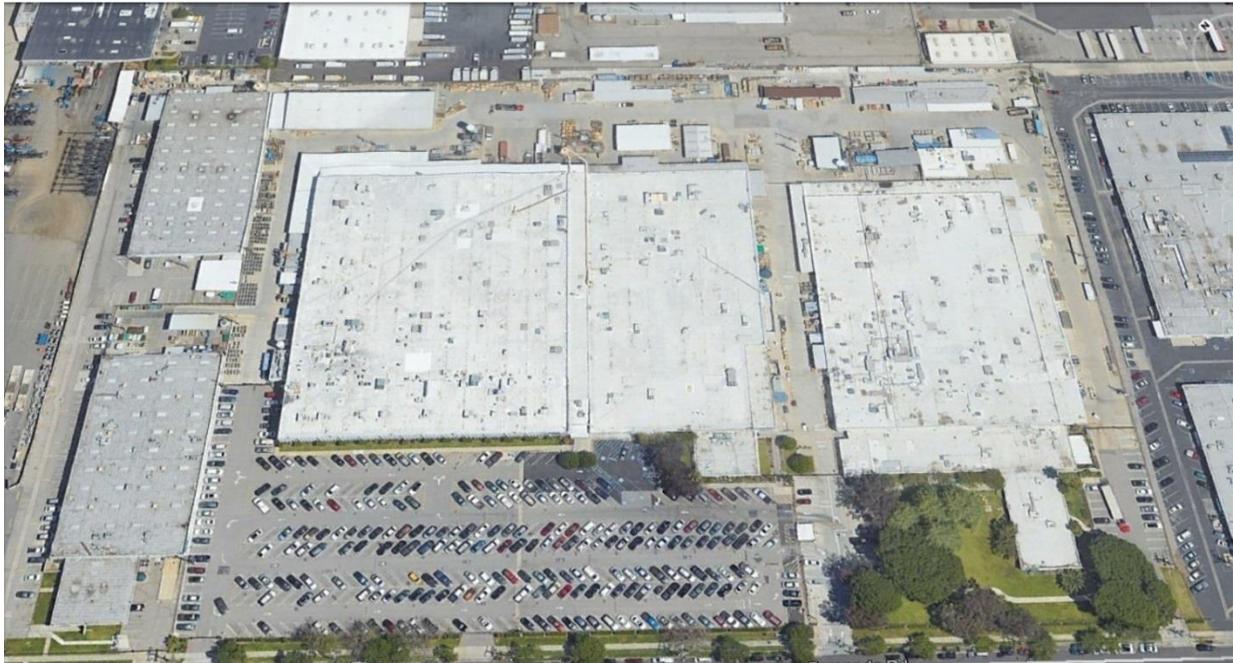


GUE Cooling Services Solution – Full Site Deployment



Aerial View of Chem-Kote International Facility in Southwestern US Showing 207 Rooftop HVAC Units

Chemical Products Facility – South Western US

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 (GUE) – 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 document describes a highly successful project GUE performed for Chem-Kote at a major plant in the Southwestern US in the Spring of 2017

Situation: After completing two successful projects at a Chem-Kote plant in the Southeastern US in 2015 and 2016, GUE leaders received an inquiry from a plant technical manager at a larger plant in the Southwestern US, regarding the deployment the GUE’s Cooling Services Solution across its entire fleet of HVAC and Process Cooling equipment. Following successful

negotiations, the Project was launched in March 2017, and completed in May 2017.

Tasks: Although Chem-Kote initially identified 207 HVAC and Process Cooling units to be treated, in the Condition Assessment Phase, GUE reduced the number of units likely to respond to treatment to 165, totaling 1,626 tons, thus reducing the project cost. The overall goals of the Project were to reduce energy consumption and cost, reduce carbon footprint, and restore cooling capacity in the 165 legacy HVAC units, and to verify and guarantee the results of both. GUE focused on restoring loss cooling capacity caused by oil fouling in each unit.

Action: The project was executed in the following four phases:

PHASE I – Condition Assessment – Perform an inventory of all legacy refrigeration units

PHASE II – Project Execution – Pre-Testing of Capacity, ProaTEQ Treatment, and Post-Testing of

Capacity. In some cases Treatment only was performed when units were not amenable to the GUE Test Procedures (see below)

PHASE III – Analysis, Modelling, and Reporting

PHASE IV – Financial Settlement Based on Possible Offsets Due to Performance Guarantees.

The Condition Assessment Phase occurred 30 days prior to starting treatment. During this Phase, each HVAC unit was assigned to one of four Classes:

- A — Treatable, Measurable and Qualified for GUE’s Payback Period Guarantee
- B — Treatable and Measurable
- C — Treatable; not Measurable unless Serviced
- D — Not Treatable

Following the Condition Assessment, Chem-Kote had the option to address issues in the C Group, so that they could be upgraded to B, and Tested. All A, B, and C Units were treated with ProaTEQ. All A and B units received Pre-Treatment and Post-Treatment Capacity Testing. A one-page “Snapshot Report”, documenting the test data and Capacity calculations, was created for each Treated and Tested Unit and delivered.

For each Treated and Tested unit, GUE modeled annual energy use and operating cost for pre- and post-treatment conditions, using GUE’s RTU Analysis Tool, which is based on ASHRAE Bin Methods, and which simulates actual part-load performance in addition to staging of units with multiple refrigeration circuits.

The field testing, combined with the simulation, allowed GUE to quantify:

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

Capacity Recovery (Tons) – This is the principal benefit of the removal of oil fouling and permanent coating of metal with ProaTEQ. Heat transfer in the equipment is improved immediately, and capacity is partially recovered.

Demand Reduction (kW) – The second key benefit of ProaTEQ is improved lubricity in compressor oil, which is manifest in a small reduction in kW draw of the compressor. The unit also runs 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 performance factor used in the industry.

Results: The overall results of the project are shown in the table below.

	Units	Values
Condition Class Counts		
A -- Treatable, Measureable, Qualified	count	39
B -- Treatable, Measureable	count	14
C -- Treatable	count	112
D -- Non-Treatable	count	42
Total Units	count	207
Fleet Aggregate Technical Performance (53 A, B Units)		
Capacity Recovery	Tons	130
Power Draw Improvement (Reduction)	kW	-33
Performance Improvement (kW/Ton Reduction)	%	-32%
Annual Energy Use Reduction (kWh)		
Fleet Aggregate Financial Performance (165 A, B, C Units)		
Annual Operating Cost Reduction (est)	kWh/yr	473,530
Simple Payback on Treatment Costs	\$/yr	\$ 80,500
	hrs	1.95

Of particular significance in this project was the successful deployment of ProaTEQ in all the **Process Chiller Equipment** in use at the Sylmar facility.

Summary: Consistent with results from prior projects for Chem-Kote, GUE achieved successful results in the Southwest Region. All four parts of GUE’s Guarantee were met or exceeded. Based on the efficacy of GUE’s cooling service solution, the Plant Manager is recommending GUE’s Cooling Service Solution for other Southwest Regional plants, and for Process Chiller applications nationwide.

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