Pulse Purge Regeneration Case Study

In January of 2008, a chemical plant In Lockport, NY purchased and installed a Pneumatech model PE-2100. The dryer was purchased to replace a competitive heatless dryer of similar size. The customer has a total of three compressors; two 150 HP load/no load compressors as well as a 100 HP compressor retrofitted with a Variable Frequency Drive.

Pneumatech also supplied a ConservAIR K-2600 Intermediate Control and a SM-812 Sequencer to control the compressors based on the projected lower requirement for compressed air. The distributor also supplied a 2,200 gallon wet air receiver and a 6,000 gallon dry air receiver.

In order to qualify for energy rebates the New York State Energy Research and Development Authority (NYSERDA) required a proposal that outlined projected energy savings. The dryer projections are below:

Energy Consumption and Operating Costs Comparison, Regenerative Dryers

	Heatless Regenerative	Externally Heated Regenerative	**Externally Heated w/PPR**	Blower Purge
Purge Flow Control Power	315	147	**147****	15 HP
Watts	50	65	**85**	85
Heater	N/A	24*	**24***	50*
Hours Per Day	24	24	**24**	24
Purge Loss/Blower HP	1409.24 KWH/24 hrs	657.97 KWH/24 hrs	**328.99 KWH/24 hrs**	268.56 KWH/24 hrs
Control Power	1.2 KWH/24 hrs	1.56 KWH/24 hrs	**2.04 KWH/24 hrs**	2.04 KWH/24 hrs
Heater	N/A	360 KWH/24 hrs	**161.28 KWH/24 hrs**	900 KWH/24 hrs
Total KW Consumption/24 hrs	1,411.14	1,019.53	**492.31**	1,170.60
Total Annual Energy Cost	$51,506.61	$37,212.85	**$17,969.32**	$42,726.90
		*62.5% heater run time based on field observations	*28% heater run time, based on field observations	*75% heater run time, based on standard theory of operation

** The totalized average purge flow is HALF of this number because of PPR. However, for comparison sizing, use this number

Although the projections focus on just PPR, the dryer was also ordered with dew point demand controls.

The result of the installation was a massive reduction in the amount of air and energy used in the compressor room. The dryer is currently running 61% in demand mode and the heater run time is 15% resulting in an actual and realized energy savings of $40,841.61 compared to a comparably sized heatless dryer. Additionally, because of the lower demand, the customer was able to shut off one of the 150 HP compressors, saving an additional $68,000 per year.