



Product Focus:

Evans Powercool 180 waterless coolant

The words 'waterless' and 'coolant' may sound like a contradiction in terms but let's take a look at what could be the most revolutionary engine cooling product in decades...

Words: Stavros Photos: Stephen Hall



The issue

While we all immediately associate water with engine cooling, it's actually far from perfect and has some serious downsides that we have all learnt to take for granted. Despite these issues there has never been a viable alternative to the usual water/anti-freeze mix... until the release of Evans waterless coolant, that is.

Evans Powercool 180 isn't yet another cooling system additive, in fact it's a synthetic liquid that's designed to totally replace, and indeed outperform, the usual water/anti-freeze mix as your engine's coolant. Not only this, but it's designed to use all your existing cooling system components such as your standard radiator, hoses, and header tank, so installation is a relatively pain-free process.

Why do we need coolant anyway?

While on the face of it this may sound like a stupid question, the answer is more complex than you might think.

The reality of engine cooling is, while some engine components routinely reach incredibly high temperatures, many components can withstand far less, and part of your cooling system's job is to keep these at a reliable level.

Even more importantly, coolant is also used to prevent engine oil from overheating and losing its lubricating properties, not to mention keeping even the hottest components within their safe operating limits. It's said that around 60% of engine failures are directly related to overheating, and the damage can be severe, with badly warped cylinder heads a good example of direct overheating. Even worse than this is the fact that almost all engine components can be rendered nothing more than scrap if the overheating causes the oil temperature to raise too high that it loses its ability to lubricate.



So why not water?

While cooling and water go hand in hand, and it's well proven as a coolant, it has various issues that we just take for granted as the unavoidable side effects of water and, in fact, there are other problems associated with it that most of us don't realise. While it would take an entire feature in its own right to cover all issues, here's a run down of the biggest problems...

Overheating

While plain water boils at 100° Celsius, and a 50-50 water/anti-freeze mix boils at around 103°, these are very low temperatures in a performance engine. To increase the boiling point to 120-130°, normal engine cooling systems are pressurised to as much as 20psi. Despite this increase, it is all too easy to reach the boiling point, especially on hard used and tuned engines, and almost everybody has experienced an overheating car at some point in their lives.

Pressure

As mentioned above, normal water-based cooling systems need to be pressurised, typically between 15 and 20psi. While they are certainly designed to withstand the pressure, any pressure creates strain, and as components get older, particularly hoses, they can fail and burst, leading to rapid overheating due to total coolant loss.

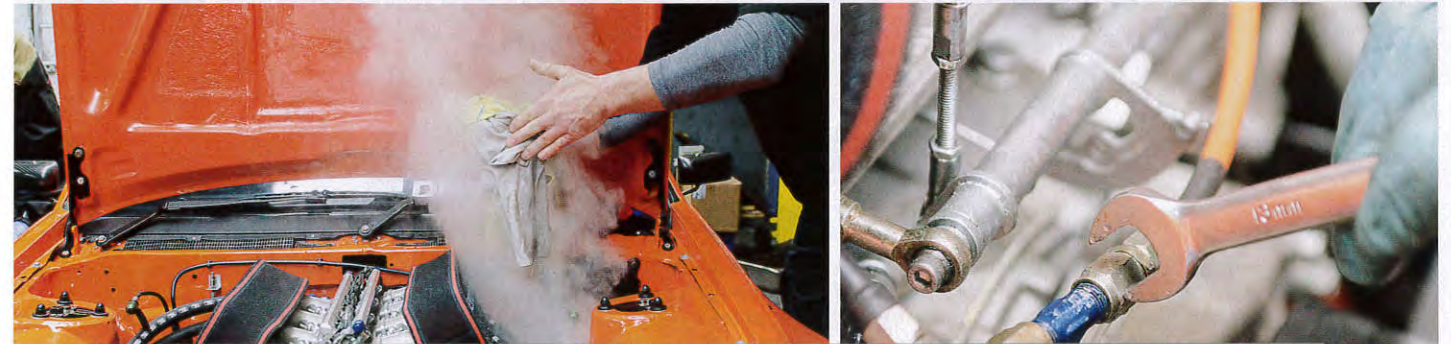
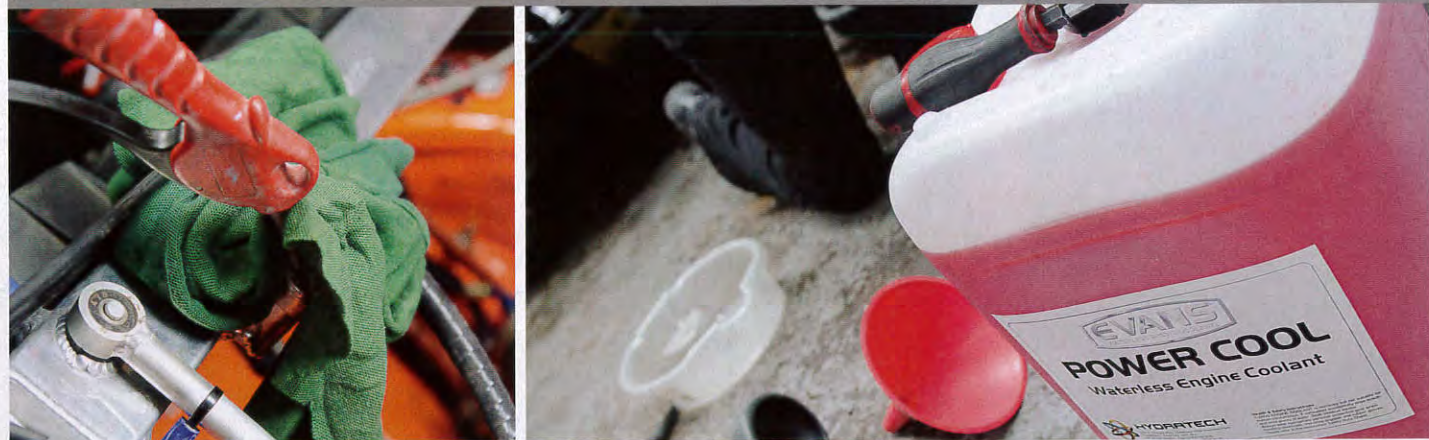
Corrosion

Water is corrosive, and while part of the duty of modern anti-freeze solutions is to prevent that, they cannot fully eliminate corrosion, and over time water will slowly eat through steel and iron engine components, which include the radiator, pipework, water pump, turbocharger cores, and even many engine blocks.

Hot spots

This is one of lesser known issues with using water as an engine coolant as it's an invisible problem that you may never actually realise is happening. Anyone who's heated water in a saucepan will have noticed that even long before the boiling point you get a film of small bubbles coating the sides and bottom of the pan. These bubbles, and in fact much bigger ones too, can occur in certain parts of your cooling system when the temperatures get very high; particularly around the combustion chambers in the cylinder head. The issue is that the coating of bubbles means less cooling water is now touching the engine in these places, dropping cooling at these points down to almost non-existent levels, potentially causing severe engine damage even when your temperature gauge may show no sign of trouble.

These hot spots can make combustion chamber temperatures high enough to lead to engine damaging detonation, therefore ignition timing and boost pressure levels have to be prematurely capped to prevent reliability issues.



The advantages of Evans waterless coolant

The reason we've chosen to do a Product Focus on Powercool 180 is the simple fact that, in essence, all the biggest problems of using water as a coolant are solved by replacing the water with this synthetic liquid. While this stuff isn't pretending to transform your car's performance when it has no current cooling problems, for people who push their car's cooling systems to the limit, Powercool 180 may be worth considering.

No overheating

Evans waterless coolants have an atmospheric pressure boiling point of a massive 180°C, which is way beyond even what the highest pressure water-based cooling systems can achieve, meaning that even in the most severe situations you're unlikely to find yourself in a boil-over situation. As many of us have unintentionally found out over the years, coolant issues only tend to become terminal once the coolant has literally boiled and steam is pouring out the engine, and with a 180°C boiling point, that's a lot less likely to happen.

Less hot spots

While preventing overall boil-over is an advantage, the most important factor of the much higher boiling point of Evans coolants

is the reduction of isolated areas of boiling coolant, particularly in the cylinder heads. With hot spots no longer an issue, there is much less susceptibility to engine damaging detonation, and many race teams have directly attributed their increases in reliability after switching to Powercool 180 to the reduction or elimination of these normally invisible hot spots.

No pressure

Conventional water coolant systems are pressurised to increase the boiling point but with the 180° C boiling point of the waterless coolant there is no need to pressurise the system at all. This reduces stress on the coolant hoses, water pump, and the radiator, improving reliability and, as a bonus, coolant flow increases when not under pressure, further reducing the chances of hot spots.

No corrosion or freezing

As mentioned previously, although anti-freeze mixtures have a dual use as a corrosion inhibitor, they aren't 100% effective so, over time, it still occurs. Evans waterless coolant on the other hand eliminates corrosion and limescale build up, keeping cooling systems at optimal performance, even decades later. From an anti-freeze point of view you have zero worries with Evans coolants too, as they're all proven to stay in liquid form even at -40° Celsius.





Installation

While Powercool 180 and indeed all Evans coolants are designed to totally replace water, for them to be effective, you need to have a maximum of 3% water left in your coolant system, ideally less. This means the install process is actually a little more complex than simply draining the water and refilling with the new coolant. Considering all the places water can pool inside an engine, even with all the coolant hoses removed, removing 97%+ of the water would be no easy task, but thankfully Evans has an easy solution in the form of its prep fluid, which absorbs water and helps clean out the system.

1) Draining the system

While this stage is quite self-explanatory, you really do want to remove as much water as possible, so it becomes slightly more in-depth than usual. First you should remove the filler cap and run the engine until warm. Then drain the fluid as comprehensively as possible by removing any hoses that may be trapping water, tilting the car so the fluid travels towards the drain points and, if possible, even using an air compressor to blow any residual liquid out.

2) Using the prep fluid

Reconnect the cooling system, fill it with the prep fluid, and once again run the car up to normal coolant temperature. The prep fluid will absorb any remaining water and then it can all be once again drained from the system. The prep fluid can actually be reused, so it's worth catching it in a suitable container for possible future use.

3) Filling with Evans coolant

This is exactly the same as adding the traditional water/anti-freeze mix, so you simply fill the system up to the usual maximum point, run the engine and make sure there is no trapped pockets of air, refit the filler cap, and you are ready to go!



Waterless coolant in competition use

While Powercool 180 is used in countless race and rally cars worldwide, the ultimate test for any cooling system is drifting, as the combination of big power and minimal frontal airflow to the radiators puts massive strain on any cooling system. Powercool 180 has been used by a number of top drift teams for a number of years, and now arguably the best known European drift brand, Driftworks (www.driftworks.com), is not only a UK distributor, but is using it on its own incredible V8-powered Toyota Corolla AE86.

With the car making its competition debut in the British Drift Championship recently, here's what owner and driver Phil Morrison has to say: "As part of our pre-season testing we really abused the car trying to find any potential faults with it, especially from a cooling point of view. The Evans coolant has kept the car at a stable temperature even under heavy load runs for over ten minutes with minimal airflow to the radiator – no easy task with any drift engine, especially not a big V8 like ours!"

Contact:

Evans Coolants: www.evanscoolants.co.uk
Driftworks: www.driftworks.com

MAXIMISE ENGINE PERFORMANCE WITH



AS USED & RECOMMENDED BY



For more info & your nearest stockist visit
www.evanscoolants.co.uk

2014 RANGE **ROTA** Engineered for Performance



The UK's largest Lightweight & Drift ranges



MXR
18x9"/10"/11"

RKR
17x8.5" / 17x9.5"

Force
18x8.5"/18x9"/18x10.5"

Drift Wheels:

- 17x9" From £165
- 17x9.5" From £170
- 18x8.5" From £210
- 18x9" From £220
- 18x9.5" From £230
- 18x10" From £240
- 19" From £240



See the full range now at:

RARE RIMS
.CO.UK

Lightweight Wheels

- 15" from £117
- 16" from £127
- 17" from £145
- 18" from £150



Titan
17x7.5"/17x8"

GRA
17x7.5" / 18x7.5"

From 4.9KG!



Zero Plus
15x7"/15x8"

Fighter
15x6.5"/16x7"
17x8"/17x9"

GR6
18x7.5"

Over 14,000 wheels in stock available for next day delivery!
Many different styles, sizes, finishes, offsets & widths available
Upload your car now to our virtual fitting bay



www.rarerims.co.uk
t: +44 (0) 1363 777 007 e: sales@rarerims.co.uk