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**Commercial thermoacoustic products and next-step developments**  
**in acoustic cooling**

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CFIC-Qdrive committed to development and commercialization of thermoacoustic energy conversion devices in 1999, by combining the newly developed acoustic perspective and tools developed at Los Alamos with a deep well of Stirling-cycle experience to achieve a total physics model with both inertial and viscous behavior of the working fluid. Such acoustic-Stirling devices combine the mechanical simplicity, robustness, and efficiency. Focusing first on refrigeration for cryogenics; this work has led to a family of standard products that have found uses worldwide, from air-quality sampling and oil refinery support to military aviation oxygen liquefaction. This paper details the basic operation of these acoustic- Stirling products and the key technological elements that make them viable and attractive in cryogenics; then examines the implications for less-cold uses like food-storage and air-conditioning; with a discussion of achievable performance in accessible applications. We review the work now underway to develop devices to meet those opportunities with environmentally benign cooling of superior performance.