

Client renovated over 27,000 tons of cooling equipment

A multi-national client wanted to extend the expected useful life of HVAC systems and lower energy costs. Their property management firm offered the *HVAC Armor Rejuvenation Process*.

These coating and repair processes protect against future corrosion and restores the equipment to near original efficiency.

Client Needs:

- Creative Ideas with Strong ROI
- Applicable to Global Facilities
- Minimal Impact on Employees
- No Negative Impact on Operations

Challenges:

- Variable Equipment Age and Condition
- Few Air-Cooled HVAC Options
- Global Facilities

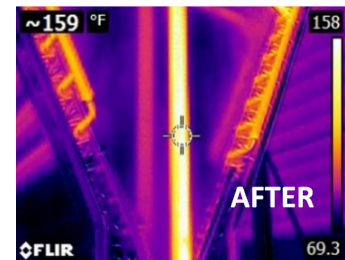
HVAC Armor Solution:

- Strong ROI
- Extends Equipment Life
- Reduces Maintenance

Fortune 500 Property Management

"ECM provided customized services for our global roll-out. These upgrades were almost invisible to our client's employees."

Global Director
Energy & Sustainability



Infrared photo shows heat transfer before and after coating

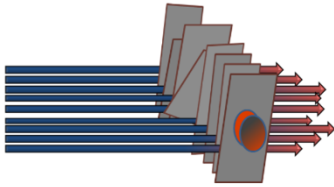
Results:		Client Portfolio			
Location	kWh Total	Price	\$ Svs	Tons	SPB
California (3 locations)	6,244,793	\$ 1,729,497	\$ 676,530	8,742	2.56
Texas	1,542,562	\$ 228,741	\$ 86,642	1,671	2.64
Massachusetts	554,656	\$ 246,330	\$ 61,789	1,555	3.99
North Carolina	8,529,198	\$ 2,281,456	\$ 728,832	13,440	3.13
Canada	320,165	\$ 136,475	\$ 42,934	1,290	3.18
Tennessee	86,536	\$ 24,992	\$ 9,917	200	2.52
India	239,634	\$ 80,803	\$ 26,839	808	3.01
Totals	17,517,545	\$ 4,728,294	\$ 1,633,483	27,706	2.89

Problem: HVAC Efficiency Decline

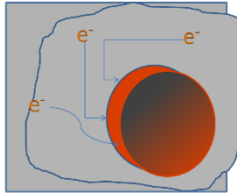
HVAC equipment varies widely in age, condition, and performance, so solutions needed to be specific to the equipment.

Three Types of Fin and Coil Deterioration:

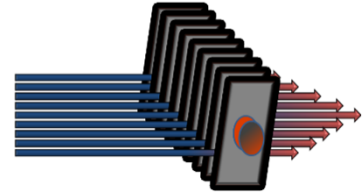
1: Damaged Fins



2: Fin Corrosion



3: Dirty Coils & Fins



Three Types of Refrigerant System Deterioration:

1. Oil Build-up

Compressor oil leaks past piston seal into Refrigerant

Refrigerant circulates oil

Oil adheres to walls of coils

Oil coating reduces heat transfer

Oil increases laminar friction for refrigerant flow

2. Variations in System Charge

3. Dryer Filter Blockage



HVAC Armor offers state-of-the-art corrosion protection coatings and solutions that save energy, enhance performance, and rejuvenate HVAC equipment. HVAC Armor is part of ECM Holding Group, a collection of conservation technology firms serving North America's leading ESCOs and corporate clients.

For more information, please visit www.hvacarmor.com, or call 920.267.6120.

Solution: 7-Step Rejuvenation Process

This 7-step air-cooled HVAC rejuvenation process extends equipment life, and typically improves energy efficiency enough to payback the cost in under 3 years.

Step 1: Pre-Inspection & Recommendations

- Review and document equipment condition to identify issues prior to service

Building	UNIT	Make	Model #	Type	Tons	Condition Status
CL1	AC-2	Trane Intellipak	SXHGC9040	RTU	90	Danger
CL1	AC-4	Trane	YCH090C4	RTU	7	Danger
CL1	AC-5	Trane	YCD060C4	RTU	5.4	Danger
CL1	AC-8	Trane	YCD102C4	RTU	9	Danger
CL1	AC-9	Trane	YCD240B4	RTU	20	Danger
CL1	AC-11	Trane Intellipak	SXHGD1340	RTU	130	Danger
CL1	AC-1	Trane Intellipak	SXHGC9040	RTU	90	Alarm
CL1	AC-10	Trane Intellipak	SXHGD1340	RTU	130	Alarm
CL1	AC-3	Trane	YCH090C4	RTU	7	Alert
CL1	AC-12	Trane Intellipak	SXHG1340	RTU	130	Alert
CL1	AC-6	Trane	YCD060C4	RTU	5.4	Acceptable
CL1	AC-7	Trane	YCH300B4	RTU	20	Acceptable

Step 2 & 3: Coil/Fin Service & Deep Clean

- Remove housings/casings
- Clean and straighten fins
- Deep clean coils from both sides



Step 4 & 5: Equipment Prep & Coating

- Mask off areas that do not need coating
- Apply corrosion inhibitor
- Spray coat coil from inside and from outside



Step 6 & 7: Refrigerant System Optimization

- Re-condition internal surfaces, filters, and fluids
- Replace dryer filters
- Level the charge to factory specifications

