

ENVIRONMENT

Fire hazard. AFM and several other panel fabricators have conducted comprehensive fire testing to recognized standards. Tests indicate that when properly installed, sandwich panels retain their structural features in a 20-minute, 1,700-degree F. fire.

The real debate is between the two competing foams: urethane and expanded polystyrene (EPS). Some urethane manufacturers say EPS panels melt in fires, despite tests to the contrary. EPS suppliers counter that urethane gives off small amounts of cyanide gas in a fire, a claim also refuted by official reports.

CFCs. Chlorofluorocarbon (CFC) gases such as Freon make urethane a better insulator than EPS. But Freon escapes both during and after manufacturing, damaging the protective ozone in the earth's upper atmosphere. Amos Winter of Winter Panel Corporation reports that progress with hybrid foams will yield a 40-percent reduction in Freon use in Winter's products this year, and near total elimination of CFCs by 1993. — Steve Andrews is a Denver-based writer and residential energy consultant.

SOURCES

Foam-Core Panels & Building Systems: Principles and Practice Plus Products Directory. By Steve Andrews. 130 pages. Contact Cutter Information Corporation, 1100 Massachusetts Avenue, Arlington, Mass. 02174. Price: \$40.
 "On the House" (quarterly newsletter). By Winter Panel Corporation, RR 5, 1688, Brattleboro, Vt. 05301. Provides practical solutions for on-site panel design and construction issues.

ENERGY PAYBACK

There are five reasons foam-panel homes should have lower heating and cooling bills than homes insulated with common wall and ceiling materials:

- Foam panels achieve thermal ratings of between R-4 and R-7 per inch; batt and loose-fill materials are about half that.
- With less wood, panels reduce thermal bridging. A 16-foot foam wall section with one 3 x 4-foot window contains 5 percent wood and 95 percent insulation. The same wall framed with 2 x 4s 16 o.c. has 20 percent wood.
- If not installed properly, batt insulation is susceptible to voids. Batts are either jammed into narrow cavities, improperly split around wiring or around electrical boxes, or cut too short or too long. In some remodeling jobs, insulation is removed, but not replaced. When used with a roof truss system, batts won't cover up the bottom chords. A solid foam panel eliminates these problems.
- Any air moving within a conventionally insulated wall or ceiling decreases the performance of batt insulation. If properly sealed, foam panels do not allow air movement.
- Depending on proper installation and effective sealing of joints and openings, foam panel construction lends itself to tighter-than-average construction. That's especially true when foam panels are used for both walls and ceiling because the systems are engineered to connect to each other easily.

CASE STUDY 1

Place: Watertown, S.D.
 Heating degree days: 9,000
 Size of home: 1,040 square feet with a full basement; identical floor plans
 Energy source: Natural gas, forced-air furnace

	Conventional frame	Panel frame
Walls	6" fiberglass batts with 1" foil sheathing; R-24	5" EPS-core panels, R-24
Ceiling	12" fiberglass; R-38	7½" EPS-core panels, R-32
Heated area	Main floor	Main floor and basement
Heating bill (Jan.-March)	\$263	\$85

Source: Enercept, Inc., Watertown, S.D.

CASE STUDY 2

Place: El Jebel, Colo.
 Heating degree days: 7,635
 Size of home: 1,336 square feet
 Heating source: Electric baseboard; HRV

	Conventional 2 x 6 frame	Panel frame
Walls	5½" fiberglass batts plus ½" exterior insulation, R-22 with airtight drywall (½")	R-22
Ceiling	Fiberglass batts, R-38 (R-30 in slope)	R-38
Heated area	Whole house	Whole house
Heating bill (Oct.-Dec.)	\$450	\$112

Source: Big Horn Construction Services, Carbondale, Colo.

CASE STUDY 3

Place: Ludlow, Mass.
 Heating degree days: 5,600
 Size of home: 2,400 square feet
 Heating source: Electric

	Conventional 2 x 6 frame	Panel frame
Walls	5½" fiberglass batts, R-19	R-25
Ceiling	9" fiberglass batts, R-30	R-33
Heated area	Whole house	Whole house
Heating bill	\$131/month	\$30/month

Source: Waverly Heights Development Corporation, Ludlow, Mass.