CA Consultants Limited
ISO 9001:2008 Certified Company

cacons Newsletter August, 2015

Volume 10 Issue 2

ROCKWOOL - A BETTER REPLACEMENT FOR FIBRE GLASS AS DUCT INSULATION MATERIAL

Duct insulation and sealing, especially insulated supply duct delivering conditioned air within a building, is meant to minimize or, if possible, prevent leakages and loss of energy. The intent of energy efficient code as related to duct insulation and sealing (see 2009 and 2012 IECC, ASHRAE 90.1-2007 and 2010; 2009 and 2012 IMC) is to keep mechanically cooled or warmed air as close to a constant, desired temperature as possible and prevent the conditioned air from escaping the duct system while it is being moved to spaces where it is needed.

The energy saved through the choice of appropriate insulation material will definitely reduce the size of HVAC equipment choice which will invariably lessen electrical and gas energy bill.

There are several duct insulation materials e.g. Cellulose, Fiberglass, Rock wool and Vermiculite etc. from which builders and designers can make better insulation choices. Two popular and competing types of duct insulation materials are rock wool and fiberglass. Both materials conserve energy for a building, but have a distinct difference that put same ahead of fiberglass.

Composition

Rock wool is called a mineral wool because it is made primarily from basalt rock, iron slag and limestone. The rock and other materials such as limestone are melted together and the liquid mixture is formed into fibers by machine whereas Fiberglass is formed by melting glass and sand, then using a machine to spin the glass into fibers. While the average fiberglass insulation product contains 20 to 30 percent recycled content, according to the U.S. Department of Energy, rock wool consists of 75 percent recycled content or greater, making it a more eco-friendly choice for advocates of green buildings.

R- Value

The main difference between rock wool and fiberglass insulation is in the materials' R-values. R-value refers to the insulation's ability to block heat flow thus keeping cooled or warmed air in the duct as close to a constant, desired temperature as possible. The higher the R-value, the better the material is able to help the duct resist thermal transfer. Fiberglass offers an R-value of 0.9 per 50 mm while Rock wool insulation provides an R-value of 1.1 per 50mm, making it a slightly better insulator than fiberglass, according to the U.S. Department of Energy.

Fire resistance

Rock wool is non-combustible and offers a higher density than fiberglass, which helps to improve fire resistance. Rock wool can withstand temperatures up to 1,800° F (982°C), while fiberglass melts at around 1,100°F (593°C), according to "The Solar House -- Passive Heating and Cooling." This higher melting point makes rock wool more effective than fiberglass at slowing the spread of flames during a fire.

Water Resistance

Both fiberglass and rock wool batts have good water-resistivity, but fiberglass absorbs 1% water by weight, while mineral wool absorbs up to 5%. Whereas rock wool retains its thermal qualities after exposure to moisture, repels water and will not support growth of bacteria, mildew or mold, moisture can compromise the effectiveness of fiberglass insulation.

Health Hazards

There are conflicting reports on the health credentials of rock wool and fiberglass insulations. Both insulation materials have airborne particles that come into contact with skin, lodge in pores and cause itchiness, rashes and irritation. When inhaled, particles can cause coughing, nosebleeds, and other respiratory ailments. Rockwool have higher tensile strength, dimensionally more stable and higher density per millimeter thickness which makes it less prone to shifting and sending out airborne particles thus put it ahead of fiberglass in terms of safety. Also, rockwool does not release harmful fibers or emissions. However, concern exists about the possible health effects of fiberglass insulation and the release of formaldehyde OSHA (Occupational Safety, Health & Administration) USA, for instance, considers this threat to be serious enough that it requires fiberglass insulation to carry a cancer warning label. The International Agency for Research on Cancer (IARC) has classified glass fiber as Group 2B, possibly carcinogenic to humans, and rock wool as Group 3, not classifiable as to their carcinogenicity to humans. It is worth noting that these risks are not at present, fully understood or agreed upon so whichever choice you make ensure safety measures are observe while working with insulation materials.

Cost

Rock wool insulation is more expensive than fiberglass due to its high melting range between 1800°C and 2000°C. When fiberglass product hit the market in 1970s, it drastically reduced the market share of rock wool insulation material particularly due to its lower cost but of recent, as awareness increase in green revolution, there has been increase in the demand for rock wool insulation material. For a typical household, fiberglass is a budget friendly, durable material that can save energy as well but not without associated risk.

Conclusion

Rock wool is among the most popular of the traditional insulation methods in use these days with much of the world's industries being made conscious of the environmental repercussions that they make. Rock wool was part of the engineering design and installation on The Heritage Place, Ikoyi, one of our on-going projects

References

- *www.ehow.com/rockwool -insulation*
- *www.inpectapedia.com/insulation /rock_wool_insulation*
- *www.ehow.com/fiberglass -insulation*
- *www.ehow.com/comparerockwool -fiberglass-insulation*
- *www.ehow.com/rockwool/ vsfiberglass*
- *www.wisegeek.com/thermal/ resistance*

Inside this issue:

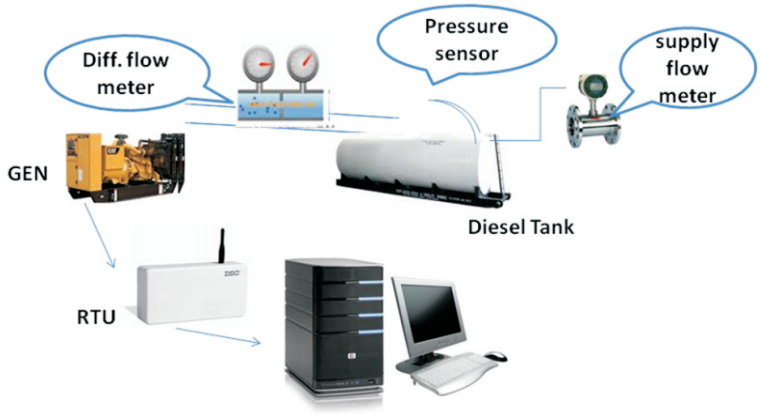
Diesel Monitoring System

In these economically difficult times, the importance of controlling and managing operational costs cannot be surpassed. Fuel costs remain the highest operating cost in most businesses and the incidence of fuel theft and fraud is substantially high. Companies' branch offices at remote locations remain at a higher risk of such fraud. Cases of unauthorized use of generators, using of generators during period when public supply is available as well as use of high capacity generators when low capacity generators will be sufficient are part of the problems that require diesel monitoring system as a solution. Fuel consumption in any operation is expensive but unavoidable, so it is essential to track fuel usage on a daily basis. The fuel monitoring system does exactly that by letting users know their expenses on fuel through detailed analysis of fuel consumed, fuel filled and fuel left over.

The diesel management system is specifically designed to promote efficiency as well as control costs at all times. The diesel monitoring system starts from the supply to consumption. Sensor and flow meters are used as readers and these are displayed and recorded. The turbine flow meter, pressure sensor switch, and differential flow meter are measuring devices in the system. The collected data is processed in the Transducer (Remote Terminal Unit) and software algorithms.

How it works

A turbine flow reader is installed at the fuel supply point which reads the exact quantity of fuel delivered by the supplier. A pressure sensor installed in the storage tank reads the exact volume of diesel in the tank while a differential flow meter installed on the diesel oil supply pipe at the entry into the generator measures the amount of diesel consumed. The process of the systems starts from the fuel point, the flow meter measures the diesel supplied and stored while a daily consumption graph is generated by the software from which the amount of diesel supply and usage is compared.



Advantages of Diesel Monitoring System:

- Real time fuel level and amount
- Indicates the amount of fuel dispensed into the fuel tank and fuel consumption rate
- Theft detection
- Automatic alerts for:
  - i. critically low level of diesel
  - ii. diesel supply alert
  - iii. fraud alert
  - iv. Public supply / Generator ON simultaneously after 15mins alert
  - v. unauthorized use of generator
  - vi. auto scheduling of generator maintenance
- Gives operational and statistical reports and invoice reconciliation
- Generates consumption rate monitoring

In conclusion, the use of power generators are core infrastructure component of many businesses in a developing country like Nigeria and one of the primary concerns revolves around the theft of fuel and fuel fraud. Therefore, detecting theft requires monitoring fuel at a high level of accuracy and tracking these levels over time. With this in mind, a Diesel Monitoring System was included in the engineering design and installed on some of our on-going projects like Diamond Bank head office annex at Oniru, Victoria Island and the MTN head office, Falomo, Ikoyi (Energy Centre).

References

- *www.glink.co.za*
- *Diesel and generator monitoring and management presented by Digiplus Limited*

CEO'S COLUMN

Volume 10 Issue 2

Dear Reader,

We are glad to be with you again on this edition of our newsletter. Our main objective is to inform you of current Mechanical, Electrical and Plumbing (MEP) Systems that will ensure success of your investment in your building projects. Most especially products that contribute to the security and low running cost of your facilities.

In order to include issues/articles that are important to you and your industry, we would love to hear from you, email us at info@cacons.com with your suggestions.

If you will require reprints of previous newsletter, kindly visit our website www.cacons\newsletters to download the newsletter.

Your active support is crucial. We thank you for staying with us all these years and we do sincerely look forward to hearing from you.

Engr. Charles 'Yele Akindayomi
Founder/CEO

cakindayomi@cacons.com

Building services design solutions to security challenges in commercial buildings

Security challenges/threats in commercial buildings range from theft, property damage, assaults, trespassing etc. In a bid to reduce, and where possible eliminate totally these menaces, both the occupants and property owners are encouraged to invest in technology solutions that will enhance the security of their buildings. The technology solutions used in mitigating security challenges include but not limited to the following:

Intrusion Detection

Intrusion detection is a concept of security that involves the use of motion detectors in combination with some type of audible alarm device that is triggered when a person accesses a building/facility without authorization. Subsequently, an alert is sent to the police or the security station to notify authorities of the time and location of the incident. Motion detectors are used to detect moving objects and people, they are sensors linked to an audible alarm. It can be integrated in the design to trigger a security camera and light in order to record the intrusion. Electronic motion detector uses combination of different technology sensors like; optical, passive infrared, microwave or acoustic sensors, ultrasonic sensor detection system.

Access Control

Access control is a means by which people are granted or denied entry to restricted areas, such as office suites, storage facilities or parking garages. This finds a lot of application in commercial buildings where varying degree of access is required depending on usage, especially in multi-tenants system. For instance, a flexible form of access control uses cards with magnetic card readers, proximity readers, biometric (as shown in the figure below), barcodes or smartcards with embedded microprocessors.

A Biometric Device

UVSS (Under Vehicle Surveillance System)

Under vehicle surveillance systems are being implemented more or seen as a necessity for security due to recent rise in terrorism or bomb attacks. UVSS are designed to scan, monitor and digitally record crisp, clear digital video images of the entire width of a vehicle's underside, all with one permanent or portable system. Careful Integration of components makes the UVSS a cost effective and convenient solution for checking passenger vehicles. It is an ideal solution for Commercial buildings where complete vehicle monitoring can be achieved.

Advanced imaging and LED illumination provides clear, high resolution video of the vehicle's underside to help detect attached packages, explosives and other objects. For monitoring, images are processed by digital video recorder of 4-16 channels simultaneously and then displaying moving images on screen. Images can be transmitted through fiber optics, IP or wireless network. UVSS are flexible in design such that they can be inte grated with other security system like video surveillance system. A UVSS can either come in as a portable item (hand held device) or permanent or fixed on the road or ground where vehicles drive over.

Electric Fence

High formidable fences are no longer in vogue, due to trending aesthetic or financial implications for large floor area (square/m^2) commercial building. With high tech electric fences, aesthetics, concepts and financial cost can be actualized while still mitigating/reducing security threats. Electric fences come with warning signs due to the incapacitating effect it has, the warning sign is meant to keep intruders away. It sends sharp and painful electric shock to anybody that touches it and will trigger an alarm if cut, climbed, shorted or tampered with. It can be free standing, placed atop a wall or attached to an existing fence. Electric fence is easy to install. It provides reliable protection and can be interfaced with other security products or systems.

Video Surveillance Technologies

Video Surveillance has evolved significantly in the last decade. Record keeping was prone to errors and looking for specific incidents on tape was time consuming. Digital Video Recorders (DVRs) made significant advances in features and functions. Newer cameras today have embedded processors that enable video to be compressed within the device and transmitted real-time over IP networks to Network Video Recorders (NVRs) that centrally manage video feeds from many IP cameras. When Digital Video Recorder is integrated with an organization's access control and intrusion detection system (as part of the broader building automation system) the user improves surveillance and reduces the need for additional security personnel. Integrated with access control, video verification for example allows a user to see live videos as well as the cardholder's picture when a given access card is presented at a reader. Video verification effectiveness occurs in identifying individuals who are 'tailgating', or when one person swipes their badge and gains access to the facility and another person follows them in without presenting their badge. The integrated system allows organizations to visually identify, verify and capture security breaches at access points.

Conclusion

The best security solution in commercial buildings involves more than just good choices of alarm systems, cameras or other security devices. For an effective security solution, a proactive approach should be embarked upon, where the owners of commercial buildings engage the services of building services consultants from the outset to design a quality and holistic security solution that takes into consideration client's specific security requirement, ease of maintenance, future expansion, administration, to reduce or eliminate identified security threats and their sources.

References

- *Under Vehicle Surveillance System by International Road Dynamics Inc.*
- *CRISP Report by ASIS Foundation*

CONSULTANTS CORNER Mechanical, Electrical & Piping Consulting Engineers

CA CONSULTANTS LTD

6th Floor, UBA House 57, Marina, Lagos
Telephone: +234-1-4622734, 4622735
Email: mainoffice@cacons.com

Abuja Office:
Suite 1, 1st Floor Wing B, City Plaza,
Ahmadu Bello Way, Garki 2 Abuja, Nigeria
Tel: 09-291 801,
E-mail: abujaoffice@cacons.com

www.cacons.com

Our Services

FEASIBILITY STUDIES:
Technical and economic surveys, comparative cost evaluations and recommendations into various methods of resolving a problem. Preparation of project reports.

DESIGN:
Design of air-conditioning, electrical , extra low voltage, lighting, plumbing & drainage systems.

CONTRACT:
Preparation of specification, functional and layout drawings for tender action.

DOCUMENTATION:
Preparation of Bills of Quantities as required.

COST CONTROL:
Budget estimating. Evaluation of Tenders. Valuation of Variations. Certification of interim payments and final accounts.

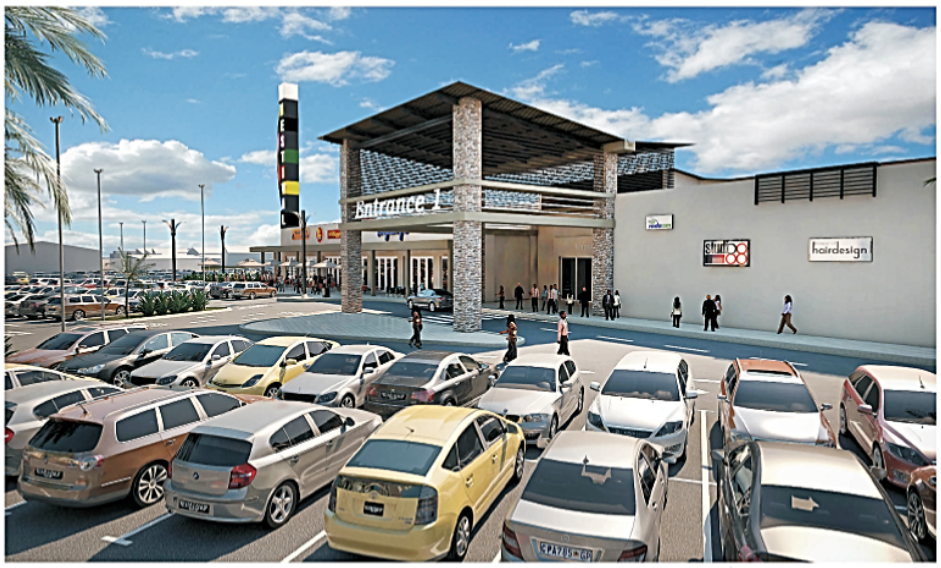
TROUBLE SHOOTING:
Investigation, reporting and recommendations on faults or lack of performance, on Mechanical and Electrical systems.

ADVISORY SERVICE:
The company advises on refurbishment and remedial works and provides supervisory site staff as required. The company is completely independent of any manufacturing, supply or construction company and its advice is completely professional and unbiased in anyway.

About Us
For the past 28 years, CA Consultants Limited, an ISO 9001:2008 Certified, Mechanical, Electrical and Piping consulting engineering firm has completed more than 155 projects for diverse clients between 2000 - 2015.

We appreciate your comments, suggestions and recommendations , please send them to any of our addresses above.

ON-GOING PROJECT



On-going Festival Mall Project at Festac, Lagos

Festival Mall is located in the Golden Tulip Hotel premises, Festac with a total building floor area of about 13,000m^2. The Mall includes a Cinema with four view halls, a Food Court and Retail Shops.

CA Consultants Limited have been engaged to provide the Mechanical HVAC, Electrical and Plumbing Engineering Services for the entire complex. The Design Development of the Electrical, HVAC and Plumbing of the Anchor tenant, was carried out by others.

The fire fighting system for the whole Mall, which was fully designed and supervised by CA Consultants Limited include Sprinklers, Fire hose reel, Fire hand appliances and external Fire Hydrants.

In view of the electrical load requirement, the Complex is fed at 11kV by an Independent Power Provider. Due to the requirement of the Anchor Tenant, additional standby power provision has been made for this Tenant.
A Central Audio System has also been provided. This is linked to the Fire Alarm System to ensure voice alert in emergency situations.

Water supply is from the existing water storage on site while a new Sewage Treatment Plant is being provided strictly for the Mall.

A variety of HVAC systems are being installed to suit the requirement of the various sections of the Mall. Air curtains are provided at the main entrances to the Mall to minimise the infiltration of air from outside into the cooled space of the Mall.

The Mall is schedule for official opening in September, 2015.

Quality Policy

" To be trusted advisers in Building Engineering System and Infrastructure who satisfy customers' expectations through active customer listening, deployment of highly competent and motivated workforce, use of advance technology, nurturing of long term mutually beneficial customer relationship and the continual improvement of our Quality Management System while complying with applicable national & international statutes and regulations".