The expert in the air dispersion industry world wide

DurkeeSox®
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(ONLY FOR NORTH AMERICA)
www.nanosox.net

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DISTRIBUTOR DATA

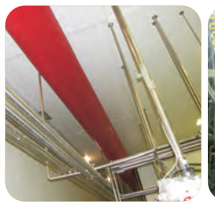
NanoSox®
Air dispersion system

PRODUCT INTRODUCTION







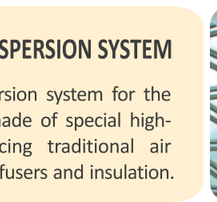
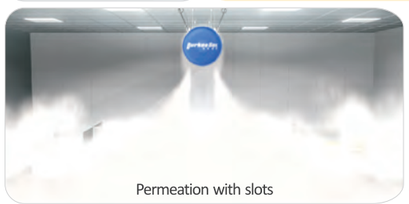





Permeation with injection

NANOSOX AIR DISPERSION SYSTEM

A flexible air dispersion system for the HVAC/R industry made of special high-tech fabric, replacing traditional air ducts, air valves, diffusers and insulation.



Permeation with slots

100% eject with permeation


2013 English

Global Nanosox®

THE LEADING BRAND OF FABRIC AIR DISPERSION SYSTEMS

NanoSox® is a subsidiary of US registered DURKEE INTERNATIONAL INDUSTRY Ltd, a multi national high-tech enterprise, with focus in the HVAC/R industry. As a manufacturing & servicing oriented organization, NanoSox® has established two manufacturing centers (China and USA), 3 sales and service centers (China, Asia and America). Being a world renowned fabric air dispersion system supplier, NanoSox® has become a dominant leading brand in the vast Asian market and globally.

As an advocate of precise air distribution conception for years, and armed with leading technology, high-tech fabric material, NanoSox® insists on using global top-level manufacturing technology and standard to produce the highest quality fabric air dispersion system products. It has acquired many national and regional standard quality certificates, such as, international QA system ISO9001：2008、ISO14001、OHS18001,North American UL AJIJ and Ac167 products certification, European EN testing ,BS testing and China NFTC testing.

So far NanoSox® air dispersion system has been widely applied in various permanent and temporary applications such as supermarkets, sports, public facilities & events, food, electronic, automobiles, logistic etc, It's 'been consistently approved by countless renowned clients in more than 32 countries and regions, including Beijing Olympics, Shanghai World Expo, Carrefour, Tesco, Kraft, Nestle, McDonald's, Yale, Verizon, Foxconn, BMW, Volks-Wagen, Nissan, Toyota, Honda, Fiat, etc. All these successful applications have made NanoSox® the one of the international leading brand.

Driven by our strong and energetic team where any innovative ideas can promptly transfer into new products, our ongoing effort will strive for the optimum solution.

NanoSox® supplies fabric air duct products and application services for many well–known organizations globally

Yale University Lab
McDonald's Playground
BMW after-sales service shop
MGM Hotel
Verizon Switch Hub
New life Church
Audi Showroom
U-haul Storage
Kraft food Baking workshop
Kellogg's
Toyota Factory
Goodyear tyre factory
Toyota showroom
OMNI showroom
Church Basketball Court
Kraft foods Brazil

America

PRIMO Small Goods Facility
LION
Melbourne Library
Calwell High School
Kathmandu
Smithton Milk Powder Processing Facility
Woolston Printing
Beef Boning Room
OBS Witte Vrouwen
Bevez
Aquasana
OCE Venlo
Autoszalon Workshop
LEMO Workshop
ATTSZ Assembly Workshop
Varroda Sewing Workshop

Europe/Oceania

India • 2010 Commonwealth games
India • Kraft/Cadbury food
India • Whirlpool, ALPLA factory
India • Bc India 2011/2013 by RMB events
India • SunGard software office
UAE • Carrefour FUJAIRAH
UAE • Fitness First / MCC (Mirdif City Centre)
UAE • Caterpillar warehouse
OMAN • Khimji Ramdas Warehouse
Saudi • Herfy food
Kuwait • Kuwait Flour Mills biscuit factory
Pakistan • Carrefour Dolmen City store
Mauritius • La Gaulette Commercial Centre
Kenya • Kenya TV Studio
Nigeria • Lecture Theater/Auditorium
Egypt • Misr International plastic factory

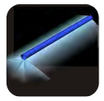
Asia/Africa

Thailand • Tesco Lotus Supermarket
Thailand • Carrefour Supermarket
Thailand • UNILEVER PCL
Indonesia • Nestle
Indonesia • BMG Group
Indonesia • Fitness First
Malaysia • Tesco Supermarket
Malaysia • Carrefour Supermaket
Philippines • Nestle
Philippines • Murata electronic factory
Philippines • SR supermarket
South Korea • Agriculture storage room
China • 2008 Olympic Games
China • 2010 Shanghai World Expo
China • Volkswagen
China • Foxconn

Asia

WHY USE

10 DISTINCTIVE FEATURES COMPARE WITH CONVENTIONAL DUCTWORK



NanoSox® Fabric Duct Air Dispersion system disperses airflow through fabric permeation and designed multi-row orifices to form a tridimensional air dispersion effect with great comfort, overall even airflow and precise air throw.

Multiple colors are available to compliment any indoor decor; meanwhile, the system as well as the color can be customized and individually designed.

Supply cooling air is permeated through fabric forming an air layer around fabric duct to result in no temperature difference between inside and outside; therefore no insulation is required to prevent condensation.

Due to easy and convenient installation and dismantlement methods the NanoSox® Fabric Duct System is very easy to wash. Improved IAQ meets higher healthy and environment-friendly requirements.

The NanoSox® Fabric Duct System uses flexible material operating at lower velocities so it does not generate noise or transmit resonance. A quiet system improves the environmental quality.

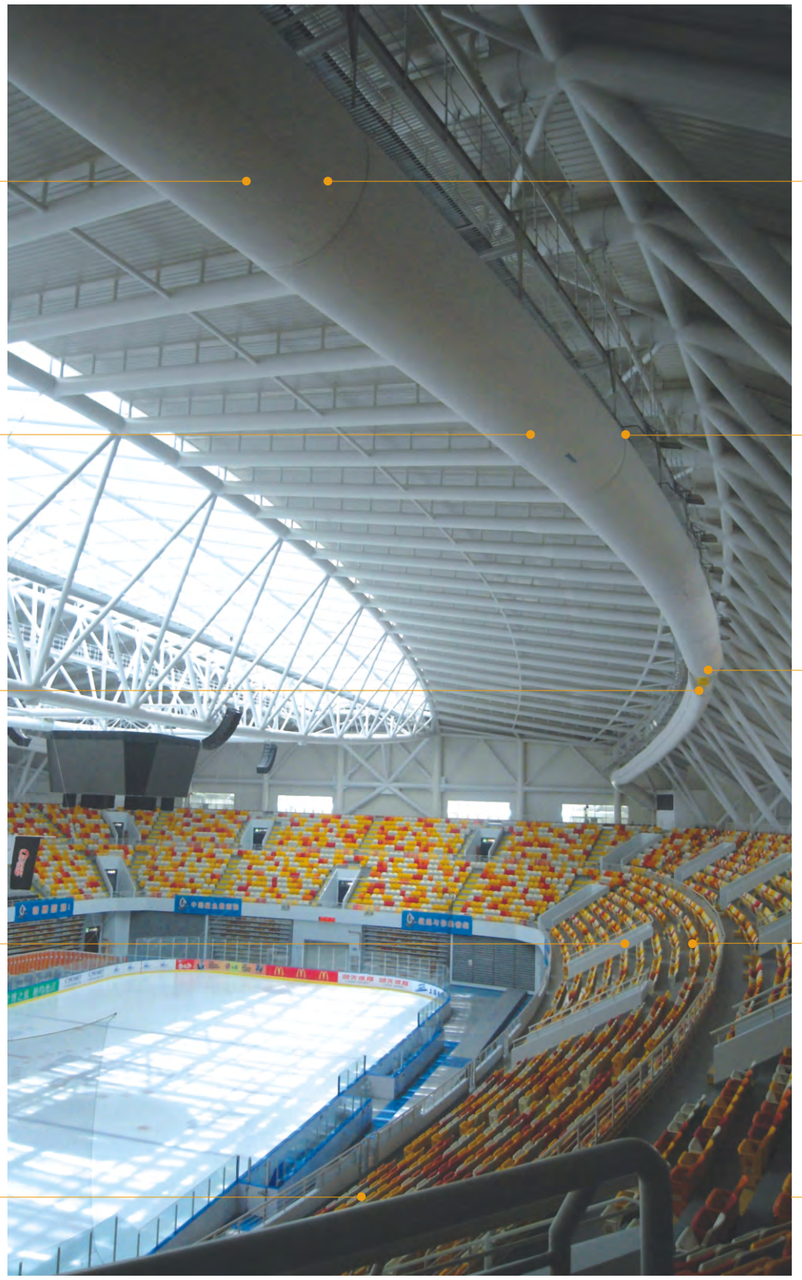
EVEN & COMFORTABLE

AESTHETIC

CONDENSATION FREE

HYGIENIC & HEALTHY

QUIET



LIGHT WEIGHT

QUICK INSTALLATION

RELIABLE QUALITY

GREEN

ECONOMICAL

The NanoSox® Fabric Air Duct System is a very light weight system which is only 1/40 the weight of a traditional metal air duct system. The NanoSox® System lends itself well to applications such as new construction and building renovations without the need of roof load requirement considerations.

Utilizing a specialized cable or track suspension system provides for simple and quick installation time and requires approximately 1/10 or less the installation time of a conventional metal duct system. This greatly reduces the construction time and ensures virtually no material is wasted on the jobsite.

Introduce large laser production line and system simulation platform into NanoSox system, all products are manufactured in our factory, to ensure high pressure resistance, tiny passive permeability, etc basic properties.

NanoSox® only uses environmental friendly synthetic fabric, green manufacturing, techniques and operating procedures, convenient remove, storage and recycle. Meanwhile, large space laminar flow model makes the NanoSox system an energy saving product.

A simpler NanoSox® design can replace the whole traditional duct-work system including air ducts, valves, diffusers and insulation materials, lightweight, easy transportation and installation to reduce overall cost.

WHY US

FEATURES THAT MAKE DURKEE THE MANUFACTURER OF CHOICE

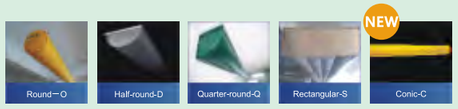
Comprehensive product line up

1 Full range of fabric material

High-quality Nanosox®-N series, optimal economic Nanosox®-L series, and top fire proof Fibersox series, with variations of regular, antistatic and anti microbial functional properties. Totally 9 products with multi-functional customization ability as per special demands, providing the most comprehensive standard permeability choices, to fulfill the higher requirements in various industries.

2 Complete duct profile

Besides the duct shapes of Round, Half round, Large half round, Quarter and Rectangular, Conic duct has been developed as the world unique, providing better air distribution performance and economic features.

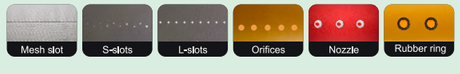


3 Versatile fittings

In addition to regular fittings (inlet, end cap, elbow, T-connector), Unique fittings such as square to round, Y inlet, bevel end cap, tension ring, wall pass-through and expansion segment and more are introduced to fit various applications.

4 Outlets

Airflow can be discharged through fabric permeation, mesh slot, s-slot, linear slot, orifice, nozzle, and rings.



Premium fabric material

1 Unique micro of permeability technology

Permeability as low as 0.2 cfm/ft² (3.6m³/m²/h) can be achieved to ensure minimum air permeation in high pressure large systems, while still maintaining condensation free.

2 Superior fire resistant NanoSox®

Powered by nano technology, the superior permanent fire resistance performance of NanoSox® does not degrade after repeated laundering.

3 Nonflammable Fibersox™ material

Nonflammable Fibersox™ is made of non-organic fire proof material. It is classified under nonflammable as Class “A” type, to meet the most stringent fire safety requirement.

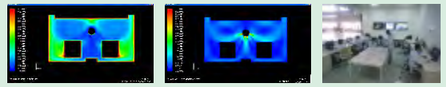
4 Best industry warranty

Exceptional product series are backed by unmatched industry warranty. A 15 years, 10 years, and 8 years limited warranties come with NanoSox®-N , NanoSox®-L and FiberSox™ series.

Professional design and installation

1 World leading air dispersion system technology

With a large space airflow lab and modern CFD computer simulation technology, NanoSox engineers can tackle the most complicated and most demanding project with precision and confidence.



CFD computer assistant simulation

2 Detailed design manual and iCase application gallery

Accompanied with thousands client iCase application gallery, the new NanoSox system design manual is easy to follow and easy to find reference project designs to achieve optimum solutions.

3 iSox design software

Unique iSox CAD design software makes the precision system design a breeze.

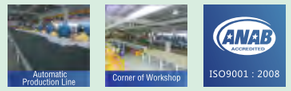
4 Full installation manual & specialized tools

Extensive work flow pictures in the detailed installation instruction, along with proprietary tool (cable tightener) quickly turn a novice installer to professional in no time.

Advanced production

1 Large scale laser automatic production line

Possessing the world unique 4 automatic production lines, NanoSox reaches the production capacity of 32,300,000ft² (3,000,000m²), with precise quality control.

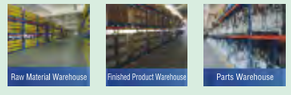


2 Global top advanced multi–head laser processing center

Precise processing technology of NanoSox System reaches the international top level with the global top advanced multi-head laser processing center.

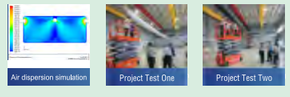
3 Large–scale and full range of storage leads to shorter lead time

Full range of storage facilities, plus high efficient production management system, shortens regular lead time to less than 15 days, and even shorter for special orders.



4 World leading effect testing simulation platform

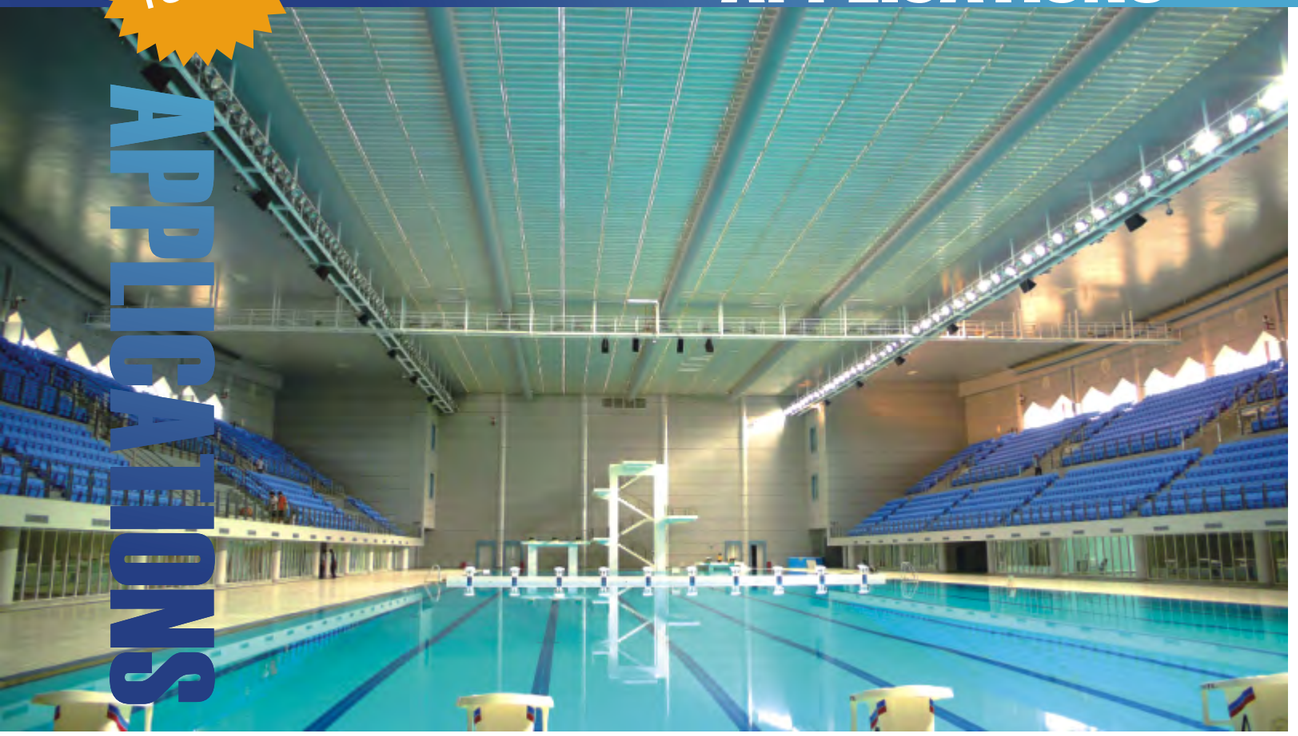
All the finished products would be tested at the effect testing platform, which guarantees the zero-defect and completely accordant air distribution effect as per the design requirement.

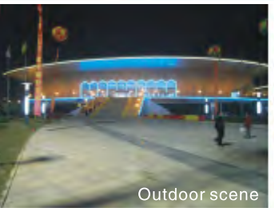


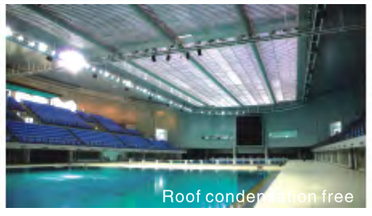
WHERE TO USE

APPLICATIONS

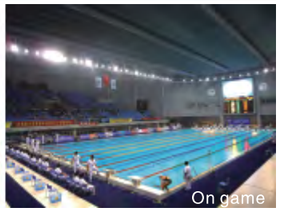
APPLICATIONS




Outdoor scene


Roof condensation free


Auditorium air dispersion


On game

NANOSOX USED IN CHINA WUHAN SPORT CENTER SWIMMING POOL

NanoSox system was successfully applied on Wuhan Sports Center of 366,000ft^2(34,000m^2)(Swimming & diving Pool), the major game venue of China 6th national city games and the largest indoor swimming pool with power sunroof. The interior walls are decorated with aluminum composite panels. The original designed metal air duct system was facing some difficult challenges: The roof of the swimming pool is glass structured, very easy to bring condensation issue; power sunroof leaves no space to install metal ducts; hundreds of adjustable diffusers are necessary and airflow is not optimum. The customer ultimately decided to choose NanoSox system in both swim competition center and training center.

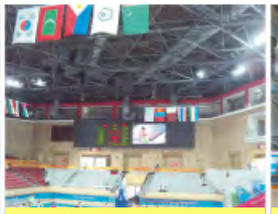
In the actual application, we placed 3 ducts above the swimming pool to effectively prevent sunroof condensation. And another 6 ducts of total 400ft(120m) long with multi-row orifices were mounted along two sides of arc walls, 10% airflow permeates through fabric, 90% was dispersed to both the walls for condensation prevention and auditorium for their comfort. Moreover, micro-permeability fabric ducts could guarantee itself condensation free.

NanoSox system applied in this project is the highlight for applying for LUBAN AWARD (Chinese supreme architecture design award), and has earned us a good reputation as expert in sports facilities from then on.

FEATURES

Even & comfortable airflow, anti–corrosive, no condensation and cost efficient.


ASIAN GAMES STADIUM


ASIAN GAMES STADIUM


ASIAN GAMES STADIUM


UNIVERSITY SPORTS CENTER


OLYMPICS GYMNASTICS MUSEUM


GYMNASIUM

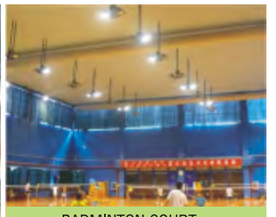

GYMNASIUM

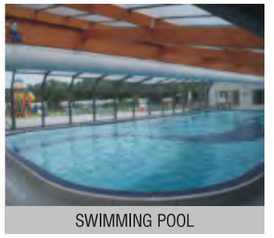

OLYMPICS TENNIS COUNT

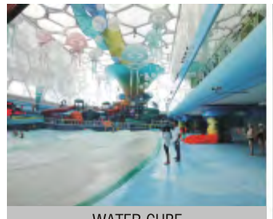

TENNIS COURT

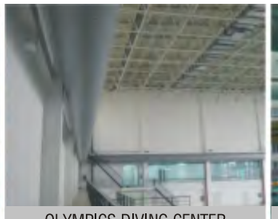

TENNIS COURT

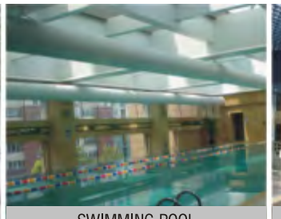

BADMINTON COURT

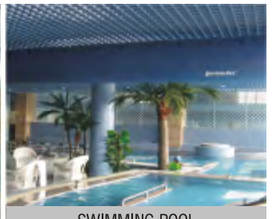

BADMINTON COURT


SWIMMING POOL


WATER CUBE


OLYMPICS DIVING CENTER


SWIMMING POOL


SWIMMING POOL

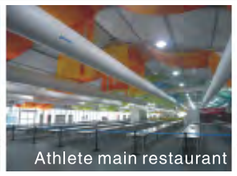
LARGE STADIUMS MID–SIZED BALL COURTS SMALL BALL HALLS FITNESS CLUB SWIMMING POOLS

WHERE TO USE

APPLICATIONS

APPLICATIONS


Outdoor scene


Athlete main restaurant


Staff dinning-room


Restaurant kitchen


Global famous athletes

Beijing Olympic Village Restaurant

----NanoSox was the global exclusive supplier of fabric air distribution systems for 2008 Beijing Olympics

2008 Beijing Olympics, a global prominent event. Green is a key prerequisite for designing and constructing the Olympic Games' facilities, where strict ecological standards and systematic guarantee systems would be established. The total construction area of the village is about 226,000 ft^2(21,000M^2), NanoSox system solution successfully won the bid, becoming the only supplier of fabric air dispersion system for 2008 Beijing Olympic games.

Aiming at requirements from BOCOG and jobsite (temporary tent, large area, low space, no insulation on roof, dense occupancies), NanoSox system made of permanent fire resistant fabric "NanoSox" with "s-slot" was arranged at lower height (10ft or 3m from the floor) to make air distribution more even &comfortable and energy saving.

After almost three months of operation for the Beijing Olympics and Paralympic Games, NanoSox system sustained cruel testing and gained a consistently good reputation from China and abroad. The advantages of safe & energy savings, green & environmentally-friendly material, recyclable and quick installation and removal ability, was greatly approved by officers of BOCOG. The NanoSox system was successfully installed in another 23 reception halls following main the restaurant.

FEATURES

Directional air dispersion, even & comfortable airflow, further air throw, improved air quality, easy to clean and maintain.


COCACOLA RECEPTION


GE RECEPTION


ADIDAS RECEPTION

SAMSUNG RECEPTION

PANASONIC RECEPTION


VISA RECEPTION


BANK OF CHINA RECEPTION


LENOVO RECEPTION


IOC RECEPTION


BEIJING OLYMPIC COMMITTEE

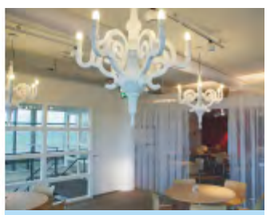

BC INDIA

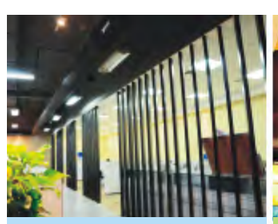
EXHIBITION


SHANGHAI WORLD EXPO


SHANGHAI WORLD EXPO


BUS STATION


OFFICES OF EIFFEL


LANDMARK GROUP OFFICE HQ DUBAI


AL MAJAZ PARK


CONFERENCE HALL

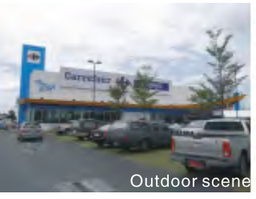

SPORTS CENTRE

Exhibition & Reception Office Conference Hall Transportation

WHERE TO USE

APPLICATIONS

APPLICATIONS


Outdoor scene


Appliances


Cosmetics area


Cds area


Fresh area

Carrefour Supermarket

----One of the largest supermarket chains worldwide

Carrefour, one of the largest supermarket chains, with business operations in many countries all over the world, features diverse structure styles in various countries, such as, Carrefour china store is typically low space with restricted room.Conversely Southeast Asian stores have higher ceiling heights and have larger spaces. Both scenarios pose a high demand on aesthetics and require a short installation time. The former used traditional metal air duct system shared the problems of poor even air distribution, bad air quality, etc, and the cleaning of the ducts annually was virtually impossible. Especially in China, due to the new national hygienic code which demands annually compulsive cleaning of AC ventilating systems in public places, Carrefour started to seek innovative air dispersion system. NanoSox's quick installation, easy maintenance and cost efficient in cleaning attracted all the sights of Carrefour. Since 2008 the NanoSox system has been employed in all Asian stores.

By application from Carrefour, NanoSox was abundantly applied to Metro, Tesco, Auchan, Decathlon, Lotus etc. large supermarket chains, and became the dominant fabric air duct system supplier for Asian supermarket chains.

FEATURES

Directional air dispersion, even & comfortable airlow,improved air quality, easy to clean and maintain.


METRO


TESCO


VANGUARD


VANGUARD


CARREFOUR INDONESIA

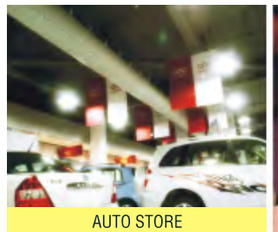

AUCHAN


RT-MART


CHAROEN LOTUS


CHAROEN LOTUS


SHOPPING MALL


AUTO STORE


CINEMA


CASUAL DINING


ENTERTAINMENT PLACES

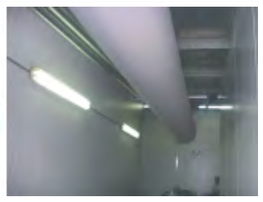
Supermarkets Shopping Mall Store Theatre Entertainment Places

WHERE TO USE

APPLICATIONS







Kraft Foods

Kaft Food is one of the world's largest food companies, with business operations in 145 countries.
Kraft Nabisco Food (Suzhou) Co., Ltd., the solely owned subsidiary of U.S. Kraft Nabisco International Co.,is located in Suzhou Industry Zone. The facility covers an area of 540,000ft^2(50,000m^2) with 310,000ft^2(28,817m^2) of production workshop which accommodates eight production lines. For traditional system delivers air through diffusers , unable to meet requirement of keeping low air velocity in large cooling capacity, along with more problems, such as increasing roof loads and high cost of cleaning and maintenance.

NanoSox system employs large air permeability fabric to introduce an environment of large air coverage area, low airflow velocity, even air dispersion without drafts to prevent the biscuit chippings and powders from being blown off and guarantee building occupant's comfort. The ductwork is cleaned in three months intervals due to easy dismantlement, clean and ease of reinstallation to meet sanitation and cleanness requirement.

NanoSox was successfully installed in the phase one project; Kraft (worldwide) has since become a regular client and partner of NanoSox, following the installations in phase two and phase three of the project.

The NanoSox Fabric Duct system does not only have incomparable advantages in the solid food industry, but also prominent advantages in AC systems of other food industries and various factories.

INDUSTRIAL FACILITIES

Ideal air exchange, even & comfortable airflow, easy to clean & maintain , quick installation,and no roof load requirement.




PRIMO


BISCUITS WORKSHOP


BEVERAGE


MEAT PROCESSING


HALWANI FOOD


WALL'S


HAAGEN-DAZS


SONY-ERICSSION


WHIRLPOOL INDIA



PHARMACEUTICAL

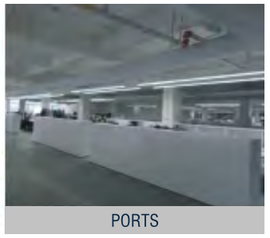


NISSAN


SNECMAS


IVECO AUTO


MENG JIE TEXTILE


PORTS

Food Electronics Tobacco Chemical & Pharmaceutical Mechnical Textile & Printing

HOW TO SELECT

Nanosox® - N Series

TOP GRADE

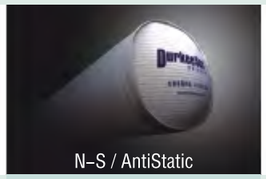
Different to most similar products been treated in flame retardant, Nanosox®–N Series adopts the material from directly weaved fabric with Nanotechnology and permanent fire retardant property, which getting the best fireproofing feature with no influence during washing. Nanosox®–N series provides higher physical properties, including high pressure resistant, tensile strength, stable permeability, antimicrobial, antistatic etc **anti–corrosion.** Along with 10 standard permeation rates and 15 years warranty, it is the top level and most widely used product series, which has gained various certifications and patents from both China and abroad.

N / General

Constructed of Nanosox®–N fabric in various permeability. Typically applied on all kinds of heating & cooling places with general comfort requirement.

N–M / Anti Microbial

Made of permanent antimicrobial Nanosox®–N fabric which guarantees both permanent antimicrobial and fire resistant performance. Mainly applied on food, pharmacy, clean room etc. industries of cleanness demanding.



N–S / AntiStatic

An combination of Nanosox®–N fabric in diverse permeability and inherent antistatic fibre to dissipate static build–up.Typically used in electronic, chemical, precision manufacturing etc industries of static sensitive environment.

N00 / Non permeable

Made of non–permeable Nanosox®–N fabric. Commonly used in industrial workshop, warehouse etc. heating and ventilating area where features a high and large space. Meanwhile, it is also applicable to light refrigerating places.

Material property & Product Performance Indicators

Property	Items		Index	Results	Code compliance	Testing organization	Remarks
Material property	Ten Permeability		0/0.2/0.5/1/2/4/6/8/16/20cfm/ft² at 0.5"w.g	0/0.2/0.48/1/2 /5.8/8.2/15.5/20	GB/T 5453-1997	CTTC	
	Fire safety	B	FIGRA, W/s≤120 THR600s, MJ≤7.5	15 2.2	GB 8624-2006 EN13501-1: 2007	NFTC	Formal testing
		s1	SMOGRA, m²/s2≤30 TSP600s, m²≤50	0 20			
		d0	Flaming particles or droplets withing 600s Ignition of the filter paper	No No		SGS	
		T0	Smoke Toxity ZA1	ZA1			
		Class 1	Calculated Smoke Developed(CSD)≤50 Flame Spread Index(FSI)≤25	20 0	UI723	UL	Formal testing and UL certificate
		Class 0	Fire propagation index	0.4	BS 476-6,7:1997	TUV SUD PSB	Formal testing
	Physics property	Tensile strength	> 3.4lb (15N)	6.5lb (29N)	GB/T 3917.1-1997	CTTC	
		Tear strength	> 112lb (500N)	279lb (1240N)	GB/T 3923.1-1997		
		Shrinkage after washing	< 2%	0.5%	GB/T 8630-2002		
		Permeability tolerance CV(%)	< 5%	3.7%	GB/T5453-1997		
		Temperature range	17.8℃(0°F)(24hours);129℃(265°F)(60days) No change of appearance	No change	Ac167 & UI181	UL	Formal testing and UL certificate
	Operational performance	Clean & fibre drop property	No fabric drops	No change	Ac167 & UI181	UL	
		Anti-mold	No Destroying or decomposing after 60days under the testing condition of UI181	No change	Ac167 & UI181	UL	
		Textile health security	PH 4.0-7.5 Formaldehyde content≤20mg/kg (20ppm) Decomposable Aromatic Amine dye≤20mg/kg (20ppm) No abnormal odor	7.4 Accord Unfound None	GB 18401-2003	CTTC	Class A (Baby cloth type)
		NS-M Anti-microbial	>95%	>99%	ASTM E2149	CTTC	
		NS-S Anti-static		0.093μc/ft² (1.0μc/m²)	GB/T 12703-1991	CTTC	
System performance	Pressure resistance		No change at 7.6 in*wg (1900pa) static pressure	No change	Ac167 & UL181	UL	Formal testing and UL certificate
			Appearance no change, no tear, no damage at 8 in-wg(2000pa) static pressure	No change	JGJ 141-2004	National center of quality supervision and inspection and testing for air condition equipment	
	Passive permeability	Passive permeability volume at 2 in-wg (500Pa)	≤ 2.8cfm/ft² (50m³/h/m²)	0.84 (25m³/h/m²)			
		Passive permeability volume at 4 in-wg (1000Pa)	≤ 5.5cfm/ft² (100m³/h/m²)	1.98 (48m³/h/m²)			
	Dimension tolerance		≤ 1%	No change			

SYSTEM SELECTION

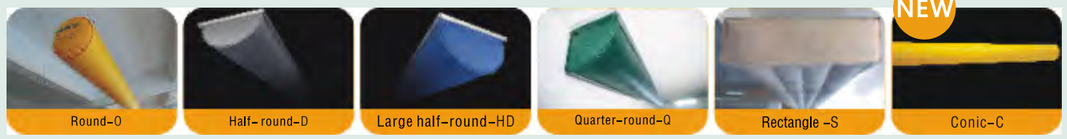
Airflow Models

Permeability Indicators (cfm/ft² in 0.5w.g.)

	PM	PS	PE	EJ
N	20 16 8	6 4 2	1 0.5 0.2	0
N–M	16	6 2	0.5	0
N–S	16	6 2	0.5	0

Note: permeability value in the table 0.2,0.5,1,2,4,6,8,16,20 is corresponding to metric system unit m3/m2/h (125Pa) : 3.6,9,18,36,72, 108,144,288. Customized permeabiliti is available.

Shape

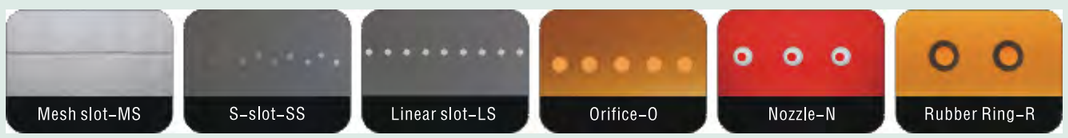


	O	D	HD	Q	S	C
N	●	●	●	●	●	●
N–M	●	●	●	●	●	●
N–S	●	●	●	●	●	●

Color

	W	R	Y	BE	BU	LGY	GY	GN	BA	CUSTOMIZE
N	●	●	●	●	●	●	●	●	●	●
N–M	●									
N–S	●				●		●			

Air Outlet Model



	MS	SS	LS	O	N	R
N	●	●	●	●	●	●
N–M	●	●	●	●	●	●
N–S	●	●	●	●	●	●

Nozzle Dia：1"、1.5" Rubber Ring Size：2"、2.5"

HOW TO SELECT

Nanosox® - L Series

ECONOMY

Nanosox®–L is made of inherent permanent fire retardant fabric with reliable & stable physical properties like high pressure resistant, tensile strength, stable permeability etc. It provides 5 standard permeation rates and 10 years warranty, mainly applied at economical sites.

L / General

Constructed of Nanosox®–L fabric in various permeability. Typically applied on all kinds of heating &cooling places with general comfort requirement.

L–M / Antimicrobial

Constructed of anti–microbial Nanosox®–L fabric with diverse air permeability. Normally applied on food, medical etc. Industries of higher cleanness requirement.

L–S / Antistatic

Constructed of antistatic Nanosox®–L fabric with different permeability. Typically used in electronic and precision manufacturing etc. Industries of static sensitive environment.

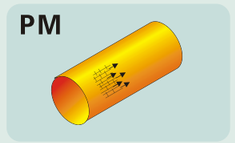
L00 / Non permeable

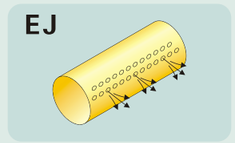
Made of non–permeable Nanosox®–L fabric. Commonly used in industrial workshop, warehouse etc. heating and ventilating area where features a high and large space. Meanwhile, it is also applicable to light refrigerating places.

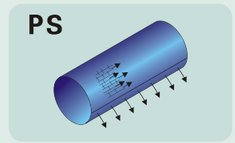
Material property & Product Performance Indicators

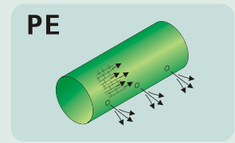
Property	Items		Index	Results	Code compliance	Testing organization
Material property	Five Permeability		0/0.5/2/6/16cfm/ft²)/ in 0.5"w.g.	0/0.48/2/5.8/15.1	GB/T 5453-1997	CTTC
	Fire safety	Class 1	Calculated Smoke Developed(CSD)≤50 Flame Spread Index(FSI)≤25	20 0	UI723 ASTM E84	UL
		Class 0	Fire propagation index	0.4	BS 476-6,7:1997	TUV SUD PSB
	Physics property	Tensile strength	＞3.4lb (15N)	6.5 (29N)	GB/T 3917.3-1997	CTTC
		Tear strength	＞112lb (500N)	279 (1240N)	GB/T 3923.1-1997	
		Shrinkage after washing	＜2%	0.2%	GB/T 8630-2002	
		Permeability tolerance CV(%)	＜5%	Accord	GB/T 5453-1997	
	Operational performance	Textile health security	PH 4.0-7.5 Formaldehyde content≤20mg/kg (20ppm) Decomposable Aromatic Amine dye≤20mg/kg (20ppm) No abnormal odor	7.4 Accord Unfound None	GB 18401-2003	
		L-M Antimicrobial	>90%	>95%	ASTM E2149	
		L-S Antistatic		0.065μc/ft² (0.7μc/m²)	GB/T 12703-1991	
System performance	Pressure resistance		No change at 7.6 in*wg (1900pa) static pressure	No change	JGJ 141-2004	UL

SYSTEM SELECTION









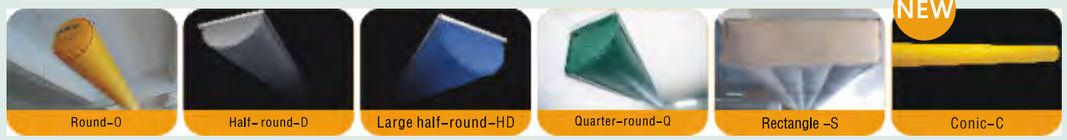
Airflow Models

Permeability Indicators (cfm/ft² in 0.5" w.g.)

	PM (大渗透)	PS (中渗透)	PE (微渗透)	EJ (不渗透)
L	16	6 2	0.5	0
L–M	16	6 2	0.5	0
L–S	16	6 2	0.5	0

Note: permeability value in the table 0.5,2,6,16 is corresponding to metric system unit m³/m²/h at 125Pa: 9,36,108,288.

Shape



	O	D	HD	Q	S	C
L	●	●	●	●	●	●
L–M	●	●	●	●	●	●
L–S	●	●	●	●	●	●

Color

	W	R	Y	BE	BU	LGY	GY	GN	BA	CUSTOMIZE
L	●	●	●	●	●	●	●	●	●	
L–M	●									
L–S	●				●		●			

Air Outlet Model

	MS	SS	LS	O	N	R
L	●	●	●	●	●	●
L–M	●	●	●	●	●	●
L–S	●	●	●	●	●	●

Nozzle Dia：1"、1.5" Rubber Ring Size：2"、2.5"

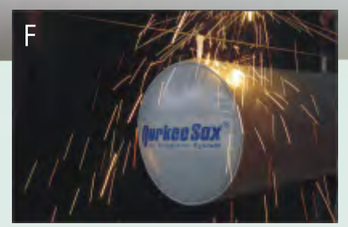
HOW TO SELECT

Fibersox™ Patented Top Fire Proof Series

COC CL52 12 11 62855 001 · 8 Years Warranty

FUNCTION TYPE

Fibersox™Series is made of Class A nonflammable fabric material providing the best fireproofing property and 8 years warranty. It is mainly for the applications which have strict fireproofing requirements during heating, ventilation and slightly cooling.



Material property & Product Performance Indicators

BS-476(part 6:1989) Class A1 · EN-13501-1 Class A2 · NFTC A2-s1,d0,t0

Property		Items	Index	Results	Code compliance	Testing organization	Remarks
Material property	Fire safety	A2	FIGRA, hp/s≤116 (W/s≤120)	4.83 (5)	GB 8624-2006	NFTC	1、Formal testing
			THR600s, kBtu≤7.92 (MJ≤7.5)	0.95 (0.9)			
			Thermal value, kBtu/lb≤7 (MJ/kg≤3.0)	3.7 (1.6)			
		s1	SMOGRA, $ft^2/s2 \leq 0.26$ ($m^2/s2 \leq 30$)	0			
			TSP600s, $ft^2 \leq 4.66$ ($m^2 \leq 50$)	1.9 (20)			
		d0	Flaming particles or droplets withing 600s	Accord			
		t0	Smoke Toxity ZA1	ZA1			
		Class A2	SMOGRA, $ft^2/s2 \leq 0.26$ ($m^2/s2 \leq 30$)	0 (9.5)	En 13501-1:A1:2009	SGS	1、Formal testing
			TSP600s, $ft^2 \leq 4.66$ ($m^2 \leq 50$)	1.9 (11.7)			
			Flaming particles or droplets withing 600s	No			
		Class A1	Fire propagation index	0.4	BS 476-6:A1:2009	TUV SUD PSB	1、Formal testing
System performance	Pressure resistance		Appearance no change, no tear, no damage at 2000Pa static pressure	No change	JGJ 141-2004	National center of quality supervision and inspection and testing for air condition equipment	
	Passive permeability	Passive permeability volume 2 in"w.g.(500Pa)	≤ 2.8cfm/ft^2 (50m^3/h/m^2)	0.8 (15)			
		Passive permeability volume 4 in"w.g.(1000Pa)	≤ 5.6cfm/ft^2 (100m^3/h/m^2)	2 (36)			
	Dimension tolerance		≤ 1%	No change			

Shape

O	S
●	●

Airflow Models

EJ

Permeability Indicators (cfm/ft^2 in 0.5"w.g.)

	EJ
FS	0

Note: Permeability tolerance is ±5%.

Color

W	GY
●	●

Air Outlet Model

SS	LS	O	N
●	●	●	●

SYSTEM SELECTION

Product identification

Material / Shape and size / Fitting ,component and accessory

Material	Permeability	(Color)	Shape	Dia	Length	(FittingxQty)	(ComponentxQty)	Suspend accessory	Rows and direction of suspension

Example of Product identification

1、N10/O20"x65.6'/G2

Nanosox®–N general fabric with permeability of 1cfm/ft2(18m3/m2/h), round, 20" in diameter, 65.6ft long, nozzle, 2 & 10 o'clock double rows cable suspension system.

2、N00(GY)/S40"x24"x67.3'/(SR1T5E1V1)–(R)–G3

Nanosox®–N non–permeable fabric, grey, rectangle shape of 40"x24", 67.3 ft long, 1 special square–round fitting, 5 T– connections, 1 elbow, 1 transition, rubber ring, 3 rows cable suspension.

Table of Material selection (1)

Fabric material		Permeability cfm/ft^2 (in 0.5"w.g)				(Color)									
Material series		PM		PS		PE	EJ	W	R	Y	BE	BU	LGY	GY	GN	BA	Customize
N	——Nanosox–N permanent fire resistance general type	20 16 8		6 4 2		1 0.5 0.2	0	●	●	●	●	●	●	●	●	●	●
N–M	——Nanosox–N anti–microbial type	16		6	2	0.5	0	●									
N–S	——Nanosox–N anti–static type	16		6	2	0.5	0	●				●		●			
L	——Nanosox–L permanent fire resistance general type	16		6	2	0.5	0	●	●	●	●	●	●	●	●	●	●
L–M	——Nanosox–L anti–microbial type	16		6	2	0.5	0	●									
L–S	——Nanosox–L anti–static type	16		6	2	0.5	0	●				●		●			
F	——Fiersox proof series.						0	●						●			

Table of shape and size selection (2)

Shape	Duct diameter (Inch)	Length (ft)
Round –O	6,8,10,12,14,16,18,20,22……60,62,64,66,68,70,72	Per project need
Half– round–D	6,8,10,12,14,16,18,20,22……48,50,52,54,56,58,60	Per project need
Large half–round–HD	6,8,10,12,14,16,18,20,22……48,50,52,54,56,58,60	Per project need
Quarter–round–Q	6,8,10,12,14,16,18,20,22……48,50,52,54,56,58,60	Per project need
Rectangle–S	(22,24,26,28,30,32,34,36…..126,134,146)x(16,18,22,24,26,28,30,32)	Per project need

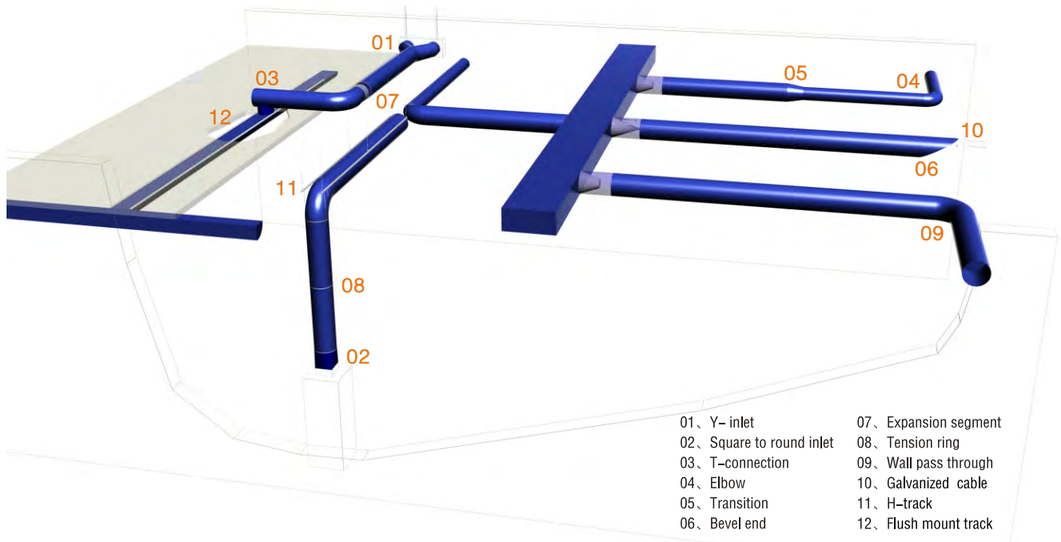
Table of fitting ,component and accessory (3)

(Fitting)			(Component)		Accessory		
General fitting	Special fitting	Functional fitting	Mesh slot-MS	Ring-R	Suspension accessory	Rows and direction of suspension	
Elbow–E	Y inlet–Y	Tension ring –TW	S–slot–SS	Pressure adjustment device–PAD	Galvanized cable–G	Single row–1	12:00
T–connection–T	Square to round–SR	Expansion segment–ES	Linear–slot–LS	Airflow control device–ACD	Stainless steel cable–S	Double rows – 2	2:00&10:00
Transition–V	Elbow inlet–IE	Through wall segment–TR	Orifice–O	Fabric air filter–FAF	Flush mount track–AF	Three rows – 3	3:00&9:00(39)
	T–connection inlet–IT		Nozzle–N		Suspension track–AH	Multiple rows	

NOTE: ——Table (1), Permeability tolerance is ±5%.
——Table (2), Duct diameter take even number as unit, 2 inch spacing in corresponding with metric unit, such as: 6,8,10,12,…..66,68,70,72 inch to 152,203,254,305…..1676,1727,1778,1829mm. Metric length measured in m, British length measured in ft.
——Table (3), The unmarked fittings, components and accessories are defined as standard: like standard inlet and end, slot and nozzle, 12 o'clock–single row suspension, 2 o' clock and 10 o' clock –double rows suspension.

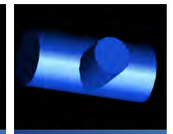
HOW TO SELECT

SYSTEM SELECTION

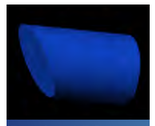
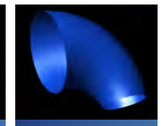
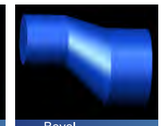


01、Y- inlet
02、Square to round inlet
03、T-connection
04、Elbow
05、Transition
06、Bevel end
07、Expansion segment
08、Tension ring
09、Wall pass through
10、Galvanized cable
11、H-track
12、Flush mount track

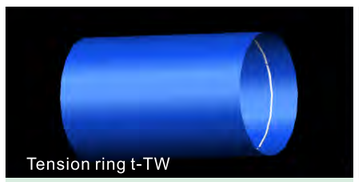
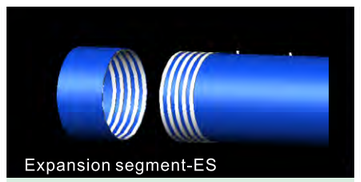
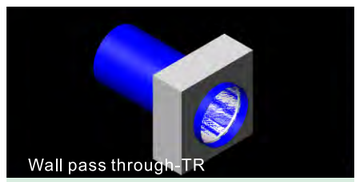
GENERAL FITTINGS

TRANSITION-V	 Bottom flat	 Concentrate	 Top flat	Connect ducts with different diameter Bottom flat: more aesthetic Concentrate: better airflow Top flat: easier to install
T-CONNECTOR-T	 Top flat	 Concentrate	 Bottom flat	Deliver the airflow to branch ducts which are perpendicular to main duct. Connected by zipper.

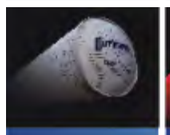
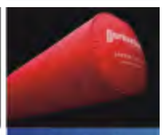
Special fittings

Y-inlet-Y	Square to round inlet-SR	Elbow inlet-IE	T-connection inlet-IT	Bevel end-BC	Transition elbow-EV	Bevel transition-BV
						
Connect two outlets of AHU to one duct.	Connect square metal duct to round fabric duct.	Connect fabric duct inlet with elbows.	Connect fabric duct inlet with T-connection.	Disperse air in bevel end of duct , Specialized for individual case.	Connect elbows in different diameter.	Connect uneven ducts with different diameters.

Functional fittings

Tension ring t-TW	Expansion segment-ES	Wall pass through-TR
		
For supporting use, fixed inside duct to produce aesthetic appearance. applied to upright elbows, etc special occasions.	Connected between two sections, Fold one end in airflow direction, fixed by hasp from outside, contributing to certain flexibility in length.	A component to resolve through wall problem, employs tension ring and certain length of duct to fix in the hole of wall and seal the gap between.

GENERAL FITTINGS

INLET CONNECTION	 Double layer inlet	 Single layer inlet	Generally, use single layer or double layer inlet to cover outlet of metal duct, fixed with belt, riveted. Nanosox®-N employs double layer inlet, only fixes the inside layer, the outer layer is used to cover up and easy to remove for washing. Nanosox®-L uses single layer inlet.
END	 End cap	 Fixed end	Nanosox®-N uses end cap, joins with duct by zipper, easier to change for washing or extend in the length direction . Nanosox®-L employs fixed end, to seam at the end becoming a part of duct.
ZIPPER CONNECTION	 Common zipper	 Concealed zipper	Join among straight duct, fittings, and components, similar to conventional used flange. Nanosox®-N uses concealed zipper, covered by sleeve from outside. Nanosox®-L uses common zipper.
ELBOW-E	 90°	 60°	 30°	Standard centerline radius is 1.5 x Dia. The elbow consists of multiple gores, different curve angles per application requirement.

HOW TO USE

SYSTEM DESIGN

This is no essential difference between design of DurkeeSox system and traditional metal duct system. Designer could make the layout design according to Durkeesox owned specialized software :isox－design. Meanwhile, Durkeesox engineering technology center is also ready to do the design work professionally for you.

A System layout

NanoSox system layout is mainly applied to air supply system. Lay out the system according to requirements of actual situation or AHU location on building and HVAC design(CAD drawing) , space , height and aesthetics, and more.

■ General location layout
— low space location layout: make ductwork layout along wall ,beam ,pole, to save space and improve aesthetics. For workshop application, lay out ductwork along production line or densely occupied area to meet both requirements of production and occupants. For supermarket application, uniformly lay out the system perpendicular to shelves and parallel to light area.

—High and large space layout: To match return air, use straight duct as possible to improve indoor air distribution. For workshop, layout shall be along production line, avoid equipments and travelling crane, meanwhile, consider directional air dispersion. For supermarket, layout is perpendicular to shelves or above main walkway. For sports place, layout shall be around auditoria. For grid structure, lay out ductwork inside it. for grid structure with berm, mount ductwork both sides along berm, both save space and convenience installation and maintenance.

■ General location aesthetics design
—The relation between duct diameter and aesthetics at different installation height: Generally, the applicable duct diameter is larger when the installation is higher to reach a perfect combination of aesthetics and effect.

—Arc, closed design: The layout could be in arc, or closed round, Oval to match with architecture style for both more aesthetic appearance and uniform air dispersion.

—Design to match with decoration: mount half－round or Quarter－round duct against ceiling, or open a groove on suspended ceiling, then put NanoSox duct inside. For meshed Suspended ceiling, just mount ductwork above it.

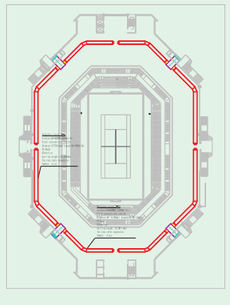
■ Special case design
—Temporary location design: Considering easy installation and dismantlement, track installation is mostly applied. To take reuse into account, maintain the same duct diameter and duct length as possible.

—Anti－condensation design: lay out the ductwork along glass curtain or specially mount one or more ducts to easy－condensation area.

SYSTEM LAYOUT

Use iSox design software, we could complete layout design and drawing work more easily and quickly, greatly reduce designer's time.

iSox design software

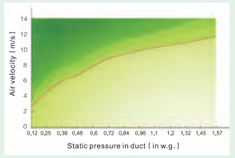


Layout

B Dimension selection

Because the NanoSox system diameter selection is related to air velocity and static pressure in the duct, when the static pressure does not match the air velocity in the duct, the airflow in the duct will become turbulent which will affect the actual air dispersion and overall performance. Shown below is a schematic illustrating the relation between pressure, turbulence and air velocity that we obtained through an experiment.

From the schematic, we could find when the air velocity is bigger, static pressure become smaller, the turbulence will be increasing.(darker the color, bigger the turbulence),it is for sure that turbulence is related to the ratio of air velocity to static pressure in duct, the bigger the turbulence is. what is more, high air velocity could increase noise from system.

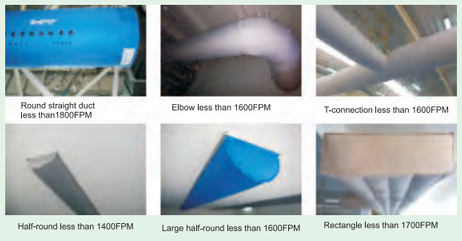


A NanoSox system diameter utilizes inches as a spec unit, starting at 6" thru 72", classified at 2 inch intervals. The duct diameter is determined according to air volume and system inlet air velocity.

Calculation equation: $g = v \cdot \pi \cdot D^2/4$

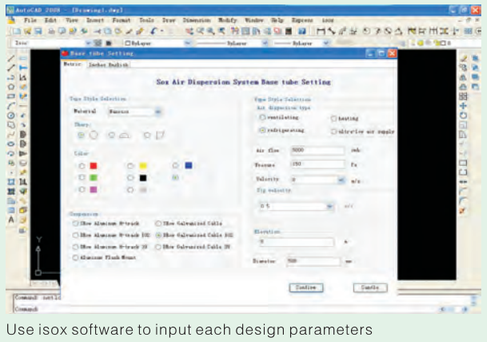
Where g: air volume per duct system，v：System inlet air velocity,
D: system duct diameter

NanoSox system inlet air velocity: to avoid system inlet turbulence and negative pressure, etc.



If the duct diameter is excessive big, installation space is not enough, it is advised to use rectangle duct or divide the system into several small ducts.

ISOX DESIGN INTERFACE



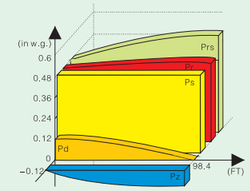
Use isox software to input each design parameters

C Air pressure design

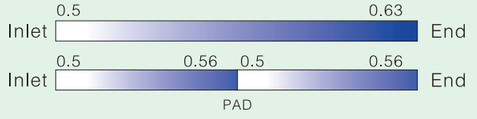
Pressure in a NanoSox system consists of static pressure, velocity pressure and resistance loss, the direct relation of static pressure regain and resistance loss plays a key role. In most cases, static pressure regain is more than frictional resistance loss in a straight duct.

Result: static pressure=inlet static pressure+ static pressure regain－pressure loss(Pr=Ps+Prs－Pz), the average pressure is the average of inlet static pressure and end static pressure. The principle is shown in below schematic.

The principle is shown in below schematic.

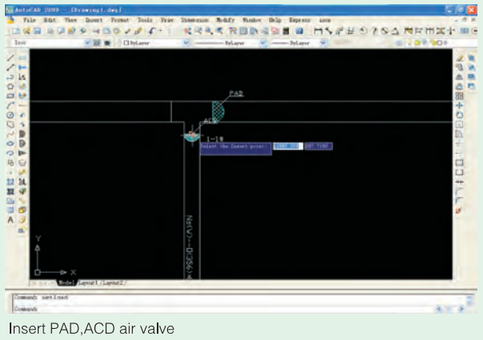


Based on abundant engineering experience , we believe that when pressure difference is less than 10% of inlet static pressure, airflow along the duct is uniform. On the contrary, PAD pressure adjustment device shall be installed to balance the pressure in duct. Shown in below schematic, after balance, maximum pressure difference is in 0.1 w.g., less than 10% of inlet static pressure.



Inlet pressure of complicated system with multi ducts is according to resistance calculation of least favorable loop, meanwhile, consider air dispersion pressure, frictional and local pressure loss from main duct , branch duct.

PRESSURE DESIGN INTERFACE



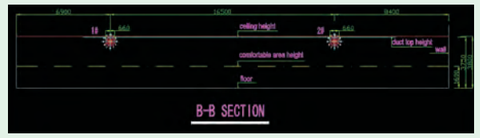
Insert PAD,ACD air valve

D Air dispersion design

Employ NanoSox patented design software specialized for fabric air dispersion system to make the detailed design,that is , to determine permeability of fabric, type, dimension, quantity, and direction of orifice or nozzle, which is made by Nanosox engineering technology center.

A According to cross section of height design, we determine air throw and controlled area.

Generally, we take the middle line of 2 adjacent ducts as the boundary, according to uniform layout principle. Based on actual project situation, in light of air volume from each duct and layout, divide the whole area, try to uniformly distribute the air volume as possible.



B Determine orifices direction

According to divided area, specify the direction of orifices and determine the number of orifice rows .

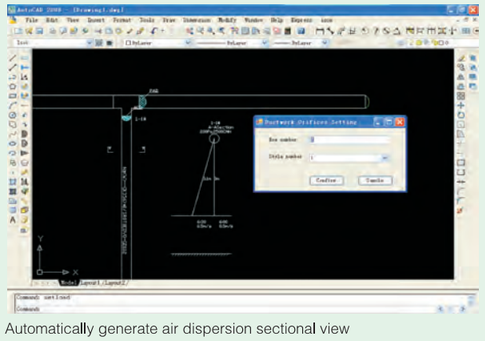
C According to airflow capacity, determine permeated air volume and air volume by orifices.

D Determine size and rows of orifice

Generally,design is completed by the patented specialized software－－－isox－manufactory, and inputted into automatic production line for manufacturing.

In addition, iSox software can help draw a standard construction plan of installation and automatically list a specification table for each portion of system.

AIR DISPERSION DESIGN



Automatically generate air dispersion sectional view

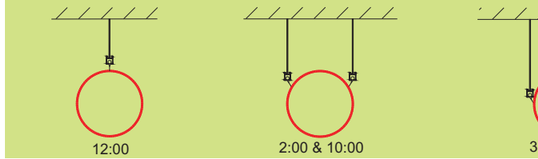
Refer to《Durkeesox Design Manual》

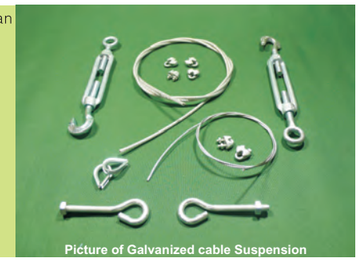
ACCESSORY AND INSTALLATION

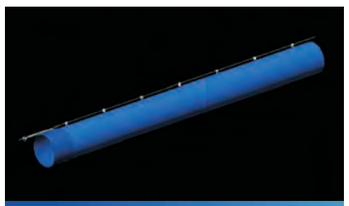
Installation of a NanoSox system is much easier than any conventional air duct system, which consists of 2 styles:
1. cable suspension system.
2. Aluminum track suspension system.
3. Internal retention ring

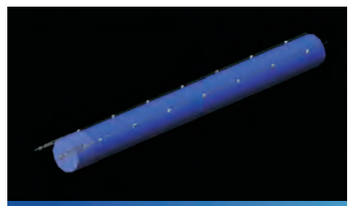
CABLE SUSPENSION SYSTEM

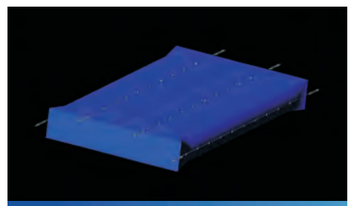
Cable suspension system is more popular due to convenient installation and low cost. Which can be divided as following: By material: galvanized cable, stainless cable
By load capacity: ordinary cable, heavy duty cable
By rows of cables: single row, double rows, multi rows
By suspension direction: 12:00(single row), 2:00 &10:00 or 3:00 & 9:00 (double rows)




Picture of Galvanized cable Suspension


Single-row suspension（GS）


Double-row suspension (GD)


Multi-row suspension（G3）

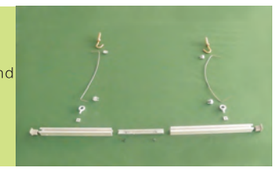
ALUMINUM TRACK SUSPENSION SYSTEM

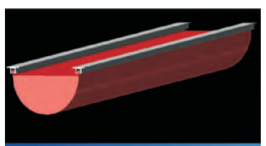
FLUSH MOUNT TRACK

For half-round, large half-round and quarter-round DurkeeSox systems which are mounted against ceiling or wall.

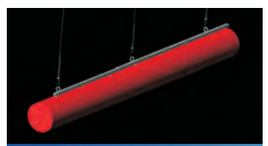
H-TRACK

For suspension type of round DurkeeSox system.




Semi-CircleFlush Mount（D）

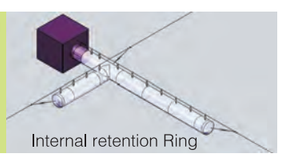

1/4 Circle ,Flush Mount（Q）


Single-Row H-track（AH-S）


Double-Row H-track（AH-D）

INTERNAL RETENTION RING

NanoSox System Air dispersion system with the internal retention ring (IRR) provides perfect inflation appearance even without air supply. Meanwhile, Inflation ?Popping? causing?by initial?ir supply can be avoided.


Internal retention Ring

The major material required to install NanoSox system includes: fabric air ducts and its fittings, components and accessories, which are supplied by the manufacturer (shipped with the consignment, including installation drawing, installation manual and assembly drawing, etc.) Other installation auxiliaries required on jobsite, such as, brackets, fastening bolts and mores shall be purchased by the installation contractor.

9 GENERAL QUESTIONS AND ANSWERS

Q What is the expected system's service life of a NanoSox system ? 01

A A NanoSox systems practical service life depends on the application environment, AC system, etc factors. Generally, service life of NanoSox®-N exceed 20 years, NanoSox®-L 15 years, FiberSox™10 years. Our warranty for NanoSox®-N is 15 years, NanoSox®-L10 years, FiberSox™ 8 years.

Q Does a NanoSox system meet the fire safety regulation in different countries and regions in global market? 02

A As an end air dispersion system in HVAC, NanoSox has passed all kinds of widely recognized international certificates and fire testings including UL AJIJ and AC167 certificates, testing certificate under EN13501-2002 class B1-s1,d0, and China official fire certificate under GB-8624-2006-Class B-s1,d0,t0 and Class A. NanoSox system meets or surpasses code regulations on fire safety in all countries and regions .

Q NanoSox system looks nice when inflated, how does it look when it's not inflated? 03

A A NanoSox system is made of flexible material, it will drop down on shape, but not crumple when no working. To gain a better visual effect when the system does not run, you can choose a double row suspension system, when looked from underside, almost no difference in appearance from what it looks like when fully inflated, a little in oval shape though. Meanwhile, a special type of NanoSox which contains internal ring, Internal Retention Ring (IRR) System.

Q Can NanoSox replace all types of air ducts? Could it be used for air return ductwork? 04

A NanoSox is made of flexible material and can only work in a positive pressure of air supply System. It cannot be used as the air return ductwork. While, the Internal Retention Ring System can be used for air return ductwork.

Q Would a NanoSox system have a condensation problem without installing a installation material on the outside of the duct? 05

A Cooling air permeates through fabric to form air layer around duct to result in no temperature difference between inside and outside, this radically resolves the condensation problem.

Q It seems that a NanoSox system has a good performance in a cooling or refrigeration application. What about in a heating application? Can the heated air could be thrown down to the occupied zone? 06

A A NanoSox system's air dispersion principle applies induction type laminar flow air dispersion, when air flow is ejected out of the duct openings at a high velocity, compared with ordinary AC system, heat exchange with ambient air in the height is rare, the airflow will not dispersed till the air flow reaches destination area, thus little difference between cold air and hot air dispersion. In a practical application, AHU if matched with cold & hot air dispersion mode could achieve a better effect.

Q What is the NanoSox air duct product cleaning and maintenance period requirement? 07

A A NanoSox cleaning & maintenance period is variable and depends on the air dispersion mode, application environmental cleanliness requirement, AHU's filter grade, etc factors. Normally recommended maintenance period is every 3 months for refrigeration and food processing applications with clean requirement; for commercial, public places and large areas, etc normally a 1 to 3 year period. In a serious pollution environment, the color of fabric may become darker after washing.

Q How much is the friction factor of a NanoSox system? Does NanoSox have a large system resistance? Are there any additional requirements on air volume or air pressure of AHU? 08

A NanoSox system friction factor is less than 0.024, similar to metal duct, but in practical applications, friction resistance of NanoSox system is much less than conventional ducts, due to mostly in round shape, lower average air velocity especially at the middle and end part. For simple straight duct, the system resistance is less than static pressure regain, so the friction resistance could be ignored. For complicated ductwork, the system resistance is only 1/3-1/5 of traditional duct. Thus pressure of traditional air duct is enough for NanoSox system. NanoSox system could design fabric permeability and orifices to guarantee the designed air supplying volume without any additional requirements on AHU.

Q Will a NanoSox system generate noise? What is the noise absorption effect ? 09

A A NanoSox system does not generate noise and transmit resonance during operating. Pleasers refer to NanoSox detailed technical manual. Noise absorption effect depends on different equipments and environment, it could not replace the absorber of AHUs system, although part of noise could be absorbed.