



Inside:

- TECTITE™ Version 2 Offers New Zone Testing Features For APT Users
- TECTITE 30 Day Demo Available From Our Website
- The Energy Conservatory is Moving September 1999
- New Marketing and Sales Manager
- Tech Tip: Using The Duct Blaster® to Measure Total System Flow
- Trade Shows
- Accessories

Engineered For Life Program Changes The Way Houses Are Built

Over the past 30 years, there has been a significant change in the way houses are built. Walk down any new development under construction and it is commonplace to see the use of housewraps, tight fitting exterior sheathings, air/vapor barriers, energy efficient wall assemblies and even the installation of mechanical ventilation systems. While a few years ago many of these products were used by only a few custom builders, they are now steadily becoming an integral part of standard new construction practice.

Many forces have been at work to change construction practice including evolving consumer demands and a better understanding of the mechanics of building performance. In addition, private sector, utility, and government sponsored new construction programs, such as the EPA's Energy Star and DOE's Building America program, have provided much needed support. A new program from cellulose manufacturer Greenstone Industries, called Engineered For Life, is attempting to advance new construction practice even further by changing the housing construction process from a loosely associated group of contractors to a systems oriented building science crew.

Engineered For Life (EFL) is a performance based program that has incorporated many of the "best practices" from research and demonstration programs across the country. EFL draws heavily from the DOE Building America program which has demonstrated how building science and value engineering concepts can be used to develop practical techniques to build affordable, durable, comfortable, healthy, and energy efficient houses. The EFL program utilizes a team of experts including Building Science Corporation (BSC), which provides the technical expertise on plan design and review. Training and certification of builders and contractors around the country is conducted by Advanced Energy Corporation (AEC).

The performance specifications for EFL are rigorous but obtainable. The entry level of EFL is the Silver level which requires proper insulation installation, continuous mechanical ventilation, combustion appliances that are sealed or power vented, and airtight duct work which is verified by a duct leakage test. To achieve the next level, Gold, plan review is mandatory and house airtightness testing is added to the Silver level requirements. The highest level, Platinum includes all of the previous specifications and requires that the duct work be inside the conditioned space as well as a more stringent building envelope airtightness specification.

⇒ Duct Testing

(Continued on page 2)



The Energy Conservatory
5158 Bloomington Avenue South
Minneapolis, MN 55417
(612) 827-1117
Fax (612) 827-1051
www.energyconservatory.com
info@energyconservatory.com

(Continued from page 1)

The duct testing standard employed for all levels limits total duct leakage (leakage to inside as well as outside measured in CFM at 25 Pascals pressure) to less than 3% of the square footage served by each unit, or less than 5% of the fan flow at high speed. Either standard can be used because they provide very similar airtightness levels if the air handler unit is sized properly. For example, if a finished house has 2,126 square feet of livable space, the duct work can not leak more than just 63 CFM as measured with a Duct Blaster®. If in that same house the fan unit is rated for 1,200 CFM, the total leakage can not exceed 60 CFM.

⇒ House Testing

For the Gold level, house airtightness is introduced. The airtightness rating is conducted using a Minneapolis Blower Door™ and is based on the envelope area of the house. Brad Townsend of Greenstone Industries describes the envelope as “that location of floor, wall and ceiling where the air barrier and thermal barrier are aligned.” If our same 2,126 sq. ft house had an envelope area of approximately 4,500 sq. ft, the house can not leak more than .35 CFM50 per livable square foot of house, or 1,575 CFM50 as measured with a Blower Door. The airtightness testing standard is more stringent at the Platinum level where .25 CFM50 per livable square foot is the maximum leakage rate. This would reduce the leakage from 1,575 CFM50 to 1,125 CFM50, a nearly 29% tighter house.

⇒ Comfort Guarantee and Energy Savings

According to Rick Davenport of Greenstone, “the goal of EFL is a comfort guarantee. The EFL program is more of a systems orientation than an energy orientation.” The EFL program incorporates cost shifting which allows the builder to spend less on the appliances and more on the building envelope to achieve total energy reductions while ensuring that the house will be comfortable all year long. There is further versatility built into the program because of the various levels of the program. Rick said that “we would like have all builders at the Silver level and that over time the builders will move themselves up to the Gold and Platinum Level.” Houses that achieve the Gold and Platinum level are also designated as an EPA Energy Star Home.

One obvious result of the EFL program is energy savings. Brad Townsend of Greenstone shared two examples of energy numbers for houses in Las Vegas. House One in Las Vegas is 2,126 sq. ft and has a guaranteed average

energy bill, to heat and cool the house, of only \$47 per month. House Two has 3,000 sq. ft and has a guaranteed average energy bill of only \$41 per month. The total program provides for not only an energy efficient house but the real value, a comfortable house. It is estimated that these same houses built without the EFL program would have an average energy bill of \$250 to \$300 per month.

⇒ Results

The results so far show a program that is building in momentum. BSC has reviewed approximately 300 home plans. AEC has had approximately 125 people through their 5 day training program which leads to designation of Master Certifier for the EFL program. A Master Certifier is the third party person that inspects the house, tests and designates the level achieved by the builder. Each Master Certifier places his seal and number on the final inspection report. AEC has conducted training in Las Vegas, Chicago, Atlanta, Raleigh, NC, Richmond, VA, and Phoenix with more scheduled for the future. The primary contractors attending the sessions have been insulators, but with a healthy mix of HVAC contractors and drywallers. Frank Vigil of AEC reports that “attendees range from novices to advanced but all are thinking about the house as a system and are interested in how their specialty can make a better house.” Rick Davenport says that about 350 homes have the energy guarantee provided with the Gold and Platinum levels. But he estimates that there are probably thousands of units that have been built using the EFL process because once a plan has been reviewed, any number of actual homes can be built.

Presently, Pulte has been the first big name builder to utilize the EFL program on a large scale. According to Rick Davenport, the Las Vegas market for Pulte is the most mature. Recently, Pulte announced that all of its homes in Las Vegas for 1999 will be built to the EFL program standards. For Pulte that means 1,000 homes or more. There are about 8 to 9 markets around the country that are at different levels of maturity with Tucson, Phoenix, and Denver close behind the level of Las Vegas. In Las Vegas 3 out of 4 major builders are utilizing EFL. Other major builders that made commitments to EFL include US Homes and Centex.

The EFL program is one of the most prominent examples of incorporating performance testing of comfort, safety and energy efficiency into the construction process. The strength of the EFL program can be summed up by Joe Lstiburek of BSC when he said “it is literally a win, win, win, win, win for every one.”

TECTITE™ Version 2 Offers New Zone Pressure Testing Features For APT Users

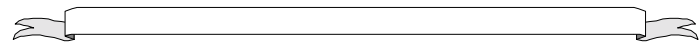
TECTITE Version 2 is now available!! After months of development the latest version of our Airtightness Testing Software is shipping. The TECTITE program makes it easier than ever to enter, analyze, and store Minneapolis Blower Door test data. The program's built-in report generator and graphing capabilities make it simple for you to document and present Blower Door test results to a homeowner or client. For those with lap-top computers, this program can be brought right to the job site. Among many of the improvements are improved reporting features that allow you to add your logo to the reports for a more professional look.

TECTITE can also be used with the Automated Performance Testing (APT) System to fully automate airtightness testing and data analysis. During an automated test, TECTITE works with the APT System to control the speed of the blower door fan while simultaneously collecting and storing building pressure and fan flow readings. TECTITE even includes a "cruise control" feature which allows the APT system to maintain a constant building pressure while the operator performs additional diagnostic or air sealing activities.

One of the more powerful features added to TECTITE is the ability to read and record zone pressures during a blower door test. This feature is very useful in diagnosing the location and size of air leaks through attached

zones, e.g. attics, crawlspaces, and garages. It can also be used to find hidden leaks and connections in commercial and multi tenant buildings.

Call 612-827-1117 for more information or visit our website at www.energyconservatory.com.



TECTITE 30 Day Demo

TECTITE Test Analysis Software for your Blower Door is available as a 30 day demonstration program. The Demo program is a fully functioning version of TECTITE that allows you to try it for 30 days.

Want to try TECTITE today? Download the demo version from our website at www.energyconservatory.com. The file is approximately 1.1 megabytes in size. Download time using a 28k baud dial-up connection will take about 10 minutes.

If you wish to purchase the program and receive hardcopy documentation and unlimited personal use, call us and we will send the full version out. The full version costs \$150. Those that have registered copies of TECTITE Version 1 can upgrade for a cost of \$50.



The Energy Conservatory is Moving

- On September 27th 1999, The Energy Conservatory will be moving to 2801 21st Avenue South, Suite 160, in Minneapolis, MN 55407. Our telephone number, fax number and website address will remain the same.
- The new headquarters for TEC will be in a building owned and operated by The Green Institute. The facility uses the latest technology for energy savings and natural lighting, as well as reclaimed and recycled products for building materials. This new facility will provide TEC with the necessary additional space to continue on our mission to provide leading products to our customers.
- Watch the mail for more information on our brand new facility.

New Marketing and Sales Manager

The Energy Conservatory has added a Marketing and Sales Manager to help implement programs to reach current and new customers. Frank Spevak comes to TEC with over 20 years experience selling to and working with contractors, engineers and various users of test instrumentation. Frank worked for Alnor Instrument Company for 14 years and most recently worked for TSI Incorporated. He has held similar positions with each company and hopes to provide continued excellence in products and services along with a desire to grow TEC. Frank can be reached at TEC by telephone or send a message to fspevak@energyconservatory.com.

Tech Tip: Using The Duct Blaster® To Measure Total System Flow

The Duct Blaster has many uses beyond measuring the leakage rate of ducts. One use is to measure the total system flow through the air handler. Because incorrect air flow has been found to contribute to poor system performance and increased equipment failures, accurately measuring total system airflow is a critical diagnostic procedure.

Refer to the detailed instructions for this procedure in the Duct Blaster Operation Manual before starting a test. Begin by placing a static pressure probe in the supply plenum a few feet from the main supply trunk. Turn on the air handler and measure the normal operating duct pressure with respect to the house. Turn off the air handler and keep the static pressure probe in place. We now need to install the Duct Blaster so that all the return airflow through the system is redirected through the Duct Blaster fan. This is done by first opening the air handler access panel and sealing off the return side of the duct system from the air handler cabinet with cardboard and tape. Now seal an additional piece of cardboard with a 10” diameter hole cut in it to the access panel opening, and tape the Duct Blaster’s square transition piece to the cardboard, directly over the hole.

Turn on the air handler fan. Now turn on the Duct Blaster fan and adjust the fan speed until the measured duct pressure (using the static pressure probe) is equal to the normal operating duct pressure measured above. At this point determine the airflow through Duct Blaster fan and you now have your estimate of total system airflow including flow through return registers, plus return leakage, plus leakage at the air handler access panel.

Accessories, Accessories, Accessories

Function and versatility are embodied in the use of the proper accessories. For example, the APT system along with a Minneapolis Blower Door is a very useful diagnostic tool for determining the airtightness of houses. But when you add a CO₂ sensor, Temperature sensor, Relative Humidity sensor and CO sensor to the APT, you now have an Indoor Air Quality investigation system. The CO₂ sensor provides you information on activity in the room or house and how it relates to the ventilation system and can also help diagnose spillage and backdrafting of combustion appliances. Temperature and Relative Humidity provide comfort zone information. CO provides safety detection for combustion appliances. Call us to add accessories to your diagnostic tool kit.

The Energy Conservatory On The Road

We recently had a very successful trade show, Affordable Comfort 99, where we introduced TECTITE 2. We will be exhibiting at other shows in the coming months where you will have a chance to talk to us in person and see some of the other products we offer.

- ComforTech - Baltimore, MD - September 15 to 18
- JLC Live West - Las Vegas - October 22 to 23
- The Builder’s Show - Dallas - January 14 to 17, 2000

PRSRT STD
 U.S. Postage
 PAID
 Minneapolis, MN
 Permit No. 1194

5158 BLOOMINGTON AVENUE SOUTH, MINNEAPOLIS, MN 55417

The ENERGY CONSERVATORY

