Who/What is Flow Tech Inc?

- Industry leader in providing energy-efficient, state-of-the-art HVAC equipment, systems and service
  - Serve commercial, healthcare, education, pharmaceutical, research water and wastewater industries

- Over 25 years of experience
  - Sales, delivery, install and service
  - Offering new, replacement and retrofit equipment

- Manufacturers' representative

TODAY

➢ Indoor Environmental Quality (IEQ) vs Energy

➢ Better Sensing – Better Control Strategies

➢ UVGI – Easy AND Cheap
Is Energy the Only - the Best - Target?

“This research suggests that the health and productivity benefits far outweigh energy costs and environmental impacts can be mitigated through a variety of readily available strategies. It is time we move away from ventilation designed for merely acceptable indoor air quality and move towards design for optimal indoor air quality. We have been presented with the false choice of energy efficiency or healthy indoor environments for too long. We can – and must – have both."

Dr. Joseph Allen
Assistant Professor of Exposure Assessment Science at the Harvard T.H. Chan School of Public Health, Director of the Healthy Buildings Program at the Center for Health and the Global Environment at Harvard Chan School, Principal Investigator for the study
2015 Study conducted Total IEQ Lab at Syracuse COE

- Cognitive performance of 24 Participants
- Six hour work day followed by 1.5 hour Cognitive Assessment

Lab Simulated Various Building Conditions and compared

- Conventional Building Conditions
- Green Building with Enhanced Conditions (lower CO2 levels)

Improvements with Green Building

- Crisis Response scores 131% higher
- Information Usage scores 299% higher
- Strategy Scores 288% higher
- Overall average all tests 101% higher

“Study suggests Indoor environments can have a profound impact on the decision-making performance of workers which is a primary indicator of worker productivity”….. Dr. Allen HSPH
Can We Have Both?

IF…..

➢ Better Sensing
  o More intelligent
  o Easier installation
  o Easier integration

➢ Better mitigation of sources
  o Structural
  o HVACR
    ▪ Dilution
    ▪ Prevention

Then…. YES
Sensing to Drive Ventilation Controls (Demand Controlled Ventilation – DCV)

Precise Management of Outside Air or Ventilation Air
Typical to Conference/Convention Spaces

- Individual Sensors – Fewer Spaces
  - CO2
  - Volatile Organic Compounds
  - Carbon Monoxide (Garages, loading docks, etc.)

- Multiplexed Sensing – Many Spaces
  - Aircuity Platform Video
Precise Management of Guest Room Thermal Control

➢ Newest Generation – Wireless Sensing
35 – 45% energy savings using guest room controls (auto temp set-backs).

*Department of Energy*

- Lower cost solutions with new wireless and battery-less IoT devices.

- Utility incentives can improve ROI (in most states) – 2 to 4 year payback.
**Interoperable Wireless Standard**
Interoperable technology and products. HVAC&R, monitoring and lighting control systems are readily available and wide-ranging products portfolio exists.

**Self-Powered**
Energy Harvesting – Entuit’s solutions make use of energy created from slight changes in motion, pressure, light, temperature or vibration.

**Proven Technology for Sustainable Buildings**
Tried, tested and true – platform components for IoT wireless networks have been installed in over 200,000 buildings world-wide.

**No Wires.**  **No Batteries.**  **No Maintenance.**
Intelligent Thermostat

- Edit Set-points
- Set Occupied
- Unoccupied Change
- Configuration Limit
- User Capabilities
- Fan Control
- Mode Control

- Temperature / Set-point
- Humidity
- Fan Status
- Compressor Status
- Valve Status
- Pipe Temperature
- Mode
Product Description:
The Entuit HVAC Setback Module is a simple way to save energy by switching HVAC units between normal and setback modes. It is low voltage, mounts easily in a typical HVAC enclosure, and communicates wirelessly with Entuit’s occupancy detection and lighting control products.

*PTAC must be compatible with HVAC Setback Module
“Within three months of installation we are seeing significant savings in our energy costs.”

*José Acosta – Director of Engineering - Penn Club, NYC*

**Penn Club**
New York, NY
The installation of lighting and HVAC controls in this historic building was performed during full operation.

**Le Parker Meridien**
New York, NY
The WCG Center system has given this 5-Star hotel full control of lighting and HVAC systems with real-time monitoring.

**Aqua Aloha Surf Hotel**
Kahului, HI
By retrofitting existing wired HVAC systems with WCG controllers, this hotel is able to save energy and money overnight.

**Río Mar Hotel**
Puerto Rico
This 400 room resort property installed occupancy-based HVAC control with door sensors for additional efficiency.

**Royal Sea Cliffs**
Kailua-Kona, HI
WCG enabled battery-less and wireless HVAC and lighting controllers that resulted in an eight month payback.

**Waikiki Marina Resort**
Honolulu, HI
The resort installed WCG occupancy based-in-room HVAC technology in 125 rooms that produced savings in excess of 30%.

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**Impact the Future**
Hospitality Solutions
THE UNSEEN IMPACT
AIR CONDITIONERS HAVE
ON FISCAL AND
PHYSICAL HEALTH.

Steril-Aire Ultraviolet Germicidal Irradiation (UVGI) for HVAC.
Your air conditioning system is delivering a lot more than cool air.
Disease

Inflated energy bills

Higher operating costs
The culprit is biofilm.

A harmful, tenacious microbial matrix that thrives in all HVAC.
Chemical cleaning doesn’t get rid of it.

Biofilm regrown on coil cleaned 3 months prior
Chemical cleaning doesn’t get rid of it.

- Chemicals are toxic and temporary
- Don’t reach build-up in deeper areas
- Mold & fungi double every 2-6 hours
- Bacteria doubles every 20 minutes
Biofilm causes air conditioners to be less efficient.

- Impedes air flow
- Reduces heat exchange efficiency
- Cuts cooling capacity
Result: Lower performance and shorter equipment life.
As biofilm builds up, so do energy costs.

<table>
<thead>
<tr>
<th>Biofilm thickness (fins)</th>
<th>Energy usage increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>.012 in.</td>
<td>+10.8%</td>
</tr>
<tr>
<td>.024 in.</td>
<td>+21.5%</td>
</tr>
<tr>
<td>.036 in.</td>
<td>+32.2%</td>
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</tbody>
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HVAC uses 60% of a building’s energy.
UVGI: the simple, sustainable and affordable solution.
UVGI systems installed in HVAC get rid of biofilm quickly and continuously.
Before UV Application
After UV Application
How it works: the right dose of germicidal UVC in the right place.

- UVC irradiation destroys the ability of microbial DNA to replicate

- The right amount of UVC energy in the right place (HVAC coils, drain pans) for the right amount of time = The correct Dose.
UVGI saves 4 ways:

1. No more toxic, costly and ineffective chemical cleaning

2. Reduced liability from illness caused by HVAC-bred microbes.

3. Air handlers run more efficiently and last longer.

4. Savings of 15% to 30% on energy bill.
ADDRESS A HOST OF HVAC ISSUES WITH A SINGLE SOLUTION.

Ultraviolet Germicidal Irradiation (UVGI) for HVAC.
Introduction to an innovative method for the control of ice machine contamination
Ice can contain...

Mold

E-Coli

Staph

Legionella

And other living organisms, some good, some bad.
Introducing…..

ICE UV (Patent pending)
Designed to control interior ice machine contamination with ultraviolet germicidal light to…

1) REDUCE MAINTENANCE
2) PREVENT CONTAMINATION BUILD-UP
3) IMPROVE EFFICIENCY AND PERFORMANCE
Application

- Illumination of interior surfaces and components for control of contamination growth and sliming
- Studies have also shown reduction in scale build up with UV light by reducing biofouling.
Installation Examples
Ice Bin Example
ICE UV Mini
Ice UV Mini Kit
Thank You For Your Time

Questions?

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