Because of the energy shortage and the expected continuation of the situation, tremendous emphasis has developed in recent years on insulation, both against heat and cold. With rising fuel costs, it becomes extremely important that occupancies which depend upon heat and air-conditioning be properly treated. The best way to conserve energy and to lessen the amount of fuel required is to properly insulate these locations. The situation is not a good one since experts indicate that nine out of ten American homeowners live in houses which waste energy through inadequate insulation.

Most dictionaries describe insulation as isolation or placing in a detached state. Therefore, an insulator is a material that is a non-conductor and isolates the exposed face from the source of heat or refrigeration. In all new construction, currently there are indicated thicknesses of insulation which will provide excellent results and cut down on the consumption of fuel. However, there is an infinite amount of work still available for reinsulating, or as is known, retrofitting, existing locations. This is currently being done in several fashions, all of which are available to be done by the contractor who normally installs or treats walls and ceilings.

History

Historically, insulation materials began to be manufactured in quantity about the early 1920's and used basic materials available at that time. A lot of these were organics and were the best materials then available for the purpose of insulation. These materials were made of animal hair, cork and wood pulp. As time went on and mineral wool began to be produced, the insulation materials took additional forms. These were later embellished by the use of fibrous glass materials. Also used was macerated pulp, treated to render it non-combustible, and sprayable materials, which could be either of the pulp type or of the completely mineral and noncombustible type.

Originally, this latter material had a high asbestos content, since the asbestos fibres knit together very well and formed an excellent and strong blanket of material to

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offer the utmost in insulation and at the same time provide a fire retardant material. However, in recent years there has been an outcry against the use of asbestos because of its occupational hazard and several years ago the use of asbestos fibre in these materials was banned. Consequently, all of this type of material currently on the market is made of mineral fibres of various sorts and mineral binders. They meet the requirements of EPA and OSHA as well as providing excellent thermal insulation.

Typical Uses

In the field of rolled or blanket insulation, the material comes in the forms of batts of specific size and specific thickness or rolls of fibrous glass materials. The blanket and batt type is best installed into the walls and roof areas of buildings as they are constructed.

Where material has to be blown into walls or into attic spaces for additional insulation, the loose fill materials, either mineral wool or fibrous glass or cellulose, are generally used. Very substantial improvements are afforded when additional materials are applied over existing insulated areas, such as attic floors, walls, etc.

There are also pourable materials which can be used in attics and also in wall cavities where they are accessible. These are mainly the mineral wool, fibre glass or expanded vermiculite or perlite materials. The use of this type of materials over existing insulation is also extremely effective.

In addition, cavities can be treated by blowing in urea-formaldehyde, which expands and fills the cavity completely, thus affording proper insulation.

There are many instances in metal buildings or other occupied commercial areas where the best way to treat the surfaces is to spary to the interior surfaces. This gives a completely homogenous blanket which goes across the walls, purlins, supporting steel and roof areas. There are, consequently, no possible air leaks to form condensation and they also afford excellent acoustical value at the same time.

All of the methods and materials discussed above have been widely used and are completely satisfactory to obtain the required results. Since each situation presents a different problem, it is well that we have so many materials available which can do the job in any particular situation.

While we now appreciate the fact that we have been somewhat negligent in the use of proper insulation materials to contain heat or cold and to minimize the use of power, we never really appreciated how much we lost through waste and how much we could save through proper use of the energy conservation systems available today and which consists of the insulation methods outlined above.

There is available a good bank of data which has been publicized in many publications recently regarding the energy consumption in the United States. According to those media, the United States last year consumed approximately 38.3 million barrels of oil per day. Of that amount a substantial quantity was wasted due to inefficiency and improperly insulated buildings. About one-third of that amount or approximately 12 million barrels per day are lost without any benefit to its users. The question becomes, what can insulation bring about? Even without improving products available today through research and using the currently available products, which I have indicated are rather substantial in number and type, we can save a large percentage.

It has been indicated that in housing alone we can recover approximately 55% of the heat lost, which amounts to about 1.75 million barrels per day. Based upon the same figures we could save approximately 9.2 million barrels of oil per day by simply using in proper thickness the insulations now available.