

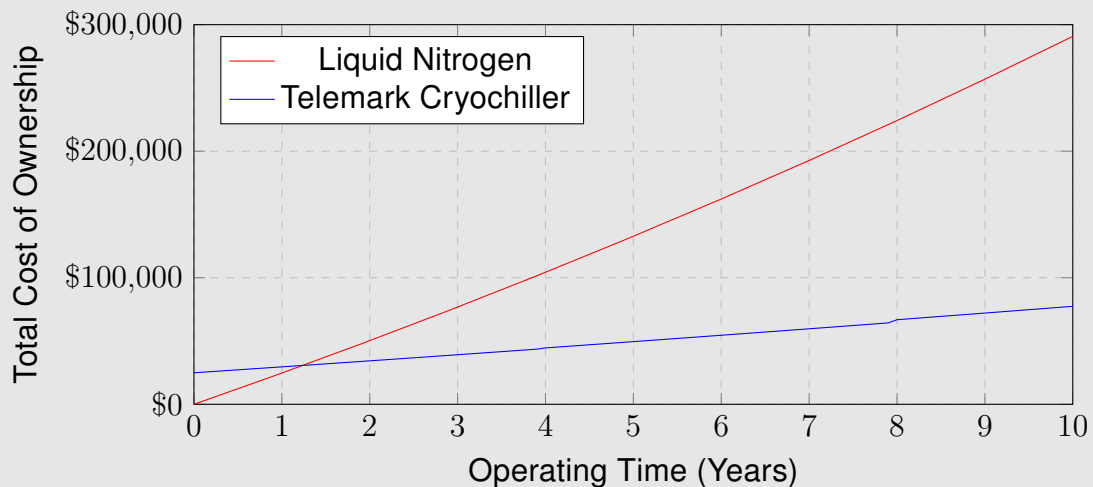


## Application Note: Lowering Operation Costs with Telemark Cryochillers

Achieving high throughput production of vacuum processes requires water vapor pumping. Typically, rapid vacuum pump downs are achieved using in-chamber cryosurfaces for efficient water vapor trapping. Replacing liquid nitrogen cooled cryosurfaces with a Telemark closed-loop cryogenic refrigeration system provides increased system performance with significant long-term lower operational costs.

While electricity prices have increased 1.4% annually over the last thirty years, increased agricultural demand for liquid nitrogen has driven liquid nitrogen prices up by almost 50% in the last two years alone. Telemark's cryochillers provide faster cool-downs and defrosts while quickly delivering an excellent return-on-investment when replacing LN2 based systems.

As an example, a 30' long 5/8" cryocoil in a chamber at room temperature will consume in excess of 135 L/day of liquid nitrogen, costing \$25,000 per operating year. A replacement Telemark 2700 cryochiller will provide better pump-down performance with a total cost of ownership savings in less than two operating years, saving more than \$200,000 over a ten year period<sup>1</sup>.



Contact a Telemark salesperson today to discuss your return on investment for replacing a liquid nitrogen cryotrap with a Telemark closed-loop Cryochiller.

<sup>1</sup> Assumes \$0.50/L LN2 cost with 3.6% annual inflation (based on 15 year historical average) and \$0.08/kWh with 1.5% annual inflation (based on 15 year historical average). Includes expected cryochiller annual preventative maintenance costs.