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News Review

PE100+ Association

Building and Construction Communiqué

Article





Plastics – building a sustainable future

GOVERNMENTS AND businesses are increasingly aware of the need to act responsibly and protect our world for future generations. This is crystallised in the drive for 'sustainable development' – acting in a way that does not limit the range of environmental, economic, and social options available in the future. This drive towards a more sustainable future is reflected in the many contributions made by plastics in the building and construction industry.

From roof to cellar, plastics play a vital role in creating more sustainable buildings. For example, it is estimated that the energy required to produce plastics-based insulation foam for a typical house is saved after only one year of use. Carbon dioxide (CO₂) emissions in the same period are reduced by two to five times when compared with CO₂ emissions created in production. Over a 30-year lifespan, this figure rises by some 40 to 60 times compared with production for energy, and 10 to 40 times higher compared to production for CO₂ emissions.

But energy conservation is only one part of the equation. Other resources, including fresh water, are becoming increasingly scarce – currently more than one billion people lack access to safe drinking water. It is estimated that with current rates of population growth, one quarter of the world's population will suffer from chronic water shortages by 2015. In Europe alone, leakage from water systems is estimated to be 30 to 40 per cent, whereas worldwide the figure could be as high as 60 per cent.

These figures emphasise the urgent need for conservation and efficient use of existing resources. Across the globe, plastics are already providing working solutions to these problems. For example, in the US state of Arizona, plastics-based irrigation systems are helping

to increase water efficiency for agriculture by up to 95 per cent. In the Almería region of southern Spain, plastics-based irrigation systems, greenhouses and films have helped to boost horticultural output three-fold. In the developing world too, plastics, in the form of lightweight, flexible piping systems, reservoirs and tanks are helping to provide millions of people with access to clean water.

Whether used for insulation, piping or irrigation systems, plastics are at the heart of providing the answer to the continued drive towards sustainable development. For further information on plastics' contribution to sustainable development, contact APME for a copy of the report *Plastics: At Work for a Sustainable Future*.

The report is also available from APME's website at www.apme.org □



Così Fan Plastics

IN 1991, a fire destroyed many of the traditional features of the Petruzelli theatre in Bari, Italy. Listed as a national monument since 1954, the

theatre is now undergoing extensive renovation. An essential element of the reconstruction project is the insulation of the roof with 600 m² of

polyurethane panels. These were selected for their superior performance in keeping the summer heat out and the winter internal heat in.

Architect Piero Masini, director of the project, explains: "In a hot climate such as Bari's, it is important that the temperature inside the theatre is kept cool. These plastics panels are the ideal material because they provide the demanding insulative qualities required for a building of this size. They are crucial to maintaining a comfortable temperature inside the theatre while keeping our energy bills in winter low." The success of the Bari project emphasises the inherent versatility and cost benefits of plastics and underlines the huge range of architectural solutions they can provide. □

Plastics pipes – serving geothermal heating

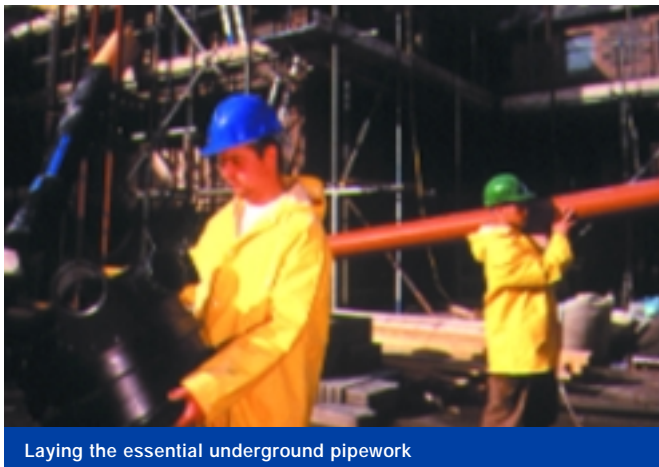
WHETHER ENABLING the safe transport of clean water to homes and businesses, or providing the means for transporting natural resources like gas, plastics are the material of choice in a range of pipe applications.

Growing awareness of the need for more environmentally friendly energy is fuelling demand for geothermal heating and the plastics pipes which bring this to consumers.

Geothermal heating takes advantage of the near-constant temperature found underground, even at shallow depths.

Consisting of an indoor heat pump and a buried pipe network, the system typically involves over 150m of plastics pipes. In winter, a pump transfers hot water from the geothermal underground wells to a building and in summer removes heat from the building, dissipating this into the ground.

In applications involving the distribution of water or gas, plastics are an ideal material due to their durability, and inherent abrasion-resistance and resistance to chemicals. Indeed, trials involving a range of different materials show plastics to be advantageous in terms of cost, tensile strength, and corrosion resistance. With geothermal heating systems' potential to save up to 40% on heating bills and 20% lower maintenance costs compared with conventional systems, the choice for consumers is clear, creating ever greater opportunities for plastics growth in this market. □



Laying the essential underground pipework



PVC pipes ready for recycling

PVC recycling – closing the loop

IN 1990, the Dutch Federation of Manufacturers of Plastic Piping Systems (FKS), developed a recovery infrastructure in The Netherlands to address environmental concerns over PVC piping. The scheme provides a viable alternative to incineration or landfill. Since the scheme was established, the volume of plastics pipes recycled by FKS has increased by over 290 per cent. FKS aims to maximise recycling of all Dutch pipe waste (approximately 5 000 tonnes/year) up to 100 per cent by the end of 2003.

A lifecycle analysis of recycled PVC pipes in comparison with alternative materials, showed PVC to be advantageous over concrete and clay in energy use, air pollution and waste volume. The study, co-funded by FKS, concluded that co-extruded recycled PVC pipes had a comparable environmental profile to traditional concrete and clay pipes.

The scheme is currently among the most advanced of its type operating in Europe. Discarded PVC pipes are sorted and reduced to a granulate form. The material is heat treated and used for the co-extrusion of non-pressure sewerage pipe. The pipe has external compact layers of virgin PVC, while the intermediate layer consists of regenerated material. In this way, the scheme permits extension of the existing life cycle of discarded PVC pipes, effectively creating a 'closed loop' from initial fabrication through collection and recycling to end of useful life.

Although FKS currently recycles only PVC pipes, the organisation also collects polypropylene and polyethylene pipes, with the anticipation of extending the recycling programme to incorporate other types of plastics in the future. □

HDPE gets new standard bearer

A NEW association to promote high standards in both the manufacture and safe use of High Density Polyethylene (HDPE) in all pipe applications has been launched. The PE100+ Association, formed by three of the leading polyethylene manufacturers uses the proposed future European standard as a reference.

The Association has already produced a list of required benchmark parameters, which exceed the requirements of the future standard, against which pipe materials are tested. The emphasis is on creep rupture strength, stress cracking

resistance and resistance to rapid crack propagation.

Organised through the testing authority, Gastec, all tests are subject to independent laboratory verification. Materials which pass the tests, carried out every seven months, are added to a list intended to encourage manufacturers to make continual improvements to their products.

TEPPFA, the European plastics and fittings association is also actively promoting standards in pipes. Comprised of a number of major European pipe manufacturers and national plastics

associations, TEPPFA is working closely with the technical committee of the European Commission on the formulation of future European standards for pipes, and are actively involved in drafting future international standards (ISO) in this area.

More information about the PE100+ Association is available from:

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