

GUE Cooling Services Solution Pilot: CHEM-KOTE International – Huntsville, Alabama

Chem-Kote International is a name used to mask the identity and protect the confidentiality of a major international Chemical Products Company served by Georgetown Utilities, LLC (GUE). Chem-Kote is over 100 years old, and is a Fortune 500 Corporation with revenues in excess of \$5 billion. Georgetown Utilities Enterprise, LLC – founded in 2003 – is an MBE (minority business enterprise) headquartered in New Hudson, MI, that offers an advanced metallurgical treatment for HVAC equipment, called ProaTEQ. This product successfully lowered operating cost of HVAC equipment at Chem-Kote’s plant in Huntsville, Alabama in the summer of 2015.

Situation: Wanting to proactively plan energy efficiency and operational cost reduction programs for its Aerospace Coatings Division, the Sourcing Agent and Corporate Supplier Development Manager – hosted a meeting that introduced Georgetown Utilities to the Facility Maintenance Manager at the Chem-Kote Huntsville plant. After planning sessions on implementation schedules, technician profiles, and pricing parameters, Chem-Kote elected to pilot Georgetown Utilities’ flagship product, ProaTEQ in two HVAC units in June 2015 at its Huntsville Plant.

Tasks: Chem-Kote identified two (2) non-critical HVAC refrigeration units for the pilot: a 12.5-ton York rooftop unit (RTU) and a 50-ton Trane RTU – The York was 3 years old and the Trane was 17 years old. The overall goals of the pilot were to reduce energy consumption, operating cost, carbon footprint, and restore cooling capacity in two of its legacy comfort cooling units. To accomplish this, GUE focused on restoring loss cooling capacity caused by oil fouling in each unit. Our M&V (measurement & verification) for this project entailed electrical sub-metering and Pre & Post performance analysis of each unit.

Action: As part of the pilot, Chem-Kote requested our Extended Monitoring & Analysis Reporting Option, which entailed electrical sub-



GUE Electrician makes airflow temperature measurements on the 12.5 Ton York Unit

metering verification and post project reporting in addition to the Cooling Capacity Snap-Shot Reporting. The objective of the Extended Monitoring & Analysis Reporting Option was to enable GUE and Chem-Kote to establish the current cooling performance of the RTUs, the baseline for energy savings, capacity recovery, demand reduction, and performance gain analysis. It also established the extent to which the unit is currently meeting the refrigeration load – or not. This is extremely important, because when oil fouling occurs, capacity is lost, and typically units fail to meet their design loads in many operating hours.

The creation of a Cooling Capacity Snap-Shot Report was done for each unit treated. This report is a short-term view of the equipment performance pre- and post-PROATEQ treatment. It was done while the RTU ran (after a brief shutdown for safety to install CTs on electrical power lines). GUE installed sufficient instrumentation to monitor performance of both units approximately 30 minutes prior to and 30 minutes after the treatment. This allowed GUE and Chem-Kote to determine:

Capacity Loss (Tons) – “Test-In” procedures established the current operating capacity as the unit’s baseline for capacity restoration. The main effect of oil fouling is degradation of heat-transfer capacity, which, according to ASHRAE, can reach 30% on older units. GUE measured the existing

capacity as a baseline for quantifying the restoration of capacity.

Capacity Restoration (Tons) – This is the principal and most dramatic benefit of the removal of oil fouling and permanent coating of metal with ProaTEQ. Heat transfer in the equipment improved immediately, and thus capacity (Btu/hour or Tons) is increased. The increase in equipment capacity was evident within 30 minutes of installment.

Demand Reduction (kW) – The second key benefit: Improved oil lubricity due to ProaTEQ insertion that reduces internal friction, resulting in a small reduction in the motor power (kW) required to drive the compressor that resulted in equipment running smoother and quieter.

Performance Increase (kW/Ton) – The combined effects of heat transfer improvement and lubricity improvement led to increases in the performance of the equipment as measured in kW/Ton – the main cooling system performance factor used in the industry.

Results: The results that Georgetown Utilities delivered in close collaboration with and substantiated by Chem-Kote Huntsville’s engineering staff are shown below.

	Units	OEM Nominal Capacity		
		York 12.5 Tons	Trane 50.0 Tons	Both 62.5 Tons
Pre-Treatment Values:				
Capacity	Tons	7.3	31.8	39.1
Capacity Loss vs Nominal	%	41%	36%	37%
Performance	kW/Ton	1.96	2.20	2.16
Annual Operating Cost Estimate	\$	4,545	20,351	24,896
Post-Treatment Values				
Capacity	Tons	10.8	44.5	55.3
Capacity Increase vs. Pre-Treatment	%	48%	40%	41%
Performance	kW/Ton	1.33	1.50	1.47
Performance Improvement (kW/Ton reduction)	kW/Ton	0.63	0.70	0.69
Performance Improvement vs Pre-Treatment	%	32%	32%	32%
Annual Operating Cost Estimate	\$	3,823	18,232	22,055
Annual Operating Cost Reduction	\$	722	2,119	2,841
Annual Operating Cost Reduction	%	16%	10%	11%
Value of Cooling Service Recovery	\$	519	1,517	2,036
Financial Performance				
Treatment Cost	\$	813	3,250	4,063
ROI Including Cooling Service Recovery	%	89%	65%	70%
Simple Payback on Treatment Costs	Yrs	1.1	1.5	1.4
ROI Including Cooling Service Recovery	%	153%	112%	120%
Simple Payback with Cooling Service Recovery	Yrs	0.7	0.9	0.8

4-Part Guarantee: In response to Chem-Kote’s request that GUE “put skin in the game”, Georgetown Utilities created a 4-part Performance Guarantee, which we consider to be a key differentiator in the coatings industry:

1. No Equipment will be damaged (GUE carries over \$5MM insurance)
2. Equipment Capacity will increase by at least 10%
3. Equipment Performance will improve by at least 10%
4. Energy consumption was reduced leading to project payback less than 3 years (in this case it was less than 2½ years).

It should be noted that ProaTEQ is typically not an RFP commodity, due to its technical uniqueness. And it is unlikely to be recommended by OEMs because it extends the equipment life and forestalls sales of replacement units and supplemental capacity.

Summary: In summary, we not only met but exceeded the client’s goal to reduce energy consumption, restore degraded cooling capacity and employing industry standards, verified the results. Our cooling energy efficiency product is a nano-technology, metallurgical treatment that removes an unwanted oil boundary layer in refrigeration tubing and internal metallic walls, restores heat transfer capability, recovers lost capacity, and improves kW/ton performance. Simply put, we refurbished or reconditioned the two units where they sit and while they are in use. This approach demonstrated was highly cost-effective. Leadership at the Chem-Kote Huntsville Plant fully understood impact of what had been achieved and based on the strength of results we delivered, made the decision to rollout ProaTEQ across its entire fleet of comfort cooling systems at the Huntsville Plant.

For More Information, Contact:

Patrick McCarthy – SVP
PMcCarthy@GeorgetownUtilities.com
301 926 7886 – Office
301 529 6647 – Mobile

