JimCathey’s Hot Sauce

Here's a write-up (not mine) on how to run your A/C on isobutane/propane:

"I fully charge the system, using a mix of Isobutane (R600a) and Propane (R290). This mix (70% Isobutane, 30% Propane) is usually available at sporting goods stores as high-altitude campstove fuel. An 8-oz (12-oz by weight) can will run $4-5, you only need one. You want Isobutane (R600a), not Butane (R600), because Butane has a too-high boiling point. It's possible for your compressor to ingest liquid if you use it instead of Isobutane, which can damage its valves. Lots of Butane/Propane mix is available out there, so beware.

One of the pitfalls of converting an A/C system away from R12 is that there are a number of things that are dialed in for R12's exact characteristics. If you use a refrigerant with a different temperature/pressure curve, the system ends up operating inefficiently. One of the beauties of this hydrocarbon blend is that you can get a very close match to R12's curve. The system then operates well.

A usable charge of this hydrocarbon blend is less than 50% of an R12 charge. In part this is because hydrocarbons are more efficient refrigerants than hydrochlorofluorocarbons. Also, most R12 systems are actually overcharged to accommodate slow leaks. If you're doing your own servicing, a lesser charge is acceptable, because it's pretty easy to re-do. And, having a lesser charge reduces the fire risk in case of a sudden large leak.

What I find works is to feed in one can of the 70/30 mix, and then augment this with straight Propane until the temperatures and pressures are right. (With the system set for maximum cooling, and the engine at 2000 rpm.) What I do is to monitor the temperature of the pipe next to the high-side fitting using an infrared thermometer. As you slowly leak in Propane, you watch the R12 *temperature* scale on the high-side gauge and the actual temperature of the fitting. When they are close to each other ipso facto you are done. You also watch the absolute high-side pressure to ensure it's not too high, and you watch the low-side pressure to make sure it's still in the 20-30 psi range. You have to make changes slowly enough to let temperatures and pressures reach equilibrium so that you get accurate readings.

It is my belief that the Propane is doing most of the cooling. The Isobutane is there to keep the pressures down. It provides enough circulating mass to transfer both heat and lubricating oil, and has a temperature range that keeps it from being a liquid in a harmful place. The proportion of the final charge that is the Propane is an 'undercharge', because if it weren't the pressures would be too high. But it's still enough to provide sufficient cooling, and the Isobutane is filling out the ranks. But because the system is still in a sense 'undercharged', it is very sensitive to leaks. A typical R12 system is actually 'overcharged' in that it is

designed to be able to lose some portion of the charge (by inevitable slow leakage) without impacting performance. This blend doesn't have that luxury, so once some charge is lost the performance will suffer. Fortunately it is cheap and easy to repair! Because the components of the blend can leak at different rates you don't know what proportions are left once you've lost some charge, so you should evacuate the system and start from scratch rather than try to top it off.

I understand that this blend will work very well until ambient temperatures get above 100°F. Because Propane has a critical point lower than R12, once its pressure gets too high it will stop condensing altogether. Then the only cooling is provided by the Isobutane, which has a higher critical temperature, and cooling performance is minimal. This can happen when it's really hot outside. If you live in such a place, stick with R12. (And you probably wouldn't be happy with R134a's inherently lesser performance if you were to convert.)

The upshot? Driving down the freeway on a 90°F day yielded 38°F vent temperatures, which is hard to beat. When stopped in traffic, the auxiliary fan kicked on. Coolant temperature throughout was just under 100°C. (Normally 87°C without A/C.) In other words, normal behavior. It works! "