

LEMINAR
AIR CONDITIONING
INDUSTRIES



Leminar

Where Trust Matters



**Fire Rated Ductwork
Acoustic Products
VAVs
Duct Accessories**



SOUND
ATTENUATORS

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VAVs &
DAMPERS

APPROXIMATELY

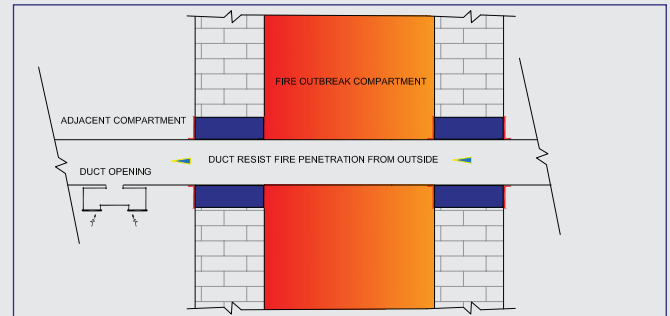
85% OF FIRE-RELATED DEATHS ARE CAUSED BY SMOKE INHALATION

Non fire-resistant ductwork systems can cause the initial spread of fire between compartments, and the rapid spread of smoke and decomposition products. The efficient use of fire-resistant ductwork ensures fire compartmentation and assists in the safe dispersal of smoke and hazardous fumes.

Leminar Air Conditioning Industries is the sole manufacturing licensee of Fenland Fire Duct System-UK (FFC 250) for the geographical market covering UAE, KSA, Oman, Bahrain and Kuwait. All Leminar personnel are trained by Fenland Fire Contracts Ltd. UK (FFC-UK) for its applications and constructional requirements.

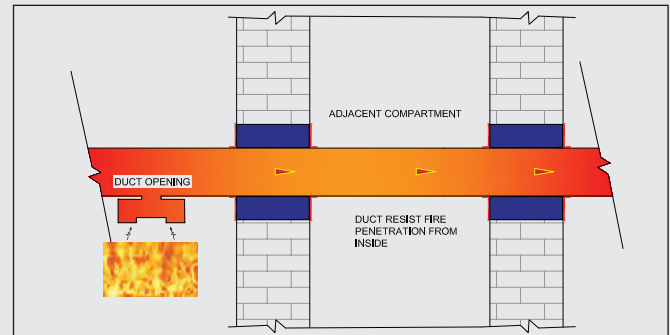
- FFC 250 coating complies with the smoke extract insulation criteria without any additional insulation.
- FFC ducts are used to guarantee the fire compartmentation. More precisely, fire rated ventilation ducts can avoid fire and heat spread between two compartments.
- Easy to install at site. 20% cost saving as compared to conventional insulated duct installation.
- The ducts have negligible VOC content and are Dubai Central Laboratory certified for Green Building Product as per AL SA'FAT Clause 404.01 304.03 701.04 (Paints/Coatings).
- FFC duct are certified for quality along with related accessories like sound attenuators, volume control damper, NRD, access doors, etc.
- The gasket and sealant also have low VOC content and comply with Green Building requirement as per CDPH standard method V1.1.
- All products comply with requirements of Method 3 of BS 5588 Part 9: 1989 & Method 3 (clause: 33.4.3.4) of BS 9999:2008 and fully tested in accordance with BS 476 Part 24: 1987 (ISO 6944: 1985) up to 4 hours stability and integrity for Type A ducts (Fire outside) and upto 3 hours stability, integrity and 2 hours insulation for Type B ducts (fire inside).
- The Fenland Fire Duct System has been tested and assessed by the BRE Centre for Fire resistance

TYPE 'A' DUCT (FIRE OUTSIDE)



- Up to 4 hours-stability, integrity and insulation.
- Typical for escape lobby ventilation and staircase pressurisation systems.

TYPE 'B' DUCT (FIRE INSIDE)



- Upto 3 hours-stability, integrity and 2 hours insulation.
- Typical for kitchen extract, smoke extract and other fire rated systems.



Mirdif City Centre, Dubai, UAE



Dubai Festival City, Dubai, UAE



Dubai Mall, Dubai, UAE

(formerly the Loss Prevention Council Board - LPCB) as being suitable for use as, "a Fire Rated Ventilation Duct, a Smoke Extract/Outlet Duct or a Kitchen Extract Duct."

The same is assessed by LPCB (UK), Warringtonfire Exova (UK) and listed in their Certifire scheme.

This is in accordance with BS 476 Part 24, 1987 for fire resistance of ventilation ductwork which is expressed as the duration of heating in accordance with the ISO 834 : 1985 (Cellulosic - Standard Time/Temperature Curve) until failure occurs due to one or more criteria :

STABILITY: Stability failure shall be deemed to have occurred in duct 'A' within the furnace and in ducts 'A' and 'B' outside the furnace when the duct no longer fulfils its intended function. (For the smoke outlet, duct stability failure will also be deemed to have occurred when there is any restriction of the cross-sectional area of the duct to 75% or less of its original area).

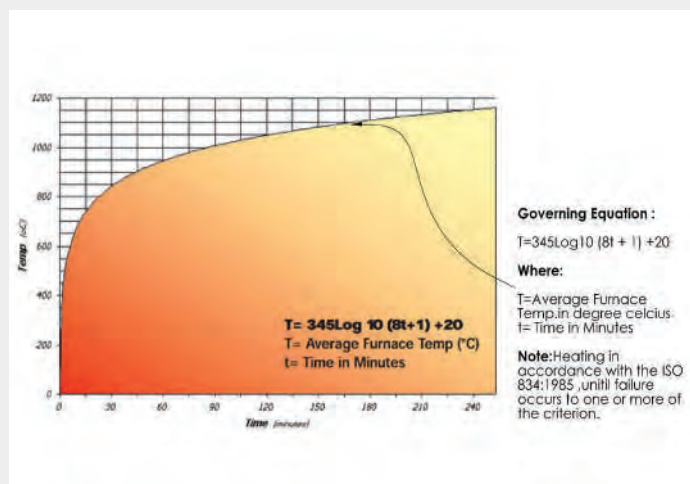
INTEGRITY: The presence and formation of any cracks, holes or other openings outside the furnace through which flames or hot gases can pass.

INSULATION: Insulation failure shall be deemed to have occurred when the initial ambient temperature on the unexposed surface of the duct outside the furnace exceeds either:

- 140°C as an average value above ambient.

- or -

- 180°C as a maximum value above ambient. For a kitchen extract duct (Type A), these temperature limits also apply to the inside surface of the duct within the furnace.



CELLULOSIC- STANDARD TIME/TEMPERATURE CURVE

LOCAL AUTHORITY APPROVALS



ABU DHABI CIVIL DEFENCE



DUBAI CIVIL DEFENCE



SHARJAH CIVIL DEFENCE



AJMAN CIVIL DEFENCE



RAS AL KHAIMAH CIVIL DEFENCE



UNITED ARAB EMIRATES
 MINISTRY OF ENERGY & INFRASTRUCTURE



ROP - OMAN

REASONS TO CHOOSE FFC



The FFC-UK fire rated duct system is tested against the most stringent international standards and certified by independent laboratories.



The FFC-UK duct system has been approved by the local Fire and Safety authorities such as Dubai Civil Defence, Abu Dhabi Civil Defence, Royal Oman Police, EHS Dept. of JAFZA, ADNOC, and Royal Court of Affairs-Muscat-Oman on their various projects.



All the raw materials like the FFC 250 coating, FFC intumescent gaskets and FFC intumescent acrylic sealant are manufactured and imported from the UK.



Leminar shall assist with any technical issues or concerns that may arise during installation at the site.



The FFC-UK duct system has been approved by all the major MEP consultants/clients and used for various prestigious projects.



Leminar is one of the largest companies in the region with facilities like duct fabrication and fire rated coating application, all under one roof. This ensures stringent quality control, easy coordination due to single point responsibility and faster deliveries.



Leminar strictly follows the Method Statement for fabrication of the ducts as defined by FFC-UK for duct fabrication to ensure compliance with test standards.



“The FFC fire rated duct system will provide 2 hour and 4 hour fire rating under insulation criteria for smoke extract ducts experiencing rise in temperatures of up to 600°C.

The FFC 250 fire rating itself will provide 2 hour and 4 hour insulation resistance. Hence, no external insulation is required. This will assist in keeping the insulation cost to a minimum and works well for places with acute space constraint.”

EXAMPLE SPECIFICATION

Fire rated ducts shall be suitable for a fire rating of 4 hours under the Stability & Integrity and Insulation criteria. The minimum sheet thickness of the GI sheet shall be 0.80 mm and shall comply to DW-144 Class C.

The Fire rated ducts shall be factory fabricated and sprayed with an intumescent coating. They should meet the design requirements of method 3 of BS-5588 Part 9:1989 & BS 9999:2008 and also fully be tested to BS 476 Part 24: 1987 (ISO 6944:1985). The supplier should have certifications from various international bodies such as Exova Warrington-fire (UK), LPCB (UK), etc.

The product should comply with NFPA 90A and 90

B standards. Fire rated ducts shall be installed as per the manufacturer's installation guidelines and support tables. The manufacturer shall inspect the installed fire rated ducts and provide a certificate of conformity for the installed system.

Fire rated ducts shall be approved by local Civil Defence and should comply with the requirements for smoke ducts in UAE Fire and Life Safety Code 2017.

The duct manufacturing and coating application should be carried out in the same factory in order to the maintain quality and consistency of the end product. The fire rated duct system should have completed installation of said system for a minimum 5 years within the GCC.



NON-COATED FIRE RATED DUCTS

As an industry leader, Leminar is at the forefront of innovation and has produced several new quality products. Its latest, FlameSafe, is a reliable and cost-effective offering non-coated, fire rated duct.

Meeting major international fire safety standards, FlameSafe is locally produced to meet the immediate requirements of clients, consultants and contractors in a cost-efficient manner.

- FlameSafe Duct are certified for quality along with related accessories like sound attenuators, volume control damper, NRD, access doors, etc. and approval from regulatory bodies like Dubai Civil Defense.

- The gasket and sealant also have low VOC content and comply with the Green Building requirement as per the CDPH Standard Method VI.1.

- The products comply with the requirements of Method 3 of BS 5588 Part 9: 1989 & Method 3 (clause:33.4.3.4) of BS 9999: 2008 and fully tested in accordance with BS 476 Part 24: 1987 (ISO 6944:1985) up to 4 hours stability and integrity for Type A and B ducts with 2 hours insulation.

- Leminar has tested FlameSafe to EN 1366-1 and the system is classified under EN 13501-3 standard for

EI 90 (ho i --> o)

EI 60 (ho i --> o)

E 60 (ho i -- o)/(ho o --> l)

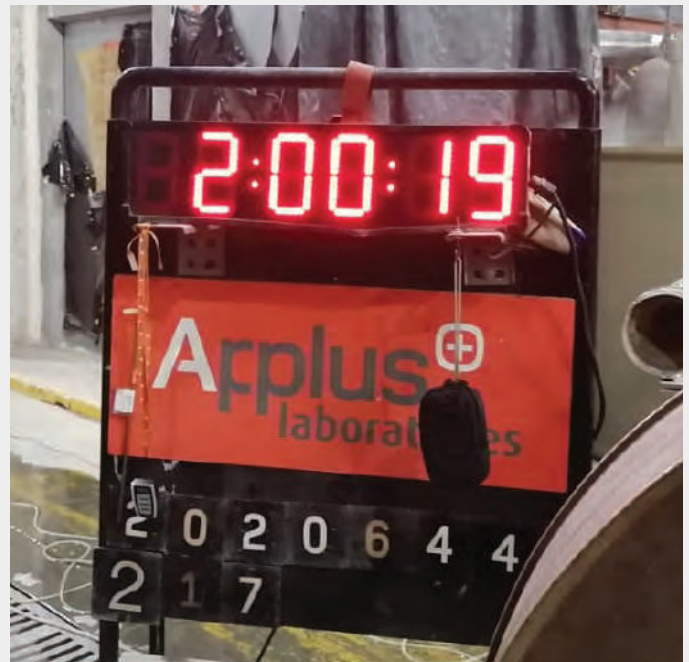
- FlameSafe is manufactured on Leminar's fully automated duct coil line from the UK. The ducts are constructed from galvanised steel sheets with CGF 1 integral flanges as transverse joints, thus **complying with the optimal energy efficiency requirement.**

- The non-coated ductwork system is tested and certified to be used for various applications such as smoke extract, car park, kitchen extract, pressurisation ducts, ventilation and other fire rated systems.

- The system complies with the Indoor Air Quality requirement as there are no puncture or welding involved while producing the ducts. Rivets or spot welding are not used on the transverse joints.

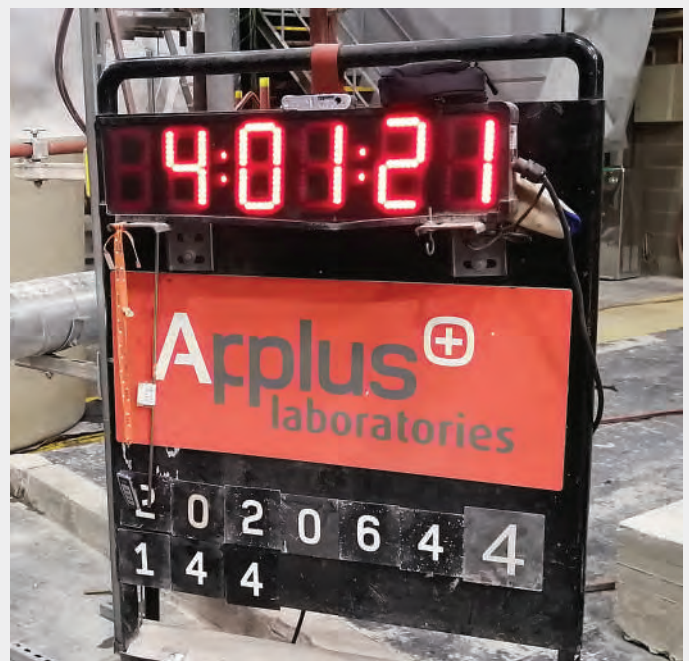
MAXIMISE SAFETY

TEST PICTURES OF FLAMESAFE FIRE RATED DUCT AT APPLUS LABORATORY IN SPAIN



2 HOURS OF TESTING

TESTING OF FLAMESAFE UNINSULATED DUCT



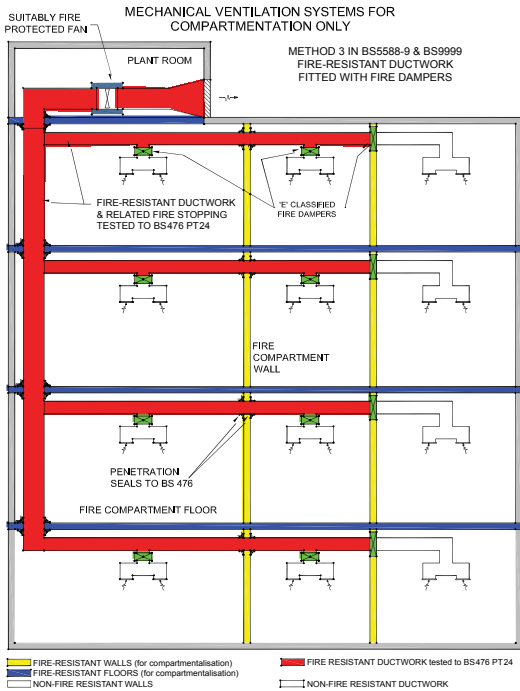
4 HOURS OF TESTING

TESTING OF FLAMESAFE INSULATED DUCT

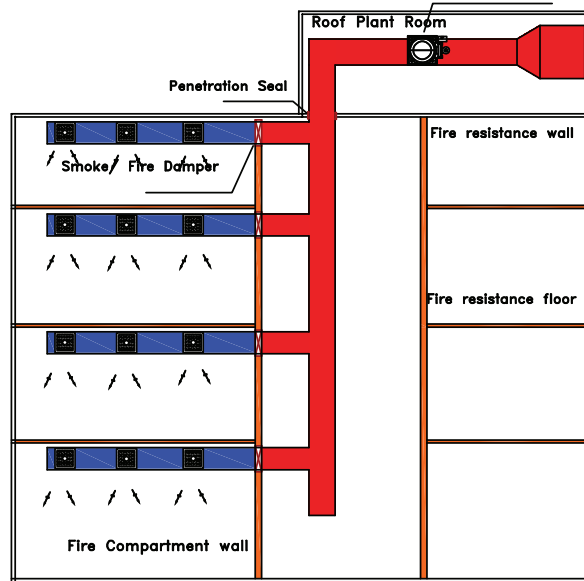
CERTIFICATIONS

Approved by LOCAL CIVIL DEFENCE AUTHORITIES

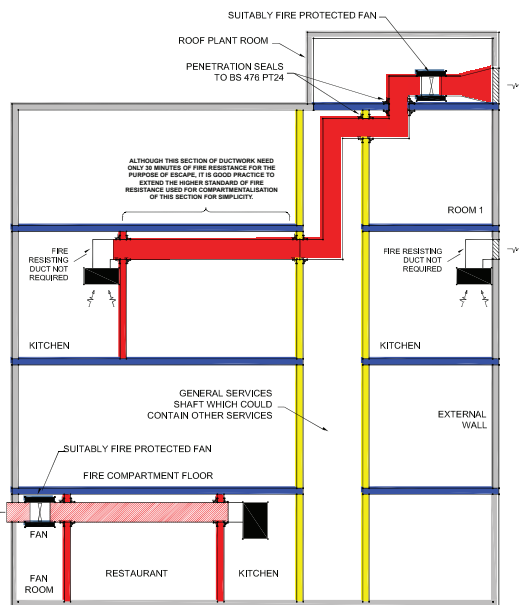
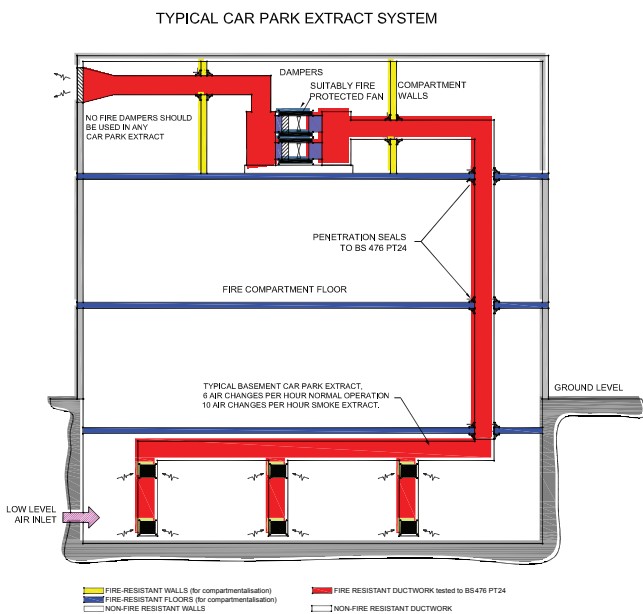
TYPICAL FIRE RATED DUCT SYSTEMS



BS 476 part 24 Layout- Smoke Outlet Duct ventilation system
Fire / Smoke protection fan



TYPICAL NON-DOMESTIC KITCHEN EXTRACT SYSTEM



Fire resistance outlet ductwork retaining cross sectional area of more than 75% of duct. Stability, Integrity and Insulation rating equal to compartment wall. Stability and Integrity is required only if shaft is dedicated.



PROJECTS

- Dubai World Central International Airport (Cargo Terminal Bldg)
- Dubai International Airport Expansion (Concourse 2)
- New Doha International Airport (CP-16, CP-95, CP-96)
- Muscat International Airport (MC-1 Package)
- American University of Sharjah
- QAPCO CCR Office Building
- Dubai International Cricket Stadium, Dubai
- Al Ghandi Auto Showroom, Dubai
- Khalifa Sports Hall, Doha
- Kindergarten and primary school, Madinat Zayed City, Abu Dhabi
- DS 161 Pump Station XI and Rising Main, Dubai
- PPM Conrad Hotel, Dubai
- RTA Al Ruwyyah Bus Depot, Dubai
- Gulf Pharmaceutical Industries (Julphar), RAK
- Sohar Aromatics, Oman
- Al Rawdah Palace, Al Ain
- Crowne Plaza, JBR, Dubai
- 139th floor, The Burj Khalifa, Dubai
- Dubai World Central International Airport Air Traffic Control Tower, Dubai
- Dubai International Airport, Crisis Building, Dubai
- Dubai Internet City, Dubai
- Sheikh Zayed Desert Learning Centre, Al Ain
- DEWA/ FEWA/ ADWEA Substations

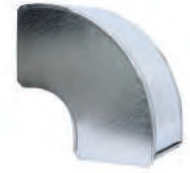
AND MANY MORE...



Galvanised Y Straight Ducts with Flange Connections



Galvanised Fittings with Flanged Connection



Galvanised Fitting with S & C Cleats

PRODUCT FEATURES



Excellent quality ducts fabricated from a variety of GI sheet makes. (Jindal, India / Nippon, Japan / AGIS, UAE, Hadeed, KSA).



Mild/ Black steel and stainless steel rectangular ducts can be fabricated with self-flange and welded longitudinal and transverse joints for airtight and watertight joints.



Black Steel and stainless steel ducts can be fabricated with up to 3mm sheet thickness.



Duct construction as per DWI44/SMACNA/ASHRAE standards provides superior strength, low leakage rate and vibration-free products.



No limitation on duct size, any size of duct can be constructed.



Available options with zero leakage with superior quality CGF-1 integral flange or less leakage on flange transverse joints with integral sealant.



All GI ducts shall be with beading at a 300mm distance, which act as stiffeners and help minimise the vibration and the drumming noise of duct sheet panels. Tie rods and stiffeners shall be provided, if required.



Factory fabricated and 'Ready to install' duct at the site.



Accurate finished dimensions.

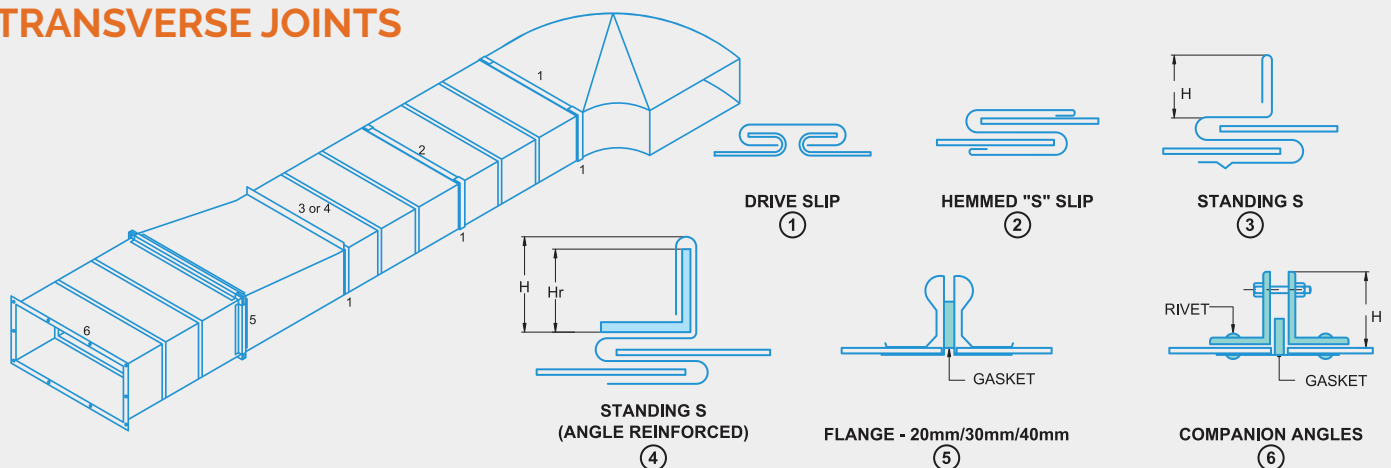


Special identification stickers on duct pieces cross-referred to AC units/ drawings/areas for easy installation.



Quick and easy installation without the use of special tools.

TRANSVERSE JOINTS

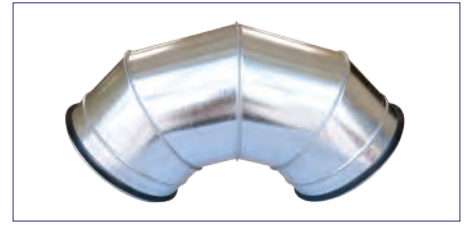




Galvanised Spiral Round Tubes



Spiral Round Duct System



Spiral Duct Elbows

'SPIROFLO' spiral duct system is manufactured to meet the most stringent specifications and quality standards using our vast experience and expertise in the field. This system is available in our range of products for various applications. Energy efficiency, indoor air quality and fine workmanship are the basis of our engineered products.

The Leminar duct shop is equipped with following original **'SPIRO' MADE IN SWITZERLAND** machines:

- Tube former (Range-100mm up to 1600mm diameter)
- Gore locker machine
- Stitch welding machine
- Fitting shaper machine (To fix EPDM Gaskets)
- Rolling machine

The **'SPIROFLO'** system is made from sheet metal consisting of lockseamed round spiral tubes with an extra deformation on lock in the seam (The 'Bubblan' patent).

PRODUCT FEATURES



Superior strength, low leakage rate & low pressure drop.



Reduces low frequency noise.



Sizes available are 100, 125, 140, 160, 180, 200, 224, 250, 280, 315, 355, 400, 450, 500, 560, 630, 710, 800, 900, 1000, 1120, 1250, 1400, 1500, 1600 mm.



Covers all pressure applications from low/medium to high pressure systems.



Lower installation and operating cost.



Aesthetic design for visible duct installation.



The patented 'Bubblan' reel makes sure to produce a fixed lock seam and assured duct quality.



Savings on sheet metal material due to reduced surface area as well as saving on associated items such as insulation, adhesives, canvas cloth, support etc.



Meets all the duct construction standards like DW-144, SMACNA, ASHRAE, etc.



Spiral tubes up to 6 meters in length can be used, which reduces the number of joints and cost, resulting in a low leakage system.



Top quality of Airtight seam and Diameter tolerance.



Superior Performance though standard galvanized steel.



Complies with air tightness as per BS EN 12237:2003, ASHRAE 90.1 and SMACNA HVAC Air Duct Leakage Test Manual, first edition, 1985.

SPIRAL ROUND DUCT SYSTEM





THE LEAKPROOF DUCT SYSTEM SPIRO SYSTEM



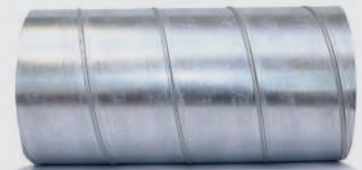
SPIRO INTERNATIONAL S.A. has developed its complete range of quick-fitting, spiral-seam ducts and fittings with factory-fitted sealing gaskets of EPDM rubber. The sealing gasket ensures tight and reliable joints. The system complies to the DW 144 Class 'C' [Eurovent 2.2=IV (DIN 24194)] specification. The SPIRO system is leakproof when fitted and does not require any additional sealing.

The SPIRO sealing system is based on a profile of homogeneous EPDM rubber, the rubber gasket is located in a groove at the end of the fitting and securely attached by means of a return edge. This design ensures that the rubber gasket is always held in its correct position.

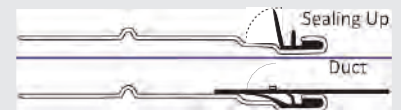
PRODUCT FEATURES

-  Fast and easy installation.
-  Factory fitted gasket without any loose parts.
-  Adjustable - Twisting and fine adjustment ensures there is no risk of leakage.
-  Environment-friendly - The system is fitted with solvent free sealant.
-  Can be installed in all kinds of weather.
-  Temperature resistant from -300°C to +1000°C.
-  Withstands positive pressure up to 3000 Pa
-  Withstands negative pressure up to 5000 Pa
-  Aesthetic design - an advantage for visible installation.
-  Reduced duct surface area compared to rectangular ducts which in turn saves the cost of insulation and accessories.

SPIRAL FITTINGS WITH EPDM GASKETS



THE SEALING GASKET



CONSTRUCTION STANDARDS [Low to medium pressure class SMACNA]

STRAIGHT TUBES DIA (MM)	G.I SHEET THICKNESS (MM)
0 - 630	0.56
710 - 900	0.71
1000 - 1250	0.90
1400 - 1500	1.00
1600	1.20

ROUND FITTING DIA (MM)	G.I SHEET THICKNESS (MM)
0 - 355	0.56
400 - 630	0.71
710 - 900	0.90
1000 - 1250	1.00
1400 - 1600	1.20



Dubai International Convention & Exhibition Centre



The American International School, Oman

PROJECTS

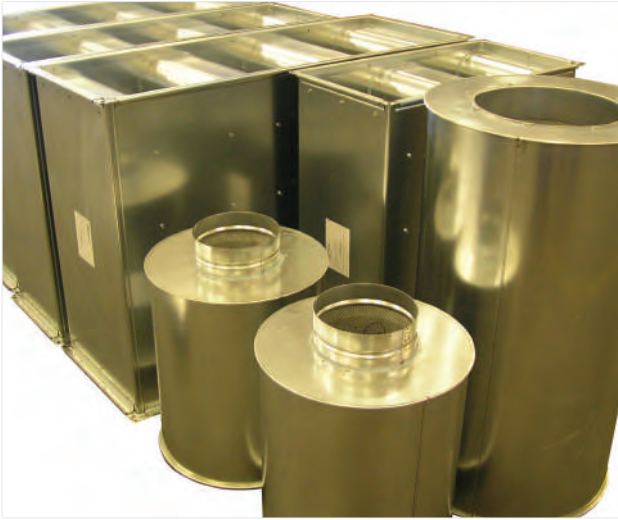
- Abu Dhabi Airport Expansion- (Air Traffic Control Tower), Abu Dhabi
- Dubai World Central International Airport, (Cargo Terminal Bldg.) Dubai
- Muscat & Salalah International Airport, (MCI Engineers office, MCI Utility Yard Building, MC12 (Cargo Terminal), Oman
- Presidential Flight Hangar, Abu Dhabi
- Barakah Nuclear Power Plant, Abu Dhabi
- Anode Baking Furnace, Emal, Abu Dhabi
- Auto Mall, Dubai Motor City, Dubai
- Dubai Metro tunneling works, Dubai
- Al Tayer Motors Showroom, Dubai & Sharjah
- Sultan Plaza, Muscat, Oman
- New Logistics Stores, SBSNB Wudam, Oman
- CEVA, Dubai
- Xerox office, DIP, Dubai
- Sports Hall, Khor Fakkan, Sharjah
- DM Sports Hall & Swimming Pool, Dubai
- RTA Al Ruwyyah Bus Depot, Dubai
- Spinneys outlet at various locations, UAE
- East End Temp Housing, Iraq
- Laboratory Building, DuBiotech, Dubai
- FTV Proclad Dubai Branch, Dubai
- Jebel Ali Power Station, Dubai
- Emirates Airlines Simulator, Dubai
- Fakeeh Medical Center, Dubai
- Khawaneej Bus Depot, Dubai



Legoland Park, Dubai



Expo Centre, Sharjah



Rectangular and Circular Silencers



Multi-section Silencer



UKAS ACCREDITED TEST RIG AT SALFORD UNIVERSITY (UK)



ATCC- Dubai World Central International Airport

Sound attenuators are systems that allow the passage of airflow while providing an acoustic loss or reduction to the passage of sound or noise at the same time.

Leminar Air Conditioning Industries is the sole manufacturing licensee for Galloway Acoustics - UK's product range for the geographical market covering UAE, Oman, Bahrain and Kuwait. Key technical personnel from Leminar have been trained at Galloway Acoustics - UK with respect to acoustic design, calculations and selection of the range of silencers. Design engineers at Galloway Acoustics are readily available to assist Leminar with technical queries as and when required.

All silencers at the Leminar factory are manufactured as per the guidelines of Galloway Acoustics - UK. This ensures continuity of the product tested performance across all projects where Galloway silencers are used. Therefore, the acoustic products manufactured by us would require no further acoustic testing.

Galloway Acoustics products are tested to BS EN ISO 7235:2009 and BS 4718:1971 at UKAS accredited test laboratories in Salford University (UK) and SRL (UK).



TESTS & CERTIFICATIONS

THE HIGH TEMPERATURE CASING ATTENUATORS ARE ASSESSED BY WARRINGTON FIRE EXOVA (UK) FOR 2 HOURS FIRE RATING FOR STABILITY, INTEGRITY AND ARE SUITABLE FOR USE IN A SMOKE EXTRACT SYSTEM EXPERIENCING TEMPERATURES UP TO 300°C.





FFC FIRE RATED SOUND ATTENUATOR (COATED)

Fire Rated Attenuators with FFC 250 coating are tested to BS476 Part 24 for 240 minutes. Fire stability, integrity and 180 minute insulation criteria suitable for temperatures as per the cellulosic curveatures.

FLAMESAFE FIRE RATED SOUND ATTENUATORS (NON-COATED)



The FlameSafe fire rated sound attenuator system with high temperature casing is suitable for use in smoke extract ductwork systems carrying smoke and hot gases for the duration of 120 minutes in terms of adopted stability and integrity criteria as per BS476 – Part 24 1987.

The product holds a 'CERTIFIRE' certification from Exova Warrington. These sound attenuators do not require any additional fire coating.

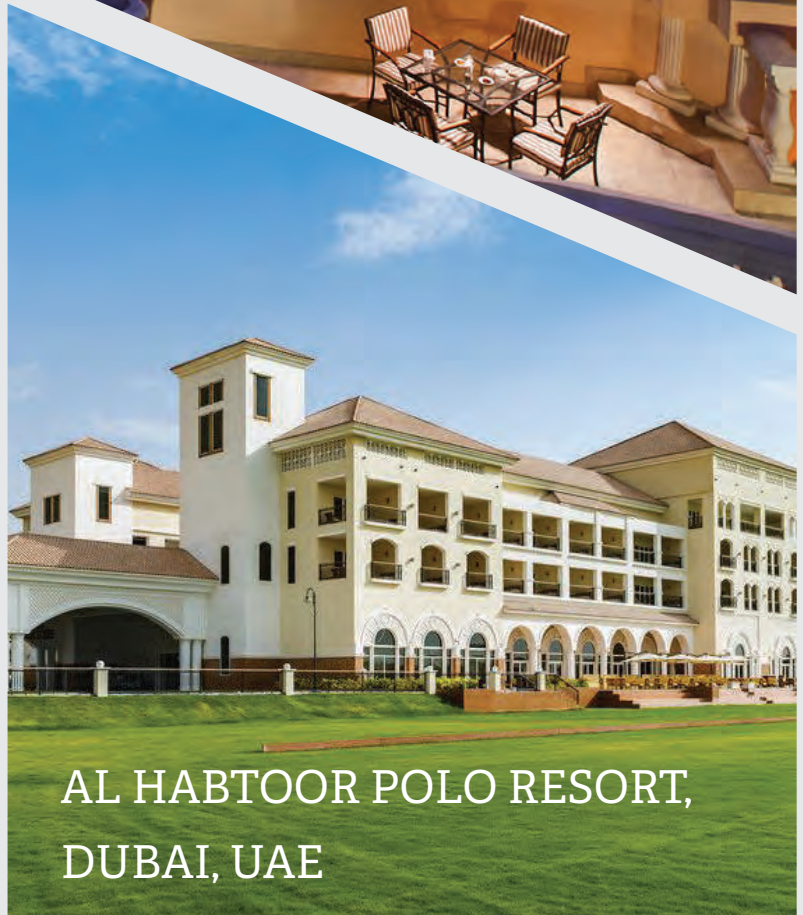
PROJECTS



KEMPINSKI HOTEL, PALM
JUMEIRAH, DUBAI, UAE



ROYAL OPERA HOUSE,
MUSCAT, OMAN



AL HABTOOR POLO RESORT,
DUBAI, UAE

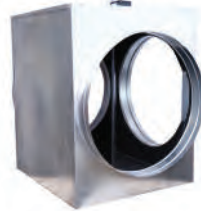
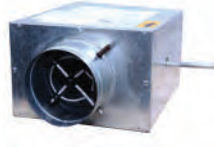
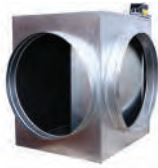


DIGITAL
THERMOSTAT



MODULATING
ACTUATOR

BYPASS TYPE VAV UNITS



VAV SINGLE DUCT
CONTROLLER &
ACTUATOR

PRESSURE INDEPENDENT TYPE VAV UNIT



RTA HEADQUARTERS, GARHOUD,
DUBAI, UAE

Galloway's Variable Air Volume (VAV) Control Units are duct mounted pressure dependent bypass-type units, ideal for low and medium pressure applications. These units are suitable for both cooling and heating systems. The temperature can be preset on the electronic analogue/digital thermostat, which senses the room temperature and controls the VAV Unit. The required quantity of air to each zone is pumped into the area based on the load requirement and the balance air bypassed through the bypass section of the VAV unit above the false ceiling or to return air ducts.

Pressure Independent units are manufactured with great precision with an acoustically lined sheet metal box, round damper, sensor and rectangular outlet. Made by Neptronic - Canada, the model has a unique Nepcross cross flow sensor and controls for BMS compatibility.

SPECIFICATIONS

DAMPERS -

1. 22 BWG galvanised steel
2. VAV casting is internally lined with 1/2" thick, fiber free/fiber glass liner as per customer's enquiry
3. Controls: Neptronic - Canada/Equal make modulating actuators (Available in 5 Nm & 10 Nm and Digital thermostat)
4. Available range: 200 cfm to 7500 cfm

PRODUCT FEATURES



Energy efficient



Easy to install



Can be used to add zone control to various areas of the existing building



These units are portable enough to be placed as per interior requirements



These units are provided with integral inlet and bypass balancing dampers



Special acoustic treatment helps achieve low NC levels for various applications



Design ensures low pressure drops on air side



Electronic digital thermostat ensures precise temperature control



VAV models tested to AHRI 880 at Intertek laboratory in USA

PROJECTS

- Boys and Girls High School, Madinat Zayed City, Abu Dhabi
- Dubai Modern High School, Dubai
- Dubai Police General HQ Reception Building, Dubai
- H.H. Sheikh Majid Office, DIFC, Dubai
- Ladies Club, Jumeirah and Zabeel, Dubai
- Ministry of Finance, Muscat, Oman
- Al Mamzar Twin Towers, Dubai
- Central Laboratory, Dubai
- Population Registration I.D Card Building, Dubai
- Al Rahba Hospital, Abu Dhabi
- Euro Offices, UAE



Flotek control dampers are manufactured to meet the most stringent specifications and quality standards using our vast experience and expertise in the field.

Automatic intake dampers and manual balancing dampers are available in our range of products for various applications. Our products are finely crafted by a core team of designers and are energy efficient as well as certified for optimum indoor air quality.

TYPES OF CONTROL DAMPERS

- Rectangular dampers with parallel or opposed blades and external linkage type (DL Series)
- Rectangular Dampers: Gear-driven (DGD Series)
- Motorised dampers (MD Series)
- Round dampers (RD Series)
- Back draft dampers or non-return dampers (BD Series)

CONTROL DAMPERS ARE AVAILABLE IN GALVANISED STEEL, MILD STEEL, STAINLESS STEEL AND FIRE RATED CONSTRUCTION

PRODUCT FEATURES



Aerofoil blades.



Concealed heavy duty and maintenance-free blade linkage.



Opposed blade action for modulating air balancing applications and parallel blades for open/close applications.



To prevent leakage, blade edges are fitted with systematic seals as an option.



Dampers are offered with flange or slip driven connections for easy installation.



PROJECTS

- 2B+G+2 Commercial Building, Nadd Al Hamar, Dubai
- G+P+4 (Belgravia-2) Residential Building at JVC Dubai
- G+2 Private Villa (Afghan Villa) P121-Palm, Dubai
- Belgravia B+G+4 Residential Building at JVC, Dubai
- (3B+G+3+Gym) Building at Al Hamriya, Dubai
- Belhasa Driving Center 984, Al Quoz 4, Dubai
- Spinneys Supermarkets, Dubai, UAE
- G+28 Tower, Business Bay, Dubai
- Education Building, Khor Fakkan, Fujairah, UAE
- Hotel Holiday Inn, Muscat, Oman
- Modern College, Bawshar, Muscat Oman
- Village Hyper Market, Jebel Ali, UAE
- Dubai Police Stores, UAE
- Lulu Supermarket, International City, Dubai
- Population Registration I.D. Card Building, UAE
- National Bank of Abu Dhabi, Muscat

EXTERNAL LINKAGE TYPE - DL SERIES

- Aerofoil blade
- High performance
- Galvanised steel construction

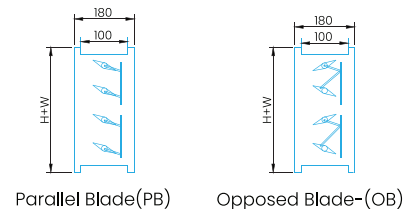
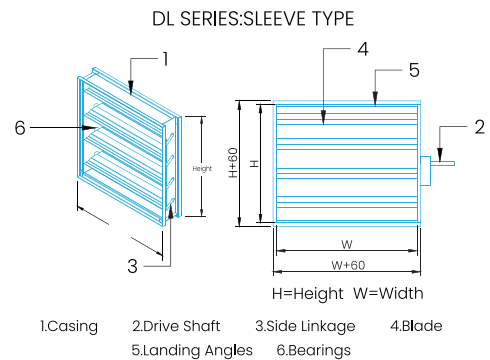
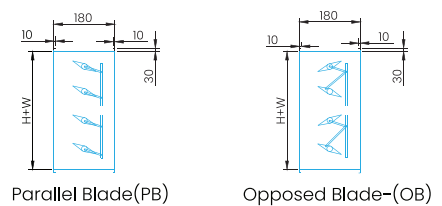
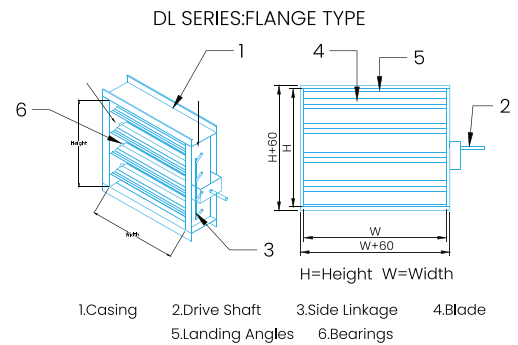
MODEL:

- PB – Parallel Blade
- OB – Opposed Blade

PB/OB series control dampers are complete with GI single skinned V grooved blades as a standard. (Double-skinned aerofoil GI blades or aluminium profile blades are available as an option if required.)

STANDARD CONSTRUCTIONS:

- **GI Sheet Specifications:** As per ASTM A653, LFQ, G90 /Z27 zinc coating
- **Frame:** 18/20G galvanised steel hat channel (for flange type), 22/20G galvanised steel (for slip drive type), optional 16G galvanised steel (self-flange type)
- **Blades:** Appx.4"/5"/6" wide, 18G single skinned 'V' grooved blades as a standard, double skin aerofoil blades are available as an option
- **Linkage:** Concealed side type totally enclosed within the frame and out of the air stream
- **Bush:** 1/2"-3/8" dia. synthetic bush, brass bushes are available as an option
- **Axle:** 1/2"-3/8" dia. plated steel fixed to the blades
- **Min. Size:** Single Blade (Parallel) 4"x4". Two blades (parallel or opposed)8"x10"
- **Max. Size:** Single blade section size is 48"x48" and multiple section is unlimited
- **Blade:** Synthetic rubber seal, as an option for low leakage



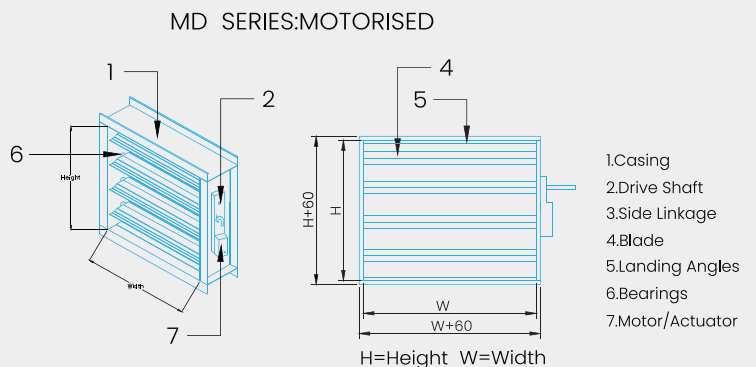
MOTORISED DAMPER – MD SERIES

- Aerofoil blade
- Motorised operation
- High performance
- Galvanised steel construction

MODEL:

- PB – Parallel Blade
- OB – Opposed Blade

PB/OB Model control dampers are complete with GI or extruded aluminium aerofoil blades suitable for a variety of pressure ratings. The damper is complete with a sturdy hat channel frame made out of 18 G galvanised iron and concealed linkages which require zero maintenance. The factory mounted motorised actuators of wide range (various brands as well as torque ratings) are available to suit the size and applications.



GEAR DRIVEN – DGD SERIES

- Aerofoil blade
- High performance
- Galvanised steel construction
- Gear-driven
- Opposed Blade damper action

MODEL:

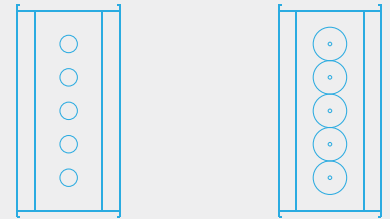
- OB - Opposed Blade

OB model control dampers are complete with GI aerofoil blades (*aluminium profile blades are also available as an option*) suitable for variety of pressure ratings. The damper is complete with a sturdy hat channel frame made out of 18 G galvanised iron and a concealed gear assembly, which requires zero maintenance.

STANDARD CONSTRUCTIONS:

- **Frame:** 18/20G galvanised steel hat channel (for flange type), 22/20G galvanised steel (for slip drive type)
- **Blades:** Appx.4"/5"/6" wide, 18G single skinned 'V' grooved blades as a standard, double skin aerofoil blades are available as an option
- **Linkage:** Concealed side type totally enclosed within the frame and out of the air stream, optionally gear driven dampers are available based on numbers of blades and size of damper
- **Bush:** 1/2"-3/8" dia. synthetic bush, brass bushes are available as an option
- **Axle:** 1/2"-3/8" dia. plated steel fixed to the blades
- **Max. Size:** Single blade section size is 48"x 48" and multiple section is unlimited
- **Blade:** Synthetic rubber seal, as an option for low leakage
- ON-OFF type belimo or equivalent actuators provided for motorised dampers

GDG SERIES – GEAR DRIVEN



NON DRIVE END DRIVE END

BACK DRAFT/NON-RETURN DAMPERS – BD SERIES

- Aerofoil blade
- High performance
- Galvanized steel /Aluminium frame

MODEL:

- DM – Duct Mounted
- FF – Front Flange type
- RF – Rear Flange type

FEATURES:

- Versatility and consistent performance in air intake or air pressure relief applications
- Durable construction & smooth operation
- Rugged GI frame (*option with aluminium frame is also available*), and aerodynamic aluminium blade design for quiet and long lasting performance
- Suitable for most light to medium duty commercial and light duty industrial requirements

ROUND DAMPERS

- Manual balancing dampers for round duct
- Galvanised steel construction

RD Series manual balancing butterfly dampers are designed for all types of round ductwork applications and is suitable for use in most low pressure and velocity commercial HVAC systems. The design features a sturdy beaded casing ideal for round spiral ductwork connections and a corrosion resistant steel blade that can be locked in any position with the hand quadrant that is supplied as standard with the damper.

RECTANGULAR DAMPERS WITH SPIGOT CONNECTIONS - SD SERIES

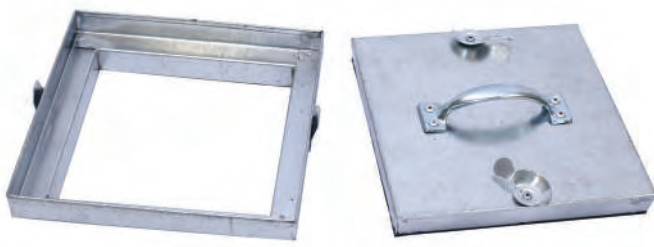
SD Series rectangular dampers with round spigot connection are designed for round dampers of diameters 500 mm and more. These dampers shall have construction similar to the rectangular dampers, however will have round spigot to connect to the spiral ducts. Any position with the hand quadrant that is supplied as standard with damper.

GALLOWAY PRODUCTS ARE MANUFACTURED TO MEET THE MOST STRINGENT SPECIFICATIONS AND QUALITY STANDARDS USING OUR VAST EXPERIENCE AND EXPERTISE IN THE FIELD

PRODUCT OVERVIEW

Fire dampers do need inspecting and testing, coils need cleaning and controls need adjusting. The Galloway range of access doors have been designed to allow easy and convenient access to equipment within HVAC ductwork while providing a secure, positive seal when closed. The AD-CL and AD-HCL models offer quality double skin construction that meet SMACNA requirements with quick simple installation. Galloway Access doors provide easy mounting and positive closure. All models are available in a wide variety of sizes to suit each specific application.

ACCESS DOORS ARE ALSO AVAILABLE IN MILD STEEL, STAINLESS STEEL AND FIRE RATED CONSTRUCTION



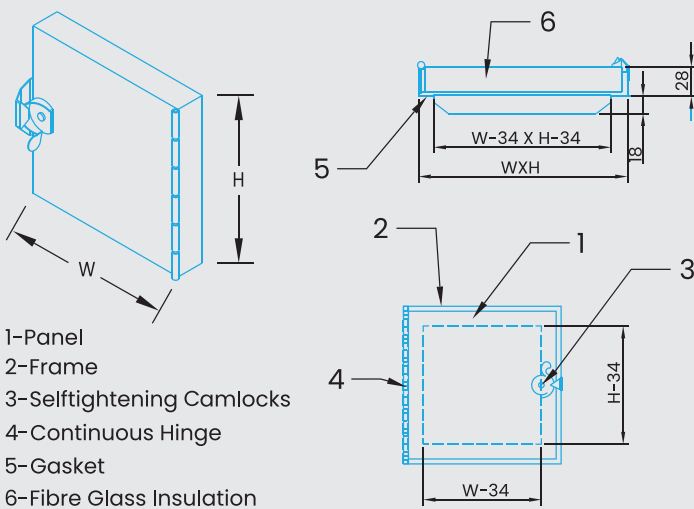
MODEL:

- AD-HCL: Hinged with camlock closure
- AD-CL: Removable, paired camlock

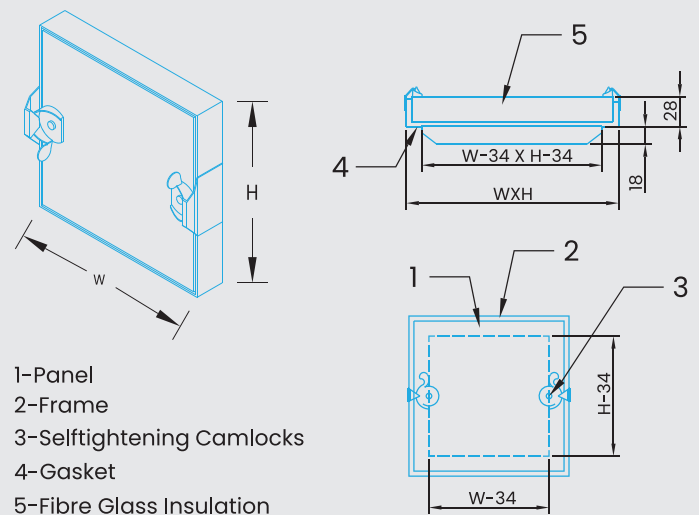
STANDARD CONSTRUCTIONS:

- 22 G galvanised steel flanged frame for strength
- Double skinned 24 G galvanised door panel
- 1-inch thick insulation
- Notched knock over tabs and camlock fasteners
- Positive seal synthetic gaskets
- Safety retaining chain on removable door as an option
- Continuous piano type hinge standard on model AD-HCL
- Available in GI, MS, SS and fire rated construction

MODEL:AD-HCL



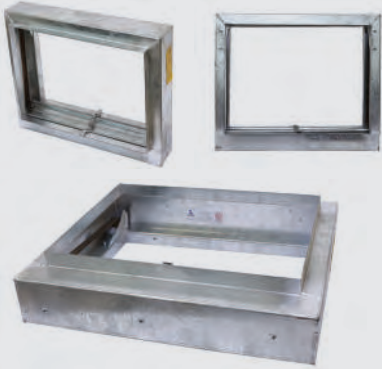
MODEL:AD-CL



PRODUCT FEATURES

- Progressive action, zinc plated camlock for secure closure.
- Synthetic gaskets for positive seal.
- 1 inch (25 mm) thick insulation for reduced noise and heat transfer (2-inch thick insulation option is also available).
- Sizes and models to suit most applications.
- Meets SMACNA construction specifications.

TYPES OF CONTROL DAMPERS



LABORATORY TESTING PICTURES



SINGLE SECTION TESTING



MULTI-SECTION TESTING

Fire dampers are passive fire protection products used in heating, ventilation, and air conditioning (HVAC) ducts to avoid the spread of fire inside the ductwork and prevent it from spreading to the adjacent compartments. When the temperature rises, the fire damper closes, usually activated by a thermal element that melts at temperatures higher than ambient but low enough to indicate the presence of a fire, allowing springs to close the damper blades.

Leminar Air Conditioning Industries, with its state-of-the-art infrastructure, highly competent resources and superior quality management systems has designed a damper that meets the stringent requirements of the UL 555 standard for static operations for 1 1/2 hour rating.

FLAMESAFE FIRE DAMPERS

MODEL: FFD (VS)

STANDARD CONSTRUCTION

- **Frame:** 1.20 mm (18 G) galvanised steel
- **Blades:** 0.80 mm (22 G) galvanised steel with interlockings
- **Fusible Link:** The link is rated at 165 °F and is secured by 18 G steel straps
- **Blade Ramp:** Formed from 1.20 mm (18 G) thick galvanised steel
- **Springs:** 0.30 mm thick at 19 mm wide of stainless steel
- **Installation:** Vertical
- **Finish:** Mill finish

FEATURES



Curtain blade type



Fire rating: UL 555 tested - Up to 3 hours for static systems



100 % free area (blades outside the airstream)



Complies to NFPA 90A & SMACNA requirements



Dampers available in Single and Multi-section

Approved by
**LOCAL CIVIL DEFENCE
AUTHORITIES**



Leminar

Where Trust Matters

Fire Damper

For use in **Static Systems**

Up to 3 hrs. rating

No:

Model # : FFD (VS)

See Leminar installation and operating instructions for this model



R27369

SAMPLE STICKER FIXED ON FIRE DAMPER

PROJECT REFERENCES





DUBAI FRAME, DUBAI, UAE

EXPO 2020, DUBAI, UAE



SEAWORLD, ABU DHABI,
UAE



JEWEL OF THE CREEK,
DUBAI, UAE



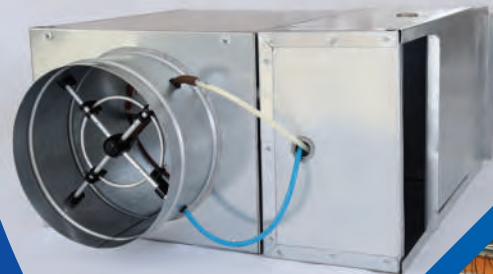
MUSEUM OF THE
FUTURE, DUBAI, UAE





Leminar

Where Trust Matters



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