Cleanrooms & BSLabs

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Computer Analysis

Projects

Design Example

BSL Facilites

Cleanrooms: Design/Build

ISO CLASS 1 - 9 Cleanrooms for:

- Pharmaceutical
- Biotech
- Medical
- Semiconductor
- Microelectronics

Technological innovation for cleanrooms and contamination control.

[Presentation on Technovation Energy Efficient Cleanroom Design/Services Synopsis]

- Energy Efficient Cleanrooms.
- Ultra low bio-burden cleanrooms.
- Advanced Cleanroom airflow design.
- Cost effective, high quality Design/Build Services and/or Turnkey Installations.

Technovation is a technology company and has a high degree of expertise in Cleanroom design, particle and aerosol science, filtration, contamination control, fluid mechanics and HVAC. What distinguishes us from other Cleanroom companies is the following:

1. ***Lower Initial and Operating costs***: .This is due to our Optimized Bypass - Distributed (patent

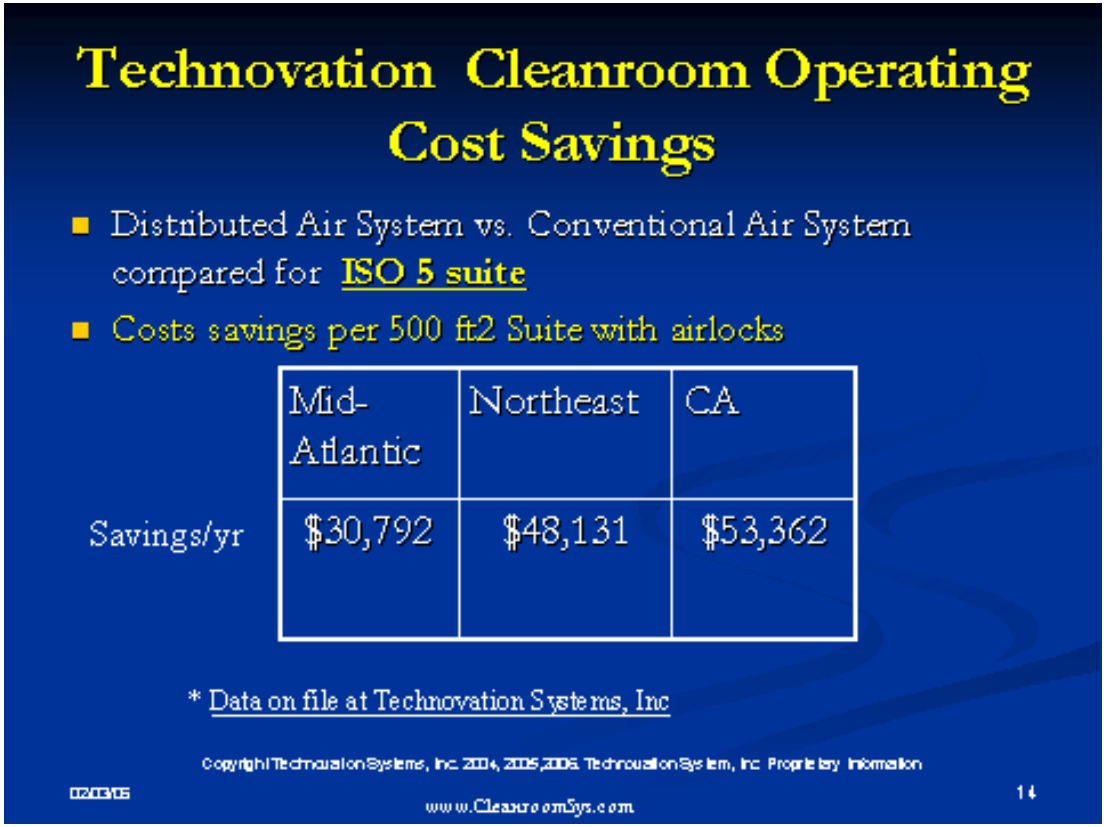
pending) air handling system which almost completely eliminates the use of reheat and due to our Computer Airflow design techniques. *Typical operating cost savings for a ISO 5 & 7, 500 ft2 suite are shown below:*

2. ***Computer Airflow Analysis for High Performance***: we use state of the art design techniques- including computer analysis for airflow. Using our modeling techniques (**Dilution & Transient Models coupled with CFD analysis**) we are able to precisely choose the correct airflow rate and predict room performance at the proposal stage. This results in high performance at lower iniital and operating costs. Technovation applies advanced scientific, engineering principles with advanced computer analysis, with practical constraints, to design cleanrooms, while most other Cleanroom companies apply over simplified rules (such as percent FFU ceiling coverage or Charts) for air flow

3. ***Expert DQ/IQ/OQ and commissioning services that enable cost effective Facility Validation for FDA and USP governed projects***.

4. ***Award winning filtration systems***- we manufacture our own award winning, energy efficient filtration systems.

5. ***Process contamination control expertise***- We have a great deal of process contamination control expertise. We routinely provide contamination control consulting to the industry.***State of the art aerosol and filtration laboratory***- Our design work is supported by our state of the art aerosol and filtration laboratory, which includes test Cleanrooms.


Technovation Cleanroom Operating Cost Savings
Distributed Air System vs. Conventional Air System compared for ISO 5 suite
Costs savings per 500 ft2 Suite with airlocks
Mid-Atlantic
Northeast
CA
Savings/yr
$30,792
$48,131
$53,362
* Data on file at Technovation Systems, Inc
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12/03/05
www.CleanroomSys.com
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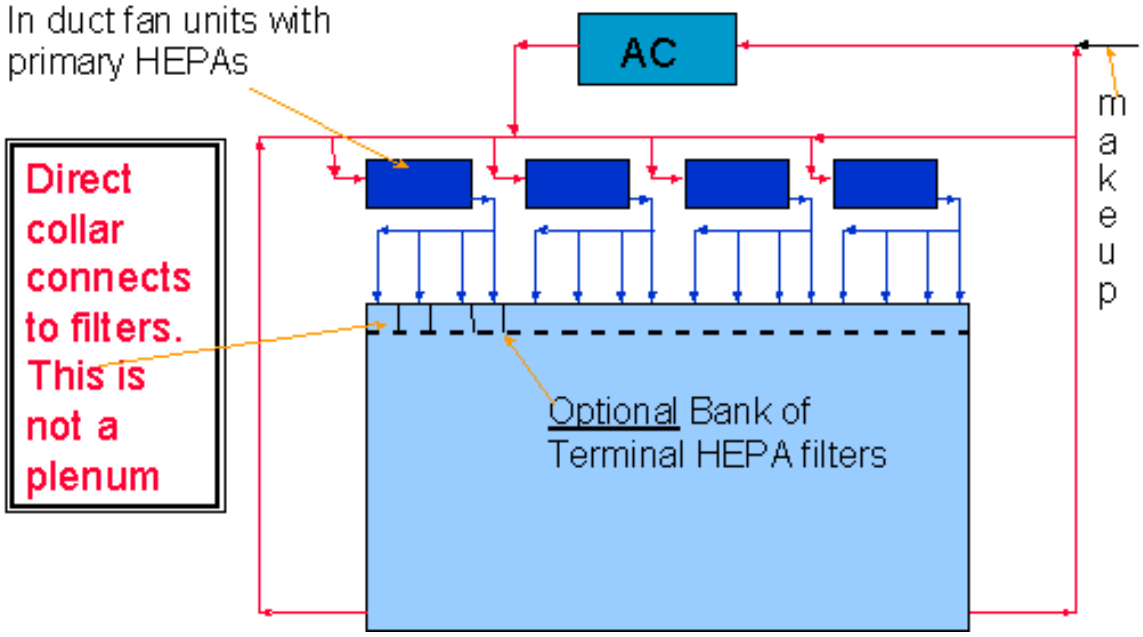
Technovation Cleanroom Operating Cost Savings

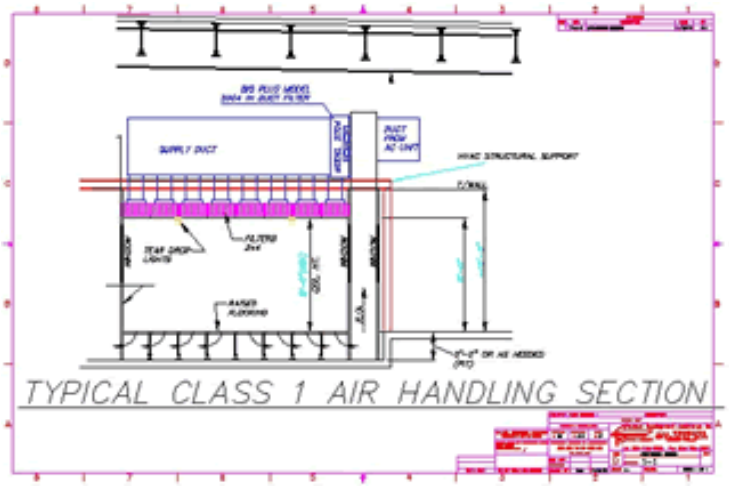
- Distributed Air System vs. Conventional Air System compared for **ISO 7 suite**
- Costs savings per 500 ft2 Suite with airlocks

	Mid-Atlantic	Northeast	CA
Savings/yr	$3,529	$4,856	$5,256

* Data on file at Technovation Systems, Inc

The Distributed Airhandling System





(Larger Image)

(Printable Version-)

We utilize the following computer models to size the air flow handling required in each Cleanroom application

a) Transient Analysis Model
b) Dilution Model
c) Computational Fluid Dynamics

Each room is analyzed at the proposal development stage and these results are included in the proposals and quotations.

The result our Cleanrooms are:

a) Energy efficient (see downloads on energy efficiency)
b) Typically achieve a decade lower classification
c) Have zero to extremely low bioburden

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