A "MULTI-FUNCTIONAL MATERIAL"

In recent years prefabricated housing’s percentage share of annual housing starts has been steadily increasing. Consequently, the number of prefabricated housing suppliers and manufacturers has also steadily increased. However, it would be dangerous to take this rate of growth from the past few years and project it as forecasts for the future of the prefabricated housing industry as the scale of this recent growth has been based on the many great technical advancements which have occurred in the field during the past few years. For example, housing manufacturers have recently moved from standard frame to panel-type construction, and even more recently, from small modular panels to large ones. Thus, the industry is now at a stage where, if more growth is to take place, the suppliers and manufacturers must again advance their building technology and systems. Recently the basic approach to the evaluation and development of materials has radically changed so that, today, we are seeing the potentials and capabilities of various materials in combination being explored. The Misawa Homes Institute of Research and Development, in connection with several other research institutes, has recently been devoting a great deal of time and effort to the development of new materials in order to further the state of the entire prefabrication industry. As a result of this program, Misawa Homes is now introducing a new multi-functional material for practical use in the housing industry.

Our industry always places importance on the development of new construction materials, because they can make two important contributions to the industry: one direct and the other indirect. New materials always have the possibility of making direct contributions to the curtailment of production costs. At the same time, they also have the potential of helping engineers to think of new possibilities in structural patterns, architectural techniques or systems engineering. Improvements or innovations in these fields are indispensable for the engineering which is always striving towards the standardization of a varied range of merchandise. Most of the construction materials now available are products that were invented or developed to suit the needs of contractors who were, and continue to be, primarily concerned with eradicating buildings which are as unique as possible, within any given set of circumstances.

However, in the case of prefabricated housing, since the industrial process is continuous and highly controlled, the supply of houses can be constant and of a uniformly high quality. At present, construction of most private houses depends largely on the expertise and experience of the men who are actually constructing them. Consequently, the quality of these houses has to be what individual contractors can furnish within their scope of experience and expertise.
開発のねらいと過程

(1) 多数の機能をもつ複合材料であるここと

(2) 複合材料であることを

(3) 図表を示す

(4) その他

開発のねらいと過程

(1) MAT-X-2の特性

(2) 多数の機能をもつ複合材料であるここと

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THE DEVELOPMENT GOALS

(1) To develop a "multi-functional material" which is composed of various kinds of materials

(2) To increase productivity

(3) MULTI-FUNCTIONAL MATERIAL DEVELOPMENT PROCESS AND GOALS

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今後の展開

新しい材料の開発は、材料そのものを直接対象とすると、いろいろな面で非効率的な面が出きます。そこで私共は材料開発を新構造、工法、システムなどの全体の中でとらえ、最後の目標を住宅の大半コストダウンに置く開発の一環として進めていきたいと考えています。したがって、材料のコスト評価にしても、単に材料の重量単価のみではなく、今後の住宅機能や、施工上のプロセスなどを加えたトータルなコスト評価が可能で、つまり住宅としての最終ユーザーの考え方をもって、目標設定がなされる必要があり、その内で工場生産住宅の開発・生産・流通のシステムが着実に発展していることが開発する好環境になっています。新たに今後の展開を考えてみると、現在では多機能素材のテーマのもとに、複合材料という形で、実験の可能性への見通しを得る段階であり、積極的に開発費を投じて、更に改良を加え、初期の目標に到達させる予定です。

住宅の場合、新築資本の開発に長い期間と大きなる費用が必要とします。自動車や家電製品等と異なり、住宅はそれ自身、はるかに長寿命が要求されること、住性能は四季を通じた評価が必要であること、気候、風土等による立地条件が多様であること、などの複雑な要因をたくさん持つ製品だけに、充分な検討なしだしに商品化することを怠まねばなりません。

多機能素材の把握から始めて、過去5年間材料設計を中心として進めてきた研究を今後は、明日の住宅としての新しい構造、工法、生産方式等に寄与させ、総合的、研究し5年後には実用化したいと考えています。材料独自の要因として、コストの低減、品質の安定化、性能の改善と併行し、実際住宅として多層住宅の建設による実大規模の実験研究があります。すでに計画から実施に移されており間もなく新らしい結果が得られる予定です。

多機能素材の研究は、非常に多くの専門分野にまたがっており、その意味で大学をはじめ、各業種の民間業界研究機関等のご支援に負うところが多く、今後の研究の積極化に伴い、なお一層のご協力をお願い申し上げます次第です。  

FUTURE DEVELOPMENT

We have been working on the theme of a "multi-functional material," and have now succeeded in the production of a compound material which satisfies our aims. We are now prepared to invest more money in this project in order to improve the quality of the compound material.

Development of new prefabricated housing involves huge investment and a long span of time. Compared with automobiles or household electric appliances, prefabricated housing must have a longer life, must withstand more effectively the changes in seasons, and must meet a wider variety of locational conditions. A manufacturer is required to carefully examine all these complicated factors before going into production.

In our case, we started from the concept of "multi-functional material" and have spent the last five years in research into appropriate designs for this multi-functional material. We shall spend another five years looking for a system to produce the material in a factory, while the same time seeking a way to adapt the material to the requirements of modern systems of construction.

At the end of our new five-year program, we hope to be able to manufacture this multi-functional material.

Low cost, uniform quality and excellent performance are requirements for any commercial product. In the case of materials required for prefabricated housing, there is also the requirement that the materials must function properly in high rise structures which are becoming increasingly common.

The materials, in this connection, must be tested in life-size prototypes. These tests are already being carried on by our research institutes with some results expected to be obtained shortly.

In any event, the study of multi-functional material requires knowledge of a variety of specialized fields, and we owe various universities and research institutes of commercial enterprises much for their cooperation and assistance.

We need their continued assistance since our project is expected soon to reach a stage that requires diversified techniques.