

“You Can’t Patent CO2” is a Patently False Claim

As someone who follows HVACR trends closely, I often see questionable marketing claims and product narratives that stir up the industry. Every few months, a new contention emerges that defies logic however you slice it. The latest assertion really gave me pause: “CO2 can’t be patented.” What does this claim even mean?

To answer the question, we must first understand patents. The patent process was established to encourage research and innovation. It is a win-win for inventors and consumers. And the system works: it is the seldom-recognized mechanism driving the new technologies from which we benefit every day, including those in the HVACR industry, such as new compressors with increased efficiency and reliability, advanced heat reclaim technology, and sophisticated control software and hardware. Everyone should be able to agree that technological innovation is good!

If marketers of CO2 are not actually anti-innovation or anti-patient, what are they hoping to signal to the industry when they claim that “CO2 can’t

be patented?” They are signaling that CO₂ is a less costly refrigerant solution. The unsound logic underlying this flawed conclusion is that, because CO₂ is naturally occurring, it is an endless, uniform resource, and therefore its price and supply cannot be controlled by a single manufacturer. This is an illogical argument and a disingenuous marketing strategy.

First, maintaining a CO₂ system is more costly for operators, not less. CO₂ systems are complex. They operate at higher pressures and as such require additional equipment to run properly: extra components to compensate for poor efficiency at transcritical conditions, safety mitigation hardware and sensors for high pressures and power failures, extra controls, etc. These parts and pieces are costly expenses that directly affect the bottom line.

Second, R-744 is not an endless, naturally occurring resource. Carbon dioxide is indeed naturally occurring in the Earth’s atmosphere. However, R-744, or refrigerant-grade CO₂, is the product of chemical processing. Pure carbon dioxide and R-744 are not the same. R-744 is not extracted from thin air. In fact, in Europe, the major source of R-744 is a byproduct from ammonia plants, and there have actually been CO₂ shortages in recent years. The unavailability of local source refrigerant-grade CO₂ service gases has been an issue for operators, especially when dealing with a loss of system charge. As a result, many retailers now carry entire back-up CO₂ charges on site at their stores, which causes space and

logistical challenges and adds operational costs for cylinder rentals.

Finally, you absolutely can patent CO₂ refrigeration systems, components, designs, and related technologies that are needed to make a transcritical CO₂ system function. There are more than 250 patent families for CO₂ refrigeration technology filed in the last 20 years alone. Nearly 100 of those were filed in the past five years. The claim “you can’t patent CO₂” is patently false.

The truth is that regardless of the refrigeration system you are using, some or most of the machinery and components supporting it are covered by patents. It is the patent process working exactly as intended to spur innovation. Some of these innovations, such as efficient heat exchanger designs, variable speed compressors, advanced controls, and even new generations of sustainable refrigerants have helped the HVACR industry to steadily evolve and continue to meet the world’s ever growing demands for sustainable cooling solutions.

Put simply, the claim that “you can’t patent CO₂ ” means nothing. It does not shine light on anything new or noteworthy for operators making decisions about their refrigeration systems. The bottom line remains that CO₂ systems have no advantage over traditional refrigeration systems as it pertains to their patented technologies and related operating and capital expenses.

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