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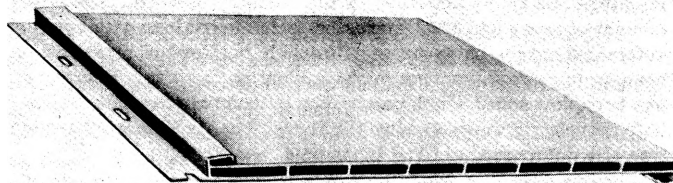
## ECONOMICAL HOUSING THROUGH THE USE OF EXTRUDED PLASTIC BUILDING PROFILES

by  
George E. Meyers\*

For the past 20 years, the use of rigid plastics in building profiles has grown extremely rapidly for use in the area of low cost modular housing. Much of the work and in fact, I would say, a major portion of the development of rigid PVC extruded profiles, was originated in Europe. Modular housing in itself was developed largely through European technology because of the need for quick, mass produced, low cost housing after World War II. Germany, Italy, and to a lesser degree, France and the Benelux countries, are all producing and using vast quantities of rigid PVC profiles in various aspects of housing. I would like to state, initially, that I hope the United States never has the incentive that the European nations did to develop new methods of producing building products. After World War II, Europe had lost almost 40% of private housing, and 60% of their industrial manufacturing capacity. In restoring housing and manufacturing capacity, new methods of construction had to be developed along with new materials and methods of fabricating these materials. Inasmuch as rigid PVC had been used since the 1930's, this was the logical material to fall back on as a general purpose building products source.



My studies during the past 20 years have shown that European technology has advanced much faster than U.S. technology in this area. During the past 5 years the U.S. plastics industry has been attempting to move ahead in the field of PVC extrusion and today many new roads have been made. PVC siding is probably the major single use of this material for the general purpose home and modular housing market, excluding rigid PVC pipe. Other uses now include baseboard moldings, PVC storm and prime windows, extruded panel board trim and moldings and interior wall paneling. The modular industry is now looking at, and developing, many new uses for rigid PVC extrusions such as electrical raceways, complete hollow interlocking wall sections, PVC core doors, baseboard moldings which may be used as conduit for electrical, telephone and other conductive wiring. The field for extruded profiles is virtually unlimited and one of the newer items now in the development stage is a series of hollow sections 2" x 10", 3" x 12", and 2" x 8". These sections will be extruded with a tongue-in-groove design so that they can be slipped into one another and used to construct load-bearing walls.



One of the reasons for the comparatively slow growth of extruded rigid PVC profiles in the market here in the U.S. has been the lack of rigid PVC extrusion technology, and also the fantastic amount of "old wives tales" that sprang up amongst custom extruders regarding rigid PVC. Even today, the average custom extrusion house will not entertain orders for rigid PVC profiles. Many misconceptions still exist: that the material degrades easily; chrome plated screws, dies and accessory equipment are a must; and that there is a constant danger of exposure to chlorine. Almost all of these misconceptions can be dismissed easily with the statement that they are completely untrue if the equipment being used by the processor has been designed specifically for use with PVC.

It is absolutely amazing to visit building shows and plastics expositions in foreign countries and see the tremendous uses to which extruded rigid PVC profiles are put. I venture to guess that most of the "under-developed countries" today are further ahead with their uses of PVC profiles than is the U.S. I have seen many intricate building systems composed of rigid PVC utilizing complete hollow wall sections with interlocking corners and accessory strips, all of which are utilized to construct a complete fabricated building.

Of course, the use of rigid PVC pipe for drain, waste and vent systems, as well as for pressurized water systems and electrical conduit is now increasing here in the United States at a tremendous rate. The art of extruding rigid PVC is gradually being turned into a science. It is this single fact that should account for an extremely rapid growth of the use of this material within the next few years.

We are now in the midst of a great housing shortage which threatens to worsen rapidly. The modular housing industry, which is now in its infancy, presents a fabulous potential market for rigid PVC extrusions. Of course, the major product to be extruded and used by the modular home market will be siding, next will come such items as gutters and down spouts, complete window and door frames, sliding windows complete with sliding sash systems, hollow baseboard moldings, hollow core wall sections for non-load building interior partitions, rigid wall coverings and extruded sections for use as furniture and interior furnishings such as shelving.

Intricate profiles such as mentioned above and illustrated here today are currently in use in such far off places as Greece, Israel, South Africa and many of the smaller countries of South America. If we here in the U.S. will only open our minds and accept some of the newer methods of extrusion technology, and at the same time adapt items produced overseas to our methods of assembly and production, it is my feeling that the use of extruded building profiles will see an enormous growth within a very short period of time.

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I predict that the rigid PVC and other rigid thermo plastic compound producers, together with manufacturers of extrusion equipment, will form alliances and possible even set up training schools in order that "inplant production" can be made economically feasible. I am sure that within a short time we will see sections as large as 2 and 3 feet wide, and possibly 2 to 3 inches thick, hollow and with tongue and groove ends, being extruded here in the U.S. Already systems for the extrusion of expanded rigid PVC foam to produce "synthetic wood" have been developed and are now for sale to manufacturers of homes and building components in order to produce all of the various types of interior moldings and trims now used by the industry in wood. The development of new rigid PVC extrusion technology along with complete automated extrusion systems will enable builders of mass low cost housing to extrude various profiles right on the site. Equipment has been developed which can be run by comparatively unskilled help thereby not only opening job areas, but also allowing production at a comparatively low labor cost.

I am sure that within a very short time we shall see the major resin producers offering many colors which will be recommended for exterior use. I am sure that we shall see the housing industry and the various building code departments accept rigid extruded plastics for what they are, ie. a new building material.

It is my opinion that the use of rigid building profiles, produced by automated extrusion systems, will grow extremely fast during the next decade and will be a major factor in the construction of low cost housing. These things will surely come to pass, and I hope, quickly.

#### ACKNOWLEDGMENT

This Paper was presented in conjunction with a series of sample profiles, photographs, literature obtained from foreign suppliers, and with a series of super 8mm movies. Photographs of extrusion systems and hollow wall siding were supplied by Extrudyne, Inc., Amityville, N.Y.