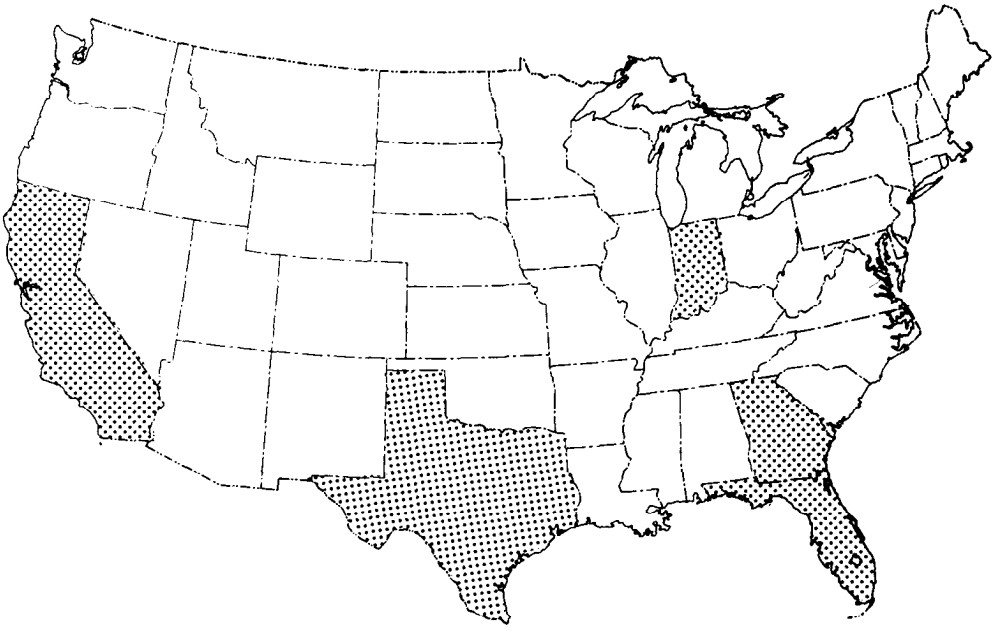
PANEL PRODUCT USAGE IN MOBILE HOME PRODUCTION IN THE TOP FIVE PRODUCING STATES AND IN THE UNITED STATES



RESOURCE REPORT FPL 3

FOREST PRODUCTS LABORATORY

FOREST SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE

MADISON, WISCONSIN 53705

1978

ABSTRACT

A survey of all mobile home plants In the United States showed considerable differences in the amounts of wood and gypsum panel products used In single-wide units as compared with increasingly popular and larger double-wides. Among the top five mobile home manufacturing states, rather sizable differences In panel product preferences were reported-especially between states In the Southeast as compared with states in the Midwest and far West. Major panel products used were softwood and hardwood plywood, hardboard, particleboard, insulation board and acoustical fiberboard, and gypsum board. Gypsum board has made significant penetration into the interior panel market, previously dominated by hardwood plywood.

A C K N O W L E D G M E N T S

The author thanks the staff of the Manufactured Housing Institute for their advice and assistance, as well as the many plant managers and other corporate officials who provided the data reported. The author also thanks Edward W. Whitehorn, Computer Specialist, Southeastern Forest Experiment Station, for his work on the computer program used to compile and analyze the data.

This study was initiated at the Southeastern Forest Experiment Station while the author was stationed at the Forestry Sciences Laboratory, Athens, Georgia.

PANEL PRODUCT USAGE IN MOBILE HOME PRODUCTION IN THE TOP FIVE PRODUCING STATES AND IN THE UNITED STATES

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INTRODUCTION

The mobile home industry is a major market for particleboard and hardwood plywood, and an important market for other woodbase panel products such as hardboard, insulation board, and acoustical fiberboard. Pending fire code legislation could make the mobile home industry a major market for gypsum board. To evaluate the demand by the mobile home industry for all panel products, the U.S. Department of Agriculture Forest Service recently conducted a nationwide survey of mobile home manufacturing plants to update previous estimates (1,2,4).[2/] This paper reports United States panel usage and compares panel preference differences among the top five mobile home producing states. Recent data about lumber use in mobile home manufacture has been published (3).

SURVEY DESIGN

The analysis is based on data obtained from a mall questionnaire with telephone follow-up. All mobile home manufacturing plants in the continental United States were contacted. Information was compiled from 178 responding plants which produced 29 percent of all mobile home units manufactured in 1974–the base year for the study. Individual state production in the top five mobile home manufacturing states represented by our respondents ranged from 9 percent of total mobile home production in Georgia to 31 percent in Texas. Total production and average size data as well as the percentages of different sizes and types manufactured are shown in Table 1.

[1] Maintained In Madison, Wis., In cooperation with the University of Wisconsin.

[2] Italicized numbers In parentheses refer to literature cited at the end of this report.

Table 1. Number, type, and size of mobile homes produced in the United States and in the top five manufacturing states, 1974.

Producing area	Number of units produced	Type and size of units [a]							
		Single-wides			Double-wides			Expandables	All other widths
		12-ft wide	14-ft wide	Av. floor area	24-ft wide	Other widths	Av. floor area	All widths	
		Pct	Pct	Ft^2	Pct	Pct	Ft^2	Pct	Pct
California	25,382	30	b/	712	65	4	1,368	d/	d/
Florida	24,038	43	b/	679	55	d/	1,271	1	d/
Georgia	30,925	77	b/	686 c/	21	d/	1,211	2	d/
Indiana	29,620	34	49	846	12	d/	1,199	4	d/
Texas	27,595	10	80	877	3	3	1,366	d/	4
Total U.S.	330,800	42	32	817 c/	22	2	1,340	1	1

a/ Data source: Mobile Homes Manufacturers Association *(6)*.
b/ Units 14 feet wide were not manufactured in this state due to restrictive highway transport legislation.
c/ Includes expandables.
d/ Less than one-half of one percent.

DEFINITIONS

The Bureau of Census *(7)* defines a mobile home as:

> ...a movable dwelling, 10 feet or more wide and 35 feet or more long, designed to be towed on its chassis, with transportation gear integral to the unit when it leaves the factory and without need of a permanent foundation. These mobile homes include double-wides, which are counted as single-units, and expandable mobile homes. Excluded are travel trailers and motor homes and modular housing.

A sing/e-wide mobile home is usually either 12 or 14 feet wide. Single-wide units are frequently referred to in terms of their width rather than length.

Double-wide mobile homes are made when each half of a specially built unit is joined lengthwise at the site to form a single unit. The chassis of each half is retained for possible future movement *(5).* Double-wides are commonly transported on the highway in half units 12 or 14 feet wide and are 24 or 28 feet in width when combined on site.

MOBILE HOME SIZE TRENDS

The questionnaire was specifically designed to compare panel product usage in single-wide mobile homes with that in double-wides. Double-wides now constitute approximately 25 percent of total United States production *(6).* Moreover, in such important manufacturing states as California and Florida, double-wides were the dominant type unit (Table 1).

Single-wides produced in California, Florida, and Georgia tended to be smaller in floor area than single-wides in other states because of restrictive highway transport regulations for "14-wides." For example, single-wides manufactured in Florida averaged much smaller in floor area than those from Texas-a state that produced mostly 14-wides. In 1974, 39 states permitted the transport of 14-wides on their highways (5). Florida and Georgia recently passed legislation permitting the movement of 14-wides on their highways. California is the only major mobile-home-producing state with legislation restricting the transport of 14-wides.

Softwood plywood use was primarily concentrated in double-wide manufacture (Table 2). Double-wides in California, Indiana, and Texas, on the average, used much more softwood plywood than double-wides manufactured in Florida and Georgia. Most of this softwood plywood was used for roof decking and ridge beams, where gable roof designs were used. The American Plywood Association has developed a ridge beam for gable roofs that has been widely adopted in double-wide mobile home construction. Plywood ridge beams fill a much-needed structural function where the two halves of the double-wide gable roof join each other.

Less softwood plywood was used in Florlda and Georgia because manufacturers had not yet begun to build many units with gable roofs as compared with the traditional flat metal roofs. Mobile homes with gable roofs look much like conventional housing units. This roof design trend seems to have begun in the West, as many housing design innovations do, and then moved eastward.

Table 2. Softwood plywood use in single- and double-wide mobile homes built in the United States and in the top five manufacturing states, 1974.

Producing Area	Softwood plywood use					
	Single-wides			Double-wides		
	Ft² use/unit		Use/ft² of living area	Ft² use/unit		Use/ft² of living area
	Surface measure[a/]	3/8-inch basis	Surface measure[a/]	Surface measure[a/]	3/8-inch basis	Surface measure[a/]
California	209	303	0.29	2,134	1,590	1.56
Florida	18	15	.03	333	479	.26
Georgia	36	28	.05	451	496	.37
Indiana	230	197	.27	1,150	1,230	.96
Texas	331	249	.38	1,593	1,746	1.19
Total U.S.	180	174	.22	1,108	1,258	.83

a/ All thicknesses.

Table 3. Hardboard use in single- and double-wide mobile homes built in the United States and in the top five manufacturing states, 1974.

Producing area	Hardboard use					
	Single-wides			Double-wides		
	Ft² use/unit		Use/ft² of living area	Ft² use/unit		Use/ft² of living area
	Surface measure[a/]	1/8-inch basis	Surface measure[a/]	Surface measure[a/]	1/8-inch basis	Surface measure[a/]
California	128	428	0.18	594	1,924	0.43
Florida	54	69	.08	153	263	.12
Georgia	90	122	.13	126	169	.10
Indiana	80	143	.09	837	1,556	.70
Texas	171	653	.19	656	2,744	.48
Total U.S.	107	275	.13	299	848	.22

a/ All thicknesses.

Hardboard is used extensively in double-wide units manufactured in California, Texas, and Indiana, but very little in Florida and Georgia (Table 3). In both California and Texas, but particularly in Texas, hardboard siding was used extensively in double-wides. This use of hardboard siding again reflects the efforts of manufacturers outside the Southeast to try to make their units look as much like conventional site-built houses as possible.

Particleboard was used in large volumes in both single- and double-wides with little variation in use per square foot of living area among the states (Table 4). Approximately 90 percent of the particleboard in single- and double-wides was used for floor decking while most of the remaining board was used in the manufacture of cabinets. Particleboard mobile home decking is manufactured according to specifications developed specifically for this use and is usually the only panel material installed over the floor joists. It has dominated the flooring market in mobile home construction since replacing softwood plywood as the preferred flooring material in the late 1960's.

Table 4. Particleboard use in single- and double-wide mobile homes built in the United States and in the top five manufacturing states, 1974.

Producing Area	Particleboard use					
	Single-wides			Double-wides		
	Ft^2 use/unit		Use/ft^2 of living area	Ft^2 use/unit		Use/ft^2 of living area
	Surface measure [a]	3/4-inch basis	Surface measure [a]	Surface measure [a]	3/4-inch basis	Surface measure [a]
California	835	634	1.17	1,575	1,270	1.15
Florida	737	647	1.09	1,244	1,051	.98
Georgia	779	664	1.14	1,368	1,161	1.13
Indiana	951	815	1.12	1,241	1,019	1.04
Texas	978	810	1.12	1,457	1,198	1.07
Total U.S.	918	757	1.12	1,433	1,179	1.07

a/ All thicknesses.

Table 5. Insulation board and acoustical fiberboard use in single- and double-wide mobile homes built in the United States and in the top five manufacturing states, 1974.

Producing area	Insulation board and acoustical fiberboard use					
	Single-wides			Double-wides		
	Ft^2 use/unit		Use/ft^2 of living area	Ft^2 use/unit		Use/ft^2 of living area
	Surface measure [a]	1/2-inch basis	Surface measure [a]	Surface measure [a]	1/2-inch basis	Surface measure [a]
California	720	719	1.01	1,848	1,765	1.35
Florida	797	747	1.17	1,044	1,039	.82
Georgia	287	237	.42	696	632	.57
Indiana	1,124	1,025	1.33	1,168	1,125	.97
Texas	468	481	.53	1,208	1,276	.88
Total U.S.	663	634	.81	1,412	1,375	1.05

a/ All thicknesses.

Insulation board and acoustical fiberboard was used in rather large quantities for both single- and double-wide construction in Calfiornia, Florida, and Indiana (Table 5). Units manufactured in Georgia used relatively small amounts of these materials, especially when compared with other states on the basis of use per square foot of living area (Table 5). In Georgia, gypsum board was often used as an alternate material. Approximately 90 percent of all insulation board and acoustical fiberboard reported was for ceilings with the remaining 10 percent for underfloor insulation board.

Hardwood plywood or gypsum board? Because of the requirements of new and/or revised building codes, and recent Industry initiatives, gypsum board is now used by many mobile home manufacturers in place of hardwood plywood interior paneling (Table 6). Manufacturers of gypsum board have mounted a strong technical and marketing effort which has been quite successful. Gypsum board has better flame spread resistance than standard hardwood plywood paneling-a fact highly advertised in the trade press as well as via several types of media which reach potential mobile home buyers.

Table 6. Gypsum board use in single- and double-wide mobile homes built in the United States and in the top five manufacturing states, 1974

Producing area	Gypsum board use					
	Single-wides			Double-wides		
	Ft^2 use/unit		Use/ft^2 of living area	Ft^2 use/unit		Use/ft^2 of living area
	Surface measure[a]	1/2-inch basis	Surface measure[a]	Surface measure[a]	1/2-inch basis	Surface measure[a]
California	[b]	[b]	[b]	62	27	0.05
Florida	163	108	0.24	272	194	.21
Georgia	719	538	1.05	514	321	.42
Indiana	263	177	.31	334	264	.28
Texas	682	483	.78	148	111	.11
Total U.S.	425	324	.52	201	149	.15

a/ All thicknesses.
b/ No gypsum board reported by respondents.

Table 7. Hardwood plywood use in single- and double-wide mobile homes built in the United States and in the top five manufacturing states, 1974

Producing area	Hardwood plywood use					
	Single-wides			Double-wides		
	Ft^2 use/unit		Use/ft^2 of living area	Ft^2 use/unit		Use/ft^2 of living area
	Surface measure[a]	3/8-inch basis	Surface measure[a]	Surface measure[a]	3/8-inch basis	Surface measure[a]
California	2,084	1,347	2.93	2,051	1,289	1.83
Florida	2,018	970	2.97	2,651	1,370	2.09
Georgia	1,738	816	2.53	2,929	1,393	2.42
Indiana	1,861	1,140	2.20	2,118	1,411	1.77
Texas	2,124	1,042	2.42	2,570	1,473	1.88
Total U.S.	1,997	1,017	2.44	2,503	1,336	1.87

a/ All thicknesses.

Because of federal building code requirements, gypsum board is almost always used in the furnace areas and in certain kitchen areas of most mobile homes.

Although gypsum board has taken a portion of the hardwood plywood market, large quantities of hardwood plywood are still used in the manufacture of both single- and double-wides (Table 7). However, hardwood plywood use will very likely decline as gypsum board further penetrates the mobile market on the basis of fire safety. Also, as manufacturers try to make their units look more like site-built homes, fewer units are likely to have hardwood plywood on all interior walls as has been the custom.

SUMMARY

A survey of mobile home manufacturing plants revealed major differences in panel usage between single- and double-wide units and in panel usage among the top five mobile home manufacturing states. Mobile home units in Georgia and Florida tended to use much less softwood plywood and hardboard as compared with units manufactured in states outside the Southeast. Units built in California, Texas, and Indiana used much more softwood plywood and hardboard because of their gable roof designs and frequent use of hardboard for siding-indicating a trend toward the design and use of materials to give the appearance of conventional site-built houses.

Gypsum board has made a major penetration into the mobile home hardwood plywood market. Previously, hardwood plywood was used almost exclusively for the interior wall covering. Gypsum board is also used now on ceilings, replacing insulation board and acoustical fiberboard panel products. The trend toward the use of gypsum board is likely to increase due to the growing consumer concerns nationwide about fire safety in homes and potential enactment of more restrictive fire code legislation.

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☆ U.S. GOVERNMENT PRINTING OFFICE: 1978—750-027/88