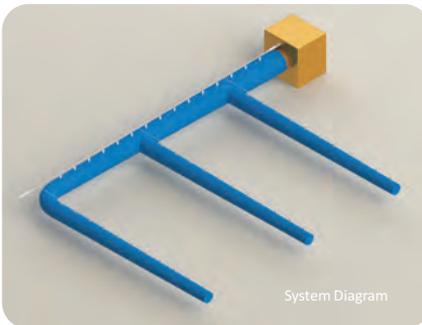


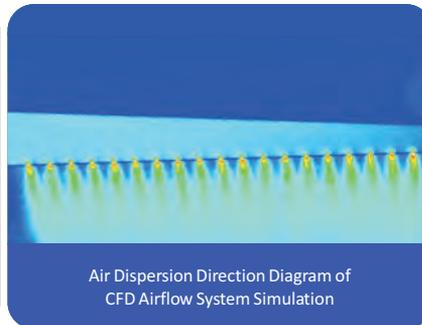
Durkeesox[®] UR Air Dispersion System

With utilization of professional uniform velocity air dispersion controlling technology, non-linear conic air duct is designed and manufactured to achieve the optimum spatial airflow system, best aesthetic property and most economical balanced product.

The Global Leading 5th Generation of
Fabric Air Dispersion System



System Diagram



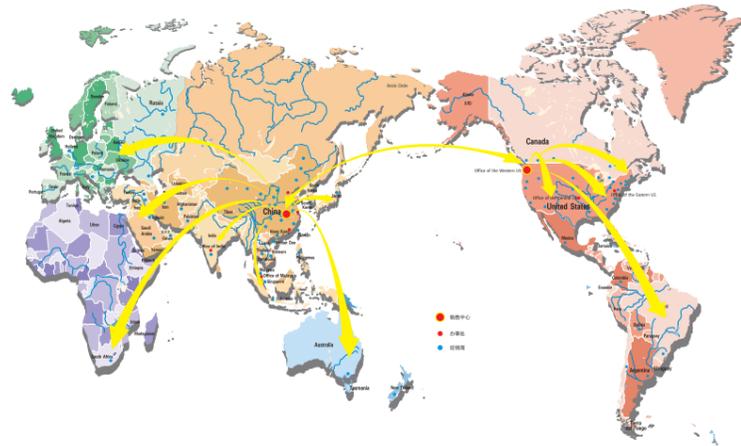
Air Dispersion Direction Diagram of
CFD Airflow System Simulation

What is UR uniform velocity air
dispersion controlling technology?



A patented design and manufacture technology
by utilizing professional iSox software system
for non-linear calculation to achieve balanced
stable air velocity inside fabric air duct.

DurkeesoX® --Predominant enterprise in air dispersion system industry worldwide



The global market leader in fabric air dispersion system



DurkeesoX® was invested and established by US registered DURKEE INTERNATIONAL INDUSTRY Ltd. It's a multinational high-tech enterprise, focusing on developing air dispersion system in HVAC/R industry. As a manufacturing & servicing oriented organization, DurkeeSox® has established two manufacturing centers (China and USA) and 3 sales and service centers (China, Asia and America). Being a member of USGBC, it has been one of the fastest growing and largest fabric air dispersion system supplier in the industry with leading brand in global market in recent 10 years.

As an advocate of low carbon air dispersion system, and armed with independently-owned intellectual property authorized fabric technology and global leading detailed design, DurkeeSox is committed to produce world-class fabric air dispersion system by using global top-level fabric materials and relying on its largest modernized manufacturing base in the industry. It has acquired many national and regional standard quality certificates, such as, international QA system ISO9001, ISO14001, OHS18001, North American ULand Ac1 67 products certification, Singapore COC certification, European EN/BS testing and China NFTC testing.



PRODUCT EVOLUTION HISTORY

1 The First generation fabric air dispersion system

Invented for world and China's frozen food industry in 50s and 60s, made of ordinary cloth, also called socks air duct, this kind of air duct can not achieve good air distribution effect due to the ignorance of fabric permeability and incompatibility with Fans or blowers. which leads to air suppress and shorter service life of fabric. Therefore, this socks air duct was gradually abandoned in 60s and 70s.

2 The second generation fabric air dispersion system

Produced in 80s and 90s, made of fabric with certain fire retardant property and range of permeability but not precisely-controlled fabric, the second generation was widely and promptly swept into different industry in Europe and North America market. By far, air dispersion system produced by most of domestic small factories has struggled at this phase.

3 The third generation fabric air dispersion system

Invented for world and China's frozen food industry in 50s As an advanced flexible weaving technology, the so-called Multi-Permeable Fabric Precise Control Technology was created after the year of 2000.

DurkeeSox fabric air dispersion system by introducing PFPC technology is the representative product of the third generation. Better than a simple socks air duct, DurkeeSox fabric air duct is a system product with accurate calculation of fabric permeability and precise orifice design to coordinate and match with A/C units for air dispersion. Compared with traditional air duct, the third generation has incomparable advantages such as multi-permeable fabric materials and extremely-low permeability error.

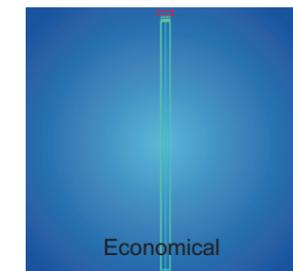
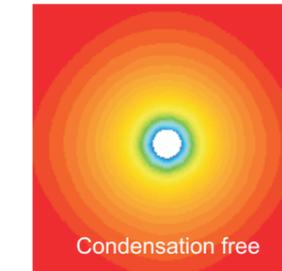
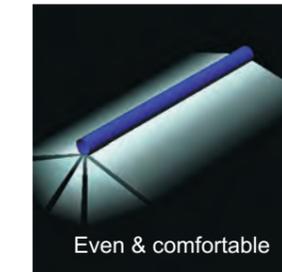
4 The fourth generation fabric air dispersion system

In 2013, DurkeesoX successfully issued IRR system (Internal retention ring system), which is developed by DurkeeSox after years of concentration, with utilization of high-tech material and patented internal support structure.

DurkeesoX air dispersion system with flexible support structure is defined as the fourth generation product, which keeps soft air duct inflated and round without static pressure and airflow.

Being gifted with many advantages , like light weight, high strength, superior flexibility and durable washing, IRR is the most aesthetic fabric air dispersion system in the industry. Main Applications are in spaces with high requirement for visual effect, system with frequent start-up and shutdown at high pressure, and complicated and difficult installation conditions.

10 Advantages of DurkeeSox® VS Traditional duct



UR SYSTEM-- The 5th generation of fabric air dispersion system

With the wide application of DurkeesoX®, customer's demand becomes higher with consideration on air dispersion details, temperature rising along the duct, aesthetic effect when the system is shut down, cost-efficiency, etc. The market demands a new product to meet higher requirements.....

What is UR air dispersion system ?



With the utilization of professional uniform velocity air dispersion controlling technology, non-linear conic air duct is designed and manufactured to achieve the optimum spatial airflow system, best aesthetic property and most economical balanced product.

The world's leading UR air dispersion system is the fifth generation of fabric air dispersion system.

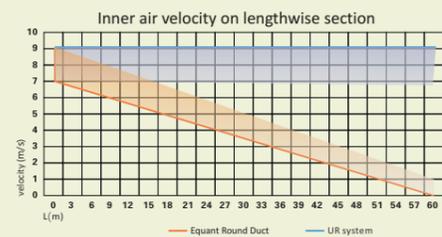
UR air dispersion system is widely applied in spaces where requires post line air supply, large and high space and demands for precisely even air supply and higher cost performance. It's especially suitable for high and large stadium, machining workshop, automobile factory, pharmaceutical warehouse and logistics, cold chain logistics and food processing plant, etc.



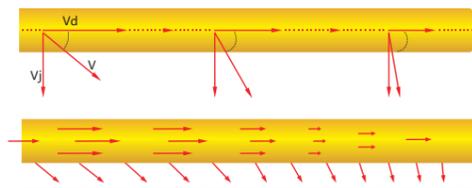
ADVANTAGE

1 To achieve stable air delivery velocity inside duct results in same air dispersion direction along the duct surface.

Under the same air supply condition, the internal air velocity curve of ordinary equant round duct is sharply descendant along with lengthwise direction, the air velocity tends to zero at the endcap; UR system can generally ensure stable internal air velocity.

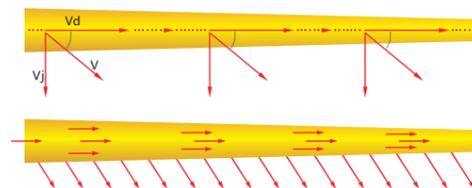


Air Dispersion Direction Diagram of Ordinary Equant Round Duct



Due to vector superposition effect, there is wide difference in internal air velocity from inlet to endcap of ordinary equant round duct.

Air Dispersion Direction Diagram of UR system

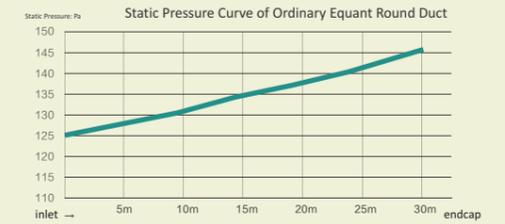


Uniform air velocity inside UR system results in same air dispersion direction along the duct.

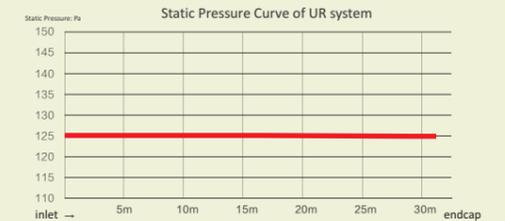
ADVANTAGE

2 Achieve more balanced static pressure to ensure uniform air velocity from inlet to endcap.

Generally speaking, the air velocity is rapidly decreasing inside ordinary equant round duct. Since the static pressure regain leads to the increasing of dynamic pressure whereas less on-way resistance, the overall static pressure from inlet to endcap has a certain increase. PAD must be installed to balance static pressure.

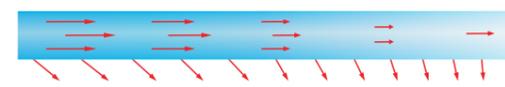


Since UR system is cone-shaped from inlet to endcap, its on-way resistance is larger than that of ordinary equant round duct. Meanwhile, the internal air velocity is relatively uniform and the static pressure regain is lower. The test result turns out that UR system could basically achieve balanced inner static pressure as long as it is not exceptionally long.



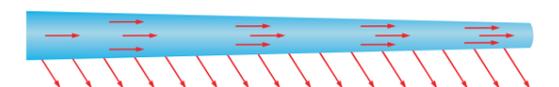
3 Effectively slow down temperature rising inside long duct

Ordinary equant round fabric duct system



If ordinary equant duct is running with excessively high surrounding temperature or over-length, the inner air temperature lengthwise has a certain rise. The degree of temperature rise is relevant to duct length and temperature difference between inside and outside duct surface.

UR air dispersion system

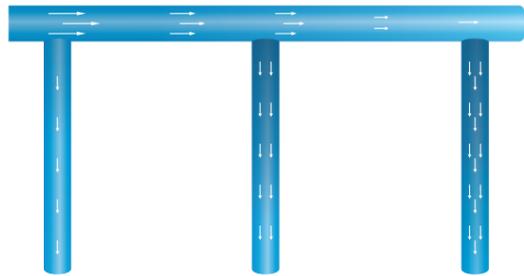


The relatively high axial air velocity of UR system reduces the heating exchange time between the inner air and duct surface, which slows down and reduces the temperature rising. Meanwhile, as the decreasing of surface area along the rear duct results in smaller heating exchange contact area, that is conducive to further slow down and reduce temperature rising. The test result turns out that the temperature rising control efficiency of UR system has been improved for 70% compared with Ordinary equant round fabric duct.

ADVANTAGE

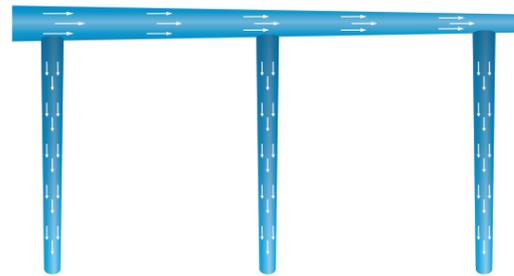
4 Achieve more uniform airflow distribution in system branches

Ordinary equant round fabric duct with multi-branches



Different air velocity in main duct of Ordinary equant round fabric duct leads to different airflow supply in each branch, which causes the nearer the branch is to endcap, the more airflow the branch is to receive. ACD is required to balance airflow in each branch.

UR system with multi-branches



Since the air velocity in main duct of UR system is completely stable and balanced while the included angle between duct surface and branch duct is slightly less than 90°, that is conducive to lead uniform air distribution to each branch.

5 Compared with transition system, UR system is more convenient for installation.



When the most common double-row suspension system is adopted, compared with traditional air duct and DurkeeSox system with transitions, UR system only use gradually narrowing suspension system rather than mount plenty of brackets and supports in transition system, which is easy and convenient for installation.

ADVANTAGE

6 More elegant and aesthetic than large-size duct or long duct with transition

Compared with Ordinary equant round fabric duct, UR system looks more light and exquisite and brings no depressive feeling with the diameter reducing along rear duct, especially when it comes to large-size duct with low-elevation suspension. Completely different from transition system, UR system seems hard to aware the diameter change, the entire system turns out to be more simple and aesthetic.

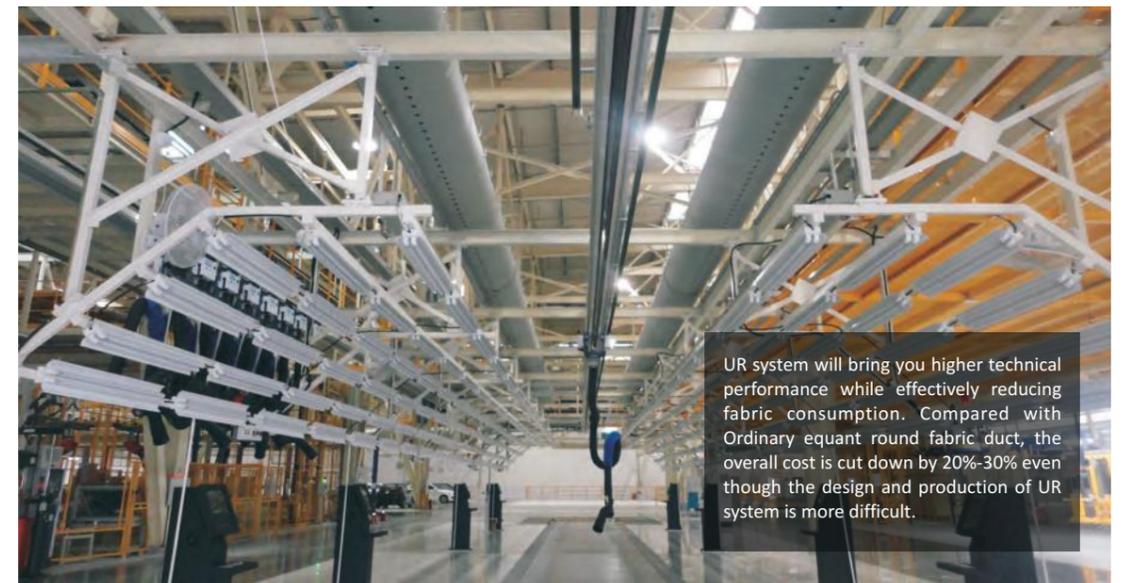


Transition in Ordinary DurkeeSox System



Variable Conicity Design in UR system, more aesthetic

7 Available higher technical performance leads to higher cost efficiency.



UR system will bring you higher technical performance while effectively reducing fabric consumption. Compared with Ordinary equant round fabric duct, the overall cost is cut down by 20%-30% even though the design and production of UR system is more difficult.

ENGINEERING DESIGN

Started with the diameter selection on the basis of inlet airflow, the engineering design of UR system is proceeded in light of approximate engineering conicity of non-linear cone to calculate engineering diameter, engineering pressure and engineering permeability so as to keep inner air velocity within certain range and obtain better airflow system and air dispersion performance. The design procedures of UR air dispersion system are as follow:

1、UR System Layout

Layout design of UR air dispersion system is almost as same as ordinary round fabric duct but more adaptable to longer duct, higher inlet air velocity and wider pressure range.

2、Inlet Diameter Selection

So far, only round shape UR system is available. The same as ordinary DurkeeSox system, the inlet diameter is selected on the basis of airflow and inlet air velocity, inlet air velocity around 7-10m/s is preferable.



Isox software-plane layout

3、Engineering Conicity Calculation

The engineering conicity is an ideal value derived from linearization of variable conicity formula. Engineering conicity is calculated in view of inlet air velocity, inflection air velocity and length. Based on the engineering conicity, the engineering diameter at the endcap can be calculated to get the surface area of UR system.



Isox software-operation interface of UR system

4、Permeability Calculation

A. Pressure Design

Pressure calculation of UR air dispersion system is different with ordinary round fabric duct. The air is no longer dispersed by static pressure only but the combination of static pressure and dynamic pressure. To maintain the stability of air velocity inside duct, diameter of the duct is gradually decreasing to increase on-way resistance along the duct. The on-way resistance varies from different conicity, that is, 1.2-1.5 times as greater as ordinary DurkeeSox system.

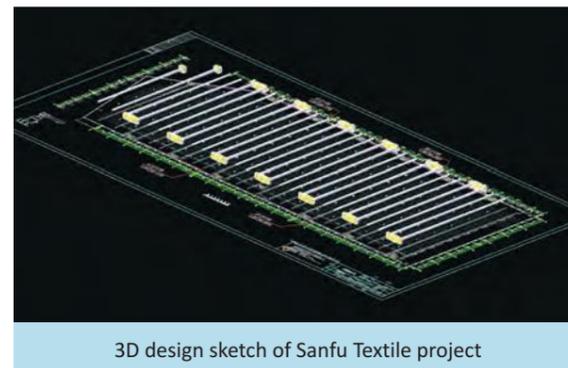
Formula:
On-way resistance= Resistance per meter × Duct length

B. Permeability Calculation

Permeability calculation of UR air dispersion system as same as ordinary Durkeesox system.

$F = Q / S$
(Whereby, F-permeability, Q-largest allowable airflow through fabric permeation, Q=permeation ratio* total airflow, S-surface area)

The calculation of surface area is subject to the engineering diameter, the static pressure is subject to the engineering static pressure.



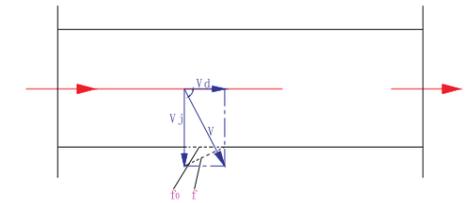
3D design sketch of Sanfu Textile project

DETAILED DESIGN

Introducing global patented technology owned by DurkeeSox-----UR uniform air velocity control technology to design vent and air throw details for previous engineering design.

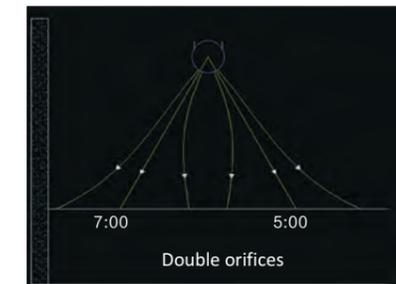
1、Variable Conicity Design

Given the rich experience and massive test data from plenty of experiment, DurkeeSox engineers use professional Isox software to adjust the conic size, the optimum conic value can be obtained with computer simulating technology.

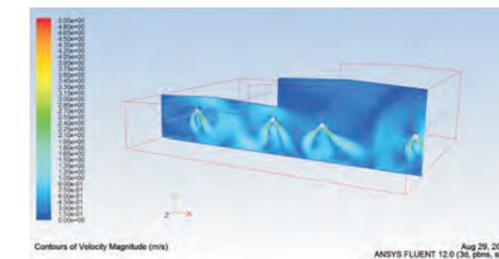


2、Air dispersion design

Introduce professional patented Isox design software owned by DurkeeSox to make detailed design, including fabric permeability, slots and orifice type, size, quantity or air throw direction. This part is designed by Durkeesox technology center.



3、Calculation Sheet Submittal

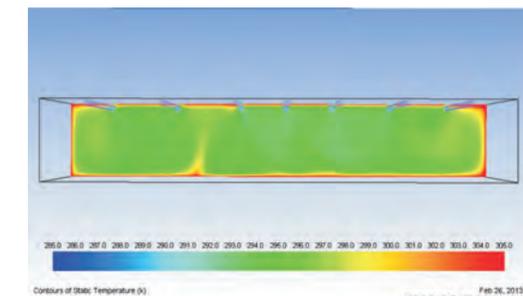
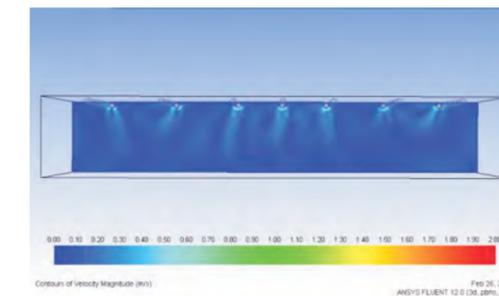


DurkeeSox
Calculation Sheet of DurkeeSox® Air Dispersion System

System 1#											
Shape	C	Diameter (mm)	800-305	Length (m)	60.0	Color	LDV	Air Volume (m³/h)	12000.0	Insulation Thickness	BID4.5
Static Pressure (Pa)	150.0	Ambient Temperature (°C)	22.0	Air Dispersion Temperature (°C)	22.0	Fabric Permeability (Qm³/h)	0.0	Air Volume through Fabric Permeation (m³/h)	818.0	Relative Rate of Permeation Air Volume (%)	7.0
Orifice Direction (Row)	Segmented Orifice (Y/N)	Orifice Direction (mm)	The Number of Orifice	Orifice Spacing (mm)	Air Volume through Orifice	Relative Rate	Outlet Air Velocity (m/s)	Air Throw Distance (m)	End Air Velocity (m/s)	End Air Velocity of Multi-orifice Dispersion (m/s)	
4:00	1	N	1.2	290	170	25.0%	0.5	4.0	0.5	0.5	0.5
8:00	1	N	0.8	302	160	11.1%	0.5	3.0	0.5	0.5	0.5

→ Air Throw Velocity Decay Curve

4、Providing CFD airflow system simulation service



Note:

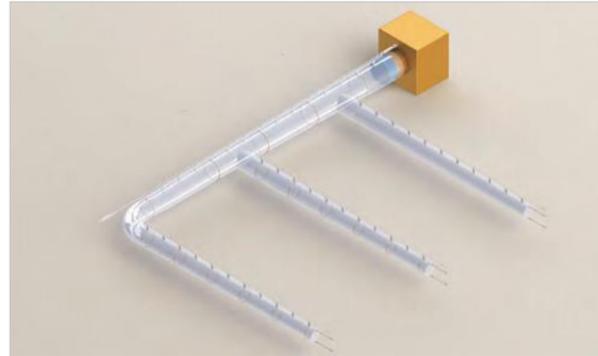
Since the precise technical data is generated in the phase of detailed design, a reasonable design expense shall be charged if the detailed design drawing, calculation sheet, CFD simulation diagram or other reference are required prior to contract signing, the design expense shall be refund after signing the contract.

URR SYSTEM



---- UR uniform velocity air dispersion system with Internal Retention Ring

Upgraded product--Internal support UR air dispersion system, referred to as URR™. By perfectly integrating IRR™ (Internal retention ring system) with UR system (uniform velocity air dispersion system), UR system remains round and taut when deflated, absorbing all the advantages of both products, such as more even airflow system, better aesthetic, easier to produce, lighter weight, convenient for packaging and transportation, simple installation, washable, long service life, higher strength and economical.



APPLICATION OF URR SYSTEM



High demands for aesthetic effect



URR system could keep round and taut when deflated, especially suitable for below spaces:
 —public area, such as stadium, offices, hall;
 —long-term shutdown application or operation on regular basis.



Single-row suspension URR air dispersion system



Double-row suspension URR air dispersion system



Frequently startup and shutdown under high pressure condition.



URR system suitable for below structures:
 —Industrial factory, such as auto factory, food processing factory, etc.



Deflated URR air dispersion system



Inflated URR air dispersion system



Short Construction Schedule and Difficult installation conditions.

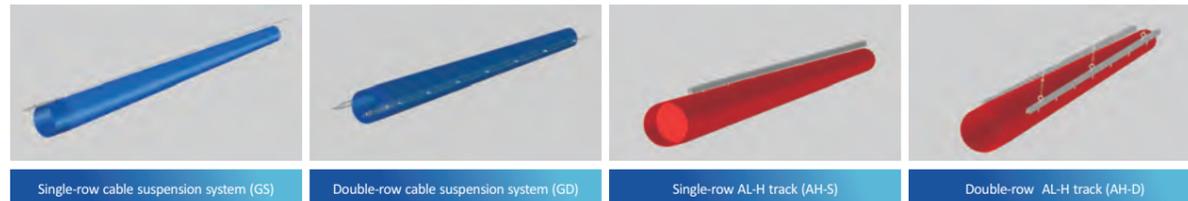


Most of URR air dispersion system adopts single-row suspension system, especially suitable for structures with many Tees, elbows and other fittings or with complicated system design or occasions where is inconvenient for double-row bracket and support installation.

INSTALLATION

The Installation of UR System is almost as same as ordinary Durkeesox air dispersion system, which consists of 2 types: Cable suspension system and Aluminum track suspension system.

According to hanging rows, the installation is classified as single-row and double-row suspension system.



According to suspension location, it could be classified as 12:00(single row), 3:00&9:00 (double rows)



Single-row suspension system is applied to URR air dispersion system with tension cables installed at each endcap of straight runs so as to pull the duct surface round and taut and improve its aesthetic effect when the entire system is deflated.

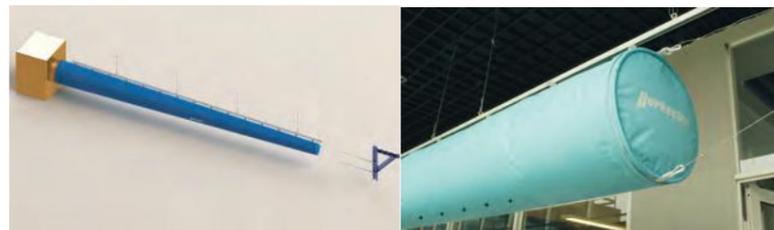
1、Cable suspension system

Tension cables at each end of the straight runs are installed to pull the duct surface round and taut and improve its aesthetic effect when the entire system is deflated.



2、H-track suspension system

Due to the intensive fixed point on track, the pulling strength along the track suspension system is weaker than cable suspension system.



APPLICATION

1、Post air supply areas.

Given high ambient temperature, large airflow and relatively long duct in such areas as machining workshop and automobile factory, UR air dispersion system maintains high and uniform inner air velocity by continuously changing conicity to achieve even air dispersion and significantly reduce temperature rising.



2、Large and high-elevation facility.

Given large airflow and high ambient temperature in high and large stadium and automobile workshop, UR air dispersion system is applied to obtain higher air velocity at each orifice and longer air throw distance with simple and aesthetic appearance.



3、High demand for Precise air throw and Even air dispersion.

Given the high requirement of even air dispersion along the duct and strict control of terminal air velocity, the global leading design software Isox5.0 is used to calculate and generate continuously variable diameter UR system to identify as the best uniform velocity air dispersion system.



4、High demand for cost efficiency.

Given the high space and large airflow in such areas as pharmaceutical logistics warehouse and cold chain logistics, both effective air dispersion and cost efficiency shall be taken into consideration. UR air dispersion system can not only ensure even air dispersion but also reduce overall cost because of less fabric consumption, which improves cost efficiency.



USERS

UR air dispersion system was initially put into application at machinery workshop of Schlumberger(China) in early 2013. With the development of product and technical Innovation, it was successively and widely applied in textile factory (Sanfu), auto factory (Nissan) and sports facility in public area.

Due to the bright prospect of UR air dispersion system, such advantages as best airflow system, better aesthetic effect and higher cost efficiency superior to ordinary Durkeesox system can promote UR system as mainstream product in HVAC industry.

1、Machinery workshop--- Schlumberger

Given the large area and high elevation with crane inside workshop, DurkeeSox system could only be installed above the crane, which makes it more difficult for air dispersion, the application of UR system is a preferable solution to address these challenges.

A. Higher outlet air velocity and longer air throw distance.

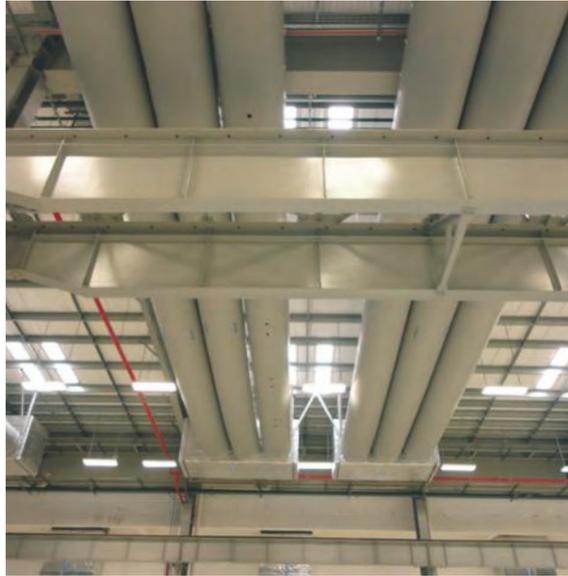
Orifice ejection activated by static pressure and dynamic pressure brings higher outlet air velocity than ordinary DurkeeSox air dispersion system so as to reach longer air throw distance.

B. Quick installation.

The installation of UR duct is almost as same as ordinary Durkeesox duct, convenient for installation, short construction schedule.

C. Higher cost efficiency.

Less fabric consumption of UR system effectively cuts down cost by 15%.



2、Textile factory---Sanfu (Fujian, China)

Given the old equipment with less precision and weak anti-interference performance, the workshop demands for high air velocity, precise control of air dispersion evenness and high cost-efficiency without blowing off silk thread, UR system is preferable to fully meet the Owner's requirement.

A. Better uniform air supply.

UR air dispersion system could maintain high air velocity along the duct, the slowly descending curve of inner air velocity slowly contributes to achieve stable air velocity and bring more uniform air velocity.

B. Economical.

By reducing fabric consumption cost, the total cost of this project is cut down by 20% versus ordinary DurkeeSox air dispersion system. The cost efficiency has been remarkably improved.



USERS

3、Auto factory---Dongfeng Nissan

Massive equipments and multiple obstacles in the workshop bring difficulties and challenges for installation while it requires for even air dispersion to low-elevation and long post line (the longest duct amounts to more than 180m) with the consideration of cost efficiency and aesthetic effect. UR air dispersion system is capable of fulfilling client's strict requirement.

A. More uniform air supply.

The continuously variable conicity of UR system contributes to constant inner air velocity and more uniform air dispersion.

B. Lower temperature rising.

The relatively high axial air velocity of UR system reduces the heating exchange time between inner air and duct surface so as to lower temperature rising.

C. Quick installation, aesthetic and elegant.

The variable conicity design of UR system results in the fact that the section boundary is a uniform curve similar to straight line. UR system is more aesthetic and elegant than ordinary DurkeeSox system with transitions.



4、Sports Facility--- US Portcourt Basketball Gymnasium

Given the high requirement of roof loading bearing capacity and aesthetic performance in this gymnasium, URR air dispersion system is feasible to fulfill client's strict demand.

A. Light weight, quick installation.

URR air dispersion system is very light in weight. The installation is almost as same as ordinary DurkeeSox system, quick installation with short working period.

B. Aesthetic and elegant.

URR air dispersion system is an ideal integration of IRR and URR, which keeps round and taut when deflated.



Durkee Sox[®]

— The expert in the air dispersion industry world wide —

[Patent protection specification]

All rights of UR air dispersion system, namely, Non-Linear Variable Diameter Uniform Velocity Air Dispersion System and related product are reserved by Durkeesox. Any counterfeit or sales by any entity or individual is strictly prohibited, otherwise, Durkeesox shall ascertain its legal responsibility accordingly.

Durkee Sox[®]

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