



Motor vehicle manufacturer OKA Australia leads the way with natural hydrocarbon refrigerants

07 Dec 2010: Hydrocarbon refrigerants manufacturer HyChill Australia is pleased to announce that the Western Australian based designer and manufacturer of the “OKA” brand of special purpose 4WD on/off road vehicles is the first vehicle OEM in the world to select and use hydrocarbon refrigerants in their production line vehicles. OKA has been using HyChill’s hydrocarbons in production for approximately four years. After two decades supplying the automotive air conditioning service market, HyChill is the first hydrocarbon refrigerant brand in the world to be used by a vehicle OEM for production vehicles.

In addition, the entire line of European-built AVIA trucks, distributed by Reymer Pty Ltd, parent company of OKA Australia, will shortly go on sale and will also be equipped with HyChill refrigerants.

“This is an Australian made natural hydrocarbon refrigerant being adopted by an Australian motor vehicle design and manufacturing company providing a solution which is proven safe, provides world-beating cost and performance characteristics, and sets new standards in minimising the environmental footprint of automotive air conditioning,” says HyChill Australia’s Mr John Clark.

Andy Granger, Reymer Pty Ltd’s Head of Marketing and Business Development, the manufacturer of OKA trucks and buses says, “Compared to fluorinated gas alternatives, the vastly increased chilling performance of HyChill Minus 30EC refrigerant has many advantages for a commercial vehicle manufacturer. For example, we are confronted with increasing levels of heat rejection from engines – an unfortunate side effect of making engines more emissions friendly. The engine and cooling system are directly below the driver’s cab so ultimately some of that heat ends up soaking into the cab structure - the increased performance of HyChill more than compensates. Furthermore, the addition of emissions control systems means that we have less space in which to package chassis and cab equipment; using HyChill Minus 30 EC, we can gain performance points without having to increase evaporator or compressor size.”

“This announcement is a huge breakthrough for hydrocarbon refrigerants in the automotive air conditioning sector,” says John Clark, a Director of HyChill. “In the early 90’s, vested interests ran ridiculous ‘bombs in kitchens’ campaigns, trying to keep the refrigerator industry from seeing the sense in using hydrocarbons. Such campaigns can be very effective at misinforming and scaring people off – for a time. However after the first refrigerator OEM made the switch to the Greenpeace-inspired ‘Greenfreeze’ hydrocarbon fridge concept the rest of that industry finally recognised how seriously they had been misguided. Today, 35% - 40% of the world’s domestic fridges are ‘Greenfreeze’ hydrocarbon fridges and that share is increasing. Campaigns similar to “bombs in kitchens” were also run in the motor vehicle air conditioning industry and these, unfortunately, succeeded in entrenching a whole range of misconceptions and fear about the viability of hydrocarbons in that market. However, this announcement by HyChill and OKA demonstrates that awareness and acknowledgement of the real-world evidence that hydrocarbons are both safe and superior in vehicle air conditioning is now approaching ‘critical mass’.”

“Peer-reviewed published research has already verified 20 years of safe use of hydrocarbons in the automotive service market. This announcement by the OKA Australia is a welcome and necessary progression that makes these facts even harder to ignore. I would not be at all surprised if this development marked the beginning of the overthrow of this formerly monopolised market, in a similar way that Greenpeace’s ‘Greenfreeze’ revolution did many years ago.”

“I’m excited to be at the leading edge of *Greenfreeze Part Two*,” said Mr Clark.

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Further notes and information for Editors:

As mentioned above OKA has been developing systems using HyChill's hydrocarbon refrigerants for all their new vehicles for four years already. So why wait until now to go public?

"Both OKA and HyChill agreed it was best kept quiet for at least a few years", says Mr Clark "HyChill didn't come down in the last shower. We bear the scars from more that 15 years of doing battle with some of the world's largest multinationals on turf that has been theirs alone for over 50 years. We know how ugly it can get. So we decided to wait until we had years of safe use in an OEM context already under our belt, as this limits the options opponents of hydrocarbons have in their likely attempts to discredit or downplay this achievement."

"OKA's selection of hydrocarbons ought to trigger a fresh approach from vehicle manufacturers and policy makers. While we don't expect major US or European car makers to be knocking on our door any time soon, more innovative and open minded manufacturers should take note of this opportunity to sidestep poor historical choices of others that currently hold the industry back. Right from the beginning the suitability of hydrocarbons in car air conditioning was overlooked based on misinformation. We hope that this announcement is the trigger for a more objective reassessment."

"Currently the global car industry are tying themselves into knots trying to choose between two weaker options because they had long ago mistakenly written off the best choice. The current options in contention are natural CO₂ and synthetic f-gas HFO-1234yf. CO₂ in cars suffers from very poor performance/efficiency in extreme climates. HFO-1234yf is relatively very costly, has relatively poor performance (compared to hydrocarbons) and is the subject of a growing list of concerns including toxicity, acidic environmental degradation by-products and energy- and waste-intensity of manufacturing. Decision makers would be wise to free themselves of flawed historical perceptions before their competitors perform an 'end run' around them by using hydrocarbons."

"HFC-134a is now being phased out for environmental reasons and, until now, HFO-1234yf is touted as the only likely alternative. HFO-1234yf is flammable, as is HyChill Minus 30, but as 20 years of use in the real world shows, flammable refrigerants can be safely used in standard car AC systems. Additional safety measures can also be employed in designs should manufacturers seek wider safety margins. The predictable attempts currently being made to "split hairs" regarding the flammability levels of these two alternatives are simply misleading, and the historical record already proves such debates are pointless. Unfortunately, commercial pressures are encroaching on the refrigeration industry's own hazard classification systems. People seeking 'arms length' information on flammability would be well advised to consider independent authorities with test methods that are uniform and publicly documented, such as the US Department of Transport (DOT), International Maritime Dangerous Goods (IMDG) and the International Air Transport Association (IATA). In Material Safety Data Sheets (MSDS), these organizations assign both hydrocarbons and HFO-1234yf the same flammability hazard classification (class 2.1)."

"These circumstances creates an opportunity for the smaller OEM's to 'leapfrog' their larger rivals," continues Mr Clark.

"By adopting hydrocarbon refrigerants they can deliver more efficient, more environmentally sustainable, less toxic, higher performance AC systems with confidence that they have a proven safety history - and all this comes at a lower price. Auto service workshops all over Australia and in other countries have known this for 2 decades now, and OKA Motor Company is the first manufacturer to get on board."

Just how widespread is the use of hydrocarbon refrigerants in vehicle air conditioning?

Since 2004 there has been peer-reviewed literature, published in a world-class journal, which quantifies the extent of use of hydrocarbon refrigerants in the automotive service market and the safety trends that have developed in that context. The full reference to that document is below:

Maclaine-cross, I. L., *Usage and Risk of Hydrocarbon Refrigerants in Motor Cars for Australia and the United States*, [International Journal of Refrigeration](#), Vol. 27 No. 4, pp. 339-345, June 2004.

That paper can be viewed [here](#). In summary, it quantifies that usage of hydrocarbons in the automotive air conditioning service market in Australia and the USA alone amounted to at least 20 million car user years by



2004. That number has steadily grown every year since. That research has never been refuted or countered by any subsequent peer-reviewed research. Rather than taking a theoretical approach, this research is based on real-world commercial usage and further illustrates that the historical preconceptions against these refrigerants was based on flawed information, flawed tests and flawed modeling.

Consistent with the widespread use of hydrocarbon refrigerants in Australia, the Australian network of technical and further education ('TAFE') colleges include training on the safe use of hydrocarbons as a standard module within their curriculum, and use hydrocarbons routinely in their practical training classes. The TAFE network trains the majority of air conditioning service personnel in Australia.

Due to 20 years of use in the auto service market, HyChill's has developed extensive distribution networks. In Australia, HyChill refrigerants are supplied to the auto service market both through specialised dealers and "big brand" auto parts distributors such as [Burson Auto Parts](#), a publicly listed company. Burson has distributed HyChill since the beginning and it remains one of their most successful products. The majority of HyChill's automotive refrigerants are consumed by professional auto service workshops.

More about the real reduction in environmental footprint provided by hydrocarbon refrigerants in automotive air conditioning.

The global environmental significance of this announcement is hard to overstate. The recently released executive summary of the Montreal Protocol's Scientific Assessment Panel states that HFC-134a emissions are growing at 10% p.a. HFC-134a has a "Global Warming Potential" (GWP) of 1430 – i.e. every kg of HFC-134a that leaks has an equivalent global warming impact of 1.43 tonnes of CO₂. In comparison, hydrocarbons have a GWP of 4. It is well recognised that hydrocarbons have significant performance advantages over HFC-134a, particularly in high ambient temperatures, leading to much lower indirect emissions from fuel consumption as well.

Europe will ban HFC-134a in new models from 2011 and in all new vehicles from 2017, and the global vehicle industry is in dire need of an environmentally benign solution that meets the markets demanding performance, servicing and cost criteria. Unfortunately, concerted attempts to misinform and make hydrocarbons "controversial" have been successful in keeping hydrocarbons off the agenda in many high-level forums. Furthermore, continual and ongoing attempts to wield influence to erect regulatory and administrative hurdles to hydrocarbons are the 'standard fare' of marketers of competing classes of refrigerant that are technically inferior. Nevertheless, many hydrocarbon manufacturers like HyChill have had growing success by taking the product directly to market and selling hydrocarbons on it's merits.

"So we are now in the position where we have extensive service market experience which is now reinforced by this groundbreaking OEM decision," continues Mr Clark. "As with the OKA decision, once the truth about safety is known, the product is clearly the most efficient, practical and environmentally beneficial solution available and simply sells itself."

For further information about the real-world progress of hydrocarbons and other natural refrigerants in replacing f-gases we recommend the latest edition of Greenpeace International's "Cool Technologies: Working Without HFC's". The latest (2010) edition can be viewed here:

<http://www.hydrocarbons21.com/papers.view.php?id=82>

Superior Performance of Hydrocarbon Refrigerants

"Adopting hydrocarbons for motor vehicle air conditioning is one of those rare win-win situations where reduced cost, improved performance and lower environmental impact has really arrived," says Mr Ken Rammell, HyChill's Perth representative who was instrumental in developing HyChill's relationship with OKA.

Particularly in the harsh Australian outback, OKA's HyChill-powered air conditioners shine. "HyChill's Minus 30 EC ('Extreme Conditions') really comes into it's own when operating in extremely hot conditions. The thermodynamic properties of this product outperforms any alternative on the market today in extreme conditions by a significant margin. It has brought a lot of success for HyChill in the mining industry. HyChill Minus 30 EC on mine sites is saving some of the larger mine operators millions of dollars a month in maintenance and downtime costs due to reduced failure rates and the ability to keep working where all other



alternatives simply fail to function,” says Mr Rammell.

Mr Clark adds, “Vehicle manufacturers spend millions of dollars researching ways to squeeze every last drop of fuel efficiency out of their vehicles. By adopting hydrocarbons, OEM’s will gain significant increases in real-world fuel efficiency for free.”

And if you’re looking for some ‘devil in the detail’ of this announcement, there isn’t any. Mr Clark adds, “These systems are ‘standard’ design, direct expansion vapour compression systems. These systems will even work with fluorinated refrigerants such as HFC-134a, but with inevitably lower performance and a much larger environmental footprint.”

Summary:

The reasons OKA Australia has selected hydrocarbon refrigerants include:

- the obligation to produce efficient vehicles with the smallest possible environmental footprint is an obligation OKA takes seriously;
- hydrocarbons have superior performance compared to all other available options - HyChill Minus 30 EC simply cools faster and longer than HFC-134a systems. Minus 30 EC has lower ‘high-side’ pressures, higher ‘critical temperature’, excellent material compatibility, superior chemical, superior thermal stability and is compatible with oils that also have superior chemical and thermal stability. These are many of the reasons why hydrocarbon refrigerant based air conditioning systems delivers higher performance, durability and reliability and lower maintenance costs;
- the fuel efficiency of vehicles equipped with hydrocarbon refrigerants is superior to fluorocarbon refrigerants (further reducing total environmental footprint of the AC system);
- the ability to make genuine environmental claims for OKA vehicles is an important marketing advantage;
- the different risk profile of hydrocarbon refrigerants simply requires appropriate attention to those differences when designing the air conditioning system, and basic training of service personnel regarding those differences to achieve normal levels of safety;
- hydrocarbon refrigerants are cheaper, and are not subject to the regulatory burdens that apply to fluorocarbons such as HFC-134a.

Various images for publication relevant to this media release can be downloaded from HyChill’s servers at the following URL’s:

HyChill Logo: <http://hychill.com.au/images/hychill-logo-and-name.jpg>

John K Clark, Director of HyChill: <http://hychill.com.au/images/john-k-clark-portrait-hires.jpg>

OKA Logo (tall format): <http://hychill.com.au/images/oka-logo-square-lge.jpg>

OKA Logo (wide format): <http://hychill.com.au/images/oka-logo-rectangular-lge.jpg>

OKA Vehicle Photo 1: <http://hychill.com.au/images/oka-1109-small.jpg>

OKA Vehicle Photo 2: <http://hychill.com.au/images/oka-1239-small.jpg>

