



Crosscut

Newsletter of the Witwatersrand Woodworkers' Association
PO Box 411346, Craighall, 2024

< Nickel Metal Hydride Rechargeable Cell – Sub C size commonly used in battery packs.

Secretary: Ken Mutch ([Ken.woodman AT gmail.com](mailto:Ken.woodman@ gmail.com) or 083 276 2351 - replace AT with @ to email)

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Next General Club Meeting on Wednesday, the 11th May 2011 from 18h00 at the WWA clubhouse at REEA. Ian Pattison who is an expert on Heraldry will be talking and showing his work. The AGM will also take place.

Next Turner's monthly meeting is on **Monday, the 2nd May 2011** at 18h00 at the WWA clubhouse at REEA. Demonstration on making Pepper Mills by Peter Middleton.

News

Turners' Meeting.

Dries Blignaut demonstrated miniature turning.

Main Club Meeting.

There was a moment of silence in the meeting to remember Alan Mason, who was an active member of the Turner's section. Alan died during a routine operation to correct a shoulder injury, on the 4th February 2011.

John Parker from Treeman talked about the work he does. A "tree surgeon" trims trees so as to preserve their health, so he explained how he does this. When a tree cannot be saved, he removes the tree. Instead of just cutting it up, he offers the option to saw the felled bole into planks on the site, which he does with his Petersen All-terrain saw. This can be carried in parts to areas that are difficult to access and assembled in-situ. Prior to sawing, the bole is cleaned up to remove side branches. Planks of most thicknesses can be cut, and the width is limited by the diameter of the circular saw blade. John can be contacted on 011-888-8033 or 072-7399-318. He is based in Linden, Johannesburg

Club Notices:

The Open Day has been provisionally set for Saturday, the 28th May 2011 at Greenside High School. We will invite a number of other craft groups, such as the lacemakers, carvers, quilters to exhibit free of charge. Catering will be done by the school to raise funds. Suppliers will also be invited to participate. Members will be required to assist with set up, demonstrating, and to bring items to show and sell.

Thanks to Builder's Warehouse for donating some gift vouchers that will be raffled to raise funds for the club.

NOTE:

There will be **No Toymakers meeting on Monday 1st May 2011.**

There will still be the turner's meeting in the evening of the 01st May 2011.

The **Wednesday Workshop will take place on the 18th May,** even though it is a public holiday (local government elections), and we will commence at 5pm

From the Committee:

The WWA would like to thank Gary Willis from First Cut for his donation off 5 Starrett Woodpecker Bandsaw Blades to the Toy Makers and Winston's Wednesday Workshop for use on the club's band saw. Starrett can be found at 18 Adam Road, Benrose, 011-614-1112. They also have branches in Cape Town, Durban and Port Elizabeth - see www.firstcut.co.za

Shaun Sampson has spent many hours transferring the WWA's videos and extras onto DVD's for the library. These will be made available for loan to members in due course. Thanks Shaun!

AGM and New Committee. Notice is hereby given of the annual general meeting for the Wits Woodworking Association that will take place on Wednesday, the 11th May 2010 at the REEA Clubhouse at 18h00. Items on the agenda:

- Report from the 2010/2011 chair.
- Acceptance of the treasurer’s report for 2010/2011. Approval of the budget for 2011/2012.
- Election of office bearers and committee members for 2011/2012. Volunteers for all the positions are welcome, as some of the committee will step down. Others will remain, subject to being re-elected, in order to ensure continuity. Having fun is definitely part of the job description!
- Address from the 2011/2012 chair.

Membership Fees for 2010/2011 year. It was decided that the annual subs for the year 2011/2012 will be R320- per year.

ANNUAL MEMBERSHIP SUBSCRIPTIONS: 2011 / 2012 year

Subject to approval at the meeting, membership subscriptions for 2011 / 2012 are due on 1 May 2011 for R320- per year. Delivery of Crosscut by email is included, postal delivery of Crosscut is R80- extra per year. Please pay the Treasurer before the end of April to maintain continuity of your membership. Post cheques to the address in the masthead of this newsletter. Details for direct deposits are on your *personal* invoice below. Thank you.

Ken Mutch Secretary

INVOICE		01 April 2011
DUE DATE		AMOUNT
01 May 2011	SUBSCRIPTION for the Witwatersrand Woodworkers Association - 2011/2012 year	R320-00
	Direct deposits to: Witwatersrand Woodworkers Association. Nedbank Main St. branch - Code: 198765. Account No: 1979-321833 – Put your name in the comment line, so that the treasurer can identify the source of the payment.	

Wanted:

Woodworking tools for a co-operative run by ex-prisoners. Power tools are needed such as a router and cutters; jigsaw; circular saw; portable drill; drill press; Biscuit jointer. Also G-clamps, T-bar clamps; wood chisels; and various hand-tools are required. This is an initiative run by John’s church – please contact John Speedy on 083-359-3149 for more information. Donations can be delivered to the WWA club house at future meetings.

For Sale

Tree Felling and Saw Mill. Dave Walkley and Grant Esterhuizen who were both visitors at the last Wednesday meeting are both tree fellers. Grant cuts trees in Johannesburg – any members who are looking for wood from specific trees can contact him and he will let know when he cuts one. Contact him on 076 146 6611 or 083 325 2073/4. Dave has a Saw Mill and works closely with Grant but cuts trees himself. Members can send him e-mails of their requirements so that he can advise them when wood becomes available – he currently has planked Poplar and Maple. Pricing is very competitive. Contact him at dkw@global.co.za or 083 652 3657

Nova lathe TL 1500 With Siemens electronic control single phase to 3 phase motor, on a steel bench. Free standing rest and ass. rests. Centre steady, Rest and tail stock cam lock. 5 chucks all with assorted sets of jaws. 47 chisels as well as sorby hollow chisel sets as well as other sets of specialised turning tools. There are a lot of specialised chisels in the set. Thread master to fit the lathe. I want to sell this all together as one “set”.
Dewalt 625 router
300mm wide belt sander.

I’M AT HOME MOST SATURDAY MORNINGS
FROM 9-00AM TO 12-00 NOON
COME ALONG - BY ARRANGEMENT

- ❖ For coffee, biscuits and a chat
- ❖ No obligation to buy
- ❖ Creates good fellowship
- ❖ Word of mouth promotes sales

I have in stock a full range of Record Irwin Lathe accessories,
Record Irwin wood turning tools, Record Irwin hand tools,
Record metal/wood band saw blades
AND MY OWN WELL KNOWN JIGS

I CAN MACHINE TOOLING ACCORDING TO CLIENTS IDEAS, NEEDS AND DRAWINGS

Lionel Soekoe 60 Darwin Street CNR Bowling avenue Wendywood
Tel (011) 802 3046 or 072 989 6310

Kitty 600mm band saw (3 phase)
Trend large and small ellipse jigs complete.
Dewalt finisher/grinder new
Leigh dovetail jig nearly new with finger joint jig and set of cutters.
Leigh mortise and tenon jig new with all templates.
Spindle moulder (reversible).
Bobbin sander with all extra spindles.
Vega joint maker with router.
Assortment of hand tools etc.

If interested, contact John Christie on 082 572 9314

Emco DB5 Lathe with Copy Attachment R5000.00 onco
Elu Lathe – view and make an offer
Contact Peter Shulter on 072 378 1128

Please Note:

Toymakers. No Toymakers meeting on Monday 1st May 2011. The toymakers meet on the first and third Mondays of every month, at 09h00 till 12h00 at the clubhouse. Contact Eddie Marchio on 011-678-8062 or renato AT pixie.co.za for more information.

Wednesday Workshop. The Wednesday Workshop will take place on the 18th May, even though it is a public holiday, and we will commence at 5pm. The Wednesday evening workshops are on the first and third Wednesdays of every month, from 18h00 till 20h00. Contact Winston Klein on 011-674-1513 for more information.

Rechargeable Batteries in Portable Power Tools

Trevor Pope



What is the most useful portable power tool you own? I bet it is your battery operated drill/driver. The convenience of cordless drills was a revelation to me – not having a mains power cord getting in the way. There are a few drilling/screwing jobs that it can't cope with, but then my trusty corded drill is brought into use, extension cords and all.

The downside of cordless power tools is the battery pack. It needs charging more and more frequently and eventually fails. My drill driver is an AEG, 14.4V model with a 1.4Ah battery. It has served me well since 2000, but recently the battery pack wore out – just before I fitted a set of drawers with slides to a cabinet, when I needed something compact and cordless!

Now I have a dilemma – buy a new drill or rebuild the battery pack?

This is an interesting topic: Jan Ferreira from Bosch expressed the opinion that when the battery dies on a cordless power tool, it is time to buy another complete tool, as the mechanical components are probably close to being worn out. The cost of the battery pack is often half that of a new unit, so he has a point. If the tool is professionally used, then I think he is right, however for the average home user, the battery pack probably dies of old age before the mechanicals are worn out. To illustrate why I think that Jan has a case, consider that a professional user, such as a cupboard installer, will probably buy two battery packs, so that one is charging, while the other is in use. Good quality NiCd or NiMH cells are good for 500 to 1000 charge/discharge cycles with the right charger and usage. So even if both packs are cycled once per day, between two and five years of battery use can be expected, by which time, the mechanicals will probably be worn out.



For hobby use, we have a different scenario – even if the pack is run flat once a week, that is 50 cycles per year. To reach 500 to 1000 cycles would take ten to twenty years. Battery packs don't usually last that long, because other wear-out mechanisms lead to failure. The mechanicals of a unit designed for **professional** use will definitely outlast the battery for hobby use.



Based on this, I decided to investigate rebuilding the pack on my AEG. (Also being an engineer, I like a technical challenge, and I don't like throwing things away.)

The first fact became apparent – I can't buy a set of cells for the price of a replacement "Hobby" spec cordless drill. The Black & Decker 18V unit shown at the middle right is R500- at Makro and the Ryobi below it is R350-. Bearing in mind that you get what you pay for, one must question how long these units will last in practise – pause for thought.

Some theory:

The first rechargeable batteries were Lead-acid and these are still in widespread use. There is one in your car and probably others in your alarm system, gate-motor and camping lantern. Lead acid batteries are well suited to standby use, but are rather heavy for their capacity. They are slow to charge, but they are relatively cheap for their capacity.

So it wasn't until the widespread availability of the next technology - Nickel Cadmium (NiCd) - that portable, battery operated power tools came into widespread use. NiCd batteries can tolerate deep discharges and provide very high peak currents. This made them ideal for battery drills. Early NiCd batteries did have some problems: self discharging quite quickly; memory effects and a limited number of charge/discharge cycles. These have been largely addressed nowadays, so they are capable of years of trouble free operation.

The next technology to come along was Nickel-Metal Hydride (NiMH). This is similar to NiCd, with increased capacities, but lower peak current capability. In many case NiMH cells can be used directly in place of NiCd, the exceptions being in some high performance applications. NiMH are also Cadmium free – NiCd cells have been banned in the EU, except for special applications, due to concerns about environmental contamination when they are not disposed of correctly.

The current hot technology is Lithium in various forms. Lithium Ion (Li-ion) has the same volumetric power density as NiMH, but significantly better mass power density, so there are significant weight savings. Li-ion technology is much more expensive than NiMH and NiCd, and needs a special charger which is more complex.

The capacity of batteries is quoted in amp-hours (Ah). In theory a cell rated at 1 Ah will provide one amp of current for one hour, but in practice at one amp, it is slightly less. Generally the capacity (C) is quoted at the ten hour rate (C/10) which means it is discharged at 1/10 of the capacity for ten hours. A 1 Ah cell should provide 0.1 A for 10 hours when it is new. At higher currents the capacity drops significantly due to a combination of reasons – resistive and electrochemical.

When the battery is charged, the electrochemical processes that provide power output are effectively reversed, albeit imperfectly. Theoretically, to recharge a cell, current equivalent to amount discharged needs to flow back into the cell from an external source. So if 1 Ah was drained, then 1 Ah needs to be put back. However, there are losses during the recharging process due to heat amongst other things, so in practice about 140 to 160% is needed. So if 1.0 Ah was drained, about 1.4 to 1.6 Ah needs to be put back. In practice one doesn't know exactly how much current was drained. There are indications from the cell voltage, but this varies with temperature and the condition of the battery, so the battery is usually assumed to be empty and given a full charge. Most batteries are designed to be charged at the ten hour rate (C/10) for 14 to 16 hours. So for a 1.0 Ah battery, it will be charged at 0.1 A for 14 to 16 hours, and then we know it will be fully charged.

For battery power tools, recharge time is important. Nobody wants to sit around for hours waiting for batteries to recharge when there is work to be done. Hence, the fast charge cycle was invented. For portable power tools, most chargers are fast chargers, and will reach 80% of capacity or better within an hour. The battery will be charged at something like the C rate for one hour and then the charge rate will taper off until a full charge has been delivered. Some precautions need to be taken as NiCd and NiMH cells heat up significantly when under fast charge. Most packs have a temperature sensor of some sort included to limit the temperature rise. This is to avoid thermal runaway, and damaged cells or worse. (Thermal runaway occurs when the battery temperature rises, and the terminal voltage drops, increasing the current, increasing the temperature in a vicious cycle, until the battery bursts.) If you examine the connections to the battery pack, you will see at least three wires, two for the battery and a third to some sort of sensor. The sensor could be as simple as a bi-metallic strip contact that opens when a threshold temperature is exceeded, thereby limiting charge current. More sophisticated sensors are thermistors, allowing the temperature to be measured and the charge current to be throttled back appropriately. It also allows the charger to take account of ambient temperature and the temperature of the pack at the start of the charge cycle, which may be significant if it has been used hard prior to charging.



Continued next month...