



CLEANPAK™ Life Sciences

Advancing the Clean Environment
from Concept to Completion

LAMINAR FLOW SYSTEMS

CLEANPAK™, a Nortek Air Solutions brand, is a fully-customized line of cleanroom equipment including ceiling grids, unidirectional plenums and custom air handling equipment serving all classes in the Biopharm industries.

With over 20 years serving all types of clean environments, we have the experience to support every phase of aseptic cleanroom design and engineering construction. Our latest innovations include modular stainless steel flush ceilings that can be packaged with fan sections for low-profile Laminar Air Flow (LAF) applications.

The custom design of CLEANPAK products offers a cost-effective combination of construction materials to fit your particular budget. Our proprietary flush welded design exceeds cGMP and FDA requirements, providing smooth seams and completely flush surfaces for easy wipe down.

Our reputation for engineering detail offers flexibility to meet the most complex fill finish layouts. Experience in the design and testing of hoods with different elevations, configurations and layouts provides us the capabilities to handle any type of project.

Typical Applications

Fill or Finish Operations
Freeze Dryer Areas
Autoclave or Oven Areas
Cell Culture Areas
Research & Development Labs

FAT capabilities include

Light Level Test
Airflow Performance Test
Air Flow Velocity Test
Filter Resistance Test
Plenum Leak Test
Sound & Vibration Test
Particle Scan Using Photometer

Factory Capabilities

- Large manufacturing facility used exclusively for cleanroom technologies
- Automated sheet metal breaking and notching equipment
- Aluminum, mild steel and stainless steel welding capabilities
- Powder coating line
- Cleanroom environment assembly
- Centrifugal fan fabrication & balancing
- Vertically integrated fabrication methods for recirculation air handlers and outside units
- U.L. Certification
- Over 60 patents and patents pending for a variety of technologies including unidirectional “Flush Grid”, air management control systems and FANWALL TECHNOLOGY®

Laminar Flow Ceiling Systems

- Clean-Trak® Modular
- Clean-Trak Stick Built
- Clean-Trak Plenums
- Fire Protection

Air Handling Units

- Recirculation Air Handler
- FANWALL TECHNOLOGY
- Makeup Air Handler
- Fan Filter Units

- Small Cabinet Fans
- Fan Powered Plenums



CLEAN-TRAK® CEILINGS

Installed in thousands of cleanroom facilities, the Clean-Trak® modular flush-surface ceiling system has revolutionized the cleanroom industry. Operational in more than 3,500,000 square feet of cleanroom ceilings, Clean-Trak is the worldwide standard providing the highest degree of unidirectional airflow and lowest turbulence of any integrated grid system.

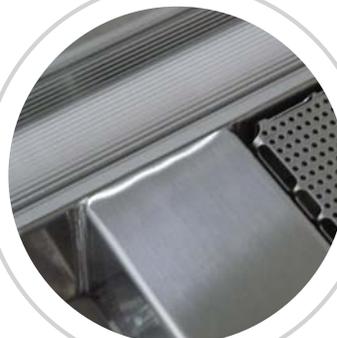
Nortek Air Solutions CLEANPAK™ products offer the widest range of cleanroom ceiling systems to suit any pharmaceutical, aerospace, biotechnology, nanotechnology, research laboratory or life science requirement. We offer several versions of modular and stick-built, top and bottom-load systems, gasketed and gel flush ceilings with integrated lighting and fire protection, and gasketed T grids.

Clean-Trak Modular grid

- Stainless Steel or Powder Coated
- Clean-Trak Plenums
- Plen-Paks
- Integrated Lighting
- T-8 or T-5 Lamps
- Fiber Optic
- Integrated Fire Protection System
- Gel Link Module-to-Module joint Seal
- Gel Share Shared-Air Openings

Featuring

- Solid Welded Pressure Plane
- Equalizer®
- Clean-Screens
- Sealed Grid Penetrations
- Hanging Hardware
- Wall Blank-Offs
- Walkable Blank Pans/Filters/Return Grills
- Superior Flexibility



CLEAN-TRAK® PLENUMS



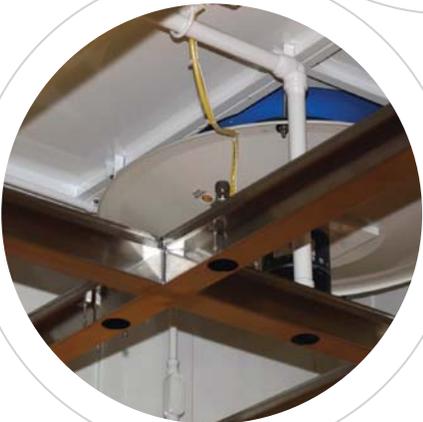
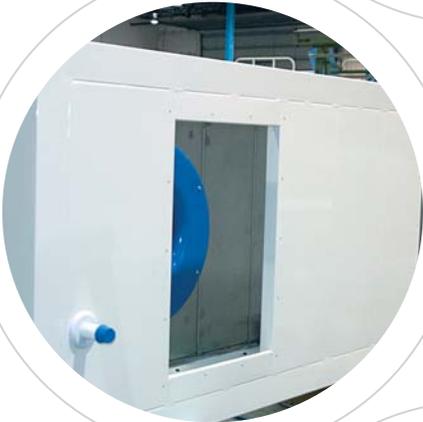
Clean-Trak Plenums are utilized to minimize transverse ducts and duct collars while reducing overall pressure drop. These plenums offer the benefits of Clean-Trak flush ceiling grid, including integrated lighting and fire protection, as well as Clean-Trak's superior performances.

Structurally, Clean-Trak Plenums support high point loads with minimum deflection. This allows the system to support a fan module, live loads and process accessories. Walkable top skins make maintenance easy by allowing quick access to the fan module.

Plenums are available with side-wall openings so one fan module can be shared with multiple plenums. We can make them ducted from the fan deck if required for special applications.

Our Laminar Flow performance can meet the highest level required in the industry whether 0.12 or 0.3 micron containment, 90 FPM or 140 FPM air velocities or positive/ negative pressure requirements. Unidirectional air flow is achieved within a few inches of discharge screens with our unique Flush Grid design and can be maintained at the work surface even in high ceiling areas.

- Support high point loads with minimum deflection
- Available with side-wall openings
- Welded construction with walkable top skins
- Powder coated for easy cleaning and non-particulation
- Integrated sprinkler system with fully concealed head
- Integrated DOP test trees and ports
- Custom sound packages and integrated cooling coils
- Stainless steel or powder coated aluminum
- Integrated flush lighting systems
- Pass through duct for transport systems



AIR HANDLING UNITS

Custom Air Handling Units offer very low vibration and noise levels. They are designed with smooth, washable interiors to withstand harsh chemicals used in pharmaceutical environments.

Polyurethane wall insulation adds protection against contaminants while ensuring both low noise and vibration. Integral to the quality of the air handling unit are high efficiency fans, designed and manufactured specifically for our products for extremely quiet/low vibration operation.

Make-Up Air Handlers

- Welded structural steel base
- Removable panels & insulation
- Rugged, efficient, & quiet fans
- FANWALL TECHNOLOGY®
- Optional P-Cone airflow measurement
- Non-shedding insulation panels

Fan Filter Units

- Stainless steel, aluminum, or powder coated
- Low power consumption & harmonics
- Open communications protocol
- 100% speed control
- Full monitoring
- Flexible filter options
- Fully integrated to flush or T-grid systems

Recirculating Air Handlers

- Highest level of performance & reliability
- Meets NC-60 noise criteria & below
- Custom sizes from 1000 to 200,000 CFM
- Easy to remove fan/motor assembly
- Volume control & flow measurement options
- Cabinet finish easy to maintain with low off-gas materials

Small Cabinet Fans

- Flexible modular design
- Sizes; 400 to 8,000 CFM & 0.5" - 5.0" TSP
- Replaces Plen Pak fans for higher CFM
- Single or dual direct drive plug fan design
- Measuring Stations available; VFD or P-Cone
- Optional HEPA filter sections
- Powder coated or stainless steel cabinet
- Quiet, low vibration operation without requiring
- An isolation base



FANWALL TECHNOLOGY®

System Redundancy and Reliability

Air handlers with a FANWALL® system provide a measure of system reliability that is beyond comparison with conventional fan air handler offerings, greatly reducing the exposure of downtime due to mechanical failure. The use of multiple, smaller fans provides unparalleled redundancy and can eliminate the need for standby units. Reliability is further enhanced by using direct drive fans that eliminate belts, sheaves and fan bearings.

Lower Installed and Maintenance Cost

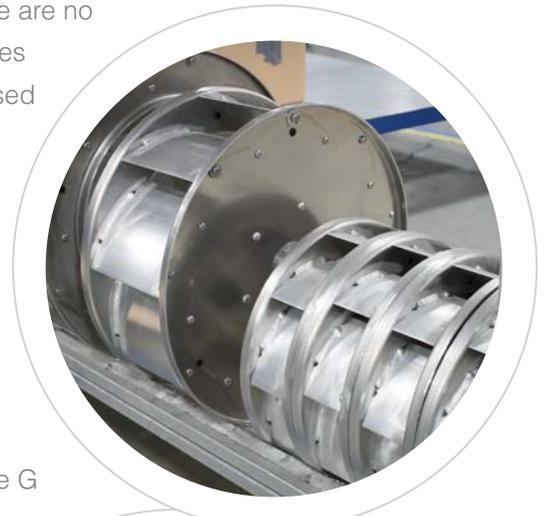
Providing a quality unit for a lower installed and maintenance cost is the heart and soul of our business. FANWALL TECHNOLOGY helps accomplish this by reducing the number of shipping splits. This is further supplemented with the fan section modules installed in the field in weight sensitive rigging situations. Finally, a reduced airway tunnel length can result in casing cost savings.

With any system, maintenance is a key factor. With FANWALL systems, there are no belts, sheaves and fan bearings to be replaced. Replacement fan assemblies can be installed in 30 minutes or less and identical fan cartridges can be used for multiple units.

Seismic and Vibration Concerns Eliminated

Air handlers with a FANWALL system eliminate vibration and seismic issues by using high frequency dynamically balanced motor/fan assemblies, reducing the need for spring isolation bases or concrete inertia bases. The casing collateral vibration is greatly reduced or eliminated due to significant reduction in airway tunnel turbulence. Finally, all fan cartridges are dynamically balanced to AMCA 204-96 Balance Grade G 0.55 (.0005 in-lb/lb rotor mass) residual unbalance at 2000 RPM.

FANWALL TECHNOLOGY, invented by Nortek Air Solutions Huntair™ now having an installed base of tens of thousands of fan cubes, offers all the benefits of an ideal fan system: unsurpassed reliability, LEED point worthy energy efficiency, extremely low cost maintenance, revenue generating reduced footprint, recording studio quality acoustical signature, and system redundancy that essentially guarantees no unscheduled down time.



EXPERIENCE

Life Sciences



ABBOTT LABS
APOTEX PHARMACHEM
BAUSCH & LOMB PHARMACEUTICALS
BAYER
BAXTER HEALTHCARE
BOSCH PACKAGING TECHNOLOGY
BRISTOL MYERS SQUIBB
BIOSTRUCT GENZIA SICOR
CAMBREX
CARDINAL HEALTH
DSM PHARMACEUTICAL
DUPONT
ELAN PHARMACEUTICAL
ELI LILLY
GENENTECH
GENZIA SICOR PHARMACEUTICALS
GSK
GSK BIOLOGICALS
MALLINCKRODT, INC.
MASS BIOLOGICS LABS
MED-PHARMEX
MEDQUEST PHARMACY
MERCCK
MERIAL
NOVO NORDISK
PHARMAFORCE
SANOFI PASTEUR
SIGMA ALDRICH
SP PHARMACEUTICALS
TALECRIS BIOTHERAPEUTICS
WYETH



Advancing Clean Environments - From Concept to Completion

CLEANPAK® continues to advance all standards of clean environments by controlling the full process of cleanroom development, from design concept to project completion. By responding to industry-specific requirements, our cleanrooms are setting precedents for the microtechnology, semiconductor, biotechnology and pharmaceutical industries. Being responsive to customer needs with strong support while maintaining active engagement in research and development has placed us in the forefront of cleanroom products and systems. Creating the right solution for your critical environment begins with discussing your specific requirements, identifying the challenges, designing a solution and ultimately delivering a custom-engineered package that meets all your unique needs.

Products may be protected by one or more of the following US patents: 5,613,759; 5,794,397; 5,014,608; 5,161,941; 5,088,886; 5,192,348; 5,207,614; 5,454,756; 5,586,861; 5,628,581; 5,681,143; 7,137,775; 7,179,046; 7,527,468; 7,597,534. Patents pending. To see patents related to products in this brochure please visit www.nortekair.com/patents.

Specifications and illustrations subject to change without notice and without incurring obligation.

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599F-0820 (Replaces CP Cleanroom LF SB 1B May 2015)