

Niagara College

18 Volt Cordless Drills

Technical Recommendation Report For J. Smith

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2012

Introduction

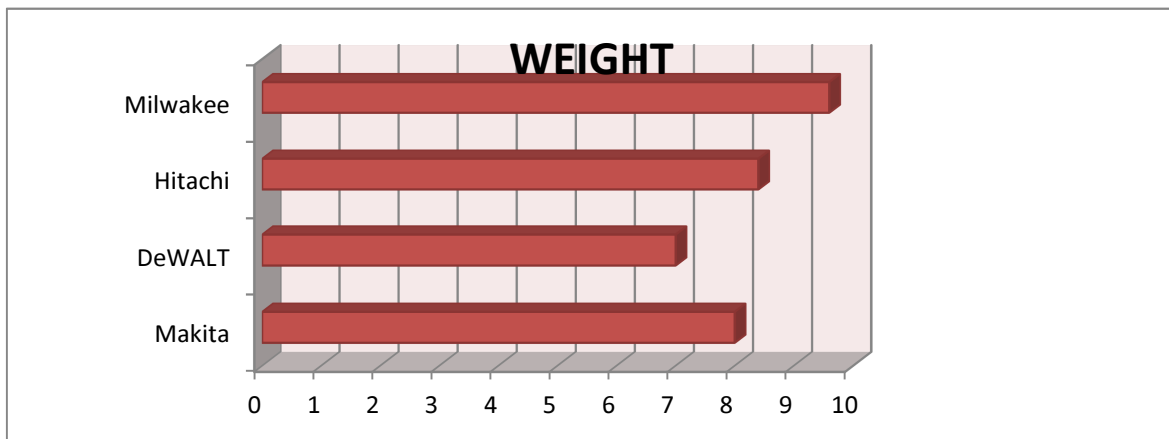
When one considers the purchase of a new cordless drill there are a number of considerations in the equation. Throughout this report the focus will be placed on ten different criteria of four different makes of drills all having 18 volt lithium ion batteries. The audience the report is being prepared for is the everyday handyman, the weekend warrior not the professional contractor who will be using the tool 40 hours a week. The report will inform the reader which item would best fit their needs as a general handyman. The reader will be able to purchase the item with confidence that all aspects of performance and value have been considered. An assumption that the buyer has a medium technical level of understanding of power tools and re-chargeable batteries. Weight, power, torque, gearing, versatility, battery length, balance, reliability, pricing and size are the major criteria being investigated. Each has its own level of importance and will be factored into the final recommendation. The four brands of cordless drills being compared in this report are, Makita LXFD01, DE WALT DC725, Hitachi DS18DSAL and Milwaukee 2601-01. A purchase price limit has been set at \$300. A vast personal knowledge of each drill is known because they have all been personal purchases and used extensively.

From this personal knowledge I have been able to prepare this report based on the decision of the aforementioned criteria. Apart from the criteria I have also placed an importance factor to each. The importance factor is exactly as it sounds, a multiplication factor out of ten that is applied to each rating of each criterion. A grand total was then applied to each drill to help in the final recommendation.



Weight

Ergonomics are an important consideration in making of a cordless drill. Your cordless drill is probably the tool you will use the most. So, why shouldn't it be designed to be comfortable? That means a drill that has a very low weight, and feels great in your hand. One of the main reasons most drills have lithium ion batteries is to reduce the weight. If you could image holding a one pound weight in your hand and doing a wind mill with it and then doing the same with a five pound weight, you can think the same way when using a cordless drill for a Friday, Saturday and a Sunday. Every ounce the designers cut is very important in the long run.



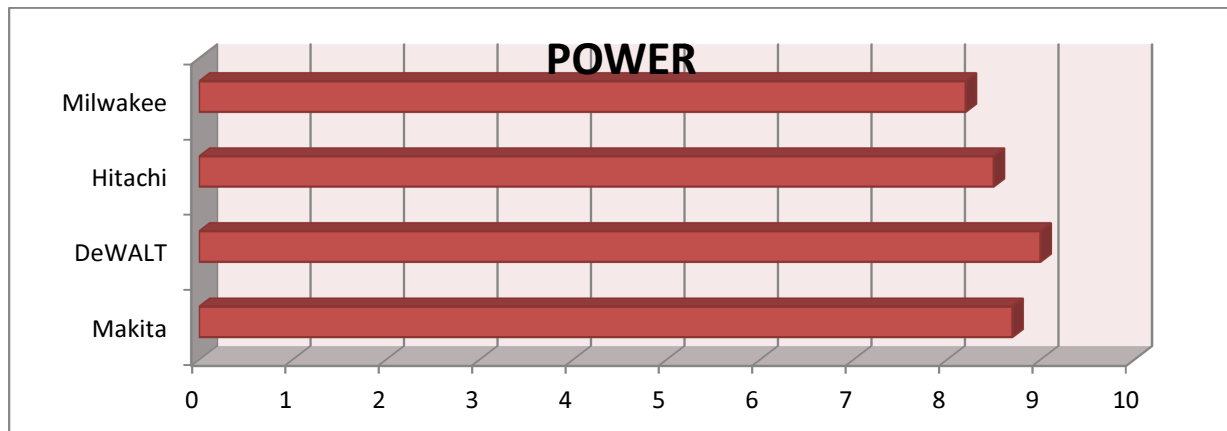
The Makita cordless drill has a weight of 4.9 lbs.[4], the DE Walt's weight came in at a hefty 5.5 lbs.[1], the Hitachi fared better at 4.6 lbs.[2], and Milwaukee was the lightest at 4.1 lbs.[3]. An importance factor was applied to the criteria of eight out of ten.

	weight /10
Makita	8
DE WALT	7
Hitachi	8.4
Milwaukee	9.6
Importance Factor	8
Makita	32
DE WALT	28
Hitachi	33.6
Milwaukee	38.4



Power

Power is important to any tool in any application. For this report power is in respect to the speed at which the drill operates. This is important for wood and steel applications. The faster a drill can operate the faster your project can be completed. Imagine laying a sub-floor in your basement where it needed to be tapconed every foot, if your drill has limited power this could double the amount of time it would take to install.



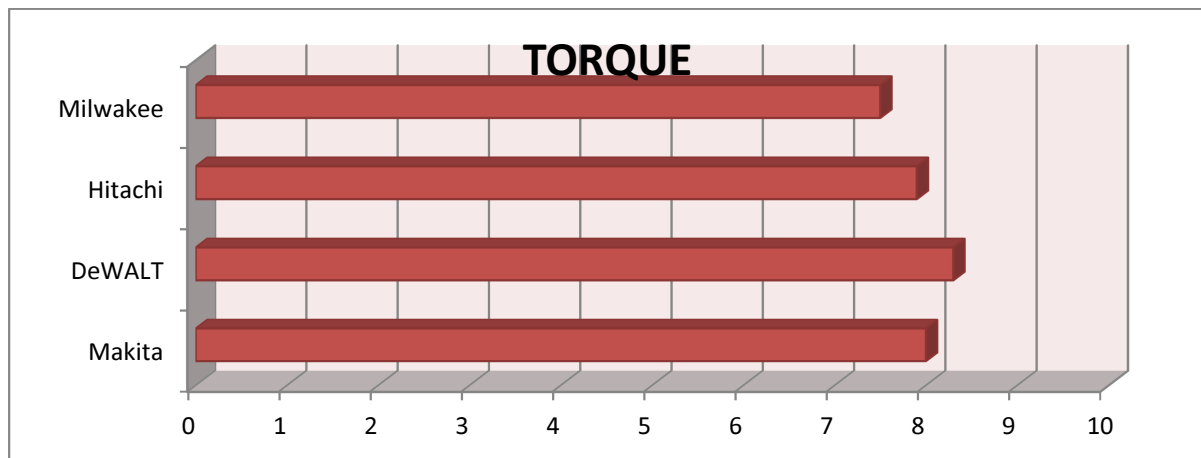
The Makita cordless drill spun at 1400 RPM[4], the DE Walt spun at 1600 RPM[1], the Hitachi fared a little lower than the Makita at 1350 RPM[2], and Milwaukee spun at a respectable 1300RPM[3]. An importance factor was applied to the criteria of eight out of ten.

NAME BRAND	power/10
Makita	8.7
DE WALT	9
Hitachi	8.5
Milwaukee	8.2
Importance Factor	8
Makita	69.6
DE WALT	72
Hitachi	68
Milwaukee	65.6



TORQUE

Torque is also important when it comes to purchasing a cordless drill. It can be simply explained as how your tool can fight through a tough situation. If you can imagine trying to drill through a two x four with a two inch spade bit. With the pressure that is applied by the user a drill with low torque will stop spinning and a drill with higher torque capabilities will keep on doing its job and spinning.



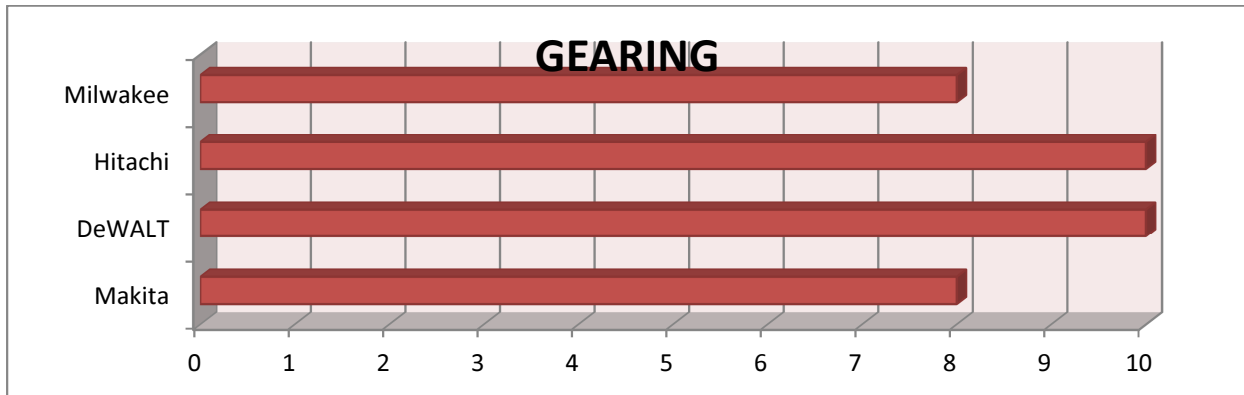
The Makita cordless drill has 450 inches to pounds of torque[4], the DE Walt has 490 inches to pounds of torque[1], the Hitachi fared a little lower than the DE WALT and Makita at 440 inches to pounds of torque[2], and the Milwaukee has 410 inches to pounds of torque[3]. An importance factor was applied to the criteria of eight out of ten. This importance factor is high because there is nothing worse than having your drill bog out under pressure.

NAME BRAND	torque/10
Makita	8
DE WALT	8.3
Hitachi	7.9
Milwaukee	7.5
Importance Factor	8
Makita	64
DE WALT	66.4
Hitachi	63.2
Milwaukee	60



GEARING

Gearing is also an important part of your drill and easily explained. Like every drill out there a gearing option is on it. Usually there is a high or low gearing selector, but on higher quality drills a medium is also available. This option dictates the rotational speed of the unit. This restriction helps with battery life, and it also is used depending on the material being used. Softer material can be drilled at slower speeds while harder materials needs a faster speed.



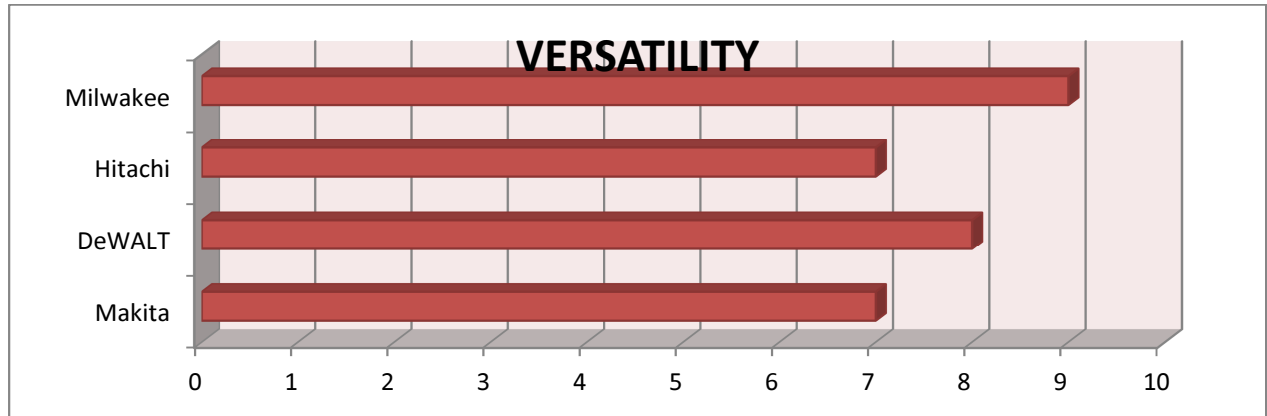
The Makita cordless drill received an eight because it has a high and low setting. The same goes for the Milwaukee[4][3]. The DE Walt and the Hitachi received a 10 because they also had a high and low setting but also had the medium as well[1][2]. An importance factor was applied to the criteria of six out of ten. This importance factor is a little low because all these units perform well in soft steel and wood, if one was to drill into hard steel or wood a powered drill would have to be used.

NAME BRAND	gearing /10
Makita	8
DE WALT	10
Hitachi	10
Milwaukee	8
Importance Factor	6
Makita	24
DE WALT	30
Hitachi	30
Milwaukee	24



VERSATILITY

Versatility is how these drills can be used in different situations. Can they all be used to drill into concrete, can they be used in cold weather, do they heat up too fast or even at all, does external temperature affect their performance?



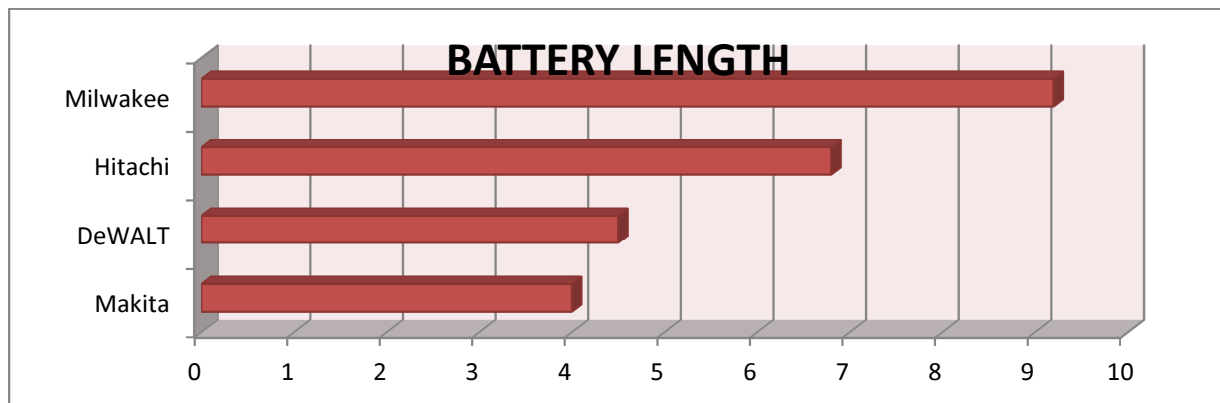
The Makita cordless drill received a seven, the DE Walt received an 8, the Hitachi fared a little lower than the DE WALT and the same as the Makita with a seven, and the Milwaukee received a nine. An importance factor was applied to the criteria of six out of ten. This importance factor is a little low because all drills perform reasonably under the conditions I previously suggested. The Milwaukee was the highest because of its light and size.

NAME BRAND	versatility /10
Makita	7
DE WALT	8
Hitachi	7
Milwaukee	9
Importance Factor	6
Makita	42
DE WALT	48
Hitachi	42
Milwaukee	54



BATTERY LENGTH

Battery length is a very important issue and it needs very little explanation. The longer the battery lasts the longer you can keep working. It also must be stated that all the drills came with two batteries and a charger. It should also be said that the extra battery fully recharged before the battery being used ran out of life.



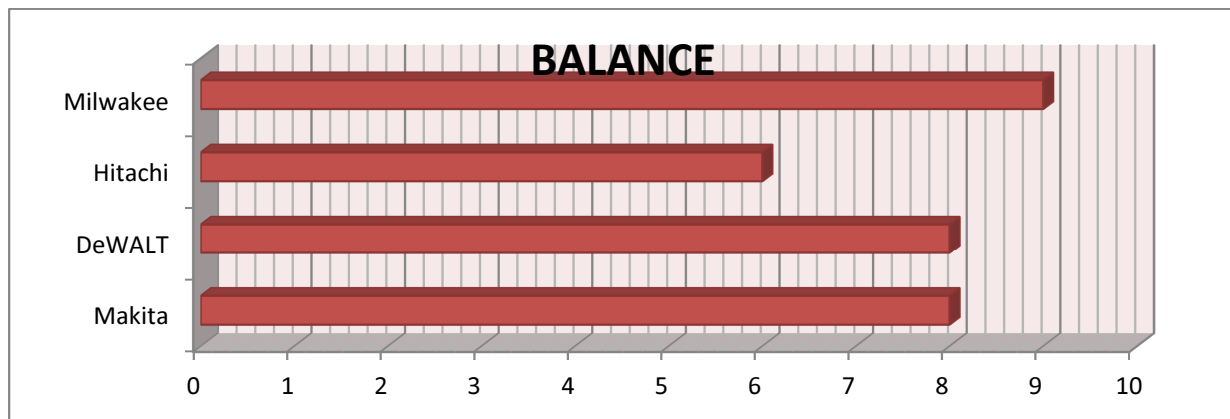
The Makita cordless drill received a four because the drill ran for 14 minutes straight on high. The DeWalt also performed low only lasting 22 minutes straight on high. The Hitachi performed better at 33 minutes straight on high. The Milwaukee performed the best and by almost double its next competitor at 63 minutes straight on the high setting as well. An importance factor was applied to the criteria of nine out of ten. This importance factor is a high because it's the battery, it's the heart of the lion and everything relies on that heart.

NAME BRAND	bat. Length/10
Makita	4
DE WALT	4.5
Hitachi	6.8
Milwaukee	9.2
Importance Factor	9
Makita	36
DE WALT	40.5
Hitachi	61.2
Milwaukee	82.8



BALANCE

Balance is very important when it comes to your cordless drill purchase. Not all drills are the same when it comes to balance. Try to imagine this, holding a broom stick in your hand, at your side with two buckets of water on the ends. Then fill one bucket with water and only fill the other bucket with half the amount of water. The strain on your wrist would be tremendous, and this is the best way to explain what an unbalanced drill would feel like after a weekend of work. So an evenly balanced cordless drill is very important.



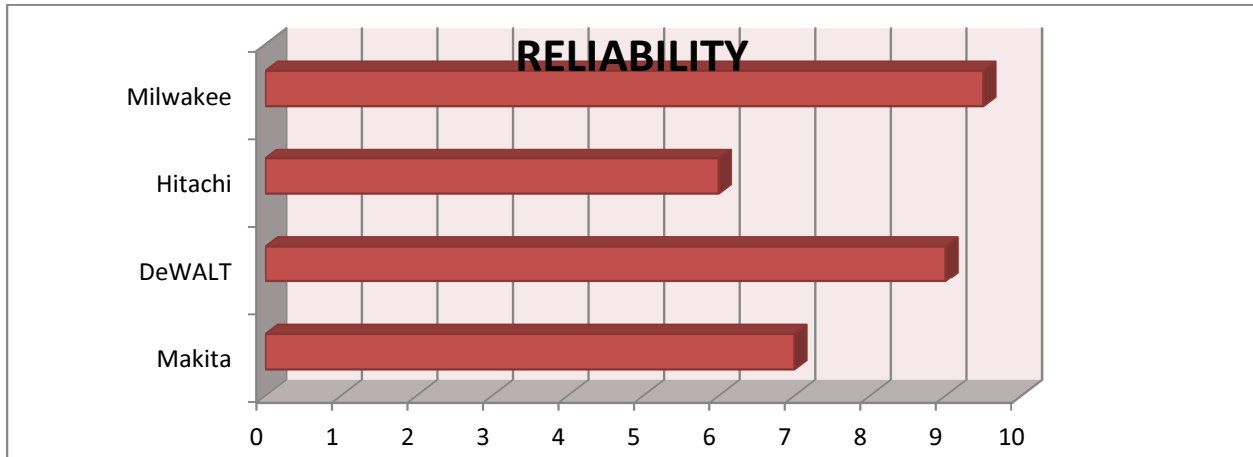
The Makita cordless drill received an 8 as well as the DE WALT. The Hitachi received a six and the Milwaukee received a nine. I can only attribute these rating to personal experience. An importance factor was applied to the criteria of nine out of ten. This importance factor is high because it makes for a long project when it feels like your tools are fighting back.

NAME BRAND	balance /10
Makita	8
DE WALT	8
Hitachi	6
Milwaukee	9
Importance Factor	9
Makita	72
DE WALT	72
Hitachi	54
Milwaukee	81



RELIABILITY

Reliability is a reference to how long will the drill perform for you without breakdown or damage of parts. Damage of parts generally refers to the brushes inside each of the units. Dead batteries are also an issue. How long or how many times can the battery be charged. These are all issues if reliability that should be considered.



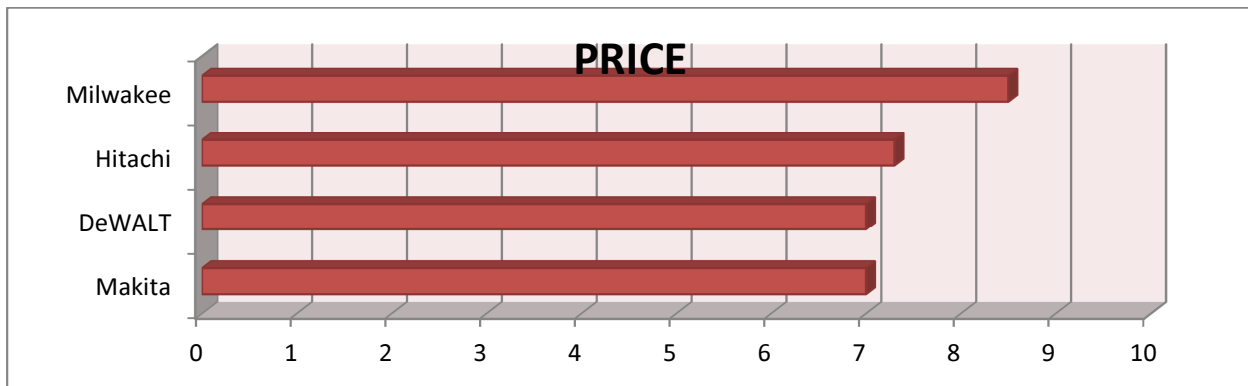
The Makita cordless drill received a seven, a lower number because I had to return a battery after eight months because it burnt out. The DE Walt received a nine because everything has performed up to expectation. The Hitachi fared lower than the Makita with a six because of the same battery issues the Makita had and the brushes had to be changed after a year and a half when the specifications imply that they should last three years. The Milwaukee received the highest grade because it has also performed up to expectations and the batteries seem to keep their power a little longer than the DE WALT. An importance factor was applied to the criteria of eight out of ten. This importance factor is high because no one wants to replace a tool before it wears out its life under normal conditions

NAME BRAND	reliability /10
Makita	7
DE WALT	9
Hitachi	6
Milwaukee	9.5
Importance Factor	8
Makita	56
DE WALT	72
Hitachi	48
Milwaukee	76



PRICE

To some the price is important and to others not so much. Like almost everything in life you get what you pay for. A \$300 limit was placed on this purchase and all four drills were under that price. For there to be a clear winner in this area there will have to be a big difference in prices.



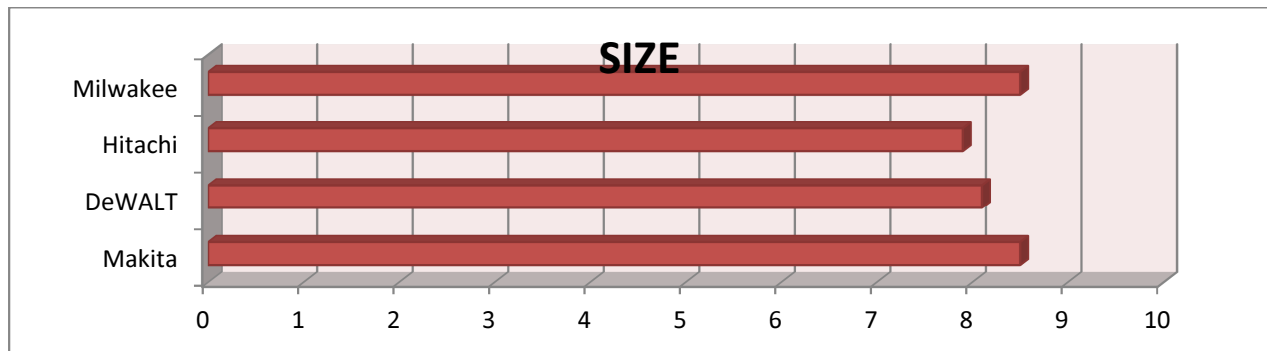
The Makita cordless drill had a price of \$299 as well as the DE WALT., The Hitachi fared better at \$279, and Milwaukee was least expensive at \$199. An importance factor was applied to the criteria of eight out of ten. The Milwaukee received the highest score because of the significant difference in price. A \$100 difference is a lot when the comparable price is \$300, that's a 30% price drop which earns Milwaukee the win.

NAME BRAND	price /10
Makita	7
DE WALT	7
Hitachi	7.3
Milwaukee	8.5
Importance Factor	8
Makita	56
DE WALT	56
Hitachi	58.4
Milwaukee	68



SIZE

Size is a factor when choosing a drill. Also it depends on the jobs at hand. If you know ahead of time what the drill is going to be used for then maybe size is not important. I assume like every handyman that your situation will change from project to project and size will probably play a factor. The main reason is the ability to get your tool into the tight positions when needed.



The Makita cordless drill earned an 8.5 as well as the Milwaukee for their eight inch stature[4][3]. The Hitachi earned a 7.9 for its eight and three quarter inch stature[2]. The DE WALT earned an 8.1 for its eight and a quarter inch stature[1]. An importance factor was applied to the criteria of six out of ten. The importance factor for this area was lower because all cordless drills are approximately the same in size, and because of this every eighth of an inch counts and therefore the higher scores for the eight inch drills.

NAME BRAND	size/10
Makita	8.5
DE WALT	8.1
Hitachi	7.9
Milwaukee	8.5
Importance Factor	6
Makita	51
DE WALT	48.6
Hitachi	47.4
Milwaukee	51



Recommendation

From all the information obtained from the previous pages an excel chart was created to help with the math and the final decision.

CORDLESS DRILLS (18 Volt)											
	weight /10	power /10	torque /10	gearing /10	versatility /10	bat. Len/10	balance /10	reliability /10	price /10	size /10	
Makita	8	8.7	8	8	7	4	8	7	7	8.5	
DeWALT	7	9	8.3	10	8	4.5	8	9	7	8.1	
Hitachi	8.4	8.5	7.9	10	7	6.8	6	6	7.3	7.9	
Milwaukee	9.6	8.2	7.5	8	9	9.2	9	9.5	8.5	8.5	
Import Factor	8	8	8	6	6	9	9	8	8	6	Total
Makita	32	69.6	64	24	42	36	72	56	56	51	502.6
DeWALT	28	72	66.4	30	48	40.5	72	72	56	48.6	533.5
Hitachi	33.6	68	63.2	30	42	61.2	54	48	58.4	47.4	505.8
Milwaukee	38.4	65.6	60	24	54	82.8	81	76	68	51	600.8

For this comparison there was a possible 700 points to be earned. There was one clear winner in this situation and it was the Milwaukee with a 600.8 out of the 700. This number was substantially lower for the second place finisher DE WALT. The DE WALT drill earned a respectable 533.5. The third and fourth place finishers were the Hitachi then the Makita. They earned 505.8 and 502.6 for their efforts.

For the serious weekend warrior/handyman I would 100% recommend the Milwaukee 2601-01. There are definitely major reasons for this, each time the importance factor was a nine the Milwaukee was rated number one. When the importance factor was an eight the Milwaukee always finished number one or two. A final consideration is the \$100 dollar savings. If the difference was only a few dollars the economics is not a huge factor, but a 30% savings is large enough to have an effect on the decision.

For all of these considerations I can confidently recommend the Milwaukee 2601-01 to any one purchasing a new cordless 18 volt lithium ion drill.

References

- [1] De Walt, "ServiceNet Official Site for Parts And Service," <http://servicenet.dewalt.com/Products/Detail?productNumber=DCD760KL>, Accessed March 1, 2012.
- [2] Hitachi,"Hitachi Power Tools Canada," http://www.hitachipowertools.ca/upload/fmproduct_files/DV18DL_DS18DL_OM_8357.pdf, Accessed March 1, 2012.
- [3] Milwaukee, "Milwaukee Nothing But The Best," http://www.milwaukeetool.com/CatalogItem/Attachments/37200_58-14-0801d2.pdf, Accessed March 1, 2012.
- [4] Makita," Makita Industrial Power Tools," <http://www.makita.com/en-us/modules/tools/ToolDetails.aspx?ID=349736>, Accessed March 1, 2012.