



SPECIFICATION SUMMARY:

SELECTED PRODUCTS

ALKALINE PRIMARY CELLS & BATTERIES

DURACELL® alkaline-manganese dioxide batteries are a popular choice for most consumer, industrial, and military applications where an economical, general purpose battery is required. Advantages include high energy output, reliability, long shelf life, and good low temperature performance.⁽¹⁾ The DURACELL® alkaline battery system is generally available in cylindrical and multicell configurations.

DURACELL PRODUCT NUMBER	SIZE	NOMINAL VOLTAGE (V)	DIMENSIONS ⁽²⁾						NOMINAL WEIGHT		NOMINAL VOLUME		CROSS REFERENCE	
			MAXIMUM		MAXIMUM		MAXIMUM							
			mm	in.	mm	in.	mm	in.	g	oz.	cm ³	in ³	ANSI	IEC

STANDARD CYLINDRICAL CELLS

			DIAMETER		HEIGHT									
MN1300	D	1.5	34.2	1.35	61.5	2.42	-	-	139	4.90	56.4	3.44	13A	LR20
MN1400	C	1.5	26.2	1.03	50	1.97	-	-	69.0	2.43	26.9	1.64	14A	LR14
MN1500	AA	1.5	14.5	0.57	50.5	1.99	-	-	23.8	0.84	8.4	0.51	15A	LR6
MN2400	AAA	1.5	10.5	0.41	44.5	1.75	-	-	11.0	0.39	3.8	0.23	24A	LR03
MN9100	N	1.5	12	0.47	30.2	1.19	-	-	9.6	0.34	3.4	0.21	910A	LR1

ULTRA CYLINDRICAL CELLS

			DIAMETER		HEIGHT									
MX1300	D	1.5	34.2	1.35	61.5	2.42	-	-	147	5.19	56.4	3.44	13A	LR20
MX1400	C	1.5	26.2	1.03	50.0	1.97	-	-	71.7	2.53	26.9	1.64	14A	LR14
MX1500	AA	1.5	14.5	0.57	50.5	1.99	-	-	24.4	0.86	8.4	0.51	15A	LR6
MX2400	AAA	1.5	10.5	0.41	44.5	1.75	-	-	11.2	0.40	3.8	0.23	24A	LR03
MX2500	AAAA	1.5	8.3	0.33	42.5	1.67	-	-	6.0	0.21	2.3	0.14	25A	LR8D425

OTHER SELECTED MULTICELL BATTERIES

			LENGTH		HEIGHT		WIDTH							
MX1604	ULTRA 9-VOLT	9	26.5	1.04	48.5	1.91	17.5	0.69	46.5	1.64	22.8	1.39	1604A	6LR61
MN1604	9-VOLT	9	26.5	1.04	48.5	1.91	17.5	0.69	45.0	1.60	22.8	1.39	1604A	6LR61
7K67	J	6	35.6	1.40	48.5	1.91	9.1	0.36	34.0	1.20	15.7	0.96	1412AP	4LR61
MN908	LANTERN	6	67.0	2.64	115	4.53	67.0	2.64	612	21.6	501.8	30.6	908A	4LR25X
MN918	LANTERN	6	136.5	5.37	127	5.00	73.0	2.87	1270	44.8	1243.5	75.9	918A	4LR25-2
MN1203	LANTERN	4.5	62.0	2.44	67.0	2.64	22.0	0.87	154	5.43	91.4	5.58	-	3LR12
MN21	CYLINDRICAL	12	10.3	0.41	28.5	1.12	-	-	7.40	0.26	2.30	0.14	-	-

(1) Operating temperature range is -20°C to 54°C (-4°F to 130°F)

(2) Dimensions are IEC/ANSI standards.

Table 1

PRODUCT NUMBER	SIZE	NOMINAL VOLTAGE	RATED CAPACITY*	LOAD	WEIGHT		VOLUME		TYPICAL GRAVIMETRIC ENERGY DENSITY**		TYPICAL VOLUMETRIC ENERGY DENSITY	
		volts	ampere-hours	ohms	pounds	kilograms	cubic inches	litres	watt hours per pound	watt hours per kilogram	watt hours per cubic inch	watt hours per litre
MN1300	D	1.5	15.000	10	0.304	0.138	3.440	0.056	59.2	130	5.2	322
MN1400	C	1.5	7.800	20	0.143	0.065	1.640	0.027	65.5	144	5.7	347
MN1500	AA	1.5	2.850	43	0.052	0.024	0.510	0.008	65.8	143	6.7	428
MN2400	AAA	1.5	1.150	75	0.024	0.011	0.230	0.004	57.5	126	6.0	345
MN9100	N	1.5	0.800	100	0.021	0.010	0.210	0.003	45.7	96	4.6	320
7K67	J	6.0	0.580	340	0.075	0.034	0.960	0.016	37.2	82	2.9	174
MN908	Lantern	6.0	11.500	15	1.349	0.612	30.620	0.502	40.9	90	1.8	110
MN918	Lantern	6.0	24.000	9	2.800	1.270	75.880	1.243	41.1	91	1.5	93
MN1604	9V	9.0	0.580	620	0.101	0.046	1.390	0.023	41.4	91	3.0	182

* TO 0.8V per cell at 21°C (70°F). ** Based on 1.2 volt average operating voltage per cell at 21°C (70°F).

Table 1. Comparison of typical energy densities of major DURACELL® alkaline cells/batteries.

Using the MN1300 data from Table 1 the previous equations can be used to determine energy density for this cell.

Gravimetric Energy Density:

15.00 Ampere Hours x 1.2 Volts	=	59.2 Watt-Hours	or	130.4 Watt-Hours
0.304 Pounds (0.138 Kilograms)		Pound		Kilogram

Volumetric Energy Density:

15.00 Ampere Hours x 1.2 Volts	=	5.23 Watt-Hours	or	320 Watt-Hours
3.44 Cubic Inches (0.563 Litres)		Cubic Inch		Litre

5.7 Shelf Life

Alkaline cells have long shelf storage life. After one year of storage at room temperature, cells will provide 93% to 96% of initial capacity. When stored for four years at 70°F (21°C), service of about 85% is still attainable. Storage at high temperatures and high humidity will accelerate degradation of chemical cells. At low temperature storage, the chemical activity is retarded and capacity is not greatly affected. Recommended storage conditions are 50°F (10°C) to 77°F (25°C) with no more than 65% relative humidity.

Figure 11 (overleaf) compares various DURACELL® zinc anode systems and the effect of temperature on capacity retention. At room temperature, the alkaline system loses approximately 5% capacity after one year of storage. Subsequent capacity loss is approximately 2% per year. By comparison,