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HEADLAMPS <100 lumen part 3

That means less than 100 so there are no 100 lumen models here, 99 is the upper limit. This is the third and final part of our GUIDE to headlamps and is the smallest selection of professional grade models. If we included all the Christmas cracker and unbranded models there would be hundreds but we're only interested in proven models although many still cost mere pennies in comparison to some of the high-powered, highfalutin models in the 100-200 lumen and especially the 300+ lumen models. We'll be adding an 'UPDATE & ADDITIONAL MODELS' in the next issue, which, I know we said that last time but we not only ran out of space again but the new models were all at the higher end of lumen output so they might as well all go in together under the 300+ Update banner. In this <100lumen category we again see some names more familiar as rope and rescue equipment manufacturers but we haven't really seen any expansion of their ranges for this year so maybe they peaked with their initial splurge into the market. We've again used part of the he intro from the previous two parts because you may either be reading this for the first time or have forgotten what we said last time.

As always we've limited our GUIDE to the best brands for professional use. That doesn't mean that there aren't one or two random, unbranded models that aren't any good or some rebadged models like Milwaukee, Coleman or DeWalt that aren't also noteworthy BUT, they're provenance isn't always with more extreme conditions in mind. You already know the brands we've used for decades and consider to be top of the tree from specialist manufactures like Petzl, Pelican, Princeton Tec, Streamlight, Koehler, LedLendser, Unilite, Underwater Kinetics and Koehler. These are hard to beat but some others with a broader product range like Black Diamond and the very impressive Silva are also worth consideration though the latter has none in this <100lumen category. We're not sure what happened to the German brand Lucido that Mammut bought a few years back, you can still buy the TX1 but it doesn't appear on any Mammut website so perhaps that didn't work out. We mentioned last time that manufacturers categorise their own products as either Sport or Industrial, sometimes separating out Emergency Services but they can virtually all cross-over into each other's fields. The exception might be 'Intrinsically safe' lighting meeting ATEX or r US HAZLOC which might be an extravagance for anyone not working in industry or mine-rescue but if you're not paying a premium for the extra certification, the light itself will be just as good as most, if not more robust than many. Similarly cave rescuers may not want the brightest spot beam on the market because it would be permanently bouncing back off close surfaces, a flood option would be essential. But otherwise, sport models just tend to be smaller and lighter which would suit many a Mountain Rescue, cave rescue or wilderness SAR team. We haven't made the distinction between sport or industry or tactical or rescue – if it has the features you want at a price you can afford, that's all that counts.

KIDS MODELS

There was a time this category would have contained the majority of world headlamps but as technology of battery and bulb/LEDs has improved so has lumen output. Some key manufacturers listed in our previous Guides don't have even a headlamp model below 100 lumen – companies like Fenix, Koehler, Nitecore, Silva and Unilite. Unusually, we have included at least 3 models here that are intended for kids but the manufacturers did such a good job that if you avoid the vibrant pink models with fluffy animals or scratch the rocket off the blue ones, they're very useful for adults too. The Petzl Tikkid for instance has a headband that releases under tension, it turns off after an hour's continuous use to preserve power and it has a luminous

Climbing Technology's headlamp being put to use in close-quarter work on Mt Blanc. Pic - Klaus von Orto

reflector so it can be found in the dark – why haven't all headlamps got that?

ANSI/PLATO FL1 PROTOCOL

The American National Standards Institute stole a march on the EU by coming up with an acceptable criterion for cross-comparison of lighting and the PLATO FL1 protocol is being widely adopted. It creates a more level playing field and enables everyone to compare like for like without the inflated and misleading figures presented by many. So look out for FL1 in the IP Rating column. Just to give you an idea of how this testing protocol is shaking this up, the Petzl E-Lite was originally quoted as 50 lumen out to 30m for 7hours but under the standardized PLATO FL1 testing it is now 30 lumen out to only 7metres for 3hours on the maximum setting. If a company as capable and up-front as Petzl is having to modify its output figures just imagine what a difference it would make to less scrupulous manufacturers' figures. It's highly likely that any peripheral brands will be making things up to look more impressive than they really are, like thousands of lumen output that actually only last for a few seconds or a beam range that is calculated on just being able to see the beam rather than what you can see with that beam! It's always worth checking on the true test parameters for the specification being presented to you but few are quite as forthcoming about this as the market leaders like the 3 P's, Petzl, Peli and Princeton Tec. We show FL1 in the IP column and here is Petzl's useful info on the FL1 test protocol:

***BRIGHTNESS** (lumens)*
This measurement is taken between 30 and 120 seconds after the headlamp is turned on. It indicates the maximum light output, when the lamp is first turned on, using new batteries.
LIGHTING DISTANCE
This is the maximum distance between the lamp and the location where only 0.25 lux of illumination remains. The measurement is taken when the lamp is turned on, using new batteries. Lighting distance depends directly on brightness, but mainly on the shape of the beam. [ED: note that we are quoting the MAXIMUM beam range possible at the highest setting]
BURN TIME (hours)
This corresponds to the length of time for which lighting remains optimal, from when the lamp is turned on, until 10% of maximum light output is reached. Then it switches to reserve lighting.

RESERVE LIGHTING
Reserve lighting ensures a minimum light level for walking. However, the light may not be sufficient for fast paced activities (such as running, mountain biking, skiing...).

ANSI IP RATING
In addition the IP rating for water-resistance or waterproof this uses X4 for water resistant (splash-proof),X7 for water proof when immersed momentarily and X8 for submersible do a limit stated by the manufacture, usually something like 1m for 5minutes etc.

CHINESE MANUFACTURE

We usually add a sub-flag to indicate the actual country of manufacturer as distinct from the main origin flag which is the home country of the company. However, we had to take them off because virtually every manufacturers' lights were made in China and the tables looked ridiculously cluttered. It's easier to tell you that Princeton Tec, Lupine, Streamlight and Pelican DON'T manufacture in China/Vietnam/Taiwan! Even Petzl use a Malaysian manufacturer. China and Taiwan obviously manufacture to a high standard and have a virtual monopoly on LEDs so Chinese manufacture is no indication of diminished quality. However, there are hundreds of unbranded Chinese models that we don't know the efficacy of in terms of testing and some claims for output that look dubious. Stick to brands you know from the rescue industry and particularly with good warranties and you should be good. The stigma of Chinese manufacture is being eroded but some are still proud to say that they make their own products in-country or with some help from neighbouring countries.

ELECTRONIC WIZARDRY

The future continues to point towards electronic sophistication although there is a lot to be said for the simplicity of an on-off switch giving you the choice of light or darkness. Petzl have been pioneering masters of technical electronics with their *Constant* lighting metering, *Reactive* lighting and programmable options. This is exemplified by the *Nao* from the last issue but shown in our headband section, although it's quite odd that *Petzl*'s most professionally capable model isn't listed under their 'Professional' range, only 'Sport'. Don't let that put you off unless you need intrinsic safety because many of these low-lumen models are aimed at sport but that nicely encompasses many wilderness rescue activities.

REGULATED OUTPUT: Petzl call it *Constant* lighting but it's the 'regulated' mode that many other brands now use and means that you get a regular light intensity for the full duration of the charge rather than a rapid or gradual drop-off of beam intensity once the batteries are low. This kind of electronic control circuitry also keeps an eye on temperature and should cells start to overheat it will regulate the light output to stop permanent damage. Boost or Turbo modes are limited by temp control. There are only handful of regulated models in this selection and the lower prices reflect this.

REACTIVE LIGHTING is completely absent from this selection and is the opposite of 'Constant'. It is of two types – Petzl's '*Reactive*', not to be confused with 'reactive' as a verb, uses a sensor to figure out the amount of reflected light and therefore the proximity of whatever you're looking at – if it's a map it turns down the lighting, if it's a way off in the distance it increases the power. The second Petzl innovation is a 'Face-to-Face' function which is much simpler than their '*Reactive*' but is still reactive in the sense that it recognises proximity of other headlights and reacts by dimming your headlight accordingly – that will please your colleagues but is only any use to you if their headlamps are similarly equipped otherwise, prepare to be blinded if you're in a consultation huddle.

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MATERIALS.....

The vast majority of these headlamps are made of some form of toughened plastic, not the thin brittle stuff that your kids' toy's battery enclosures are made of but tough enough to withstand a drop onto concrete from a metre/3ft up. That particular test is what sets the professional grade models in this guide apart from the cheaper camping lights. Machined and die-cast alloys are also evident in some brands like LEDLENSER and NITECORE. This always gives a reassuring feeling of being robust even if some of the carbon-plastics are just a s tough but they don't feature in many ATEX/intrinsic safety models! Talking of which, we've included mention of ATEX (or Intrinsic Safety in old money) in the NOTES column but a hazardous atmosphere is not normally a risk that needs to be catered for in wilderness search and rescue. Nevertheless, many teams have responsibility for road accidents and remote industrial sites so intrinsic safety could be a useful feature. It tends to be on the lower power lights in part 1 of this guide because of close-quarter and confined space working which doesn't require a 1000 lumen spot light blinding everyone and everything in a 10 foot radius.

HEAD BANDS.....

We didn't have room to include a column for the type of headbands available. We barely had room for all the data as it is. However, headbands are a consideration when it comes to comfort and fit. There are five types for the smaller lights but the bands we show for the Nao with its odd cats-cradle and the Zipka with its retractable headband, don't feature in this Guide pt3:

1) FULL strap with a lateral and dorsal strap, usually in a soft facing elasticated fabric. This retains the front light-housing and rear battery mount (if separate) well, especially on a helmet which can be slippery and require additional clips.

2) HEADBAND-ONLY which is the vast majority of the <100 lumen models and will be in either a sweat-wicking elasticated band or it may be a much heavier duty solid black rubber for industry and helmet adhesion.

3) INTERMEDIATE headband as exemplified by Fenix which has an occipital band coming off the lateral headband that helps keep the headlamp centred. There's also the Petzl Nao, minimalist elastic cord version which is about as light as a headband can be and again hugs the occiput (rear brain-case). The 'oddities' from Petzl are the Zipka **4)** with a **RETRACTABLE** cord strap and the Elite **5)** with a single 'bootlace' tightened through a simple toggle.

IN THE FOLLOWING TABLES.....

COSTS Are rounded up. no £19.99 here!

MAX LUMEN as quoted by the manufacturers has become the industry standard measurement for light output in preference to Lux etc. so is the easiest way to compare like-for-like. Note that for some models, the quoted max lumen is for very short bursts only because the overheat protection would otherwise kick in. Unlike the high-power models, these <100 lumen models don't have a higher-power 'burst' so the Lumen figure quoted is pretty much the lumen you get, at least for the early part of battery life. Some models have lumen-output adjustment listed in the MODES column as 'DIMMABLE' but not to be confused with 'FINITE BEAM' which refers to beam width adjustment. Power adjustment may be found on the rear battery housing as a dial or lever as with the LEDLENSER H6 pictured opposite next to the H5 which is a lighter, less costly variant that doesn't have that feature. In both cases, beam width adjustment is via a sliding lever below the bezel.

MIN RUN TIME is given for the main White light only and at its most powerful constant output setting (if this is variable). There are some models that offer red, green and/or blue LEDs which will extend these times as will the emergency flashing modes but that is never at the max lumen and NOT included in our quoted figures.

MAX RUN TIME is at the minimum constant power output but might not be using the main beam at all even if it's got variable output because many have additional, smaller 5mm LEDs. Some have a high power LED , a low power LED or LED(s) and a coloured LED(s). In the case of one tactical helmet mounted light, the white LED is quoted at 48 hours on low while the blue LED will give 120 hours – we have quoted the lowest power white LED on constant beam even though flashing (strobe) beams will also extend run time , considerably in most cases. There is a technical difference between what most users think is run time ie. from switching it on to the beam dying completely – it's a little better than that as Koehler nicely explain: "*Run Time is defined as the duration of time from the initial light output value – defined as 30 seconds after the point the device is first turned on – using fresh batteries, until the light output reaches 10% of the initial value.*"

FRONT LEDs.....

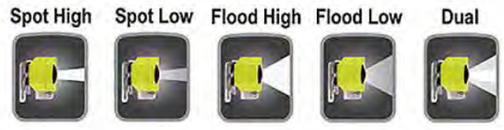
Indicates front beam colour options and a rough guide to LED size. This is obviously dictated by the colour of the LED but it can simply be a coloured lens over a white LED. Most LEDS are white with a clear lens and many have an additional, often smaller white or coloured LED to offer less dazzle and/or longer duration than the main beam alone. Some have a Red, green or blue LED to preserve night vision, some have all three colours. Pelican has a model with '*colour-correction*' output which casts a 'real' white light that doesn't artificially alter the colour of things like blood or change blues to green etc. Each separate LED gets its own square indicating colour of the front LED and relative size. Interchangeable lens colour options would normally be listed in the **NOTES** but there are none in this selection.

SPOT to FLOOD.....

refers to the width and/or strength of beam. This used to be altered with a twist of the bezel and in many cases still is but more often than not, variable or mixed beam output (shown as ■) is provided by the push of a button or might be automatic. Most will adjust between a tight spot giving intense light across a narrow beam to a more diffuse flood across a wide area and some combine the two types to create a mixed or vari-beam but this is rare in this class of light, much more common in higher lumen output models. At least one model here, the CT Lumex uses a swing-down diffuser to change from spot to flood while the LedLenser H5 has bezel adjustment to change from spot to flood.

BEAM MODES.....

Are unfortunately called by a wide variety of company-specific terms as they seek to stamp their own mark on industry



nomenclature. So we've pretty much listed the modes as they do even though you'll spot many of the same modes under different names. The examples above are from Nightstick (Bayco) and seem pretty straightforward where two LEDs are used either separately or at the same time. Modes are changed by a range of mysterious push-button combinations, similar to a Freemason's handshake – nobody really knows what the sequences are, they just pretend that the ultimate beam mode is what they meant to do. A notable exception is the Petzl E-Lite (pic right) which has the unfortunately rare feature of icons on a rotating switch to show exactly what mode is where. I wish all headlamps did this. The E-Lite is a tiny, emergency-only headlamp that comes in a little storage case and has been around for a few years but still not enough (if any!) companies have followed their lead and simplified the switching modes. For all lights other than the E-Lite, read instructions carefully and practice before you get into the field. If there is a rotating bezel around the bulb/LED this will generally adjust the beam width so have an infinite number of 'MODES' listed as 'FINITE brightness adjustment' in part 1, 'Finite Beam' in part 2 and not required in this issue! With some intelligent systems the beam will automatically adjust for distance-from-object so that map reading uses a dimmer light than distance searching and this will be further indicated in the 'REGULATED' column. Some lights have flashing or strobe modes that may be SOS signalling, rapid, epilepsy-inducing flashing or slow flashing. Emergency service vehicles discovered long ago that the most conspicuous lighting is a flashing white light so these will not only be more likely to attract attention it generally uses less energy as well. A number of the modes are designed to extend battery life by using a lower lumen output than the maximum and indeed some models only achieve the maximum quoted lumen output by pressing a 'boost' button for a few seconds at a time. The beam modes listed are for FRONT-White LEDs only.

REAR LIGHT....

Some models have a rear red or white LED – very useful for knowing the proximity of your colleague in the dark – that's if the enormous front-facing white light hadn't already given the game away. In actual fact, the rear light can be seen from over a kilometre away so there is method in the madness and these can be flashing or constant, flashing giving the longest battery life and shown □ for white flashing or □ for red flashing. An understandably popular feature for tactical users who are using a low visibility red or coloured beam and don't want to be shot in the back by colleagues.

BEAM THROW/DISTANCE....

is measured from the light to the point at which the lux reading is 0.25 which is roughly the same as a full moon on a clear night. **CANDELA** in burnt orange (which should really be Candelas with an 's' but we couldn't fit it in!) is the figure for beam intensity, generally at the centre of the beam and is the term that replaced 'candlepower' in the lighting industry.

ADJ HEAD ANGLE....
refers to the angle that the front headlamp can be manually adjusted to. Some will rotate 90 degrees to point directly at your feet while your face is still pointing forwards. This is generally achieved with an incremental 'ratchet' to keep the head firmly located in each of the desired angles. Some do not quote an angle so there may just be a black square in this column, you can safely say that these will adjust from/to at least **60°** and probably closer to **90°** in most cases.

BATTERIES included....
A description in orange indicates the cells supplied with the light. Where a choice exists, the output data is based on the first battery type listed. Unless otherwise stated AA and AAA refer to disposable batteries. But rechargeable or high-power lithium and/or Nickel Metal Hydride cells are often an option. There is also a **BATTERY/RECHARGEABLE** column indicating whether the supplied cells are disposable ■ or rechargeable batteries ■ and if the headlamp can use other types of cell shown as □ for rechargeable option and □ for disposable cell options. Check out the '**USB**' column for models easily charged via laptops, phones, vehicles etc. the oval USB-C will likely become standard but most still use the flat-bottomed mini USB.

BELT MOUNT.... This refers to the ability to move the battery pack to your belt or to keep them warm inside clothing while still in use. This feature is common in high output models needing larger batteries but rare for the lower lumen output ranges from 0-299lm. There are again none in this GUIDE with a dedicated belt mounted battery pack and the vast majority have batteries within the headpiece rather than in a separate battery compartment on the head band. For the few with separate battery cases, you m*ay* be able to partially dismount these in order to stow on a belt or in a pocket and these are indicated by □. This option also takes weight off the head. Not all are easily moved from their headband but in an emergency, ie. where power is low and the outside temperature is sucking the life out, you could resort to a multitool, cut it away from the headband and stow in under a warm armpit. Nice.

POWER STATUS....
Not to be confused with 'Charge-Status' which is how long your depleted cells are taking to charge up. Power Status is how much usable power you have left and is given as ■= for constant power status always on view- usually indicated by a series of small LEDs. □=power status shows temporarily whenever the light is switched on. ■=indicates that an incremental power status is shown on request (by pressing a button) and an outline square □=indicates that intermittent flashing, or a solid red LED or an audible beep tells the user that the battery is getting low – some have LEDs *and* an audible reminder.

WATER RESISTANCE is shown with a black square and is listed under the **IP RATING** where the last number ranges from 1 to 8 with X7 and X8 being submersible. The X in these examples refers to dust ingress and is a number from 1 to 6 but not often given for headlamps.

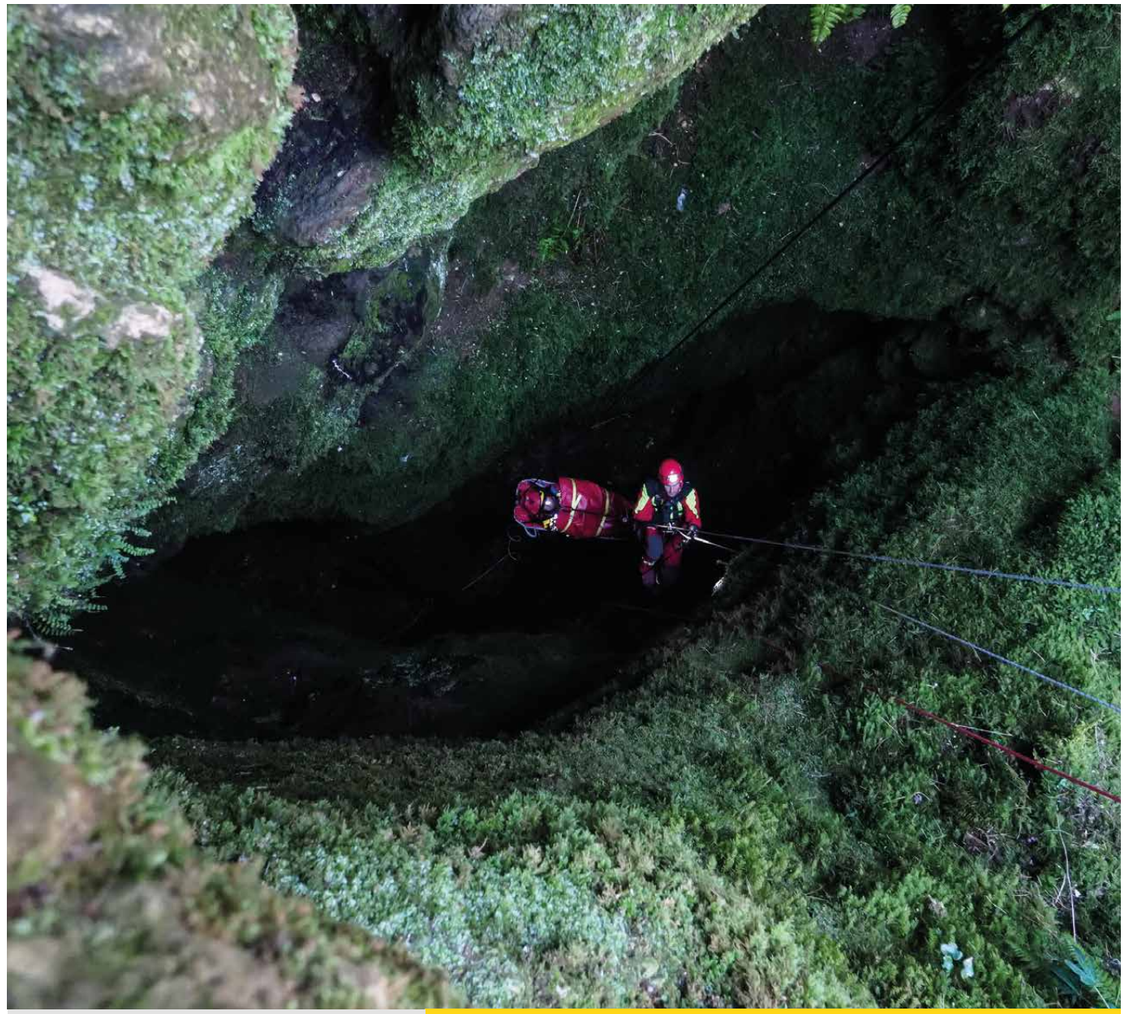
WARRANTY....
Unlimited Lifetime warranty is shown as ■
Limited lifetime as □ but these may only be valid in the country of purchase. A Square AND a number = a limited time warranty in years OUTSIDE the country of origin, none in this list though. A plus symbol + after a number means the warranty may extend further but will generally exclude the cost of parts.

COB or Chip-On-Board **(pic right)**

Are becoming the norm and have been around in area lighting for many years. Not so many of these smaller lights have them but as singles or arrays you will see them more and more. They are distinctive as what looks like a flat strip of plastic sometimes with more distinct flat circles or squares sat at the back of the reflector. Even less to break with no glass optics.

HAZARDOUS ATMOSPHERES
These do crop up in low power headlamps because confined-spaces for instance don't require or want lights that are too powerful and therefore blinding in a small space. This feature is highlighted in the NOTES section. In Europe we cover this with the acronym ATEX and zones 0 for the longest exposure to a hazardous atmosphere to zone 2 for the shortest exposure and in the US as HAZLOC (for Hazardous Location) but the two standards are not mutually exclusive in pure standards terms even though performance might be. In the US The National Electric Code (NEC) further defines hazardous locations by "class" and "division."
There are three classes of hazardous locations:
Class 1 locations are made hazardous by the presence of flammable gases, liquids or vapors.
Class 2 locations are described as hazardous because of the presence of combustible dusts.
Class 3 locations contain easily ignitable fibers or flyings [ED: not to be confused in the UK with 'filings' as in... iron-filings].
"Division" refers to the likelihood that ignitable concentrations of flammable materials are present.
Division 1 designates an environment where ignitable concentrations of flammable gases, liquids, vapors or dusts can exist some of the time or all of the time under normal operating conditions or where easily ignitable fibers and flyings are manufactured, handled or used.
Divison 2 locations are areas where ignitable concentrations are not likely to exist under normal operating conditions or where Class 3 materials are stored or handled.

As with parts 1 and 2, there will be many brands you might know that are not featured in this Guide. We have stuck with brands and lights that are either at the top of the professional tree or are reliable enough to be used by professionals even though many will be from the sport sector. 'Sport' can be just as professional as 'Industrial' or Rescue'!



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IMAGES NOT TO SCALE	MODEL	COMPANY	ORIGIN	COST	WEIGHT inc. batteries	MAX LUMEN	MIN RUN TIME @max power	MAX RUN TIME @min power		FRONT LEDs	SPOT FLOOD VARI	FRONT MODES	REAR LIGHT FLASHING	MAX BEAM DISTANCE CANDELA	ADJ HEAD ANGLE	BATTERIES included	CHARGE TIME	POWER STATUS	USB CHARGER to MINI USB	STD BATTERIES RECHARGEABLE	BATTERY to BELT	REGULATED AUTO LIGHT DIM	SWITCH LOCK	IP RATING FL1	COLOURS	WARRANTY LIFETIME	NOTES	WWW.
	Gizmo	BLACK DIAMOND EQUIPMENT		£20 $20 €22	84g 2.9oz	90	30h	75h		□	■	Dimmable Spot Strobe	-	30m 98ft	■	3x AAA	-	-	-	■ □	-	-	-	X4	■ ■ ■ ■	3	discontinued	blackdiamond equipment.com
	Stride	BLACK DIAMOND EQUIPMENT		£30 $30 €30	35g 1.2oz	25	1.5h	1.5h		□ □	□	White Flood Red Flood Red Strobe White Strobe	-	8m 26ft	-	Li-ion	-	□	■	■	-	-	-	X4	■	1	Intended as a strobe or rear light adjunct to more powerful head-lamps	blackdiamond equipment.com
	Wiz	BLACK DIAMOND EQUIPMENT		£25 $20 €20	67g 2.4oz	30	5h	60h		□ ■	□	Full Dimmed Strobe Red	-	8m 26ft	■ +/- 30°	2x AAA	-	-	-	■ □	-	-	-	X4	■ ■ ■	1	Equally great for adults! Auto shut-off after 2hrs. Head tilts both ways, multi-coloured LED	blackdiamond equipment.com
	Lumex (HD972)	CLIMBING TECHNOLOGY		£25 $36 €33	59g 2oz	85	2h	2h		□ □ □ □	□ ■	Spot Flood Red Red Flashing	-	?	■ 90°	1xAA	-	-	-	■ □	□	-	■	X4	■ ■	2		climbingtechnology.com
	Pentalite	EDELRID		£14 €15	90g 3.2oz	33	25h	30h		□ □ □ □ □	□	High Medium Strobe	-	25m 82ft	■ 60°	3x AAA	-	□	-	■ □	-	-	-	X1	■	-	Magnet on head for separate attachment to metal surfaces	edelrid.de
	HL10	FENIX LIGHTING		£28 $35 €25	57g 2oz	70	0.5h	30h		□	■	Low Medium High	-	15m 50ft 55	■ 100°	1x AAA NiMH	-	-	-	■	-	■	-	X8	■	5	head detaches as a stand-alone light	fenixlighting.com
	Command Lo-Pro (410-L06)	FOXFURY		$70	272g 9.6oz	65	7h	26h		□ x10	□	Low Medium High	□	28m 92ft	-	4x AA	-	-	-	■ □	□	-	-	X7	■	□	Alloy head	foxfury.com
	Command Tilt (410-T09)	FOXFURY		$75	272g 9.6oz	65	7h	26h		□ x10	□	Low Medium High	□	28m 92ft	■ 38°	4x AA	-	-	-	■ □	□	-	-	X7	■	□	Alloy head	foxfury.com
	Klik Micro	KONG		£20 $23 €18	30g 1oz	25	40h	77h		□ ■ ■	■	High Low Red Red-flashing	-	25m 82ft	■ 90°	2x CR2032	-	-	-	■	-	-	-	X6	■ ■	2		kong.it
	H5	LEDLENSER		£33 $35 €35	120g 4.2oz	25	20h	20h		□	□ ■	High	■	70m 230ft	■ 90°	3xAAA NiMH	-	-	-	■ □	□	-	-	X4 FL1	■	5-7	Alloy casing	ledlenser.com
	NEO	LEDLENSER		$25 €25	88g 3.1oz	90	10h	40h		□	□	High High/red blink Low/red blink both Blink	■	10m 33ft	■ 90°	3xAAA NiMH	-	-	-	■ □	□	-	-	X4 FL1	■ ■ ■ ■ ■	5-7	Alloy casing	ledlenser.com
	Pulse Micro (PS318)	LUXPRO		$7	68g 2.4oz	30	6h	10h		□	□	High Low Strobe	-	25m 82ft	■ 90°	2x CR2032	-	-	-	■	-	-	-	-	■ ■ ■	-	comes with hat clip	luxproflashlights.com
	NSP-4602B	NIGHTSTICK		$30	101g 3.5oz	35	12h	36.5h		□ x12	□ ■	Spot High Flood High DualBeam	-	19m 62ft 92	■ 45°	3x AAA	-	-	-	■ □	-	-	-	X7 FL1	■	1	Inc. elastic and rubber head bands	nightstick.com

NOTES: COST: Approx. inc tax and batteries when indicated in **orange** in BATTERIES column. POWER STATUS: ■=Constantly displayed □=Displays when first switched on ■=Displays on request □=Beep/flash when low BATTERIES: ■=Regular batteries as standard □=Optional Regular batteries ■=Rechargeable as standard □=Rechargeable option

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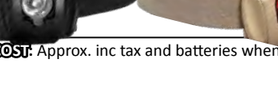
	XPP-5450G	NIGHTSTICK		$35	101g 3.5oz	90	13h	22h		□	■	Spot High Spot low	-	80m 263ft 1615	■ 90°	3x AAA	-	-	-	■ □	-	-	-	67 FL1	■	□	ATEX/HAZLOC Inc. elastic and rubber head bands	nightstick.com
	2610 (HeadsUP)	PELICAN		£36 $37 €72	91g 3.2oz	30	19h	47h		□ □ □	■	High Low	-	28m 92ft 194	-	3xAAA	-	-	-	■ □	-	-	*	X4 FL1	■	■	ATEX zn 0 Class I, Div1/ IECEx.	pelican.com peliproducts.co.uk
	2690 HeadsUPlite)	PELICAN		£41 $36 €82	116g 4.1oz	74	11h	11h		□	■	High	-	92m 302ft 2124	■ 60°	3xAAA	-	-	-	■ □	-	-	-	X7 FL1	■	■	Class I, II & III, Div1/ IECEx. Comes with rubber & elastic headbands. Helmet clip option.	pelican.com peliproducts.co.uk
	2740	PELICAN		£24 $24	94g 3.3oz	66	3h	103h		□ ■ □	□	High Low Red	-	22m 72ft 122	■ 45°	3xAAA	-	-	-	■ □	-	-	-	X4 FL1	■ ■	■	Transluscent blue head casing.	pelican.com peliproducts.co.uk
	2745	PELICAN		£45 $29	94g 3.3oz	33	20h	40h		□ □ □	■	High Low Flashing	-	35m 115ft 309	■ 45°	3xAAA	-	-	-	■ □	-	-	*	54 FL1	■ ■	■	ATEX zn 0 Class I, Div1 / IECEx- *Low-profile switch protected by shroud. Inc helmet clip	pelican.com peliproducts.co.uk
	2755cc	PELICAN		$37	96g 3.4oz	72	6.75h	15h		□	■	High Low Flashing	-	50m 164ft 632	■ 45°	3xAAA	-	□	-	■ □	-	-	*	54 FL1	■	■	ATEX zn 0 Class I, Div1 / IECEx- *Low-profile switch protected by shroud. CC= Colour Corrected	pelican.com
	Pixa1	PETZL		£35 $48 €34	160g 5.6oz	60	3.5h	16h		□	□	High Low Reserve	-	90m 295ft	■	2 xAA or NiMh or Li-ion	-	□	-	■ □	-	■	■	67 FL1	■	3	ATEXzn2/HAZLOC, Class 1 Div2 Helmet clip included	petzl.com
	Pixa2	PETZL		£50 $60 €49	160g 5.6oz	60	3.5h	26h		□	□ ■	High Low Reserve	-	55m 180ft	■	2 xAA or NiMh or Li-ion	-	□	-	■ □	-	■	■	67 FL1	■	3	ATEXzn2/HAZLOC, Class 1 Div2 Helmet clip included	petzl.com
	Pixa3R	PETZL		£99 $140 €98	145g 5.1oz	90	3h	11.5h		□ □	□ ■	Flood Mixed Focus (spot) Reserve	-	90m 295ft	■	930 mAh Li-ion Polymer	3h	□	-	■ □	-	■	■	67 FL1	■	3	ATEX zn2/HAZLOC, Class 1 Div2 Helmet clip included	petzl.com
	E+ Lite	PETZL		£24 $30 €26	26g 0.9oz	30	3h	11.5h		□ ■	□	Max Standard Flashing Red Proximity Red Flashing	-	70m 230ft	-	CR2032 Lithium	-	-	-	■	-	-	■	X7 FL1	■	10	Batteries can be stored for 10yrs. Toggle-adjustable headband	petzl.com
	Tikkid	PETZL		£25 $25 €26	80g 2.8oz	30	2h	120h		□	□	Low High Flashing	-	60m 197ft	■	3x AAA or NiMh or Li-ion	-	-	-	■ □	-	-	-	X4 FL1	■ ■	5	Core Li-ion power pack compatible	petzl.com
	Bot	PRINCETON TEC		£16 $16	64g 2.25oz	30	3h	58h		□ □	■	Flood High Flood Low Flood Flashing	-	27m 89ft	■	2x AAA	-	-	-	■ □	-	■	-	X4 FL1	■ ■	5		princetontec.com
	Eos Tactical	PRINCETON TEC		£60 $56	103g 3.6oz	60	1h	108h		□	■	Spot High Spot Low	-	48m 158ft	■	3x AAA	-	-	-	■ □	-	■	-	X7 FL1	■ ■ ■ ■	□	Red, Blue Green filters included. When installed flips up to cover LEDs	princetontec.com

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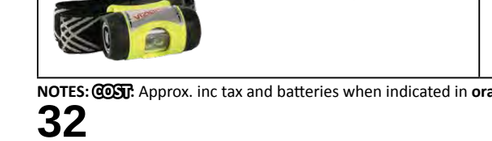
IMAGES NOT TO SCALE	MODEL	COMPANY	ORIGIN	COST	WEIGHT inc. batteries	MAX LUMEN	MIN RUN TIME @max power	MAX RUN TIME @min power		FRONT LEDs	SPOT FLOOD VARI	FRONT MODES	REAR LIGHT FLASHING	MAX BEAM DISTANCE CANDELA	ADJ HEAD ANGLE	BATTERIES included	CHARGE TIME	POWER STATUS	USB CHARGER to MINI USB	STD BATTERIES RECHARGEABLE	BATTERY to BELT	REGULATED AUTO LIGHT DIM	SWITCH LOCK	IP RATING	COLOURS	WARRANTY LIFETIME	NOTES	WWW.
	Fred	PRINCETON TEC		£35 $30	78g 2.8oz	45	74h	120h		■ □ □ □	□	Flood High Flood Low Red High Red Low	-	35m 115ft	■	3x AAA	-	-	-	■ □	-	-	-	X4 FL1	■ ■ ■ ■	5		princetontec.com
	Fuel	PRINCETON TEC		£30 $30	78g 2.8oz	70	74h	120h		□ □ □ □	□	Flood High Flood Medium Flood Low Flood Flashing	-	44m 144ft	■	3x AAA	-	-	-	■ □	-	-	-	X4 FL1	■	5		princetontec.com
	Quad/ Quad Industrial*	PRINCETON TEC		£45 $38	96g 3.4oz	78	1h	108h		□ □ □ □	□	Flood High Flood Medium Flood Low Flood Flashing	-	50m 164ft	■	3x AAA Lithium	-	■	-	■ □	-	■	-	X7 FL1	■	□	*Industrial version is Class1 Div1 costing £50/$42	princetontec.com
	Quad Tactical	PRINCETON TEC		£53 $43	101g 3.6oz	78	1h	108h		□ □ □ □	□	Flood High Flood Medium Flood Low (RGB Filters)	-	50m 164ft	■	3x AAA Lithium	-	-	-	■ □	-	■	-	X7 FL1	■ ■ ■ ■	□	Red, Blue Green filters included. When installed flips up to cover LEDs	princetontec.com
	Argo Haz-Lo (Haz-Lo ATEX)	STREAMLIGHT		$57	153g 5.4oz	90	8h	50h		□	■	High Low	-	113m 371ft 3200	■ 90º	3x AAA 3x Lithium	-	-	-	■ □	-	-	-	X4 FL1	■ ■	□	ATEX or HAZLOC, Class 1 Div 1. inc. elastic and rubber headbands. HAZLOC= yellow only	streamlight.com
	Buckmaster Trident	STREAMLIGHT		$47	156g 5.5oz	80	5h	63h		□ ■ ■ ■	□	High 1x Green 3x Green	-	126m 413ft 5000	■ 90º	3x AAA	-	□	-	■ □	-	-	-	X4 FL1	■ ■	□	Flood is green -only	streamlight.com
	Enduro (2018 model)	STREAMLIGHT		$20	78.5g 2.75oz	50	5.5h	25h		□	□	High Low	-	66m 100ft 1100	■ 45º	2x AAA	-	-	-	■ □	-	■	-	X7 FL1	■ ■	□	integrated helmet/ cap clip	streamlight.com
	Septor Haz-Lo/ Haz-Lo ATEX	STREAMLIGHT		$57	156g 5.5oz	85	8h	50h		□ □ □ □ □ □	□	High Low	-	50m 164ft 620	■ 90º	3x AAA 3x Lithium	-	□	-	■ □	-	-	■	X4 FL1	■ ■	□	ATEX or HAZLOC, Class 1 Div 1. inc. elastic and rubber headbands. HAZLOC= yellow only	streamlight.com
	Sidewinder Compact II	STREAMLIGHT		$109- $156	94g* 3.3oz*	55	6h	70h		□ ■ ■ ■ IR	■	High Low Flashing	-	69m 226ft 1175	■ 185º	1xCR123a Li 1x AA 1xAA Li	-	□	-	■	-	-	■	X7 FL1	■	1	*Weight includes *optional* headband (Aviation version = Green LED) both versions have Infra Red LED	streamlight.com
	Trident	STREAMLIGHT		$42	156g 5.5oz	80	5h	53h		□ □ □ □	■ □	High Medium Low	-	126m 413ft 4000	■ 90º	3x AAA	-	-	-	■ □	-	-	■	X4 FL1	■	□	Class 1 Div 1	streamlight.com
	Green Trident	STREAMLIGHT		$42	156g 5.5oz	80	5h	63h		□ □ □ ■	■ □	High Medium Low (green)	-	126m 413ft 4000	■ 90º	3x AAA	-	□	-	■ □	-	-	■	X4 FL1	■	□	Class 1, Div1. 10hrs longer on low (green LED) than the Trident (white LED)	streamlight.com
	Trident Haz-Lo/ Haz-Lo ATEX	STREAMLIGHT		$58	156g 5.5oz	85	8h	24h		□ □	□ ■	High Spot Low Spot High Flood Low Flood	-	35m 115ft 2600	■ 90º	3x AAA 3x Lithium	-	-	-	■ □	-	-	-	X4 FL1	■ ■	□	ATEX or HAZLOC, Class 1 Div 1. inc. elastic and rubber headbands. HAZLOC= yellow only	streamlight.com
	Vizion 1	UNDERWATER KINETICS		$57	110g 3.9oz	65	13h	17h		□ ■	□ ■	Spot Diffuse Diffuse Red	-	60m 197ft	■	3x AAA	-	-	-	■ □	-	-	-	X8	■ ■	□	ATEX. Light can be removed to stand as area light.	uwk.com

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