



The New Cool

Myths and Truths

CO₂ as a refrigerant is surrounded by myths – we provide facts and clarify.



#1 The “Scary System”-Myth: CO₂ Solutions are Big and Complex

That’s a thing of the past. With the new Copeland CO₂ scroll technology, you can achieve the efficiency of conventional booster systems without complex system designs. There is no need for parallel compression, reducing the physical footprint as well as the system costs by up to ten percent.



#2 The Poison Myth: CO₂ is a Toxic Gas

You can’t generalize that. We all inhale and exhale CO₂ in our daily lives. CO₂ is already present in our atmosphere at an average concentration level of around 400 ppm. Clearly, at this level of concentration, it is not toxic to human beings. However, CO₂ can be dangerous at higher concentrations that may exist for example in confined rooms exposed to CO₂ leakage. When industry standards and best practice rules are followed, CO₂ is considered a safe refrigerant. There is also no need to worry about the climate: CO₂ is a sustainable alternative to the harmful F-Gases. CO₂’s global warming potential is 1 (GWP=1), its ozone depletion potential is 0 (ODP=0). That’s highly sustainable in comparison with typical F-Gases like HFCs with an GWP up to 1.500 (ODP=0).



#3 The Money Myth: CO₂ Systems are Expensive

Traditional CO₂ systems face challenges with efficiency levels when operating in warm ambient (or “transcritical condition”). That’s why most CO₂ systems are equipped with additional parallel compressors removing the flash gas from the tank. This increases efficiency but also adds complexity since the additional compressor requires an additional frequency inverter, additional piping, and wiring. Subsequently, in the past high investment costs were characteristic of early CO₂ projects and sourcing all needed equipment was difficult. Today, these challenges have been overcome: There is no difficulty in sourcing anymore and the costs are on a downward trend. This will even be accelerated by the new Copeland CO₂ scroll technology “Dynamic Vapor Injection”: This innovative technology replaces the function of parallel compression keeping the system’s efficiency level high while reducing complexity as less components are required. Investment, operational and even maintenance costs of CO₂ systems will be optimized further. And note that CO₂ as refrigerant is easy to produce and thus cheaper than any other refrigerant.



#4 The Desert Myth: CO₂ Does Not Perform Well in Hot Climates

The so-called CO₂ equator used to be a fact: While previous CO₂ systems performed quite well in cold climates, they used to be very inefficient in hot climates. With the innovative Copeland Dynamic Vapor Injection (DVI), this is a thing of the past. Now, a smart system control constantly operates all relevant parameters of the cooling circuit in a way that ensures ideal operations under all conditions. This makes the new Copeland refrigeration technology an efficient and reliable solution regardless of the climate it operates in.



#5 The Danger Myth: CO₂ Systems Are Risky

Yes, CO₂ systems are facing high pressures. But first, this is contributing to the efficiency of the system. Second, the system design comes along with many safety features, detecting even minor variations. And third, even if CO₂ vents out of the system due to an incident like a power failure or overheating – the high standstill pressure of the compressors allows for enough time for service personnel to fix the problem before food spoilage occurs. Also, a CO₂ leak is significantly less problematic than leaks of other refrigerants like flammable propane or toxic ammonia – CO₂ is not flammable.



#6 The Large Application Myth: CO₂ Systems Are a Most Efficient Solution for Large Applications or Shop Formats

That's no longer true. Copeland CO₂ scroll compressors (10 to 40kW MT) are ideally positioned to provide cost effective solutions for small to medium sized supermarkets ranging from 600 to 2500 m², something that has not been available before. Whether as integrated CO₂ scroll compressor solution for compact booster systems or as a CO₂ refrigeration unit, this broad portfolio ideally supports the trend towards smaller and more compact CO₂ systems.



For more details, see copeland.com/TheNewCool

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