Improve Plant Efficiency with Interphase Materials
Nano-Engineered Solution for Heat Transfer Assets
How it Works

1. **Nano-engineered** technology treats **hardware** through water application
2. **Efficiency increases** above pristine system
3. **Analysis** on performance & operations
4. **Actionable reporting** for business and technical teams
5. **Sustainable**, no toxic chemical discharge
Case Studies

Improved Production Efficiency

Optimized Chilled Water Production and System Protection

Improved Usage Efficiency

More Efficient Transmission of Chilled Water to Customer
Improved Production Efficiency

Side-by-Side Experimental Design

**Treated**
2,000 tons Centrifugal Chiller Copper Tubes

**Control**
2,000 tons Centrifugal Chiller Copper Tubes

- 3+ Months of Operation
- Monitored approach temperature over-time
Improved Production Efficiency

8°F Improvement in Approach Temperature

- Immediate approach temperature improvement
- 2°F Approach Temperature on Treated Chiller
- 10+°F approach on untreated chiller
- Engineers commented, tubes ‘like new’ after season of operation
Project Impact

Technology Impact

- Immediately improves chiller efficiency
- Reduces long-term biological & inorganic fouling on chiller tubes

Benefits

- Saves money by lowering energy requirements
- Saves time by reducing maintenance and down-time
- Saves environment through improved energy efficiency of plant

8° F better approach temperature on treated chiller

“Like New” tubes after a full season

No mid-season cleaning needed
Improved Usage Efficiency

Side-by-Side Experimental Design

- Treated
  Stainless Steel Plates
- Control
  Stainless Steel Plates

- 7 Weeks of Operation
- ETS Serves Medical Site
Improved Usage Efficiency

Temperature Differential Across Heat Exchanger

- HX1 (Control)
- HX2 (Treated)
- Treatment Date

45% Improved Temperature Differential

- ~ 3°F temperature differential increase on treated HX
Improved Usage Efficiency

Heat Exchanger Approach Temperature

- **1.7°F reduction** in approach on treated HX Control HX
- Control HX approach increased by **8.0°F**

30% Reduced Approach Temperature
Improved Usage Efficiency

- Enabled 5-7% reduction in valve opening
- Lower valve % allows for reduced water consumption by 350,000 gallons daily

**Water Flow Through Heat Exchanger**

![Graph showing water flow through heat exchangers from March 18 to April 15, 2019, with a significant reduction in water consumption as indicated by the green line representing the treatment date.]
Project Impact

Technology Impact

- Immediately improves heat exchanger effectiveness
- Reduces long-term biological & inorganic fouling plate surface

Benefits

- **Saves money** by lowering production requirements for each HX asset
- **Saves time** by reducing maintenance and down-time
- **Saves environment** through reduced water usage

Energy Transfer Station

- **350,000+ Gallons Water Use Reduction**
- **45% Improved Temperature Differential**
- **30% Reduction in Approach Temperature**
Holistic Value & Impact

**Sustainability**
- Reduces Energy & Water Consumption
- Eco-Friendly Materials
- Enables Sustainable Operations

**Financial Impact**
- Lowers Energy Spend
- Reduces Maintenance Costs
- Increases Profits

**Maintenance**
- Limits Need for Mid-Season Cleaning
- Reduces System Down-Time
- Improves Asset Availability

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Questions