

# ARB CLIMBER

Aerial Arboriculture, PPE, Climbing and Cutting Equipment



ISSUE  
**19**





# EXTEND YOUR REACH

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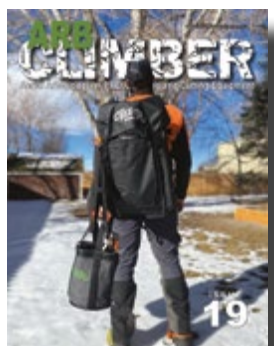
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#### FRONT COVER:

Issue 19's cover is a climber assessing the days work on a cold but bright day. He's carrying Weaver's hefty Cavern bag so he could just be pretending to be assessing the tree and instead be casing the joint safe in the knowledge that he could get away with half the contents of the house in that bag. PIC LEFT is one of the aircraft Rescue scenarios in December's TREEAPALOOZA held in Florida. Ox will take you through that and the evolution of Competition climbing on p42





# NEED A BAG? THEY GOT BAGS...



This issue's pretty chilled front cover features a contemplative arborist equipped with a foot ascender and ready to go. It's at this stage that most climbers are cursing whoever quoted on the job and neglected to mention the high-tension cables, greenhouse and bee-hives in and around the tree. In this case, the climber can remain chilled because it looks fairly straightforward. He's definitely a Weaver fan because he's carrying no less than three of their bags; the Cavern(ous) Gear bag that we've detailed on the right, the Throwline Storage bag or more accurately, Cube shown below (or you could go for the snazzier, multi-pocket Throwline bucket bag in red (pic below) which is 15L, costs \$47 and offers separate pouch and tie-in eyes for up to 4 throwlines plus two external pockets) and their standard Rope Bag with a whole host of colour options. Our man has the \$60 small bag with lime green logo but you can have it with hot pink logo. The small is 22L and holds around 150-200ft of 1/2" or the XL is 55L costs \$68 and holds 500ft of 1/2" rope. If you're into wacky colours you can get the small-size in various graphics for a few Dollars more. We've been trying to fleece one of their DeLuxe Collapsible bags for a Gear Review since 2019 which is why we became familiar (and impressed) with their diverse range of bags. They have over 20 of the things including some oddities like this torpedo-shaped Crane bag, a Doctor's-bag style tool bag in canvas or yellow vinyl with reinforced plastic base. They also have rucksack style bags, budget bags, two collapsible 'pop-up' bags, you get the picture...they got lots. We're aiming to have a full review of their Cavern and Deluxe Collapsible bags later this year.



Images not to scale



## WEAVER ARBORIST CAVERN BAG

**DIMENSIONS:**  
610mm/24" high by 280mm/11" deep x 381mm/15" wide

**CAPACITY:** 70L

**Top Carry handles**

**Removable, buckle-secured top lid (see pics below) covering a toggle-closure, mesh cover**

**Reflective piping to enhance visibility in low light**

**Daisy chains for carabiner/clip attachment. 4 in total.**

**Adjustable saw-retaining strap**

**Reinforced Side handles (1 per side)**

**Zip-closed, large front pocket with mesh divider & internal daisy-chain for carabiner/clips**

**General pocket with buckle closure and drain hole (1 pocket on each side)**

**Material is heavy-duty, waterproof tarpaulin. Mildew and tear-resistant**

**Handsaw pocket with drain-hole**

**Padded & adjustable back-carry straps  
Padded back pad**

**Reinforced 'bucket' base allows freestanding of partially filled bag**

**Web hauling eye**



## ON-THE-COVER

### USING the Weaver Cavern Gear Bag

The Weaver Cavern Gear bag is a great gear bag. After months and months of use, it's resistant to weather, tears, and extremely spacious. I can easily fit my saddle, lanyards, and regular climbing hardware, as well as other less used gear I need from time to time.

One thing that impressed me about the Cavern Gear Bag is the contemporary, yet classic look of the bag. A few of my clients have actually mentioned to me how professional the gear bags (including Weaver rope bags) look on the job site. Professional, durable, and functional, that's a win for any serious arborist!

Weavers rope bags stay open with the reinforcement band around the upper rim. This allows for the bag to be flexible, while stowing away in the truck, but also stay open while stacking rope away in the bag.

Materials used in the construction of these bags make them functionally practical, while looking very professional day after day of tree climbing.

**Jamie Spader**  
Arborists-R-Us  
Michigan – USA

[www.weaverarborist.com](http://www.weaverarborist.com)





## THAT's not Light This is light....

### CAMP Safety Atlas Lock carabiners

[ED: In the last issue we had an item from RnR on what they thought was the lightest 40kN carabiner in the world at 4.6oz or 131g. As it turns out, that was short-lived, in fact, it may not even have been quite accurate at the time because C.A.M.P. Italy had this beauty but obviously didn't promote it well enough in the first place! Long-time readers will hurl abuse for me bringing it up yet again but my favourite carabiners when I started out nearly 40 years ago were the CAMP Betclimb and Hi-Strength carabiners – big-ass, non-snagging and at the time a mighty 30kN – these are unquestionably the modern equivalent of those, they look like Hi-Strengths that have had a Hollywood makeover.]

The only aluminum alloy carabiner that can compete with the strength of steel: 40 kN at only 87 grams or 3.1oz! The large cross sections and unique design make it a lightweight but practically



indestructible carabiner. Keylock closure prevents snagging during use.

Available with screw gate locking system (Atlas Lock), automatic twist lock closure that requires two actions – twist and pull – to open (Atlas 2Lock) or automatic triple action twist lock closure – slide, twist and pull – for maximum security (Atlas 3Lock).

Suggested retail prices

Atlas Lock cod. 137304: €17.80 / £15.50 / \$22.00

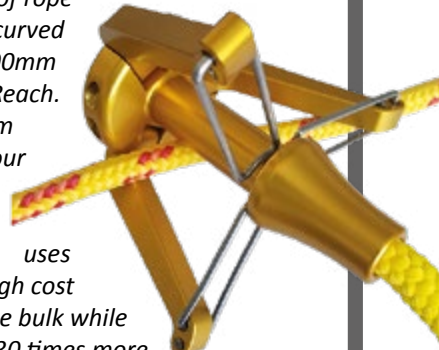
Atlas 2Lock cod. 137404: €21.80 / £19.00 / \$27.00

Atlas 3Lock cod. 137504: €24.60 / £21.50 / \$30.00

www.camp.it

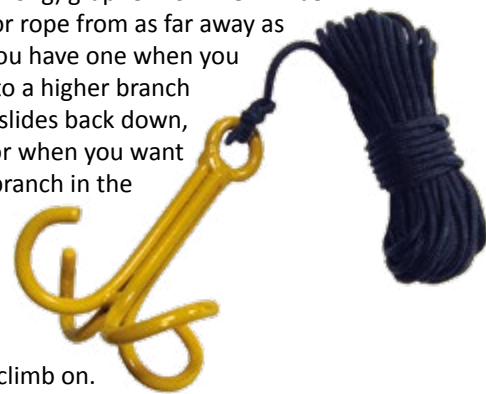
## Rescuing your Rope

[ED: NEW TRIBE are big in the recreational tree climbing world as well as arboriculture so we wondered if the Yella was more of a rec thing but Tree Stuff carry it as an arborist tool so maybe not. That being the case I thought we should also highlight a device we're again featuring in our rescue titles with techniques articles for water rescue but we have used this same device as an in-tree grapple for about 20 years so it's worth a mention here too. The REACH device is very compact and with sprung arms and captive bars that stop your captured rope from escaping it is a much surer bet than breaking off a nearby twig or swinging the tail of your climbing rope with a hopeful carabiner on the end. The Yella looks as though it's been designed to do a similar job of rope retention once captured with deeply curved and slightly offset tines. At only 4"/100mm long it's almost as diminutive as the Reach. This is the REACH and with a 6 or 7mm cord attached it is easily carried on your harness in a very low-bulk package. In fact, even with a 6mm cord this is a life-safety device so it has other uses if you want to splash out and put a high cost rescue or dyneema cord in to minimise bulk while maximising strength – it's only 20 or 30 times more expensive than the polyprop you could put in if all you're doing is capturing a wayward throwline. A throwline rescuing a throwline! If this looks useful, take a look at [www.crosslinereach.com](http://www.crosslinereach.com) and imagine trees in place of the fast running water!]



## New Tribe Yella Grapnel

With this little (4 inches long) grapnel from New Tribe you can retrieve a line or rope from as far away as 20 feet. You'll be glad you have one when you make an in-tree throw to a higher branch and your throw weight slides back down, dangling out of reach, or when you want to traverse to another branch in the same tree, or traverse into a neighbouring tree, or when you want to retrieve a lost arrow or bolt dangling out in branches too skinny to climb on.



**Not for life safety use!**

Wt exc cord: 5 oz.

Cost \$44.99 from [TreeStuff.com](http://TreeStuff.com) or [newtribe.com](http://newtribe.com)

## ALTERNATIVE CARABINER? Notch Quickie v3

[ED: Arb hardware genius Kev Bingham has taken the humble shackle and turned it into a kind of mini carabiner with zero risk of cross-gate loading and that you could smuggle into the country in a hollowed out tooth. At the time of writing version 3 of the Quickie is not certified PPE in Europe but that will surely come].



Steel connector with great versatility

- ½ size of standard carabiner
- Great solution for basal or canopy anchor
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- Features quadruple action slic pin ensuring safe and secure connection
- Design reduces risk of side loading
- Rotating slic pin reduces friction when used in chocking configuration

Technical Info:

- Material = Stainless Steel
  - Major Axis Rating = 30kN
  - Minor Axis Rating = 13kN
  - Length = 57mm/2.25"
  - Width (with slic pin) = 63.5mm/2.5"
- COST: £34 / \$35 / €34

Available from pretty much every ArbClimber stockist in our Stockist table on page 9



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Forst Sub 750kg ST6P and TT6 wood chippers

Forst said they wouldn't build a sub 750kg wood chipper unless they were so confident in its strength, performance and longevity they could place their 3-year warranty stamp on it. They went ahead and did it with when they built the ST6P. It's a genuine, hardy tool which builds on Forst's reputation for no holds barred performance and features with robust, tough construction. The ST6P hosts a 37HP petrol engine which is much lighter than the diesel unit, and yet it puts out more horsepower to offer a staggering performance and chipping speed for a sub 750kg machine. It picks up quicker than a diesel when the no-stress cuts in, making it fast and, incredibly, as fuel-efficient as the diesel equivalent.

Featuring the Forst Open Flywheel system, chip is thrown, not blown, right to the front of the wagon, making blockages on wet material no longer a problem. Auto intelligence control takes care of the electrics with a completely water and vibration proof system for outstanding reliability. The illuminated touchpad IP 69 rated feed controls remove any possibility of water and vibration issues related to electrics. They are located conveniently either side of the hopper. The ForstGrip Feed Roller System features a twin hydraulic horizontal feed with exceptional grip on timber and the large top feed lifts on an arc, making climbing butt ends exceptional. Twin heavy-duty springs and large bearings either side of the roller ensure strength and durability. The feed roller aperture is 6" x

8" (150 x 200mm) and capacity is 30 litres. Machine width is 1,335mm, length 3,350mm and height with chute 2,280mm.

Having done it once, Forst has done it again by taking the ST6P attitude and producing the TT6 wood chipper, adding a whole new dimension with its 360° turntable making it far more versatile for street work and much safer to use. The punchy 37HP petrol engine offers exceptional performance and amazing fuel economy while complying with Stage 5 emission regulations. The TT6 is extremely compact too, way shorter than the average 6" standard chipper at 2,250mm when turned 90°. In transport position, it is just 2,800mm. For a sub 750kg petrol wood chipper, it still has a chunky chassis and its steel fabrications are manufactured and finished to a high standard to guarantee a strong, robust product.

Sharing the same chipping chamber and features of the ST6P, there is a wide hopper right down to the ForstGrip feed system. The machine sits nice and low with a low centre of gravity making it a great tow. The TT6 is perfect for city contractors and arborists looking for outstanding performance, unrivalled manoeuvrability and convenience. And to further prove a point, every new Forst Wood Chipper comes with a guaranteed, no quibble 3-year warranty. Forst provides a service network of its own people and approved service partners across the UK, which means service support for a Forst chipper is never far away.

[www.forst-woodchippers.com](http://www.forst-woodchippers.com)

Husqvarna, one of the world's leading producers of innovative forest, park and outdoor power equipment products, has set a new standard for professional pole saws with the launch of its latest industry-first innovation – the 525DEPS MADSAW. MAD is a commonly used industry term, an acronym for OSHA's Minimal Approach Distances. The MADSAW is designed with operator safety in mind, as it's the first and only dielectric gas-powered pole saw individually tested to meet the OSHA standard for electric

power generation, transmission, and distribution (OSHA 1910.269).

The MADSAW offers insulation to prevent electrical conductivity and extreme versatility with the ability to be operated aloft in a bucket, in-tree, as well as on the ground. The two available lengths will make it easier for operators to access hard-to-reach areas, reducing the amount of time climbing aloft – ultimately, maximizing operator productivity.

"Knowing the constraints of currently available hydraulic powered or manual insulated pole saws, it was clear that innovation was needed to boost productivity while safely working around power lines," says Robert McCutcheon, President at Husqvarna North America. "The MADSAW was designed to enhance versatility and maneuverability for the user, and we're confident that this new innovation has the potential to revolutionize the way utility arborists perform their day-to-day work."

The MADSAW also offers revolutionary storability. The purposefully designed dielectric midsection can disconnect from the cutting head and powerhead, giving the operator the option to store the tool safely, in multiple locations within a utility or arborist truck.

HUSQVARNA  
MAD  
POLESAW

With utility professionals completing work through bucket trucks or tree climbing, which could pose safety risks,

the need for a dielectric pole saw designed for versatility and enhanced safety is evident. Thanks to the greater reach

Included with the saw is Husqvarna's 525 powerhead, a trusted 25cc 2-stroke engine with 1.34 HP and X-Torq. This engine ensures high performance and reliability. The tool's aluminum couples with shaft seals and



and maneuverability, clearing services can be completed in reduced time and allow for an operator to reach multiple areas while remaining in one fixed position when working aloft.

sealed bearings are ideal for all-weather use. Safety enhancements include a movable rubber barrier, which operators can adjust according to their desired reach area, as well as a LowVib, Husqvarna's unique vibration reducing technology which incorporates rubber isolation to minimize the vibrations transferred to the user.

By utilizing the nonconductive properties and extended length of the saw, operators can work more efficiently while staying further away from the strike zone and line of fire. For groundwork in storm emergency situations, both the 9-foot and the 12-and-a-half-foot lengths of the pole saw are suitable for on-the-ground line clearance work.

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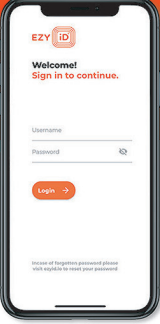
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*new*  
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News from Paul Poynter at ODSK, our stockist in Japan:  
A new climber inspired chainsaw trouser by the Japanese brand KIYARI is now certified and set for release in Summer/ Autumn 2021.

Objectives of the design were to make a trouser that could be comfortably worn in all seasons. As the Japanese summer is hot and humid, a lightweight trouser that was comfortable to walk and climb in was the most important factor. The trousers shape takes inspiration from traditional Japanese Gardeners uniform and has a roomy thigh and slim lower leg, allowing unrestricted movement and easy use of foot ascenders.



There are no upper pockets and combined with a deep crotch ensures that pinch points from the harness are eliminated. The trouser has been designed so as not to hang heavy on the waist, the cut accentuates the lightweight (1004g) feel.



- Features:
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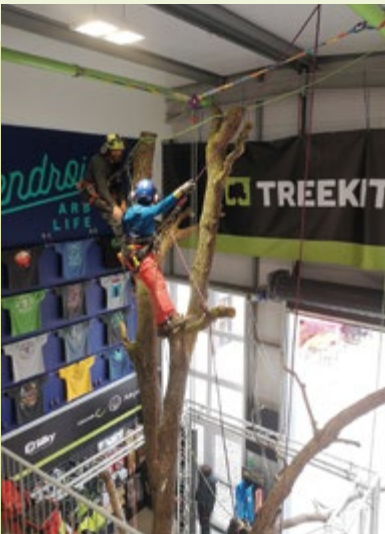


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## EDELRID

by Adam Jones

## TALON

We're not born with squirrel-like claws enabling us to scurry up trees so we, as climbing arborists, have come to depend on artificial aids for achieving the same feats of agility – some with more grace than others. Many of the techniques and pieces of equipment that we so readily accept as being unique to arb actually originate in other industries, professions or pastimes. In the case of

climbing spikes, they can be traced back to the 1880's and the early days of pole-carried telecoms, both in the USA and Australia. The early spikes were constructed from a single piece of iron, hammered, bent and ground to a sharp and effective point. Strapped onto the

wearers legs with hide or fibre rope, these early incarnations definitely lacked finesse and comfort. You'll notice that the spike on these is on outer edge so, apart from changing that to the stronger, inner edge in line with the leg support, things didn't really progress all that much until the end of the 20th Century. Thankfully, today we are spoilt for choice, whether you call them spikes, gaffs, irons, spurs or crimps; manufacturers strive to provide a combination of functionality and comfort for the wearer, as well as durability. This last factor is considered carefully by prospective buyers as the cost of this kit can be significant particularly for the more exotic materials.

Edelrid are relatively new to the game having taken the plunge in July 2017 when they became the first major rope-gear player to join a quite specialised field with some very established players like Buckingham, Distal and Bashlin with a client base who can be very loyal and very particular. To join this field and do so with a top end product is a tall order, but Edelrid have stepped up to the plate well.



Talon is part of a new generation of tree climbing gaffs that have become the norm but still not quite replaced the traditional leather and steel designs. In most cases 'traditional' is still as bulky and uncomfortable as their 20th century predecessors but this new genre pioneered by companies like Gecko and Distal saw an improvement in strapping and padding and in the materials used for the spike and frame; more carbon-fibre, alloys and even titanium. But these all came at great cost which would have made Talon's current price tag even higher. So Edelrid took the middle road of affordability, stuck with steel, albeit very precisely milled and engineered and instead concentrated on a revolutionary approach to the pads and securing elements. As is always the case with a diversification from their rope-oriented comfort zone, Edelrid had to undertake a fair amount of outside consultation to ensure that they were bringing something that was actually

wanted in the industry rather than beaver away in secret for years before foisting their own in-house ideas on everyone and expecting them to be adopted because of the Edelrid name. The arb world is pretty good in its developmental work with equipment companies, keen, knowledgeable and operational on a daily basis so plenty of real-time testing. In the case of the Talon, Edelrid worked in conjunction with TreeStuff, then under Luke Dunleavy's helm and self-confessed 'tree nerds'. This relationship was further enhanced with the addition of crowd sourced research, so theoretically, the wider arb world. With this collective R&D department you could expect a positive result.

At the end of the day, Talons are just climbing spikes not jet-packs, the picture on the right would be familiar to a climber from 50 years ago but they might notice more refined metal-work and that the rest of the structure is noticeably different from what had come before. Based around an adjustable steel shank, the weight has been shed by innovative use of a recycled plastic frame made from Edelrid rope production waste. This helps makes them one of the lighter-weight options on the market while remaining reasonably affordable.

The straps are quite innovative, with three as compared to the conventional two. They use Velcro and wide area pads for security and fitting. There are two straps to wrap around the calf and the third secures the ankle. The upper pair allows for fine adjustment and do seem to provide an enhanced and more secure fit. The ankle strap, which also employs Velcro, is equally secure when fitted. In combination they ensure that the connection between the wearer and the spike is solid. There are also three possible adjustments for orientation of the instep-plate and the 3-way connector further improving the fit. You can see this odd webbing arrangement in the picture on the right and opposite and in more detail over the page where the three sewn 'bunchings' push through the plate eye and open like a grappling hook at the required length. The Velcro straps infinite adjustability by virtue of the finite tweaking that can be carried out because you are not relying on punch holes for sizing as is traditionally the case. Once secured, the broad Velcro straps hold fast.

The steel spine or shank has been subject to a significant amount of thought and research, resulting in a finished product designed ergonomically to contour with the leg. Height adjustment is achieved by removing the calf pad,

## SPECIFICATIONS

Cost:	£390/\$600/€395
Weight/pr	2.5kg / 5.5 lb
Height Adjustment	355-457mm/14-18"
Ht Increments:	5mm/0.2"
Calf Girth	330-483mm/13-19"
Spikes:	70mm/2.75" & 43mm/1.7"
WEB:	www.edelrid.de





## GEAR REVIEW

removing two screws and then offering the spikes up to the wearers leg, marking the correct height (5cm/2" below the knee) and re-securing to the nearest hole at 5mm/0.2" increments with new screws (provided with thread-lock). This also puts the tip of the gaff in the optimum position for both balance and locating home into the tree or pole with little conscious effort.

The bindings are all broad nylon straps with equally broad Velcro fixings, they are good for load support, minimizing pressure points and easily replaceable when that time comes. This is no reflection on quality but a considered reality for such a material in this type of working environment.

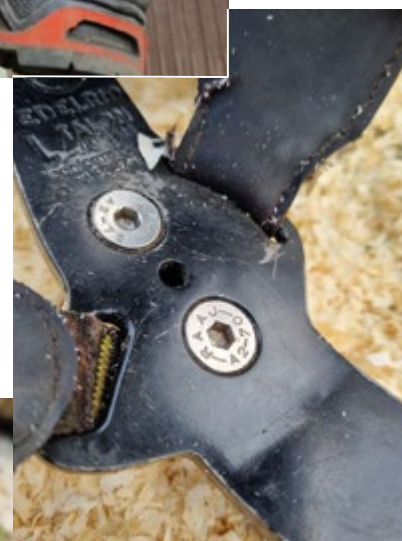
The upper pad is a vitally important part of any set of spikes, ensuring security, stability and as a welcome bonus; comfort on the calf muscle. All too often you might have experienced the upper end of other brands of spikes creeping around your calf during use, applying torsional stresses and twisting the foot bed from its optimum position. On those occasions you cannot get the things off quickly enough when you get to the ground. This might be a thing of the past with the Talons although, once you settle into the new level of comfort you'll soon be comparing them unfavourably with your beach sandals and again start moaning about how soon you can get them off. The pad itself is made from recycled materials so you can feel good about yourself as you dismantle another helpless, oxygenating tree. They have a firm yet cushioned quality which provides good comfort and minimal deformation. Some older leather padding got thinner and worn with age and ended up as a crumpled, annoying heap trapped between the strap and your leg. These more ergonomic pads are also the location of a helpful label, indicating left and right. Obviously for when you replace the pads and also for some of us that need a subtle reminder when putting them on. The pad is kept in position



with a plastic frame, which constitutes an exoskeleton for the upper parts as well as attachment for the fitting straps. This recycled plastic is combined with glass fibre to produce a composite material which is both lightweight and (hopefully) strong and durable. Able to absorb the stresses of use by being able to flex sufficiently to absorb imparted energy without breaking. You can purchase replacement pads for £46/\$50/€52 pair.

The adjustable steel shank and webbing union (pic left) is formed to accommodate the boot without applying pressure and further up, to better accommodate the shape of the leg as evidenced by the picture top left. The footplate is removable/replaceable. This section will also accommodate the Edelrid CRUISER, foot ascender which attaches semi permanently to the plate, just above the gaff and is available in both left and right fitting, good for use with 8 – 13mm ropes. You will also have a choice of gaff length, either the shorter 'pole' gaffs, measuring in at

43mm/1.7", or the longer and slightly more expensive tree gaffs which check in at 73mm/2.9". Not only does this difference give the expected variation of performance on different surfaces but they also they feel like they throw the working position slightly; arguably favourable when you step up to the 73mm tree gaffs.



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The suggested usable life span of the spikes is between two and four years, depending on the operating conditions and frequency of use, a temperature range of between -20°C and +40°C is advised although, good luck working at those outer temperature ranges, personally my operating range is a very narrow +10 to +21°C. There is an advised maximum working weight of 150kg or 330lbs so that should cover you climbers and stop your largest ground crew borrowing them for the moonlighting job they have on. Checks should be made before and after each use and should include visual examination for any damage, including cuts, cracks and deformation of metal and plastic and of course cuts and wear to strapping. Edelrid provide a 'Gaff and Leg Iron Stirrup Gauge', which allows the user to check set parameters for wear and tear, including widths, lengths and angles.

Talon seems proportionally more expensive in the US than Europe, probably due to shipping, which puts it firmly into the top bracket at around £€300/\$600 as distinct from a £€\$200ish traditional model. Imagine how much it would be in titanium!

There have been many threads and discussions referencing these spikes on various social platforms, as expected with the world as it is today. Among these and through anecdotal accounts over tool-boxes and dealership counter chats, there are tales of product failure, although these are dwarfed by the positive accounts of comfort and functionality. The shortcomings have been identified as being the plastic frame showing signs of early fatigue (or in very few cases failing) and the Velcro straps de-laminating. Globally the shell failure has involved only four items and the Velcro issue is not much more significant. In February 2018, Edelrid issued a recall on all Talon Tree & Pole Climbers sold between July 2017 and February 2018, they replaced components or the entire unit, despite exhaustive testing in extreme conditions, Edelrid failed to recreate the reported problems. Unfortunately there were some unconfirmed instances of retailers stalling this service, which was probably due to the failure to communicate to customers that Edelrid were dealing with the issue directly. Having got over this blip, the product has gone on to prove to be a successful competitor and a sought after asset for many teams and individuals.

Having climbed on a range of different spikes over the years, these are probably the most comfortable set that I have used. Not once have I or my associates come back to the ground, racing to shed the kit is search of relief from the discomfort. Instead, full days, or certainly hours pass with 100% focus on the work and no need to ignore and pain from ill-fitting or twisted spikes. That's not to say that these are *THE* most comfortable because I have yet to savour the heady heights of titanium with chinchilla lining. But overall, at this much more affordable end of the market (and even these aren't cheap) we have been very impressed with these spikes and hope to find that with continued use we get to see the best part of the full life expectancy from them.

ARBCLIMBER has a MARKET GUIDE to SPURS/GAFFS coming up.

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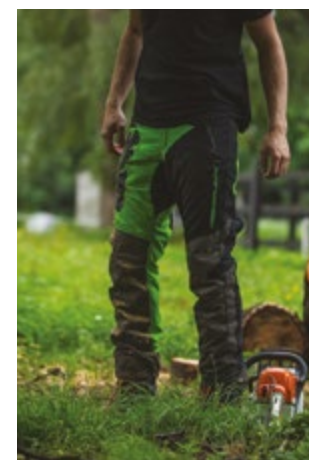
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# CORDLESS HAND-HELD BATTERY BLOWERS

>10cmm/350cfm

lawn are the ultimate test for a blower and this is where the differences in power become obvious and why you need a round nozzle, not just the leaf-capable flat nozzle. Arborists don't just get to clear dry leaves from the driveway, they need a stronger and more direct airflow to loosen and shift wet wood-chippings and tiny twigs from the clutches of grass, something that the broad redistribution of a flat nozzle doesn't usually excel at. Of course, if it's a powerful enough machine it will do the job whatever the nozzle but, in terms of power, batteries still come a poor second to petrol/gas models and maybe even third if you bring wheeled push-along models into the equation. Before we get onto the relative merits and disadvantages of battery power, it's worth noting that the humble blower can make the difference between a clean and tidy work area that inspires the neighbours to hire your services and the aftermath of a tornado that makes them glad they didn't. It's not enough that you've threaded the eye of a needle and dismantled an 80 foot eucalyptus on their back lawn without so much as a dent in their pristine bowling green or that the adjacent greenhouse, swimming pool, power cable and satellite tracking station are also untouched. No, all they see is the sawdust-encrusted lawn with seven twigs and twenty three damp leaves and that's your recommendation out the window. "They were quite good" they will say, "but they left such an unholy mess". So stump up for a quality powered blower because there's never been so much choice.

We've divided this guide into three parts dealing first with cordless battery powered, hand-held models. There is a model from Stihl, the BGA45 that isn't included in these GUIDES as it's below our air speed/volume criterion and doesn't have a replaceable battery but it's worthy of mention. It has an

**D**omestically, this equipment is often described as a 'leaf-blower' but professionals and arborists in particular, need it to do a whole lot more. The fella in the picture above has a cushy job shifting dry leaves on a tarmac strip, a doddle for the Husqy machine he's using. My mum's hair dryer would manage this if it had a longer lead. Arborists need their blowers to clean up sawdust, chippings and small twigs as well as leaves and if you're burning on-site it will also help turn your drizzle-dampened bonfire into a raging inferno and get the job finished much faster. Sawdust and chippings on a



on-board rechargeable battery as so many household products do these days. You get around 10 minutes of use on a single charge but even if it was upgraded to a more professional sized battery, unlike the tools in this GUIDE, you still have the problem of the whole machine being out of action while you recharge.

For battery models, 'cordless' means it's not wired to the mains but it's a misleading term when describing hand held models that are powered via a cord to a backpack battery like the Ego model LBX6000 (below-right) or to a waist belt like the Honda HHB or the Snapper (above right). We're classing these as corded because their function is wholly determined by a cord so these and back-pack blowers are covered in part2. Some models can be self contained OR corded to a waist belt or back pack and will be included in this issue AND the next like the Stiga 700 model on the right. Back-pack blowers are nearly always more powerful with greater longevity and more comfort during protracted operating. By their very nature they are 'professional' grade tools and only the largest garden owners and those that like to show off to and/or annoy their neighbours will invest in one. Parts 3 and 4 will be filthy, dirty, noisy but infinitely more powerful petrol/gas powered blowers (Greta told me to say that). We figure if we leave it until last, petrol engines will be banned and we won't have to bother. However, companies like Echo won't thank us for saying that because even though they have joined the battery fray with a whole heap of battery driven tools like the selection of 58v shown top right, they have no less than 16 petrol/gas models. There are hundreds of blowers, even well-known companies normally thought to be outside our sector like Hyundai have several petrol/gas back pack models. As it is, we've had to narrow down this hand-held battery selection to around 50 models from a choice of well over 150 by only including higher volume models.

Many of you will purchase battery tools based on the complete range of products offered for the same battery and this makes a lot of sense because the batteries are not cheap so if you can get a battery to power your saw, strimmer, hedgecutter AND blower you can justify more batteries and always having one or two charged and ready to go. We're now seeing blowers



included in the 'Combi' ranges of companies like Stihl and Makita where one powerhead operates several tool extensions. Some of the "Construction" brands like Makita (top left) have an enormous range of tools, in this case 18v.

ANY battery powered blower, no matter how small and cheap, will do a job of blowing leaves from point A to point B but because this is a professional readership we've limited the models to the three key orange(tree) brands and for the rest, the most powerful (at the time of writing) with a cubic displacement volume of 10 cubic metres per minute or 350 cubic feet per minute (to be precise 10cmm is 353.15cfm but that wouldn't fit in the titles). We would have preferred to use the more useful and accurate unit of Force measured in Newtons because your blower is invariably acting against a solid surface but it's not quoted by the majority of manufacturers. Newtons combines the volumetric grunt of the machine with the air flow and would be by far the best indication of the power of the machine if only they all quoted it. Officially, it's defined as the



air density x dynamic pressure x surface area.....or something similar. As it is, the constriction (or otherwise) at the end of the nozzle can give a rather artificial indication of power so the highest speed does not necessarily equate to an ability to shift stuff. While speed may not equate directly to force it *is* part of the equation and there's no doubt that if you've got a hurricane emitting from the nozzle-end it will shift leaves and sawdust, it may just be a very restricted patch that you're blowing and it might only do it for a few minutes before either the battery depletes or the machine malfunctions and you're fumbling around in that drawer to see if the 2 week warranty is still valid. Our advice – stick to the quality, professional brands and **go for the highest Cubic volume** and make sure it has a nozzle or option that concentrates the air-flow enough to get the speeds you want.

We will undoubtedly have missed several worthwhile models but this selection represents the vast majority of more recognised brands which will be up to the task, whether that be a more domestic or semi-professional model used infrequently and for short periods or the top-end professional machines used day-in, day-out for long periods of time. Choosing any figure for the cut-off is somewhat arbitrary since 1cfm below our cut-off does not make it an inferior model and as we've already mentioned, anybody can increase the air speed of an existing model – you only have to narrow the nozzle and force the same air through a smaller opening. My mum's hair-dryer worked well with a McDonald's drink straw duck-taped to the end until the strain of trying to blow the same volume of air through a very narrow opening caused it to explode. The question is, can a blower quoting a high speed in an obviously small machine keep it up for an adequate period of time and over a reasonable lifespan or is it just a blowhard? Unfortunately, the mass of online testing which goes on extol the virtues of certain models always fail to take longevity into consideration. I would much rather have a Husqvarna or Stihl that blew at 100mph than an obscure Walmart brand that purported to blow at 200mph because the Husq or Stihl will still be working in a few years when you're on your third DIY model. But we had to draw the line somewhere and there seem to be several offering high speeds that are not bad at all but are ALL domestically oriented machines so we can leave them out of this GUIDE for professionals in good conscience. As already mentioned, had our criterion been based ONLY on air-speed, we would have picked several of the 'Workshop' blowers. These often look like the DeWalt above with the round fan housing (a dying breed?) but are much smaller. The Hikoki model above is typical of this style of one-handed, lighter designs also available from many of the manufacturers. They have high air speeds thanks to a small nozzle and most, like the Makita 100/101/183/15/186 models have a leaf-blower nozzle which is long with an upturned and slightly flattened opening but they all have low volume at under 200cfm. The Bosch ALB36i (right) is a typical design for the many lighter weight models with high air speed but relatively low volume.



...anybody can make  
a blower with a high air-speed – you only have  
to narrow the nozzle and force the same air through  
a smaller opening.....



Run times too are often extremely short especially with 'workshop' models. It's hard to recommend such machines for arborists over a number of the blowers with large round nozzles and hence lower air speeds. But workshop models do have a wide range of uses. Their various nozzle attachments are good for cleaning machinery and workshops and some even function as vacuums.

Back to more conventional large-capacity blowers and luckily for Husqvarna, and Stihl we've included all of their models even though some are substantially less powerful than some lesser brands that we've left out. You might want to investigate further if you're after the smallest, cheapest and perhaps lightest models. Maybe you're after a sacrificial machine for the chipping crew because you've never really trusted them with your best kit? We've indicated the total number models including lower speed and back-pack machines in the tables. Be aware that some models are not available in all countries – we've indicated a region where there is a difference, for instance Husqvarna in the US has 3 handheld battery models and 2 Backpack models while Europe has an extra handheld model, the domestic 120i. You also need to be aware that the airspeed can apparently vary with the Ah of the battery. Greenworks for instance looks as though it has about 20 models but many are a variant with a different battery Ah giving a different power output. This is another reason we may have missed some models from this selection. However, for the most part you will want models that are listed as Semi-Pro with a ■ or Professional with a ■, that is not necessarily the same as simply including the word Pro in the name of the model!



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Mains CHARGERS can be standard or rapid and higher initial cost of a rapid charger can make the difference between waiting around for 20 minutes or an hour or two. These three (and the Echo) are the current crop of battery tools we're using and all four continue to provide exceptional service, even the EGO which we had not previously used. It has something of a space-station as its impressive charging dock and you can see that its 54v batteries are larger than the Stihl 36v and the even sleeker Oregon 36v. The charge status is shown as 4 LEDs which illuminate when you press the button. In the case of the EGO it's the round button on the top and the LEDs are around the circumference of the button. Unlike most images in this article, these chargers are in scale to each other.



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delicate garden Obje'd'Art or their Pekinese.

- Don't waste time trying to blow twigs that are too large to move easily on grass – just get the rake back out.

CHARGERS

It's not like you have a choice here – whatever charger goes with the battery series is what you need but the option of a fast charger over a standard charger might be worth the extra money.

Husqvarna have an additional compact and/or vehicle charger which is simply a plug-in lead and this is much smaller than every other charger in which the battery is 'parked' for charging. This one is more like a large printer or laptop transformer and plugs straight into the battery, They take longer to charge though at upwards of 2hrs.

TECHNIQUE

There is some skill and technique to debris-blowing. I'm surprised it's not a separate event at climbing competitions – get up and down the tree quick as a flash then clean up the mess. There are five key things to consider when corralling leaves and debris into a pile if you don't want it to be like herding cats; all should involve wearing protective eyewear:

- 1) Wind speed and direction
- 2) Wet or dry?
- 3) Hard-standing/paths or grass/flowerbeds
- 4) proximity to things best avoided: wet paint, swimming pool, garden umbrella, Bentley parked down the drive, prize dahlias and street-exits or open railings/fencing to the street.
- 5) Fine particles on hard surface can create static electricity

- Powerful blowers can blow against a lower-speed wind easily enough but it can gust or be redirected by buildings or fencing and catch you out. It's much better to work with the wind – figure out where the wind wants to put stuff and make that your direction for a collection pile if you can. If you have to fight against wind use the same principle as swimming against a current and go diagonally so that you combine the direction the wind wants with some progress towards where you actually want to go.
- Approach large areas of debris from a distance and angle inwards from the outer edge of the debris-spread to concentrate the spread rather than wading into the middle and disappearing in a flurry of your own making.
- Make sub-piles to collect and carry rather than trying to relocate vast swathes of leaves and chippings half a mile to the truck. Wet conditions can actually make life easier because bone-dry leaves and chippings stay separate like fairy dust and disperse to all corners just as easily.
- Wet and compacted is a different story, that's when you need to blow at close-quarters and make use of the various scraping options that some have. This may be metal reinforcement or a lip or 'teeth/claws. You can scrape with the plastic lip of your nozzle but it will quickly wear out and disintegrate.
- If blowing out towards the street, check for traffic and pedestrians long before you get close – some bits of debris can become unexpectedly dangerous projectiles. For the same reason avoid going near the client's prize Bentley, Roses,

BATTERIES

Inevitably the first comparison will be with traditional petrol/gas blowers and you will see a number of brands claim that the gap is closing. It is closing but only in the sense that the tortoise chasing the hare has bought himself a set of roller skates but is still well behind. What they mean of course, is that the best battery powered blower is getting much closer to the least powerful petrol blower and if you take noise and pollution into account, battery continues to be the healthier option.

The biggest contributor to the number of tools now available isn't so much the batteries being improved, although they have. It's that so many manufacturers have spotted the need for batteries to work across a number of platforms since they're an expensive initial investment. So you'll find the same battery can power everything from chainsaws and blowers to hedge-trimmers and mowers. There are even blowers appearing in some multi-head tool systems where you purchase not just a cross-compatible range of batteries but the same power-unit and drive-shaft for a range of tools. This all means there might be a degree of having to rush out a tool to fill a multi-tool niche they weren't previously involved in. Chainsaws is a perfect example so if you hadn't heard of them before they invented a range of 700 tools that now includes 15 different types of chainsaw and 13 blowers, you might want to check out their credentials within the professional arena before investing. Surprisingly there are some lesser known brands producing very good battery saws. If they can produce a good chainsaw then a blower is a cinch because it's a non-critical item with no real safety concerns and a very straightforward function – blow hard and long!

Unlike the chainsaws we covered in previous GUIDES, battery blowers are a little more forgiving in terms of performance; blowing leaves is not as critical as completing a cut on a half ton-section of tree 60ft above the ground! Consequently we do see 20/18volt models in this GUIDE as well as the more expected 36 to 120volt machines. It's the voltage

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in combination with the AmpHour of the battery that gives you the all-important total WattHours so you're almost certainly going to want the higher voltages for professional work. In fact, Stihl and Husqvarna ONLY quote Watt-hours but since absolutely everyone else quotes Ah, the only way to compare like with like is to convert theirs back to Ah. So not all Ah batteries are the same – at the quality end – a 4Ah 36/40v Oregon and Stihl AK series 36v 4Ah battery is 144 while the Stihl AP(pro) 4Ah battery is 187WattHours. ALL of the blowers in this list are Lithium Ion (Li-ion) and more effective with higher AmpHour (Ah) batteries. Indeed some manufacturers ignore the lower Ah batteries when they list those that are suitable for the blower in question. In reality it would be very unusual if any given model didn't accept ANY of the batteries from within that range – case in point, EGO has batteries from 2Ah up to 10Ah but they only list their more professionally oriented models as using 5 and 7.5Ah batteries (their 10Ah doesn't get much of a mention despite it's longevity). Go for the highest Ah that you can afford but there is a significant difference in weight and cost between say a 2Ah and 7 or 9Ah – this can be a few hundred dollars/pounds difference. If you haven't got the readies at the time of purchase just know that the lower Ah cells will do perfectly well, but they're maybe not the best.

Stick with the brands you know well and those in our table rated as Pro and semi-pro depending on how much work you expect it to do. Be careful on multi-platform systems that the battery for use in the blower is the same as that used in the other tools you may want to buy – frequently some tools within the same range require a different Ah battery. If the tool is listed in our guide as suitable for Domestic use that doesn't preclude it from use by professionals – it will just be used far less frequently and under less arduous conditions than a pro or semi-pro tool.

The most 'powerful' battery hand-held model as at early 2021 displaces around 18.4 cubic metres per minute (cmm). The best petrol model displaces around 24cmm so it seems to be much closer unless you look at Newton of force – that's more like 50+Netwons for petrol compared to maybe 25N at best. But it's not all about power. There is a strong case for using battery simply because it's is so much lighter, there are no carbon-rich fumes and it's 'quieter' than petrol/gas. Not 'quiet' just 'quietER'. Remember though, a battery will run DOWN as distinct from fuel running OUT. Up to the point the fuel ran out, your petrol machine produced the same quality output from start to finish (unless you screwed up the fuel mix). Cheaper brand batteries may show a power reduction long before the LEDs show that it's run out or it may become twitchy and switch on and off as it runs out. Most models step down to a lower power level as they run out. Batteries may not be quite as powerful yet but they are quieter, lighter, more convenient and responsive.



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So it's all about the battery, if you don't have a quality battery system it doesn't really matter how good the bare blower is. Some companies have invested enormous resources in producing their own battery systems – in our sector, Stihl, Echo, Makita, Oregon and Husqvarna are the most notable proponents but they are joined by some unexpected competition from China – the Ego and Greenworks brands are both affordable and surprisingly capable and all of these companies offer tool systems that use the same batteries so your investment in batteries can be spread across a range of tools including top-handle saws, the ultimate pro-only tool. The vast majority of Lithium Ion – (Li-ion) batteries typically weigh around a kilogram/2.2 lb each. Some hand-held blowers aren't actually much lighter than the smaller engined petrol models. And they don't last as long as a tank of fuel but that's why you will ALWAYS have at least one if not two spare batteries, it takes a few seconds to switch out batteries, a lot faster and cleaner than refuelling and spilling a bit on the client's prize dahlias – more bad press. Your batteries are such an investment that Makita even have a protective jacket for theirs (pic above).



DUAL VOLTAGE & DOUBLE BATTERIES

A bit of electronic alchemy has produced batteries that can service two different voltages – Greenworks has a 24-48v range, Hikoki (Hitachi/Koki) has an 18/36v system and DeWalt has it's FelxVolt system where a 20v battery can also service 60 and 120v tools. They automatically detect the required draw and the ampHour rating will be halved for the higher rated tool – so a 4Ah battery for a 24v tool will become a

2Ah battery for a 48v tool. This gives you an even bigger range of tool options to fit one battery so it's worth considering if you're using these particular tool systems. The 'big-4' in the arb industry won't have or need Dual voltage batteries since they entered the battery market at a very precise time and with the very specific aim of powering chainsaws and THEN other tools. For those that had an existing platform that used lower voltage batteries the answer for improving longevity was to double up and use two batteries on one device. We think Makita started this with their twin 18v but many others have followed with double 20v like the Worx model above. It's a fair trade-off but bulk, weight and cost are all increased.

MOTORS

All except two or three of these models have brushless motors. Having no brushes to wear out increases the lifespan of your saw and the smart element of electronics that seems to be a feature of most modern battery tools helps mitigate the tendency in underpowered tool/battery combinations for the battery to overheat and cut out to protect itself leading to you needing to swap batteries while it cools down or wait. And waiting never seems to work that well because the battery is



a dense mass that retains a lot of residual heat and so overheats quicker the second and subsequent times than it did the first time. If your battery-tool combination is cutting out regularly you need to upgrade the battery if a higher Ah is available and compatible or accept that the tool is not up to the job you're asking of it. This will almost always only apply to the less professionally oriented models. One thing to be aware of that is unique to blowers is that in order to blow, it needs to suck and it sucks a lot of air either via an open mesh on one side of the machine for those circular designs or at the very end for in-line models, which is the majority. (In-line is more efficient as it creates less friction). If your overalls/trousers get anywhere near that intake it will be sucked against it. Repeatedly in the case of a side-vent held on the wrong side of your body.

BACK PACKS & WAIST BELTS

These have their own GUIDE in the next issue so none are included here but Echo, Stihl,Husqvarna Hitatchi, Makita and Oregon all have professional-grade -backpacks offering enhanced longevity. These incredibly useful options cost a lot of money but you can easily get a full days work out of one backpack and it can reduce your front-end weight. Your back is a much stronger part of the body than arms so is a worthwhile compromise in terms of having to work with your blower on a lead. You do pay for that extended duration in money and with charging times that, in the case of the Echo backpack are five and a half hours but I guess if you're charging overnight prior to a days work this should work out just fine. Many of the domestic and semi-pro brands also offer backpack models better suited to professionals – Kobalt, Ego, and Greenworks all offer a backpack model (covered in the next issue's GUIDE). If a full backpack is beyond your budget but you like the idea of increased duration or reduced front-end weight there are backpack-carriers and waist-belts that simply use the existing battery like EGO, Al-Ko and Snapper. Some, also in the next issue's Guide like Honda and the Snapper model shown earlier have a waist belt as a dedicated element – in other words, the battery can only be used as cord-connected. This again requires an extraneous lead similar to the full backpack models and some may find this cumbersome but for ground work in particular it can be useful and the weight-in-hand is again minimised making the nozzle-end far more manoeuvrable.

PRO vs SEMI-PRO vs DOMESTIC

You will obviously be aware that the key professional arborist brands remain the best options for blowers in terms of quality

of product and faith in the warranty. It is the larger backpack models like the Stihl BGA100 left that have the grunt and longevity for professional use but these are still using most of the weight of a hand-held just without the extra couple of pounds of battery since that's been transferred to your back. It's a lot more efficient and less tiring to use fully integrated backpacks where the nozzle is directly attached to the powerpack as with the Oregon model (pic top). Weight in the hand is minimal and you can work all day with one of these. I used to kill two economic birds with one stone and had a Stihl petrol backpack Sprayer giving me the option of a powerful blower AND a wildlife-killing insecticide/herbicide sprayer but, for now, battery only seems to have made it as far as the lance-style sprayers. As for brands, Husqvarna, Stihl, Echo, Makita and Oregon are easy for us to recommend but there are some outliers that either specialise in battery products, and quite sophisticated battery products at that, or have a range so large they're hard to ignore – Ego, Greenworks and WorX come to mind. All are Chinese in origin but with large administrative and manufacturing bases in Europe and the US. Until we started using Ego's new tree saw we weren't sure of quality but can now say with some confidence that they are definitely worth consideration. You see online comparison sites lauding Ego quite often but we're never sure of the impartiality of such sites and whether sponsorship or advertising has greased some palms to get a favourable review... It seems not. Ego tools aren't small and light, they do have some substantial batteries, chargers and tools but also the performance to justify the bulk. Greenworks we're not sure of, they have remained more firmly rooted in the domestic market even though they have a 'Pro' range which includes a top-handle saw. Greenworks and Ego's jump into the professional chainsaw market implies a firmer belief in the ability of their products to stand up to daily abuse. WorX we have less knowledge of but they are another battery specialist company from China with a huge worldwide network and a lot of commendations for products in the domestic/DIY sectors so might again be worth consideration. As usual, look out for similar (if not the same) models rebranded by multiple companies eg Cramer by Greenworks. The Poulan Pro, McCulloch and Jonsered blowers all look similar since they're all owned by Husqvarna but there are some differences in performance.

The next group of products are what we will call 'DIY/Garden' brands. In fact, the aforementioned Greenworks and Worx could well be included here but we're thinking more of garden/landscape brands often sold by large retailers like B&Q/Home Depot and Lowes and often rebranded time and time again. Kobalt is owned by Lowes in the US but it does seem to be on the way out in Lowes line-up in favour of Craftsmen. Other 'DIY/ Garden' brands include Cobra, Hart, Wolf-Garten, Wen, Redback






(which used to have a 120v blower but now just scrapes in with their 40v model), SunJoe, Stiga, Craftsman, Westinghouse, Black&Decker, Zomax, Netta, Hychika, Al-Ko, Swift, Flymo and Warrior Eco. Some of these are big names but that doesn't necessarily equate to professional quality. Others are niche specialists – Germany's Wolf Garten and Cramer, Cobra, Stiga/Mountfield and Warrior Eco all deal only in outdoor maintenance products. Warrior Eco has a feature you would think might be present on ALL blowers especially since they're often used at the end of the day in diminishing light.... an LED headlamp kinda thing (above).



The last category we've invented are 'Tradesman' brands – these might be more ruggedised for professional use but equally, may be no better than the 'DIY' brands. Usually though they will have a better reputation and some will be HUGE grounds maintenance companies like Toro and Snapper (Briggs & Stratton). Tradesmen will often be using a wide range of tools so it's a no-brainer to adopt new tools that utilise the same battery platform. Some will be just garden or outdoor products while the majority will include construction tools like Makita, DeWalt Milwaukee, Hitachi-Koki (now Hikoki and Metabo), Skil and Bosch. All are reputable brands with good products that are more often than not regarded as semi-pro rather than Pro for purposes of the Outdoor Power Equipment in our GUIDES.

**Brands that didn't make the cut** here but may be worth a look include Al-Ko, Black&Decker, Bosch, Cobra, Craftsman, Flymo, Hart, Netta, Swift, Von Haus, Wen, Westinghouse and Zomax among many, many others.

If you're struggling for money, the consideration is simply whatever you can afford and that can easily include 'domestic' models because these are not life-critical items – if your blower packs up (and there's a good chance it will if you overstretch it) you could always resort to a yard broom whereas your chainsaws and safety PPE cannot be skimped on.

Professional models are built for prolonged and sustained use in all-weathers with features that suit arborists ground-work requirements. Domestic products always seem to have a fair percentage of complaints about early battery discharge and/or not charging properly. Semi-Pro indicates that a model is robust enough to be used for professional work but only for limited periods and for more limited applications. Domestic blowers work perfectly well but not daily and only for short periods at a time. Within the USE row there is a solid box to indicate suitability for tasks –  for Pro,  for Semi-Pro or  for Domestic. Make no mistake, some of the new Chinese based super-companies are driving development even if they so far fall a bit short of the main pro companies.

IN THE FOLLOWING TABLES:

**PRODUCT NAMES:** these are invariably code numbers seem to vary from country to country and stockist to stockist. We have gone with the manufacturer name which is normally a huge mouthful of letters and numbers but this may be at odds with the names you see in your local store.






**ORIGIN:** is for the company selling the blower, not necessarily the country of manufacture. Where we know, we've put an inset flag to show where it's made. This can be a bit complicated for some companies. For instance Ryobi is Japanese but it licenses its power tools to Hong Kong/ Chinese company Techtronic who also own iconic 'US' brands Milwaukee, Homelite and Hoover. Some tools continue to be made in the US but many have moved production to China.





**MAX VOLTAGE:** Should be straightforward you would think but it can be quoted with no load or when running. 36v for instance is often shown as 40v and likewise 80v may be listed by some as 82v and an 82v may actually be 72v- If one manufacturer has two slightly different voltages quoted it may be a difference in countries so they're actually the same but one exception are the two Echo blowers which actually two different battery systems separated by only a few volts. Don't be tempted to buy cheaper replacement batteries for some of the construction-grade machines like DeWalt, Milwaukee and Makita. They look attractive but performance will be reduced and in the long term their longevity will make it a false economy. Again, if you're strapped for cash you may consider it as a short term fix but as soon as you start earning enough, buy the branded batteries.


**MAX AIR SPEED/VOLUME/FORCE:** a minefield for speed in particular because, as already mentioned it can vary simply by tapering the nozzle end and concentrating the air-stream. We originally had 125mph as our entry criterion but there were so many models that could simply have added a flat nozzle to get in that we reverted to a minimum 300cfm/ to whittle the models down. The volume gives you a better idea of the actual shifting capabilities and if you see that the nozzle has a wide opening and relatively low speed at or below 125mph you can be sure that it could increase significantly with a concentrator nozzle. Better still is the figure for force in Newtons – if they all quoted it, that would be the fairest way to compare like with like and would have been our entry criterion. **Max Forces and speeds shown are on boost or flat-out with their best battery.**

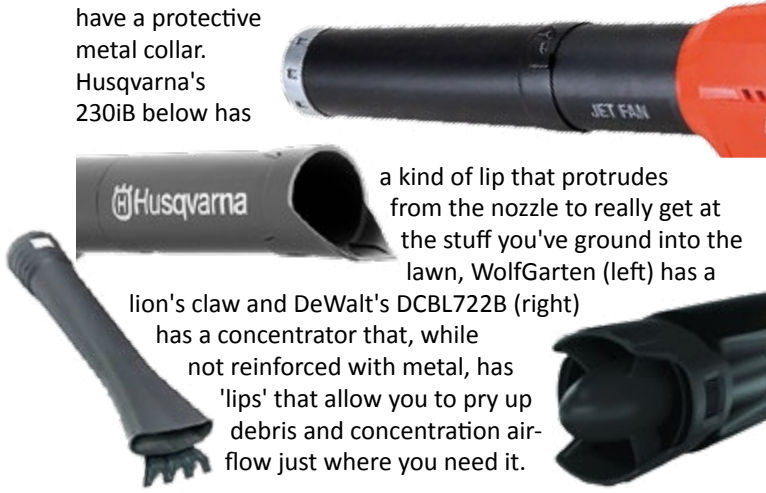
**COST:** The price quoted is for the body-only minus a battery, which is the best guide to use. A complete package of body, basic charger and recommended battery is often discounted compared to buying battery and charger separately. For all entries we have shown the default battery in **burnt orange**. Default batteries for professionals tends to be mid to higher AmpHour options but you can choose any of the battery options listed. All prices INCLUDE VAT/local taxes. – expect to pay quite a lot more for higher capacity batteries. Battery prices are for a **SINGLE** battery, many models require two to function in which case the kit price will be for 2 batteries.

**DURATION/RUN-TIME:** Is a range from constant full speed/BOOST using most power down to the lowest power setting for the longest duration. In reality the boost mode is used sparingly so actual run time will rarely be the minimum time shown. **Min-Default-Max** means the **minimum** run time using the smallest Ah battery to the **maximum** run time using the largest Ah battery with the min/max for the **default** battery in between. A backpack max duration figure may be shown in **green** Sometimes the default battery might be the smallest or the largest figure.

**RECHARGE** and **CHARGERS** is to 100% charged – a number of companies quote 30to 80% charged because it's so much quicker than that last 20 or 30%. Fast charging is shown in **green** with **backpack** charging in ArbClimber green. Standard charging (which may also include multi-charging) is in black with charging times for the default battery shown in **burnt orange**. For Chargers: Fast/Rapid charger =  Standard charger =  High capacity =  12v/vehicle charger =  and Multi Charger = 


**CHARGE STATUS**  : This allows you to know how much power you have left at any time in your battery – generally this will be a push button on the battery itself with LED indications like this Briggs&Stratton battery on a Snapper Blower. This is shown as a solid black square. It can also be a status panel close to or on your trigger handle shown as a black outline square. In reality you're more likely to keep working until the battery falters or kicks down a level to show it's running out with status checking undertaken at the start or end to determine if it needs to be charged. **Don't forget that batteries need to cool down before they will charge properly.** Some chargers have fans to help this but can be quite noisy.

**COLLAR-SCRAPER** : Because some of the job involves getting stubborn leaves and compressed wood chips out of the ground many models have a 'scuff-collar', 'debris-scraper' or, in DeWalt's case, a concentrator with scrapers. This is a reinforcement of the nozzle-end that allows you to pry up leaves and chewing gum. Some, like this Echo have a protective metal collar. Husqvarna's 230iB below has





a kind of lip that protrudes from the nozzle to really get at the stuff you've ground into the lawn, WolfGarten (left) has a lion's claw and DeWalt's DCBL722B (right) has a concentrator that, while not reinforced with metal, has 'lips' that allow you to pry up debris and concentration air-flow just where you need it.




**CRUISE CONTROL**  is the ability to lock the speed at a particular level so that you don't need to keep the trigger held. This might be for air speed or air volume. It's not quite the same but we've taken this term to also cover any device that has speed settings where you switch to a set speed and don't need to keep the trigger depressed. Some of these have no trigger so a set speed is your only option.


**SPEEDS** is either a number indicating that you can cycle through x-number of set speeds or it will say 'variable' which means the speed will vary infinitely depending on how far the trigger is depressed. Some offer both variable speed via the trigger and also switch settings, via a button, switch or rotating 'cog' for want of a better word. As already mentioned these setting are usually for speed but may be for volume giving you a vast number of actual speed options.

**TURBO/BOOST**  is a push-button, short-term boost to maximum power. This is normally only deployed occasionally to help shift stubborn debris or overcome a head-wind (good luck with that) because it uses the maximum amount of power.

**BRUSHLESS** : is a brushless motor which virtually all of these blowers are. Regular motors use brushes which rub causing friction and excessive heat. Without brushes there's less to wear out, less friction and greater efficiency. Motors last longer and are quieter.

**VACUUM** : Among the 'Features' rows we have included a nod to vacuum models – that means blowers than can convert to vacuums and suck up leaves (and maybe mulch them down) instead of just spreading them around the garden. These are rarely, if ever, professional grade models but on small jobs in small gardens you may find a benefit.




**STRAP** : This is standard on vacuum models but is also a useful option on many regular hand held blowers because it can get tiring waving several pounds of plastic around the clients driveway for an hour. On the Makita 361 (right) you'll notice there's a chainsaw-style clip on the rear for attaching a shoulder strap but we don't see this on many others unless they're also vacuum-capable.

**SOUND PRESSURE/POWER** is an important consideration if you're using a blower for extended periods. Battery blowers are of course MUCH quieter than petrol/gas models, especially the lager back-pack models but really, it's academic because you are equipped with ear defenders for chainsaw and chipper use so wear them when using a blower as well until or unless battery blowers become silent. Some give just one figure which might be pressure or power.

**WARRANTY:** Some list 'Pro' but be sure to double check that the warranty extends to professional use. This is a good way to differentiate the pseudo pro stuff -some don't.



IMAGES NOT TO SCALE					
					
MODEL /VARIANTS	DCB770/DCM572N	DCBL772B/DCMBA572N	DCBL722B/DCMBL562N	DPB-600	CPLB-58v
COMPANY	DEWALT	DEWALT	DEWALT	ECHO	ECHO
ORIGIN					
MAX VOLTAGE	60(54)v Li-ion* FlexVolt	60(54)v Li-ion* FlexVolt	20v Li-ion Max/FlexVolt	50v Li-ion	58(51.1)v Li-ion
MODELS-IN-RANGE/ <b>BACKPACK</b>	5	5 (20to60v Flex)	5 (20to60v Flex)	1	1
MAX AIR SPEED m/s <b>kmh/mph</b>	78 208-281kmh/129-175* <b>mph</b>	56 201kmh / 125 <b>mph</b>	56 201kmh / 125* <b>mph</b>	72.5 265kmh / 164 <b>mph</b>	64 230kmh / 145 <b>mph</b>
MAX AIR VOLUME cmm / <b>cfm</b>	12 / 423	17 / 600	12.7 / 450	10.8 / 381	15.5 / 547
MAX AIR FORCE Newtons	11	-	-	-	-
USE: <b>PRO</b> / SEMI-PRO/ <b>DOMESTIC</b>	■	■	■	■	■
COST: BODY ONLY COST: inc charger & battery	£170 / \$220 / € £309 / \$330 / €	£185 / \$220 / €200 £350 / \$330 / €349	£150 / \$155 / €190 £300 / \$390 / €340	£379 / €330 £635 / €750	£180 / \$220 / €195 £349 / \$270 / €355
COST EACH: BATTERY <b>Default Battery</b>	£120-140-230 \$170-220-270 €140-200-260	£120-140-230 \$170-220-270 €140-200-260	£120-140-230 \$170-220-270 €140-200-260	£175-264-995 €220-300-1200	£150-200 \$150-185 €156-200
WEIGHT: EXC. BATTERY	3.3kg / 7.3lb	3.1kg / 6.8lb	2.5kg / 5.43lb	3.2kg / 7lb	2.5kg / 5.5lb
WEIGHT: INC. BATTERY & NOZZLE	4.5kg / 9.9lb	4.3kg / 9.5lb	3.5kg / 7.7lb	5kg / 11lb	3.7kg / 8.1lb
BATTERY Ah: <b>Default Battery</b>	2(6),3(9),4(12)Ah*	2(6),3(9),4(12)Ah*	Flex-6,9,12Ah*	2,4,16Ah	2,4Ah
Min & Max WEIGHT of BATTERY inc <b>Default Battery</b>	1.1, 1.2, 1.5kg 2.4, 2.6, 3.2lb	1.1, 1.2, 1.5kg 2.4, 2.6, 3.2lb	1.1, 1.2, 1.5kg 2.4, 2.6, 3.2lb	1, 1.8, 9.4*kg 2.2, 4, 21*lb	1.2, 1.8kg 2.6, 4lb
LENGTH body + Nozzle/ <b>Diameter</b>	18"	24"	-	-	-
NOZZLE OPTIONS	Round, Concentrate, Flat	Round,Concentrate	Concentrate/Scraper	Round	Round
DURATION: min - <b>default</b> - max	15	10	12-20	7-15-72	15-20, 25-30
RECHARGE: <b>FAST (Backpack)</b> STANDARD/MULTI <b>Default</b>	60mins	45mins 70mins	30mins 75mins	21-44-168mins 42-88-336mins	30-60mins
CHARGERS: <b>FAST</b> , STD, <b>HiCap</b> , <b>12v</b> , Multi	■ ■ ■ ■	■ ■ ■ ■	■ ■ ■ ■	■	■
CHARGE STATUS / <b>COLLAR-SCRAPER</b>	■	■	■	■ ■	■ ■ ■
CRUISE CONTROL/SPEEDS/ <b>BOOST</b>	■variable	■variable	■variable	■variable ■	■variable ■
BRUSHLESS MOTOR <b>VACUUM STRAP</b>	■	■	■	■ ■	■
SOUND PRESSURE: LpA/ <b>POWER LwA</b>	89/67 (99.5UK)	107	66	81.9/97	102.4
WARRANTY (years) / <b>BATTERY</b>	3/3	3/3	3/3	2/2 year pro	1/ 2 year pro
NOTES	*Speeds are with round & flat nozzle. *Back-compatible with 20v system so Ah is a third for 60v system	*Back-compatible with 20v system so Ah is a third for 60v system	*Speed is WITH concentrator nozzle FlexVolt works in 20, 60 & 120v tools. *also fits 2,3,4,58v MAX batteries	* backpack battery weight with harness	
WEBSITE	dewalt.com	dewalt.com	dewalt.com	echo.com	echo.com

NOTES: USES: COST is approx including VAT/local Tax. CHARGE STATUS = ■ = Status On Tool Body, ■ = Status on Battery. CHARGER TYPES: ■ = Standard/Trickle, ■ = Rapid Charger ■ = Hi-capacity ■ = 12v/Vehicle STRAP: Included ■ Option ■



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IMAGES NOT TO SCALE							
	MODEL /VARIANTS LB5800/5804	LBX6500/504	LB6150/1	LB5750/E	LB5300/302/E	GE-LB 36/210 Li E-Solo	2419302 / 2414602
COMPANY	EGO	EGO	EGO	EGO	EGO	EINHELL	GREENWORKS
ORIGIN							
MAX VOLTAGE	56v Li-ion (Power+)	56v Li-ion (Power+)	56vLi-ion (Power+)	56v Li-ion (Power+)	56v Li-ion(Power+)	36v (2x18v) Li-ion X-change	48v (2x24v) Li-ion
MODELS-IN-RANGE/ <b>BACKPACK</b>	7/1(US), 4/1 (EU)	7/1(US)	7/1(US)	7/1(US), 4 /1 (EU)	7/1(US), 4 /1 (EU)	2	3 USA, 4 EU (24v)
MAX AIR SPEED m/s kmh/mph	75 233-270kmh/145-168* <sup>mph</sup>	80 258-290kmh/160-180* <sup>mph</sup>	76 241-274kmh/150-170* <sup>mph</sup>	59 212kmh/ 132 mph	49 176kmh / 110mph	59 212kmh / 132 mph	62 225kmh / 140mph
MAX AIR VOLUME cmm / cfm	16.4 / 580	18.4 / 650	17.4 / 615	16.3 / 575	15 / 530	13.6 / 480	16.6 / 585
MAX AIR FORCE Newtons	18	21	18.5	18	16	-	-
USE: <b>PRO</b> / SEMI-PRO/ <b>DOMESTIC</b>	■	■	■	■	■	■	■
COST: BODY ONLY COST: inc charger & battery	£189 / \$ / €219 £460 / \$350 / €570	\$299 \$670	\$238 \$515	£169 / \$219 / €212 £440 / \$590 / €560	£135/ \$209 / €180 £410 / \$580 / €529	£110 / \$120 / €130 £175 / \$250 / €200	£70 / \$90 / €90 £265 / \$200 / €320
COST EACH: BATTERY Default Battery	£189-280-385* \$280-380-510* €249-379-499*	\$280-380-510*	\$180-280-380-510*	£189-280-385* \$280-380-510* €249-379-499*	£189-280-385* \$280-380-510* €249-379-499*	£37-44-52-55-75 \$42-44-60-80-100 €35-40-50-60-70-80	£50-75 €65-100
WEIGHT: EXC. BATTERY	2.17kg / 4.77lb	2.17kg / 4.77lb	2.15kg / 4.74lb	2.2kg / 4.84lb	2.2kg / 4.8lb	2.38kg / 5.2lb	2.3kg / 5.1lb
WEIGHT: INC. BATTERY & NOZZLE	4.42kg / 9.75lb	4.42kg / 9.75lb	4.65kg / 10.6lb	4.41kg / 9.75lb	3.5kg / 7.7lb	3kg / 6.6lb	3.2kg / 6.6lb
BATTERY Ah: Default Battery	5, 7.5, 10Ah*	5, 7.5, 10Ah*	2.5, 5, 7.5, 10Ah*	5, 7.5, 10Ah*	2.5, 5, 7.5, 10Ah*	2, 2.5, 3+,4,5.2+Ah*	2, 4Ah*
Min & Max WEIGHT of BATTERY inc Default Battery	2.21, 2.9, 3.4kg 4.9, 6.4, 7.5lb	2.21, 2.9, 3.4kg 4.9, 6.4, 7.5lb	1.3, 2.21, 2.9, 3.4kg 2.9, 4.9, 6.4, 7.5lb	2.21, 2.9, 3.4kg 4.9, 6.4, 7.5lb	1.3, 2.21, 2.9, 3.4kg 2.9, 4.9, 6.4, 7.5lb	0.4, 0.5, 0.6, 0.67, 0.88kg 0.9, 1.1, 1.3, 1.5, 1.9lb	0.5, 0.9kg 1.1, 2lb
LENGTH body + Nozzle/Diameter	914mm /36" 69mm/2.7"	914mm /36" 69mm/2.7"	914mm /36" 69mm/2.7"	-	912mm /35.9" 69mm/2.7"	860mm /33.8"	mm/"
NOZZLE OPTIONS	Round,Flat,Concentrate,Gutter	Round, Flat,Concentrate,Gutter	Round,Flat,Concentrate,Gutter	Round	Round, Flat	Concentrate-Extendible	Concentrate
DURATION: min - default - max	18-200-300mins	16-200-300mins	10-100-300mins	18-150-225mins	10-75-225mins	4-10-116-165	19-30mins
RECHARGE: FAST (Backpack) STANDARD/MULTI Default	40-60-70mins 100-145-190mins	40-60-70mins 100-145-190mins	30- 40-60-70mins 50-100-145-190mins	40-60-70mins 100-145-190mins	45-120-160mins	50-75mins	45-90mins 45-120mins
CHARGERS: FAST, STD, HiCap, 12v, Multi	■ ■	■ ■	■ ■	■ ■	■ ■	■ ■ ■	■ ■ ■&micro-charger
CHARGE STATUS /COLLAR-SCRAPER	■	■	■	■	■	■ ■	■
CRUISE CONTROL/SPEEDS/BOOST	■variable	■variable	■variable■	■variable	variable ■	■variable■	Variable ■
BRUSHLESS MOTOR VACUUM STRAP	■ ■(option)	■ ■(option)	■ ■(option)	■	■	■ ■	■
SOUND PRESSURE: LpA/POWER LwA	78.4 / 95	91.6	84 / 95	83 / 95	82/97	84.5/94	66
WARRANTY (years) /BATTERY	2pro/3	2pro/3	2pro/3	1pro/3	5/1	2	3/3
NOTES	*EGO Batteries WITH LED Charge status. Non-led available - cost & weigh less. *Round & Flat nozzle	*EGO Batteries WITH LED Charge status. Non-led available - cost & weigh less. *Round & Flat nozzle	*EGO Batteries WITH LED Charge status. Non-led available - cost & weigh less. *Round & Flat nozzle	*EGO Batteries WITH LED Charge status. Non-led available - cost & weigh less.	*EGO Batteries WITH LED Charge status. Non-led available - cost & weigh less.	*X-change series has some upgraded batteries called X-Change +	*Also 1.5 & 5Ah in some countries 24/48v Dual Volt batteries available. 24v Batteries will fit 50+ other tools
WEBSITE	egopowerplus.com	egopowerplus.com	egopowerplus.com	egopowerplus.com	egopowerplus.com	einhell.de einhellusa.com	greenworkstools.com


































NOTES: USES: COST is approx including VAT/local Tax. CHARGE STATUS = ■ = Status On Tool Body, ■ = Status on Battery. CHARGER TYPES: ■ = Standard/Trickle, ■ = Rapid Charger ■ = Hi-capacity ■ =12v/Vehicle STRAP: Included ■ Option ■



IMAGES NOT TO SCALE							
	<b>MODEL /VARIANTS</b> BLC361 /GD60AB/2401307 2414402/ BL60B00	BLC402/BL60L 2419502VTBT	BLC402 /2412902VTBT	BL80L00/2404602	GBL80320/ 2400--- GD80BL / (82B900*)	RB36DA/J4Z/ RB36DAW4Z	120iB
<b>COMPANY</b>	GREENWORKS	GREENWORKS	GREENWORKS	GREENWORKS	GREENWORKS	HIKOKI (HITACHI)	HUSQVARNA
<b>ORIGIN</b>							
<b>MAX VOLTAGE</b>	60v Li-ion PRO	60v Li-ion PRO	60v Li-ion PRO	80(82)v Li-ion Pro	80(82)v Li-ion Pro	36v Li-ion MultiVolt	36v Li-ion (BLi10-series)
<b>MODELS-IN-RANGE/ <span>BACKPACK</span></b>	3/1 USA 1 EU	3/1 USA	3/1 USA	2/1USA	2/1USA. 1/1EU	1 (+1x18v)	2EU-1UK
<b>MAX AIR SPEED m/s kmh/mph</b>	63 225kmh /140mph	58 209kmh/130mph	76 274kmh/170mph	65 233kmh / 145mph	58 209kmh / 125mph*	53 191kmh / 119mph	46 201kmh / 125.3mph
<b>MAX AIR VOLUME cmm / cfm</b>	12.7 / 450+	12.3 / 610+	19.8 / 700+	16.4 / 580+	14.2 / 500+	13.3/470	10.3/364
<b>MAX AIR FORCE Newtons</b>	-	18	-	-	12	3.9 N/m²	10N
<b>USE: <span>PRO</span>/ SEMI-PRO/ <span>DOMESTIC</span></b>	■	■	■	■	■	■	■/■*
<b>COST: BODY ONLY</b> <b>COST: inc charger &amp; battery</b>	£150 / \$130 \$380	\$149 \$199	\$200 \$330	\$100 \$270	\$120 / €270* \$290 / €460*	£400 / \$410 / €436 £650 / \$600 / €650	£169 / €200 £249 / €330
<b>COST EACH: BATTERY <span>Default Battery</span></b>	£120-180-250* \$140-150-200-250	\$150-200-250	\$150-200-250	\$180-200-230-300	\$180-200-230-300 €160 (€280-400*)	£130-160 \$130-170 €203-238	£100-160-250 €90-130-280
<b>WEIGHT: EXC. BATTERY</b>	2.3kg / 5.1lb	2.4kg / 5.3lb	2.4kg / 5.3lb	2.45kg / 5.4lb	2.58kg / 5.7lb	2.8kg/ 6.2lb	2kg /4.4lb
<b>WEIGHT: INC. BATTERY &amp; NOZZLE</b>	4.2kg / 9.2lb	3.64kg / 8lb	4.3kg / 10.4lb	3.8kg / 8.3lb	4kg / 8.9lb	3.5kg / 7.7lb	3.2kg / 6.6lb
<b>BATTERY Ah: <span>Default Battery</span></b>	2/2.5, 4, 5, 6Ah*	2/2.5, 4, 5, 6Ah*	2/2.5, 4, 5, 6Ah*	2/2.5, 4, 5Ah	2/2.5, (3*) 4, 5,(6*)Ah	2.5(5), 4(8)Ah	2,4, 7.5Ah*
<b>Min &amp; Max WEIGHT of BATTERY</b> <b>inc <span>Default Battery</span></b>	1.24/1.26, 1.9, 1.9, 2.7kg 2.7/2.8, 4.2, 4.3, 6lb	1.24/1.26, 1.9, 1.9, 2.7kg 2.7/2.8, 4.2, 4.3, 6lb	1.24/1.26, 1.9, 1.9, 2.7kg 2.7/2.8, 4.2, 4.3, 6lb	1.46/1.46, 2.6, 2.6kg 1.8/3.2, 5.7, 5.7lb	1.46/1.46,(1.6*)2.6, 2.6,(2.6*)kg 1.8/3.2,(3.5*)5.7, 5.7(5.7*)lb	0.7, 0.8kg 1.5, 1.8lb	0.8, 1.2, 1.9kg 1.8, 2.6, 4.2lb
<b>LENGTH body + Nozzle</b>	1140mm/45"	585mm/23"	585mm/23"	1140mm/45"	1050mm/41"	940mm/37"	900mm /35.4"
<b>NOZZLE OPTIONS</b>	Round, Concentrate	Concentrate, Flat	Concentrate, Flat	Round, Concentrate	Concentrate, Flat	Round	Round
<b>DURATION: min - <span>default</span> - max</b>	15-20-90-135mins	15-45-135mins	15-20-90-135mins	19-mins	19-(90*)mins	8-30mins	10-20-30-65mins
<b>RECHARGE: <span>FAST (Backpack)</span></b> <b>STANDARD/MULTI <span>Default</span></b>	30/40-60-90-120mins 60/75-120-180-240mins	30/40-60-90-120mins 60/75-120-180-240mins	30/40-60-90-120mins 60/75-120-180-240mins	30/45-60-75mins	30/45(45*)-60-75,(90*)mins	52-75mins 100-150mins	40-40-50mins 40-45-80mins*
<b>CHARGERS: <span>FAST</span>, STD, <span>HiCap</span>, <span>12v</span>, Multi</b>	■ ■ ■	■ ■ ■	■ ■ ■	■	■	■ ■ ■	■ ■ +compact
<b>CHARGE STATUS /<span>COLLAR-SCRAPER</span></b>	■ ■	■	■	■ ■	■ (■*)	■	■
<b>CRUISE CONTROL/SPEEDS/<span>BOOST</span></b>	■ variable ■	■ variable ■	■ variable ■	■ variable+3Volume ■	■ variable+3Volume ■	4 ■	variable+3volumes
<b>BRUSHLESS MOTOR <span>VACUUM</span> <span>STRAP</span></b>	■	■ ■	■ ■	■	■	■	■
<b>SOUND PRESSURE: LpA/<span>POWER</span> LwA</b>	103/83.2	-	-	-	73/73*	81/93	83/96.6
<b>WARRANTY (years) /<span>BATTERY</span></b>	1Pro	1Pro	1Pro	4	4 (2EU)	3	2
<b>NOTES</b>	*2,4&6 in Europe, 8Ah due soon. Power output varies with battery. May be 3Ah in some countries.	*2,4&6 in Europe, 8Ah due soon. Power output varies with battery. May be 3Ah in some countries.	Same model as left (BLC402) with different battery & power ouput. *2,4&6Ah in EU	2.5Ah not sold in all countries, same weight as 2Ah .	* (Rebranded by CRAMER with 3 &6Ah battery options). *Europe lists 126mph, sound =88/96.2 for 4Ah.	Dual voltage 'Multi-Volt' =36v fits 28 tools plus 54 existing 18v system tools at higher Ah (in brackets).	*Will also take ALL BLi100 batteries *Note Battery recharge times are different on English language chart!
<b>WEBSITE</b>	greenworkstools.eu	greenworkstools.com	greenworkstools.com	greenworkstools.com	greenworkstools.com	hikoki.com	husqvarna.com

NOTES: USES: COST is approx including VAT/local Tax. CHARGE STATUS = ■ = Status On Tool Body, ■ = Status on Battery. CHARGER TYPES: ■ = Standard/Trickle, ■ = Rapid Charger ■ = Hi-capacity ■ =12v/Vehicle STRAP: Included ■ Option ■



IMAGES NOT TO SCALE				
MODEL /VARIANTS	320iB (320iB-US)	230iB	525iB	
COMPANY	HUSQVARNA	HUSQVARNA	HUSQVARNA	
ORIGIN				
MAX VOLTAGE	36/40v Li-ion (BLi10-series)	36/40vLi-ion(BLi10-series)	36/40vLi-ion(BLi100-series)	
MODELS-IN-RANGE/ <b>BACKPACK</b>	2USA-2EU	2USA	2/ <b>2</b> EU	
MAX AIR SPEED m/s <b>kmh/mph</b>	54(37) <b>201kmh/(98*)125mph</b>	61 <b>219kmh / 136mph</b>	56 <b>202kmh / 126mph</b>	
MAX AIR VOLUME cmm / <b>cfm</b>	12.4/ <b>438 (289*)</b>	18.4/ <b>650</b>	13.3 / <b>470</b>	
MAX AIR FORCE Newtons	9N	19.4N	14.5	
USE: <b>PRO</b> / SEMI-PRO/ <b>DOMESTIC</b>	 /  *	 /  *		
COST: BODY ONLY COST: inc charger & battery	£300 / \$170 / €330 <b>£500 / \$230 / €510</b>	\$220 <b>\$360</b>	£379 / €360 <b>£698 / €670</b>	
COST EACH: BATTERY <b>Default Battery</b>	£100- <b>159</b> -249 \$130- <b>150</b> -250 €100- <b>130</b> -280	\$130- <b>150</b> -250	£149- <b>219</b> -299 \$130- <b>200</b> -300 €160- <b>240</b> -400	
WEIGHT: EXC. BATTERY	2.4kg /4.8lb (5.3lb)	2.6kg / 5.8lb	2.4kg / 5.3lb	
WEIGHT: INC. BATTERY & NOZZLE	3.6kg / 7.2lb (9.5lb)	3.8kg / 8.4lb	3.7kg / 8.2lb	
BATTERY Ah: <b>Default Battery</b>	2,4, <b>7.5(7.7)</b> Ah	<b>2,4</b> , 7.5(7.7)Ah	2.6, <b>5.2</b> , 9.4Ah*	
Min & Max WEIGHT of BATTERY inc <b>Default Battery</b>	0.8, 1.2, <b>1.9</b> kg 1.8, 2.6, <b>4.2</b> lb	0.8, <b>1.2</b> , 1.9kg 1.8, <b>2.6</b> , 4.2lb	0.9, <b>1.3</b> , 1.8kg 2, <b>2.9</b> , 4lb	
LENGTH body + Nozzle	904mm/35.6"	991mm/39"	603mm/23.7"	
NOZZLE OPTIONS	Round	Round, Flat	Flat-end	
DURATION: min - <b>default</b> - max	5- <b>15</b> -30-50mins	10- <b>15</b> -35-60mins	10- <b>15</b> -35-60mins	
RECHARGE: <b>FAST (Backpack)</b> STANDARD/MULTI <b>Default</b>	<b>40-40-50mins</b> 40- <b>45</b> -80mins	<b>40-40-50mins</b> 40- <b>45</b> -80mins	<b>50-50-60mins</b> 50- <b>65</b> -210mins	
CHARGERS: <b>FAST</b> , STD, <b>HiCap</b> , <b>12v</b> , Multi	  +compact	 	   	
CHARGE STATUS / <b>COLLAR-SCRAPER</b>		 	 	
CRUISE CONTROL/SPEEDS/ <b>BOOST</b>	 variable 	 variable 	 variable 	
BRUSHLESS MOTOR <b>VACUUM STRAP</b>				
SOUND PRESSURE: LpA/ <b>POWER LwA</b>	80/ <b>95</b>	n/a	82/ <b>98</b>	
WARRANTY (years) / <b>BATTERY</b>	1pro 2	2	2	
NOTES	*Will also take BLi100 PRO batteries *US version quotes a LOWER air speed and volume than EU model	436LiB Discontinued	*100 series X-batteries also available US battery prices included because all blowers can take them	Greenworks models but batteries moulded differently to fit only Kobalt. SEE ALSO <b>KOBALT model 600B/400B</b> same spec as Greenworks GBL80320
WEBSITE	husqvarna.com	husqvarna.com	husqvarna.com	
			hyundai.com	lowes.com

NOTES: USES: COST is approx including VAT/local Tax. CHARGE STATUS =  = Status On Tool Body,  = Status on Battery. CHARGER TYPES:  = Standard/Trickle,  = Rapid Charger  = Hi-capacity  =12v/Vehicle STRAP: Included  Option 















































































FLASH ACCESS



Comfortable and durable professional protective helmet designed for rope access and other work at height activities.




















































































Weight: 455 g • 16.05 oz  
CE (LD, 440V a.c., -30°C)



IMAGES NOT TO SCALE							
	MODEL /VARIANTS DUB184 or XBU03 COMPANY MAKITA (DOLMAR)	MODEL /VARIANTS DUB362 or XBU02 COMPANY MAKITA (DOLMAR)	MODEL /VARIANTS DUB363 or XBU04 COMPANY MAKITA (DOLMAR)	MODEL /VARIANTS M18 FUEL Gen II COMPANY MILWAUKEE	MODEL /VARIANTS BL300 A6/A4 COMPANY OREGON	MODEL /VARIANTS PRB675i / (B750i) COMPANY POULAN-PRO/(JONSERED)	MODEL /VARIANTS E435C COMPANY REDBACK
ORIGIN				 	  	 	
MAX VOLTAGE	18v LXT/XPT Li-ion	36v (18v x2) LXT/XPT Li-ion	36v (18v x2) LXT/XPT Li-ion	18v Li-ion High-Output series	36(40)v Li-ion	58v Li-ion	40v (Samsung)
MODELS-IN-RANGE/ <b>BACKPACK</b>	6 (LXT)	6 (LXT/XPT)	6 (LXT/XPT)	1	1	1/ <b>1</b>	1
MAX AIR SPEED m/s <b>kmh/mph</b>	52.1 <b>270kmh / 168mph</b>	54 <b>201kmh /125*mph</b>	65 <b>234kmh / 145mph</b>	54 <b>193kmh / 120mph</b>	59 <b>212mh / 131mph</b>	58 <b>209kmh / 130mph</b>	50 <b>180kmh / 111mph</b>
MAX AIR VOLUME cmm / <b>cfm</b>	13 / <b>459</b>	13.4 / <b>473</b>	13.4 / <b>473</b>	12.7 / <b>450</b>	14 / <b>400</b>	<b>675 (21.2/750)</b>	13 / <b>459</b>
MAX AIR FORCE Newtons	11.3	14	14	11.2	17	-	-
USE: <b>PRO</b> / SEMI-PRO/ <b>DOMESTIC</b>							
COST: BODY ONLY COST: inc charger & battery	£118 / \$129 / €136 <b>£251 / \$586 / €290</b>	£270 / \$220 / €312 <b>£324 / \$460 /€375</b>	£270 / \$270 / €312 <b>£480 / \$380* / €560</b>	£129 / \$253 / €195 <b>£320 / \$474 / €365</b>	£108 / \$151 / €125 <b>£245 / \$360 /€285</b>	\$100 (\$110) <b>\$200 (\$312)</b>	£140 / \$110 / €135 <b>£280 / \$200 / €300</b>
COST EACH: BATTERY <b>Default Battery</b>	£55-80-84- <b>106</b> \$99-109-130- <b>159</b> €65-93-100- <b>122</b>	£55-80-84-106 \$99-109-130-159 € <b>65</b> -93-100-122 (allx2)	£55-80- <b>84</b> -106 \$99-109- <b>130</b> -159 €65-93- <b>100</b> -122 (allx2)	£70-99- <b>150</b> -190 \$100-140- <b>170</b> -250 €81-115- <b>170</b> -220	£110- <b>150</b> -180 \$100- <b>145</b> -200 €130-170-200	<b>\$50</b> -110	£ <b>98</b> -142-160 \$110-200-230 € <b>113</b> -160-188
WEIGHT: EXC. BATTERY	3kg / 6.6lb*	3.5kg / 7.7lb	4.5kg / 9.9lb	2.2kg / 4.9lb	4.9kg / 6.2lb	2.7kg / 5.9lb	2.5kg / 5.5lb
WEIGHT: INC. BATTERY & NOZZLE	4.36kg / 9.6lb	4.2kg* / 9.25lb	6.6kg / 14.6lb	3.3kg / 7.3lb	6.1kg / 8.9lb	4.1kg / 9lb	3.3kg / 7.5lb
BATTERY Ah: <b>Default Battery</b>	3, 4, 5, <b>6Ah</b>	<b>3</b> , 4, 5, 6Ah	3, 4, <b>5</b> , 6Ah	3, 5.5, <b>8</b> , 12Ah*	2.6, <b>4</b> , 6Ah	<b>2.6</b> , 5.2Ah	<b>2</b> , 4, 6Ah
Min & Max WEIGHT of BATTERY inc <b>Default Battery</b>	1, <b>1.36</b> kg 2.2, <b>3</b> lb	<b>1</b> ,1.36kg <b>2.2</b> , 3lb	1, <b>1.36</b> kg 2.2, <b>3</b> lb	0.7, 1.1, <b>1.1</b> , 1.7kg 1.5, 2.4, <b>2.4</b> , 3.7lb	1.2, <b>1.2</b> , 1.27kg 2.7, <b>2.7</b> , 2.8lb	<b>1.1</b> , 2.3kg <b>2.5</b> , 5lb	<b>0.9</b> , 1.3, 1.7kg <b>2</b> , 2.9, 3.7lb
LENGTH body + Nozzle	921mm/36.25"	830-940mm/32.75-36"	<1396 mm/55"	386+mm 36.9"	502mm/19.75"	960mm/37.8"	800mm
NOZZLE OPTIONS	Flat, Round, Ext & Concentrator	Flat, Round, Extending	Round, Flat, Extending	Round	Tapered	Tapered	Round
DURATION: min - <b>default</b> - max	<b>12</b> mins	4- <b>6</b> - <b>44</b> -84mins	6.5- <b>11</b> - <b>73</b> -84mins	10- <b>36</b> - <b>70</b> ,60	10-50, <b>15</b> - <b>90</b> ,22-120mins	< <b>30</b> mins	<b>25</b> - <b>50</b> , 50-70,-70-200mins
RECHARGE: <b>FAST (Backpack)</b> STANDARD/MULTI <b>Default</b>	<b>22</b> - <b>36</b> - <b>45</b> - <b>55</b> mins 60-90-110- <b>120</b> mins	<b>22</b> - <b>36</b> - <b>45</b> - <b>55</b> mins <b>60</b> -90-110-120mins	<b>22</b> - <b>36</b> - <b>45</b> - <b>55</b> mins 60-90- <b>110</b> -120mins	<b>36</b> - <b>35</b> - <b>45</b> - <b>60</b> mins 70-130- <b>190</b> -285	<b>50</b> - <b>70</b> - <b>120</b> mins 90- <b>140</b> -200mins	<b>30</b> - <b>45</b> mins <b>60</b> -90mins	<b>30</b> - <b>60</b> - <b>90</b> mins <b>70</b> -135-200mins
CHARGERS: <b>FAST</b> , STD, <b>HiCap</b> , <b>12v</b> , Multi	  	  	  	   	 	 	 
CHARGE STATUS / <b>COLLAR-SCRAPER</b>						 	 
CRUISE CONTROL/SPEEDS/ <b>BOOST</b>	 variable	 variable+6volume	 variable	 variable+2volume	Variable 	 Variable 	 <b>4</b> 
BRUSHLESS MOTOR <b>VACUUM STRAP</b>		 	  		 		 
SOUND PRESSURE: LpA/ <b>POWER LwA</b>	86.6/ <b>93.5</b>	79.1/ <b>93.5</b>	84.8/ <b>94.9</b>	62/ <b>87</b>	64.6/ <b>84</b>	<b>103</b>	-
WARRANTY (years) / <b>BATTERY</b>	3pro	3pro	3pro	3	3/ <b>2</b>	5/ <b>3</b>	3/ <b>3</b>
NOTES	* weight with extension tube, Length with basic nozzle. Others are options. 5 & 6ah weigh the same	Can also be used with a <b>back-pack</b> *higher speed with flat nozzle. *Weight with extending tube	Can also be used with a <b>back-pack</b> Converts to Vacuum with 50L bag except *US\$ which is exc Vacuum bits. 5 & 6ah weigh the same	*also takes - 1.5,2,3,4,5,6 & 9v regular M18 batteries. Gen II smaller than Gen I, <i>Fuel</i> range is brushless.	A6 and A4 refer to the battery options	Owned by Husqvarna also branded by McCulloch. B750i not quite the same but data availability and market presence on these is poor	Waistbelt option. original 120v model is <b>DISCONTINUED</b> and this one is hard to find as well!
WEBSITE	makita.biz	makita.biz	makita.biz	milwaukee tool.com	oregonproducts.com	poulanpro.com jonsered.com	redbackpower.com















































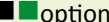




NOTES: USES: COST is approx including VAT/local Tax. CHARGE STATUS =  = Status On Tool Body,  = Status on Battery. CHARGER TYPES:  = Standard/Trickle,  = Rapid Charger  = Hi-capacity  =12v/Vehicle STRAP: Included  Option 



IMAGES NOT TO SCALE							
MODEL /VARIANTS	40470	BL48	XD 1696776/SXDBL82	LB934	BL4713-10	BL47148-10 /0330	SAB 500 AE/MBL50Li
COMPANY	RYOBI	SNAPPER (Briggs&Stratton)	SNAPPER (Briggs&Stratton)	SABO	SKIL	SKIL	STIGA/MOUNTFIELD
ORIGIN	 	 	 		 	 	 
MAX VOLTAGE	40(36)v	48v Li-ion	82v Li-ion	40v Li ion	40v Li ion (PWRCORE40)	20v Li ion (PWRCORE20)	48v Li-ion(Expereince)
MODELS-IN-RANGE/ <b>BACKPACK</b>	3 / <b>1</b> USA, 1EU	1 USA, 1 EU	2 USA, 1 EU	2	1	1	2/ <b>1</b>
MAX AIR SPEED m/s <b>kmh/mph</b>	56 <b>201</b> kmh / <b>125</b> mph	53.6 <b>193</b> kmh / <b>120</b> mph	58 <b>209</b> kmh / <b>130</b> mph	58 <b>209</b> kmh / <b>130</b> mph	58 <b>193</b> kmh / <b>130</b> mph	54 <b>160</b> kmh / <b>120</b> mph	55 <b>198</b> kmh / <b>123</b> mph
MAX AIR VOLUME cmm / <b>cfm</b>	15 / <b>550</b>	12.7 / <b>450</b>	15 / <b>550</b>	15.5 / <b>547</b>	14.2 / <b>500</b>	11.3 / <b>400</b>	11.4 / <b>403</b>
MAX AIR FORCE Newtons	-	-	13.75	-	12	9	-
USE: <b>PRO</b> / SEMI-PRO/ <b>DOMESTIC</b>							
COST: BODY ONLY COST: inc charger & battery	\$150 \$299	\$79 \$249	£ / \$120 / €231 £ / \$299 / €513	€240 €540	\$150 \$200	\$130 \$198	£142 / €170 £324 / €280
COST EACH: BATTERY <b>Default Battery</b>	\$99- <b>140</b> -160-200	\$ <b>100</b> -150	£ <b>170</b> -265 \$ <b>180</b> -230-300	€220- <b>270</b>	\$ <b>160</b> -280	\$55-65- <b>75</b>	£101- <b>141</b> -161 €109- <b>160</b> -189
WEIGHT: EXC. BATTERY	2.5kg / 5.6lb	2.4kg / 5.2lb	2.4kg / 5.3lb	2.15kg / 4.7lb	2.1kg / 4.6lb	2kg / 4.4lb	2.8kg / 6.2lb
WEIGHT: INC. BATTERY & NOZZLE	4.4kg / 9.7lb	3.4kg / 7.3lb	3.9kg / 8.58lb	3.5kg / 7.7lb	2.5kg / 5.6 lb	2.7kg / 6lb	3.1kg / 6.8 lb
BATTERY Ah: <b>Default Battery</b>	2, <b>4</b> ,5,6,Ah	<b>2</b> , 5Ah	<b>2</b> , 4, 5Ah	4, <b>6</b> Ah	<b>2.5</b> , 5Ah	2/2.5, 4, <b>5</b> Ah	<b>2</b> , <b>4</b> , 5Ah *
Min & Max WEIGHT of BATTERY inc <b>Default Battery</b>	0.95, 1.45, 1.5, 1.6kg 2.1 , <b>3.2</b> , 3.4, 3.5lb	<b>0.95</b> , 1.6kg <b>2.1</b> , 3.6lb	<b>1.46</b> , 2.6, 2.6kg <b>3.2</b> , 5.7, 5.7lb	1.25, <b>1.35</b> kg 2.75, <b>3</b> lb	<b>0.45</b> , 09kg <b>1</b> , 2lb	0.45, 0.7, <b>0.7</b> kg 1, 1.6, <b>1.6</b> lb	0.88, 1.37, 1.4kg 1.9, 2.6, 3, 3.1lb
LENGTH body + Nozzle	-	1021mm / 40.2"	-	-	900mm / 35.4"	909mm / 35.8"	1010mm/39.7"
NOZZLE OPTIONS	Round	Tapered	Tapered	-	Round, Concentrator	Flat, (Option-Taper, Spread)	Round, Flat
DURATION: min - <b>default</b> - max	<b>15-30</b> -90mins	< <b>20</b> mins	<b>15-40</b> mins	-	-	<b>10-36</b> mins	<b>18-120</b> mins
RECHARGE: <b>FAST</b> ( <b>Backpack</b> ) STANDARD/MULTI <b>Default</b>	20- <b>40</b> -50-60mins	<b>60</b> -150mins	<b>30-60-75</b> mins	<b>80-95</b> mins 95- <b>200</b> mins	<b>60</b> -120mins	<b>30-50-60</b> mins 60-100- <b>120</b> mins	<b>50-110-120</b> mins 90- <b>180</b> -220mins
CHARGERS: <b>FAST</b> , STD, <b>HiCap</b> , <b>12v</b> , Multi	  	 	 	 		 	  
CHARGE STATUS / <b>COLLAR-SCRAPER</b>	 						 
CRUISE CONTROL/SPEEDS/ <b>BOOST</b>	   	  	  	  	  	  	   
BRUSHLESS MOTOR <b>VACUUM</b> <b>STRAP</b>	 						 
SOUND PRESSURE: LpA/ <b>POWER</b> LwA	59dB	-	88	87.8/ <b>98</b>	-	90 / <b>101</b>	96/ <b>93.4</b>
WARRANTY (years) / <b>BATTERY</b>	<b>5</b> / <b>3</b>	<b>3</b>	<b>5</b> / <b>2</b>	-	<b>5</b> / <b>2</b>	<b>5</b> / <b>2</b>	2
NOTES	Ryobi Japan sold OPE to Techtronics (China). One of the quietest models. Also 7.5Ah. 4060/70/80 not in EU		Corded battery waist-belt available for this model. Basically Greenworks - Amzon quote a 750cfm version	New for 2021 - full details sketchy		Batteries have a USB port. Hanging tab on tool	*7.5Ah available via backpack. Aslo a 20v model SAB100AE. Stiga 80v SAB80AE= Discontinued
WEBSITE	ryobitools.com	snapper.com	snapper.com	sabo-online.com	skil.com	skil.com	stiga.com






































































NOTES: USES: COST is approx including VAT/local Tax. CHARGE STATUS =  = Status On Tool Body,  = Status on Battery. CHARGER TYPES:  = Standard/Trickle,  = Rapid Charger  = Hi-capacity  =12v/Vehicle STRAP: Included  Option 



IMAGES NOT TO SCALE							
MODEL /VARIANTS	SAB 700 AE	BGA 57	BGA 86	JB500	BVM190	IONBVXR	iON100V-550JB-CT
COMPANY	STIGA	STIHL	STIHL	SUN JOE	SUN JOE	SUN JOE	SUN JOE
ORIGIN							
MAX VOLTAGE	48v Li-ion (Experience)	36v Li-ion (AK-system)	36v Li-ion (AP-System)	48 (2x24)v Li-ion	48 (2x24)v Li-ion	40v Li-ion	100v Li-ion
MODELS-IN-RANGE/ <b>BACKPACK</b>	2/ <b>1</b>	1	1/ <b>2</b>	2	2	1	1
MAX AIR SPEED m/s <b>kmh/mph</b>	60 <b>216</b> kmh / 134mph	60 <b>198-216</b> kmh/123-134* <b>mph</b>	69 <b>248</b> kmh / 154mph	63 <b>225</b> kmh / 140mph	85 <b>306</b> kmh / 190mph	89 <b>322</b> kmh / 200mph	43 <b>153</b> kmh / 98mph
MAX AIR VOLUME cmm / <b>cfm</b>	11.6 / <b>410</b>	9.3-10.3 / <b>329-364*</b>	13 / <b>459</b>	15.9 / <b>560</b>	9.6 / <b>340</b>	8.5 / <b>300</b>	14.6 / <b>516</b>
MAX AIR FORCE Newtons	-	9	15	-	-	-	-
USE: <b>PRO</b> / SEMI-PRO/ <b>DOMESTIC</b>							
COST: BODY ONLY <b>COST: inc charger &amp; battery</b>	£200 / €250 <b>£431 / €450</b>	£120 / \$200 / €130 <b>£240 / \$360 / €330</b>	£260 / \$250 / €320 <b>£490 / \$480 / €660</b>	\$100 <b>\$200</b>	\$120 <b>\$260</b>	\$172 <b>\$200</b>	\$130 <b>\$428</b>
COST EACH: BATTERY <b>Default Battery</b>	£101- <b>151</b> -200 €109- <b>160</b> -220	£80- <b>109</b> -140 \$90- <b>120</b> -150 €100- <b>140</b> -180	£110-130- <b>190</b> -230 <b>648-1500</b> \$120-160- <b>190</b> -239 <b>720-1200</b> €150-220- <b>280</b> -330 <b>949-1650</b>	\$ <b>50</b> -60-80-100 (x2)	\$ <b>50</b> -60-80-100 (x2)	\$130-150- <b>160</b> -180	\$220- <b>300</b>
WEIGHT: EXC. BATTERY	2.7kg / 6lb	2.3kg / 5lb	2.8kg / 6.2lb	2.6kg / 5.7lb	2.6kg / 5.7lb	2.75kg / 6lb	2.8kg / 6.2lb
WEIGHT: INC. BATTERY & NOZZLE	3.3kg / 7.3lb	4.6kg / 10.1lb	4.6kg / 10.2lb	3.5kg / 7.7lb	3.5kg / 7.7lb	3.95kg / 8.7lb	4.6kg / 10.1lb
BATTERY Ah: <b>Default Battery</b>	2, 4, 5Ah*	2, 4, 5Ah	2, 4, <b>5</b> , 5+Ah	<b>2</b> , 2.5, 4, 5Ah	2, 2.5, <b>4</b> , 5Ah	2.5, 4, <b>5</b> , 6Ah	<b>2.5</b> , 5Ah
Min & Max WEIGHT of BATTERY inc <b>Default Battery</b>	0.88, <b>1.37</b> , 1.4kg 1.9, <b>2.6</b> , 3, 3.1lb	0.8, <b>1.2</b> , 1.3kg 1.8, <b>2.6</b> , 2.9lb	0.9, <b>1.8</b> , <b>5.5-9.5</b> kg 2, 4, <b>12</b> to <b>21</b> lb	<b>0.45</b> , 0.45, 0.8, 0.8kg <b>1</b> , 1, 1.8, 1.8lb	0.45, 0.45, <b>0.8</b> , 0.8kg 1, 1, <b>1.8</b> , 1.8lb	0.8, 1.2, <b>1.2</b> , 1.2kg 1.7, 2.6, <b>2.6</b> , 2.6lb	<b>1.8</b> -3.1kg <b>4</b> , 6.8lb
LENGTH body + Nozzle	1050mm / 41.3"	603mm / 24"	813mm / 32"	762mm / 30"	724mm / 28.5"	960mm / 37.8"	952mm / 37.5"
NOZZLE OPTIONS	Round, Flat	Adjustable, Tapered, Flat	Round, Adj, Tapered, Flat	Round, Concentrator	Round	Round, Concentrator	Round
DURATION: min - <b>default</b> - max	<b>18-120</b> mins	<b>6-15-39-48</b> mins	<b>6-15-39-48-89-245</b> mins	<b>18-50-125</b> mins	<b>18-36-50-125</b> mins	<b>19-56</b> mins	<100-< <b>200</b> mins
RECHARGE: <b>FAST (Backpack)</b> STANDARD/MULTI <b>Default</b>	<b>50-110-120</b> mins 90- <b>180-220</b> mins	<b>45-60</b> mins 150, 205mins	<b>45-45-35-45 (120-220)</b> mins 100-200- <b>250-300- (160-400)</b> mins	<b>55-70-110-140</b> mins	<b>55-70-110-140</b> mins	<b>180-120-300</b> mins 210- <b>240-330</b> mins	50- <b>100</b> mins
CHARGERS: <b>FAST</b> , STD, HiCap, <b>12v</b> , Multi							
CHARGE STATUS / <b>COLLAR-SCRAPER</b>							
CRUISE CONTROL/SPEEDS/ <b>BOOST</b>	 Variable+3	Variable	Variable	 variable 	 <b>6</b> 	 <b>6</b> 	 <b>5</b> 
BRUSHLESS MOTOR <b>VACUUM STRAP</b>			 option				
SOUND PRESSURE: LpA/ <b>POWER LwA</b>	95/ <b>92.7</b>	79/ <b>90</b>	79/ <b>90</b>	-	-	-	-
WARRANTY (years) / <b>BATTERY</b>	2	2	2, 1Pro	<b>2/90day</b>	<b>2/90day</b>	<b>2/90day</b>	<b>2/90day</b>
NOTES	* 7.5Ah battery can only be used via a Backpack which takes any 2 batteries to double duration	Replaced BGA56 *higher speed is with flat nozzle	Replaced the BGA85. Uses AP &/or 3xBackpack batteries. Basic, Quick & Hi-Speed chargers			Being replaced by more Vacuum oriented BVM143	100v batteries have USB ports for powering of smartphones etc.
WEBSITE	stiga.com	stihl.com	stihl.com	snowjoe.com	snowjoe.com	snowjoe.com	snowjoe.com

NOTES: USES: COST is approx including VAT/local Tax. CHARGE STATUS =  = Status On Tool Body,  = Status on Battery. CHARGER TYPES:  = Standard/Trickle,  = Rapid Charger  = Hi-capacity  =12v/Vehicle STRAP: Included  Option 



IMAGES NOT TO SCALE								
MODEL /VARIANTS	51820T/51825T	WEP8121LB	24B		LeafJet WG543E	Nitro LeafJet WG585	WG584E	WG583E
COMPANY	TORO	WARRIOR ECO	WOLF-GARTEN		WORX	WORX	WORX	WORX
ORIGIN								
MAX VOLTAGE	60v Li-ion FlexForce	60v Samsung Li-ion	72v Li-ion		20v Li-ion (Pro)	40v(2x20v) Li-ion (Pro)	40v(2x20v) Li-ion (Pro)	40v(2x20v) Li-ion (Pro)
MODELS-IN-RANGE/ <b>BACKPACK</b>	1	1	1		5	5	5	5
MAX AIR SPEED m/s <b>kmh/mph</b>	54 <b>193kmh /120mph</b>	54 <b>193kmh / 120mph</b>	67 <b>240kmh / 149mph</b>		58 <b>209kmh / 130mph</b>	82 <b>298kmh / 185mph</b>	38 <b>137kmh / 95mph</b>	82 <b>298kmh / 185mph</b>
MAX AIR VOLUME <b>cmm / cfm</b>	17 / <b>605</b>	15.6 / <b>550</b>	12.5 / <b>441</b>		11.6 / <b>410</b>	17.5 / <b>620</b>	12.2 / <b>430</b>	9.9 / <b>350</b>
MAX AIR FORCE Newtons	19	9.7	-		7.3	14	-	-
USE: <b>PRO</b> / SEMI-PRO/ <b>DOMESTIC</b>								
COST: BODY ONLY COST: inc charger & battery	£125 / \$140 / €129 \$199	£99 £209	£140 / €150 £290 / €300		£90 / \$100 / €100 £170 / \$150 / €196	\$199 \$220	£140 / \$140 / €160 £220 / \$215 / €281	£170 / \$150 / €140 £280 / \$270 / €250
COST EACH: BATTERY <b>Default Battery</b>	£110-210 \$120-150-207-260-360	£119	£180 €200		£35-40-60-70 \$70-80-100-130 €35-40-60-90	\$100-130	£35-40-60-70 \$70-80-100-130 €35-40-60-90	£35-40-60-70 \$70-80-100-130 €35-40-60-90
WEIGHT: EXC. BATTERY	2.8kg / 6.2lb	1.22kg / 2.7lb	3.5kg / 7.7lb		1.7kg / 2.3lb	1.7kg / 3.8lb	2.5kg / 5.5lb	2.5kg / 5.5lb
WEIGHT: INC. BATTERY & NOZZLE	4.2kg / 9.2lb	2.4kg / 5.2lb	4.5kg / 9.9lb		1.7kg / 3.8lb	3kg / 6.6lb	3.8kg / 8.4lb	3.8kg / 8.4lb
BATTERY Ah: <b>Default Battery</b>	2, <b>2.5</b> , 4, 6, 7.5Ah	<b>2.5Ah</b>	<b>2.5Ah</b>		2, 2.5, <b>4</b> , 5Ah*	2, 2.5, <b>4</b> , 5Ah*	2, 2.5, <b>4</b> , 5Ah*	2, 2.5, <b>4</b> , 5Ah*
Min & Max WEIGHT of BATTERY inc <b>Default Battery</b>	1, <b>1.4</b> , 1.9, 2.7, 2.9 kg 2.3, <b>3</b> , 4.2, 6, 6.4lb	<b>1.3kg</b> <b>2.9 lb</b>	<b>1.5kg</b> <b>3.3lb</b>		0.37, 0.37, <b>0.64</b> , 0.65kg 0.8, 0.8, <b>1.4</b> , 1.45lb	0.37, 0.37, <b>0.64</b> , 0.65kg 0.8, 0.8, <b>1.4</b> , 1.45lb	0.37, 0.37, <b>0.64</b> , 0.65kg 0.8, 0.8, <b>1.4</b> , 1.45lb	0.37, 0.37, <b>0.64</b> , 0.65kg 0.8, 0.8, <b>1.4</b> , 1.45lb
LENGTH body + Nozzle	940mm / 37"	910mm / 35.8"	990mm / 39"		876mm / 34.5"	980mm / 38.6"	962mm / 37.9"	1036mm / 40.8"
NOZZLE OPTIONS	Round, Flat, Concentrate	Round	Round, Flat / Scraper		Round, Gutter	Round, Gutter	Round, Gutter	Flat
DURATION: min - <b>default</b> - max	<b>7-90mins</b>	<b>15-60mins</b>	<b>30-60mins</b>		<b>10-20mins</b>	<b>10-35mins</b>	10-20-60-n/amins	<b>7-30mins</b>
RECHARGE: <b>FAST (Backpack)</b> STANDARD/MULTI <b>Default</b>	<b>60mins</b>	<b>40mins</b>	<b>60mins</b>		<b>25-30-45-60mins</b> 45-60- <b>120</b> -120mins	<b>25-30-45-60mins</b> 45-60- <b>120</b> -120mins	<b>25-30-45-60mins</b> 45-60- <b>120</b> -120mins	<b>25-30-45-60mins</b> 45-60- <b>120</b> -120mins
CHARGERS: <b>FAST</b> , STD, <b>HiCap</b> , <b>12v</b> , Multi					   	   	   	   
CHARGE STATUS / <b>COLLAR-SCRAPER</b>						 	 	 
CRUISE CONTROL/SPEEDS/ <b>BOOST</b>	 variable 	 variable 	variable 		 <b>2</b>	 <b>2</b>	 <b>4</b> 	 <b>2</b>
BRUSHLESS MOTOR <b>VACUUM STRAP</b>			 					 
SOUND PRESSURE: LpA/ <b>POWER LwA</b>	-	87/ <b>104</b>	85		-	-	62/ <b>95</b>	70
WARRANTY (years) / <b>BATTERY</b>	<b>3/3</b>	<b>3/3</b>	3		<b>5/3</b>	<b>5/3</b>	<b>3/3</b>	<b>5/3</b>
NOTES		Has a built-in LED light			Variable Tube opening for wide area or high-speed concentrated. *Also 6Ah available in some countries 0.7kg/£90/\$130	Variable Tube opening for wide area or high-speed concentrated. *Also 6Ah available in some countries 0.7kg/£90/\$130		*Also 6Ah available in some countries 0.7kg/£90/\$130
WEBSITE	toro.com	cordlessgardenequipment.co.uk	wolf-garten.com		worx.com	worx.com	worx.com	worx.com

NOTES: USES: COST is approx including VAT/local Tax. CHARGE STATUS =  = Status On Tool Body,  = Status on Battery. CHARGER TYPES:  = Standard/Trickle,  = Rapid Charger  = Hi-capacity  =12v/Vehicle STRAP: Included  Option 



**2020** might seem like a long time ago but at the time of writing it's only a few of months ago and besides, for much of the world, 2021 will end up being 2020 all over again! TREEAPALOOZA 2020 was held in Jeb's Wood Yard in Palatka Florida (about 50miles inland from St Augustine) between the 11th and 13th December. The key protagonists for this event were Chris Coates, James Andrew Bowles, Nick Markley, Jeb Teuton, Taylor Passetti, Phillip Kelley, and Reggie Copes with valuable assistance from 40 volunteers and dozens of sponsors.

TREEAPALOOZA is a hybrid training/fun/competition event that sparked the discussion of where treeclimbing competitions are headed. I was wondering about that independent terminology for a type of treeclimbing competition. Thanks for bringing it up!

'Sanctioned' may have been a good word about 5-10 years ago prior to the ISA's ITCC format for a climbing competition held in conjunction with a regional annual meeting of one of the 50 or so ISA chapters or associated organisations. Someday there will be a definitive treatise on the evolution of the tree climbing competition, in print, or preferably in a multimedia format with photos, videos and links. Lets just make a start now, ok?

# TREEAPALOOZA

A brief evolution of competition leading to TREEAPALOOZA

by **Michael (Ox) Oxman**

pic by Robert Oxman

Title Pic: AIRCRAFT RESCUE. A commuter aircraft has come down in a wooded area with the fuselage splitting in three on impact. Impossible to get fire dept aerial appliances to the scene so arborists in the locale are helping out. The three judges are: L-R: Phillip Kelley, Reggie Copes and 'Nice-Guy' Dave Stice.





The Aerial Rescue competition involved 5 teams of 6 climbers. There were a total of 5 dummies in 3 fuselage sections. The fuselage suspended in the tree was hoisted into place by human power, no power equipment. Just prior to the event, a crane was brought in to stabilize the plane as a safety precaution, to prevent the climbers and in-tree judges from causing excessive movement, and possibly shaking it loose during the competition. Safety requirements dictate that our would-be rescuer uses a Rocker-style fall arrester on a second rope. A shock absorber connects to the casualty's Petzl ASAP and all sharp edges are protected with Duck tape and plastic piping. Having installed a harness onto their casualty and ensured he cannot fall, our rescuers next move is to bring him out of the fuselage and either have a ground crew lower him to the ground guided by the rescuer or treat it as a 'pick-off', connect the casualty to the rescuer's harness and rappel him to the ground.

Of course competition may not be anything new, there were probably prehistoric challenges by younger climbers to the best local tree climber, to collect coconuts, dates, avocados or harvest other agricultural crops. I envision Spanish explorers Magellen, DeSoto or Balboa seeking the best candidate from their ship-board crew to go ashore from the royal sailing ships and climb the tallest tree to survey the farthest reaches of the New World forest and lay claim to the maximum amount of land to be controlled by their Queen.

One of the arborists on our crew was Dave Murdock the son of the winner of the very first tree climbing championship, which was called Jamboree. His dad, a Euc-Man named Gene Murdock was described in don Blair's book Arborist Equipment published by the ISA. When the Oak Man met the Euc Men by Donald F Blaire, Blairs Arborist Equipment (blairsae.com). Gene was a hard drinking bar brawling tree trimmer who was known for throwing the first punch when someone got in his face. Dave remembers when his dad was given an enhanced sentence for his conviction on assault charges when he threatened to punch out the judge in the courtroom. Gene was first Jamboree and received the perpetual trophy engraved with his name to be held until the following year when it would be presented to

the new champion. Well, Gene refused to relinquish his trophy much to the consternation of Richard Alvarez the organizer and founder of ITCC. I asked Dave to show me the trophy he had inherited from his dad which he said was in storage but I never did see it.

When I moved to Grants Pass, Oregon in 1985, I enrolled in the timber sports class at Rogue Community College taught by a former record holder in the Pole Climb event at Haywardm Wisconsin. Dennis Butler was a logger who had graduated from and then adopted the Forestry Club at Grants Pass High School and convinced the administration to allow him to teach a timber sports class for Physical Education credit. He then approached the Forestry Department administration at the neighbouring Rogue Community College to offer the same format education in their 2 year Associate Arts degree. The training I received there allowed me to win the spur climb event at a local PNW-ISA tree climbing contest.

While Dennis was reigning World Champion his time to climb a 100 pole, ring a bell at the top and return to the ground was just about 30 seconds flat. Then Guy German, a drywall contractor from Alaska knocked Dennis off his throne by



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Carson Bartlett-Smith of Florida was the only person in the 30-competitor roster to accomplish this task. The judges wanted an 'impossible' station, but he fooled them all! This event is typical of what the ISA would probably not sanction, due to possible injury. I guess there is a dichotomy amongst organizers that is risky/risk averse. ED: yep, this manoeuvre asks questions of both anchors and intermediate connections because they're both starting to load well beyond the climber's weight. Pic courtesy of Sean Lyn



redesigning climbing spurs to move the point forward to the ball of the foot. The new time to beat had dropped to 27 seconds. This was about the time when custom spurs had no upper pads, but were slid into the upper bracket of the gaff which was sewn into the calf part of the high top logger boots.

In the late 1980s a fatal accident at a tree climbing competition caused the ISA to suspend their contest due to the unavailability of liability insurance. Another arborist from Grants Pass, Jimmy Harris, won the ISAs championship in 1994. We hung out and collaborated on jobs together because living in a small town of 20,000 residents in rural Oregon required a pooling of resources.

Jimmy travelled frequently to comps in other ISA chapters rubbing elbows with the top climbers from all over the world. He was exposed to the newest gear and techniques and wrote an Arbor Age Magazine article with his photo of Blake's Hitch on the cover.

I had some crude desktop publishing software so we pasted up a fake magazine cover as a practical joke on Jason Blake we invented a publication called Pacific Tree Byline featuring Jimmy's photo about the Blake's Hitch.

Jason Blake had filmed an instructional video on how to tie the revolutionary rope climbing knot and took out a classified advertisement in Arbor Age to sell VHS video cassettes for 20 USD each. I had picked cones with Jason and his brothers and rubbed him about trying to capitalise on secrets the video supposedly revealed about friction reducing properties of smooth sliding knot. Jason steadfastly refused to barter my cones in exchange for a copy of the video which was the source of unending fun.

So Jimmy and I decided to prank him with the competing magazine articles, complete with a new name for the knot which was called the Oxman Hitch. There was even a coupon in the fictitious Pacific Tree Byline to cut out and send in with 20

USD to obtain a non existent video cassettes promising to train climbers in using the knot to improve heir efficiency.

We sent it to Jason and no-one else. Months later Jimmy and I went to see Jason in Ashland, Oregon when he was on a cooking tour while recuperating from breaking his leg in a walnut tree removal. Jason received our visit well and cooled

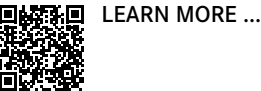
**COMPETITION in the 'REAL' WORLD**

*One time there was a scramble among parks aborists to get a zoo work order (which I snatched) calling for the climber to cut branches closest to the Lemur cage because the animals were attempting to wriggle through gaps in the roof. The arborist who scored this plum assignment was going to have to 'out-climb' the Lemurs - a seemingly impossible task.*

*On another occasion a tree service owned in Mt Shasta, California spread the word that a job at an exclusive private estate required several climbers to prune old growth Fir and Cedar trees at Wintun a 1907 stone castle n the McCloud River owned by the family of William Randolph Hearst. This lead to competition in the hiring of elite climbers keen to expand their resumē with such a high-profile job.*

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COMPETITIONS

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Main Pic: Arborist Kyle Jacobs shepherding a child on the recreational climb zipline. This pic was "liked" extensively in the Facebook group called TREEAPALOOZA. Many comments were generated, amounting to a mini-treatise on the legacy of ziplines installed at recreational tree climbing events as fundraisers conducted for the student arborist scholarship fund called the Tree Research Education Endowment Fund. [www.treefund.org](http://www.treefund.org). Pic opposite: Carrie Tauscher and Brad Booher assisting a budding arborist. pic by Robert Oxman

COMPETITIONS

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off after hearing that the fake article was only a spoof. In 1997 I went to Slat Lake city to see Jimmy Harris compete in ITCC and saw German climber Kay Busemann use the French Prusik to streak around the trees with far less impedance then the other climbers who were still using Blake's Hitch. Dan Kraus lived in Hawaii but entered and won the Rocky Mountain TCC in 1997. He was ruled ineligible to represent the home chapter since he did not live within the geographical area of the chapter. Dan was invited to perform the run-thru of the Work Climb and the Throwline in Salt Lake City. This was prior to Dan's decades long dynasty of wins in the Western Chapter ISA & PNW Chapter ISA and the winning of the 2005 world championship in Nashville which I attended. Funny how my video of Dan in 2005 are in mini DV video cassettes that have been in a drawer for 15 years.

Dan had climbed the 250 Sitka Spruce on the Bogachiel River and his dad Mike Kraus slept in it for 3 days in 2002. A scouting trip after the 2001 Milwaukee ISA ITCC is where Jelte Buddingh and I located it. Finding this very picturesque tree led to my donation of an auction item for old growth tree climbing services. Three former ITCC champions were required as climbing guides; Ken Palmer (who carried the insurance) Rip Tompkins and Christine Engle, the first womans ITCC champ. Other volunteer guides and financial sponsors contributed generously to this auction item donated in the 2001 *ISA Tree Fund Auction*.



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Jerry Beranek was asked to film a video of this Olympic Rainforest Tree Fun(D) Climb which he titled the Bogachiel Spruced and 500 DVD's were distributed by Bishops Arborist Supply. The Forest Service permit for the 2 day event with no more than 12 participants was applied for and held by the TREE fund.

The Moonlight Madness climb convened the following day in Bogachiel Spruce, hosted by Tom Dunlap and myself which constituted the first modern old growth treeclimbing commercial guide service. Another 12 climbers climbed the Bogachiel Spruce and eight of them spent the night in the hammocks, including Greg Bernstein a CBS cameraman. This made a total of 25 aborists who ascended the tree over 4 days leading up to the 2002 ISA ITCC in Seattle's Volunteer Park. Among the participants were a film crew from the Sunday Morning TV show. A 9 minute segment was broadcast on CBS.

Two significant events happened at the 2002 Seattle ITCC. The first was the new rule to secure the end of the lanyard instituted after a woman competitor was smacked in the head by the snap of the end of her flipline. The other major change in 2002 was the advent of the Teufelberger/New England Fly Rope, which was the first climbing line smaller than 1/2" be allowed, and was labelled expressly for use in trees by the manufacturer.

Many other group climbing events have happened in many areas, such as the volunteer arborist work parties. Examples are the pruning of the Marylands Wye Oak which fell over in 2002, **The Treehouse Project** to preserve an 18'/5.5m DBH hollow redwood tree in California, and **Saluting Branches**, the veterans cemetery annual work parties at more than 50 burial grounds.

Scott Baker was recognized for his exciting childrens' treeclimbing education program which we proposed to be offered to teach kids to climb in Seattle's King Country Parks. We jointly donated gift certificates to **the TREE Fund** for guided climbs that were auctioned off at the **PNW-ISA Annual Training Conference**, and held on the Forest Service land near *Out 'n'About* aTreehouse resort in Oregon.

Donation to the scholarship fund for college students enrolled in tree research projects was inspired by James Luce an arborist and mountaineer from Bellingham, Washington. He began the trend with donations to **the TREE Fund** for climbing guide services to ascend Mount Baker, an extinct volcano in the Cascade Mountain Range near the Canadian border. The past twenty years has seen greater collaboration between researchers, manufacturers and industry leaders resulting in new products more suited to evolving methods for operating safely in trees. As far back as 1983 Peter Jenkins had recognized this need and founded **Tree climbers International**, a school in Atlanta to make students safe and bridge the gap between rock climbing and tree climbing. **New Tribe** designed lightweight saddles built for comfort and aimed specifically at recreational climbers though these have inevitably evolved into professional arborist harnesses as well.



Above: Chris Coates MC'ing the night head-to-head ascent with Shawn Welch on deck.  
Below: Texas arborist Dustin Goodman ropes a log in the timed contest to see who can use the Good Rigging Control System (GRCS) hand winch to hoist a limb and redirect it to a smooth landing on the opposite side of the tree.



As commercial exhibitions and trade shows began to attract thousands of visitors, new opportunities to make climbing easier with new rope tools spawned many new tree climbing classes, competitions and recreational tree climbing safety events with ever more complex and adventurous scenarios. New certificates provide tree-climbers with credentials to verify their training and market services that stress adherence to safe climbing practises.

TREEAPALOOZA took things to the next level with its full aircrash scenario and some of the most imaginative and outlandish ropes courses and canopies for kids to climb.

The aircraft fuselage was kindly donated by Jeb Teuton, host and owner of Rooted Paintball Park. Sections were literally man-handled into position after protecting the bark of the host trees and protecting climbers from the sharp edges of a torn fuselage. This scenario crosses right into mainstream rescue but is nonetheless a wholly credible scenario for any aircrash into a wooded environment



I want to stress the often-overlooked titbit about ziplines that the 'reception committee' is just as important as the folks on the 'send-off' end. This zipline topic will be an article in my new regular column in ARBCLIMBER.

because that will always be difficult, if not impossible for ladder trucks and hydraulic lifts of the fire department to reach. Many of the evacuation and causality handling techniques will be similar to other rescues from trees but the aircraft element adds an extra degree of interest and problem solving.

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# Recreational tree climbing meets 'trespass'

by Charlotte Ina Sterland



& Ade Scott

we want to make sure we have a sturdy tree with large, easily accessed and easily assessed branches rather than a congested canopy that's difficult for non-arborists to assess safely or worse still, a pine or cypress with masses of deadwood. We might want a location which is easy to access and take a group to, or we might want to trek further, deep into a magical 'unexplored' rainforest for an impressive view. There are areas of stunning forest in most towns and cities around the world which are easy to access, just for the day, often by road or short walk.

## ADVENTUROUS NOT DAFT

The general rule in ALL climbing is 'don't go off into the middle of nowhere alone and or without telling someone specifically where you have gone – just ask Aron Ralston! It's worth emphasising to every wannabe adventurer that adventure needs to be within certain safety ideals, otherwise you are asking for trouble.

Where you climb will depend on a few things, like who you are going with, what gear you have, whether you are taking clients, friends, etc.... If you are climbing alone, or going with clients, you'd want to stick to somewhere fairly accessible, but if you are going with some friends on an adventure it might be preferable to find some places off the beaten track and

Climbing trees can really be done anywhere, but not always lawfully; there are a surprising number of laws and local by-laws regarding the particulars of climbing trees. On first climbing, most climbers will want to climb straight away on the best tree they can find, regardless of the rigging or bark type. Even without considering the law, it is worth thinking about a few guidelines and rules so that your climb doesn't upset anyone. Signs like the one above are easy to misread or even miss completely. It could be a carte blanche to climb any tree not in the park boundaries, for example. A rule might not mean much if no-one sticks to it but it might matter if you have to explain why you are up there to local police.

As with rock climbing, we can view tree climbing in its purest form as free climbing with no equipment beyond a pair of climbing shoes or boots, as in the picture opposite. Or it can be an equipment intensive epic for the tallest, most difficult to access trees. You might intend to spend a protracted amount of time in the tree – with overnight hammocks. Such trees call for ropes, harnesses, rigging, and maybe helmets and tree-protective measures. When we're looking to use rigging,

unlike rockclimbing or mountaineering there are millions of first ascents to be had in recreational tree climbing!

## TECHNIQUE

Climbing technique is worth working on, but you don't need to be out in a tree to gain the right strength. Climbing a rope up to a branch as quickly as possible is a key movement technique which can be practiced on a single rope in an training gym, to prepare you for the outside. Training on aerial ropes courses is another great way to build climbing strength. Prusiking too, as the fundamental rope climbing skill, can easily be practised by setting up two prusiks on any short length of rope. Strength, agility and rigging knowledge are key for climbing the largest and most difficult of trees unless you are a very accomplished 'free-climber' but even this 'extreme' skill will only take you so far on quite specific tree species with close branching. Good luck free climbing a giant Euc or Cedar of Lebanon. Even accomplished arborists might need to re-learn certain climbing techniques if taking up or introducing friends and family to recreational climbing – the full double ropes and hybrid systems you use for work are probably too complex for an afternoon's climbing with the kids. The K.I.S.S.\* principle is most likely the best mantra. Recreational climbing is definitely of two distinct types – freeclimbing of the tree itself – hand-over hand, branch over branch and rope access where you mostly ascend the rope to reach the canopy. In both cases a throwline may have been used to fix an access or belay rope and this is certainly something that arborists will excel at and impress the friends and family. No pressure. Other than having to prove your skills, the other elephant in the room is 'trespass' – are you actually allowed to climb your intended tree?

## PARKS AND FORESTS

Forest covers 31% of the global land area. From rainforest to pine forests and ancient oaks. There is much to explore around the world and many have unexpected histories that are well worth investigating. As an arb climber, you're most likely more interested in climbing trees than studying them; but you might be interested in trees which have spectacular views, or are not too difficult to access.

Some of the best trees might be in hiding in plain sight in locations which are surprisingly accessible for example the home counties of London, the ovals and bush around Sydney or Griffith Park in Los Angeles. Some might relish a trek into a national park while others might want the closest tree in the closest park. Whatever destination you choose you will inevitably have to work out whether you need permission.

It is highly unlikely that ANY national or regional park will allow climbing without first asking permission via the Parks or agency office. The enormous choice of trees OUTSIDE of national and regional parks is a different matter. It's not our place to encourage 'trespass' but it is often the case that it's better to ask for forgiveness than for permission. We have even set-up a tree climbing system in the park outside our house during lockdown, which might have needed permission but no one asked, since it was dusk at the time. We wanted to be somewhere with people around and it seemed like a good option to just go for it. You can get away with a lot more during a pandemic than you can in more normal times that's for sure but don't let the current skewed perspectives lull you into thinking that you can climb any tree, any time. Where you climb depends on a few things: if it is private land and you seek permission of the owners this can be simplest option..... until somebody whispers in their ear about liability- then they might change their tune and you'll need to head back to public parks and forests. If your in the local park or common land and you set up a picnic kind of area beneath your tree, a kind of 'base camp' it's a bit like staking a claim and it looks less threatening and suspicious to others who

might find it strange that grown adults are clambering around the local trees. Even better is to borrow somebody's kids and teach them how to climb, at least around the lower limbs which leaves you free to explore higher up using the kids as camouflage – nobody thinks it strange to see kids in trees.

## 'WHERE' ALSO MEANS 'WHAT TREE?'

Natural woodlands are the best for finding large oak and beech trees with really great branches. These kinds of trees are all over the UK, on public and private land. Planted forests of trees like Scots pines are often really beautiful, in a regular way, but have fewer great climbing branches than older, natural forest. At certain times in history, trees have been planted for their properties: Cedar trees were popular in stately home gardens and mansions from the 1740s onwards. Not only did they represent incorruptibility and eternal life in mythology, but they have insect repellent properties. A huge number of these large estates fell into disrepair around the turn of the 20th Century and when most able bodied estate workers went of to a series of wars the death knell was sounded. Now, Cedar trees that were once in private estates are now in the public domain and they are fantastic trees to climb with ropes (NOT free-climbing). The UK, Germany and eastern Europe are woodland nations with a huge variety of trees which are climbable: The large areas of parkland and accessible woodland provide many trees



# RECREATIONAL TREE CLIMBING

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of a good height to climb or rig and climb like this old cedar in a park in Lisbon, Portugal. However there is no mistaking the hint that climbers are not allowed on this one. Again, would this imply that any other trees in that park not fenced are fair game for climbers?

In the UK there is something of a culture of tree climbing in some places, not just as a leisure activity but for protecting nature and guarding our wildlife; the National Trust and tree climbing companies offer tree climbing to parks and properties across the UK, allowing the public to get into the treetops. Companies like Go Ape have taken the tree experience to new levels, with their tree-top adventures and The Big Tree Climbing Company is providing the rigged tree climbing experience. From climbing an apple or plum tree to retrieve fruit, to shaking the branches of a chestnut tree, there are reasons to climb trees just for fun and some fond moments consist of just this.

Here are some of my favourite trees to look out for in the UK: As a starting point, it's probably easiest to climb the tree in the park by your house, of course if you are looking to experience some really magical areas of forest, there are some very wonderful places with amazing trees.

Quercus Robur, the English oak is a crucial species for supporting nature in the UK. In it, birds nest, and fungi thrive. A 2017 survey revealed England has more ancient oak trees than the rest of Europe put together. According to the survey, at the



Royal Botanic Gardens in Kew, About 85 per cent of them are between 400 and 600 years old, while some 12 per cent date back 600 to 800 years, with 3.4 per cent (117 examples) dating back 800 to 1,000 years. This is due to the growth of parks for deer shooting, after the Norman conquest, as open woodland, with trees like oak was the most suitable. Birch trees are some of the most beautiful trees to be found native cross the UK. With low branches, they are easy to rig, for a small outing and the bark is soft to the feel. Near Selkirk in the Scottish borders, there is an area of woodland called Harestanes which has some really tall beech trees. Very ancient and beautiful; this place is easily accessible from the road or woodland paths with many birds and other animals to keep company.

Some of the oldest trees in the UK are yew trees. Up to about 4000 years old, some of these trees are protected but are interesting as they have foot-like holes and shapes in their structures but they can be quite dense with a lot of deadwood, much of it unforgiving in terms of sharp snags that can be tough enough to be impale hazards in a fall.

The New Forest in Hampshire in the south of the UK was only 'new' when first planted by William the Conqueror in the 11th century – by today's standards, it's a pretty old forest deserving of the more usual term 'ancient'. Because of its age it not only has a high proportion of modern managed conifers including sequoia and hemlock. It's an interesting place for scaling old oak trees. Many of the Royal Navy's most venerable ships – from the Mary Rose to HMS Victory were hewn from New Forest oak and it's not often appreciated that the huge curved timbers used to shape the keels weren't steamed and bent to shape they were actually carved from appropriately grown, pre-shaped branches – often branch unions. Forestry management in the UK, including the New Forest National Park, used to be under the umbrella of the 'Forestry Commission' in all four UK countries before devolution of parliaments led to Forestry Wales, Forestry Scotland and Forestry Northern Ireland. We asked Forestry England what their policy is on tree climbing and they were a little surprised that we would even ask – that's a pattern you might see repeated in all national bodies. Having

got to grips with what we were asking they said that 'apart from kids', (implying that kids didn't need permission) 'all others should seek permission of their local office'. They have no aversion to tree climbing but there could be wildlife or safety considerations that cause them to decline your request.

Elsewhere in the UK, chestnut, beech and oak trees are also common throughout the south east of England particularly, Kent, from Tonbridge to Dover but a huge number were destroyed in a 'hurricane' in 1987. In London, The Royal Parks Charity Ltd looks after eight large parks; where tree climbing is 'an offence' but permission can be sought from individual park offices to climb or run events.

Kyloe in the Woods, Northumberland is interesting although better for rock climbing, but worth mentioning. Trees often make the only anchors and could be climbable themselves: Some really ancient trees growing alongside rock faces, climbs which were only recently established as routes since the climbing world did not discover them hidden in the trees. The feeling is of being in an enchanted forest, with undisturbed magical moss in all directions. Kyloe is home to some of the toughest rock-climbing routes in the UK, the woods are covered in ancient moss, and were named, quite aptly, when discovered by climbers in the 1980s things like 'The Elf' and 'The Hobbit,' since the woods have a magical feel. Planted from collected species in the 1860's, the wood has over 123 species of trees. Sea Captain, Leylandii, brought tree species he found all over the world to be planted at Kyloe. There are stunning examples of Wellingtonia, Lodgepole Pine, Chilean Pine and, the Noble Fir.

## The USA and Canada

Oak trees are native to the northern hemisphere. They may be common in the UK but the US and Canada boast about 90 species of oak. American beech trees are normally a good size to climb: Native to North America, found right across the US and Canada, from Nova Scotia to southern Ontario and Wisconsin, Texas, and Northern Florida. Trees in the southern half of the range are sometimes distinguished as 'F' variety. Beech trees can develop into giants which tower over all other woodland trees and live up to 300 years, but when coppiced can live for more than 1000 years.

Redwood trees grow naturally in the US on the slopes of the Sierra Nevada mountains. The oldest known giant Sequoia is 3200-3266 years old. These trees are among the oldest living organisms on earth and are a better climbing prospect than the oldest trees (if you don't include clonal colonies) the Bristlecone ones that are several thousand years old but only 6 to 10 feet high. Not many people have climbed a redwood tree; the first branches are high off the ground and mostly, they are protected; so climbing is only allowed in places like the Santa Cruz Mountains in Northern California. The challenges to rigging and ascending are often worth the view on reaching the crown of a tree like this as long as you chose one on the outside of a stand otherwise you're only view might be the adjacent redwood.

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We're gonna need a bigger ladder – Sequoia National Park in California – don't climb these without permission!

The north eastern edge of the USA has many aspen, birch and spruce trees, for example: The north west corner has Douglas firs, hemlock-sitka spruces and larch. South-eastern areas are populated by loblolly short-leaves, longleaf slash-pines, and oak hybrid species such as oak-pine and oak-gum-cypress trees with some tropical hardwood areas. The extreme south west has Joshua trees and giant Seguro for the masochists among you while closer to the west coast are renown giant sequoia in places like Kings Canyon National Park, Sequoia National Park (pic above) and at intervals all along Pacific Coast Highway 1. The climate variations across the USA have lead to this rich diversity of trees throughout the continent. While there are many trees available in stunning locations in the USA, they are protected by each state and often require permission to climb.

Tree Climbers International (TCI) is one of the organisations which set up some of the standard practices used in recreational tree climbing today. It aimed to promote tree climbing in

Gainesville, Florida. Through setting up contracts with the city, Tim Kovar's company established that they could take paying clients climbing, as long as they put 10% of his income towards maintaining the parks they climbed in. Other climbers have followed suit follow suit in setting up arrangements like this. As with rock climbing, there is a standard etiquette to protect the tree branches themselves from rope rub. Now operating with Tree Climbing Planet (TCP), in Portland and Nashville, Kovar has expanded operations across different states.

The US Department of Agriculture does not have a specific policy on personal tree climbing on National Forest land, but do say that safety is their foremost concern and they would want visitors to reach out to their local forest or grassland offices for information on restrictions or required permits.

Rules for parks vary. Parks which do not allow spontaneous tree climbing include Portland, Oregon (Portland Parks and Recreation, 2009); Elkhart County Parks, Indiana (Miscellaneous



Much more accessible (for kids at least) are these Cypress in Guadalupe State Park, Texas. Gnarly roots turn into an easily climbed buttress

Prohibitions, 2012); San Francisco, California (San Francisco Park Code, 2014); New York City Parks (NYC Parks, n.d.), where un-roped tree climbers are fined around \$50. For state specific regulations, it's best to contact the relevant park office. All this said, where climbing is done with ropes, by trained climbers or instructors who are following the Tree Climbers International Protocol, and are unlikely to have any problems, the parks may well give permission, so it's a good idea to ask. There is also much more policy developing for tree climbing practice, and as recreational tree climbing becomes more understood (as more people do it), it may be that rules are relaxed in parks, with the understanding that recreational tree climbing rarely harms trees; similarly to rock climbing regulations, which have been much more comprehensively set out since the sport has become more and more popular. Since climbing trees is more often about maintaining than harming them, the recreational tree climbing world may become more closely linked to arborist work. For example, the National Tree Climbing Programme, which exists to set out policy and

industry standards for tree climbing in the US largely exists to train climbers safely. Much training is done in conifer trees, since most tree work has been in these. While much tree climbing is allowed on work grounds, this means most of the methods are suited to conifers rather than hardwoods. Recently though, to tackle exotic pests which attack hardwoods, methods for accessing hardwoods have been developed. This programme could be linked to training recreational tree climbers, as well as those doing so strictly for tree maintenance purposes.

Much regulation for climbing trees for fun exists and it's banned in national parks and many urban parks (like Central Park in NYC). This said, there is much more policy developing for tree climbing practice, and as recreational tree climbing becomes more accepted, it may be that rules are relaxed in parks, with the understanding that recreational tree climbing rarely harms trees; similarly to rock climbing regulations, which have been much more comprehensively set out since the sport has become more and more popular.



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# CLIMBING ROPE

## 11.5 TO 11.8mm (0.45")

### Ropes for Hardware/Hybrids

Give or take a mm or two. In old money this equates to something like 375/480ths so it doesn't really roll off the tongue. Suffice to say – the range of this GUIDE covers from 11.5mm or 9/20" to 11.8mm or 15/32" – let's just call it 0.46" and get you to refer to the metric diameter! You might have noticed that virtually all of the new climbing ropes in the past couple of years have been within this magic diameter band. We had the Cousin Trestec 11.6mm Atrax on the cover of issue 10 in 2016 and our last three reviews have been the 11.7 & 11.8mm Teufelberger DrenaLINE & Xstatic, FTC's 11.7mm Argiope and Edelrid's 11.7 Woodpecker (next issue). This sounds European driven but the writing was on the wall several years back when Sterling, Bluewater and New England Ropes/ Teufelberger started to produce 11.5mm ropes for the access and rescue markets to bridge the gap between the standard 11mm and the US Fire service requirement for heavier duty 13mm ropes. You'd think that might be 12mm since it's smack in the middle but it still needed to be accessible to the plethora of technical hardware without stepping up to completely different models necessary for the 13mm ropes. Ditto arborists who, in the past decade, have seen a steady shift from prussic systems to hardware-based systems. After a generation of using 12mm 1/2" ropes, the switch to SRT/SRS\*, which most suited 11mm ropes led to a similar realisation that the crossover hardware from rescue and access didn't really like the much fatter and softer traditional arb ropes but equally most arborists don't really want 11mm 'string'. What they really wanted was something that would work for BOTH and the 11.7/11.8mm diameters fit that bill. Yale immediately stepped up with their 11.7mm XTC24 ropes and simultaneously kicked off (or joined) an odd trend among US arb rope manufacturers to produce

the same rope as if each colour is a different model. Not sure if that's genius or annoying. Teufelberger has just the one Tachyon in 5 different colourways while Yale, Samson, and All Gear have what looks like several options for an 11.7mm rope but it's the one model in different colours. These ropes all have the advantage of being the diameter that most future hardware will be designed for (give or take a few mm).

#### HARDWARE/HYBRID COMPATIBLE

Most of the ropes in this GUIDE are intended specifically to be used with hardware – that means some form of constant camming or compressing of the rope which can cause ropes with a looser or coarser braid (sheath) to milk so that you can end up with a whole load of sheath hanging off the end of your rope or a concertina effect as the extra sheath runs up against an end termination. Tighter braids will grip the core more firmly and be less inclined to milk but this is virtually always at the expense of handling and knotability – they're simply stiffer. It's worth noting that the use of sewn terminations is for anchoring only, they're not designed to be used as an end-stop termination to stop you abseiling off the end. Most will be fine but you'll notice that the softer, smaller eyes like Petzl FLOW and Teufelberger's sPLIFE FTC's Slimtech and Edelrid's Woodpecker are actively designed to go through devices so they're no use as an end-stop! This ability to feed a spliced end through a device like the Petzl ZigZag is shown in the column headed- **SPLICE THRU ZIGZAG** and may just influence the design of future devices which might otherwise have avoided the threading option in favour of more

\*The tree industry has tried to implement a more technically accurate acronym for SRT & DRT or Single/ Double Rope Technique. The terms SRS Stationary Rope System and then SRWP Stationary Rope Work Positioning have been introduced and gallantly lauded by industry hierarchy and training establishments but once you start fiddling with replacement acronyms you know you're on the slippery road back to calling it SRT! MRS is Moving Rope System, used to be DdRT or Doubled Ropes.

complicated opening systems. The ZigZag probably has the smallest rope-path so if your rope can get through this it might be quicker to thread mid-line attachable devices like Akimbo, Unicender and RopeRunner than fiddling about opening them. In the rope images on these intro pages you can see the differences in bulk between the high-strength sewn eyes like the Sterling Scion (pic-centre) and the Teufelberger drenaLINE shown threaded through a Petzl ZgZag. Courant's Japora on the left and Cousin's Atrax overleaf are also low-bulk splices. FTC's second splice on Argiope (far right) is sealed beneath a protective plastic cover which protects the rope marking and helps differentiate the two ends of a double spliced rope. Perhaps the most unusual termination is on Edelrid's Woodpecker (below right) which is basically a length of webbing sewn onto the rope with a gap at the top for an eye. This has a quoted minimum breaking load of 15kN and is said, by Edelrid, to be the lowest bulk yet available. Genius.

#### ELONGATION/STRETCH

We often see (and use) the terms 'Low-stretch' and 'static' ropes but there is technically a difference between 'Static' which the US Cordage Institute describes as having 6% elongation at 10% MBS and 'Semi-static' which has between 6 and 10% stretch at 10% MBS. Arborists didn't take much notice of such terminology until there started to be more crossover with kernmantle access and rescue ropes but it's still not a defining term even though elongation percentages should be. We're showing up to four figures (when given) for elongation or stretch. The first is the industry standard degree of stretch at 10% of the minimum breaking load. This is some harsh treatment and would rarely concern a climbing rope unless you're huge, it's more for rigging ropes being subjected to high loads and, even worse, dynamic loads. The second figure in blue used mostly in Europe is for Static Elongation at 50 to 150kg loading over a set time period. The third figure in burnt orange is the US norm for stretch at 136kg/300lbs and this is much more indicative of a climber's body mass. Finally we've included the US ANSI Z133 driven figure of 540lb in green, not because we necessarily agree that arborists have put on a lot of weight over Christmas but because the operating weight of a climber has generally increased substantially in recent years with all the hardware, full body harnesses, chainsaw protective clothing and even helmets – a Protos with accessories is a helluva lot heavier than a 1970's builder's helmet. In rescue, we've increased our figure for a rescue load twice in the last 30 years as average bodyweights and kit increased so 245kg/540lbf could well be the kind of weight that a working arborist might attain when wet and fully kitted but a competition or recreational climber very rarely would! In Europe, the use of a sub-13mm 1/2" rope is nothing new, in fact 1/2" and above was unusual with 12mm being closer to an Arborist norm but in the US this has become such a measure of the minimum that the US standard ANSI specifically states that any arb rope UNDER 1/2" requires specialist training before use! That means ALL of the ropes in this GUIDE. We think this is

a case of standards not keeping up with developments. Equally the NFPA standard lists rope to within 0.5mm which is why you see such a discrepancy in the definition of a 7/16" rope – some 11mm can be listed as anything from 10.8 to 11.6. BWII is sold by stockists as anything between 11mm and 11.6mm. It's certified at 11.4mm but we're assured by BW that it's actually 11.5mm. A whole can o'worms we don't want to open right now!

#### UNIFIED & BONDED SHEATH/CORE ROPES

One other thing that warrants special mention but has not

seen much traction in the arb market beyond the Teufelberger's Platinum Arbor Access is the genre of unified sheath-core ropes. Normally, the sheath is separate from the core and free to 'ride' over it such that when squeezed between the surfaces of a bar or bobbin, it can 'slide' along the core. This results in the milking we mentioned earlier. Some ropes have the sheath bonded or glued to the core or, in the case of Arbor-Access, the sheath strands are partially woven into the fibres of the core so that it can no longer move differentially when subjected to high loads using compressing cam hardware. Ropes like *Meetic* from Courant, *Link-Tec* from Edelrid, *Platinum* from Teufelberger/ New England and *Unicore* from Beal are examples. Cost is higher but if you've had problems with sheath slippage this could be the answer but remember that, while this construction can limit milking

and may improve durability, there will be some downsides otherwise ALL ropes would be made this way - some ropes may exhibit 'dimpling' under excessive load or the bonding agent may eventually flake off but they are worth a look.

#### IN THE FOLLOWING TABLES.....

The data in these tables is always ridiculously difficult to compile because there is so much conflicting information even within the same company with catalogues or websites saying one thing and the stockists saying another. In the end we've had the various companies sign off their own listings but even so there's a lot of data not given for some of our entries, the best we can do is tell you the ropes exist! Some of the data we always list in our rescue titles is not listed here and not even tested by everyone – the US tends not to quote the NUMBER OF FALLS or a KNOTTED BREAKING STRENGTH. The latter because of the arb preference for sewn or spliced terminations. Surprisingly these are often weaker than the knotted figure. Teufelberger's sPLIFE is now stronger than the Slaice it replaced last year which, for instance, came in at 16.5kN on the 35kN drenAline but 18kN in a knot.



## MARKET GUIDE

www.rescuemagazines.com

The advantage of any splice is obviously much lower bulk than a knot and many can be fed through hardware but there can still be a significant strength loss.

The number of Factor 1 falls is rarely quoted in arb so we've omitted it but it can be a telling figure. A large number of falls may mean the rope is more elastic which is obviously safer in a fall but increases 'bounce' during ascending and is generally less abrasion resistant.

**COST** – Some manufacturers stoically ignore our question about a retail price, so we've circumvented that by listing an approximate retail price from key distributors. Not all are sold by the metre/foot so we've used a ratio of the shortest length sold and rounded up by 10%. This is the most expensive way to price rope so these may not be exact but they give you a rough idea. Prices are per metre (3.28 feet) in US \$Dollars, UK £ Sterling and/or € Euro and **EXCLUDE Splices/Sewn eyes**. We usually round the prices up but if it seems a little precise it will be a manufacturers stated retail cost.

**LENGTHS** – Many are sold as set lengths as well as being sold by the metre/foot from a reel. 'Set lengths' because they are supplied with a spliced/sewn eye. Some offer extra metric lengths for instance 200m as well as 183m/600ft

**WT** – This is the WEIGHT or MASS per metre and per 100feet. We have made conversions based on a linear mass density conversion rounded to one decimal place (we occasionally sneak in two if it's .25 for a quarter) so if there are a few discrepancies it is because the manufacturer has used their own conversion.

**MATERIALS** – Arborist ropes tend to be primarily Polyester sheath with a polyester or nylon core. Nylon is referred to in Europe as *polyamide* because Nylon is Dupont's trade name and differentiated by some as such or as Nylon 66 or Perlon. Polyester reduces stretch in the sheath and increases durability to some extent. Nylon absorbs more water than Polyester but is stronger when wet and provides more elasticity so it's often used for the core material.

**EASE of TYING** – is really '**FLEXIBILITY**' and should more correctly be defined as the '*coefficient of knotability as a ratio of 1.1 times the rope diameter*' but we couldn't fit that in the header. It refers to deformation of a rope in an overhand knot subjected to a 10kg load but is basically how easy it is to tie a knot. This is again not quoted by everyone but ranges from 0.6 for the easiest to tie to 1.1 for the hardest. Ropes closer to 1 hold their shape well, work well in mechanical devices and are easier to untie. However, we're not sure how much notice to take since the Argiope at 1. is far easier to tie than DrenaLINE at 0.6? SherillTree offer a different guide to several ropes with a 1 to 10 where 10 is excellent knotability – this is shown in **burnt orange**.

**SHEATH CONSTRUCTION** – This is expressed as the number of carriers/threads used to construct the outer 'jacket' or braid. The lower the number, the more flexible the rope will be. Most of the ropes in this category are 24-braid and are **DB** or double braids meaning the core package (comprised of multiple bundles of fibres) has its own woven sheath. The core bundles can be separate from each and parallel or twisted together in a plait or braid. Static Kernmantle (**KM**) usually has a 32 or 48 carrier and parallel core fibres thus less rope in any given linear inch than a double braid or a dynamic rope with a twisted core construction. Less rope, less stretch.

There are two columns indicating general areas of suitability. **OPTIMIZED FOR ASCENT DESCENT** indicates a *particular* suitability for use with ascenders and descenders beyond the norm for all these ropes. This means 1) that it will fit key devices 2) that the sheath won't milk or bunch under compression 3) that the rope stays quite round and doesn't 'squash' and 4) it maintains these attributes through its life. To be fair, *ALL* of the ropes in this GUIDE can be used for abseiling, ascending, hauling and even ziplines but some do it better than others and with greater safety margins. The second column is for SRT/SRS and/or DdRT/MRS. Again, all of these ropes will do both but some are better at one or other, maybe due to being quite stiff or too soft and puffy.

**SHRINKAGE** – in water. Some ropes are pre-shrunk or use fibres that won't shrink which is not necessarily the same as thermo-stabilised or 'heat-set' rope although that process will help reduce overall shrinkage. **These processes use heat, usually steam**, to thermally alter the rope fibres to improve performance consistency, reduce shrinkage and several other mystical advantages that vary from manufacturer to manufacturer. We can say that they've gone the extra mile to provide you with a decent rope so the least you can do is (probably) pay a little extra. Untreated Nylon does 'retract' a little unless factory pre-shrunk. This harks back to the days when the first thing you did with a new rope was chuck it in the bath overnight. This figure is not the same as Sheath Slippage which is where the sheath 'milks' some extra length in relation to the core and ends up with a dubious looking end. The ropes listed in the '**Optimized for ASCENT DESCENT**' column will specifically NOT do this.

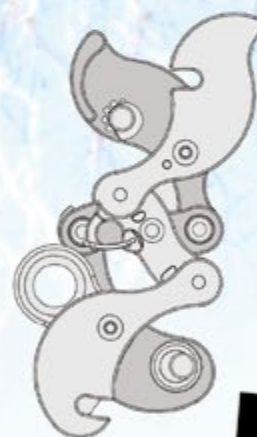
**BREAK LOADS** – We've listed Average break loads where given but it still goes against the grain not to quote *ONLY* the minimum Break load as is the case in access & rescue! We always used to assume that a knotted rope reduced strength by 50% and worked to that limit to be on the safe side but you'll notice that the majority of figures are around a third less than the minimum breaking load. In industry you generally get a WLL or WORKING LOAD LIMIT quoted at between 7:1 and 10:1 of the **MBL**. Some companies deal in **AVERAGE** breaking strength rather than MINIMUM. We never quote this in life-critical rope-work because it does not take account of the lowest possible failure load but some will only deal in an Average so these are shown in 'burnt-orange' in kg and lbs. Hopefully you'll never reach anywhere close to this average figure.

**SHEATH %** – This is the opposite to CORE percentage so we haven't bothered listing both – do the math(s). The higher the sheath percentage the stiffer the rope. It will therefore usually have a much higher initial resistance to abrasion over an edge or sheath creep under high loads from a camming device. On the down side, it won't handle so well or tie knots as nicely as a 'thin'-sheathed rope. Most arb ropes used a much coarser braid, in fact a braid covering a braided core hence Double Braid and this was/is anything from 12 and 16 to 24. More recently, as SRT/SRS took hold, the Kernmantle norms for 32 carrier sheaths has come in providing greater abrasion resistance and inhibiting ingress of dirt and debris with its tighter weave. But the traditional arb constructions provide a much softer feel and easy knot tying and though less abrasion resistant, trees are far more forgiving than rock, metal and concrete.



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---

MBS increased by 25%, to 6,744 lb/30kN

No milking of sheath

Sheath slippage reduced by 40% to 0.3%

Meets ANSI Z133 and EN 1891 Type A

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**NEW! Low-profile  
SlimStitch eye**



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


































IMAGES NOT TO SCALE	MODEL	COMPANY	ORIGIN	COST per Metre/3.28ft	LENGTHS M Ft		Ø mm (0.46")	WT g/m lb/100'	MATERIALS: SHEATH CORE	EASE of TYING	SHEATH BRAID /PLAIT	SPLICEABLE SPLICED/SEWN	OPTIMIZED for ASCENT DESCENT	SRT/SRS MRS/DoRT	CE /NFPA ANSI	MBL Minimum Average Break Load	Knotted Spliced Sewn Break Load	SPLICE THRU ZIGZAG	% SHRINKAGE	ELONGATION @10% MBS @50-150 kg @300LB/136K @540 lb/245kg	SHEATH %	OTHER COLOURS	NOTES	WWW.
	Arborist 24str* Atlas, MardiGras2, BlueCraze2, Inferno CherryBomb2	ALLGEAR		\$3.40*	37 46 61 183	120 150 200 600	11.8	89g 6.1 lb	Polyester Polyester	-	24 DB	■		■ ■ ■	■	29.8kg 6700 lb	-	-	-	4.9	-		*Model names equate to colour options	allgearinc.com
	GripFlex-24	ATLANTIC BRAIDS		£2.25* \$3.14* €2.61*	37 46 61 183	120 150 200 600	11.7	98g 6.6 lb	Polyester Polyester	-	24 DB	■		■ ■ ■	-	27.5 kN 6173 lb	-	-	-	-	-			atlanticbraids.com
	Biloba	BEAL		€3.25	20 to 60 200	66 to 197 655	11.7	89g 6 lb	Polyester Nylon	-	DB	■		■ ■ ■	■ ■ ■	30 kN 6744 lbf	18 kN 4047 lbf 18 kN 4047 lbf	-	-	3.8	44			bealplanet.com
	Antipodes	BEAL		€2.40	100 200	328 655	11.5	78g 5.2 lb	Nylon Nylon	-	32 KM	■		■ ■ ■	■ ■ ■	35 kN 7868 lbf	22 kN 4946 lbf 26 kN 5845 lbf	-	-	2.6	38			bealplanet.com
	Armortech	BLUEWATER		\$6.30	100 200	328 655	11.5	98g 6.55 lb	Technora/ Polyester Nylon	-	32 KM	■		■ ■ ■	■ ■ ■	32.1 kN 7216 lbf	-	-	0	1.9	39.4		Double sheath. Technora sheath over polyester sheathed kernmantle Up to 934 deg F	bluewaterropes.com
	Technora Assaultline	BLUEWATER		\$3.35	46 61 984 200	150 200 300 600	11.5	92g 6.2 lb	Technora Polyester	-	32 KM	■		■ ■ ■	■ ■ ■	40 kN 8993 lbf	-	-	-	2.8	53		highly abrasion- resistant	bluewaterropes.com
	Assaultline/ BWII+	BLUEWATER		\$3.75	46 61 984 200	150 200 300 600	11.5*	90g 6.1 lb	Polyester Nylon	-	32 KM	■		■ ■ ■	■ ■ ■	37.8 kN 8497 lbf	-	-	1.9	1.8	53		*CE diameter is reported at 11.4mm	bluewaterropes.com
	SpecStatic	BLUEWATER		\$3.35	46 61 984 183	150 200 300 600	11.5	100g 6.7 lb	Polyester Polyester	-	32 KM	■		■ ■ ■	■ ■ ■	34.5 kN 7745 lbf	-	-	-	1.2	41			bluewaterropes.com
	Komora	COURANT		£3.25 €3.70	20 to 45 60	66 to 148 197	11.7	94g 6.3 lb	Polyester Nylon	0.8	16 KM	■		■ ■ ■	■ ■ ■	30 kN 6744 lbf	19 kN 4271 lbf	■	2.7	2.5	68		Replaced the Kanopa Pro.	cordescourant.com
	Japora	COURANT		£3.00 €3.20	20 to 45 60	66 to 148 197	11.5	93g 6.2 lb	Polyester Nylon	0.58	24 DB	■ ■		■ ■ ■	■ ■ ■	23.8 kN 5350 lbf	20 kN 4496 lbf	■	1	3.5	59		Captive rope marker within splice	cordescourant.com
	Squir v2	COURANT		£1.12 €2.15	40 60 200 900	131 197 655 2952	11.5	91g 6.1 lb	Polyester Nylon	0.74	32 KM	■		■ ■ ■	■ ■ ■	30 kN 6744 lbf	21kN 4721 lbf	-	2.7	2	43		Pink Dragon version is a limited edition for breats Cancer Awareness	cordescourant.com
	Atrax	COUSIN- TRESTEC		£3.20 €3.70	5to 60 200	16to 197 655	11.6	102g 6.9 lb	Polyester Polyester	1.03	24 DB	■ ■		■ ■ ■	■ ■ ■	30.7 kN 6902 lbf	15 kN 3372 lbf	■	0.5	2.8	55			cousin-trestec.com
	Cougar	DONAGHYS		£3.40	100	328	11.7	93g 6.25 lb	Polyester Polyester	-	32 KM	■ ■		■ ■ ■	■ ■ ■	34.75 kN 7812 lbf	-	-	1.5	<3.0	-			donaghys.com
	Bucco	EDELRID		£3.20 \$4.25 €3.40	35 45 60	115 148 197	11.8	96g 6.4 lb	Polyester Nylon	-	32 KM	■		■ ■ ■	■ ■ ■	40 kN 8992 lbf	22 kN 4946 lbf	-	0.8	1.9	47		ECO-Made from recy- cled yarn	edelrid.de
	Woodpecker	EDELRID		£3.30 \$4.50 €3.50	35 45 60	115 148 197	11.7	95g 6.3 lb	Polyester Nylon	1.0	24 KM	■		■ ■ ■	■ ■ ■	25 kN 5620 lbf	16 kN 3597 lbf	■	0	2.1	55		Web-eye termination is virtually the same diameter as rope.	edelrid.de
	Silva-Tex 24	ENGLISH BRAIDS		£3.15 \$3.75 €3.50	25 35 45 60 200	82 115 148 197 655	11.5	93g 6.2 lb	Polyester Nylon	0.9	24 DB	■ ■		■ ■ ■	■ ■ ■	31.6 kN 7104 lbf	25.6 kN 5755 lbf	■	2.5	2.8	49		Model sometimes listed as 11.7	englishbraids.com
	Argiope	FTC		£2.95 \$4.00 €3.00	20 30 40 50 60	66 98 131 164 197	11.7	95g 6.3 lb	Polyester Nylon	-	16	■ ■		■ ■ ■	■ ■ ■	30 kN lbf	22 kN lbf	■	-	2.5	68			ftc-tree.com

NOTES: ORIGIN: Company selling the product, not necessarily the country of manufacture. COST: INCLUDES local taxes/VAT, \*Not sold by m/ft, price shown is a proportion of shortest length rounded up by 10%. DIAMETER: 15/32 or 0.46" =11.7/8mm  
SHEATH: DB=Double Braid, KM=KernMantle. STANDARDS: CE EN1891 Type A or Type B. NFPA = type T (Technical) with MBS over 20kN or type G MBS over 40kN. ANSI= American National Standards Institute. CAN= Canadian Standard, ASNZ= Australian and/or New Zealand



IMAGES NOT TO SCALE	MODEL	COMPANY	ORIGIN	COST per Metre/3.28ft	LENGTHS M Ft		Ø mm (approx 15/32")	WT g/m lb/100'	MATERIALS: SHEATH CORE	EASE OF TYING	SHEATH BRAID /PLAIT	SPLICEABLE SPLICED/SEWN		OPTIMIZED for ASCENT DESCENT	SRT/SRS MRS/DdRT	CE / NFPA ANSI	MBL Minimum Average Break Load	Knotted Spliced Sewn Break Load/ *Average	SPLICE THRU ZIGZAG	% SHRINKAGE	ELONGATION @10% MBS @50-150 kg @300LB/136K @540 lb/245kg			SHEATH %	OTHER COLOURS				NOTES	WWW.
	Safe Nordic	LIROS		£2.40 \$3.50 €2.75	200	656	11.5	80g 5.4 lb	Nylon Nylon	1	32 DB					A	34 kN 7643 lbf	22 kN 4946 lbf	-	-	3.8	46							liros.com	
	Safe Vision (Reef)	LIROS		£2.51 €3.05	200	656	11.8	82g 5.5 lb	Polyester Nylon	0.7	24 DB	 			 	A	28.5 kN 6407 lbf	23 kN 5171 lbf	-	-	2.5	54					Branded as 'Reef' by Honey Brothers UK	liros.com		
	Venom	MARLOW ROPES		£3.51 \$4.90 €4.10	25 35 45 200	82 115 148 656	11.8	89.7g 6 lb	Nylon Nylon	0.9	24 DB	  			 	A	36.8 kN 7283 lbf 26.72 kN 5890 lbf	17.7 kN* 26.2 kN* 28.3 kN*		4.5	3.7	-					3979 lbf* 5890 lbf* 6362 lbf*	marlowropes.com		
	Vega	MARLOW ROPES		£3.06 \$4.10 €3.60	25 35 45 200	82 115 148 656	11.7	101g 6.8 lb	Polyester Polyester	0.6 10	24 DB	 		 		B	43.1 kN 9666 lbf	18.9 kN* 25.6 kN* 27.8 kN*	-	0	1.2	-					4249 lbf* 6755 lbf* 6250 lbf*	marlowropes.com		
	Banshee	NOTCH		\$3.60*	37 46 61 183	120 150 200 600	11.7	110g 7.4 lb	Polyester Nylon	10	24 DB	 				-	37.1 kN 8353 lbf 28 kN 6300 lbf	-	-	-	3.8	-				Gold fleck thread	notchequipment.com			
	Response	NOVABRAID		n/a			11.7	107g 7.2 lb	Nylon Nylon	-	48 KM			 		 		23.86 kN 5260 lb 43.6 kN 9612 lbf	-	-	-	2.8	-					novabraid.com		
	Tree Viper	PELICAN ROPE		\$3.45	37 46 61	120 150 200	11.8	84.8g 5.7 lb	Polyester Nylon	-	24 DB			 	 	 		31.3 kN 7033 lb	-	-	-	-	-					pelicanrope.com		
NOTES: <b>ORIGIN:</b> Company selling the product, not necessarily the country of manufacture <b>COST:</b> INCLUDES local taxes/VAT, *Not sold by m/ft, price shown is a proportion of shortest length rounded up by 10%. <b>DIAMETER:</b> 15/32 or 0.46" =11.7/8mm <b>SHEATH:</b> DB=Double Braid, KM=KernMantle <b>STANDARDS:</b> CE EN1891 Type A or Type B <b>NFPA</b> = type T (Technical) with MBS over 20kN or type G MBS over 40kN <b>ANSI</b> = American National Standards Institute <b>CAN</b> = Canadian Standard, <b>ASNZ</b> = Australian and/or New Zealand																														

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















































































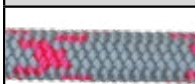





































120X80 mm28 kN12 kN10 kN85

Hot forged - the perfect combination of made in Italy contemporary blacksmithing and craftsmanship for achieving excellence.







IMAGES NOT TO SCALE	MODEL	COMPANY	ORIGIN	COST per Metre/3.28ft	LENGTHS M Ft		Ø mm (approx 15/32")	WT g/m lb/100'	MATERIALS: SHEATH CORE	EASE OF TYING	SHEATH BRAID /PLAIT	SPLICEABLE SPLICED/SEWN		OPTIMIZED for ASCENT DESCENT	SRT/SRS MRS/DrRT	CE / NFPA ANSI	MBL Minimum Average Break Load	Knotted Spliced Sewn Break Load	SPLICE THRU ZIGZAG	% SHRINKAGE	ELONGATION @10% MBS @50-150 kg @300LB/136K @540 lb/245kg			SHEATH %	OTHER COLOURS				NOTES	WWW.	
	FLOW	PETZL		£4.10* \$5.00 €4.20	35 45 60	115 148 197	11.6	102g 6.8 lb	Polyester Polyester	-	24					 A	30 kN 6744 lbf	15 kN 3372 lbf 15 kN 3372 lbf		-	2.8	55							petzl.com		
	Hyperclimb Hot,Cool	SAMSON ROPE		\$3.05	37 46 61 183	120 150 200 600	11.7	97g 6.5 lb	Polyester Polyester	-	-						28.9 kN 6500 lbf 32 kN 7194 lbf	-	-	-	1.6 1.3	50							samsonrope.com		
	Voyager Cool, Tangent	SAMSON ROPE		£3.65 \$4.35	46 61	150 200	11.8	97g 6.5 lb	Polyester Nylon	10	24 DB						41.8kN 9400 lbf 43 kN 9667 lbf	36 kN 8000 lbf	-	-	3 1.99	50					366m/1200' reel also available	samsonrope.com			
	IVY Silver Ivy, Tango Ivy, Midnight Ivy	SHERRILLTREE (SAMSON)		\$3.60*	37 46 61 183	120 150 200 600	11.7	102g 6.8 lb	Polyester Polyester	10	24 DB					-	29 kN 6500 lbf	-	-	-	1.3	-							sherrilltree.com		
	Scion	STERLING		£2.60* \$3.75	37 46 61 183	120 150 200 600	11.5	91g 6.1 lb	Polyester Nylon	10	24 DB					 A	30 kN 6744 lbf	25.5 kN 5732 lbf	-	-	3.8 1.5 4	-							sterlingrope.com		
	ACR-24 Acuda, Mantra, Outback	STEIN		£3.42 €4.80	25 35 45 60 197 200	82 115 148 197 656	11.7	98g 6.6 lb	Polyester Nylon	-	24 DB					 A	25kN 5620 lbf	18kN 4047 lbf	-	-	-	-							steinworldwide.com		
	Timber Evo	TENDON (LANEX)		€3.25	30to 80 100 200	98to 263 328 656	11.5	90g 6 lb	Polyester Nylon	-	24 DB					 A	30 kN 6744 lbf	18 kN 4047 lbf	-	1	3	54					Evo replaced the original green Timber	mytendon.com			
	drenaLINE*	TEUFELBERGER		£3.24 \$3.65 €2.80	45 60 80 500	148 197 262 1640	11.8	96.5g 6.5 lb	Polyester Nylon	0.8 7	32 KM					 A	35 kN 7868 lbf	18 kN 4047 lbf 16.5 kN 3709 lbf		<5	2.3 2.3	58					*+Limited edition colours unique to some stockists: 'Pink', 'Red', 'Jungle' & 'HBROS'	teufelberger.com			
	Xstatic	TEUFELBERGER		£3.54 \$4.50 €3.72	45to 183 366 549	148 600 720 1800	11.7	105.6g 7.1 lb	Polyester Nylon	6	32 KM					 A	32 kN 7194 lbf	17 kN 3820 lbf		<5	1.4 1.5	54						teufelberger.com			
	Platinum Arbor Access	TEUFELBERGER		\$5.63	50 180 475	164 590 1558	11.5	90g 6 lb	Polyester Nylon	-	32 KM	-				 A	33.7 kN 7418 lbf	18 kN 4047 lbf	-	1.5- 3.5	1.8	45					DISCONTINUED as 11.5, 10.5-only Sheath woven into the core at intervals	teufelberger.com			
	Tachyon Ash,Lava Surge,	TEUFELBERGER		£3.45 \$3.45 €4.20	35 45 60	115 148 197 600	11.5	85.4g 5.7 lb	Polyester Nylon/Polyester	0.64	24 DB					 A	24.45 kN 5497 lbf	21.85 kN 4912 lbf 24 kN 5395 lbf	-	0.3	2.2	58					Double Braid rope. Soft handling.	teufelberger.com			
	SafeVision	TREERUNNER (GRUBE)		€3.25	20 35 45 60	66 115 148 197	11.8	82g 5.5 lb	Polyester Nylon	0.6	24 KM					 A	37 kN 8318 lbf	22 kN 4946 lbf	-	2.5	2.5	54						grube.de			
	Safe +	TREERUNNER (GRUBE)		€2.87	20 35 45 60	66 115 148 197	11.5	100g 6.7 lb	Polyester Nylon	1.1	24 KM	-				 A	46 kN 10341 lbf	22 kN 4946 lbf	-	1.7	1.5	46						grube.de			
	Scandere	YALE CORDAGE		\$3.00	46 61	150 200	11.7	97g 6.5 lb	Polyester Nylon	-	48 DB					 A	32.3 kN 7100 lb	-	-	-	3	-							yalecordage.com		
	XTC-24 Blue Moon,	YALE CORDAGE		£4.27 \$3.25 €4.52	46 61	150 200	11.7	97g 6.5 lb	Polyester Polyester	10	24 DB					 A	31.4 kN 7050 lbf 29.5 kN 6500 lbf	-	-	-	1.4	-						yalecordage.com			
	XTC-24 (1of2) Sunburst Yellow&Orange BlueTongue, Hedera, Energize	YALE CORDAGE		£4.27 \$3.25 €4.52	46 61	150 200	11.7	97g 6.5 lb	Polyester Nylon	10	24 DB					 A	31.4 kN 7050 lbf 29.5 kN 6500 lbf	-	-	-	1.4	-					Also Prism and Arrow Frog in OZ/NZ	yalecordage.com			
	XTC-24 (2of2), Poison Ivy, Calamine, Poison HiVv, Tropical Ivy, Lime-lite, Neon Ivy	YALE CORDAGE		£4.27 \$3.25 €4.52	46 61	150 200	11.7	97g 6.5 lb	Polyester Nylon	10	24 DB					A	31.4 kN 7050 lb 29.5 kN 6500 lbf	-	-	-	1.4 1.8	-					Poison Ivy colour (black/Green) discontinued. LimeLite UK-only	yalecordage.com			
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## BCM Biodegradable Solutions

## SAP ZAPRRR

Clean dirt? Unlike mechanics or construction contractors, an arb worker's hands and arms are generally exposed to primarily natural dirt, mud, dust and of course the ever-tacky resin or pitch exudate from coniferous trees, which then attracts dust and dirt!. Hydrocarbon and mineral contaminants (oils and greases) have a plethora of products designed specifically for their removal from skin, until now, removal of tree resin has not been so well catered for. Enter Sap Zaprrr.

Having a background in used oil and chemical recycling has helped Sap Zaprrr inventor Brian Milner come up with a blend of natural products which does just the job. Brian's background as a chemist has included working in used oil and chemical recycling, taking harmful products and bi-products and deconstructing them, leaving reusable or inert materials. This background has enabled him to minimise harm to the environment while remaining effective at cleaning otherwise the customer will simply sling it and reach for the hydrocarbons, alkali or other synthetic solution. Motivated by Mrs Milner, who was perplexed by the tack left on products by the sales labels, Brian retreated to the basement and set about concocting a product that would deal with this issue and using a secret citrus oil mix, coincidentally discovered an array of products. So many in fact that he now has a company selling biodegradable cleaning solutions. One of these is Sap Zaprrr specifically targeting tree and forestry workers. We've all traditionally relied on an abrasive component to aid in the removal of dirt, whereas SapZaprrr is solely reliant on the chemistry afforded by natural products, to break down the adhesive resin.

Resin occurs in many species but for most of us it's the pines and firs that mostly gum up the works. The ancient Chinese, Japanese, Egyptians, and others used resins in preparation of lacquers and varnishes but the most use we ever achieve is a tacky dirt attractant, leaving exposed skin and kit blackened or something akin to being tarred and feathered because even though resin is a relatively clear substance – it's black by the time you come to deal with it (have you ever taken down an araucaria!). Despite the global appetite for responsibly sourced products we have a much greater desire to 'clean dis shiddoff' and would probably use any dubious chemical we were offered. Luckily Sap Zaprrr uses 100% natural ingredients, a blend of plant extracts and citrus oils, which combine to produce a fluid, which is easy to apply as a spray. This is clearly important as the last thing that you need at the end of a long day is to mess about with a complicated mix or ritual in order to clean up.



The top image shows a modicum of pine resin...what!? I'm a clean climber! Having Zaprrrd it, you can see the slightly oily residue that remains and is easily wiped off

Supplied in handy 500ml/16.9fl. oz. bottles with a hand pump spray, it is easy to keep in the works truck, washroom or workshop. Application is simply to spray a small amount on the contaminated area or gear and allow it a few minutes or several minutes if really contaminated, to do its work. With some gentle rubbing or maybe 'massaging' you can accelerate the process. After the resin has dissolved it can be wiped off with a cloth. This is can be anything from a pale watery liquid to what appears to be a kind of oil but either way it's easily removed. It's quite similar in action to some of those dubious solvents that will melt the superglue out of a broken ceramic ornament accidentally attached to the dog – but this one has no mind-altering odour and won't attract the attention of animal rights groups.

The days of futile scrubbing (and in some cases abandoning all hope and throwing kit away) are now behind us. Sap Zaprrr does appear to do what is says on the bottle. The solution has the ability to easily dissolve dried pitch/resin residue and allow for the cleaning of hands, arms and kit in a painless, sensation-less and harmless way.

When it comes to kit; hardware, machinery, chains and tool handles etc. are no problem at all but we instantly become concerned with the use of anything but the most gentle soapflakes being applied to our ropes and fabric gear. As part of the R & D for Sap Zaprrr, safety-critical gear was given a good soaking and then subjected to destructive testing, although not exhaustive, no loss of integrity was found to occur. Being a citrus-oil based product you would expect it to be pretty safe and Dave Stice at Wesspur is OK with it being used on rope so that's good enough for us. In the meantime, the benefits for personal and fabric cleaning are more that sufficient for this to be a product I will be continue to have in the glove box, not least because it smells good too. Cost is around \$15 for a US16oz or almost 0.5L spray bottle. [www.bcmchem.com](http://www.bcmchem.com)

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# PETZL TREECARE SOLUTIONS

Being effective in your daily work as an arborist means mastering advanced techniques and having the best equipment to efficiently move around and position yourself in the trees. Here's Waldo Etherington in his element at Stourhead Arboretum in Wiltshire.

Tree care solution includes a ZIGZAG PLUS mechanical Prusik, a CHICANE auxiliary braking device and a 11.6 mm FLOW low stretch kernmantel rope. [www.petzl.com](http://www.petzl.com)



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