

Thermal and Moisture Protection

This category outlines technologies that could be applied to thermal or moisture protection in homes to keep people more comfortable and protect the building from the elements.

Technology Scanning

One of PATH's major research support services is Technology Scanning. *Technology Scanning* tells us about technology developments in other industries, from other nations, from federal laboratories, and from other building sectors. PATH looks for breakthroughs in other industries that could be transferred and applied to housing. *Technology Scanning*-published by the U.S. Department of Housing and Urban Development/PATH and prepared by Newport Partners LLC-is updated as technology developments dictate.

This issue of *Technology Scanning* is one in a series. Each issue in the series falls into one of the following categories:

- Design and Internet Tools
- Safety
- Surfaces and Interior Finishes
- Building Envelope Technologies
- Heating, Ventilating, and Air Conditioning
- Energy/Power Systems Generation
- Basic Materials
- Information Technology
- Thermal and Moisture Protection
- Indoor Environmental Quality

For other available Technology Scanning issues, log onto www.pathnet.org.



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Electro-Osmotic De-Moisturizing (EODM) Technology

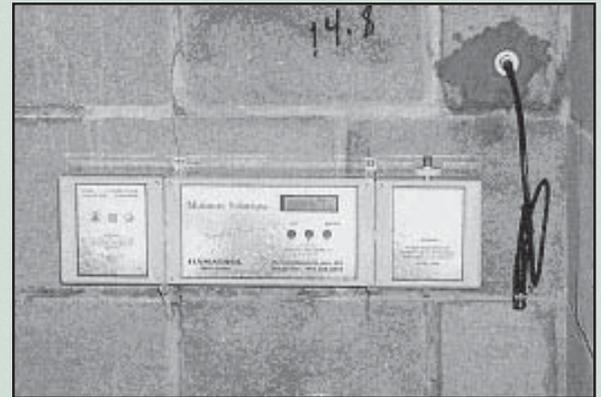
EODM technology provides a low-energy method of moving moisture through soils. Moisture Solutions L.L.C. claims to use this technology to prevent moisture in the ground from entering a structure through sub-grade concrete and masonry structures. As a result, mold, mildew, and related odors, and other indoor air quality problems can be reduced or eliminated. The method has been used for 15 years in Europe and demonstrated by the U.S. Army on a limited basis. EODM takes advantage of the electrical properties of the earth, water and concrete to impede the intrusion of ground moisture. It sets up a virtual electronic shield around a building to keep moisture out. The system does not employ chemicals and is minimally invasive. It generates energy levels far below those of a cellphone or cordless phone.

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Remote Freeze and Water Alarm System

Control Products distributes a plug-in alarm system that can be used to remotely monitor temperatures in critical locations. When the temperature drops below 45 degrees the



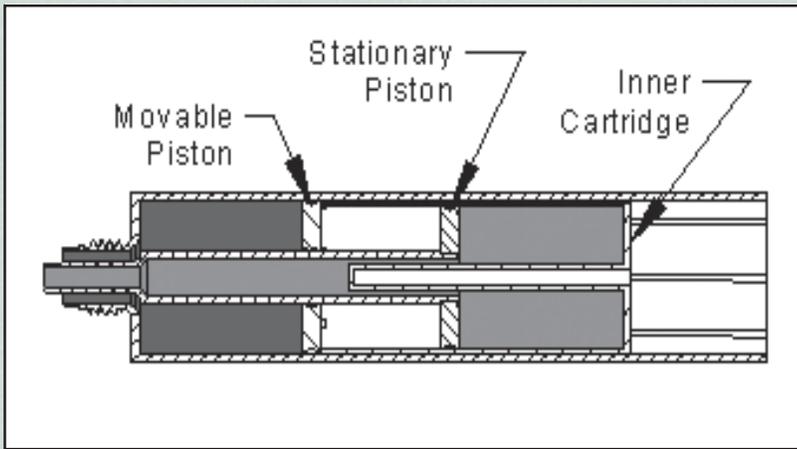
Moisture Solutions Control Unit (EODM)

Courtesy Photo: Moisture Solutions LLC

Freeze Alarm System calls out to another telephone and plays a prerecorded message (MSRP \$104). An upgrade model calls up to three numbers (MSRP \$210). A remotely controlled switch can be used to turn on a heater in a crawl space during a cold spell, control the HVAC in a vacation home or cabin, or simply function as an alarm system. The Water Alarm is an add-on that is designed to detect water on floors.

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Courtesy: TAH Industries

Two-Part Universal Sealant Cartridge

Two-Part Universal Sealant Cartridge

Use of two-part caulks or sealants has always been limited because of the need for mixing and metering of the individual components. A new product now opens up many more durable sealants to the industry by eliminating the need for special mixing or applicator tools. The two-component cartridge is designed to fit into a conventional caulk gun. The design will make it much more practical to use two-part sealants including many urethane products. TAH Industries has developed the TAHplus Universal Cartridge to deliver two-part sealants using a standard 1/10 gallon single component caulking gun. The cartridge will hold 250 ml in a 1:1 ratio of each component. This allows it to hold an equivalent amount to a single component adhesive. Other similar products designed to fit into a conventional caulk gun are only applicable to high ratios that are not mix sensitive, require adaptor tools, or have much smaller capacities. The TAHplus provides accurate metering at the 1:1 ratio. A cartridge for 2:1 ratio components is also under development.

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Construction Drying Systems

Munters provides a desiccant-based construction drying system. The technology addresses construction site moisture problems with dehumidification, instead of relying on propane heaters or the building's A/C system. Munters' dehumidifiers continuously replace humid air inside the building with air which has been dehumidified. This extremely dry air accelerates moisture removal from wet surfaces, such as from flooring, walls, stored building materials, etc. Munters provides a turnkey moisture reduction and management process for the builder during critical construction phases. Munters provides a desiccant dehumidifier to the job site and temporary ductwork to run throughout the construction project. The system shows promise for reducing moisture or mold-related problems.

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Formed-In-Place Gasketing Systems

Gaskets are critical components that must perform under extremely difficult conditions. They often are the last line of resistance between interior and exterior, hot and cold, or wet and dry. What is more, they must be absolutely reliable and have the longest possible service lives. Wacker Silicones has developed a series of technologies called formed-in-place gaskets (FIPG), compressive or "cured-in-place" gaskets (CIPG), and liquid-injected seals (LIS). The automotives and electronics sectors both include highly specialized applications that make extreme demands on the sealing materials used. They include engine gaskets, control unit gaskets, electronic encapsulation and special elements for decoupling noise and vibrations. The Wacker technology injects silicones into these products to create the gasket. Potential applications in the building industry are window and door installations, as well as any product or material that penetrates the building envelope.

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Portable Infrared Thermal Imaging Systems

Infrared thermal imaging systems are now more portable, powerful, and accurate than ever. Handheld units for on-site inspections have efficient firewire connecting ports with supporting software. High performance units, such as the TVS-8500 by CMC Electronics Cincinnati, display critical temperatures on the built-in 5" liquid crystal screen. High fidelity images are acquired at 120 frames per second over a temperature range of -40 degrees C to 900 degrees C with options to extend beyond 2000 degrees C. More portable units for specific industrial applications are available from FLIR Systems through its ThermaCAM E-Series. Infrared systems can help to identify loose connections, roofing leaks, predict sources of future malfunctions, detect corroded connectors, verify proper corrective maintenance, find faulty fuse connections, or discover insulator defects. Some of the portable units have the ability to store data for later viewing and analysis on a computer. Builders or remodelers could use the technology to verify the house's thermal protection system.

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Prefabricated Drainage Systems

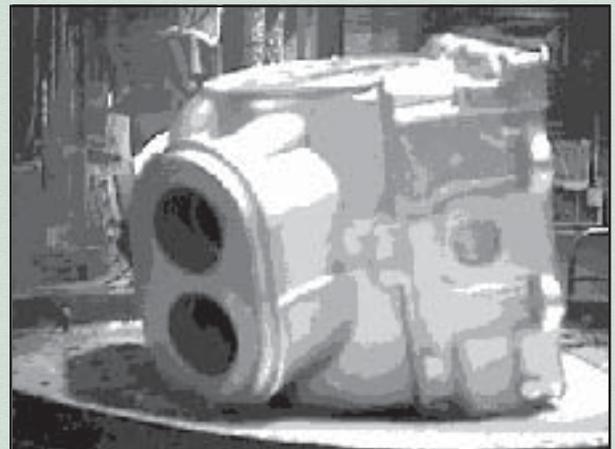
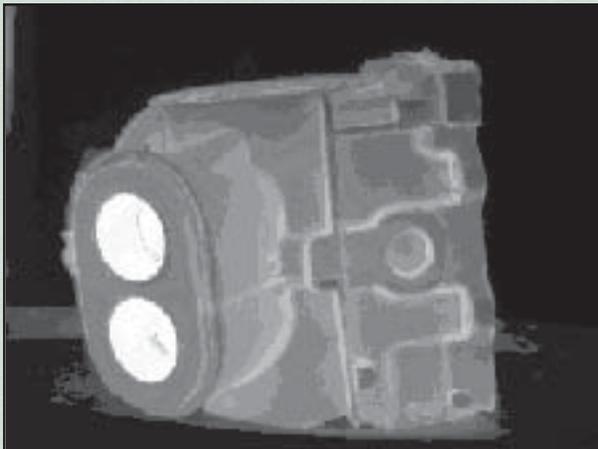
EZflow produces prefabricated drainage systems designed specifically to replace stone aggregate systems in a variety of applications. The aggregate used in EZflow Drains is recycled expanded polystyrene (EPS) - the same material commonly used for drink cups and packaging. Non-degradable EPS is light in weight.

The basic unit of EZflow Drain is a 10-foot length of 4-inch perforated, corrugated plastic pipe surrounded by EPS aggregate held in place by a

cylindrical shaped polyethylene netting either 6, 10, or 12 inches in diameter. EZflow Drain systems replace stone aggregate subsurface drains in such applications as foundation drains, embankment drains, retaining walls, road underdrains, vertical drains, and perimeter drains. They are also used in septic systems.

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Infrared images of cooling process in Engine Block Molding.