

Press Release

CenturyYuasa

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A NEW CENTURY OF BATTERY DESIGN

What makes for a good battery here in Australia may not apply elsewhere and vice-versa. Patterns with climate, road conditions and journey types can vary enormously around the world.

Safely hidden inside the rectangular battery container is an 'acid soup' sloshing around lead plates and other components. Temperature has a dramatic affect on this mixture making Australia's battery needs quite unique.

Surprisingly, higher temperature gives higher electrical output. The hotter it is, the more active the 'acid soup' becomes.

The general rule-of-thumb is that a battery at 18 degrees Celsius puts out twice the electrical capacity and current than compared with the same battery at minus 18 degrees Celsius.

A hotter temperature also makes a battery's work easier. Engine oil is thinner at higher temperatures and makes it easier to get an engine turning over. Spare a thought for those Siberian truck drivers who have to start a fire under their engine sumps to melt the engine oil.

While tropical heat will give a battery a boost, snowy winter conditions can push a battery to its limits. The impact that colder climates can have on battery performance is so severe that overseas manufacturers focus their design efforts at squeezing small extra amounts of starting power out of their batteries, at the expense of other design features. We don't need to worry about this so much in Australia.

In fact, the ratings provided on Australian batteries can be misleading because they are rated using tests relevant for the colder climates of North America and Northern Europe. These tests are conducted at minus 18 degrees Celsius. So for example, a new fully-charged battery with a CCA ("cold" cranking amps) rating of 600 would really offer double the "cranking amps" at a more normal Australian temperature of 18 degrees Celsius - far more than what is required to start an engine. Mainland Australia doesn't experience extreme sub-zero temperatures in winter except for in small pockets (eg, Mt Kosciusko).

Therefore, buying a battery because it has a slightly higher CCA rating is not a wise decision in Australia. Other factors are more important – such as corrosion resistance.



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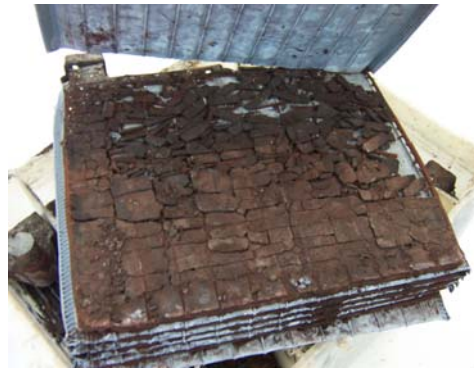
HEAT & CORROSION EFFECT

What we do have to worry about in Australia is that as the 'acid soup' in a battery gets hotter it becomes more corrosive – eating away faster at the critical lead components of the battery or reacting internally to form hard sulphate layers that can inhibit electrical current flows.

The general rule-of-thumb for chemical reactions in a battery is that for every 10 degree increase in temperature, there is a doubling of chemical reaction rates.

Battery designs that produce marginally higher cranking amps in cold winter conditions can result in batteries that are more susceptible to corrosion in hotter climates. Compromises are made in the selection of materials and in critical component thicknesses.

In fact, recent research conducted in the United States by the Battery Council International shows that the life of a calcium/calcium design battery reduces as average temperature increases – from 60 months in the colder north of the US down to 25 months in the more sub-tropical south.



Corroded Positive Plates – End of Battery

Summer operating temperatures for batteries are also hotter than what most people would expect. Century Yuasa has conducted a study of under-bonnet temperatures with the latest model Ford Falcons and Holden Commodores operating in Sydney and Melbourne. A variety of highway and city driving conditions were included in the study.

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Temperature Trials

Driving Conditions	Temperature °C	
	<i>Ambient</i>	<i>Under bonnet</i>
Highway	35	78
Highway	28	73
City	37	85
City	29	85
City	30	77
City	35	77
City	16	75

The findings were that under-bonnet temperatures ranged from 73 degrees Celsius to 85 degrees based on an ambient temperature range of 28 degrees to 37 degrees. It gets very hot under the bonnet and it is interesting to note that this heat does not really change with the outside temperature.

A GOOD BATTERY FOR AUSTRALIA

Australian conditions also make internal battery corrosion worse. Our rough roads can vibrate and stress critical components causing cracks, allowing acid to seep in to cause corrosion. A battery designed for Australian conditions should have components built with extra strength and maximum corrosion resistance.

The constant use of headlights, air-conditioning and other accessories in congested traffic conditions can also put a battery under strain. Automobiles generally do not provide sufficient recharging capacity at slow speeds. A battery designed for Australian conditions should have enhanced cycling ability to power accessories when they are needed.

Much like boiling a jug of water, excessive heat leads to fluid loss in a battery. Even sealed automotive batteries have vents to allow gassing and hence water loss. A battery designed for Australian conditions should have low water loss characteristics to begin with, and in addition, should allow for the maintenance of fluid levels.



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Australia also has an older vehicle fleet. Many older vehicles experience problems with their electrical systems that can lead to a flat battery before they are fixed. Many overseas battery designs have a poor ability to recover once they have gone flat. A battery designed for Australian conditions should have the capacity to be easily recharged after going flat.

OUR SOLUTION

Century Yuasa has invested \$6 million dollars and two years in developing a new battery design suited to Australian conditions. The company has reviewed the best battery technology the world has to offer, plus it has used the common sense of its own local engineers who fully understand the implications of Australia's climate and driving needs.



As a result of our R&D efforts, the new Power Series of batteries has been developed. Following a rigorous testing program, the new Power Series is proving to be a winning technology capable of far longer life than other common automotive battery brands.

The Power Series delivers longer life by taking account of the dangers of corrosion and water loss, while at the same time offering enhanced cycling capability.

But Century Yuasa does not want the market to have to rely on only its claims. The company is investing heavily in independent testing to benchmark the Power Series against other brands sold in the Australian market. The independent laboratory testing program is clearly demonstrating that Power Series batteries outlive other brands by a substantial margin. Results will be released shortly.



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