AGRICULTURE ROOM

Partial List of
USES OF FOREST PRODUCTS IN SUBSTITUTIONS FOR STEEL AND TIN

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UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
FOREST PRODUCTS LABORATORY
Madison, Wisconsin
In Cooperation with the University of Wisconsin

Partial List of

USES OF FOREST PRODUCTS IN SUBSTITUTIONS FOR STEEL AND TIN

In response to a growing number of requests for suggestions about possible wood substitutes for materials which are no longer available for civilian purposes, the Forest Products Laboratory has prepared the following partial lists. These cover only steel and tin, but their variety and potentialities are suggestive of the greater number of uses to which wood can profitably be put during the wartime emergency.

The starting point of the listings is official Forest Service records of items for which wood has been used in the past, interpreted and modified by the best supplementary knowledge that can be brought to bear on relatively short notice and without exhaustive special inquiry. Obviously, such lists and classifications, built on arbitrary lines, cannot be above question or debate, especially with regard to some of the items included. A 100 percent satisfactory and precise classification would presuppose more knowledge than probably any individual or group of individuals can bring to bear without more time and work than is presently feasible. Nor are the listings entirely suitable as a basis for definite action until they have been considered by such specialized authorities as representative wood fabricators and suppliers as to adequacy of present plant capacities and the availability of suitable sizes, grades, and dryness of the woods required to meet expanding demands. In fact, considerable time would be required by the wood supplying industries before increased demand for many of the items could be satisfied.

It should be pointed out that the steel list contemplates substitution of wood, for the most part, in its natural state; that is, shaped and turned as lumber to replace steel items, such as fence posts, furniture, and similar products. It may be treated with fire, decay, and insect-resisting preservatives. On the other hand, wood products as substituted for tin would be chiefly of paper and wood pulp. For this reason, the two lists are set up in slightly different form, although for comparison purposes their content is similar.

The classification columns are intended chiefly to indicate present availability of the suggested substitutions. The column headed "commercially used now" indicates that the wood substitute is now in common use, either predominantly or to a significant degree; in this classification, the displacement of wood has not progressed to the extent that revival of its use would not be relatively easy. The second column listing, "largely developed" uses, includes items for which wood is now used in a small degree or in which its use would not be hindered by technological obstacles. The column headed "more development required" indicates items for which wood can serve, although new or changed designs may be involved or some further technological work required; it also indicates items for which production is not now fully organized on a quantity scale.

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Partial List of Uses of Forest Products in Substitutions for Steel

Steel product	Status of technological development		
	Commercially used now	Largely developed	More development required
Advertising signs, other than billboards		X	
Agricultural implements:			
Beams and handles, plow		X	
Housing, threshing machines, and shredders		X	
Platforms, shelves and chutes		X	
Arches, buildings (up to 150-foot spans)	X		
Automobile license plates			X
Balusters, newel posts and railing	X		
Barges	X		
Battens, barn	X		
Barrels:			
Beer	X		
Rosin	X		
Billboards, outdoor	X		
Bins and cribs, grain storage	X		
Brooders			X
Buildings, temporary	X		
Cabinets (not lining):			
Ice cream			X
Soft drinks			X
Cable and wire reels	X		
Casing and base, house	X		
Caskets and burial cases	X		
Ceilings, pressed	X		
Cheese presses and vats (not lining)	X		
Clothes hampers	X		
Clothes hangers (except hook)	X		
Concrete forms	X		
Concrete piling and posts, re-enforced	X		
Curtain poles and brackets	X		
Display racks			X
Fence posts	X		
Fences, snow (all steel)	X		
Fencing and gates, ornamental	X		
Fire doors (1-hour resistance)			X
Floor girders, house and barn	X		
Floor joists, house and barn	X		
Frames, window and door, nonfireproof structures	X		

(continued)

Partial List of Uses of Forest Products in Substitutions for Steel (continued)

Steel product	Status of technological development		
	Commercially used now	Largely developed	More development required
Freight car:			
Box	X		
Lining	X		
Roofing	X		
Siding	X		
Furniture:			
Hotel, restaurant, cafe	X		
Household (except folding beds, davenports, etc.)	X		
Office and store, desks, filing cabinets	X		
Outdoor and porch	X		
Game boards	X		
Gates, farm	X		
Garages	X		
Golf shafts		X	
Gutters		X	
Hangars	X		
Highway guard lines	X		
Highway markers and posts	X		
Hog houses	X		
Hoppers and boxes -- agricultural implements	X		
Ice-cream freezer tubs	X		
Incubators		X	
Insulator pins	X		
Kegs, putty and paint		X	
Kitchen cabinets	X		
Lamps, floor and table	X		
Lath	X		
Lawn mower tongues	X		
Light standards, ornamental			X
Lookout towers	X		
Mine framing	X		
Novelties:			
Book ends		X	
Calendar mounts		X	
Souvenirs		X	
Paper-roll plugs	X		
Partitions, office and shop, movable		X	
Poles:			
Agricultural implements	X		
Telephone, telegraph, electric	X		
Posts and rails, porch	X		

(continued)

Partial List of Uses of Forest Products in Substitutions for Steel (continued)

Steel product	Status of technological development		
	Commercially used now	Largely developed	More development required
Radiator covers		X	
Reaches -- agricultural implements	X		
Refrigerators, mechanical			X
Roofing, houses, barns, and sheds	X		
Rowboats and skiffs	X		
Sash, window			
Shelving	X		
Shoetrees	X		
Silos (all steel)	X		
Stock racks, store		X	
Store fronts		X	
Studding	X		
Tanks:			
Acid			X
Brewery	X		
Hot grease			X
Farm, water	X		
Water storage, railway, and industrial	X		
Tennis rackets	X		
Toy wagon boxes and scooters	X		
Troughs, farm feeding	X		
Trucks and trailers, farm, horse	X		
Trucks, motor, commercial:			
Cabs		X	
Bodies		X	
Trusses:			
Buildings (up to 100-foot spans)	X		
Highway bridges (up to 100-foot spans where no drawbridge is required)	X		
Venetian blinds	X		
Wagon wheels, horse	X		
Wheelbarrows:			
Garden and toy	X		
Handles	X		

(concluded)

Partial List of Uses of Forest Products and Derivatives in Substitutions for Tin

Tin product or composition	Wood product or derivative	Status of technological development: Commercially used now	Largely developed	More development required
Bearings (babbit metal)	Compreg wood			X
	Solid lignumvitae and maple (oilless)	X		
	Lignin and fabric compositions (water lubricated, heavy-duty, high-speed, viz., "Lignalloy")	X		
	Compressed, resin-impregnated paper plastic, viz., ("Micarat" and "Formica")	X		
Boxes and cans:				
Candies	Paperboard cartons of varied types, linings and coatings	X		
Coffee				
Cookies				
Crackers	Molded pulp cans		X	
Food powders				
Talcum	Plywood	X		
Tea	Solid wood			
Tobacco				
Tooth powder				
Miscellaneous dry food and drugs				
Buttons, tinned	Laminated paper plastics	X		
Cans and containers:				
Paint	Molded pulp, resin lined			X
Lard, greases, and fats	Wood kegs, pails and barrels	X		
Oil	for bulk shipment in lieu of small cans.			
	Sheet iron with cellulose lacquer or paint coating		X	
Cans, food liquid				
Condensed milk	Paperboard cartons and molded pulp cans coated, with			X
Vegetable and fruits	or without inner cellulose			
Fruit juices	receptacle. Wood kegs	X		
	Sheet iron cans with cellulose lacquer or resin enamel coatings			X

Partial List of Uses of Forest Products and Derivatives in Substitutions for Tin (continued)

Tin product or composition	Wood product or derivative	Status of technological development: Commercially used now	Largely developed	More development required
Clips, paper, tinned	Larinated paper plastic	X		
Cups, kitchen	Lignin and cellulose plastics	X		
Foil for dry or semi-dry packaging	Grease-proof or wax paper	X		
	Cellophane			
Forks, spoons, and spatulas, tinned	Laminated paper or paper plastic			X
	Wood veneer	X		
Ornaments, toys, advertising specialities, labels, and similar miscellaneous	Wood	X		
	Lignin and cellulose plastics	X		
	Paper plastics		X	
	Iron with cellulose lacquers and paints	X		
Pails: Water Paint	Molded pulp; laminated paper plastic; paper plastic; paperboard (coated); wood staves (coated)	X		
	Sheet iron with cellulose lacquer or paint coating		X	
Pins, tinned	Cellulose lacquer and enamel coatings		X	
Plates, baking, cake, pie, etc.	Paper board stamped or molded (single use)	X		
Roofing	Wood shingles	X		
	Impregnated paper	X		
Sheet -- certain miscellaneous uses	Impregnated paper	X		
Shoelace tabs, tinned	Cellulose lacquer dips	X		
Snap fasteners, tinned	Laminated paper plastic	X		

Partial List of Uses of Forest Products and Derivatives in Substitutions for Tin (continued)

Tin product or composition	Wood product or derivative	Status of technological development		
		Commercially used now	Largely developed	More development required
Tops, bottles, cans, tubes, tinned	Lignin or cellulose plastics	X		
	Lignin and cellulose plastics		X	
Trays, refrigerator, restaurant, and kitchen	Paper plastics and pulp	X		
	Compreg wood		X	
Tubing, noncorroding	Cellulose plastic tubing	X		
	Compreg wood			X
	Laminated paper plastic			X
Tubes, collapsible (tooth paste, shaving cream)	Plastic top with casing of cellulose film			X
	Cellophane			
Wire, tinned	Wire, dipped in cellulose lacquers or enamels	X		
	Or wrapped in protective papers.			

(concluded)