Tip-On

Tip-On is a tandem drawer runner with an add-on that allows for a handleless drawer that will work by pushing in the drawer front by a couple of mm; this then pushes the drawer out of the cabinet.

Hettich P2O (push to open)

Hettich's version of the Tip-On is the Quadro V6/300mm full extension runner – known as the P2O (push to open). It's a bit more elegant as it's an all-in-one component drawer runner rather than a bolt-on to the tandem runner. These runners are favoured by shop fitters.

Electronic drawer boxes

The latest innovation in drawer runners is electronic drawer boxes. Blum has Tandembox Servo-Drive, and Grass call theirs Sensomatic. The drawer is touch-sensitive and

has electrical paddles at the back of the drawer. A light touch or push is converted into an electric signal, which opens the drawer. The drawer is a mixture of soft close-and-push latch and the two systems offer the advantages of handle-free opening with dampened closing.

The system comes with a number of components, which make it up and a three-drawer cabinet from either supplier will cost in the region of £700.

Double-ended drawer runners

The double-ender from Hettich is a very clever and complex drawer runner system that could be used in a kitchen island unit or a games table, where the drawer needs to be accessed from either side of the tabletop. It has face-mounted drawer fronts and an integrated dampened closure mechanism.

Suppliers

Full Extension Tandem Drawer Runner

www.isaacclord.co.uk
Product No. 560H45ZP 450mm
Price £16.49 per pair inc. VAT

Blum Tandem Locking Device

www.isaacclord.co.uk
Product No. T51
Price £1.33 each inc. VAT

Hettich Concealed Drawer Runner

www.comptools.co.uk
Product No. 56014 355mm long
Price £41.10 per pair inc. VAT

Full Extension Drawer Runners

www.comptools.co.uk
Product No. 45292
Price £29.86 per pair inc. VAT

Catch for Wood Drawers

www.comptools.co.uk
Product No. 9058303
Price £2.18 per pair inc. VAT

Blumotion Drawer Runner

www.isaacclord.co.uk
Product No. 560H45B 450mm
Price £28.64 per pair inc. VAT

Suppliers

Blum Tandem Tip-On Catch

www.isaacclord.co.uk
Product No. T55.7150
Price £9.46 per pair inc. VAT

Push to Open Full Extension Runners

www.comptools.co.uk
Product No. 9111236
Price £28.71 per pair inc. VAT

Grass and Blum Electronic Drawer Box

www.isaacclord.co.uk
Please call for
specification advice
Tel 0845 600 8898
Price £POA

Hettich Double Ender Full Extension Runner Set

www.comptools.co.uk
Product No. 9080298
400-480mm
Price £544.55 inc. VAT

► Bearing roller slide

Accuride, Topslide and Hettich make bearing roller slides which are side mounted on the drawer side and are therefore visible and industrial looking. Their advantage is that they can carry much heavier loads – up to 250kg. However, they can suffer from more lateral movement from left to right. They can also be used under shelves as keyboard slides but they will not carry as much weight.

A lightweight drawer slide is made by Italian company, OMGE, with a 12kg loading. It sits in a 27mm groove within the drawer side and then screws on to the side of your cabinet. It's guided by means of two ball cages.

A better quality full extension drawer slide is made by Topslide but it is important to note that when side mounted it has a 45kg loading and when under carriage mounted this is reduced to 20kg loading.

The Hettich Full Extension Ball Bearing Runner, is a full extension with a 35kg loading and a smooth running 'Silent System', which lets the integrated dampened closure mechanism close the drawers gently and quietly. They're side mounted and detachable via a release lever.

Hettich also make a similar and neat P20 (push to open), side mounted full-extension ball bearing runner, with a 35kg loading. This also incorporates a release lever for quickly detaching the drawers.



Ball bearing runners – left to right is the lightweight OMGE, the full extension Topslide with 45kg loading, Hettich 35kg with dampened closure, Hettich side mounted full extension (P20) runner with 25kg loading

Suppliers

Single Extension Drawer Slide

www.isaacclord.co.uk
Product No. 42095527
Price £3.10 per pair inc. VAT

Full Extension Drawer Slide

www.isaacclord.co.uk
Product No. 5633450
Price £10.42 per pair inc. VAT

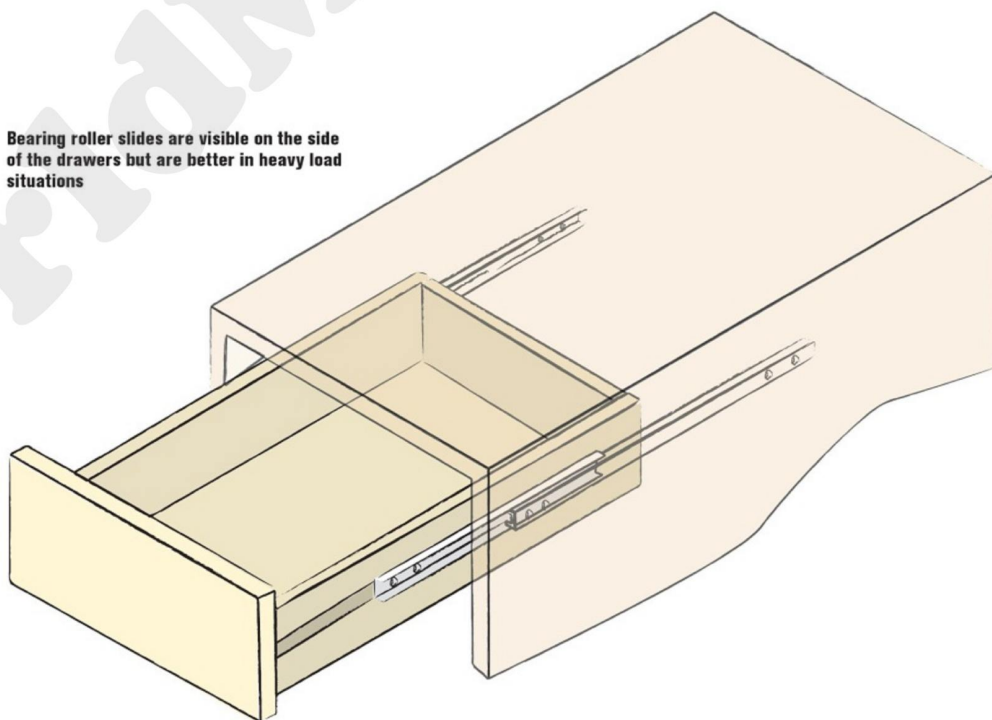
Hettich Full Extension Dampened Closing Ball Bearing Runner

www.comptools.co.uk
Product No. 9114275
Price £20.27 per pair inc. VAT

Hettich Full Extension Push to Open Ball Bearing Runner

www.comptools.co.uk
Product No. 9114284 450mm
Price £20.27 per pair inc. VAT

Bearing roller slides are visible on the side of the drawers but are better in heavy load situations



Peter Sefton

Peter teaches long and short courses in woodworking and furniture making at his school in Worcestershire. For more information go to www.peterseftonfurnitureschool.com F&C

In a future issue, I will be looking at drawer construction

Domino Extra Large

Derek Jones finds favour with Festool's new Domino XL proving that even a one trick pony can learn a new trade



Festool presented the woodworking world with the Domino back in 2006. Such was its impact that you'd have to look long and hard to find another development in power tool technology since that has had as much impact on the way we work. As someone who struggles to find a new angle each month on the subject of woodworking I don't envy the technicians who are charged with developing new concepts in what is an ancient process.

Festool get round this mental block by establishing a few ground rules. First, they won't even consider working on a new product that's already in the market-place if they can't significantly improve on the idea. Second, they don't go in for the 'big sell' believing that the tools they produce are capable alone of delivering the right message. So with the bar already raised way above some of their competitors how does a second generation Domino fit into the market-place?

Same concept

The Domino XL has much in common with the original machine but as the name implies it's a bigger unit. The original concept remains the same; a hand-held machine to cut flat bottom mortises for loose tenons. The XL is aimed squarely at the

joiner and in true Festool fashion it's designed to operate at the heart of a system where it can make a difference. The XL uses cutters from 8 to 14mm and will bore to a depth of 70mm. The pre-cut beech tenons are available in three short sizes (80, 100 and 140mm) and in 750mm lengths. The joint sizes are ideally suited to larger stock and the powerful 720W motor runs smooth and is relatively quiet. I worked repeatedly on sections of oak for this review process and at no time did the motor feel laboured. There are a number of features on the XL that make it a good machine for repeat cutting and batch work.

A lever on the side of the motor casing causes the cutter to produce

mortises wider than the pre-cut loose tenons. When working from free-hand marks this compensates for any misalignment in the marking or machining process.

Stops save time

Built into the XL are a series of stops that can be used to position the machine for cuts off a fixed datum such as the face or edge of the mating components or the previous mortise. Working in this way takes a little getting used to but once mastered it can save a great deal of time. The position of the stops is recorded in the sole plate of the machine to help with this. The sprung stops can be depressed



The wide slot setting allows 2mm of play side-to-side



The switch between wide and narrow mortises is clearly indicated on the top of the machine casing



The quick set stops can be pressed into the base plate. A visual guide is etched into the base for quick reference

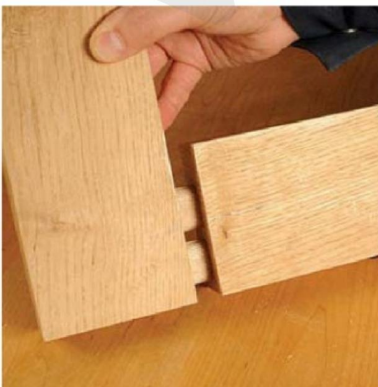


Use the stops to work off a fixed datum

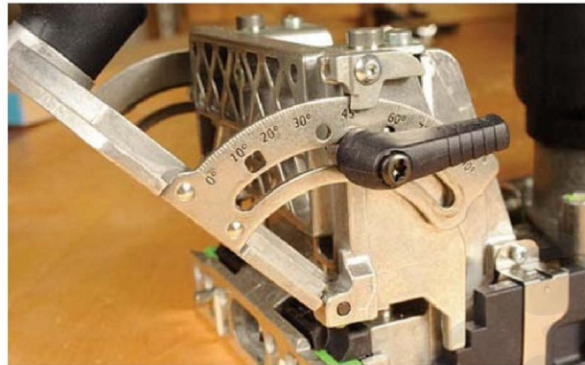
into the casing where they remain until released by a small button each side of the plate. As an example the spacing allowed for mortises to be grouped in pairs on a frame leaving space for any extra details like grooves, mouldings or a rebate. With so many nooks and crannies built into this machine it's good that the extraction port is well placed to remove the large amount of waste for the 12mm cutter I was using.

Set for production

There are a few makes of power tools available that are calibrated in the factory to perform accurately from the scales indicated on them. Festool is one of them and this makes for quick initial set-up for a single process and freedom to switch between settings for a complex one. The XL will work from angles between 0° to 90° with presets along the way. Depth of cut from the face of the fence can be set free-hand or by using pre-sets. The depth of the mortise can also be adjusted to a given setting or permitted to work within a specific range. Tool changes are also quick to do. A small lever is flicked with the wrench supplied, which releases a catch holding the machine body and faceplate together. It's possible to swap tooling without disassembling the XL but there is a risk of knocking the sharp edge of the tool against the metal of the machine. *F&C*



Control spacing for framework to allow for additional details



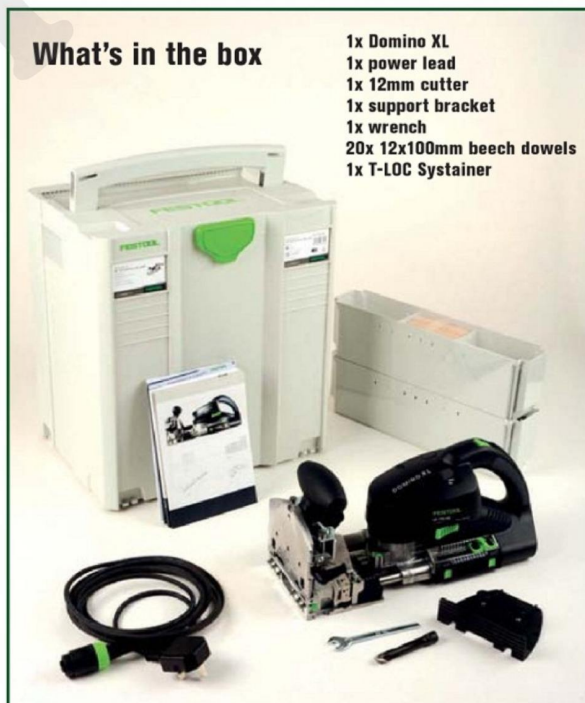
A mitre fence with a scale you can trust



Dismantling Domino XL is a single step process

What's in the box

- 1x Domino XL
- 1x power lead
- 1x 12mm cutter
- 1x support bracket
- 1x wrench
- 20x 12x100mm beech dowels
- 1x T-LOC Systainer



F&C verdict

It's not a huge leap from furniture maker to joiner and the Domino XL closes the gap even further. There's an interesting demonstration of this machine to be found on the Festool website. A comparison is made between the processes required to assemble a single typically framed panel door with stand-alone machines and the Domino XL. Some parts of the process are shortened by as much as 40% using the Domino system. It's unlikely that manufacturers producing doors in any quantity would benefit from a Domino XL. Those looking for a way to compete on a smaller scale undoubtedly would, for the machine lends itself to a whole host of other opportunities; think chair making, large tables and other architectural joinery.

The XL has a range of accessories, some of which are interchangeable, which expand the use of the machine to working on round section and handrails. For external joinery Festool produce the Sipo range of dowels that are treated to resist mould and insects. Those already used to the ways of the Domino will have no problem getting to grips with the XL. Those who aren't might be put off by the price but it's not always the best frame of mind to be in when considering how to grow your business. This machine represents a small investment in return for some new opportunities.

Pros

Quick to set up
Various applications
Superb build quality

Cons

None

The numbers

Power consumption 720w
Depth stop for routing depth 15-70mm
Domino slot cutter dia. 8, 10, 12, 14mm
Routing height adjuster with scale 10-50mm
Movable stepped stop 10, 15, 20, 25, 30, 40mm
Mitre routing 0-90°
Weight 5.2kg

Price £924
From www.festool.co.uk

35000 ft² of new & used machinery on display

Sip Oak Wooden Carpenters



A modern version of a traditional woodworking bench. This bench is constructed from quality oak - much harder wearing than standard softwood benches. Environmentally friendly - manufactured from 100% sustainable forests. iTECH 01441 Workbench

iTECH SIP 01482 Bench



iTECH bobbin sander
This is a substantial and well built machine ideal for difficult or awkward sanding applications including curved or straight edges. It has a heavy-duty, cast iron table that tilts through to 45° with an easy-to-read tilt angle gauge.

iTECH 01456 Tilting Spindle



The 01456 spindle moulder is designed to cope with a wide range of woodworking tasks: end moulding, profiling and tenoning. It features a large cast iron table with tilting spindle for greater flexibility.
The 4 - spindle speeds and a heavy duty

iTECH 26133 Roller Conveyor



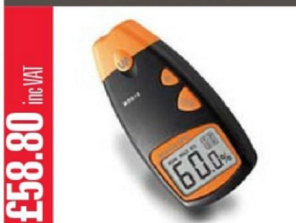
New adjustable roller table - compact and versatile!
These roller tables are expandable ... just pull it out - Compressed it is 490 mm long - fully extended it will support 1390 mm. If you need longer, you can just clip another one

Martin T45A Thicknesser



The T45 Thicknesser is an ideal machine for modern joinery. It delivers a beautiful finish, is very quiet, quick and easy to use. The standard electronic control unit with the T45 has 99 stable planing dimensions, this makes setting the planing height so easy that

iTECH 912 Moisture Meter



This simple to use pocket moisture meter has two hardened steel pins which are pushed into the wood or material to be measured to obtain a moisture content on the LCD screen. The meter has autocorrect for environmental temperature, and a choice of 4 different wood

iTECH SIP 1375 1" Chisel



iTECH 1375 Mortiser
A robust mortiser ideal for small workshops and home workshops. The machine has a grey cast iron table and column and the head movement is balanced by a gas strut. Adjustments are easy with the two hand

Sedgwick 571 Chisel Mor-



Sedgwick 571 chisel mortiser - This British made mortiser is a rugged compact machine - The Sedgwick 571 mortiser is ideal for a lifetime's use in professional workshops. The table, column and head are all made from high quality cast iron and mounted on

iTECH Heavy Duty Roller



Heavy duty roller stand with cast iron base and roller housing. Technical Specification:
Roller diameter 50mm
Working height 580 - 790mm
Maximum weight supported 800kg

Martin T54A Surface Planer



The T54 surface planer is a superb machine designed to last and last. The bearing mounted fence is a dream to use - it can be adjusted with one hand and features an integrated auxiliary fence to enable easy planing of thin and narrow strips. The optional

iTECH 01332 10" Cast Iron



iTECH 01332 Cast Iron Table Saw Bench
This cast iron table saw bench represents probably the best value for money saw bench that we have ever offered, and comes with a manufacturer's two year warranty.

iTECH 1446 300mm Cast Iron



The 01446 is big brother to the 1332, this cast iron table saw bench represents a great addition to our range. The saw is powered by a high powered, quiet running 4hp induction motor that will run reliably, day in, day out in small workshops. The saw has a large

Sedgwick Ta315 Circular



Sedgwick TA315 Sliding Table Bench Saw
This British engineered cast iron table saw bench represents excellent value for money. The saw is driven by a high powered, quiet 4 hp induction motor that will run reliably, day in, day out in trade workshops.

iTECH AF32 Junior Power



A compact power feeder that is ideal for smaller machines such as universals, edgebanders, spindle moulders, saws and shapers. The feed is supplied complete with adjustable universal stand. Power feeders help to improve productivity

Martin T27 Flex Spindle



The Martin T27 Flex is a heavy duty spindle moulder with touch screen control and shaft that tilts both forwards and back ±46°. An efficient and versatile spindle moulder built to the highest possible standards using innovative design. The modern touchscreen

iTECH C300 Universal Wood-



The new C300 Universal Machine is the latest addition to the iTECH family. It has been specifically designed to be an industrial standard machine, but at a size intended for the small professional workshop or home user. This industrially rated machine features

iTECH DC001S Dust Extractor



iTECH DC001S 1 Bag Dust Extractor

Technical Specification:
[Fan diameter] ~ [300mm] ~
[Inlet diameter] ~ [125] ~
[Inlet holes] ~ [2 x 100mm] ~
[Air capacity] ~ [1490cfm] ~

Startrite 352 Bandsaw (230v



A compact and economic machine yet with all the features and build quality customers have come to expect from a Startrite machine. Taking up to a 25mm blade and having a cutting height of 280mm, it can easily handle most operations. It is equipped with cast

iTECH BS600 Bandsaw 3ph



The new BS600 bandsaw is an exciting new addition to the range. A professional quality bandsaw at a great price. The BS600 has cast iron wheels with electro-mechanical braking giving easy smooth cutting with safety.

Martin T60 Classic 3000mm



Perfect interaction - The perfect balance of a modern touchscreen controller & smart software provides the operator full control over their saw. The touchscreen controller provides all necessary information needed by the operator. The height & angle of the saw

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Could you benefit from a Solar-powered kiln?



COURTESY ANDY LOCKHART

With prime timber in short supply Andy Lockhart decides to cut out the middleman and build his own solar-powered kiln

As a woodworker, I'd describe myself as a serious amateur. Retired from a career in the financial services industry, I have a decent sized 'shop which turns out mostly furniture, with some turning and small wood-hinge boxes in the mix as well. What spurred the desire to have my own kiln was discovering some sources of a wood called big leaf maple (*Acer macrophyllum*) in British Columbia, about 1000km west of where I live. Since one of my sources is running low on seasoned, air dried stock, I asked him to try to find me a figured log, with the intention of having it custom milled and drying it myself. Hence the concept of a solar drying kiln.

The locality

I live on an acreage a bit south and west of Calgary, Alberta, Canada. Our place is in the foothills, about 80km west are the eastern slopes of the Rocky Mountains. We're at an elevation just under 4000 feet above sea level. Our latitude is roughly 51° north, which would put us approximately between London and Nottingham, but our climate, as you will see, is somewhat

more harsh. Native woods are predominantly coniferous – spruce (*Picea abies*), pine (*Pinus spp*), fir (*Pseudotsuga menziesii*) and aspen poplar (*Populus tremula*). Most furniture grade hardwoods – oak (*Quercus robur*), hard maple (*Acer saccharum*), cherry (*Prunus spp*), walnut (*Juglans regia*) – are imported by wholesalers from eastern Canada or the north-eastern United States.



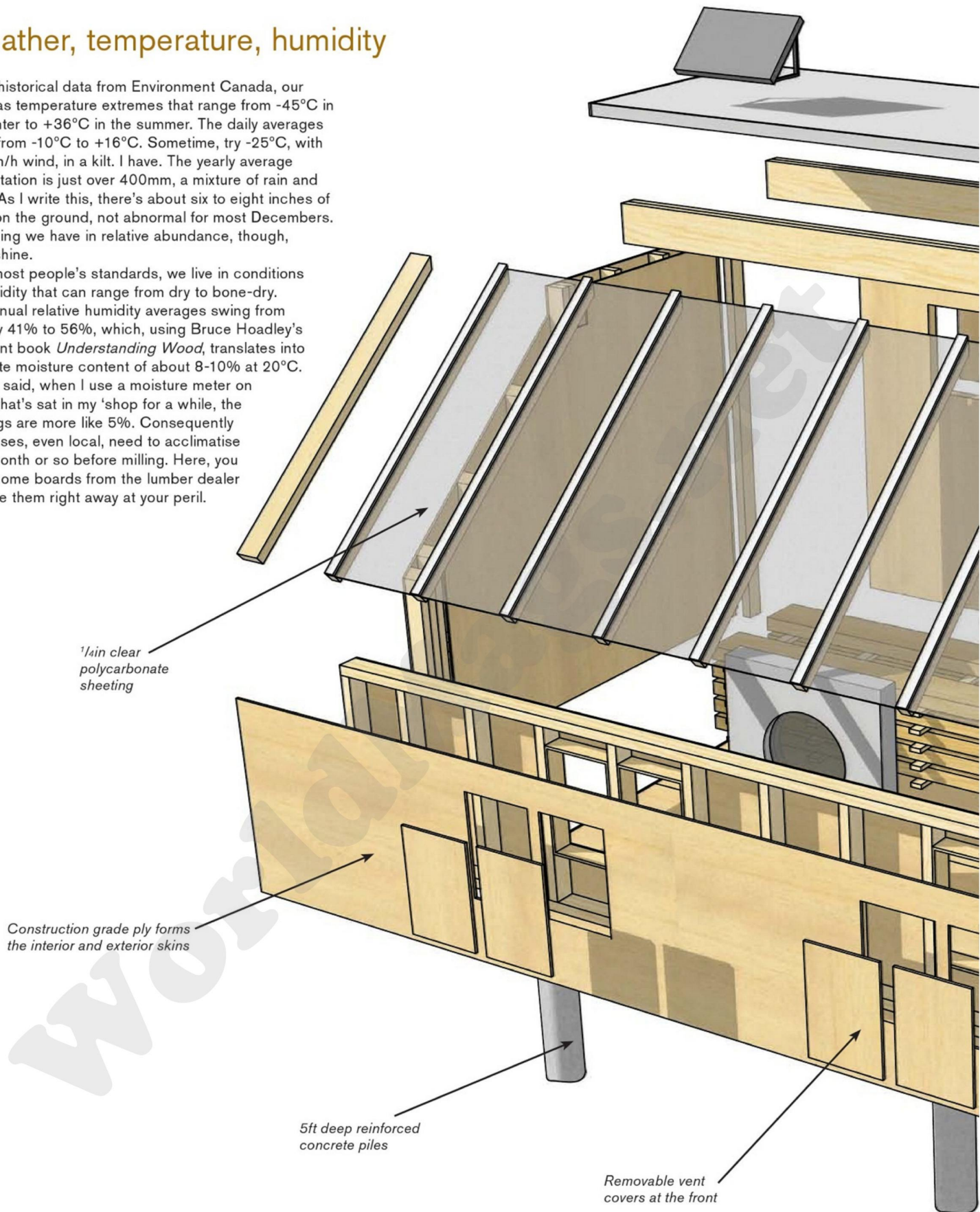
Andy's kiln is located close to his main workshop

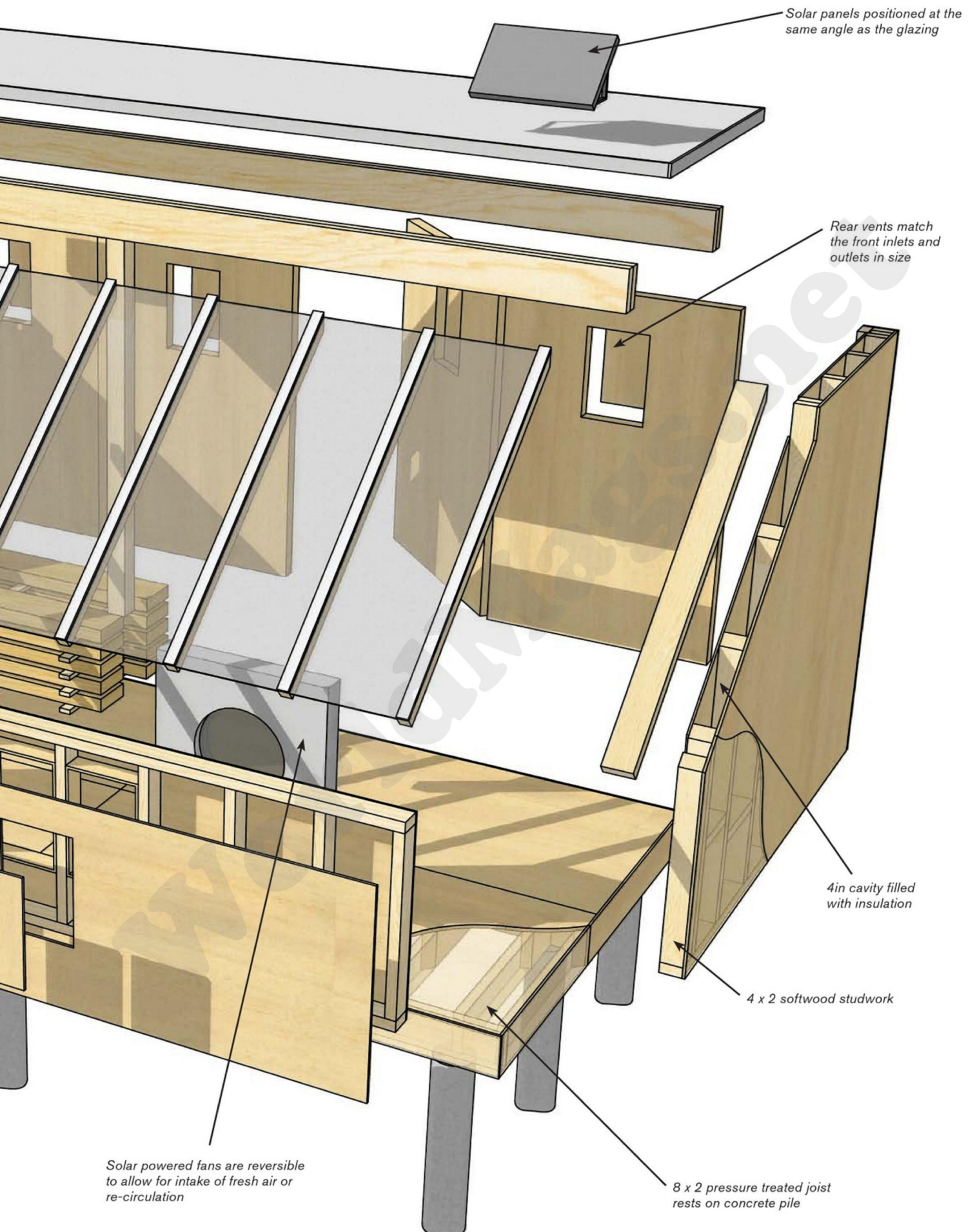
► Weather, temperature, humidity

Using historical data from Environment Canada, our area has temperature extremes that range from -45°C in the winter to $+36^{\circ}\text{C}$ in the summer. The daily averages range from -10°C to $+16^{\circ}\text{C}$. Sometime, try -25°C , with a 30km/h wind, in a kilt. I have. The yearly average precipitation is just over 400mm, a mixture of rain and snow. As I write this, there's about six to eight inches of snow on the ground, not abnormal for most Decembers. One thing we have in relative abundance, though, is sunshine.

By most people's standards, we live in conditions of humidity that can range from dry to bone-dry. The annual relative humidity averages swing from roughly 41% to 56%, which, using Bruce Hoadley's excellent book *Understanding Wood*, translates into absolute moisture content of about 8-10% at 20°C .

That said, when I use a moisture meter on wood that's sat in my 'shop for a while, the readings are more like 5%. Consequently purchases, even local, need to acclimatise for a month or so before milling. Here, you bring home boards from the lumber dealer and use them right away at your peril.





► Design considerations

A search of the internet will turn up a lot of articles about drying wood, but probably the two best sources I found were the US Forest Service's website, and a book published by Taunton Press called *Wood and How to Dry It*. One of the challenges in building this kiln is that a lot of the research seems to contemplate almost equatorial conditions. Northern latitudes obviously have lower temperatures of course, but also the sun's angle in the sky changes with the seasons, and this must be compensated for.

The drying process

Green wood contains two types of moisture; free water and bound water. Essentially, the free water exists in the spaces between the cells of the wood, and leaves the wood fairly easily and quickly. The bound water is located inside the cell structure, thus it must pass through the cell walls, a slower process which results in shrinkage of the cells and a consequent shrinkage of the lumber.

It's a statement of the obvious that

one can dry as quickly as possible if one is dealing with firewood. Quick drying pays no heed to the effect on the cell walls, resulting in significant cracking of the wood. This is because the escaping moisture has volume itself, and as that volume leaves the wood, the fibres need to compensate. The bulk of the moisture migrates through the cut ends, which is why you see the worst cracks on the ends of the boards. The objective here is to dry wood in a way that maximises the value and usefulness of the lumber while reducing the drying time to something more practical for the average woodworker.

Airflow

All of the articles on kilns that I read showed rectangular buildings which accept stacks of lumber, where the stack is separated by 'stickers' which are essentially $\frac{3}{4}$ in x $\frac{3}{4}$ in spacers placed between the boards, one directly above the one below it, at close enough intervals to minimise sagging of the boards. What caused

me to continually scratch my head was that all the representative kilns had their fans mounted on the ends of the buildings. This didn't make a lot of sense, as the result seemed to be that the stickers between the boards would basically act as air dams, restricting the airflow between boards just at the point where one would want to encourage such airflow. This led to the design decision to put the fans and vents on the long wall of the building instead of the ends, so that the air, whether re-circulated or fresh, could move freely within the pile.

Latitude

We have long summer days with the sun high in the sky, and short winter days with the sun very low on the south horizon. The research I was able to find suggests that the best way to maximise the heat gain from the glazing panels would be to put them on an angle which roughly equals the latitude. Thus we planned the south wall to be 51° from the horizontal.

Solar fans



Gable-mounted solar-powered fan from Sunrise Solar

Although the kiln is only about 10-15ft from my 'shop, I didn't want to run electricity out to it. I was able to find a company near Chicago who make solar fans – mainly intended for venting attics in houses. The company SunRise Solar has advised me that they have sold fans into the UK.

Essentially, a solar panel is mounted on the roof of the structure, with wires that connect the fans in the building to the panels on the roof. I mounted the panels at the same angle to the earth as the glazing, figuring if the glazing maximised the light gain that would be good for the panels. I put the fans in a basic frame for two reasons. First, if they are freestanding – as opposed to mounted in the wall – they could function as intake or re-circulating fans simply by opening or closing the vents. Second, they could be moved out of the way when not needed. Note: SunRise makes fans that mount on the roof, and fans which mount on a gable end. The roof fans won't work. For this application you must get the gable fans.

Doors and venting

Four vents were put along the south wall, utilising the spaces between the framing studs, roughly 14.5in wide and 20in high. The large open loading space on the north is filled with rather large bi-fold doors that are made in a torsion box-style containing Styrofoam

insulation. I used $\frac{3}{8}$ in sheeting to skin the doors. From a weight perspective I should have used $\frac{1}{4}$ in. Each door has a vent cut into it as well. Vents are held closed by basic barrel bolts, and held open with hooks and eye screws, all available at almost any hardware dealer. Weather sealing of the south wall vents is a simple wood stop ripped from scrap. I'd sealed the door vents with duct tape, but noted that it failed in the cold, so it was replaced with a weather-strip material that sealed by compression by the doors.



Fans located in the side of the kiln aid airflow through the stack

Construction

I'm used to doing fine woodworking and furniture making. This ain't it. Basically, I've built a slightly higher-tech garden shed or greenhouse. The overall dimensions of the building are about 18ft long by about 9ft deep, and 8ft high at the door side, tapering down to about 3.5ft on the south wall. This gave the desired angle for the glazing.

Weight bearing

Anticipating a lot of weight, particularly from green wood, and to forestall any frost heaving which would disrupt the level floor, we set out a pattern of nine concrete piles, which go about 5ft into the ground. We used 8in piles but drilled 16in holes. This allowed a sort of inverted concrete mushroom at the base of the hole, which adds somewhat to the bearing, and also helps in the positioning of the piles when the floor joists are set on top of them. Each pile had three pieces of 1/2in steel-reinforcing bar placed into the concrete. On top of the piles we laid floor joists of 2 x 8 pressure treated lumber, 16in on centre, and this received a floor of 3/4in pressure treated plywood. Care was taken to make the floor dead level and dead flat. Some shimming between the joists and the piles was needed.

Framing

Typical framing here is 2 x 4 construction, 16in on centre, although residential construction has moved to 2 x 6 framing to obtain better wall insulation. I chose 2 x 4 construction because I had them around – a

theme you will see again. When filled with fibreglass batt insulation, this gives a wall insulation rating of R20, which I thought was enough under the circumstances. We needed two spans, one on the front wall, which was done as a torsion box, and one at the ridgeline, which was a beam made up of 2 x 8s. In hindsight I wish I'd done the ridgeline beam as a torsion box as well, so as to avoid the support post in the centre of the beam, which bears through the floor to a central concrete pile. I didn't insulate the floor. In hindsight I wish I had, and may do so at a later date.

Glazing

A while back, I had to replace the skylights in my main 'shop because they were leaking. This resulted in several sheets of 1/4in polycarbonate left over. Rather than taking them to the dump, I decided to recycle them into the glazing for this project. There was almost enough to double-glaze the whole building, we only had to buy one more sheet to complete the job. If you choose this material but have to buy it, make sure you get the clear version, not the smoked, to maximise the solar heat gain. We set the polycarbonate into the spaces between the rafters, using 'shop-made glazing stop below, between, and above the sheets of plastic. A friend in the window business had some leftover glazing tape and this helped get a seal between the plastic and the glazing stop. Silicone caulking was applied to the top of the rafters. Since I detest painting, I wanted to find something



to cover the wood rafters. Luckily, at a lumber store near us, I found a product that is normally intended as fascia board, which is a composite board of recycled plastic – basically old pop bottles. Even better, there were a number of damaged pieces, which the lumber guy was happy to make a great deal on, and these were ripped to provide rafter caps and end seals that will never need any attention again.

Double skinned and insulated, the kiln is oriented to capture maximum exposure to sunlight and maximise heat gain



Andy Lockhart, his kiln and a stack of prime timber in the making

► The drying experience

This account was written in December of 2010, and it's now November of 2011. How did it work? In the spring of 2011, I was approached by some people who were building what we call an 'infill' house – essentially building a new home in an older established neighbourhood. This meant that the existing house needed to be either demolished or moved off the site. They chose to move and resell it, but there were two birch (*Betula*) and one green ash (*Fraxinus pennsylvanica*) trees in the way of getting the house off the property. They wanted to do something more responsible than cutting the trees up for firewood, which happens to great timber more often than it should. In this case, the desire was to use the lumber as stair treads in the new home.

The owners engaged an arborist, who took the trees down and left the trunks in long (10-12ft) lengths. I have a contact who has a portable sawmill, so we brought the logs and the sawmill out to my property, and set to work milling everything up.

Sealing the ends

One thing I did that worked very well – almost as the boards came off the saw, was to coat the end grain and about the first six to ten inches of the ends of each board with end sealer. This is essentially an emulsified wax. It retains moisture from evaporating out of the cut end grain, and is quite effective.

We loaded the kiln with just under 500 board feet, which had been mainly milled to about two inches



A portable saw mill was used to convert the logs into planks at Andy's workshop

thick. The boards were separated with stickers, which had been ripped from ¾in scrap. Sometimes there can be staining resulting from the interaction of the moisture in the lumber and tannins in the stickers, so I covered the stickers with a layer of the clear tape usually used to seal cardboard cartons. Carton tape is a staple in my 'shop, but that's another discussion. For the duration of the drying cycle I kept the vents closed. I was concerned that opening them would cause the wood to dry too quickly, and evidently there was enough leakage in the kiln

that I didn't need the vents.

So what's the outcome? The batch went in on 5 June and was in equilibrium with other wood in my 'shop (about 8%) by 5 August. I resawed a small section of one of the boards and measured the core of it; the drying was consistent throughout. The end seal worked like a dream, and I only noticed one end crack in the whole load. Surface checking was minimal and appeared to be 1/16in or less. The maximum-recorded temperature in the kiln during the drying cycle was 51°C.

Subsequently, I found my figured maple log, and it's pretty sweet. At the end of September 2011 we reloaded the kiln with a bit over 700 board feet of material, this time milled to 2½ and 3½in boards. I'm intrigued to learn the differences between summer and winter drying. Clearly, the additional thicknesses will slow down the process, as well as the colder weather and lower heat gain from the sun, but then again, the slower the drying, the better the lumber, right?



Before loading the planks into the kiln the ends were sealed with an emulsified wax to slow the drying process down



Two birch and a single green ash tree had to be removed from the site before the house could be dismantled. The logs were the first batch to be dried in the kiln

Air drying



Air drying involves keeping your timber in logs or planks for years. As a rule of thumb, a 25mm (1in) plank will take one year to dry, so a 75mm (3in) plank can take three years to come down to around 18% moisture content – that's a long time to wait. If you have a lot of space to keep a stock of timber for rotation, you will always have timber ready to use.

If your timber is planked then you need to place sticks between each plank to allow air flow. These need to be around 25mm (1in) square and must be in line with the stick below to avoid the timber bending while in the stack. If you have sycamore (*Acer pseudoplatanus*) then you need to stand the planks on their end to dry; if you use sticks you can have discolouration on the planks where the sticks have been.

I like to turn my timber wet to save on drying time so the moisture content is not a problem. This way, I am only drying the useable timber; with more moisture in the stock, there is less dust.

Philip Greenwood

Sticks placed between planks of timber to allow air flow

Steam treatment

From Classic Hand Tools, this wood kiln is available as two different models: the VT3 and the VT5. This wood kiln works on steam treatment of wood, followed by a controlled drying process, and is used widely by furniture producers in Scandinavia. This method creates superb quality wood that is extremely stable and free from flaws.

The Sauno method involves a two-stage process. Firstly, the wood is steamed at 70-75° which opens the pores of the wood.

The second stage is the drying process at a temperature of 40-50° which slowly evaporates the moisture from the centre of the timber. This two-stage process keeps the risk of cracking to a minimum. The VT3 model is for kilns with a maximum length of 3m and a total inner volume of 3.5m³.

The minimum dimensions are 1 x 1 x 0.6m. This model uses 2,000W of power and needs about 100-150kWh for each cubic metre of wood. The larger VT5 model has a power rating of 4,000W and can have a maximum inner volume of 12.5m³.

You can download a PDF from the Classic Hand Tools website which will give you instructions on how to build your own Sauno Kiln Dryer. Further details can also be found on the website; see supplier list for details. *F&C*



Buying moisture meters

So you want to know the moisture content, but what do you need? Well, a moisture meter will cost from £80 up to around £400. Yes, you can go to an auction site and pick one up for around £10 but don't expect the accuracy of a more expensive meter. These will tell you the percentage of moisture content, but only as far as the pins on the meter penetrate into the surface, so a reading of 11% on the surface does not mean the centre would not be higher.

Resources

SunRise Solar

www.sunrisesolar.net

The Met Office

www.metoffice.gov.uk

Suppliers

Moisture meters

Extch Pinless Moisture Meter

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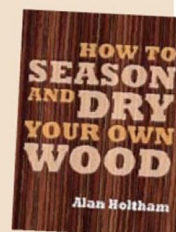
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TESTS & EQUIPMENT

Microclene MC3000 ambient air filter



Filter focus

Anthony Bailey tries out the Microclene MC3000 ambient air filter from Acrol Ltd, to see if it makes a difference to the atmosphere

Ensuring the workshop environment is safe to work in is a persistent problem that we all have to be aware of. Air quality is a major part of that concern and while good extraction at source is essential and using the correct PPE is sensible, there always remains a certain amount of fine dust floating in the air. Ambient air filters are designed to remove as much of this micro-fine dust as possible, making the atmosphere much safer and more breathable.

The unit

The Microclene MC3000 is a large unit designed as a replacement for the larger less powerful MC2800 model. It's claimed to filter more than 3,000 cubic metres of air an hour in up to a 300 cubic metre workshop when used singly. It's a solid piece of construction designed for long life. We needed three people to raise it into position on chains, after bolting those chains to the top of the MC3000. It has no less than four motors to draw air through all sides and expel the cleaned air through the top. *F&C*



F&C verdict

Heavily built, it does need to be securely fixed for safety. The noise level is quite high but not a high note, which you get used to. In any case many operations require ear defence, so the background sound is less important then. As usual with these devices it pays to start them running before actual machining, so the air is already in circulation although this air cleaner has very powerful fan suction in any case. Turning it on is simply a matter of pressing the switch at the socket, no plug is provided which is unusual these days.

The numbers

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Is wax the only finish you need?



COURTESY YANNICK CHASTANG UNLESS OTHERWISE NOTED

Not quite but Yannick Chastang suggests three different formulas for producing your own finish wax

Wax is a wonderful material that's been used for thousands of years to enhance and protect wood surfaces. There are many waxes available on the market, either as ready-made products or in raw material

form, all with varying qualities and characteristics. The application of a well-chosen wax can achieve various results; it can impart shine, can dull or can offer more or less protection. Not only can wax be applied directly on to the wood surface, it can also be

applied on top of a protective layer to alter the sheen of the polish.

In the field of restoration and conservation a wax finish is becoming increasingly popular as, not only is it easily reversible, but it's also closer to the original 18th-century practice.



This desk from around 1900 has received a wax finish directly on to a shellac polish



Wax is a perfect one-stop finish for this 17th-century marquetry commode

One should remember that French polishing – the application of shellac with a rubber to impart a high shine – is almost certainly an invention of the second quarter of the 19th-century and not appropriate for antiques that predate 1820.

The problem with shellac

Eighteenth-century cabinetmakers finished their pieces with an application of shellac or sandarac, however both presented difficulties. The shellac available was not de-waxed – a process that lightens the shellac. So it remained dark and was generally reserved for dark woods such as rosewood or mahogany. While sandarac has the virtue of being a clear resin it's very difficult to apply and takes a long time to dry, if ever, often remaining tacky and prone to collecting dust. A clear transparent lacquer was highly regarded by the 18th-century cabinetmaker and

recipes were published in Stalker and Parker *A Treatise of Japanning and Varnishing*, London, 1668 and Roubo's *L'Art du Menuisier en Meubles*, Paris, 1772-1774 – both available in modern reprints. Both publications suggest reserving the use of lacquer to the highest quality furniture of the time. However, recent research into 18th-century cabinetmakers' bills suggests that wax was generally the finish of choice, favoured even for royal furniture.

Suppliers

Stalker and Parker:
A Treatise of Japanning and Varnishing

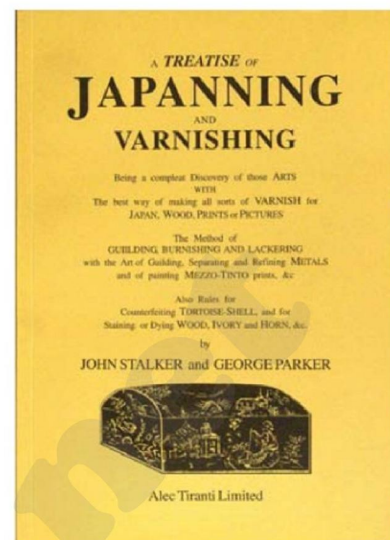
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www.laverdure.fr

www.kremer-pigmente.de



Three types of wax

There are three types of wax that are generally used in the production of wax polish:

1. Waxes of mineral (petrol) origin such as microcrystalline or paraffin
2. Waxes of vegetable origin such as carnauba
3. Waxes of animal origin such as beeswax or shellac wax, which is obtained from shellac.

The three most important properties of any wax are hardness, acidity and reversibility. For the cabinetmaker interested in enhancing the beauty of his wood surface his choice of wax will be primarily dictated by hardness. As a basic principle the softer the wax, the easier it is to apply. This is

largely dependant on the amount of solvent used.

However, a soft wax will always remain soft and tacky on the surface, it will attract dust and will be impossible to burnish to a high shine. A hard wax, by contrast, will be extremely difficult to apply but, once achieved, the wax will lay in a hard, solidified film that can be burnished to a high degree of shine. Ready-made waxes available from various manufacturers are no more than a combination of hard and soft waxes in solvent.

Quite often the only thing distinguishing them from one another is the price, which depends on the quality of the waxes chosen and the amount of cheap solvent added.

Our friends the bees produce a great natural product but remember it should not be used on metals



Why make your own?

There are many different types of wax and knowing their properties is essential. As a furniture conservator I need to be totally cognisant of what substances I'm using. To use a cooking analogy, if you buy a ready-made meal and you don't like it you won't know why. There may be a list of ingredients and you may have your suspicions about the level of salt, sugar, spices, or even miracle flavour enhancers such as MSG, but without knowing what exactly was put into the dish it will remain a mystery.

However, if you've cooked the meal yourself, you'll know exactly what you've put in it and how to go about improving it. Putting aside the conservation issues and considering the ease of making your own and the advantages of being able to manipulate the recipe, why not try making your own? Fortunately there exist many publications detailing the properties of each wax and with a little research and experience you can certainly develop your own preferred wax.



Turpentine is the product of distilled resin harvested from pine trees, sometimes called turps



Petroleum wax is used extensively in products around the home such as cosmetics and candles

► What's in your wax?

A high ratio of solvent to solid will make for an easy and immediately rewarding wax such as that applied by a housemaid to domestic furniture. The solvent wets the wood thereby immediately enhancing its appearance. However, once the liquid evaporates there remains very little solid wax available to be burnished and any long-term effect is non-existent. More expensive waxes can offer better results but you should be sure to use the right wax for the job. Animal waxes such as beeswax are extremely acidic and any wax applied on to metal hinges or gilded bronze will not protect it, but can cause the opposite effect resulting in degradation over a fairly short time.

Reversibility concerns the long-term survival of an object and ease of removal of a wax may also need to be taken into account.

Solvents

Having said that the wax itself is hard or soft, the choice of the solvent can also alter the properties of the finished wax. The two most widely available are white spirit and turpentine. Turpentine, which was historically favoured and combined with beeswax, is slowly being replaced as it's believed to be carcinogenic. However with appropriate protection, and considering the minimal use I make of it, I still regard it as a useable

product. Turpentine is obtained from natural sources, being the sap of softwood pine. Given the non-volatile components of natural turpentine, the use of turpentine in wax recipes adds flexibility and ease of application without loss of sheen. Nowadays this could almost be called a plasticiser.

Silicone-based plasticisers are common components of ready-made wax. Although silicone has come a long way since its first appearance, it's still not regarded as easily reversible and I therefore prefer to avoid it. White spirit is a petroleum distillate that dissolves the wax while adding virtually nothing to it so that when it evaporates the wax will harden back to its original properties.

Choosing the ingredients

When making your own wax you'll need to include a soft wax for ease of application, a hard wax for shine and protection and a solvent to dissolve the wax and enable its application as a thin film. My recipes play with the amount of turpentine and white spirit in the same way that I play with combinations of hard and soft wax. Having decided which wax you want to use, be it beeswax, carnauba, shellac or microcrystalline, the ease of application and degree of shine can be adjusted by the proportions of wax and the amount of solvent used. I highly recommend playing about with the quantities to find what works best for you, but here are some of my own.

1. Soft wax

This blend produces a wax with a nice smell, it doesn't offer much protection but wets wood sufficiently. This is a general wax, particularly useful for interiors and drawers. It's for solid, unvarnished wood only and is acidic so mustn't be used on metal.

200g beeswax
100g white spirit
300g turpentine

2. Hard wax

This wax is suitable for new pieces or for imparting a high shine to antiques. It offers a good level of protection. I use this wax when restoring for dealers. Like the soft wax recipe it's acidic and shouldn't be used on metal. This wax can be applied on top of a lacquer finish.

200g beeswax
100g shellac wax
200g white spirit
100g turpentine



A block of brown beeswax (1); biscuits of high quality white beeswax (2); shellac wax (3); carnauba wax (4); the mix is stored in an airtight container (5)

3. Medium hard wax

A blend that will offer good protection but can't be burnished to a high shine. It's very useful for antiques that are part of a collection as it will allow the newly conserved piece to blend with the old. I favour this wax for any museum pieces with which I am entrusted and it should be applied on top of a shellac finish or polish. This wax is also acidic and should not be used on metal.

200g beeswax
60g shellac
150g white spirit
150g turpentine

4. Microcrystalline

This product can be used on its own but it remains very soft. It can be

combined with white spirit. Although it can be used on top of a shellac finish it will give a matt finish. Unlike the other recipes, it's safe to use on metal and is generally favoured by conservators.

It can be helpful to keep track of the recipe by labelling the jar



Mixing up

Having selected and weighed all the ingredients the easiest and fastest method of preparation is to melt the wax, preferably in a bain-marie comprising a Pyrex bowl over a saucepan of hot water, before slowly adding the solvents. If no bain-marie is available preparation can be done in a saucepan over direct heat. However this is not recommended as the wax and the solvents are flammable. The importance of having a fire extinguisher to hand is demonstrated by my early experiences of melting wax over an electric plate. Not only were the 50cm high flames distinctly alarming but the resulting fire alarm caused the complete evacuation of tourists from the Louvre which was above the workshop.

As can be seen, all my waxes have a beeswax base. Beeswax varies dramatically in quality and price. I tend to favour the expensive, lighter

coloured wax. Traditionally this was the wax collected from the hives early in the spring, however nowadays lightness of colour is achieved by sun or chemical bleaching rather than depending on the time of year of harvesting. Cheap dark beeswax is fine for use in general woodworking or on dark wood.

I generally use shellac wax for the hard element obtained from Laverdure in Paris or Kremer Pigments in Germany. I know that many of my colleagues are happily using carnauba that has a similar hardness. In my experience the bright yellow coloured carnauba will form light coloured residues in the grain of the wood that can be an issue for dark timbers like ebony. This problem doesn't occur with shellac wax. It's also possible to dye your wax with a chosen pigment or dye but beware of the risk of the pigment migrating and staining the wood.



An old glue pot will make a perfect bain-marie

Applications



A soft cloth dampened with white spirit makes applying hard wax a little easier

The application of wax will be eased by the softness of the wax however, in all cases, the secret of a good wax finish lies in not applying too much. Wax should be applied with a rag and, if necessary, the application marks can be smoothed by wetting the rag slightly with white spirit. When using a very hard wax the applied wax can be smoothed using a rubber in the traditional French polishing style i.e. a woollen pad covered with a rag then impregnated with white spirit. Unlike varnish, layering the wax is not going to produce anything different and one coat is sufficient. Once fully dried the surface of the wax can be burnished with another clean, soft rag. However, for that extra professional look try burnishing with the sheepskin pad on the Festool Rotex tool.

In conclusion, wax is a quick and easy way of finishing that has great potential. However, it must be said that no wax or varnish will ever look great on a poorly finished piece of furniture. Unless the grain of the wood has been raised again and again before sanding, the open grain of the wood will prevent the wax achieving a nice surface. In my workshop new pieces of furniture are sanded with 200/300 grit paper, then wetted with warm water before being sanded with 300/400 grit paper. This process is repeated 3-4 times allowing the wax finish to properly showcase the natural beauty of the wood.

F&C

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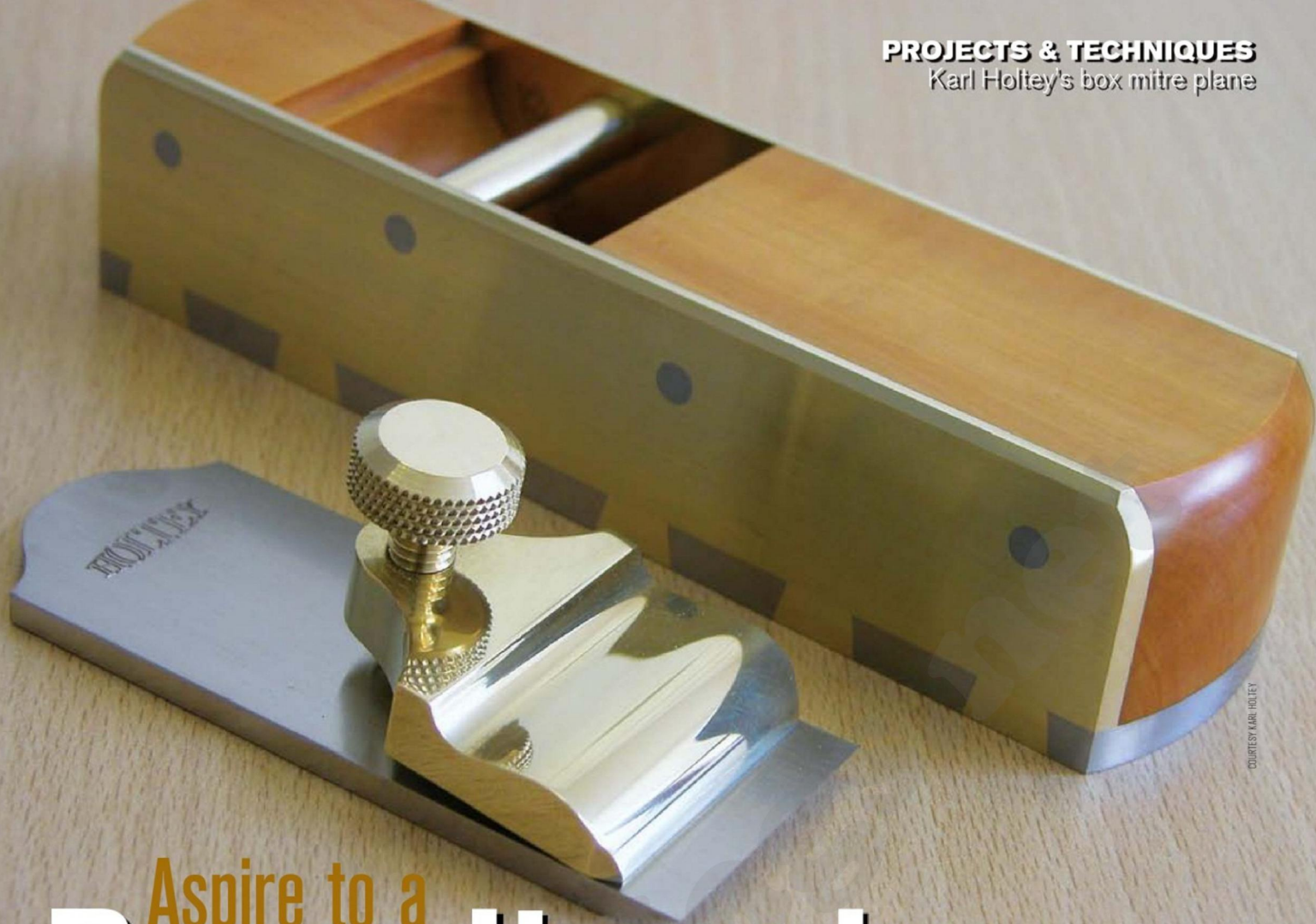
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COURTESY KARL HOLTEY

Aspire to a Box mitre plane pt2

In the second of this mini-series Karl Holtey demonstrates the techniques you need to build one of his box mitre planes in your own workshop using just hand tools

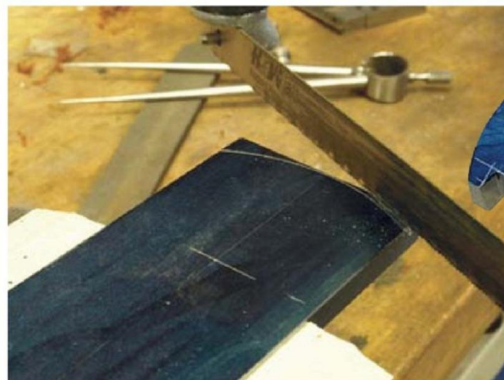
In the first part of this project I covered how to prepare your components in readiness for cutting dovetails in metal and started the process with the brass sides. A few weeks have passed and by now you should have these completed along with the rivet holes. The time has come to separate them by cutting to the right length so that the riveted ends fall away leaving you a perfect matched pair of sides.

Bottom

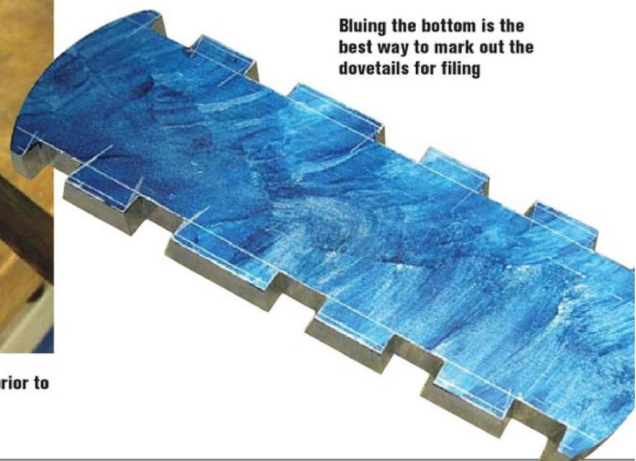
The plane sole will be made out of a single piece of 6mm or 1/4in mild steel bar. It's essential that this is prepared with parallel sides and with square

edges before bluing and marking out referring to the drawing.

Just as you would with timber, much of the waste can be removed with a ➤



Much of the waste material can be removed with a saw prior to filing the shape at each end



Bluing the bottom is the best way to mark out the dovetails for filing

► Bottom – cont'd

saw close to the finish line to save time spent on filing.

When it comes to filing out the dovetails that correspond to those already cut in the sides, there are no special techniques involved, although constant bluing for any filing work will provide much needed feedback as you get closer to the line. Above all it's important to keep all edges perpendicular. Sometimes it's necessary to clean and re-blue as some of the ink will rub off whilst work is going on.

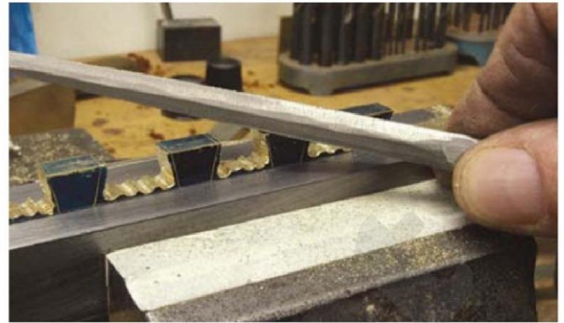
The dovetails should be as close

a fit as you would attempt when working with wood. Before panic sets in I should point out that you'll only be able to test fit the rear three dovetails and the two front ones separately. This is because of the extra space between dovetails 2 and 3, which is the mouth area where the bottom will be separated.

The dovetails need to fit nicely with no gaps, otherwise you'll have some very big spaces to fill when peining. Don't forget that the tails (pins) on the sides are an extra $\frac{1}{16}$ in long to allow for the peining.

Modify your file

I use a saw file that I've modified by grinding a side away, so that I can form much sharper corners to make the dovetail. This image shows the file being used to complete the dovetails in the brass sides.

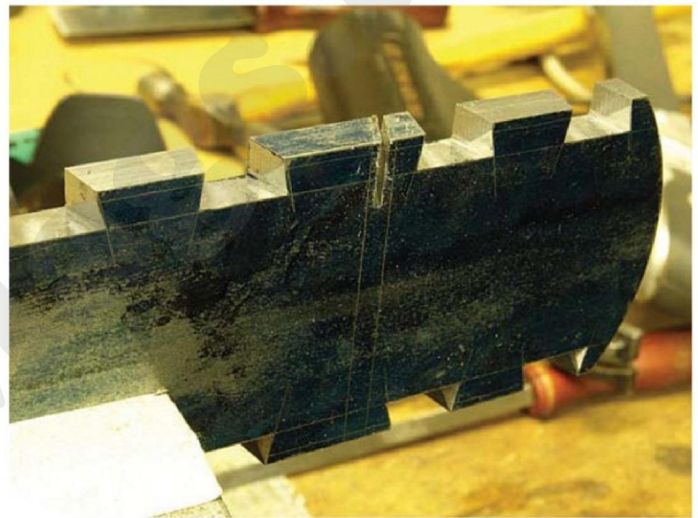


Try modifying your file so that you can work into the corners without affecting the surfaces of the neck of the dovetail

Compound dovetails



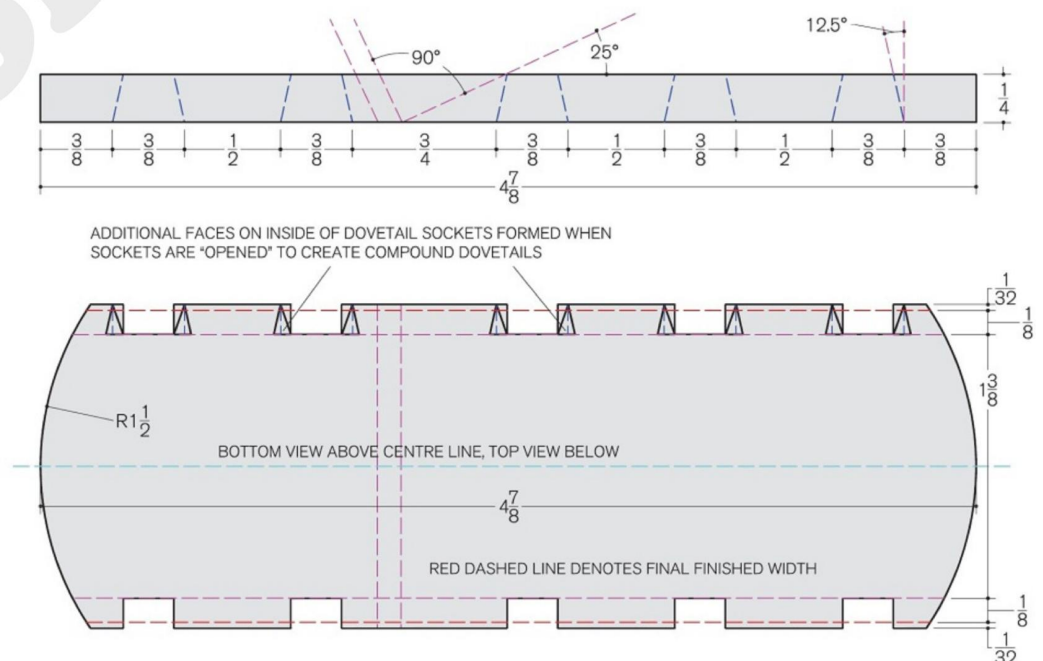
File each dovetail using a straight edge to maintain a flat shoulder line



The separating cut is contained within an $\frac{1}{16}$ in to avoid a lot of filing afterwards

Compounding dovetails is an advantage that can only be achieved with metal and not wood. Sometimes referred to as double dovetails, their shape is difficult to describe in words but requires you to remove from the under side of the bottom – as shown on the drawing, right – a small amount of material so that the socket is tapered. (Note the pins on the sides are not compounded.) It may seem strange to be telling you to deliberately file a gap when I have just expressed the importance of a nice tight fit but this gap will allow the dovetails from the sides to form a compound joint from the peining.

Once you're satisfied with the dovetailing you can separate the bottom. It's important to mark out the two finish lines either side of the saw cut so you saw exactly in the middle. Only $\frac{1}{16}$ in has been allowed for this cutting and joining to leave a minimum amount of filing afterwards.



Creating the mouth

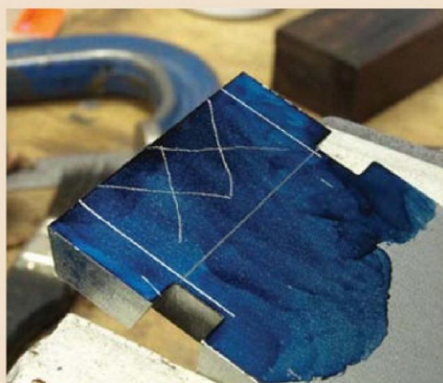
Sizing the mouth is a contentious issue and perhaps not wise to enter into at this point, but obtaining the right angle is of utmost importance. To help with this use a block of wood, preferably hardwood, to work the edge of the mouth opening. This angle has to be filed on the front and rear portions of the bottom. You need to maintain precision and keep checking for the fit on to the plane sides. The fit of the dovetails are your reference here. When the two bottom pieces fit nicely together into the sides you'll need to disassemble and clean up for re-bluing to mark out for the plane bed, the angle of which will be 25°.

There is no short cut here, it will take a long time and you should start the process with a bastard file (coarse) followed by a second file (medium) and finish with a smooth file.

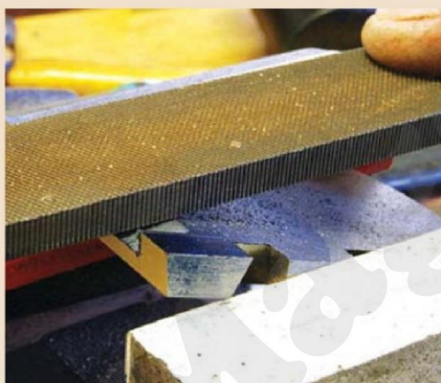
Once again this process has much in common with working in wood so you don't need to go right up to the sides. Allow for a small amount of finishing as you approach the final stage. The width needs to be a loose fit for the plane blade – I've allowed 20-30 thou, which allows the blade to move laterally. As you get nearer to the finished angle accuracy becomes crucial, so work off a second block of wood prepared with the right angle.



Filing the correct angle of the opening accurately is best done using a hard wood block for reference



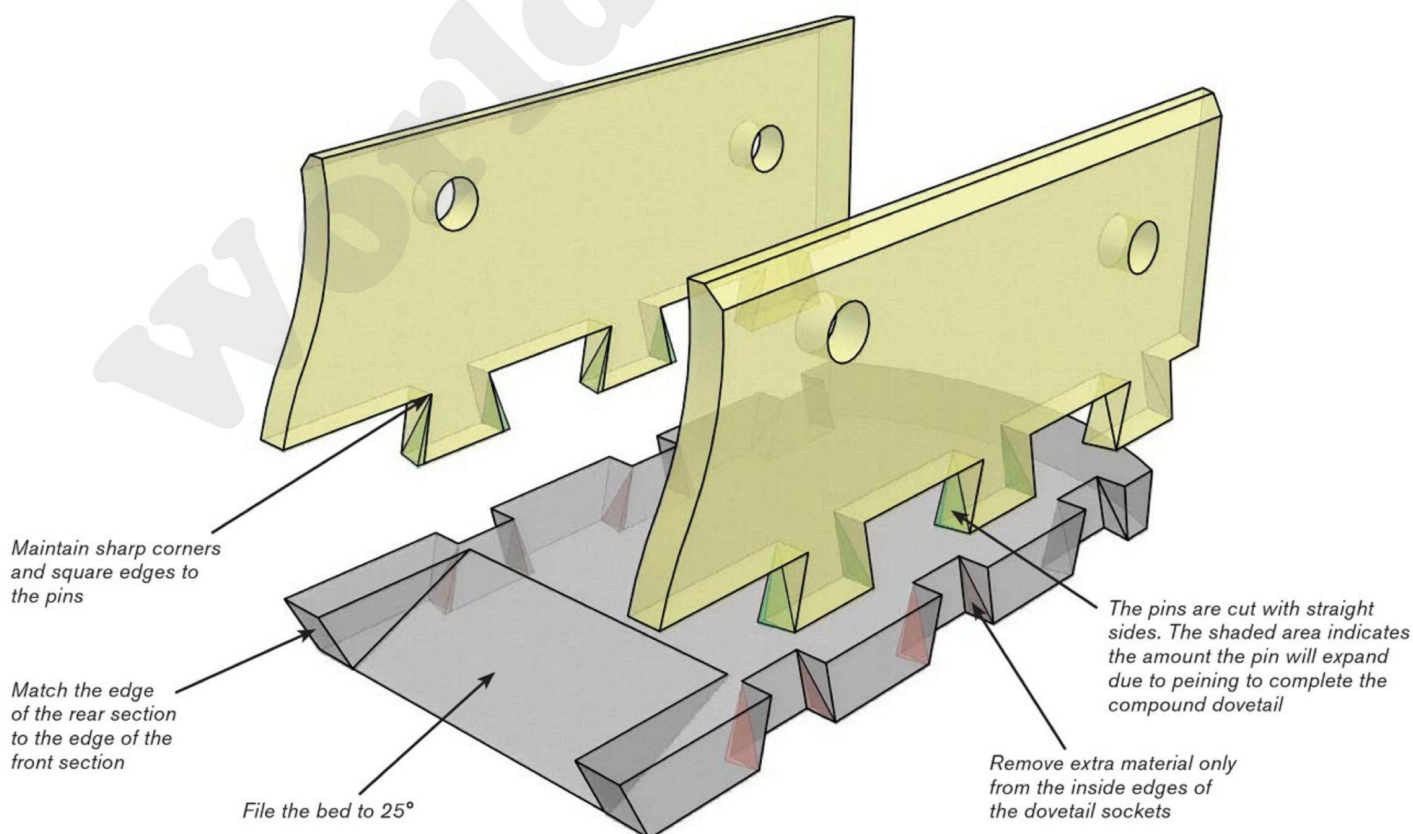
Mark out and prepare the 25° bed for filing with bluing



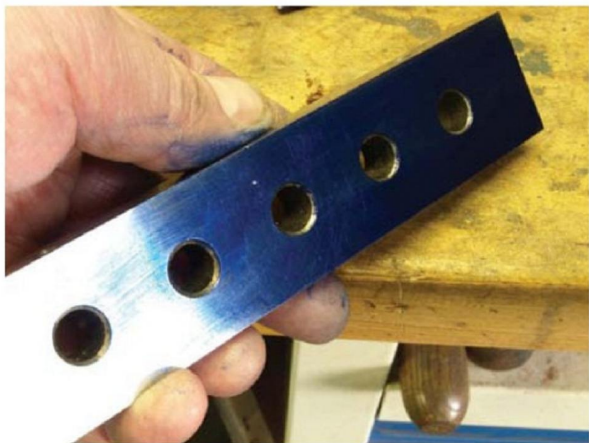
Start removing the waste with a bastard (coarse) file working down to a fine file as you get closer to the line



Once again a block of hardwood cut to the right angle makes a great platform from which to gauge progress



► Tuning the bed



Marking blue is used on a flat piece of steel to identify any high spots in the bed



Draw the flat piece of steel across the bed...

Dedicated hand plane users will know the importance of having a perfect register between blade and bed. Making adjustments to the bed will be nearly impossible after the plane is assembled so it's crucial to get this detail absolutely right first time.

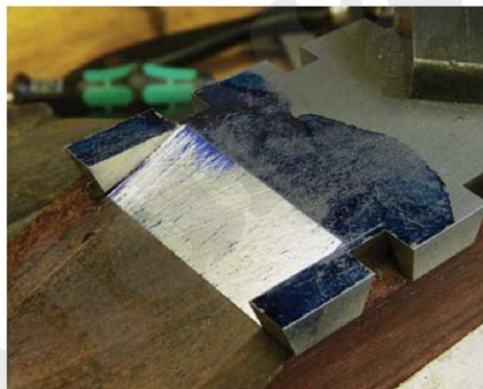
To help with this I use a marking blue. This is a different type of blue to the one used before for highlighting the marking out; it's an engineering blue for showing high spots and needs to be used very sparingly. Apply a coat of the blue to a piece of metal, any piece of metal will do as long as it has a true flat surface. Stroke the block over the bed and the blue will indicate any high spots.

It must be remembered that this stage of the work is going to determine the position of the mouth of the plane. All the measurements shown on my drawing are guidelines and show the mouth opening as zero. The width of the mouth is a personal preference, but should you wish to aim for the finest

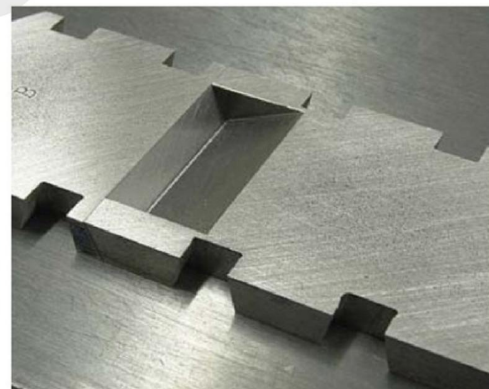
opening, removing more of the bed at this stage won't help.

Note that the leading edge on the rear part of the bottom has been prudently filed away so that a gap has been created. This gap will not increase the mouth of the plane as this is behind the blade but it will allow you to make any mouth-size adjustments after the whole plane has

been assembled. Remember you can always make the mouth bigger but not smaller. It takes a great deal of experience and skill in arriving at the correct mouth size after the plane has been assembled and the dovetailing flushed away. This is why I work on a zero mouth and with a very fine file I can gain access to generate the preferred mouth.



... to mark areas that still require a little work



The bottom of the plane shown from above to see the bed...



... and from below to show the mouth opening

Joining the body

You are now ready to assemble the plane body for the final time. Remember that there's no turning back once you start peining so it's a good idea to make sure everything is all nice and clean. The next thing you'll need is a former. A nice dry piece of hardwood will do well for this purpose. You'll need to plane up a short length just slightly longer than the length of the plane. The sectional size will need to be slightly less than the width of the plane; for example 1⁹/₁₆in square if you're following the dimensions on this drawing, but this is not critical. You'll need to add a rebate on two sides so it fits snugly inside the plane body but shouldn't reach the bottom. Aim to leave a gap of around 1/16in.

The object of the former is so that the sides of the plane can be pinched tightly in an inverted position in a vice, and blocked up from the underside with something solid enough to hit against when you start peining from above. Ensure the dovetailing is above the vice jaws so all your peining keeps the bottom pressed down tight on to the sides.

Start peining on the ends of the dovetails so that you fill the voids. Be very careful not to spread the sides with the peining – they mustn't be moved outwards, keep them tight at all times. Any unwanted swelling will push the sides outwards and you'll not get them back in again. In the past this peining work was done with a direct blow from a ball pein hammer but I find that this is a little bit hit and miss (yes the pun was intended). An unwanted ball mark on the bottom will take a long time to file out. I use a peining punch I made myself which has the advantage of being more controllable.

Work the bottom dovetails first in opposing pairs either end-to-end or end-to-centre, it doesn't make much difference but you need to keep it



A block of wood prepared to the thickness of the infill is used to support the sides during the peining process

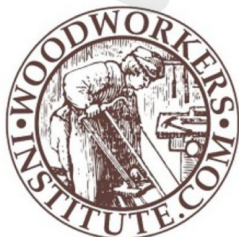
balanced. When these are done turn the plane over on its side and work the dovetails in the same way. Make sure you're closed and tight round the whole of the steel dovetail – the top long section of the dovetail can only be peined very lightly otherwise you'll push the bottom away from the sides. Be especially careful where the mouth

is because there's no support either side of the mouth and you could push this area in and will lose the width for the blade. It could be useful to put in a temporary steel spacer to prevent this. Or just use some very light taps.

With much of the hard graft done, next month we'll start work on the infill and other components. *F&C*



Assembled and a little rough round the edges the components are starting to resemble a plane



If you've enjoyed this article on planes, you'll find related articles on the Woodworkers Institute website –
www.woodworkersinstitute.com

20
minutes
with...

Sebastian Cox

This month we're talking to Sebastian Cox, the young maker given special commendation in The Wood Awards for Outstanding Design



Sebastian Cox's furniture is all made from locally coppiced hazel. When the hazel rods are cut they re-sprout with vigour providing a new crop for harvesting again. This makes the timber inexhaustible and sustainable. He combines his furniture making skills with traditional green woodworking methods making Cox and his work rather unique.

His Suent Superlight Chair, weighing only 1.7kg and strong enough to seat a 120kg person, was given an award for Outstanding Design at The Wood Awards 2011. We wanted to find out more about this intriguing young maker.

F&C: What are you working on at the moment?

Sebastian Cox: I'm currently making some commissioned pieces for a client near Lincoln, a large table and some interesting slanted oak shelves. I'm also making lots of stock of my Products of Silviculture pieces to go into galleries ready for Christmas, this week specifically the National Centre for Craft and Design, and Modern Art Oxford.

F&C: Why did you become a furniture maker?

SC: I've always grown up making things, I recently had a conversation with someone where we discussed a kids' TV programme called 'Itsa Bitsa'. It basically encouraged you to make things with toilet roll tubes, butter tubs, matchboxes, and sticky tape, and I spent many hours inventing my own versions of the stuff

they showed. I suppose it all started at that very young age; I was always going to end up doing something where I could combine creativity and practical skills, and this carried on throughout my teenage years too. I felt very pressured by my school to go on after my A-levels and study a 'proper' academic subject, and so, being a slightly stubborn character, I found myself being drawn to things that were not that, outdoorsy and hands-on things like forestry and conservation. However, in a parentally-encouraged browse of the UCAS website, I stumbled across a university course that guaranteed 50% of the taught time as making, in the charming and lively city of Lincoln. I signed up, and from the moment I stepped into the workshop I loved it.

F&C: What inspires you?

SC: It's such a cliché, but I draw inspiration from anything. If you work in a creative discipline you have to be able to look at something and expand the ideas in your head or on paper. If you were to really pin me down, I'd confess that I get most excited by the way material responds to process, and in particular natural materials and natural processes. Most of my current Products of Silviculture pieces have been designed in this way. I look to how people would respond to the things I make to determine the form, and how the material responds to



the process to inform the detailing and textures. Generally I don't draw inspiration from other pieces of furniture or buildings, it's much more directly linked to the material or user than that.

F&C: If your furniture were music, what kind of music would it be?

SC: I suppose something quite minimal and lo-fi, perhaps with exciting hooks and samples. Perhaps with a folk edge. Morris dancing meets minimal house? That sounds like it might be hideous though...

F&C: Who do you admire in the craft at the moment?

SC: I really like the work of Simon Hasan. He makes some incredible objects with boiled leather and I've been a fan of his for some time.

F&C: Who has been your greatest mentor/role model?

SC: While studying at undergraduate level I developed a serious interest in the Arts and Crafts Movement. Ernest Gimson interested me hugely, as indeed did so many of the pioneers of this important movement. They have pretty much guided the academic ideas of my work since I first read about them.

F&C: What comes first, design or technique?

SC: Technique. In this field of creativity design is best carried out when you have a thorough understanding of making. I'm a huge proponent of the idea of getting in the workshop and experimenting with the making process. Most of my pieces have been designed through making.

F&C: Is all your work made to commission or do you produce speculative pieces?

SC: My catalogue pieces all started out as speculative pieces, which I've refined over many hours. When I launch a new collection, these will start out as speculative pieces too. I think it's important to set a completely new brief and challenge yourself with some speculative work.

F&C: Are we too obsessed with outdated modes of work?

SC: This is a huge debate that I'm very interested in. I use many different modes

of work, some modern and some ancient. Cleaving and riving have been essential to the development of my recent collection, and here, what could be considered as an 'outdated' mode of work has been useful in a very contemporary collection. However, I'm not an absolute purist with traditional processes, I recognise that I wouldn't be able to make any money if I didn't use any machinery, and so I use whatever is appropriate to get a job done well.

F&C: How or where do you like to exhibit your work?

SC: I exhibit every year at Tent London, on Brick Lane during the London Design Festival. It's a really great show that is predominantly focused on design, but it shows some fantastically experimental and creative stuff too.

F&C: Are there any elements of your work that you out-source to others?

SC: I pretty much do everything, from harvesting and seasoning the timber to lacquering the final product. As my business grows I will have to begin to out-source the work, but at the moment I can just about keep up. And of course, I really enjoy that level of engagement with the material and processes.

F&C: How comfortable are you working to someone else's design?

SC: It depends on the design. I've had architects send me drawings of how they'd like a particular project, and I really don't mind that if it's been well considered. But if it's badly designed I might not be so comfortable with it.

F&C: What's your creative process like?

SC: Playful, messy, done at the workbench, respectful of traditional techniques, zealous, sensitive to the material, and then towards the end, refined.

F&C: Do you consider yourself an artist or a craftsman?

SC: I consider myself to be a craftsman more than an artist, but I'm still not entirely comfortable with labelling myself with that prestigious title. I've only been working with wood for four or five years, and although I think I know enough to work well, I've still got a lot to learn.

F&C: What advice would you give to young makers just starting out?

SC: Find a good balance between being a maker and a designer, and do what you enjoy and what excites you. Don't be afraid to spend hours on something that won't work if you think the idea might lead to something interesting. And mind your fingers, you'll need them.

F&C: What's the practical process you take when moving through a project?

SC: With commissions, I generally start out with an idea in my head, which quickly gets translated into CAD. Once the CAD drawings are approved I may make a small sample to show the material or construction process, and then I begin the work. With speculative pieces, I'll just go into the workshop and experiment, taking photos all the way through, and putting anything I like up on the wall for later consideration. Once I've got an idea, I'll make it, and then I'll find a way of making batches of them quickly.

F&C: What irritates you about the industry?

SC: The way that so many universities are closing their courses which involve making.

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Toolbox

On these pages we bring you our pick of the best tools and workshop aids on the market

All sterling prices include VAT, correct at time of going to press

Leica DISTO™ DXT

The Leica DISTO™ DXT is the only laser distance metre in the world which is protected against jet water and completely sealed against dust (IP65 Certified). As well as having a solid rubber housing, the DISTO™ DXT also has additional internal strengthening and protection around the measuring module to withstand drop tests from two metres.

Another key feature is the proven multi-functional end piece with automatic position detection. Irrespective of whether measuring is carried out with the end piece activated or not, the correct distance is automatically detected and displayed, avoiding any measuring errors.

From Leica Geosystems

Web www.disto.com

Tel 01908 256 500



£234.00

Richard Maguire Wagon Vice

Richard Maguire has made it his mission to create a great English made wagon vice that he's proud to install into his benches. These are now available to purchase for use in your own workbench builds.

Richard wanted this vice to represent England and its heritage of quality industrial innovation. The handle combines polished bronze with aged steel; its patina is forced by hand so that each vice is individual with a sense of age and long life. Above all Richard has aimed to create a vice that would be addictive to use, touch and turn.

Tail vices can be notorious for pushing your work up as you try to obtain a grip between bench dogs. This wagon vice has been built with precise tolerances that will simply not allow for lifting, and instead pulls

the work down when tightened. Working with such tight tolerances requires materials of the highest quality; Teflon-coated bushes run off hardened steel shafts and the result is super smooth travel.

Full installation instructions are supplied. Two lengths available:

standard – min 420mm overhang recommended, or extra long – min 550mm overhang recommended.

From Classic Hand Tools

Web www.classichandtools.com

Email sales@classichandtools.co.uk

Tel 01473 784 938



£278.50

Mak1159 PRO-XL Set



£132.00

Makita has designed a new and comprehensive range of useful power tool accessory sets and structured the range at three levels of user experience. Within those three tiers is a wide variety of the most useful and popular accessories.

Specific attention has been taken to provide industry sizes for UK professionals and duplications of the most popular dimensions have been provided in some of the sets. Each set contains a balanced selection of sockets, screwdriver and drill bits while the high-end kits also incorporate tape measures and spirit levels, ensuring that a professional has everything they may need for the job.

Top of the range PRO-XL sets are carried in a robust, aluminium carry case. PRO-XL sets are also available in 70 and 40 piece sets. Mid-range and trade sets are also available.

From Makita
Web www.makita.co.uk
Tel 01908 211 678

Premium French Polishing Kit

After many years of professional furniture restoration, Rest Express Director Weston Mitchell has put together the Premium French Polishing Kit, containing everything you need to begin French polishing.

The Premium Kit contains a selection of shellac French polishes ranging from white polish, special pale polish and button polishes, to the darker deep brown garnet polish and jet black polish. A French polishing rubber, pure cotton rags and cotton waste are included, along with a professional No. 6 Zorino Mop for brushing French polish. Also included are raw linseed oil, 0000 wire wool, grain filler, tack cloths, spirit wood dye, methylated spirits and 3M silicon carbide abrasive sheets.

This Kit also contains a simple



guide to French polishing, designed to help beginners understand the technique and develop the necessary skills to achieve beautifully rich and stunning results.

From Rest Express
Web www.restexpress.co.uk
Tel 01285 831 668

£86.00

Wood Finishing Oil



£8.99

Ideal for woodturners and cabinetmakers alike, Mylands Wood Finishing Oil from Record Power combines the hardwearing properties of Tung Oil with other quality oil resins to provide a tough finish resistant to alcohol, water and heat. Finishing oil is suitable for all interior woodwork, especially kitchen or bathroom work surfaces, tables and other furniture which is in constant use. It's also suitable as a high quality exterior wood oil in particular for garden furniture or wooden features. The oil is available in 500ml or 1-litre cans.

From Record Power
Web www.recordpower.co.uk
Tel 01246 561 520



£38.95

Rob Cosman Marking Knife

Rob Cosman has been planning this marking knife for many years and he finally brings this tool to the marketplace. Hand cut dovetailing is Rob's speciality and he's no doubt this tool will complete the stable of his dovetailing tools and DVDs.

This is what he says, "For over thirty years one of my most trusted dovetail tools has been my modified marking knife. Working with renowned blade manufacture IBC

we have recreated every detail in this replica tool. Transferring tails to pins accurately is such a vital step in the dovetail joint, I think you'll find this to be your missing link." Cast metal handle. Replacement blades available.

From Classic Hand Tools
Web www.classichandtools.com
Email sales@classichandtools.co.uk
Tel 01473 784 938

Hand Chisels Range

This range of premium quality hand chisels has been developed by Record Power to offer discerning cabinetmakers a selection of essential tools that can take pride of place in any workshop. The chisels are available individually and in three sets offering added value.

A four piece bevel edge set, features a modern thin edge profile for more accurate cutting than is possible with cheaper DIY standard alternatives. The three piece mortise chisel set is a must-have for cabinetmakers who need to complete accurate, easy mortising. The three-piece specialist set, featuring two skew chisels and a corner chisel, offers anyone who's

serious about their woodworking the tools to create more accurate and professional results.

The blades are manufactured from chrome manganese steel, prized for its high tensile strength and resistance to corrosion. After machining, rather than being cold quenched and reheated to harden, blades are isothermally cooled. This involves quenching them in molten salt to gradually reduce the temperature.

The handles are made from white hornbeam, renowned for its hardness and close-grained structure to give long life and excellent resistance to blows from a mallet. The exclusive handle shape has been designed to



give optimum grip whilst also being extremely comfortable to hold, and finished with an attractive and tactile wax.

From Record Power
Web www.recordpower.co.uk
Tel 01246 561 520

From £44.99

Dowelling Jig

Rockler's new Dowelling Jigs make it easier than ever to drill straight, centred holes for dowel joinery without having to use a drill press.

Available in three sizes - 6mm (1/4in), 10mm (3/8in), and 12mm (1/2in) - the dowelling jigs deliver joint set-ups for hand-drilling in just seconds.

The 5mm (3/16in) thick transparent acrylic faces eliminate the need for transferring multiple marks from the jig to stock, making it possible to line up the jig, clamp it to the stock, and start drilling. Hardened steel drill guides ensure drill bits are centred and won't wander during the drilling process, resulting in perfectly aligned, perfectly centred, hand-drilled dowel holes.

The ability to drill accurate dowel holes is a key ingredient to making strong, simple joints. With a Rockler Dowelling Jig, woodworkers are able to create perfectly mated holes for panel glue-ups, substituting complicated mortise and tenon joints with easy dowel joints, and creating stable joints in tight spaces where traditional joinery might not fit.

These Dowelling Jigs are made from durable, 5mm (3/16in) acrylic faces and hardened steel drill guides with evenly spaced guide holes. The 6mm (1/4in) and 10mm (3/8in) jigs have holes spaced 20mm (3/4in) on-centre, while the 12mm (1/2in) guide has holes spaced 25mm (1in) on-centre.

From Rockler
Web www.rockler.com
Tel (001) 800 279 4441

\$13.99



Dust Right Multi-Port Quick Release Starter Kit

The new Dust Right Multi-Port Quick Release Starter Kit creates on-demand dust collection for any workshop tool with a 63mm (2 1/2in) or 100mm (4in) dust port. For the many hobbyists and owners of small professional workshops who lack adequate dust collection with the suction power to handle multiple tools, this product is an ideal solution.

Tool ports feature a 100mm (4in) handle/hose port and either a 63mm (2 1/2in) or 100mm (4in) tool port (two of each), making it possible to include a wider variety of power tools in dust

collection operations.

The complete set includes a Dust Right Handle, four Dust Right Tool Ports, and five Keyed 100mm (4in) Bridge Hose Clamps to ensure airtight connections. With tool ports connected to any four 'shop tools, and the Dust Right Handle connected to a designated dust collection hose, woodworkers have the convenience and efficiency of moving dust collection from one tool to the next, quickly and easily throughout any workshop.



From Rockler
Web www.rockler.com
Tel (001) 800 279 4441

\$39.99

Marquetry Embellishments

QJS Marquetry has introduced a new range of marquetry embellishments. Supplied as pre-cut discs measuring 50mm (2in) or 63mm (2 1/2in) in diameter, designs range from geometric shapes and classical paterae through to complex roses and hummingbirds. Suitable for use in the base of a platter or bowl, or on the lid of a trinket box, prices range from just £5 through to £20. Discs of specimen veneers, ideal for creating contrast in your work, are just £1 each.

Individual initials are also available to order in a range of fonts from just £5 - great for personalising your latest turned gift. QJS Marquetry will also cut other sizes and shapes and even work to your own design. You can see the full range of embellishments on the website; see details below.

From QJS Marquetry Web www.qjsmarquetry.co.uk
Email quentin@qjsmarquetry.co.uk

From £5.00

The Greenheart stove

Michael Huntley has discovered a new kind of stove, perfect for a cabinetmaker's workshop

It seems pretty logical, if you're a woodworker then you have wood waste to burn; off-cuts, mistakes – yes, I've made a few – sawdust, shavings and sweepings etc. Well when you look into the subject not all of these can be burnt on a wood-burning stove. The big problem is sawdust. This needs a special firebox.

If you put sawdust on a normal wood-burning stove it will put the fire out. This is because the sawdust is so dense it stops air getting in and smoke getting out. To load a traditional sawdust stove you put a pipe down the middle, load the sawdust, remove the pipe and light from the bottom. The gap left by the removed pipe allows air and smoke in and out. The Greenheart stove supplied by Stoves Online Ltd, has a pipe built-in to supply air for sawdust combustion. Also, in a traditional sawdust stove you have to let the stove go out before reloading with sawdust, not so a Greenheart.



COURTESY MICHAEL HUNTLEY

How was the Greenheart designed?

John Nightingale of Stoves Online told me the story. After the earthquake in Pakistan in 2005, aid agencies put out a request for small simple stoves that could burn anything. Winter was approaching and there was a desperate need for heating the displaced population. John was aware that a small, simple stove similar to the Greenheart had been made in Spain for many years and managed to get 500 of this type of stove to Pakistan in the four weeks before that Christmas. As it has no firebricks it's light and therefore simple to ship and assemble. It was this stove that led to the development of the current Greenheart stove series. Although it won't burn coal, it will burn anything from shrubs to dried animal dung as well as peat and wood.

The Greenheart series, which

comes in seven sizes, is a light steel cylinder that has an air intake that is suitable for both solid wood lengths and sawdust. Being a cylinder with no odd corners it burns easily and well, giving out a surprising amount of heat.

John also told me about shavings. Sawdust is dense but a handful of shavings has airspace in it. The fact that the shavings from a workshop are dry and have plenty of air between them make them like rocket fuel. They'll burn too hot. Green-woodwork shavings are different, but dry wood shavings need to be mixed with sawdust to reduce the amount of air available for combustion. It's also necessary to keep a close eye on the stove and adjust the air intake and flue damper as necessary. Running the stove red hot, which is easily done with shavings alone, will severely damage the stove.



The Greenheart stove in use

► Smouldering

What sort of burn are you aiming for? Well, don't try to save fuel by burning at too low a temperature. Smouldering is not good. You don't get much heat and there's lots of smoke, which contains tar. Tar condenses on the inside of the flue because the fire gases aren't hot enough. Tar on the flue is the main cause of chimney fires.

That of course begs the question how often should you sweep the flue. The answer according to John Nightingale is once, at the beginning of the burning season, once in the middle and once at the end. With a workshop stove you can do this sweeping yourself. Oh, and whilst we're on the subject of tar, don't burn damp

and unseasoned wood, that is where the biggest tar problem comes from.

Sawdust from woodwork shops using kiln-dried timber will burn cleanly. Just add more air, by adjusting the controls, if the stove smokes. Fast burning will keep the flue clean, but don't go to the other extreme and run it too hot.

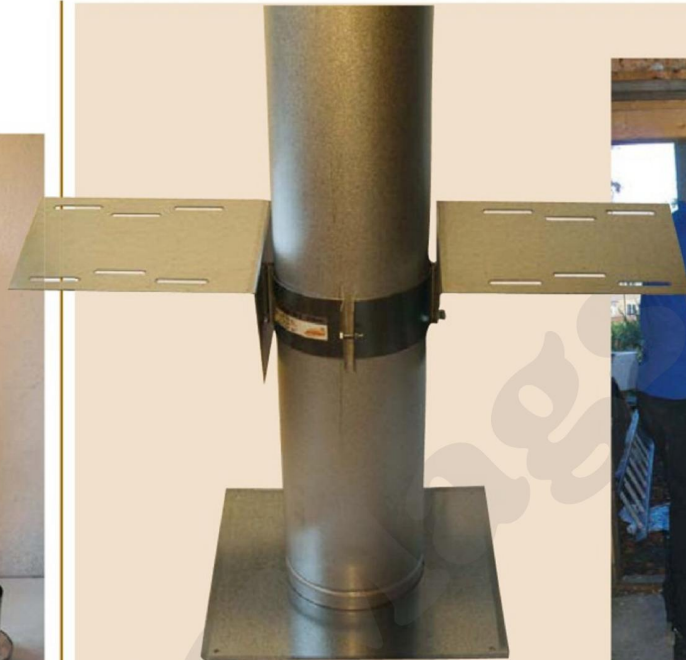
What do you need?



Some of the parts of the flue system as it arrived

Once I'd made the decision to install a Greenheart I telephoned the office to check which auxiliary components I needed. This included flue pipe, flashing kit and so on. Although all this information is given on their website, I wanted to be certain that I had the right bits. The main consideration is the size of room to heat, the height of the ceiling and the roof type. Once all that was sorted out the order was confirmed and four boxes of stove parts arrived two days later.

One very important part often overlooked in a workshop set-up is the flashing kit. It's too easy to cut a hole in the roof, poke the flue through and seal with mastic. All you need is one constant drip to start a rust hole in the flue and compromise the whole system. Get a proper flashing kit, there are ones for all roof profiles that also give the flue the correct support and keep it away from joists and roof deck. This is shown in my series of pictures of the actual fitting process.



Trial fitting of the rafter bracket and the register plate



I used a fire-resistant board called Cemboard particleboard behind the flue. The flue gets really hot so it's essential that the recommended clearances are maintained. I'm using strips of Cemboard to make the main board stand off the plywood wall.



The register plate screwed up to the rafters. This was when I realised that the register plate is designed for a rafter system that runs at 90° to mine. In order to adapt and maintain the clearances to combustible materials I had to make a jury-rigged system

Practical tips

Don't start the stove with sawdust. It's likely that the flue will be cold, after all it's winter, and a cold flue will smoke. Start with kindling and paper in the usual way for a fire. My stove smoked horrendously until I learnt this, which actually only took a couple of days. If the fire-cement seal opens up this is

not a disaster. With the draw up the flue, the flue is in negative air pressure so won't let gasses out, it will only draw in air from the room. You will also hear occasional pops and perhaps a small explosion as you feed in sawdust. These are normal. Popping noises are resin pockets exploding and

the sawdust woomphing can be avoided by putting sawdust into a paper bag before feeding it. However I get my sawdust out of the way in the first hour of the day and then feed the stove with off-cuts. That way the sawdust goes in before the body of the stove is hot enough to make it woomph.



The gimbaled rafter hanger in position. Note I've had to turn it through 90° to accommodate my rafter run. That has required trimmers. At this point I doubled up on trimmers as the rafter bracket provides the main support for the external double skin flue. Once satisfied with the location I replaced the extra trimmer, seen here at an odd angle, with a steel angle beam. This was both extra strong, easy to bolt to and non-combustible



This is the flue damper in position. Drilling holes are easy but wiggling the spindle in is a bit of a fiddle



The hole in the roof deck has now been cut



All components loosely positioned and the first home-made flue bracket is fitted



Close up of the flue bracket using fixing band from my local builder's merchant. You can fit as many of these as you like

Contact

Stoves Online Ltd
Capton
Devon
TQ6 0JE
0845 226 5754
www.stovesonline.co.uk

Conclusion

The stove and parts for my installation came to £550 including VAT. Every situation would be different but for my 5m², well insulated workshop, the Greenheart 2 workshop stove is quite sufficient. In fact, I never run it all day long, I usually run it down at midday and the heat stays in the workshop all afternoon. You may also want to buy brushes to sweep the flue and Stoves Online sell these as well. My thanks to John and Caspian at Stoves Online for help preparing this article. If you want to know if a Greenheart stove is suitable for your workshop just give them a ring.

F&C

Woodburner roundup

**Here's our pick of winter warmers
for your workshop**

Arada Multifuel Stove

- Choice of 4kW or 5kW heat outputs
- Airwash system for sparkling clean glass
- Primary and secondary burn system for high efficiency
- Cast iron grate, will burn any solid fuels
- Choice of rear or top flue outlets
- Made from 3mm rolled steel plate for high durability

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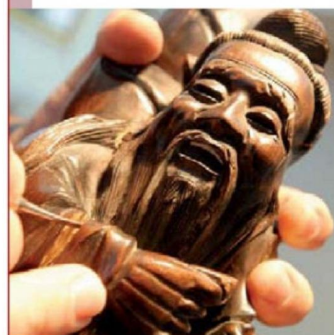
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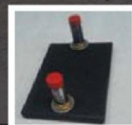


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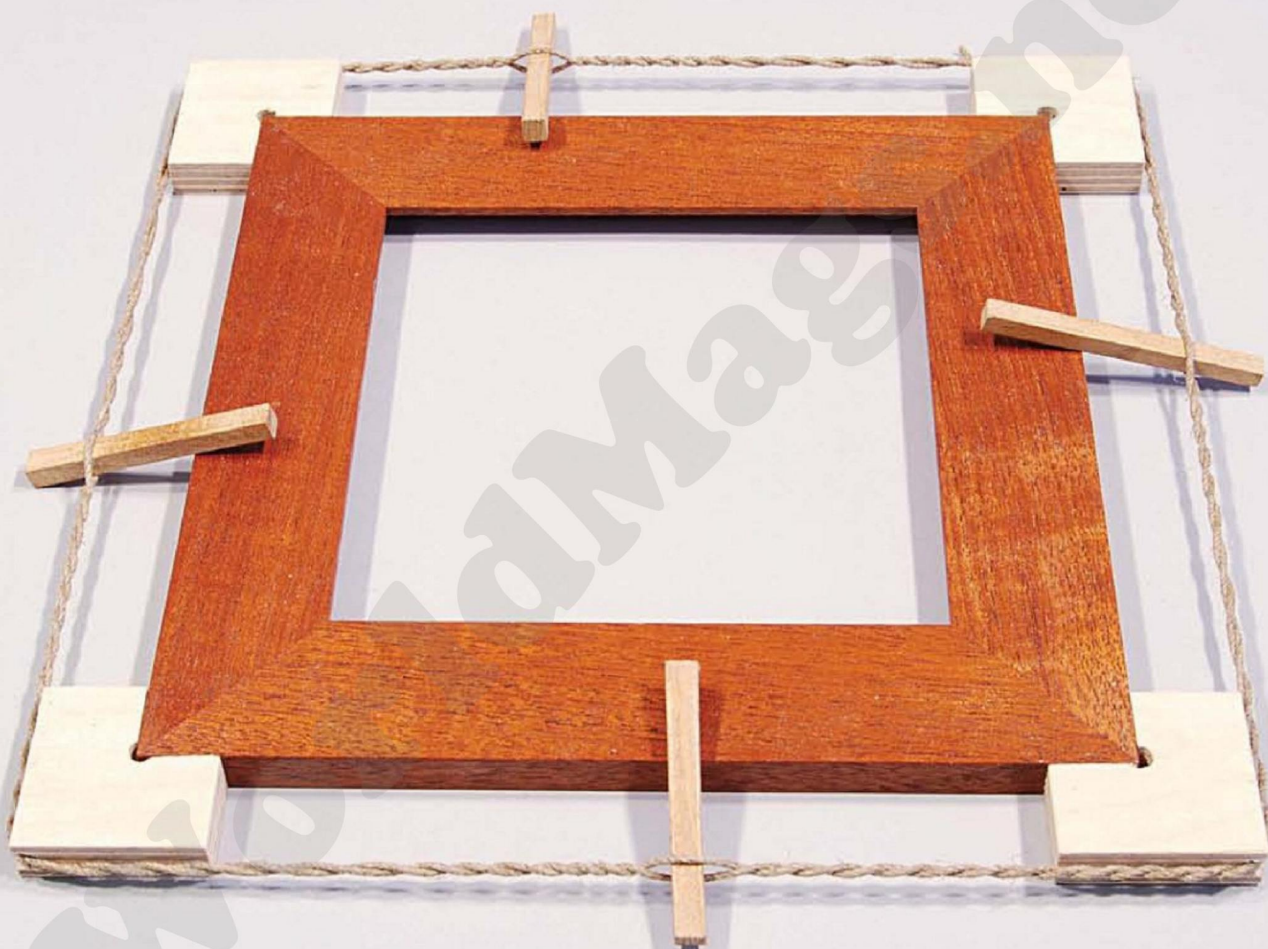
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