



*protecting
people,
building &
environment*

PGF Insulation Sdn. Bhd. (228905-M)

Penang Factory

2449, Lorong Perusahaan Sepuluh
Kawasan Perusahaan Perai
13600 Perai, Penang, Malaysia
T +604 390 8460
F +604 399 6197

www.polyglass.com.my
www.ecowool.com.my



KL Office

46-2, Block D, Zenith Corporate Park
Jalan SS7/26, 47301 Petaling Jaya
Selangor Darul Ehsan, Malaysia
T +603 7886 0074
F +603 7886 0077

info@polyglass.com.my
info@ecowool.com.my



Fire-Safety



Sustainability



Thermal Comfort



Energy Efficiency



Sound Comfort



Lightweight

your ideal partner in sustainable insulation material

PGF Insulation has been providing fire safety, thermal and acoustic solutions in the Asia-Pacific with a range of environmentally sustainable products that can make your home, office or factory more comfortable and energy efficient. We are committed to providing the Earth with a better and greener tomorrow by putting a stop to climate change. Whatever it is, you will find that we offer quality insulation materials that suit your need. This is coupled with our first class manufacturing facility which manufactures glass mineral wool insulation by using 80% of recycled glass as a substitute for silica sand. This plant uses advanced technology to ensure that the production of a superior insulation material which allows us to offer a wide range of high quality products meets the needs of the residential, commercial, HVAC and industrial sectors.

A subsidiary of Poly Glass Fibre (M) Berhad, PGF Insulation constantly continues to offer the latest high grade insulation materials by means of new innovative products, production line expansion and development. Over the years, our highly trained and experienced team with world class manufacturing skills are ever ready in helping you and your projects with the insulation needs.

Moving towards sustainable insulation materials which contribute towards energy conservation and reduction of carbon emission is a social challenge that entails adjustments in individual lifestyles.

Lets join our hands together to shape a greener pasture for our future. Together with PGF Insulation, we can insulate for a better future.

Fong Wern Sheng

Executive Chairman

Poly Glass Fibre (M) Bhd.

Poly Glass Fibre Group

POLY
GLASS
FIBRE™
Insulation




Total Commitment Results in Excellence

PGF Insulation specializes in design & manufacture of formaldehyde free glass mineral wool for fire safety, thermal and acoustic insulations. With production site and sales office in Malaysia, the subsidiary of Poly Glass Fibre (M) Berhad ranks among the top glass mineral wool manufacturers in Asia. Since 1984, PGF Insulation has consistently demonstrated its ability to invent products that improve quality of life. As one of the top mineral wool insulation manufacturer in Asia, PGF Insulation continues to deploy its technological know-how, often in partnership with the most prestigious and reputable organisation in the industry.

Being one of the industry leader in the mineral wool insulation, PGF Insulation offer solutions to the major challenges of energy efficiency and environmental protection. No matter what new needs emerge in the construction industry, PGF Insulation will be proud to extend our insulation experience and expertise to you.

Specializes in design and manufacture of formaldehyde free glass mineral wool for fire safety, thermal and acoustic insulations



Global Presence

PGF Insulation has manifested its product by its global presence. PGF Insulation is the largest glass mineral wool insulation manufacturer in South East Asia with a closely woven distribution network. Regional distribution offices with trained design and specification division provide comprehensive service for the planning and implementation of high-quality system solutions. Our specifiers give advice concerning the overall and detailed planning for building physics and energy efficiency, with examples for thermal insulation calculations. Tendering texts, work sheets as well as detailed drawings can be obtained for all PGF Insulation application areas. The people involved in the construction industry are supported with general building supervision approvals, test certificates, technical reports, installation instructions and references.



Sustainable Production

Sustainability is becoming more important and the demand for sustainable products with low environmental impact continues to grow. The question of how to choose the right insulating material can only be answered by the right approach:

- Does the insulating material address both Safety and Sustainability?
- Does it contribute to positive Energy and Emission values?
- Does it possess an above average life span (compared to other insulating materials)?
- Does the insulating material sustain its properties over time ?

PGF Insulation offers a high end glass mineral wool insulation material which earns an excellent rating in its overall performance assessment. Therefore, the unique combination of physical characteristics, which provide safety, durability, sustainability, and long term economic benefits, making PGF Insulation glass mineral wool the preferred insulating material for the construction industry.

PGF Insulation produces high end superior quality insulation material for the construction industry. The insulation is manufactured primarily from more than 80% of recycled glass cullet to replace silica sand in our manufacturing process. With the recycling of glass, PGF Insulation makes an important ecological contribution.



Recycled glasses are all that is required to produce PGF Insulation glass mineral wool insulation. At PGF Insulation, more than 80% of recycled glass cullet are used to replace silica sand which otherwise will be sent to landfill. The recycled glass cullet melted at 1,450 °C to form a lava like molten glass. The molten glass produced is converted into fibres by rotary process that combines a centrifugal drawing of the glass through a rotating device drilled with thousands of tiny holes and attenuated by high temperature gas jet streams

Benefits of Insulation

Thermal Insulation

Insulation is an essential building component as it offers excellent thermal insulation property, enhancing the quality of life, fitness for purpose and performance of buildings in which it is installed. Insulation incorporated into walls, ceilings and roofs makes a significant contribution to a building's long-term energy performance by resisting heat flow. Heat is a form of energy, it always seeks a cooler area flowing outward in winter and inward in summer.

All building materials used in a wall, ceiling and roof increase the thermal resistance to a certain extent; however glass mineral wool is the most efficient at adding thermal resistance because of their low thermal conductivity. Heat flow through a building element can occur through conduction, convection or radiation. By reducing heat flow, a properly insulated building increases overall occupant comfort while maintaining lower energy costs.

PGF Insulation glass mineral wool is fast to install and performs for the life of a building with no need for ongoing maintenance.

Acoustic Insulation

Acoustic design and requirements are becoming increasingly stringent. By far the most effective, durable and economical method for controlling noise is to install glass mineral wool products in an area where noise control is required. Be it cinema, auditorium, meeting room or office, glass mineral wool could be applied on ceiling or wall to reduce the sound reverberation and noise. In addition, when installed in wall cavity, sound transmission from one room to another could be reduced significantly.

Buildings need to be incorporated with noise control measures covering both sound insulation and sound absorption not only to meet building regulation requirements, but also health and safety regulations. The sound absorption characteristics of glass mineral wool make it ideal for acoustic treatment to comply with sound insulation regulation requirements.

PGF Insulation glass mineral wool has excellent acoustic absorption characteristics. It is used in carefully specified constructions with good detailing to contribute towards a conducive environment.

Hygrothermal Behaviour

PGF Insulation glass mineral wool is a waterproof (non hydrophilic) and non capillary insulation material. This means that it does neither take in nor transmits the humidity.

The water vapour permeable insulations will be more useful when they are placed in the outer face of a wall partition. When they are placed on the inner face of the partition, a vapour barrier must be jointed in order to avoid the formation of condensation at the contact of insulation to the partition.

In order to minimise potential condensation problems in attics, floors, and walls, three things need to occur:

- Sufficient ventilation to reduce excessive water vapour build-up within the home.
- Ventilation of building sections so that excessive water vapour is dissipated to the outdoor air.
- Use of vapour retarders to limit water vapour transmission into building cavities.

PGF Insulation factory laminated vapour retarder attached to our glass mineral wool insulation products decrease the possibility of moisture vapour condensing to water within the structure.

Fire Protection

Often after fire incident, heated discussions are often ignited about responsibility and protection against fires. The question of insulation materials also often plays a central role.

PGF Insulation glass mineral wool products is non combustible and has excellent resistance to fire. The glass mineral wool insulation by PGF Insulation as classified Class '0' by BOMBA can be used in a wide range of partitions, walls, ceilings and other building structures. It also has excellent resistance to the surface spread of flame and fire propagation complying to BS 476. Many of our products are classified Class '0' to the Building Regulations.

PGF Insulation glass mineral wool insulation are superior in both reaction and resistance to fire. Reaction to fire tests are used to evaluate the

contribution of a material to fire growth. Tests are carried out according to BS 476. On the other hand, building structures have to provide a certain amount of fire resistance. In the event of fire, the structural strength will be compromised. Therefore, PGF Insulation will be the alternative material to be paired with the building structures in order to retain the structural strength. The level of fire resistance provided is dependent on the complete system being installed in accordance with our instructions.

PGF Insulation can contribute conclusively to fire protection. PGF glass mineral wool insulation is not only absolutely non-combustible, but also develops no black smoke or toxic gases.



Applications

Residential Application



Home insulation is an essential step in making your home a comfortable place for you and your family.

A well insulated home will provide the highest level of fire safety, thermal and acoustic performance for building occupants to achieve the optimum level of indoor comfort deserved. It is not just about comfort, our glass mineral wool insulation will add value to your home, as well as make it more energy efficient.

Whether you want to reduce your energy bills, retrofit your current home or build a new home, PGF Insulation shares your goals of creating a comfortable, healthy and energy efficient indoor environment. To achieve those goals, the products you choose do make a difference.

We offer a complete line of formaldehyde free glass mineral wool for home insulation. These insulation products are available in the form of blankets, batts, boards and loose fill catering to the various needs and designs of the residential buildings. They deliver superior fire safety, thermal and acoustical performance you expect as well as promote improved indoor air quality and the healthier and safer home you want by reducing your overall exposure to formaldehyde.

Due to the unique and superior characteristics of PGF Insulation glass mineral wool, it is a preferred insulation material in the residential industry.

Industrial Application



Using PGF Insulation glass mineral wool insulation to insulate industrial applications can save thousands of times amount of energy that is actually used to produce PGF Insulation products. This makes us a key contributor in reducing heat lost and energy consumption for various industrial applications. Applications such as industrial pipes, boilers, ovens and other industrial machineries place very high demand on insulation systems. As they operate at high temperatures, the main purpose of the insulation system is to prevent heat lost or gain as well as personnel protection from skin burns, which can occur at temperatures above 60°C. Adding to our collection of unbeatable glass mineral wool insulation, PGF Insulation offers Sectional Pipe Insulation to be used for hot and cold air, water, and steam pipelines. PGF Insulation glass mineral wool insulation withstands high operating temperature and is suitable for use with service temperature up to 350°C.

A well designed insulation considerably reduces energy usage, protects personnel and CO₂ emissions, helping to increase of the overall efficiency of the insulated item or system.



Commercial & Mechanical Application

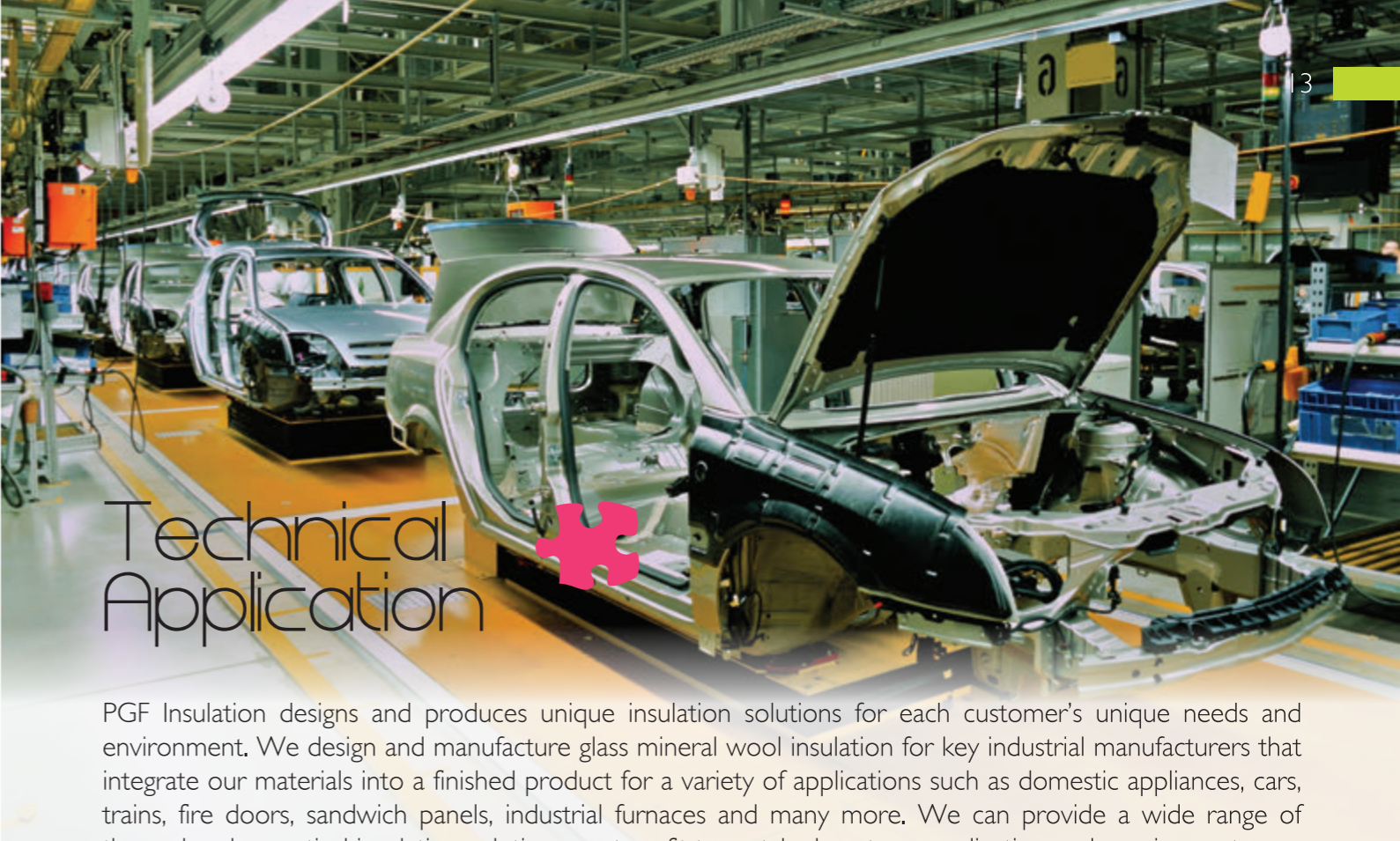
Commercial application insulation is the most important factor for a building owner when it comes to energy efficiency, heat conservation and saving money. The term 'commercial' refers to many different projects including hotels, hospitals, commercial buildings, schools and many more. Commercial applications require good and reliable insulation for all the same reasons as any other applications. PGF Insulation glass mineral wool has been designed to provide fire safety, superior thermal and acoustic control for this application. We provide for a competitive, high performance thermal and acoustic treatment for partitions, wall assemblies, roofs as well as ceilings which provides a range of thermal resistance value up to R4.0 and acoustic ratings up to NRC1.00. These product ranges are made available in the form of panels, blankets, batts, boards and loose fill insulation.

Comfort will be the primary concern in designing HVAC installation and it is undeniable that it is the main reason for installing an HVAC system in a building. In this application, comfort refers to temperature, humidity, air replenishment and noise levels etc. These then need to be regulated to deliver the perception of comfort to the user. Ultimately, this comfort has to be achieved with the rational and efficient use of energy.

PGF Insulation provides a full range of products for thermal and acoustic insulation of HVAC ducts and pipes. Developed to meet the needs of the installer and building user, PGF Insulation HVAC products are designed for different building characteristics and uses. The insulation products will significantly improve thermal and acoustic comfort as well as maximising energy savings and contributing to a safer working and living environment.

Our pre-insulated duct work systems are designed to enable ducts to be constructed in a single operation, without the need for metal ductwork. The glass mineral wool duct board provides built-in thermal insulation and sound absorption, so there is no need for further insulation to be added once the duct is fabricated.

PGF Insulation glass mineral wool insulation not only delivers comfort in the building but it also ensures reduction in energy consumption and superior acoustic performance. We take great pride in offering an extensive range of products for the commercial and mechanical application at unbeatable pricing.



Technical Application

PGF Insulation designs and produces unique insulation solutions for each customer's unique needs and environment. We design and manufacture glass mineral wool insulation for key industrial manufacturers that integrate our materials into a finished product for a variety of applications such as domestic appliances, cars, trains, fire doors, sandwich panels, industrial furnaces and many more. We can provide a wide range of thermal and acoustical insulation solutions, custom fit to match almost any application and requirement.

Shipbuilding

Lightweight insulation board and blankets for the shipbuilding industry. PGF Insulation glass mineral wool is not only an excellent insulator, it also offers weight reduction in comparison with other conventional mineral insulation of the same thermal and acoustic performance. These non-combustible glass mineral wool products provide excellent thermal and acoustical insulation as well as a higher degree of fire safety on marine vessels. PGF Insulation offers perfect insulation solutions for the shipbuilding industry. They improve safety, help to reduce unwanted noise and maintain comfortable working temperatures within the vessels.

Appliances

A wide range of insulation products are carefully designed for major appliances such as ovens, water heaters, washers and refrigerators. In addition to absorbing sound within a particular frequency range, the insulation manufactured also prevents thermal transfer. These insulation products are made available in a full selection of sizes, densities and forms for various types of appliances. They can also be specially fabricated to make final assembly quicker and easier to solve critical thermal and acoustic needs.

High Energy Efficiency Devices

Vacuum Insulated Panels (VIP) are made available for high energy efficiency devices like refrigerators, cooled boxes, refrigerated trucks and containers. VIP is developed to provide better insulation that has high thermal resistance which can be used in a limited space. These insulation panels are available in various sizes to suit the need of high energy efficiency devices.

Automotive

Glass mineral wool helps to reduce the transmission of noise and heat in a wide range of automobile applications including passenger car, buses, transit cabins, train cabins and other automobiles. These products are available in a variety of forms including loose wool, pre-molded shapes, boards and plain rolls for various automotive applications.

Others

PGF Insulation products are also offered for other technical applications such as thermal solar collectors, sound barriers and fire protection doors. Our specialised high performance glass mineral wool are found in a wide range of technical applications and is the ultimate solution for your fire resistance, non-combustibility, thermal and acoustic insulation requirements.





our Products

ECOWOOL is a specifically designed new generation glass mineral wool for fire safety, thermal and acoustical insulation. The high performance glass mineral wool acts as a highly effective barrier to heat flow, provides excellent acoustic treatment and is a non-combustible insulation. It ensures building occupants the optimum level of indoor comfort and safety deserved.

BROWNIE®, the formaldehyde free range of ECOWOOL glass mineral wool insulation manufactured by PGF insulation employs formaldehyde free binder that is free of formaldehyde, phenol or any other artificial chemicals.

BROWNIE™ BLANKET

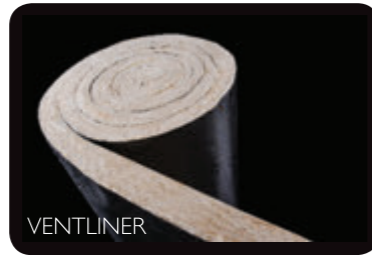
The insulation blanket acts as a highly effective barrier to sound transmission and heat flow, keeping your building cool and at the desired interior sound levels. BROWNIE® range of blankets is available either in plain or faced with Foil-Scrim-Kraft (FSK), woven glass fabric or white polypropylene facings.



BROWNIE® Blanket



BROWNIE® Roofwhite



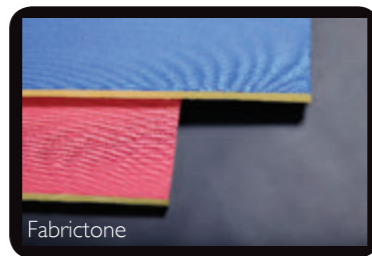
VENTLINER



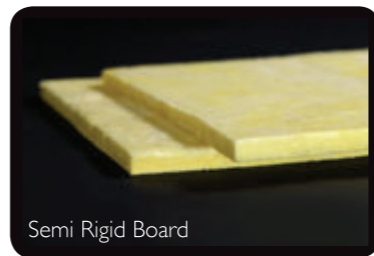
BROWNIE® Vapourshield

ECOWOOL BOARD

A series of semi rigid or rigid thermal, fire safety and acoustical glass mineral wool boards. Specifically designed to provide superior insulation performance when installed in glass, metal or stone spandrel systems or in fabricated metal pans. ECOWOOL range of boards are available either in plain or faced with decorative woven fabric, black or white glass tissue, woven glass fabric or Foil-Scrim-Kraft (FSK) facings.



Fabrictone



Semi Rigid Board

SMARTDUCT – PRE-INSULATED DUCT WORK SYSTEM

A high density glass mineral wool based composite material designed to meet specific requirements in the HVAC equipment industry. It is laminated with woven glass fabric as internal lining and aluminium glass cloth as external lining.

ECOWOOL ACOUSTIC CEILING PANEL

An aesthetical and decorative suspended ceiling system, specially designed for selective and distinctive applications, where acoustical (sound) control is crucial and paramount. ECOWOOL acoustic ceiling panels include most edge designs and 4 different finishes.



CLASSICTONE™



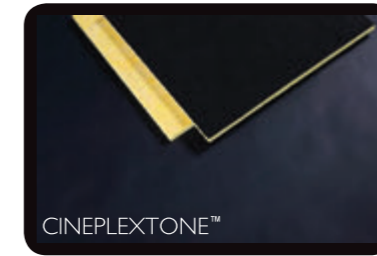
CLASSICTONE™ Coated Edges



CLASSICTONE™ Recessed Edges



POLYTONE™



CINEPLEXTONE™



BROWNIE® Batts

BROWNIE® BATTS

Lightweight thermal and acoustical glass mineral wool insulation made of fine, longer and evenly distributed fibre network coupled with optimum fibre diameter. BROWNIE® range of batts is available in plain form.



ECOWOOL SPI

ECOWOOL SPI

Manufactured from rigid glass mineral wool pre-moulded into one-piece cylindrical sections. ECOWOOL range of sectional pipe is available either in plain or faced with Foil-Scrim-Kraft (FSK), foil reinforced kraft paper, Sisalation foil or kraftless foil.

FIB Insulation Unique Product Properties

Smaller fibre diameter

Optimal fibre diameter ranging from 4 - 5 microns produces more air pockets which enables the insulation to provide a better and enhanced performance.

Better fibre network

Fine, longer and evenly distributed fibre network helps in creating better tensile strength allowing the insulation to demonstrate superior durability, flexibility and feeling much softer.

Less dusty and less itchy

Specifically engineered to produce a comfortable and less dusty insulation. The insulation creates a pleasant work experience by reducing the tingling feeling during installation.

Environmentally friendly

Free from CFCs, HCFCs and any other materials with ozone depletion potential in its manufacture and content and poses no known threat to the environment.

Durable

The performance is further enhanced by the ability of the glass mineral wool to resist damage from shrinking, swelling, rot and other forms of potential deterioration, thus, ensuring that the insulation value (R-Value) is maintained.

Absorbs disturbing sound

Exceptional sound-absorbing properties.

Mould growth

Does not encourage growth of mould, fungus, bacteria or rodents.

Corrosiveness

Chemically inert. Will not cause or accelerate corrosion of steel, stainless steel, copper or aluminum due to its specific inorganic and mineral composition.

Alkalinity

pH9.

Dimensionally stable

Dimensionally stable under varying conditions of temperature and humidity if applied correctly.

Exceptional vapour retarder

Faced with factory laminated facing material offers low permeance properties that provides excellent vapour sealing. Properly installed glass mineral wool insulation with foil faced will help to minimise concerns with concealed condensation.

Non-combustible

Due to its non-combustible raw material content, ECOWOOL reaches a reaction to fire classification of Bomba Class '0' and BS 476, Part 4, 6 and 7 which is the highest level a building material can achieve.

Condensation control

The combination of the glass mineral wool and the impermeable foil facing prevents the warm moist air reaching the roof surface, significantly reducing the possibility of condensation problems.



Accreditation

Our new generation of glass mineral wool is the result of twenty six years of intensive research and development in the insulation industry. As a part of our continuous improvement effort, it is our on-going desire to provide our customers with innovative and high end insulation products which also meet the growing industry demand for more sustainable construction materials.

Strict controls guarantee a level of quality on which the construction industry can rely on. All of our glass mineral wool are approved by the construction industry's appropriate regulatory authorities and carry the Green Building Certified mark. They are manufactured in Malaysia at the cutting edge manufacturing facility strictly governed by our quality management division. Being certified to ISO 9001, are the guarantee of our commitment to offer constant high standard of quality glass mineral wool insulation for the construction industry. Therefore, PGF Insulation is proud to boast that our products are of prime quality.

We Are Environmental Friendly



Recycled symbol indicates that our glass wool is manufactured using more than 80% of recycled glass



AS / NZS 4859.1:2002 | D No 2962
Australian / New Zealand Standards



Intertek
Rgn No : Q813188



MS ISO/IEC 17021:2011
QS 10082001 CB 02



Certified to : MS 1202 : 2012
BS 476 : PART 6 : 1989+A1 : 2009
BS 476 : PART 7 : 1987
Certification No : PC001273



MADE IN MALAYSIA



Energy Efficiency

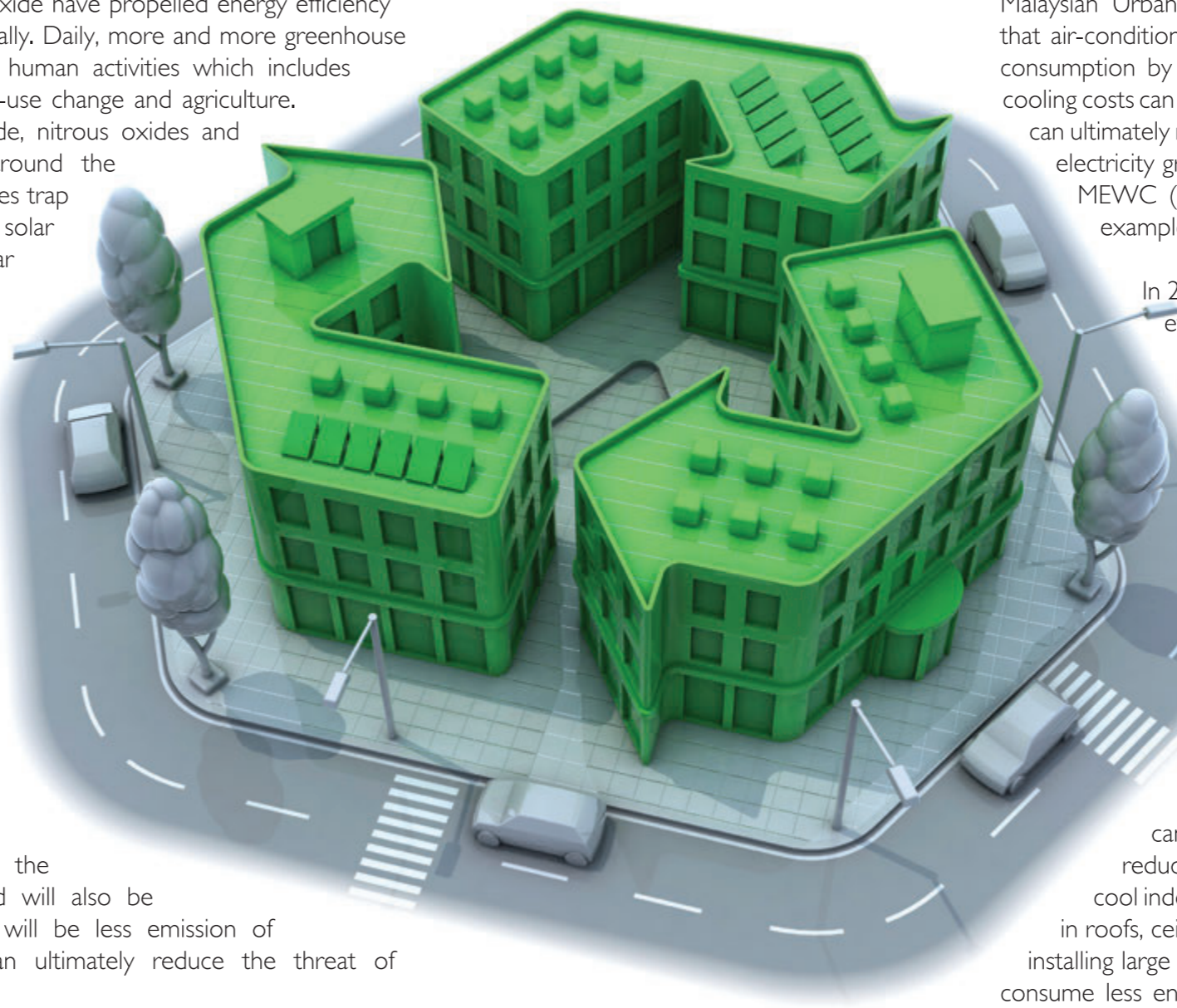
your ultimate solution for low energy building

Soaring energy prices and concern about climate change from man-made emissions of carbon dioxide have propelled energy efficiency to the top of the agenda globally. Daily, more and more greenhouse gases are generated through human activities which includes the burning of fossil fuel, land-use change and agriculture.

Gasses such as carbon dioxide, nitrous oxides and methane, form a blanket around the earth's atmosphere. These gases trap and reflect the re-radiated solar energy from the sun, similar to the greenhouse effect of letting the sunshine in but stopping the heat from escaping. Over time, this causes an increase in the overall temperature of the earth, known as global warming. Climate change is the direct result of global warming, affecting people's health, changes in food and water supplies, melting of glaciers which cause coastal flooding, interruption of ocean's ecosystems and severe droughts in various places.

If less energy is consumed, the amount of fossil fuel burned will also be reduced. As a result, there will be less emission of greenhouse gasses which can ultimately reduce the threat of global warming.

In various researches and reports in Europe and North America, building has been identified as one of the big energy wasters, accounting for about 40% of energy used mainly for heating and cooling. With increasing global economic and social growth, the world's energy consumption



is expected to soar. Of this energy, 86% is being fueled by dwindling, non-sustainable natural sources that further add to man-made carbon dioxide pollution.

In hot tropical climates like Malaysia, the use of air-conditioners contributes greatly to energy costs. A study done by CEDTEM (Centre for Environment, Technology & Development Malaysia) in 2006 for Malaysian Urban Household Energy Consumption Patterns showed that air-condition and fan accounts for 35% of the average electricity consumption by residential end users. This means that reducing the cooling costs can have a significant impact on energy consumption, which can ultimately reduce the strain of fossil fuel supplies and the country's electricity grid demand. The LEO (Low Energy Office) building of MEWC (Ministry of Energy, Water & Communications) is an example of where up to 50% energy costs can be reduced.

In 2006, the Energy Commission acting chairman said that even at a low demand rate of 4.7% a year, Malaysia's energy consumption by 2020 would reach 74.1 million tonnes of oil which is 10 times the amount used in 1980. He believes that this will inevitably cause constraints on the nation's ability to meet future energy needs, unless energy-efficiency measures are taken.

LESS ENERGY CONSUMPTION, LESS CO₂ EMISSION

The potential for energy savings through technologies that is affordable and well proven already exists in Malaysia today. Insulation is one of the best and simplest solutions to reduce energy consumption of a building. Good insulation can minimise heat penetration into the building, thereby reducing energy required to cool it down and maintaining a cool indoor temperature. Insulation in buildings is mainly applied in roofs, ceilings, walls, internal partitions and floors. So, instead of installing large and expensive air-conditioners, only small models that consume less energy are needed. In some cases, the number of air-conditioners used can also be reduced.

INEFFICIENT BUILDINGS ARE BIG ENERGY WASTERS, SO INSULATE MORE.

éc@wool

PGF Insulation believes that the use of PGF Insulation products is an effective choice when seeking to achieve certification under green building rating systems.



Our pride, Your Glory

A reference project database has been developed to exhibit PGF Insulation's outstanding projects across the world. We are proud to present some of our key achievements that demonstrate our capabilities to contribute to high performing constructions. This special focus made on high-performance and prestigious projects show with real cases the added-value of our glass mineral wool insulation and increase visibility amongst our customers, architects, press and other partners.

You can find this database on the corporate website.