

# **CONSTRUCTION ADHESIVES: WHAT THE FUTURE HOLDS**

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New housing starts have maintained their number of builds in contrast to many other industry sectors. Estimates for 2002 are between 1.5 to 1.6 million units with single family units predicted at 1.27 million. This is the fifth straight year that single family units will have stayed between 1.23 to 1.30 units being built. Additionally, the medium size house today is 15% larger than that of ten years ago but now built on a lot approximately 11% smaller. These factors plus the expanding rehab and remodeling markets have pushed all types of construction adhesives usage to over \$1.4 billion annually.

Over the years there has been increasing use of adhesives and, in particular, construction mastics and foamed adhesives. Part of this growth resulted from constraints of lumber supplies, which in turn, initiated the gluing of sub-flooring to the joists. This construction technique has allowed for longer spans without increasing the depth of the joist. In more recent years, the shortage of longer sizes of wood has led to the development of various engineered wood laminated glued trusses for floor joists that are now finding increasing use. However, there are far more profound changes occurring in the emerging construction methods that are not be as apparent to the layman since the house exterior appearance shows no change.

Each of these emerging methods will result in an increase in adhesive usage. These methods are summarized in Table 1.

The constraints on lumber supplies and the cost of labor have helped to increase the diversity of building materials as well as building techniques. Both of these factors have taken away from the traditional all stick-built house and have lead to increase factory-built components and whole homes. The various building systems currently being used, and the approximate market share for each, are shown in Table 1 in the first two columns. The succeeding columns indicate the likely usage of an adhesive. The final column provides an approximation of adhesive usage for that type of build by considering only the sides, ceilings and roof, plus the average size house built by that system.



**Table 1**

**POTENTIAL ADHESIVE USAGE**

Side Walls, Ceiling & Roof

<b>Home Construction System</b>	<b>Percent Build</b>	<b>Drywall Side</b>	<b>Drywall Ceiling</b>	<b>Sheeting Side</b>	<b>Sheeting Roof</b>	<b>Side Component</b>	<b>Adhesive lbs/house</b>
Stick & Component	56%	few	no	few	no	no	5
Mobile Homes	15%	yes	yes	yes	no	no	100
Panelized Homes	13%	few	no	yes	no	no	35
Modular Homes	8%	yes	yes	yes	no	no	120
Foam Core Panels	3%	yes	yes	yes	yes	yes	65
Foam Block Concrete	2%	yes	no	no	no	yes	130
Steel Homes	2%	no	no	no	no	no	0
Log Homes	1%	no	no	no	no	yes	75
<b>TOTAL</b>	<b>100%</b>						

In reality, an all stick-built home is becoming a rarity as more factory-built components are finding increasing usage. This does not necessarily convert into increase adhesive usage, such is the case with roof trusses, but other components generally do use adhesives. Many of the production type builders now have their own factories producing wall units and roof trusses.

Much confusion exists in the term “manufactured housing” which is an explicit term specific to mobile homes only. This type of home must be built on a chassis, and secondly, they are built to HUD building codes. All other housing is built according to state and local building codes. Additionally, mobile homes generally have their own separate lending system and have a lower average square footage size (approximately 1200-1300 square feet) as compared to other average size homes of 2100 square feet.

These type of homes are most likely to be found in the south. Like other factory-built homes and components, these homes make use of adhesives to have a more rigid construction in order to maintain their integrity during shipping and moving.



Modular homes are factory-built and are transported as “three-dimensional” pieces to the construction site. Generally, two or more sections are combined to create both one and two story houses. In this type of construction, adhesives find use on all exterior sheeting for the sides as well as adhesives used on the drywalls for the walls and ceiling. The flooring, although not counted in the above Table, also is glued to the joists. These type of homes are most prevalent in the non-metropolitan areas.

The panelized home is a factory-built package of walls, roof trusses and other components that are assembled on site. The degree to which the components are assembled may vary but sidewalls generally have the exterior sheeting glued in place. This type of construction is popular among many builders. Foam core panels or structural insulated panels (SIP) are foam insulation sandwiched between oriented strand board (OSB) and OSB or drywall. The foamed polystyrene is laminated to the boards or, in some cases, polyurethane is injected between the panels. These panels are used for the exterior walls as well as the roof panels. An additional adhesive/caulk is used between the panels as well.

The foam block concrete is a rather new innovation and has been predicted by some to show a dramatic increase. This system utilizes a styrene foam building block that is hollow throughout its center and is interlocking with one another. The hollow core has plastic spacers that allow for the holding of rebar. The house basement walls as well as its sidewalls are constructed with these foam blocks and then concrete is pumped down through the center.

These styrene blocks are dot glued together plus the interior drywall is adhesive bonded to the styrene. On the exterior, brick or siding may be used similar to any other types of housing. Log homes use either a foamed gasket or a bead of construction mastic between each log. An eight-foot ceiling house generally has an average of 12 logs.

The trend towards factory-built housing, as well as the use of other construction systems will continue to increase the use of adhesives within the construction industry, allowing it to grow faster than GDP.



## **About The Author**



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