

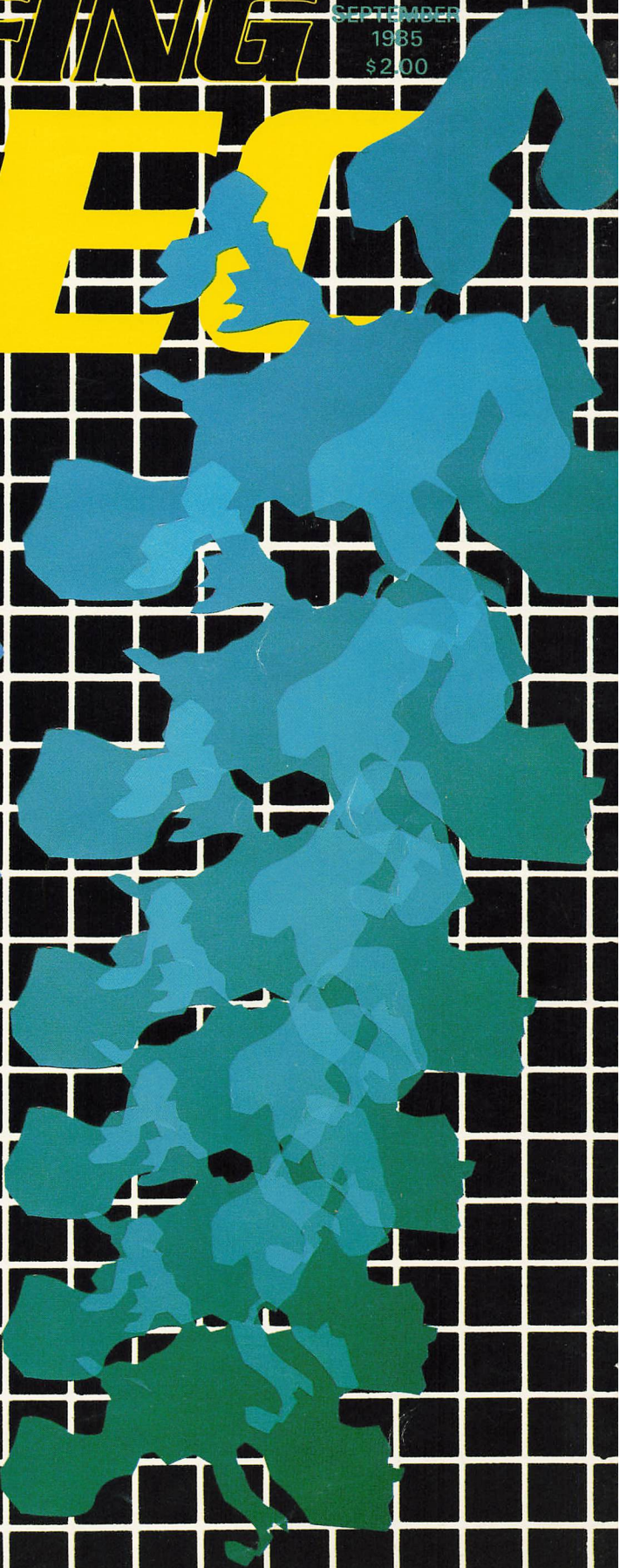
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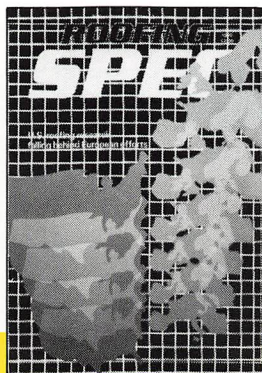
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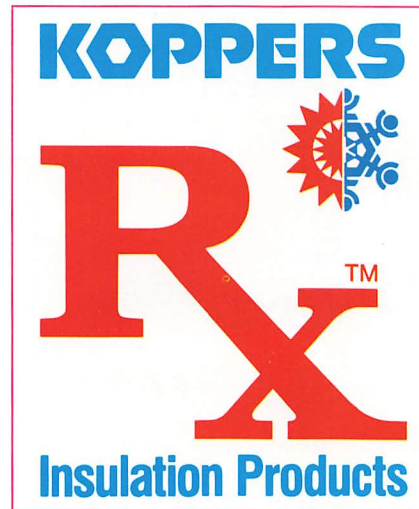
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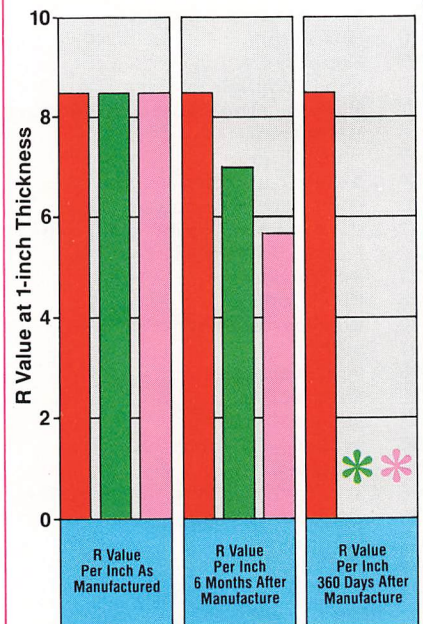
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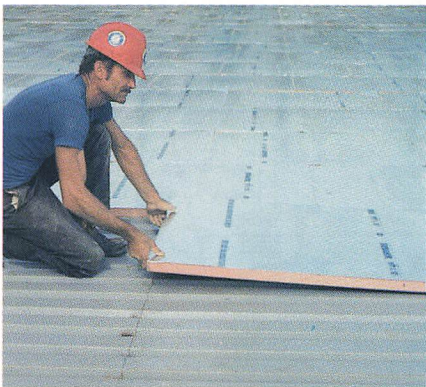
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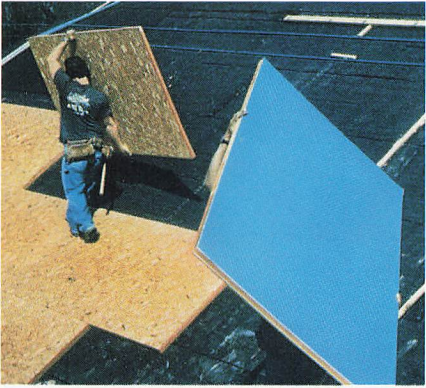
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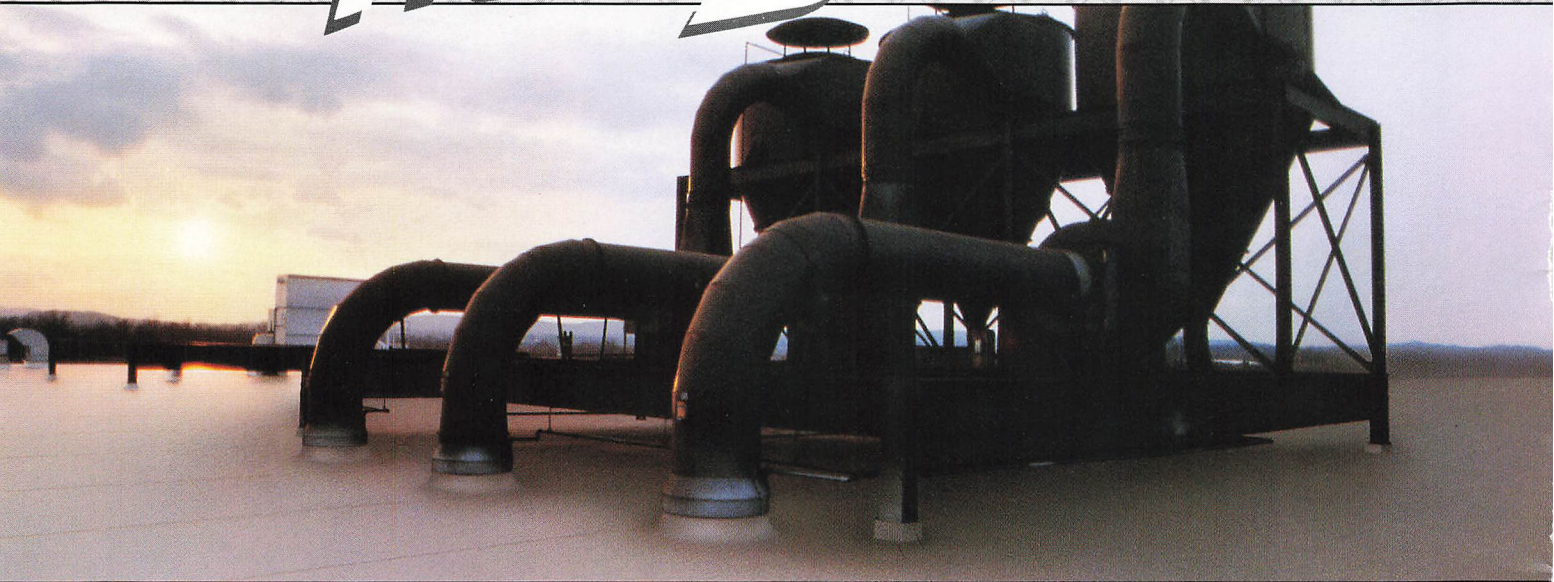


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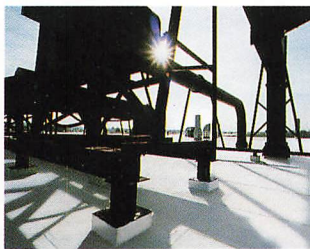
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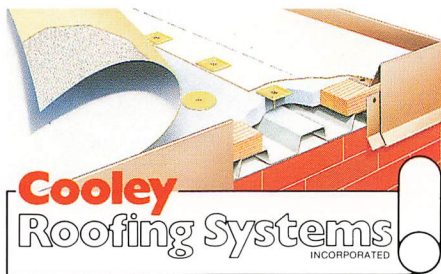
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Non-residential construction falls 21 percent in June, says Dodge

After three months of record-high building activity, contracting for new construction retreated in June, according to the F. W. Dodge Division of McGraw-Hill Information Systems Co.

June construction declined 12 percent, bringing the seasonally adjusted annual rate of contracting to \$199.8 billion. Nevertheless, higher building activity rates in April and May helped 1985's second quarter reach an all-time peak of \$218.1 billion.

"After a surge of record contracting in response to falling interest rates, the building market now seems to be reacting to some of the negative economic developments of 1985," said George A. Christie, vice president and chief economist for F.W. Dodge. "Although lower interest rates continue to encourage a strong volume of single-family home building, June's contracting data also showed evidence of growing concern about industrial stagnation as well as uncertainty about tax reform."

The seasonally adjusted Dodge Index fell to 142 in June, following three months in the 160s (1977 = 100).

The unadjusted total contract value of all newly started construction for the first half of 1985 was \$108.2 billion, a narrow 2 percent gain over the same six-month period of 1984. Compared with 1984's first half, contracting for new construction through June of 1985 was up 16 percent in the Northeast, up 5 percent in the North Central region and down 2 percent in both the South and West.

June contracts for non-residential building fell 21 percent to a seasonally adjusted annual rate of \$66.1 billion. Office building led the decline in this category with a 25 percent drop in June.

"Despite this retreat from recent peak rates of building, June's contracting for offices, still a strong \$20.1 billion, was anything but a 'crash,' and this overbuilt market could be headed for further declines," Christie said. "By contrast, June's 21 percent decline of industrial construction contracting was another in a series of cutbacks that has reduced the current rate of building to what it was when recovery first began."

For the first six months of 1985, unadjusted non-residential building contract value totaled \$37.1 billion, up 6 percent from last year's first half.

Residential building, at \$93.5 billion in June, slipped 9 percent from May's annualized rate, but the second quarter as a whole is holding steady with the first quarter's \$100 billion.

"Uncertainty surrounding the tax reform issue has added an element of

volatility to multi-family building that has put recent rates of contracting out of touch with reality," Christie said.

June's contracts for non-building construction projects (public works and utilities) declined 2 percent to a seasonally adjusted annual rate of \$40.2 billion. Within the public works sector, highway construction remained strong in June, but declines in water resource and waste water treatment projects led to an overall 7 percent drop. Utility construction, which recently sank to the vanishing point, showed a modest recovery in June.

At the end of six months, contracts for non-building construction totaled \$20.1 billion, a gain of 12 percent over the same 1984 period. Transportation construction was the source of most of this year's gain.

Analyst predicts modest profits in 1986 and sales of 85 million asphalt shingle squares

The residential asphalt roofing industry will continue to grow over the next few years, Jonathan Goldfarb, vice president of the Securities Research Division, Merrill Lynch Capital Markets, told the Board of Directors of the Asphalt Roofing Manufacturers Association (ARMA).

Goldfarb, a noted building industry analyst, was speaking at the Board's meeting in Tucson, Ariz.

He also predicted a modest return to profitability for the industry this year, with this trend continuing into 1986.

Goldfarb foresees asphalt strip shingle shipments rising 2 percent to 2.5 percent this year and increasing by a similar amount in 1986, with next year's shipments totaling more than 85 million squares.

"Asphalt-based materials account for at least 90 percent of all residential roofing, and this high market share does not appear to be diminish-

ing," Goldfarb said. Goldfarb noted the increasing acceptability of upgraded roofing products with new textures, depth and dimension, color patterns, and laminated construction.

Laminated shingles currently account for 7 percent of the residential market's total volume, while the market share of fiber glass mat shingles now exceeds 75 percent.

Goldfarb also believes the built-up roofing sector will continue to show gains, bolstering the outlook for the entire bituminous roofing industry.

The housing market is currently healthy, Goldfarb noted, but he warned the ARMA executives not to expect rapid growth during the remainder of the decade. He expects housing starts this year to be 1.85 million, down considerably from 1978's 2.2 million high point, but still continuing strong.

ROOFING SPEC

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Indoor swimming pool roof collapses "rust-free" ceiling slab hangers blamed

Swiss researchers now believe that the collapse of an indoor swimming pool's roof in Zurich was caused by the corrosion of supposedly rust-free ceiling slab hangers. One engineer described the collapse as a brittle fracture without any earlier deformation. Engineers had told authorities in 1979 that the ceiling was sagging 0.8 inches, but no change was noticed in the hangers at that time.

The hangers may have been corroded by repeated exposure to chlorine vapor produced by a disinfectant used in the water of the 13-year-old pool, according to the researchers. Authorities are also questioning the hangers' quality. Ernst Waedensweiler, whose office engineered the structure, said, "I cannot explain why some of the supports were thoroughly rusted."

The 3.3-foot-long, Z-shaped hangers were made of chromium-nickel steel and were designed to hold four times as much weight as was needed. The hangers, which measured 0.32 inches in diameter, were attached to the roof framing every 7 feet.

The accident occurred last May, when the 3.2-inch-thick ceiling concrete, made of poured-in-place concrete, fell in virtually one piece. When it fell, the slab covered the occupied pool area like a lid, killing 12 persons and injuring four.

EMPA, the federal institute for testing materials in Switzerland, is investigating the accident with the help of officials in the community where the collapse occurred and Zurich authorities.

Competency-based apprentice program approved

"Wheels of Learning," an education program of the Associated Building and Contractors (ABC), has been approved by the U.S. Department of Labor's Bureau of Apprenticeship and Training (BAT) as the format for the ABC's competency-based apprenticeship programs. To use the program local ABC chapters must still secure approval from the regional BAT offices, however.

"Wheels of Learning" is a competency-based, modular approach training program. Advancement in the program is based on the worker's individual ability, rather than the traditional, time-based apprentice programs.

The training program is an extension of the merit shop philosophy, Jack Zimmer, ABC's director of education, said. Like other ABC programs and policies, "Wheels of Learning" is based on the idea of productivity through merit. Under this program it takes from six months to one year less to be trained than in standard training

programs. In the case of exceptional workers, training time could be reduced by as much as one half, predicts Zimmer.

ABC will be seeking approval for its training program from its local chapters during the next year, according to Zimmer.

ASA wants fairer bidding structure pushing for system similar to generals'

The American Subcontractors Association (ASA) is working to shift the construction industry toward a new, fairer subcontractor bidding structure that would resemble the process general contractors use.

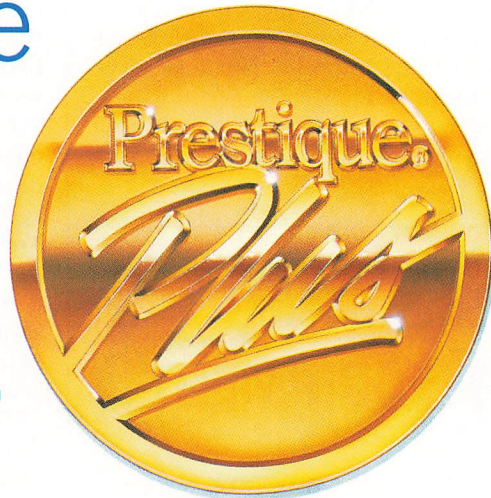
The Association's efforts are directed at obtaining bid-listing legislation at the state and federal level. ASA Legislative Committee Chairman Jesse M. Pickett Jr. sees this as a step toward developing a better system to handle subcontractor bids.

"Our immediate goal is to halt bid shopping," Pickett said, "However, I dream of a time when all subcontractors in the country will work with general contractors through the same system general contractors have with owners."

Pickett believes the current subcontractor bidding system wastes time, and bid shopping by general contractors hinders the entire construction process by seeking lower and lower bids at the expense of legitimate bidders, owners, and at times, the entire project.

The anti-bid-listing legislation is based on an ASA resolution that was approved at the Association's April legislative convention in Washington, D.C. The resolution says: "the procurement of construction contracts historically has been based on a competitive bid system in which the lowest responsible bidder is awarded the contract . . . Bid shopping is the antithesis of the competitive bid system."

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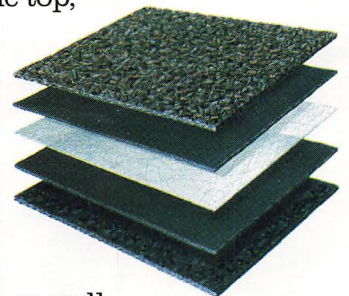
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Armco, banks agree in principle; debt restructuring nears end

Armco, Inc., of Middletown, Ohio, said it reached an agreement in principle with its major banks, of which Chase Manhattan is the leader, on a collateralized loan agreement that would complete the company's debt restructuring, *The Wall Street Journal* reported.

Armco's 1984 financial statements were qualified by its auditors partly

because no outcome was determined in negotiations between Armco and its banks. The auditors, Deloitte Haskins & Sells, also mentioned uncertainty about the adequacy of provisions for losses on the disposal of insurance and other financial service businesses.

Under the proposed loan agreement's terms, about \$485 million in

outstanding debts is to be extended to Dec. 31, 1986. The banks also agreed to provide a \$300 million revolving credit line until Dec. 31, 1986. This credit line replaces a previous line for the same amount that was used because the company did not comply with certain conditions.

Certain obligations Armco has guaranteed to its subsidiaries also will be extended. All borrowing under the agreement is to be collateralized with Armco receivables and inventories, the company said.

In its annual report, Armco said that about \$600 million of debt and letters of credit extended by the company probably would be collateralized.

The agreement specifies that on Dec. 31, 1986, as much as \$385 million of debt under the agreement will be converted to a four-year term loan. Armco agreed to apply a certain portion of receipts from asset sales to pay its debt under the agreement.

In its annual report, Armco said that it expects internally generated cash to meet 1985 capital expenditures and normal debt payments.

Previously, Armco had announced it is seeking a buyer for its Aerospace and Strategic Materials Group, which had a 1984 pre-tax operating profit of \$44.9 million on sales of \$500.5 million. Other Armco units had huge losses. The group's net worth, as of Dec. 31, 1984 was \$255.8 million.


Armco earlier reached a preliminary agreement to sell its domestic finance leasing subsidiary. The company will also sell other assets, including its insurance operations, to help reduce its debt, according to its annual report.

Armco's agreement with its banks provides for common stock dividends to be restricted until at least half the debt is repaid.


In 1984, Armco had a \$135.6 million loss from continuing operations and a \$295 million net loss on sales of \$4.54 billion.

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Prompt payment legislation passes; agencies must pay in 45 days

Texas Governor Mark White recently signed legislation that enforces Texas' prompt pay laws. The law will eventually require government agencies at all levels to pay contractors within a month of a project's completion.

House Bill 275, which becomes effective in 1986, was initiated by the American Subcontractors Association of Texas, Inc. (ASA). The legislation initially requires state government bodies to pay their bills within 45 days after a service has been performed. In 1987, the law sets even stricter guidelines and moves the payment deadline to 30 days.

"We've worked hard for prompt payment for subcontractors and we've worked hard for this legislation," said Norma Mann, president of ASA of Texas, Inc. "We thought it was fair and we knew others would agree if they understood the issue. We made our case, they listened and we're very pleased with the result."

Texas' previous law, although urging prompt payment by the government, was ineffectual because it set no penalties, according to Mann.

ASA received support for the new legislation from a study by the office of the Comptroller of Public Accounts. The study found that most contractors had to wait nearly two months for their payments to be approved and disbursed.

"We've needed this law. Cash flow is a major problem in this industry and when we have state and local governments speeding up their payment of bills, it not only helps minimize a problem that can strangle a small company, but it really benefits the entire state economy," Mann said.

Under the new law, government entities must meet the deadline for payment or pay an added interest charge of 1 percent per month. The law also requires general contractors or subcontractors to pass on government funds to their subcontractors within 10 days after they receive the funds.

The prompt payment requirements are being phased in to ease the burden that might be caused during the state's difficult fiscal periods, ASA officials noted.

The bill was approved in the House March 13 by a 90 to 15 margin and passed unanimously in the Senate. Governor White signed it May 8.

Building industry acquisitions up 12 percent in 1984, says consultant

Merger and acquisition activity in the building products and materials industry showed a 12 percent increase in 1984, according to *1984 Mergerstat Review*, a publication of leading merger and acquisition consultant W.T. Grimm & Co.

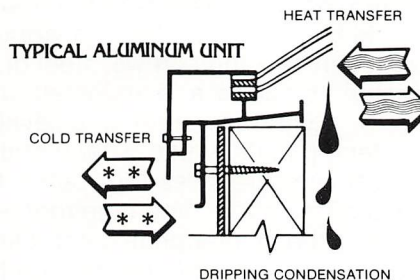
Grimm's annual study found that during 1984 there were 29 mergers or acquisitions in the building products and materials industry, ranking the industry 28th in Grimm's 50-industry list. In 1983, there were 26 such trans-

actions. The dollar value of these 1984 mergers and acquisitions was \$621.2 million, rising from \$268.4 million in 1983.

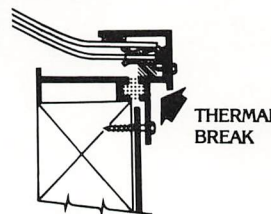
U.S. Gypsum Co.'s 1984 acquisition of Masonite Corp. for \$377.9 million was the largest transaction in the building products and materials industry's history, according to the report.

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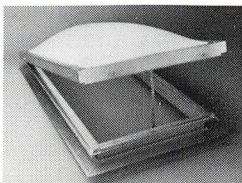
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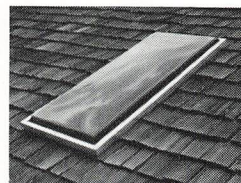


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EXCLUSIVELY YOURS FROM ATLAS.



KWIK-CON™, KWIK-DECK™ AND KWIK-FLEX™ INSULATION FASTENING SYSTEMS.

In North America, Atlas is now the one company to call for the Kwik line of products developed by Mage SA, one of Europe's leading roofing products manufacturers. With the Atlas network of convenient warehouses and factory-trained sales reps, you'll get better service than ever on all of these proven performers.

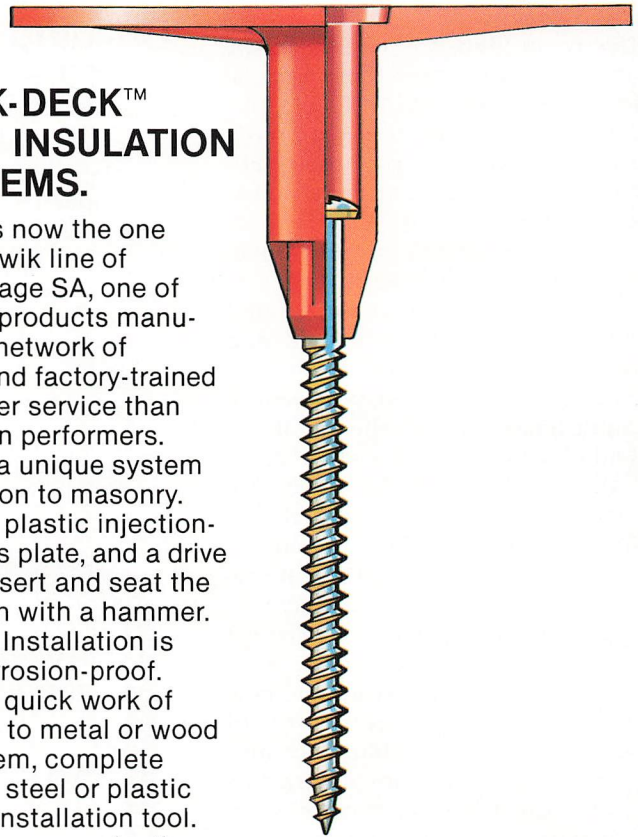
Kwik-Con (left) is a unique system for securing rigid insulation to masonry. The system consists of a plastic injection-molded anchor with stress plate, and a drive pin. Simply drill a hole, insert and seat the anchor, then tap in the pin with a hammer. No special tools needed. Installation is fast. And all parts are corrosion-proof.

Kwik-Deck makes quick work of mounting rigid insulation to metal or wood decking. It, too, is a system, complete with self-tapping screws, steel or plastic fastening plates, and an installation tool.

Kwik-Flex (right) is a new plastic fastening plate which, after installation, leaves the screw head $\frac{1}{2}$ " below the surface of the plate. When the roof is walked on and the insulation is compressed, the screw head *will not* pop through the roofing material.

With all types of Kwik-Deck plates, you get maximum protection against wind uplift, vibration, and movement.

To place an order or ask for more information, call Atlas, exclusive distributor for Mage roofing products. Call toll-free 1-800-321-6846 from anywhere in the United States and you'll be automatically connected to your nearest Atlas Sales and Service Center. In Canada phone 1-800-268-3718. Atlas Bolt & Screw Company, 1628 Troy Road, Ashland, Ohio 44805.



We make more sheeting screws than anybody else in the world.

Check #7 on Reader Service Card

CSI elects Solomon 1985-86 president; Board also named

The Construction Specifications Institute (CSI) recently announced its new officers for 1985-86.

Richard B. Solomon, FCSI, CCS, Miami chapter, was elected Institute president. Solomon is vice president of APEC Consultants, Inc., Miami, and has been a CSI member since 1963. During his membership he has served as a director and vice president of the Institute.

Charles "Chief" Boyd, FCSI, CCS, a Tulsa chapter member since 1961 and currently CSI's secretary, is president-elect. He is also president of The Boyd Group of Tulsa, an architectural firm.

Robert W. Johnson, FCSI, CCS, representing the professional members, was elected vice president of the Institute. Currently a CSI region director, he is vice president of Specifications Consultants, Inc., Boulder.

Robert L. McManus, FCSI, CCS, Central Illinois Chapter, has been re-elected as vice president. McManus is a specifications manager with Beling Consultants Inc., Peoria, Ill., and has been a member of CSI since 1969.

Robert C. Hockaday, an industry member of the Honolulu chapter since 1968 and president of Manufacturers Agency Pacific, Kailua, Hawaii, was also elected vice president.

Weldon W. Nash, Jr., FCSI, CCS, will be CSI's secretary. He is a principal of JPJ Architects, a member of the Dallas Chapter since 1967 and currently director of the the South Central region.

The following members were elected directors of their regions. Dell R. Ewing, District of Columbia metropolitan chapter and president of Dell Ewing Associates, Inc., Vienna, Va., is Middle Atlantic region director. He is also vice president of Unified Technologies Inc., Baltimore. Thomas R. Doman, Atlanta chapter, vice president and sales manager of the Fred R. Hillis Co. of Georgia, Inc., Atlanta, is the Southeast region director.

The Great Lakes region director is Thomas I. Young, CCS, Detroit chapter, director of specifications for Smith, Hinchman & Grylls Associates, Inc., of Detroit. The South Cen-

tral region's director is Jane D. Baker, CCS, Oklahoma City chapter, a specifier with BSW Architects, Tulsa.

Robert D. Haack, Denver chapter, manufacturer's representative for the Southwestern Portland Cement Co. of Denver, was elected Southwest region director. The Northwest region's director is John Harold

Greiner, Portland and Puget Sound chapters, an architect with Thomas & Greiner/Architects PC, Bellevue, Wash.

The West region's director is Virgil Luther Larson, Monterey Bay and Santa Clara Valley chapters, window wall manager, Kawneer Co., San Jose, Calif.

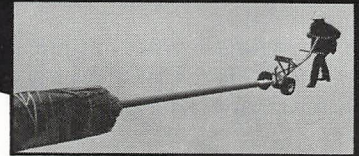


AEROIL'S Husky Handler III For Rolled Single Ply Roofing Sheets.

Provides low cost transportation, hoisting and application of single ply roofing sheets and eliminates breakage of center core.

Does 3 Separate Jobs...

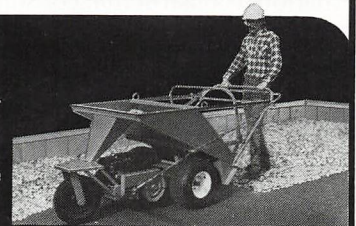
1. Use as a center core support for hoisting to the roof.
2. Use as an across the roof transporter.
3. Use to unroll material over application site.



"Ballastmaster"

A powered dispenser of roof ballast stone for use on single ply roofs. Mounted on high flotation tires, the "Spreader" carries 9 cubic ft. of stone which is spread evenly onto roof behind the wheels as the machine moves forward.

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1985 BUR sales to reach 10 million squares, predict trend watchers

Asphalt shingles will remain the largest product group used in shingle roofing and will account for roughly 95 percent of total residential shingle consumption, predicts Business Trend Analysts, Inc., a New York-based business information and market research firm. Built-up roofing systems will grow the fastest and will recover from last decade's multi-family construction decline, according to *Single-Ply & Other Roofing & Siding Markets*, a recent industry analysis published by Business Trend Analysts.

The analysis projected that BUR use would increase more than 50 percent, from nearly 6.5 million squares sold in 1983 to nearly 10 million squares in 1995. Cost benefits associated with improved built-up roofing techniques, and a relative increase in multi-family structures will help spur this growth.

Wood shingle use will continue to decline, and demands for tile shingles will rise moderately, the analysis said.

Consumption of aluminum, steel, brick, lumber and wood shingles, which currently are more popular than vinyl, will decline moderately over the next 12 years, it is predicted. Plywood and hardboard will exhibit moderate growth through 1988, then consumption will decline.

By 1995, roofing demand is expected to approach 92 million squares annually. More than 70 percent of roofing requirements in the 1995 market are expected to come from replacements and additions.

Price is the crucial factor in the competition among the many materials used in roofing, according to the report. Roofing material types compete in terms of raw material costs, installation expenses, and the net effect of differences in longevity and durability.

No single firm operating in the roofing market holds a share in excess of about 7 percent. However, concentration varies widely among segments; the brick segment is highly

fragmented while hardboard production is highly concentrated. In addition, the industry's structure is shaped by the presence of large, diversified and usually vertically integrated firms.

Most of the leading firms fall into four categories: large integrated metals firms (ALCOA, Kaiser Aluminum), large forest products and diversified building products companies (Georgia-Pacific, Weyerhaeuser), diversified manufacturers of chemical, rubber, petroleum-based and fiber glass products and building materials (Atlantic Richfield, CertainTeed), and firms whose activities are highly concentrated in building products (Alside, Bird). Competition among these producers centers on economies of scale in manufacturing and high-volume distribution, as well as on the advantages of diversification, integration or raw material production with finished products, and access to significant amounts of capital.

Building owners blame poor workmanship for plague of leaky roofs

Leaky roofs and problems with heating and air conditioning continue to plague a large proportion of major construction owners in almost every industry, a new Wagner-Hohns-Inglis poll reports. Cost overruns and projects completed behind schedule were also cited by the poll's respondents as common problems.

The industry survey of almost 500 owners is conducted periodically for Wagner-Hohns-Inglis, Inc. (W-H-I), an international construction consulting firm.

According to W-H-I, more than half of all owners surveyed reported that their major projects had leaky roofs.

Almost half had problems with heating and air conditioning, 43 percent said their projects were completed behind schedule and 40 percent said they have experienced cost overruns.

Compared with previous polls, these results show a slight improvement in both leaky roofs and problems with HVAC systems, no improvement with cost overruns and a worsening problem with the on-time completion of projects.

Owners tended to blame their leaky roofs on the quality of the workmanship. They claim architects are the primary culprits for heating and air conditioning problems.

Cost overruns are most often caused by design problems, poor construction scheduling and change orders during construction, the owners said.

Private developers, who are least likely to rely on the competitive low-bid system for selecting contractors, reported the fewest schedule problems. Government owners, who rely heavily on competitive low bids, had the most late projects.

One-fifth of the owners polled reported that an increasing percentage of their projects are becoming mired in construction disputes that must be settled by negotiation, arbitration or litigation.

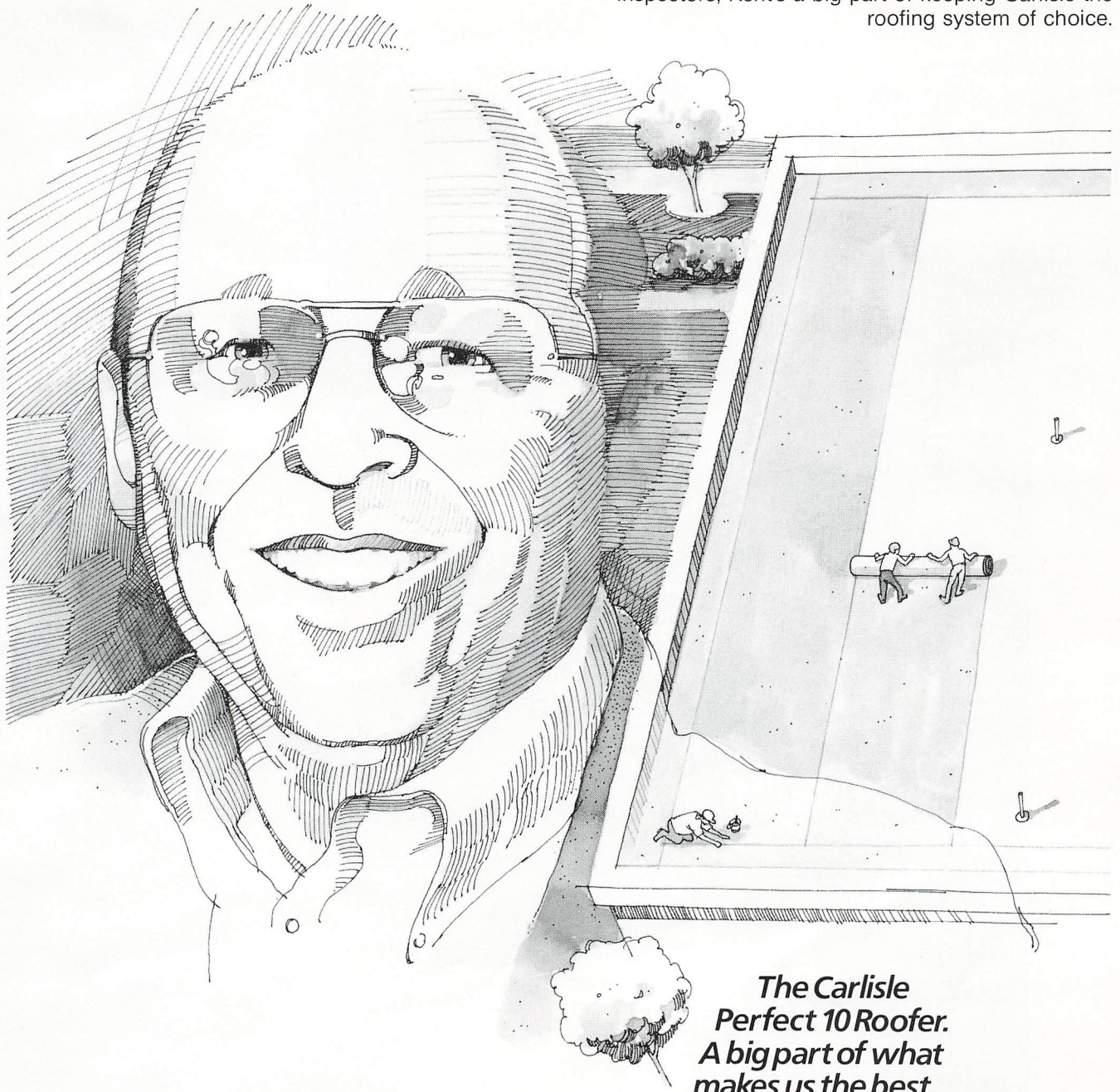
**"14 million square feet
of Carlisle roofing
and no failures--
that's the accomplishment
I'm proudest of."**

*W. Kent Nielsen, President
CURRAN V. NIELSEN CO., INC.
Minneapolis, MN*

For over fifty years, the Nielsen family has built its business reputation on quality. Kent Nielsen calls it a "quality work ethic." And it's reflected in the company's people, salesmanship, service, workmanship and its product line. That's why today, Kent Nielsen remains committed to Carlisle Sure Seal® roofing systems.

"Minnesota weather is very tough on roofing," explains Kent. "Building owners and managers have suffered through failure after failure. But we offer a roofing system that holds up." And that's contributed a lot to the company's success story.

Likewise, Kent's quality orientation has contributed a lot to Carlisle's success story. As an installer of over 150 perfect roofs, as judged by Carlisle technical inspectors, Kent's a big part of keeping Carlisle the roofing system of choice.



**The Carlisle
Perfect 10 Roofer.
A big part of what
makes us the best.**

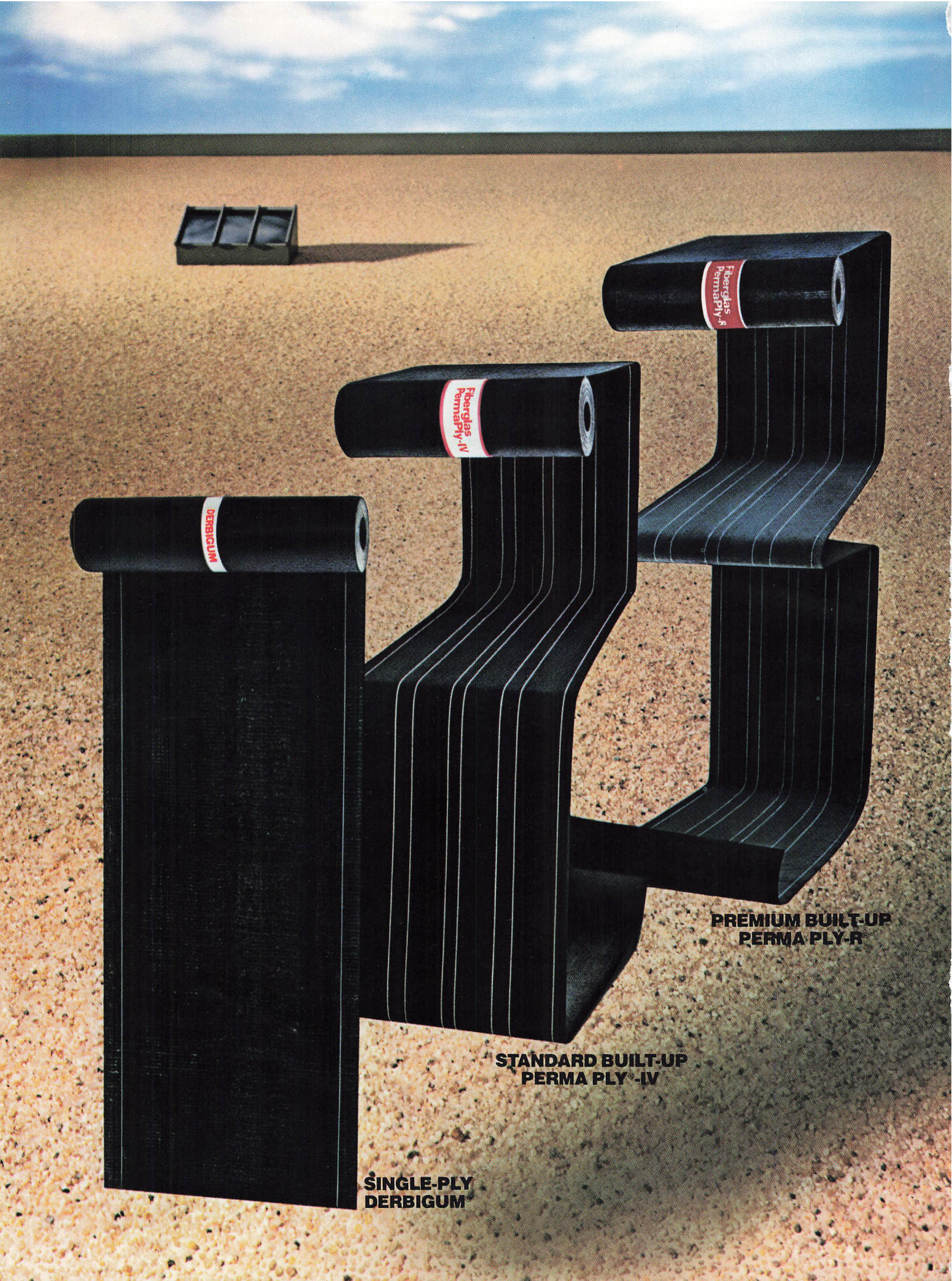
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Carlisle SynTec Systems
Division of Carlisle Corporation, P.O. Box 7000, Carlisle, PA 17013

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The right roof at the right price is easy to find when you come to the experts—Owens-Corning.

With three membranes and three types of insulation to choose from, you can simply custom-design the roof that's best suited to your project.

THREE OUTSTANDING MEMBRANES

Choose DERBIGUM® roof membrane for the performance of a 3-ply roof in a single layer. A proven success in Europe and the U.S. for 17 years, it's the largest selling modified bitumen membrane on the market. Excellent for all roof types—dome, barrel, peaked or flat.

PERMA PLY®-IV roofing felt gives you quality plus economy in a built-up roof. It meets or exceeds every industry standard. At a competitive price.

And PERMA PLY® roofing felt delivers a premium built-up roof of exceptional strength. You can count on its continuous strand construction for long lasting high performance. The proof? Over 6 billion square feet successfully installed since 1964.

THREE EFFECTIVE INSULATORS

You've picked the right membrane. Now mix 'n match with a quality insulation at the right price.

You can't beat FIBERGLAS® roof insulation for a truly superior roof. Available in a range of thicknesses and R values, it's the standard of excellence in the industry. It conserves energy. Helps reduce operating costs. And can save on initial

equipment costs as well.

Choose OCFOAM™ roof insulation for exceptional resilience and dimensional stability. You'll find it in a full range of thermal values. At a price that's reasonable.

And if you want an inexpensive roof insulation that's also versatile, you can't do better than Owens-Corning WOOD FIBER. For roof leveling, reroofing and recovering, it's simply the finest wood fiber insulation you can buy.

Of course, we back all our roofs with the best warranties and guarantees in the business. So if you're in the market for roofing, contact Owens-Corning. Where finding the perfect roof for your needs and budget is as easy as 1, 2, 3.

Call your Owens-Corning sales representative. Or write B.Y.L. Meeks, Owens-Corning Fiberglas Corporation, Fiberglas Tower, Toledo, Ohio 43659.



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OWENS/CORNING
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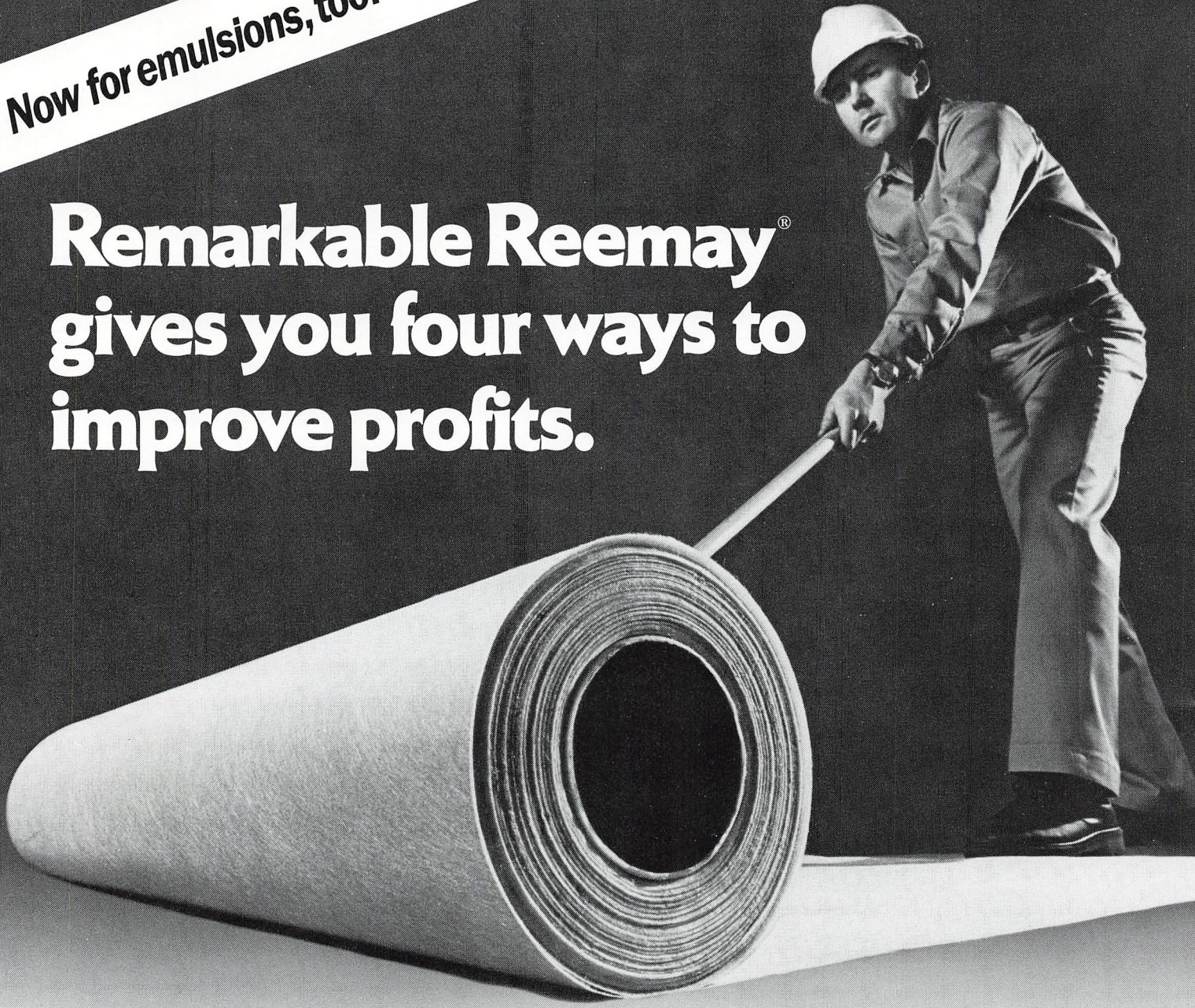
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Now for emulsions, too!

Remarkable Reemay[®] gives you four ways to improve profits.



REEMAY[®] Roofing Fabric by DuPont is superior to felts in four key ways that reduce your costs.

2 times stronger

REEMAY is twice as strong as fiberglass felt. It holds together over seams and joints. You install a more durable membrane and reduce call-back costs.

9 times lighter

Lightweight REEMAY cuts labor costs because it goes down faster, easier. Cuts freight costs significantly, too.

20 times more stretch

REEMAY elongates 43% its normal size, while fiberglass breaks at 1.8%. That means REEMAY adapts to extreme heat, cold and ponding weight. You get a more failure-proof

REEMAY vs. FELTS	Organic Felt, 15 lbs.	Fiberglass Felt	REEMAY S-2024
1 Strength, pounds	1	10	22
2 Weight, pounds/100,000 sq. ft.	45,000	36,000	4,050
3 Elongation, percent	1.5	1.8	43
4 Flex-life, cycles-to-failure	2	100	100,000
All materials tested in 3 plies in asphalt.			

roof and reduce call-back costs.

1,000 times more flexible

REEMAY exceeds 100,000 flex cycles without cracking. Fiberglass felts fail at 100 in the same test. Over years of freeze/thaw cycles, REEMAY holds up. You get a long lasting, reliable roof.

Used with most common cold mastics, for single-ply or built-up roofs, remarkable REEMAY Roofing Fabric gives you a more troublefree,

more profitable roof. For more information, call (302) 999-5077 or write DuPont Company, Room G-39978, Wilmington, DE 19898.

*DuPont registered trademark

Ask about DuPont Certified Systems



American Hoechst hires PR firm

The American Hoechst Corp., Plastics Division has chosen Emery Public Relations of Hunt Valley, Md., as its public relations agency.

Blaine Taylor, director of public relations at Emery, will supervise the Hoechst account.

Emery Public Relations is a department of the Emery Advertising Corp., a full-service marketing, advertising and public relations agency.

American Hoechst also recently dedicated its expanded polystyrene sales and technical development center. The center includes a pre-color laboratory and continuous polystyrene pilot plant. The Hoechst facility employs 260 people.

American Hoechst Plastics is moving its high-density polyethylene sales, marketing and technical development group from Leominster, Mass., to Bayport, Texas, where the manufacturing facilities are located.

The expanded polystyrene business units relocated a year ago from Leominster, Mass., to Chesapeake, Va.

Monsey promotes Grauer to general manager

P. James Grauer has been promoted to general manager of Monsey Products Co.'s new manufacturing facility in Bartow, Fla.

Grauer has worked at Monsey for 11 years. He was a sales manager prior to his promotion.

J.A. "Gus" Harkins has been promoted to assistant for the national accounts manager. His headquarters will be at Monsey Products Co. in Kimberton, Pa.

Harkins was formerly a salesman in the mid-Atlantic region. He will handle existing accounts, develop new business and coordinate national account sales in branch locations.

Armco names project manager

David F. Parker has been appointed project manager for the special projects group of Armco Atlantic, Inc., of Cincinnati, Ohio. He will be responsible for sales and project management for large projects.

Parker joined Armco in 1974 as a sales trainee. He has held various positions in the 11 years he has worked at Armco. Prior to his appointment to project manager, he was district manager of the Dallas office.

continued on page 21

HAVE YOU HEARD ABOUT lite^{top}?

New LITE-TOP is a single-ply Hypalon®* sheet roof membrane that gives you the best of both worlds . . . the best of both plastic *and* rubber.

LITE-TOP goes down like plastic because it's seamed with hot air welding. Then LITE-TOP self-cures to the feel and superior weatherability of rubber.

LITE-TOP is especially resistant to contaminants, and is reinforced with a tough polyester scrim for added strength and stability.

Plus it presents an attractive, energy-saving white surface to the sun. Other colors are also available.

Look into the next generation of the best in single-ply roofing from Hydrotech.

"Keeping Water in Its Place"



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NEW

Partner gives you a better saw K500

THE HANDIEST CUT-OFF SAW EVER MADE

Partner again presents an entirely new generation of cut-off saws.

Handier, lighter, better and with features only a Partner has.

SLEEK AND SLIM

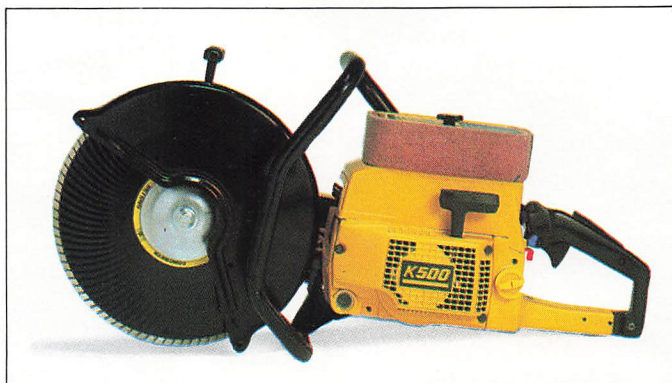
Only 7-1/2" narrow. Handle design and weight distribution give perfect balance in all cutting positions.

INCREDIBLE LOW WEIGHT – ONLY 17 lbs.

The low weight of K500 makes it a genuine hand tool allowing the operator to use it in almost any position. Low weight but power to do the job.

SIMPLE AND RELIABLE DESIGN

Integrated choke/starter for easy starting. Electronic ignition. Large three filter system for maximum protection of the engine.



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Cuts Your Costs

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CertainTeed makes personnel changes

Daniel D. Sirb has been appointed regional accounting manager of the Lake Central region for CertainTeed Corp.'s roofing group.

He is responsible for pricing, accounting and financial analysis, and reporting for the Avery, Ohio facility.

Prior to joining CertainTeed, Sirb was accounting supervisor for the Parker Hannifin Co. of Ostega, Mich.

W. Stanley Stuart Jr. has been named vice president of marketing for CertainTeed's shelter materials group.

Prior to his promotion, Stuart was director of marketing for the group. His new responsibilities will include national advertising, public relations, literature and publications, sales promotion, marketing research and new product development for residential and commercial products.

Conglas promotes Reid and hires Rose

Consolidated Fiber Glass Products Co. (Conglas) has named Jim Reid products manager.

Reid previously was Conglas' Central California representative.

Stanley B. Rose has been hired as sales representative. Rose will be responsible for sales in the Sacramento and Fresno, Calif., areas.

Rose has been in the construction industry for the past 13 years. Before joining Conglas, he was manager of R & S Supply.

Thermo Materials hires Western representative

Thermo Materials, Inc., has hired Vernon J. Farrow Jr. as regional sales manager. He will be responsible for sales in the Western states.

Farrow previously worked for Owens-Corning Fiberglas and Johns-Manville Corp. He served as executive director of the Roofing Contractors Association of San Diego from 1981 to 1984. He is a member of the Construction Specifications Institute and a former member of American Society of Heating and Air Conditioning Engineers, Inc.

MacLean-Fogg appoints two to building division

Jim Higgins has been appointed Eastern sales manager for the Building Products Division of MacLean-Fogg. Higgins was previously a senior distribution manager with I.T.W.'s Buildex division.

Sue Flaksman has been appointed as inside sales-customer service representative for the building products division.

U.S. Intec names employees to new jobs

Paul Graham has been named U.S. Intec's regional manager for the Midwestern and Southeastern United States.

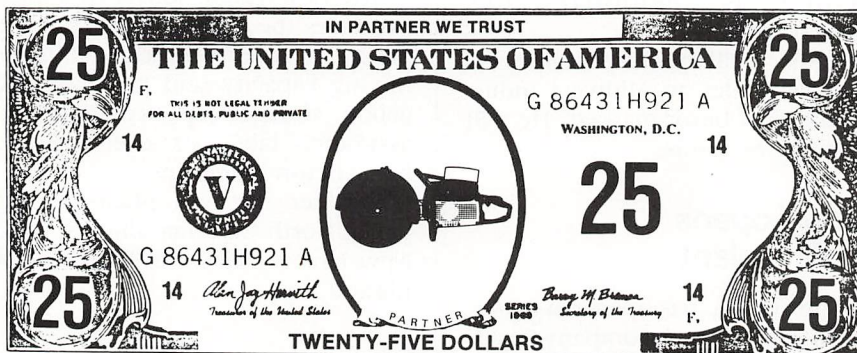
Ray Carter and a representative yet to be named will replace Graham in the North Texas/Oklahoma region.

Shawn Walker has been appointed products manager. He has extensive experience in construction and roofing work.

Kyle names new vice president

Don Kyle was named vice president-general manager of F.O. Schoedinger, Inc.

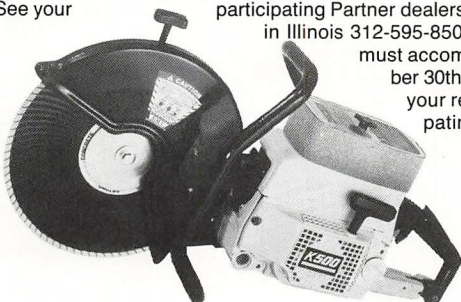
Kyle previously worked for Carlisle SynTec Systems as its Midwest and national sales manager.



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For each Partner gas powered cut-off-saw you buy, Partner will send you a check for \$25.00! See your participating Partner dealers for your rebate form or call 1-800-323-3553/ in Illinois 312-595-8500 for the nearest dealer. Proof of purchase must accompany the rebate form. Offer expires November 30th, 1985. Allow 6-8 weeks for Partner to process your rebate. This program available only at participating dealers.



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INTRODUCES A "NEW" DURABLE LINE OF FLUID APPLIED ROOF COATINGS!

These coatings insulate, waterproof, deaden sound, neutralize rust (on metal surfaces) and provide a deep velvety appearance.

*"The Insulating Quality is
Unsurpassed in the Industry."*

**SAVINGS OF UP TO
40% ON HEATING AND
COOLING COSTS**

And Qualifies for the Federal Energy Tax Credit

In independent testing for fire resistance, our material had a Fuel Contribution Factor of 0.

The **HYDRO-THERM** Roof System forms a blanket of protection shaped around roof edges, vents, and irregularities, leaving **NO** seams that develop into leaks.

HYDRO-THERM is excellent for application on polyurethane foam, metal substrates, plywood, built-up roofs and asphalt shingles.

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ARE NOW AVAILABLE.



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**PROTECTIVE
COATINGS**

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(806) 376-4046

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Wasco names new sales manager

David E. Miller has joined Wasco Products, Inc., as Midwest regional sales manager for the company's residential products division.

Miller was previously sales manager for the Pacific Products Division of the Mayfield Building Co. and Southwest regional sales manager for the Masonite Corp.

Genstar names Lambden president

The Genstar Corp. has appointed Richard L. Lambden as president of the Genstar Roofing Products Co.

Lambden joins Genstar from the Pittsburgh-Corning Corp. where he served as chief operating officer.

Lord Corp. appoints technical sales rep

The Lord Corp.'s industrial coatings division has appointed Charles Boehner as technical sales representative.

Boehner will be responsible for Chemglaze sales to Midwest industrial and distributor markets. He will be based in St. Louis.

Lutrasil opens Carolina plant

The Lutrasil Co. has opened a manufacturing plant and company headquarters in Durham, N.C.

The company is a joint venture of two textile firms, Freudenberg & Co. of Weinheim, Germany, and The Kendall Co. of Boston, Mass.

The plant will manufacture a variety of spunbonded, non-woven textiles for the North American market.

The plant's 100,000-square-foot building is located on a 165-acre site in the Eno Industrial Park. The plant currently employs 67 people. Executives from both Freudenberg and Kendall have relocated to the Durham area.

Mineral Fiber names marketing director

Steven L. Foster has been appointed marketing director for the Mineral Fiber Manufacturing Corp. Foster will be responsible for marketing the firm's new torch-applied modified bitumen, Bituflex, as well as their complete line of low-slope roofing materials.

Gardner opens West Virginia plant

The Gardner Asphalt Corp. has opened its 10th manufacturing plant. The plant is located in Hurricane, W.Va.

The new 15,000-square-foot plant produces the entire line of Gardner products. It features a 10,000-gallon mixing capacity and has a 30,000-gallon storage capacity. A quality assurance lab tests each product batch before filler runs.

Gardner operates plants in Alabama, North Carolina, Illinois, Ohio, New Jersey, Delaware, Kansas, Florida and Texas.

AFM PerformTM roof insulations save now, last later.

EPS roof insulations cut costs.

How? — Perform reduces installation time by eliminating material application on the job. Factory-applied facings mean consistent product quality. And cost-effective Expanded Polystyrene, EPS, is the main ingredient in Perform roof insulations.

Perform 1

unfaced EPS board.
Compatible with all
roof membranes...

Perform 2

EPS with a factory
laminated 1/2" hard-
board face for high
panel integrity.

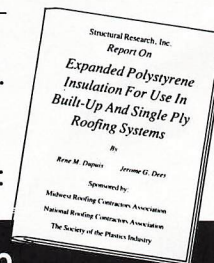
Perform 3

EPS laminated to a
foil/kraft face to
separate membrane
and insulation.

AFM Perform EPS will last...

A comprehensive study by the National and Midwest Roofing Contractors Associations and the SPI was just completed. It showed EPS insulation, taken from 10-year-old built-up and single-ply roofs retained R value — with no significant change. EPS also maintained all structural characteristics.

Get the facts of the roof study and our new brochure on Perform EPS.
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CALL TOLL FREE 1-800-255-0176

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Seam. Mop. Shovel.



Or Simplify.

And save with roof mastics
based on Rhoplex[®] EC technology.



Most roofing systems end up working against you. They take too much time to install. Too much manpower. And a lot of equipment.

A roof mastic based on Rhoplex EC technology is the simple solution. It's a liquid roof coating that sprays, brushes or rolls right on and cleans up fast with water. It's also seamless and self-flashing. And the savings in time and labor can add up to the lowest cost per square foot applied.

Maybe you want to fix up an old roof. Or put on a new one. Or extend the life of an existing roof. It will pay you to look at the quality and proven durability of roof mastics based on Rhoplex EC technology.

Whether used over a prepared substrate or as a separate system with polyurethane foam or modified asphalt directly on the deck, Rhoplex EC technology offers excellent resistance to dirt pickup and UV degradation.

Even ponded water. And it delivers exceptional durability and flexibility. That kind of performance means fewer call backs.

What could be simpler than roof mastics based on Rhoplex EC technology? Finding out about it. Just call your local manufacturer or call Bruce Nebens at (215) 592-2664.

Before application of any roofing systems, be certain they are permitted by local building codes or other authorities. Rhoplex is a registered trademark of Rohm and Haas Company.

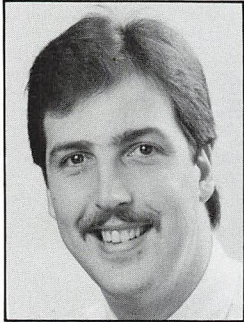
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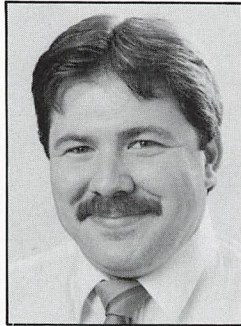
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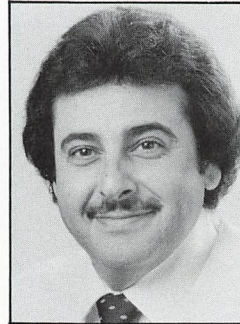
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Sales



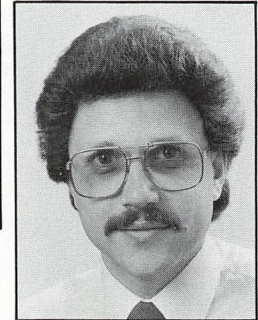
Stan Choiniere
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Dom Insero
Operations Manager



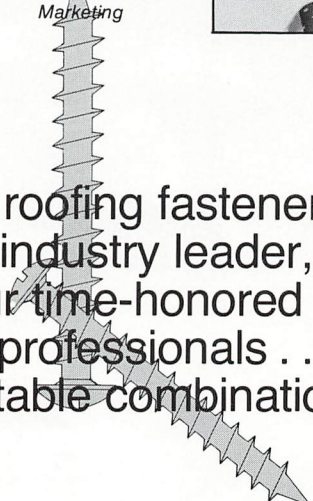
Rich Ugles
Sales



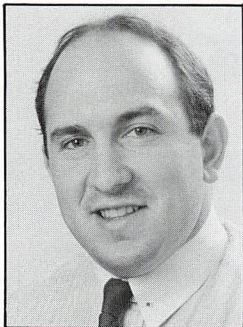
Mike Tuckey
Vice President
Marketing



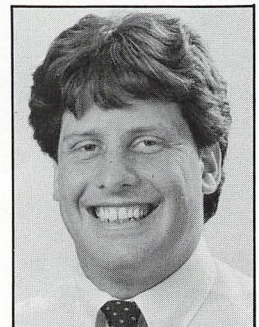
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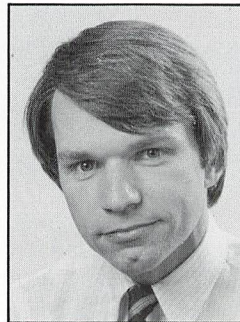
Dan Murphy
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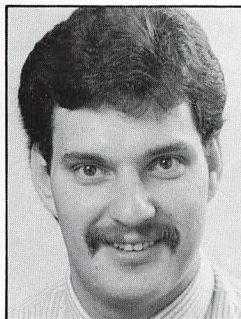
Karen Kingsbury
Customer Service



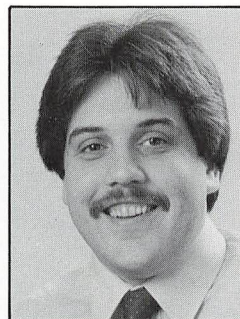
Steve Shevlin
Sales



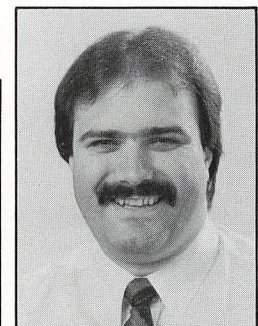
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Florida affiliate helps Boy Scouts reroof camp

The Northeast Florida Roofing & Sheet Metal Contractors Association (NEFRSA) did their good deed when they helped the Jacksonville Boy Scouts reroof the Meninak Lodge at Camp Shands.

Ray Stephens, NEFRSA president, is proud of the Association's work and pleased with the number of companies that donated materials.

Among the manufacturers that contributed materials were JGA/Ponsell Supply, GAF Corp., Gate Roofing Manufacturing, Gulfside Supply and Altech.

Ed Barnard of Sverdrup & Parcel and Julien Benjamin, formerly of J.P. Benjamin Equipment, coordinated the project.

Western States elects Lawson president

Frank Lawson Jr. of the Lawson Roofing Co., San Francisco, was elected president of the Western States Roofing Contractors Association during the group's annual meeting June 14 in Reno.

Other officers elected were: Andy Radonich of Radonich Insulation & Roofing, San Jose, Calif., senior vice president; Melvin Wagner of M.G. Wagner Co., Inc., Yakima, Wash., first vice president; Linda Scott of Scott Roofing Co., Inc., Oceanside, Calif., second vice president; Jim Kilbourne of Ross and Barrows, Inc., Santa Anna, Calif., treasurer; Lorne Memmott of Modern Roofing Co., Napa, Calif., secretary; and Arnie Schmutz of Buckaroo-Thermoseal, Portland, Ore., immediate past president.

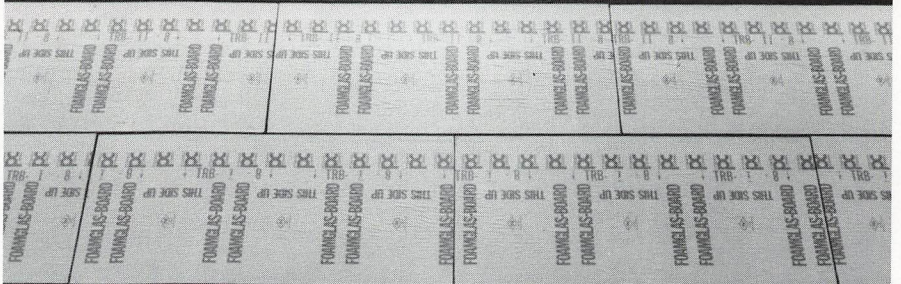
The Board of Directors for 1985-86 include: Roy Bolt of McDonald & Welte, Portland, Ore.; Gaylord Blue of Blue's Roofing Co., San Jose, Calif.;

Dick Wilmot of Keith E. Davis Roofing Corp., Chandler, Ariz.; Pat Lease Jr. of Stockton Roofing Co., Stockton, Calif.; Robert Porter of Douglass Roofing Co., Greeley, Colo.; Joedy Becker of Modern Roofing & Insulation Co., Pocatello, Idaho; Garry Tolley of Tolley-Hughes, Inc., Boise, Idaho; Robert "Kink" Clawson of Superior Roofing Co., Inc., Salt Lake City, Utah; Walt Crow Sr. of Crow

Roofing & Sheet Metal, Seattle; Leigh Haight of Haight Roofing, Seattle; Ted Peterson of Puget Sound Roofing Co., Inc., Seattle; Peter Stanley of Stanley Roofing Co., Inc., of Bellevue, Wash.; Dean Van Dyne of Van Dyne & Sons Roofing, Sparks, Nevada; and John Hoogs of Peerless Roofing Co., Honolulu, Hawaii.

continued on page 30

Roofing Professionals Rely On FOAMGLAS® Insulation Systems



FOAMGLAS® cellular glass insulation is the most moisture-resistant roofing insulation on the market today. So professionals know they can rely on it to give customers guaranteed long-term performance.

What makes it so reliable? Rigid FOAMGLAS® roof insulation is all-glass; it won't warp, shrink, stretch, or swell. And it provides a strong stable base for BUR or single-ply membranes, protecting them from stresses that can cause leaks.

Most important, all FOAMGLAS® roof insulation systems provide **constant insulating value** — this means long-term roof

efficiency for your customers and fewer profit-eating call-backs for you.

For more information about FOAMGLAS® roof insulation systems, contact Pittsburgh Corning Corporation, Dept. FB-5, 800 Presque Isle Drive, Pittsburgh, PA 15239, Tel.: (412) 327-6100.

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WHEN THE HEAT IS ON.

Brai has been singled out among single-ply roofing systems. And for very good reasons. The exclusive formula of straight asphaltic bitumen and modifying resins gives Brai extraordinary heat resistance and low-temperature flexibility. Brai goes to the extremes and has been proven to withstand virtually all climatic conditions. And our torch-applied membranes mean small crews and easier installation. Use our toll-free number and a regional representative will contact you. **For technical information call our hotline 1-800-62INTEC.** We're hot and we're rolling.

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ROOFING

AND WATERPROOFING

PRODUCTS

NOBODY BEATS BRAI FOR TOPPING QUALITY

When you are selecting a roof for a prestigious building like New York's famous Bloomingdale's, you look for qualities beyond just quality.

That is why U.S. Intec/Brai was selected to top one of New York's most well-known department stores. Bloomingdale's requires not just quality, but a roof that represents time savings to the contractor, cuts down on roof loading time and provides watertight integrity.

While those ingredients seem contradictory, the facts are that workability, ease of loading the roof and ease of deliverability are just as important to the contractor as the client.

U.S. Intec/Brai adapts easily onto existing built-up asphalt roofs. There are no kettles, odors or other objectionable features that interfere with customers or employees for businesses that go on while the roof goes down.

U.S. Intec/Brai matches its ease of application with a 12-year warranty. Plus, the company is the world's largest manufacturer of A.P.P. modified bitumen that is U/L and FM approved. U.S. Intec/Brai is installed by approved contractors who have received full factory safety and application training.

Add to that the fact that U.S. Intec/Brai is a professional company oriented toward distributors and contractors in the U.S. roofing market — a market it has spearheaded over the last seven years — and you have an unbeatable system.

That includes superior technical knowledge in roofing systems as a result of two decades of experience.

For more information, use our toll-free number.

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Michigan contractors elect officers

The Michigan Roofing Contractors Association elected officers and directors for 1985-86 during their annual meeting August 9-11.

Roger Steyer of Steyer Roofing Co., Warren, was elected president; and George Schena of Schena Roofing Co., Mt. Clemens, was elected vice president.

The Association's new treasurer is Charles "Dan" Boom of J & L Roofing Co., Grand Rapids. Mervin E. Smith is secretary.

Elected to the Board of Directors were William Bornor, Ray Coppens, Ron Kanaar, Everett Sova, John Gundrum, Phil F. LaDuke, Jim MacArthur, Ralph Maier, Richard A. Reynolds, Walter Duke and Marvin Stephenson.

Ed Garwood of Garwood & Associates, Inc., and Tom Keough of Manville Building Materials Corp. were appointed associate member representatives to the Board.

TARC names Rackley president

William Rackley was named president of the Tennessee Roofing Contractors Association (TARC) for 1985-86.

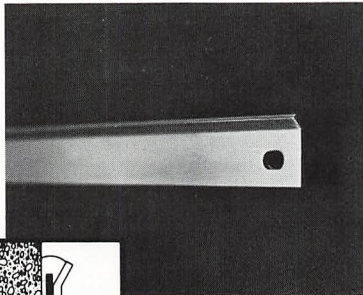
Other officers elected were: Bob Harrison, first vice president; James Whitley, second vice president; and Barry Frazier, secretary/treasurer.

New directors include: Mark Henley, Bobby Herbert, Bobby Smith, John Vick, Doug Wyatt and David Brooks.

TARC's associate members elected the following officers: Baxter Masters, president; Beckey Harvey, vice president of the Eastern region; Bell Depp, vice president of the Central region and Ray McQueeney, vice president of the Western region.

Pressure Bar

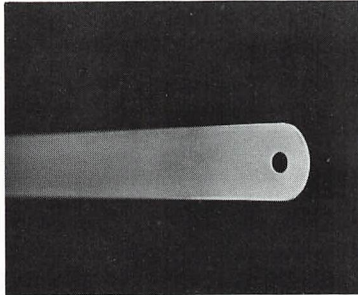
Product No. AL 200



- .100" mill finish 3003 H-14 aluminum.
- 10' 1" x 1" over-all dimensions.
- Slot holes 1/4" x 3/8" punched 4", 8" or 12" on center.

Bar Anchor

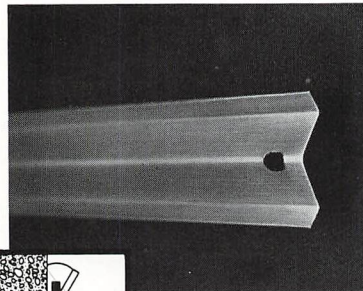
Product No. GA 300



- 16 ga. CR coated steel — four (4) times better than G-90 galvanized.
- 1" x 10' long.
- 1/4" hole punched on 12" centers. End radius rounded.
- Exceeds new FM specs for corrosion resistance.

TermBar Patent Pending

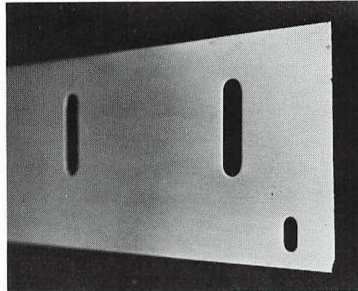
Product No. AL 100



- .040" mill finish aluminum.
- 10' 1" x 1-3/4".
- Slot holes 1/4" x 1/2" punched on 8" or 12" centers.

Gravel Retainer

Product No. AL 500 (aluminum)



- .100" mill finish aluminum.
- 10' x 3-1/2" wide.
- 3/8" x 1-1/2" slots spaced 4" on-center along entire length for drainage.
- Slot holes 1/4" x 1/2" punched 12" on-center for fastening.
- For use with ballasted systems.

JBD SUPPLY

High performance roofing systems require quality accessories to complete every installation. JBD Supply has the hard-to-get items so important for a good job.

Pressure Bar — The most popular termination bar on the market today! Aluminum bar formed with a caulk trough. Excellent rigidity, easy installation.

Term Bar — Two pressure points for superior holding power. Keeps membrane secure, even on irregular walls. Great for modified sheets as well as single ply.

Bar Anchor — Quality attachment strips for mechanically fastened roofs. No sharp edges, no burrs to cut membrane. Now made of CR steel for superior corrosion resistance. Available with counter-sunk holes or LW profile for use with Gyptec™ style fasteners on lightweight decks.

Gravel Retainer — Allows drainage of ballasted roofs while keeping the gravel in place, now made of aluminum for improved appearance and corrosion resistance.

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A WEDGE AGAINST WATER DAMAGE.

The solution is a tapered roof system. The use of a tapered insulation will give your flat roof the proper drainage to eliminate standing water and its inherent problems. It can also add more thermal value to your roof system for important energy savings.

Permalite's Tapered Roof Insulation offers even more advantages. First, it's perlite...making it the most cost-effective method of providing slope-to-drain. It's

carefully cut and vacuumed in our factory to form a clean, dry insulation, with slopes of 1/8", 1/4", 1/2" per foot. It's lightweight, easy to handle, cuts and fits easily. And it's thermally stable, assuring you a constant insulation value for your roof.

TALK TO A REGISTERED CONTRACTOR.

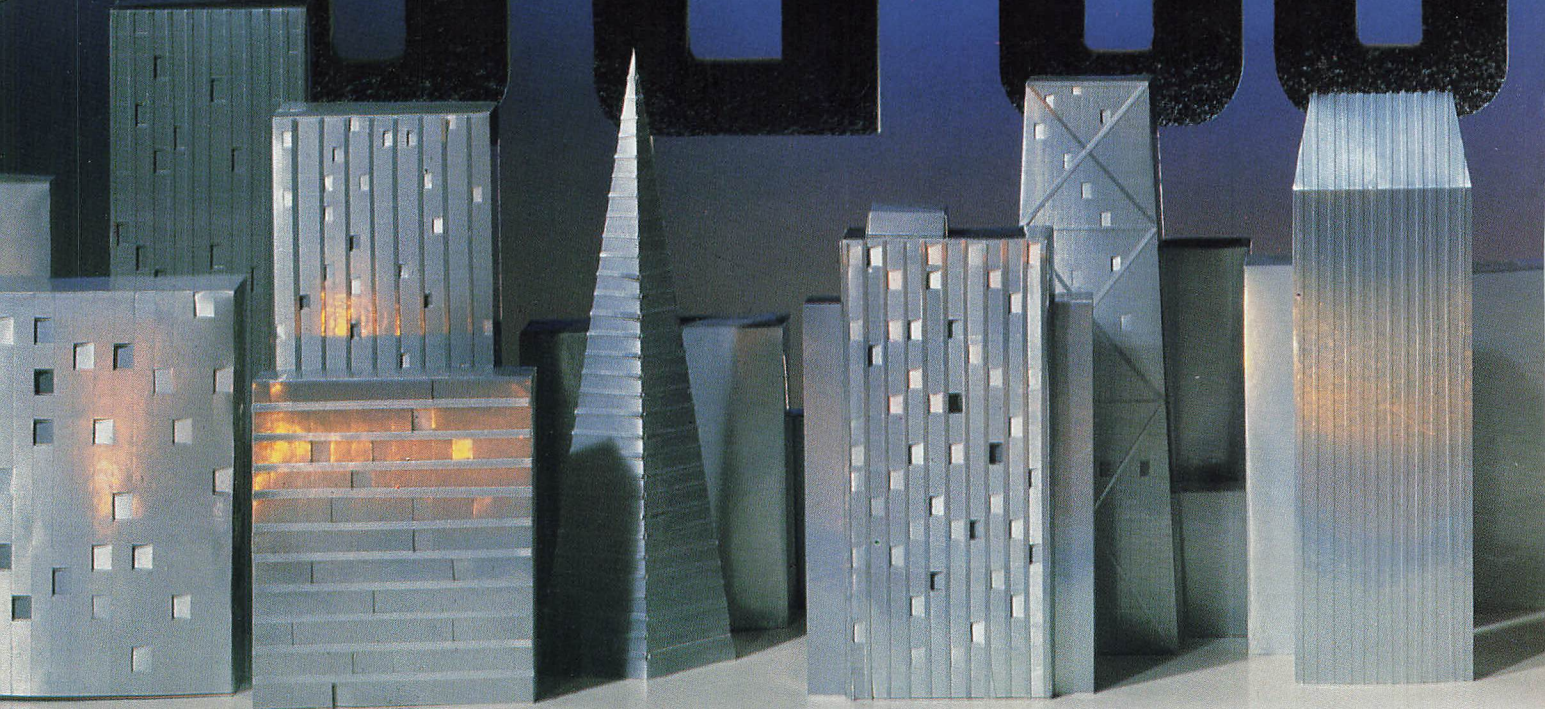
The potential damage due to ponding water is not worth the risk. Let one of our Registered Tapered Systems Contractors in your area show you why a tapered roof is a wise investment. Write to International Permalite, Inc., 300 N. Haven Ave, Ontario, CA 91761, or call (714) 983-9591 or (312) 654-4500. A stable, long-lasting tapered roof can be your best insurance against a rainy day.



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STRUCTODEK



Now! A substrate that exceeds today's tough demands for single ply systems

STRUCTODEK™ wood fiber substrate is fast-becoming today's professional choice in underlayments for new or re-roof applications. It is scientifically designed to actually exceed the stringent standards established for single ply systems. Whether mechanically anchored, adhered, or used in a ballasted system, the substrate you use should equal the highly advanced technical requirements set for single ply membranes. That's why we urge you to compare this superior underlayment with alternative products on all five counts pictured here.

Tough, rigid STRUCTODEK substrate is asphalt coated to provide an excellent moisture retarder. Special water resistant additive helps reduce wicking. And it's also available in an asphalt-free formulation for PVC membrane systems. Get specifics on this UL Classified roofing substrate with service to match. *Call Chicago at 1-800-621-9624...the Philadelphia area at 1-800-257-7885...or Los Angeles at 213-380-3461. Or write to us at 101 S. Wacker Dr., Chicago, IL 60606-4385, Dept. RS985*

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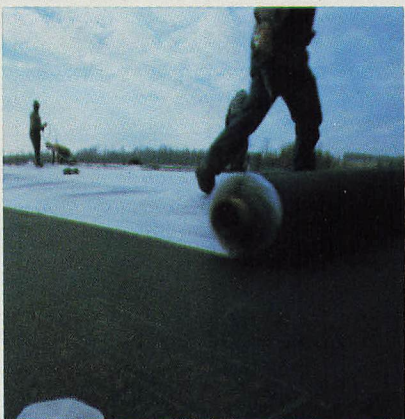
Contractor: Leonard Smith,
SHEETMETAL & ROOFING, INC.
Salem, VA

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Roofing Substrate from USG

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WOOD FIBER DIVISION
USG Industries, Inc.

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High compressive strength permits normal foot traffic during installation.



Provides excellent base—even over uneven surfaces.



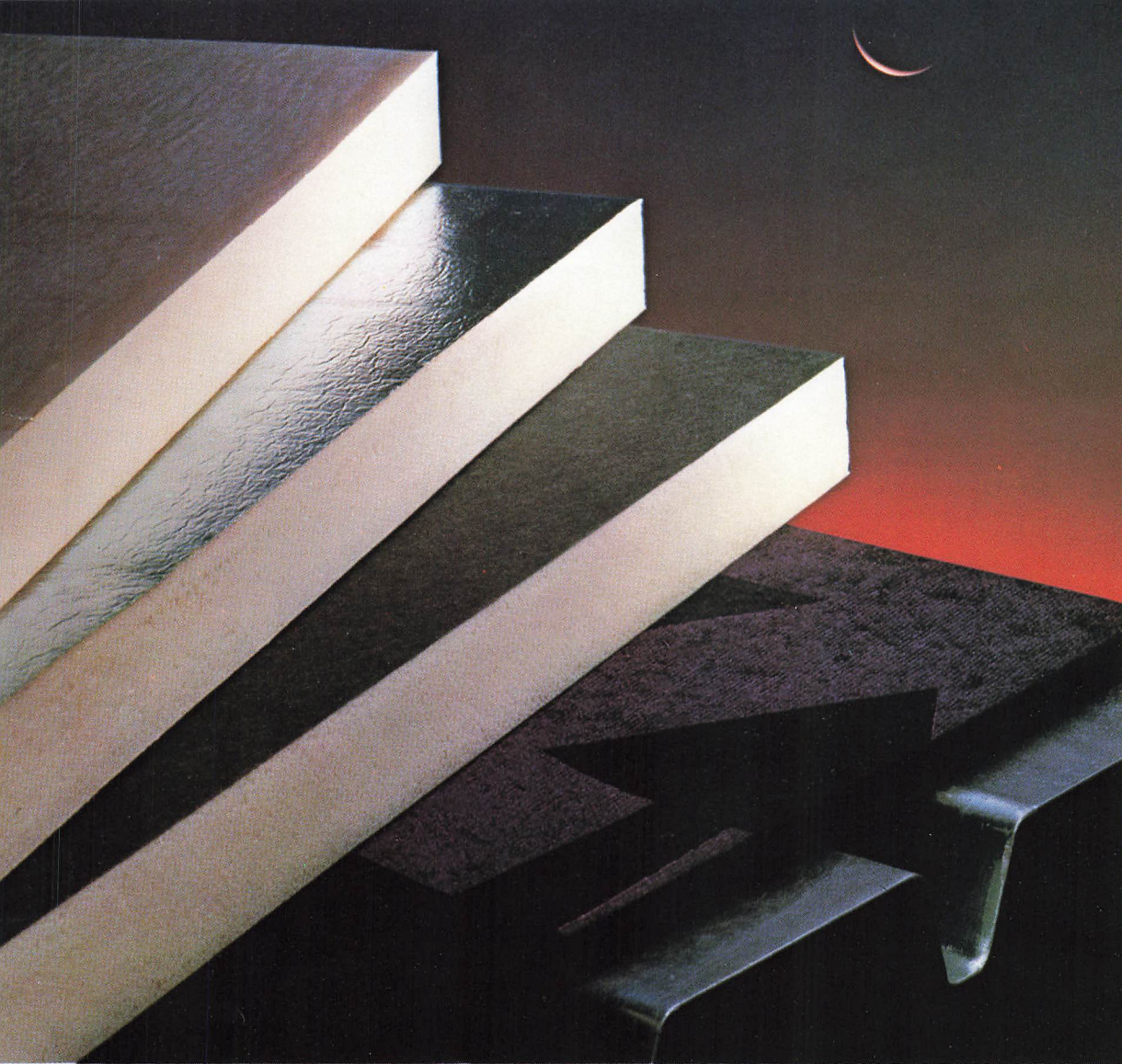
Precision cut square edges expedite professional quality installations.



Superior surface characteristics offer improved base for fully or partially-adhered surfaces.



Greater tensile/transverse properties add extra mechanical attachment strength.



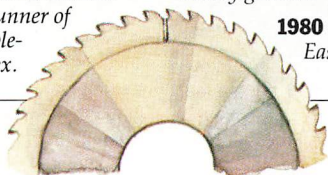
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When you need the most efficient insulation product you can get for your roofing application. Temple-Eastex has it. ■ With Fiber Base roofing substrate, you get high compressive strength and durability in an economical asphalt-coated fiberboard. It's ideal for retrofit built-up roofing and single-ply systems. ■ When you want the energy efficiency of a polyisocyanurate core, choose TemPro Standard. It comes with non-asphaltic facers and can be used in all types of roofing systems. Or for single-ply ballasted and mechanically fastened systems, go with TemPro SP, the polyisocyanurate insulation with the fiberglass reinforced foil facers. These products provide maximum R-value with minimal thickness, and are Factory Mutual and Underwriters Laboratories approved. ■ Temple-Eastex will keep you on top of all your roofing needs. Call toll free: 1-800-231-6060. In Texas, 1-800-392-2872.



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1893 A new forest products supply company was formed in East Texas by T. L. L. Temple. It was the forerunner of Temple-Eastex.



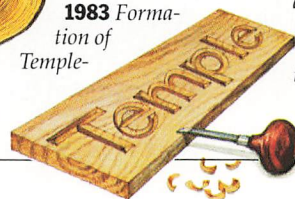
1958 Expansion into the manufacturing of fiberboard products after 60 years of steady growth.



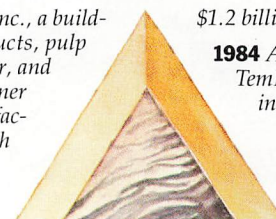
1980 Opening of the Temple-Eastex rigid foam insulation

plant in Diboll, Texas.

1983 Formation of Temple-



Inland, Inc., a building products, pulp and paper, and container manufacturer with



\$1.2 billion in sales.

1984 Addition of TemPro roof insulation to the company's product line.

U.S. roofing research falling behind European efforts

For all practical purposes, the amount of roofing research being conducted in the United States today adds up to zero.

The programs that are underway in some government laboratories, such as the National Bureau of Standards (NBS), the Construction Engineering Research Laboratory, the Cold Regions Research and Engineering Laboratory and more recently, the Department of Energy-supported work at the Oak Ridge National Laboratory are only token efforts. As far as we know, little if any roofing research, other than some product development work, is underway in the manufacturers' laboratories.

Because of this situation, it is not surprising that the roofing industry has given us so few standards in spite of the fact that we must depend on this multi-billion dollar business to protect our homes, schools and workplaces. Standards don't just happen! They must be backed by the data and technical information that are the products of the research process.

Although several groups in this country are actively developing standards, very little progress has been made that will have a significant impact on the roofing industry or the public it serves. Considering the roofing industry's size, it is difficult to believe that it cannot supply the resources needed to improve its products' stature. If just a small fraction of the advertising and promotion budgets were allocated to research efforts, the payoff in improved design, materials and construction practices would be large indeed.

William Cullen is a research associate with NRCA's Technical Department. He recently visited Britain's Building Research Establishment laboratories, touring the Building Research Station in Garston and the Princes Risborough Laboratory in Buckinghamshire. In 1984, he toured the Centre Scientifique et Technique du Batiment laboratories in France.

Token U.S. efforts no match

by William C. Cullen

In the meantime, the absence of composite built-up membrane and single-ply standards in the United States has sometimes resulted in the marketing and application of unacceptable materials. Even though this has frequently led to customer dissatisfaction and litigation, it seems that many of us are satisfied to have things remain at the status quo for the foreseeable future.

The European approach

The roofing industry in Europe, on the other hand, approaches the issues of research and standards differently. I have had the opportunity to work side-by-side with European technical committees and have seen firsthand the nature and results of their testing and research activities. Based on the evidence I have gained from my contacts with European colleagues, I can categorically state that Europe's activities in this area far outdistance research and testing activities in the United States.



The author (far right) on a tour of the Building Research Establishment's (BRE) Princes Risborough Laboratory in Buckinghamshire, England. Joining him on the tour are (from left): John Beech, of BRE's Flat Roof and Sealant Section; Walter Rossiter, a research chemist with the National Bureau of Standards; and Bob LaCrosse, director of NRCA's Technical Department.

I can categorically state that Europe's activities far out-distance research and testing activities in the United States.

One example of Europe's greater commitment to research and testing may be seen in the work of France's Centre Scientifique et Technique du Batiment (CSTB). Researchers in CSTB's laboratories outside of Paris and in the field take great pains to evaluate roofing materials, design and applications, and their findings are often quite influential. The decision to accept or reject a roofing material for use in France may be based on CSTB's test results.

Important roofing research is also being conducted at the Building Research Establishment (BRE), a government laboratory in the United Kingdom. At two of BRE's facilities researchers evaluate the more practical aspects of material performance such as durability and in-service life. They also study water, heat and moisture transfer.

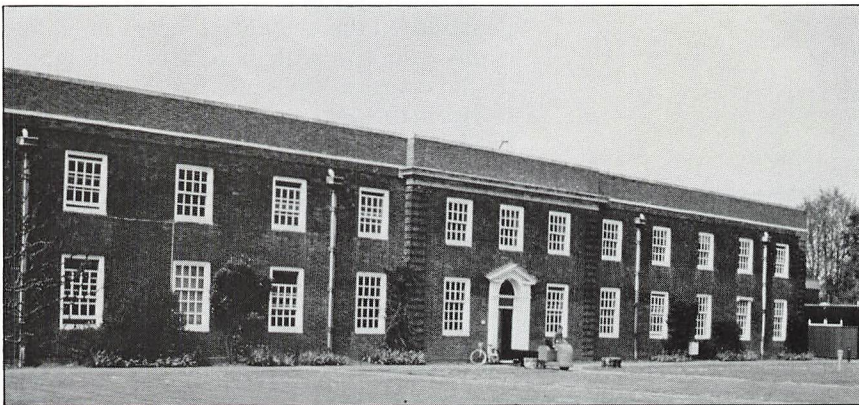
European roofing research isn't limited to France and England, however. Studies are being conducted all across the Continent. The Bundesanstalt für Materialprüfung in West Germany, the Bouwcentrum of Holland, and the Industrializzazone e la Tecnologia Ediligia of Italy, as well as facilities in Denmark, Spain, Portugal, Austria and Belgium, all sponsor roofing-related programs.

The widespread availability of roofing research has allowed many countries in Europe to formulate significant national roofing industry standards. More often than not, these standards are prescriptive in nature. Each country has an organization quite similar to this country's American Society for Testing and Materials (ASTM) that uses the laboratories' test results to prepare and circulate consensus standards for materials, test methods and construction practices. In France the Association Francaise de Normalisation is the official standards organization. It is non-governmental, but a substantial portion of its operation is publicly funded. The independent, non-profit British Standards Institute is the nationally recognized standards organization in Britain. The Deutsches Institut für Normung is the private, non-profit standard-writing group of West Germany.

A standard complement

By working cooperatively, European countries have also been able to develop performance documents to complement their prescriptive standards. Most of this work has been accomplished under the auspices of the European Union of Agreement (UEAtc).

UEAtc membership includes organizations from Britain, West Germany, France, Holland, Austria, Italy, Denmark, Belgium, Spain and Portugal and an observer representative from Erie. Each of these countries has established a national authority for the testing and evaluation of building materials and construction methods. These national authorities test, evaluate and certify construction products to ensure their safe and effective use. They award "Agreement Certificates" to products that demonstrate an acceptable standard of performance during testing. UEAtc's major objectives are to coordinate the activities of these organizations and to ensure that "Agreement Certificates" issued by different members are equivalent.



BRE's Princes Risborough facility in Buckinghamshire, England, where much of the organization's roofing research takes place.

Command performance

UEAtc has been very active in developing roofing performance guidelines. In January 1983, UEAtc member organizations issued a general directive for the assessment of roof waterproofing systems. The directive's approach is related to the in-service performance of the roofing membrane. Unlike efforts in the United States, the directive does not prescribe standards, which may describe good PVCs, good rubbers, good bituminous felts and so on, without describing good or even acceptable roofing membranes. The UEAtc document provides evaluation guidelines that use the classic performance approach to assess roofing systems with any type of membrane, whether built-up or single-ply. Neither generic materials nor their method of manufacture or application are referenced in the directive.

A straightforward guide

The general directive is a straightforward, realistic guide to assessing the quality of a roofing system. The information it contains is written in easy-to-understand, non-scientific language. First, it provides guidelines for the classification of roof systems. According to the document, systems may be classified by:

- the type of membrane;
- the accessibility of the roof;
- the roof slope; and
- the method of membrane attachment.

Next, the document details the quantitative requirements that must be met for:

- safety;
- fitness for use;
- durability;
- workability; and
- maintenance.

The directive also describes a series of test methods to be used to assess roofing products' on-the-roof performance. These basic test methods apply to all membranes regardless of type. They are designed to test a membrane's:

- fire resistance;
- water resistance;
- wind uplift resistance;
- thermal shock resistance;
- peel strength;
- dimensional stability;
- static indentation;
- dynamic indentation;
- slippage;
- cyclic movement; and
- water vapor permeance.

The directive also requires further tests to evaluate a material's resistance to tearing and low temperature flexibility. These properties are related to a membrane's ability to withstand handling at the jobsite.

Single-ply membranes must be subjected to an additional series of tests, according to the directive. These tests evaluate a single-ply system's seam strength, its resistance to seam leakage and its durability in the presence of high temperatures or water.

The general directive was supplemented with three special directives in 1984. These special directives give specific guidelines for the assessment of PVC and SBS- and APP-modified bitumen sheets, dictating specific requirements for the components of the sheet materials, their application parameters and durability. It is interesting to note that these tests are not only for the sheet materials themselves, but also for field-formed laps and seams.

Europe takes the lead

In the area of research and performance standards, our European colleagues have a clear advantage. In private- and public-sector laboratories all over Europe, scientists are engaged in basic, applied and problem-solving roofing research, and their findings are being used to develop performance-oriented directives such as UEAtc's. More importantly, these directives are being used to evaluate materials, so that only quality products will be accepted for use. These performance directives are complemented by each country's prescriptive standards, which describe generic materials.

The UEAtc document provides evaluation guidelines that use the classic performance approach to assess roofing systems.

Most of the token projects being conducted in this country are in the problem-solving category.

By comparison, roofing research activity in the United States seems insignificant. Most of the token projects being conducted in this country are in the problem-solving category. In light of this situation, it is not surprising that the development of performance or prescriptive standards in the United States has been a slow process.

In this country, there are no standards available for the composite built-up membrane, although prescriptive component standards have been available for decades. And while ASTM has been attempting to develop standards for the newer materials since the late 1970s, its only success to date has been the adoption in 1985 of a prescriptive standard for PVC sheet materials. Nonetheless, some progress is being made; a standard for rubber-like membrane materials is nearing completion. But the development of modified bitumen membrane standards is still a few years away.

The only performance standards developed in the United States have been the preliminary performance criteria NBS published for bituminous roofing membranes in 1974 and the MRCA recommended performance criteria documents for PVC, elastomeric and modified bituminous membranes, which were published in 1981, 1982 and 1983 respectively. These documents have found little acceptance in the roofing industry in spite of the efforts of NBS and the Midwest Roofing Contractors Association. The information contained in these documents has certainly not been used to evaluate materials.

Studying abroad

Perhaps we in the United States can learn from the experiences of our European colleagues over the past decade and apply them to our own methods. This is not to suggest that everything is perfect in the European roofing industry. Each European country has its share of problems and litigation resulting from faulty design, material and construction practices. However, these problems are being addressed constructively and cooperatively through research and the development of performance and prescriptive standards.

But before we can profit from the European roofing industry, we must know where the roofing industry in this country wants to go. The following are the needs of the U.S. roofing community that I believe must be addressed:

- The industry must have the resources to conduct realistic, applied research at public, academic and independent laboratories.
- The industry must increase and accelerate its progress in the development of prescriptive standards under the auspices of ASTM and the American National Standards Institute.
- The industry must initiate and pursue the development of performance-oriented documents similar in nature to the UEAtc directives to complement its prescriptive standards.
- The industry must develop standards information into some sort of acceptance process to give designers, materials manufacturers, contractors and owners confidence in the quality, service and performance of the products they design, apply, buy and sell.

Historic roofing: half art and half science

Roofing can be an important part of a renovation or restoration project. The designer and contractor must work together to preserve the original aesthetics of the old roof while adding the durability and energy efficiency today's materials can provide.

The following four examples detail projects that were enhanced both aesthetically and structurally by the addition of a new roof system.

Contractor at Bay uses urethane insulation

Joining the ranks of Boston's Faneuil Hall and Baltimore's Harborplace as a major restoration and revitalization project is Bay Street Landing, a new residential and commercial community on New York City's Staten Island.

The project involves converting seven turn-of-the-century warehouses into open-space apartments and a commercial pavilion. A marina, hotel, and health and racquet club will be among the amenities featured. Bay Street Landing's location will offer breathtaking views of New York harbor and the Manhattan skyline.

Like its predecessors, Bay Street was designed to preserve existing industrial and seaport elements. Exposed wood and concrete slab ceilings, brick, hand-hewn timber and authentic bollards will add to the building's rustic charm.

To bring the commercial pavilion up to today's energy efficiency standards without covering its handsome tongue-and-groove wood ceiling with insulation, nailable urethane board is being applied to the existing roof deck's exterior and then covered with shingles.

Blending new materials with old buildings

The nailable insulation, manufactured by NRG Barriers, Inc., of Sanford, Maine, is made from urethane chemicals produced by the Mobay Chemical Corp. of Pittsburgh. The rigid, closed-cell, urethane foam is bonded to waferboard on one side and to asphalt-coated fiber glass facers on the other. The 3-inch thick insulation provides a thermal resistance of about R-21.

The roof insulation, coupled with an efficient R-19 wall insulation system, provides an effective thermal envelope that resists the passage of heat and cold, according to the project's designer James E. Nealand, AIA, of New York City. Thermal efficiency is important to the project because its location exposes the 45,000-square-foot building to the cold winter winds that sweep off the harbor. In the summer, temperatures often climb to the 80s.

"Our primary design objective was to leave the existing timber roof exposed. But we also needed to insulate the roof to meet local energy code requirements and to keep heating and cooling costs down," Nealand explained.

"In addition," he continued, "we wanted to be able to shingle the sloped roofs for aesthetic reasons. The nailable urethane board allowed us to achieve all of these objectives."

To install the 47-inch-by-96-inch insulation board, workers had to remove and repair the deteriorated and uneven areas of the decades-old built-up roof. The insulation boards were then secured to the wood deck with common nails that penetrated 1½ inches into the deck and were placed every 8 inches along the width and every 24 inches along the length. The boards were laid with the longer dimension parallel to the eaves. End joints were staggered at least 12 inches apart.

The artistry of a 23-year-old roofing contractor has helped restore a 100-year-old national landmark.

This octagonal roof was no obstacle for Phil Hogan Roofing and Sheet Metal, Portland, Ore. Hogan's metal reroofing work on Portland's Pioneer Courthouse has been hailed a "mastery of hands-on roofing creativity."

At points where the composite boards intersected with structural members, 7-inch nails were used to penetrate through the roof deck and 1½ inches into members for reinforcement. Wood nailing strips equal to the thickness of the board were installed along eave and rake edges. Then, roofing tarpaper and asphalt shingles were applied to cover each day's insulation work.

Complex roof renovation is a terne-coated work of art

On the West Coast, the artistry of a 23-year-old roofing contractor has helped restore a 100-year-old national landmark.

Phil Hogan of Phil Hogan Roofing and Sheet Metal, Portland, Ore., has built his reputation on restoring historical structures. His new dome on the Pioneer Courthouse in Portland is what *Portland*

Magazine referred to in a recent article as a "mastery of hands-on roofing creativity."

Using 22,000 square feet of 28-gauge, .015 terne-coated stainless steel (TCS), Hogan and his team spent three months replacing the original terne that had been put on the building more than 100 years ago. Hogan chose TCS for the project because it doesn't crack, peel or flake. It is the ultimate metal for use in weather sealing applications because the terne coating enhances soldering, he explained.

Expansion and contraction damaged the Courthouse's original roof. The joints, while pieced together with great care, were soldered tight, leaving the roof rigid. Also, the dome's copper and roof's terne were nailed directly to the wood beneath. "They didn't know about expansion joints in those days," laughs the affable artisan.



One of the main obstacles Hogan faced was the roof's shape—an eight-sided dome. Because of the job's complexity, Hogan installed a direct telephone line to the manufacturer in the attic under the roof. This allowed the manufacturer to “talk us through technical problems as they came up,” he said.

Hogan's company has done churches, post offices, a train depot and several historical monuments. “This kind of work is a profitable labor of love,” he explains. “Since the roof should last 200 years, it's really a monument to the city.”

CSPE roof renovated under deadline

When Brattleboro, Vt., decided to reroof its historic municipal center, it faced a challenge. The work had to be completed in 240 days. The roof was the first step in renovating the building. The eight-month deadline was necessary for the town to qualify for a federal grant under the Emergency Jobs Bill.

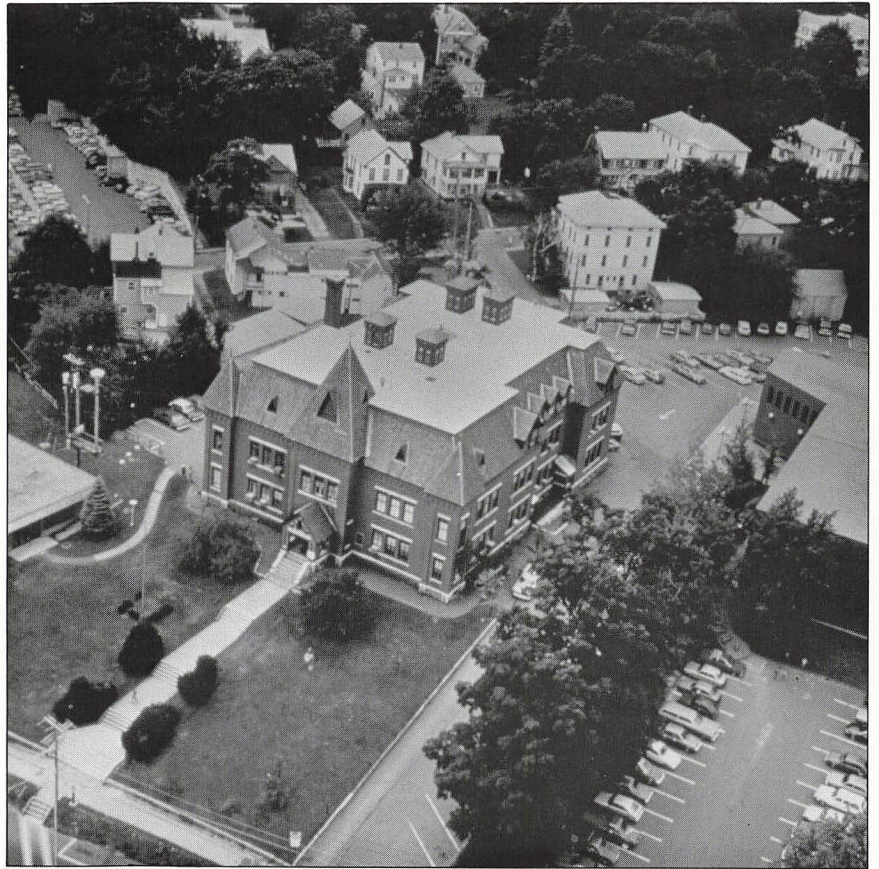
The municipal center, which was built in 1884, is listed in the National Register of Historic Buildings. Repair of the mansard-style roof, with its numerous angles and valleys, required work on badly rotted wooden air shafts, a terminally corroded skylight and other penetrations.

The 35-year-old roof on the facility had been leaking badly. On rainy days at least 25 buckets were needed to catch the drips, recalls general contractor Art Greenbaum, president of GPI Construction.

After the old built-up roof was torn off and a slate section repaired, a new Hi-Tuff single-ply membrane system from J.P. Stevens & Co., Inc., of Easthampton, Mass., was installed on the roof's flat portion.

The town awarded the roofing contract to Brattleboro Roofing & Sheet Metal Co., Inc., whose president, George “Ed” Bedard, has used Stevens Hi-Tuff since its introduction and recommends it for its durability, ease of installation and aesthetic quality. “It's a trouble-free system—one I feel secure with,” Bedard said.

The OJR-H architectural firm of Putney, Vt., submitted plans to the State Historic Preservation Bureau for materials approval, said Thomas Lynch, director of community development.



In four weeks, Bedard had stripped the 5-ply pitch and gravel roof to the board. He then installed 9,000 square feet of single-ply Hi-Tuff membrane. The new watertight roof was mechanically attached and field-seamed with a self-propelled automatic hot-air welding unit to produce seams as strong as the material itself.

A unique blend of old and new was accomplished by adding special touches such as copper flashing, slate restoration and refurbished finials to the ultramodern roof. The steep pitch of the roof's slate portions made the detail work difficult. Elaborate scaffolding was used to help repair the mansard features, which included wooden louvers, marble sills and a 96-square-foot glass skylight built to duplicate the original.

Even with the added attention to detail, the roof was completed a month before the federal deadline, said Greenbaum. A prompt inspection by Stevens helped the process.

The Brattleboro municipal center's mansard-style roof receives a blend of old and new as it is reroofed with a single-ply roofing system and finished with copper flashing and slate refurbished finials.

A unique blend of old and new was accomplished by adding special touches such as copper flashing, slate restoration and refurbished finials to the ultramodern roof.

"It's a quality roof. I've used Stevens for the last three years and never had a failure," Bedard said. Hi-Tuff also withstands the effects of ozone, sunlight, chemicals and industrial pollutants, while retaining its flexibility and elasticity over a wide range of temperatures.

The new historic municipal center is now a source of pride for the town. "The roof looks like a sculpture—just beautiful," said Bedard. Additional renovation can now follow. On its 100th anniversary, the old Victorian building has a new image—one that can stand up to rainy days.

Concrete tile makes a significant contribution

When the decision was made to restore the Broadmoor and Greenwood housing areas at Fort Lewis, Tacoma, Wash., the project was complicated by the military facility's historical significance to Tacoma and Washington.

Fort Lewis, or Camp Lewis as it was first known, was the first military installation constructed on land donated by private citizens. Washington's Pierce County citizens voted to tax themselves for 20 years in order to purchase 70,000 acres and donate the land to the federal government for the construction of a military base.

No effort was spared in the design and construction of Fort Lewis, which was built in the late 1920s and early 1930s. Under the direction of George B. Ford and Frederik Olmstead, two prominent urban designers, the Fort symbolized the very best in urban planning. The design provided unity to groups of buildings, creating a harmonious composition. The way the buildings were laid out also patterned well from the air.

When plans for refurbishing the Broadmoor and Greenwood areas began, the roofs were given first priority. The existing Ludowici-fired clay tile, which compliments and enhances the overall building design, had been in place over 50 years and was considered to have historic value.

However, the tile fastening system was rapidly deteriorating, and the subroofs were leaking. In order to protect the structures, the clay had to be replaced. The mandate was, however, to replace it with an identical or less expensive material that had the same aesthetic appeal.

At first the renovators planned to simply install new Ludowici tiles. In considering this possibility, a joint committee composed of the Washington State Preservation Office, the Advisory Council on Historic Preservation of Washington, D.C., and Fort Lewis' own Facility Engineering Department concluded that clay tile was too expensive to warrant serious consideration. Slate was also discarded because of cost and longevity concerns.

The Fort Lewis development team turned to Monier's Northwestern Region office in Tacoma for help in solving the Broadmoor and Greenwood dilemma. Facility Engineering was already familiar with Monier because they had previously used the company's 400 Flat Tile series on the roof of a general's quarters at the Fort. This information was turned over to the U.S. Corps of Engineers in Seattle, which was responsible for the project.

The Corps decided that, while Monier's flat tile was priced within budget, its aesthetic characteristics were inappropriate. Monier then made a presentation of its new satin mat finish Classic profile tile, which the Corps agreed met all the established standards.

The International Roofing Co. was chosen to reroof the buildings. The workers began by stripping the old clay tile and replacing it with new Monier tile this summer. More than 4,000 squares of Monier Classic roof tile will be used to reroof the 200 buildings that comprise Broadmoor and Greenwood.

Saving energy: contractor's PC shows clients how

Professional roofing contractors don't necessarily work harder, just smarter. At least that seems to be the philosophy of Charles "Rusty" Griffiths Jr. of Binghamton-Slag Roofing Co., Inc., Binghamton, N.Y.

Last year, Griffiths programmed the company's Apple Macintosh personal computer to analyze the energy conservation characteristics of his clients' roofs. Griffiths explains that the main purpose of his program, which incorporates all the data from the *NRCA Energy Manual*, "is to determine the amount of roof insulation needed in a commercial or industrial building." The program also estimates annual energy savings and the payback period.

By letting the machine do the tedious math, Griffiths found it much easier to show customers how having more efficient insulation installed could save them money.

The program, once Griffiths had it up and running, proved to be an effective marketing tool for the company as well. "It's been 100 percent successful," Griffiths claims. "It's helped us capitalize on every job where we've had the opportunity to help an owner understand how insulation works to his benefit."

Architects who call on Binghamton-Slag for roof design guidance or recommendations have also found the program's output persuasive. Griffiths says that in many cases he has been able to convince architects that higher R-value insulation would perform better than the insulation specified. "To justify our recommendations," he says, "we encourage architects to make the calculations themselves. However, if they're not comfortable doing it, we'll do it for them."

The Apple program has enhanced more than Binghamton-Slag's insulation sales, however; the company's image has had a big boost as well. By providing useful and accurate information to its customers, the company has increased its status as a knowledgeable, professional organization. Griffiths believes this "puts us in a different class than the guy who just wants to sell a roof and make a quick profit."

Saves contractor energy too

by Jim Matthews

Manual labor

Griffiths was analyzing roof energy use long before his computer program was developed. He began shortly after the *Energy Manual* was published in 1977, hand-calculating energy use according to the *Manual's* formulas. However, performing all the computations manually proved to be a very time-consuming task. "I wanted something that would do the math after I plugged in the variables," he says.

After investigating different possibilities, Griffiths decided a computer with spreadsheet software offered the quickest and simplest way to analyze roof data. He chose Apple hardware and *Multi-Plan* software because the combination wouldn't require a computer wizard to make it work. "I got the Apple because it's so easy to use," he confesses. "I didn't have much experience with programming computers, and I didn't want to re-educate myself."

The *Multi-Plan* software proved to be just as simple as the Macintosh. Griffiths claims it took him only a couple of days to get reliable results from the system. "You just keep playing with the data until it comes out right. You debug as you go, so there are no unpleasant surprises at the end. It's all part of the way the spreadsheet works," he says.

Spreadsheet offers calculated success

An electronic spreadsheet is a gigantic grid containing as many as 250 columns across and 1,000 rows down. When a column and row intersect they form a box, or cell. The spreadsheet user can place one piece of data, such as net sales for January or the R-value for a steel roof, in each cell.

Once all the numbers are entered into the cells, the software's real power becomes apparent. By applying pre-

Jim Matthews is a free-lance writer from Chicago and a frequent contributor to Roofing Spec.

**"We're talking about numbers that will make the uninitiated call you a liar."
—Griffiths**

assigned formulas to the data, the program can calculate whatever results are needed. The formulas, which users insert wherever necessary, can be simple or complex. For instance, the program might be told to add all the numbers in a column or row, or to multiply the number in one cell by the number in a second cell and put the result in a third.

The formulas Griffiths incorporated into *Multi-Plan* were taken from the *Energy Manual*. To analyze a specific building's energy use with the program "all you have to do is input the variables—the building's dimensions, its use and the materials used in its roof," Griffiths says.

Even though automating the roof analysis has taken much of the tedium out of the process, collecting the raw data is still an important human function. To compute an overall R-value for the roof system, all the components in the system, from the interior ceiling to the roof deck, and their respective R-values must be determined. "Even trapped air spaces above suspended ceilings must be known and figured in," Griffiths says, "because they can provide insulating value."

Griffiths has simplified the data-gathering process somewhat by filing information from the *Energy Manual* in a separate section of the *Multi-Plan* program. He has entered the *Manual's* Table 9, which lists the R-values for the most commonly used roofing components, into this section. Now, when he analyzes a roof, he can select the R-values that apply to the roof's components from this electronic file and plug them directly into the spreadsheet's formulas.

Think of the possibilities

With the help of the computer program, showing an architect or building owner the cost and energy savings possible with different components is simply a matter of changing a few of the variables. "You can have existing insulation, and, say, a proposed higher R-factor insulation. Then you add up all the other components of the entire roof system. You put in the type and cost of fuel and that's basically all there is to it," says Griffiths.

Although the results of Griffith's calculations are only estimates, they can be quite close to the results of a more detailed analysis. After Griffiths presented estimates of how much a school board could save by installing roof insulation in one of its buildings, the board retained a professional engineer to verify his figures. According to Griffiths, "The PE's estimate, which was based on a complex heat transfer analysis,

turned out to be just a few percentage points different than mine."

Selling more than price

Griffiths says that his program enables him to suggest options in his bids that other roofers don't consider because the added cost of the options would make their bids uncompetitive. Many roofers minimize the amount of insulation they'll install so their bids will be as low as possible, Griffiths believes. But, he asserts, if the contractor can present evidence in a bid that the added expense up front will actually save money in the long run, the building owner might consider him over lower bidders.

Consequently, Griffiths submits two quotes if an energy analysis indicates that insulation will benefit the owner. One quote is his price to install a roof with minimal insulation. He submits this bid to stay in the same ballpark as the other bidders. His second quote includes the cost of the insulation plus the projected annual operating savings it can provide. "We give building owners several options," Griffiths notes. "By showing owners the options, which come from our energy analysis program, we get them involved in the decision-making for their own project."

The money-saving information quite often comes as a pleasant surprise to the owners. It's been Griffiths' experience that before he submits his bid, most owners have absolutely no idea how much money roof insulation can save them. When they see Griffiths' figures they are often astounded at the difference. "We're talking about numbers that will make the uninitiated call you a liar," he says.

But because the formulas in the *Energy Manual* only yield estimates, Griffiths presents the information carefully. "I don't guarantee my estimates," Griffiths emphasizes. When building owners want more detailed energy cost savings estimates, he suggests they hire a specialist to conduct the necessary tests and perform the sophisticated calculations required for more precise results.

Griffiths believes that by providing services such as his roof energy analysis he is strengthening his company's image as a professional organization. When owners discover that added insulation can pay for itself as well as a new roof, they ask, "Why didn't those other roofers tell me about that? Don't they know what they're doing?"

This distinction between Binghamton-Slag and its competitors is important, Griffiths says. "We get the job and end up with a satisfied customer."

Global roofing community gathers for International Symposium

Roofing experts from around the world will be gathering this month for the Second International Symposium on Roofing Technology, being held at the National Bureau of Standards (NBS) headquarters in Gaithersburg, Md. Joint sponsors of the meeting are NRCA, NBS and the International Union of Testing and Research Laboratories for Materials and Structures (RILEM).

During the three-day Symposium, nearly 1,000 participants will exchange information on the science and technology of roofing. Through the formal presentation of 80 juried papers, attendees will have the opportunity learn about worldwide advances in roof design, construction, performance and materials. Informal gatherings during meals and receptions will give international colleagues the chance to meet and talk face to face.

Most of the meeting's registered attendees will be coming to Gaithersburg from other parts of the United States or Canada. Some, however, will be coming from as far away as New Zealand and Japan. At press-time, representatives from 17 countries, coming from every continent except Antarctica, had registered for the meeting.

The wide range of papers being presented at the Symposium will ensure a truly global exchange of information. Symposium participants will have the opportunity to learn about roofing practices and research in such countries as France, Australia and the People's Republic of China.

Each paper submitted for consideration went through a lengthy review and editing process by a panel of reviewers and professional editors. The papers that were selected for presentation at the Symposium were chosen for their originality, appropriateness, significance, technical accuracy, organization and completeness, and objectivity.

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80
papers**

Accepted papers were returned to the authors for revision and then sent to a technical editor, who proofed them for consistency, grammar and punctuation.

All of the papers have been printed in a hardbound book that is part of the materials each Symposium attendee will receive.

Shuttle bus provided

Early Wednesday morning, Sept. 18, the first shuttle bus will leave the Washington Hilton hotel for NBS headquarters in Gaithersburg. On the first morning, the buses will take attendees from the Hilton to NBS from 6:30 to 7:15. On the following two mornings the buses will run from 6:30 to 7:45. All departure times are approximate, however, because the buses will leave as soon as they are filled.

After the sessions on all three days, attendees will be able to take shuttle buses to the planned evening events or back to the Hilton. After the last day's sessions, transportation will also be provided from NBS to the Washington airports. Reservations for this service must be made prior to the last day, however.

Broad scope presents challenge

Special accommodations were necessary to handle such a large and diverse group of roofing experts. Because of the number of papers being presented and the large number of attendees, it was necessary to schedule simultaneous presentations in two different halls, the Red Auditorium and the Green Auditorium. Signs posted in the registration area will help participants identify these two rooms.

The sessions' locations will be listed in the Symposium program. The larger Red Auditorium, which seats about 800, will be reserved for sessions covering topics with broad appeal. The smaller Green Auditorium, which holds about 300, will be the location for more specialized topics.

Special accommodations were necessary to handle such a large and diverse group of roofing experts.

The official languages of the conference are English and French. All Symposium presentations will be simultaneously translated. Presentations in English will be translated into French and German, and presentations in French will be translated into English. Attendees will be able to hear the translated versions of the presentations through headphones provided at their seats.

Three days of presentations

With words of welcome, officials of the three sponsoring organizations will open the Symposium and greet the gathered attendees on Wednesday morning. Immediately following the opening remarks, the authors of three invited papers will present their views of roofing in North America, Europe and Asia. Richard Fricklas, director of the Roofing Industry Educational Institute, will describe North American roofing; William Allen, senior partner, Bickerdike Allen Partners, London, will outline Europe's roofing practices; and Michio Koike, a professor at the Research Laboratory of Engineering Materials, Tokyo Institute of Technology, will detail Japanese roofing techniques.

The welcoming remarks and the invited papers will be presented in the Red Auditorium. Attendees may also hear the presentations over the public-address system in the Green Auditorium.

After the invited speakers have provided a general overview of roofing around the world, other roofing experts will present papers that get down to specifics. Symposium planners have grouped these presentations into sessions, lasting 1½ to two hours. Each session will feature papers focusing on a particular roofing topic. During Session I-A, for instance, five papers will be presented that cover different aspects of quality assurance and repair.

Each session will be followed by a break or lunch. Attendees will be able to pick the sessions they wish to attend.

Because of the large number of papers being presented in such a short span of time, each presentation is being limited to 20 minutes. To maintain control of the schedule, questions will be answered only after all the papers in a session have been presented. Attendees will be asked to jot their questions on note cards that will be provided, and pass them to the session panelists to be answered.

Relaxation and food for thought

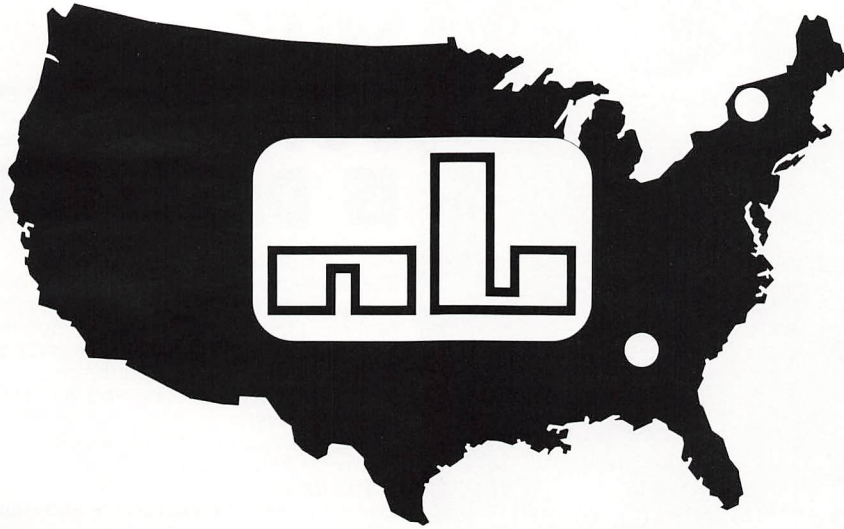
The Symposium planners have also included some social activities in the itinerary to give attendees the opportunity to relax and meet their colleagues in less formal settings. On Wednesday evening a cocktail reception is planned in the beautiful Cannon Caucus Room in the Cannon House Office Building. On Thursday evening a Symposium banquet will be given in the International Ballroom of the Washington Hilton. And on Friday after the sessions, there will be tour of NBS' facilities.

Meals and refreshments will be provided during the conference's lunches and breaks. Signs will be posted to lead attendees to the NBS cafeteria down the hall, where lunch will be served. Each morning coffee and rolls will be provided in the back of the cafeteria.

At presstime participants from 17 different countries had registered for the Second International Symposium on Roofing Technology. The following countries have representatives attending the meeting:

Australia	Italy
Belgium	Japan
Brazil	The Netherlands
Canada	New Zealand
Denmark	South Africa
England	Sweden
Finland	Switzerland
France	West Germany
Israel	

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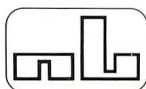
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What's the typical NRCA director like?

He (they're all male) is either from the South or the Midwest. More than 90 percent of his business is commercial work and about 70 percent of that is reroofing. About half of the roofs he installs are BUR, one quarter are EPDM, 15 percent are modified bitumen and 7 percent are PVC. And with a backlog of almost 3 1/2 months worth of work, he's expecting 1985 to be a better-than-average year. His forecast for 1986 is about the same.

Although you probably won't find a single director who fits this description exactly, many of them come close, according to an informal straw poll conducted at last July's Board of Directors meeting. The directors' answers to the survey were averaged to come up with this composite picture of the "typical" contractor serving on the Board.

The poll was an expanded version of an informal survey that has been conducted at the midyear Board meeting for the past few years. NRCA executives decided to plan a more formal survey this year to see if it

would yield more usable results.

During a brainstorming session at the midyear Executive Committee meeting, each Committee member suggested a question or two for the survey. The questions were phoned in to the NRCA office and quickly typed onto an overhead projector transparency. The next day, the questions were projected onto a screen during the Board meeting and the directors were asked to answer with information about their companies. As each director stood up and gave his responses, the answers were tabulated in the back of the room.

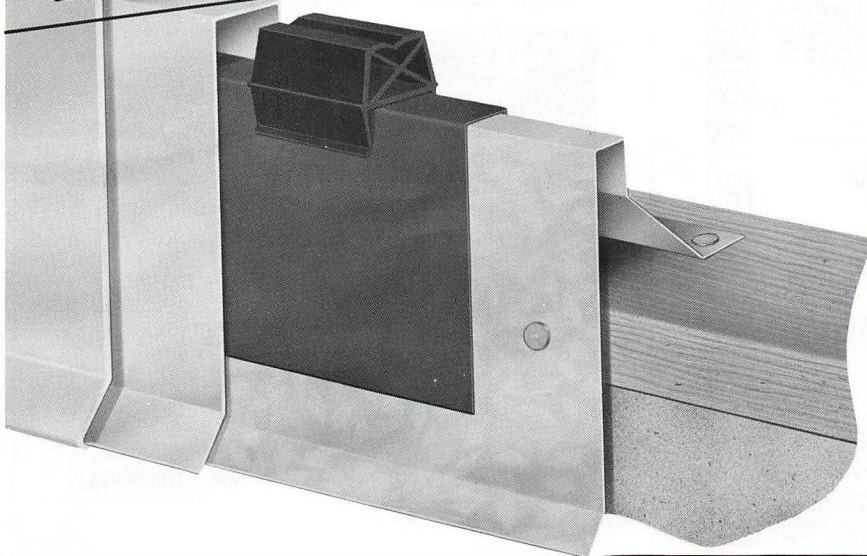
Although the sampling method would probably make George Gallup shudder, it did yield answers that give a rough picture of how the Association's leaders conduct business. The questions the directors were asked (along with the average response in parentheses) were:

1. What percentage of your low slope roofing business is:

- hot applied BUR? (90)
- modified bitumen? (15.6)
- PVC? (6.5)

Survey yields picture of typical NRCA director

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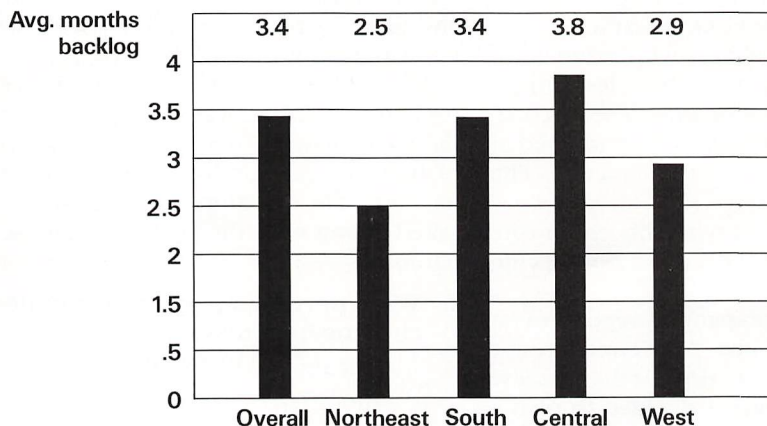
MM Systems Corporation
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Some regional differences did emerge in their responses.

- EPDM? (25.6)
 - all others? (4.1)
2. What is your backlog (in number of months)? (3.4)
 3. What percentage of your low slope roofing business is:
 - reroofing? (69.1)
 - new construction? (30.9)
 4. How would you rank on a scale of one to 10 (10 being the best) your business outlook for the calendar years of 1985 and 1986?
 - 1985 (6.6)
 - 1986 (6.4)
 5. What percentage of your roofing business is steep roofing? (7.5)

Average number of months backlog by region



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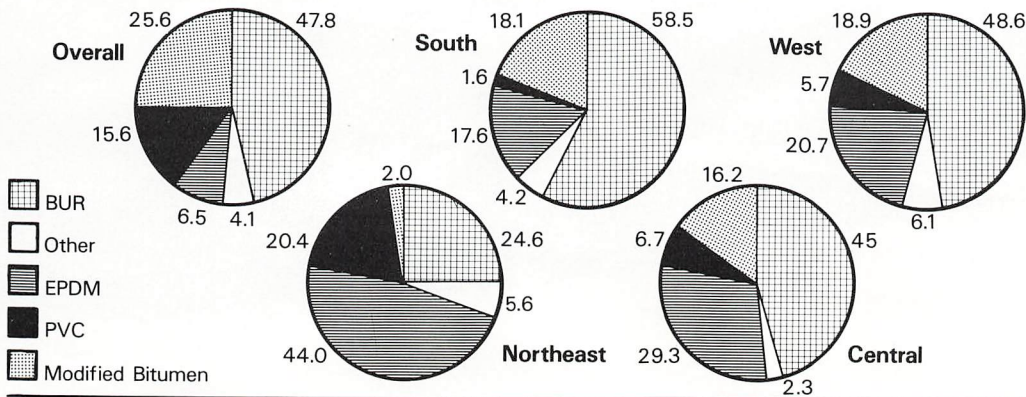
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Average percentage of total business by roofing type



According to the survey, the directors are a relatively like-minded group. However, some regional differences did emerge in their responses. The answers of the five contractors from the Northeast differed the most from the norm. Unlike the rest of the directors, nearly half of their work is EPDM and one fifth is PVC. BUR accounts for only one quarter of their business and only 2 percent of the roofs they install are modified bitumen. A little more than 80

percent of their work is reroofing. The Northeastern directors' backlog is also about one month less than the average; they said they have only 2.5 months worth of backlogged work.

The answers of the 14 directors from the South, the 14 from the Midwest and the seven from the West were all closer to the norm, although the directors from the West rated 1985 and 1986 a little better than everyone else.

NRCA executives decided to plan a more formal survey this year to see if it would yield more usable results.



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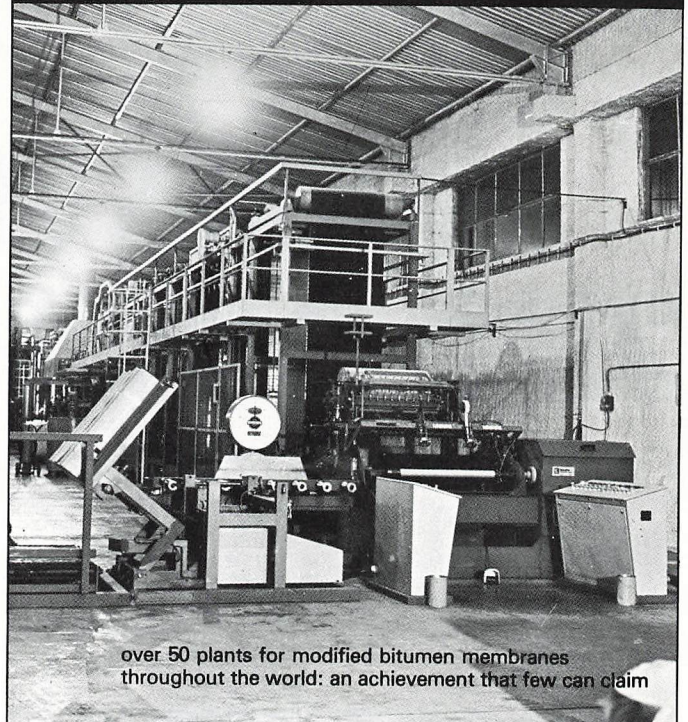
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Check #35 on Reader Service Card

Copper, clay and EPDM are some of the roofing materials being used on the widely publicized restoration of the Statue of Liberty and the Main Immigration Center on Ellis Island. The two monuments are being refurbished in preparation for the Statue's centennial celebration, scheduled to begin July 1986.

Most of the roofing work will be performed on the massive French Renaissance-style Main Immigration Center, where some 17 million immigrants were processed. The

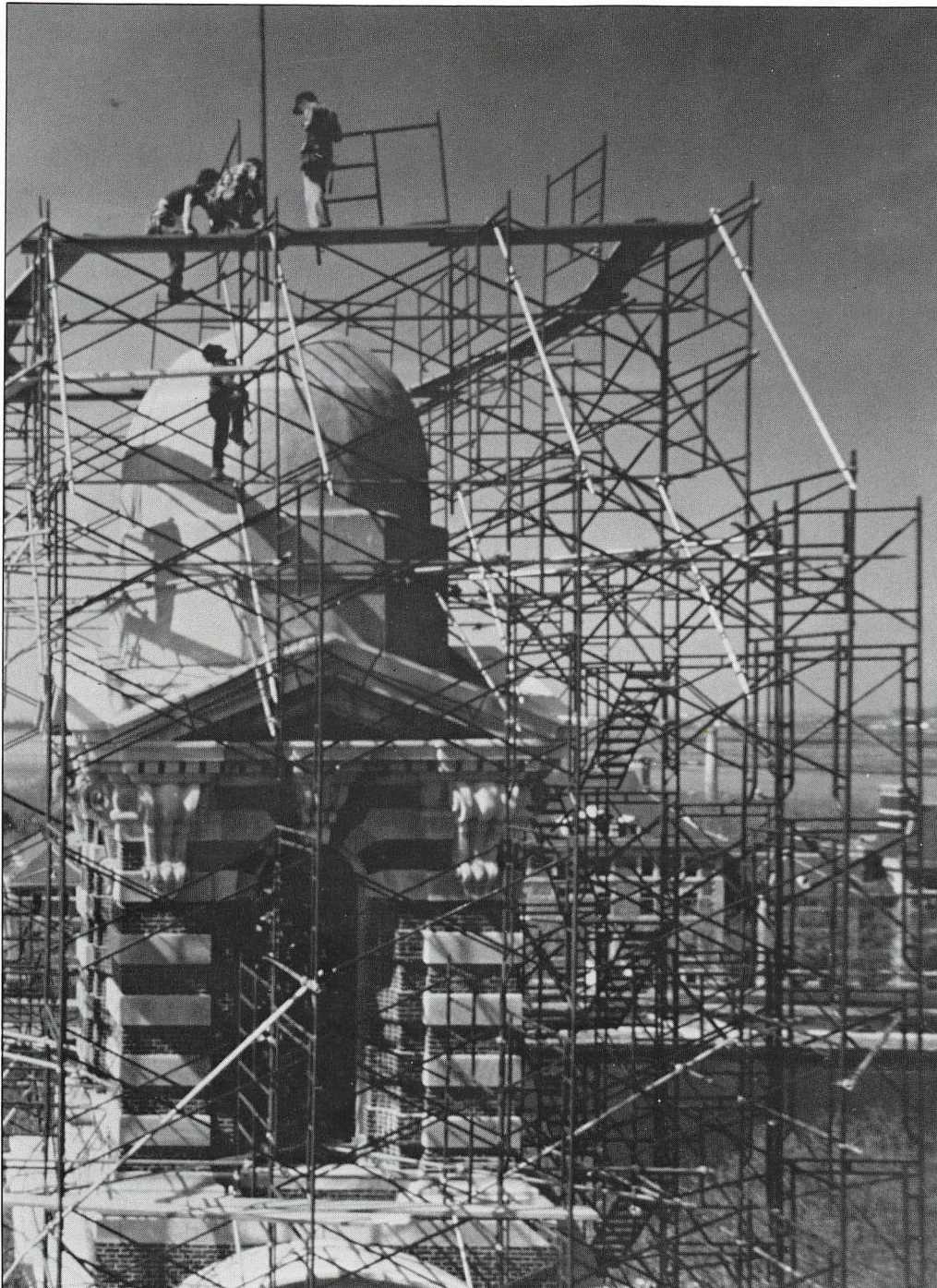
Center covers more than 222,000 square feet of Ellis Island. It was built in 1898 and has been closed since 1954.

A roofing challenge

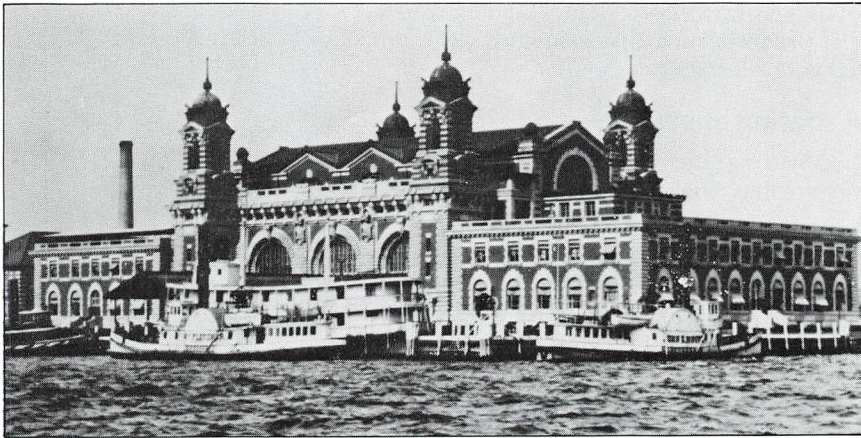
Restoring the building's large roofing surface has challenged the resources and ingenuity of the companies involved. Architect Bruce Heyl of Beyer Blinder & Belle, the New York firm overseeing the project, says, "We are constantly being faced with decisions about what materials will give us the best performance and still

Roof restoration part of Ellis Island project

The four corner towers of Ellis Island's main building are being reroofed with ornamental copper, as originally designed. They were temporarily roofed with concrete.



ON THE ROOF



Ellis Island's Main Registry Building, also part of the renovation project, was the major historic processing station for immigration to the United States.

remain compatible with the existing roof.”

Most of the roof will be replaced with the same type of Spanish and clay tile used in the building's original construction. But in many areas the tile is being patched with other materials. In spots where the roof is so badly worn that the building's steel frame is actually exposed, Heyl plans to apply an EPDM membrane system. “In areas that are not visible from the ground, we have chosen to use the lighter weight single-ply system because it puts less stress

on the existing structure,” he explains.

According to Heyl, the architects chose materials that they believed would perform best under the unique conditions present on Ellis Island. The manufacturer's warranties helped them determine which products were most suitable.

The roof project will also require the replacement of the building's four copper domes above the corners of the Registry Room and restoration of the building's decorative copper work. According to Heyl, this work has not started, although fabrication of the ornamental pieces that will replace the original decorative copper is well under way.

In addition to the current roof restoration, plans are under way to repair flaws in the exterior shell of the building and remove stains on the brickwork and stone. Internal drainage will replace the rain gutters. A dining terrace and a waterfront promenade will also be developed.

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ON THE ROOF

One of the problems with a project like this, says architect David Pitches of the New York firm of Swanke Hayden Connell, is maintaining the building's original appearance and making structural improvements when accurate plans that show the structure as-built are not available. The drawings of the original structures that are on hand are not always accurate, he said.

Making progress

The entire Ellis Island restoration project is scheduled to be finished in time for the station's centennial in 1992. Much of the "not-so-glamorous-but-necessary prep work" has already been completed, according to William F. May, president of the Statue of Liberty-Ellis Island Foundation, Inc. Construction site lighting and a new

generating plant have been installed, and heaters have been set up throughout the building to dry out walls and ceilings that have been subjected to years of salt air and water leakage. A new furnace and duct work have been installed and the old water tanks and boilers have been demolished and removed. And the three large chandeliers in the Great Hall have been crated and put away so workers can begin restoring the famous vaulted tile ceiling. In addition, the exterior of the building has been scaffolded and masonry work has begun.

The restoration is being funded through the Liberty Centennial Campaign, with the support of schoolchildren, individual citizens, corporations, trusts, foundations and various grass roots groups throughout the United States.

The drawings of the original structures that are on hand are not always accurate.

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Place a classified ad in *Roofing Spec* for 50 cents per word. There is a minimum charge of \$20. Boxed or display advertisements are available in the classified section for \$40 per inch (one inch minimum). Ads using blind boxes available at no additional charge to NRCA members; non-members add \$10 to total order. Send ad copy and payment to: Advertising Manager, *Roofing Spec*, 8600 Bryn Mawr Ave., Chicago, Ill. 60631

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Leading San Francisco Bay-area roofing contractor seeks top-notch operations manager. Must have long and successful track record in full charge of all roof, yard and equipment operations for a substantial roofing contractor. Top salary and incentives. Send resume to our consultants: Popell, Inc., 625 Ellis St., Suite 301, Mountain View, Calif. 94043.

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COMING EVENTS

(For inclusion of events, address all correspondence to:
Roofing Spec "Coming Events"
 8600 Bryn Mawr Ave.,
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Sept. 9-13

Basic Membrane Roofing Systems
 Roofing Industry Educational
 Institute
 Dallas, Texas

Sept. 10-13

Eastern International Construction
 Exposition and Conference
 Associated General Contractors
 Raleigh, N.C.

Sept. 13-14

Annual Convention
 Associated Roofing Contractors of
 the Bay Area Counties, Inc.
 Lake Tahoe, Nev.

Sept. 18-20

International Symposium
 National Roofing Contractors

Association, National Bureau of
 Standards and the International
 Union of Testing and Research
 Laboratories for Materials and
 Structures (Europe)
 Gaithersburg, Md.

Oct. 3-6

Annual Convention
 Arizona Roofing Contractors
 Association
 Sadona, Ariz.

Oct. 4-5

Legal Considerations for the Roofing
 Contractor
 National Roofing Legal Resource
 Center
 Nashville, Tenn.

Oct. 8-11

Basic Membrane Roofing Systems
 Roofing Industry Educational
 Institute
 Washington, D.C.

Oct. 10

One day roofing seminar
 WatPro Corp.
 University of Cincinnati
 Cincinnati, Ohio

Oct. 11

One day roofing seminar
 WatPro Corp.
 University of Akron
 Akron, Ohio

Oct. 29

One day roofing seminar
 WatPro Corp.
 East Carolina University
 Greenville, N.C.

Oct. 15-18

CMC '85 and A/E Systems
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Oct. 28-Nov. 1

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Brochure details contour map use

A-Tech, Inc., has released a seven-page brochure titled *How to Use Contour Maps*. The brochure outlines the relationship between roof moisture content and roof maintenance, and explains how contractors and building owners can use roof moisture contour maps as part of a roof maintenance program.

The company also offers field and laboratory analysis of roof moisture problems. Testing procedures can locate hidden problems and define wet membrane and insulation areas. In addition, the company can calculate if a roof's thermal insulating efficiency is less than its original design specifications.

Check #44 on Reader Service Card

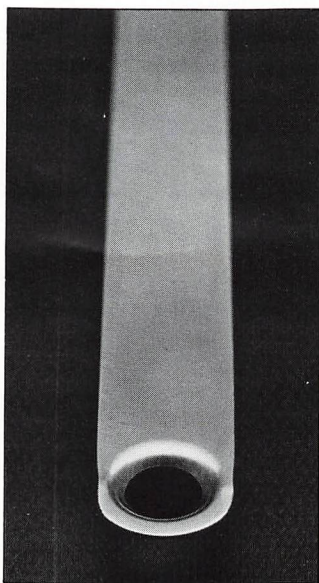
JBD markets coated bar anchor

JBD Supply has introduced a new line of bar anchors that are specially coated to resist corrosion.

The bar anchors, used in single-ply roofing systems, are treated with CR coating. This coating makes the bars four times as resistant to corrosion as G90 galvanized bars, according to the manufacturer.

JBD is using the coating on all of its bar anchors in anticipation of upcoming Factory Mutual specifications that will require all bar anchors and batten strips to meet minimum standards for corrosion resistance. JBD claims that the CR coating will exceed specifications.

Check #45 on Reader Service Card



IBI publishes aids for business

The Independent Business Institute has released two publications for owners of private businesses.

Your Business and the 1984 Tax Act provides descriptions of all the changes in the new tax law, including information on interest rates, capital gains, stock purchases, real estate depreciations and personal taxes on company-owned vehicles.

A 16-page booklet, titled *Dear Mr. Butrick*, answers questions from parents and heirs about family businesses. The author gives advice on such topics as turning over the family business to the most qualified heir, working on a semi-retired basis and paying family members equitably.

Each booklet is available for \$1.

Check #46 on Reader Service Card

Company markets glass insulation

The Pittsburgh Corning Corp. is marketing a cellular glass insulation for use in single-ply or built-up roofs on non-residential buildings.

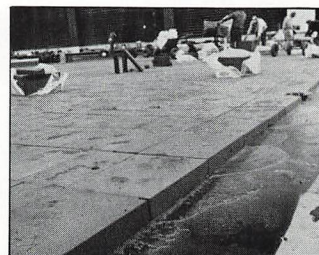
Foamglas® insulation weighs 8/12-pound per cubic foot and maintains an average compressive strength of 100 pounds per square inch. Because the product is all glass and contains no binders or fillers, it will not burn. It is warranted against moisture absorption for 20 years from installation.

The insulation may be shaped with hand tools to fit around existing openings and protrusions.

Foamglas is available in flat and tapered block and board. The tapered systems come with a factory-fabricated slope of 1/8-inch or 1/4-inch per foot. Four basic tapered systems are available along with six cricket systems.

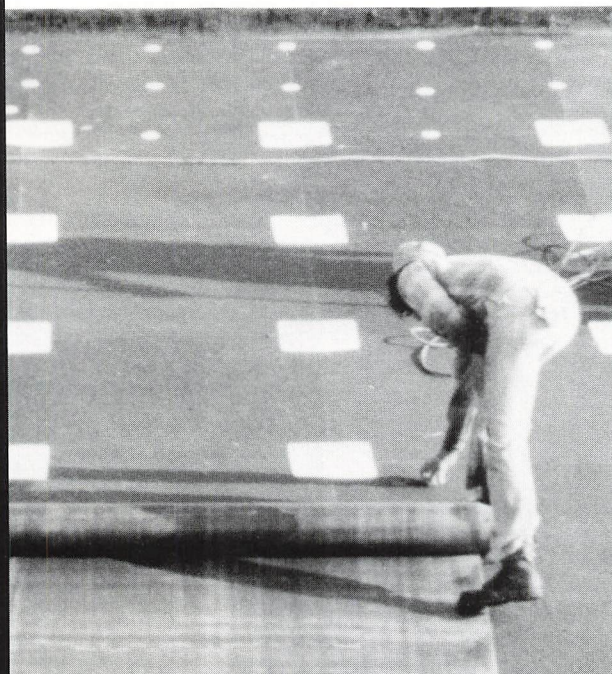
The cricket systems, which are designed for drain-to-drain use, come in lengths from 30 to 80 feet.

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NEW IDEAS

Acrylium panels simulate nature

Nailite International, Inc., is marketing a line of non-fiber glass acrylium siding panels that simulate cedar shake, brick and stone.

The panels, which measure 40 inches by 18 inches, form a seamless interlocking system that can be used for full siding, mansard or roofing facades. The system also includes matching corners.

Panels and corners are available in a variety of colors for exterior, interior, commercial and residential applications. The entire product line is covered by a 60-year non-prorated warranty.

A color brochure describing the Nailite line is available.

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Business cards fit Rolodex file

Vividize, Inc., is marketing a business card that can be inserted directly into a Rolodex file for quick reference by clients or customers.

Phone-Dex cards list the product or service, the name of the representative and the company, and the business address and phone. Cards may be printed in one-, two- or four-color process on one or both sides.

A file tab on the card indicates the company name or product for easy identification.

Check #49 on Reader Service Card

NEW IDEAS

Company adds new concrete tiles

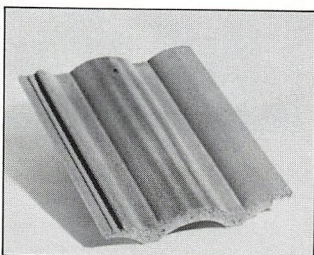
Celotex-Marley has added two new products to its line of concrete roofing tiles.

Duralite is a lightweight concrete tile that weighs approximately 300 pounds less per square than other concrete tiles, according to the company. The lighter weight reduces or eliminates the need for structural reinforcement.

The tile, which is available in several colors and styles, carries a Class A fire rating and a limited 40-year warranty.

The company has also developed a new concrete roof tile that is designed to resemble cedar shake. The Frontier Shake features a grooved surface texture and an irregularly routed front to simulate cedar shake's rough profile. Frontier Shake comes in three colors, is Class A fire-rated and has a 50-year limited warranty.

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Shingle fights fungus growth

The CertainTeed Corp.'s Shelter Materials Group has announced the addition of two new shingles to its product line.

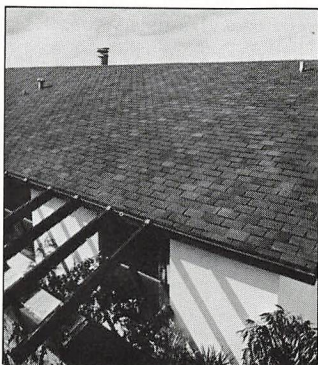
The Glassguard Fungusbuster is designed specifically for use in the South, where fungus stains are a common problem with light-colored shingles. The new fiber glass-based shingle combines zinc granules and regular granules in the shingle's coating to provide fungus resistance for 20 years.

The shingle is available in three colors: star white, cinnamon frost and timber blend.

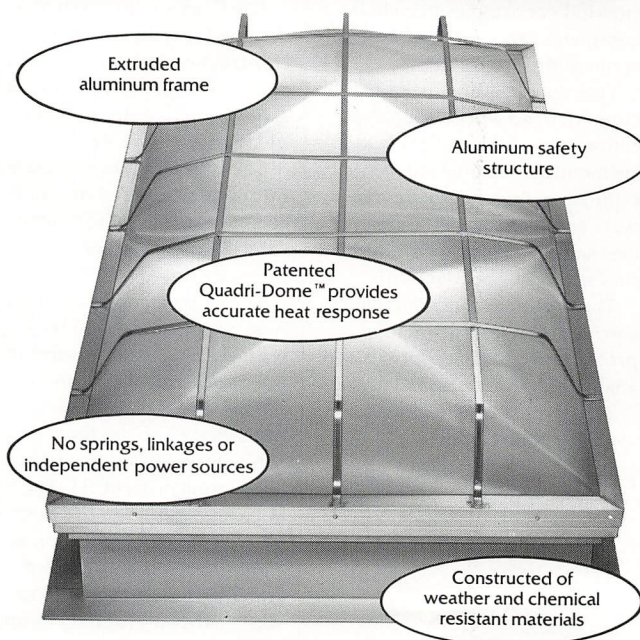
CertainTeed has also introduced the Hearthstead shingle, a four-tab, fiber glass-based shingle with a blend design that yields an intermittent shadow line and the appearance of random thickness and depth.

The shingles carry a 22-year warranty and are available in saddle brown, desert blend, sandstone, driftwood, graystone, weathered gray, slate gray and charcoal.

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IBM offers guide for contractors

The IBM Corp. has published a booklet to help contractors and other construction industry officials understand the use of computer workstations in the trade.

Construction Industry—Workstation Applications Model cites industry studies that chart contractors' trends toward office automation.

The report outlines personal computer and workstation applications for jobsite project management, scheduling and estimating. It also discusses the ways computer workstations are best suited to improving contractors' marketing productivity.

The processes for collecting, sorting and tracking potential projects, preparing proposals and analyzing bids are also noted.

The 52-page publication is available at no charge.

Check #52 on Reader Service Card

Construction software available for networks

Software Shop Systems has developed a network version of its Construction System job cost/accounting package. The Novell local area network allows several users at five IBM PCs, PC/XTs or PC/ATs to work with the system concurrently.

The Construction System is designed specifically for the construction industry with such programs as *Job Cost*, *General Ledger*, *Payroll*, *Accounts Receivable* and *Accounts Payable*.

The system is fully integrated. Information entered for each accounting function automatically updates all other applicable functions.

The system, created for first-time computer users, is packaged with learning materials and an operator's instruction program.

The company has also published a booklet for contractors wanting to automate their accounting procedures. The booklet, *Eighty Tough Questions You Should Ask Before You Buy a Computer for Construction*, contains information on software, hardware, and servicing and features a 20-page software evaluation checklist. A review of the Construction System is also included.

Check #53 on Reader Service Card



Temple-Eastex expands roofing products line

Temple-Eastex, Inc., has expanded its roofing products line with new insulation and roofing substrate products.

The Temprow line of polyisocyanurate roofing insulation is designed to offer high thermal efficiency, dimensional stability and compressive and peel strengths.

Temprow and Temprow Standard have latex-saturated glass facers. Temprow satisfies any non-rated roofing situation, while FM-rated Temprow Standard is recommended for both new and retrofit uses. Foil-clad, FM-rated Temprow SP is designed specifically for single-ply roofing applications.

Another Temple-Eastex product, Fiber Base, is a general purpose wood fiber roofing substrate designed to be compatible with most single-ply and built-up roofing applications.

Fiber Base is made from interlocking wood fibers and is especially suited for applications requiring strength and rigidity, according to the company. It is treated to resist moisture and coated with asphalt. Fiber Base measures 1/2 inch by 4 feet by 8 feet.

Neither the the Temprow line nor Fiber Base is marketed west of the Rockies or in the Northeast.

Check #54 on Reader Service Card

Mill Supply offers truck parts catalog

A free parts catalog for Grumman Olson trucks is available from Mill Supply, Inc.

The catalog includes supplies and parts for Kurb Side, Kurb Van, Kurbmaster and Olsonette trucks. Rear and side door hardware, ventilators, heaters, windshield washers and wiper kits are illustrated, along with lamps, mirrors and seats. Body shop supplies such as abrasives, tapes, caulks, body fillers and fasteners are also included.

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Textron develops fastening system

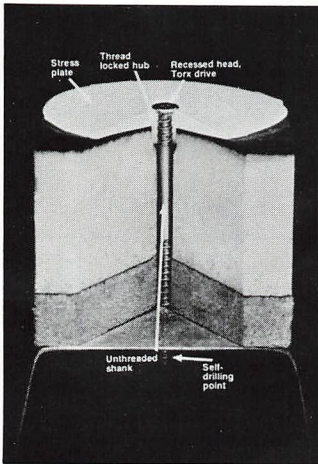
A new roof insulation fastening system that features a positive stress plate/fastener lock design has been developed for use in single-ply and BUR systems by Fabco Fastening Systems, Townsend Division of Textron, Inc.

The Plate-Fixx® system uses a 3 1/2-inch diameter plastic stress plate and a 1/4-inch self-drilling screw. During fastening, the screw taps into a center guide hole and forms its own thread in the plate. The screw is thereby thread-locked into the plate, reducing the risk of screw back-out and penetration of the roofing membrane.

The plate and screw are installed with a tool that has been designed specifically for the system. A worker using the Straight-Shooter® tool slips a screw into a side port and snaps a plate into the plate holder. The driver is then positioned on the work surface. A trigger at hip level drives the screw into the insulation and deck.

The system has received Factory Mutual approval for I-90 and I-60 wind uplift loads. Plate-Fixx screws also carry a 10-year corrosion-resistance warranty.

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Lift-A-Loft offers deck extension

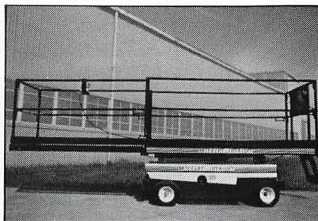
A 7-foot deck extension for the SP-series Mite-E-Lift self-propelled scissor-lift platform unit has been introduced by the Lift-A-Loft Corp.

The Extenda-Deck™ option adds 25 square feet of work area to the basic platform floor, making a total work space of up to 57 square feet accessible. The Model SP 19-15 Mite-E-Lift extends to a working height of 25 feet and can support 500 pounds on the Extenda-Deck. The total platform capacity is 800 pounds. The Model SP 24-7.5 also carries 500 pounds on the extension for a total weight capacity of 600 pounds at a maximum working height of 30 feet. No base outriggers are required for the units.

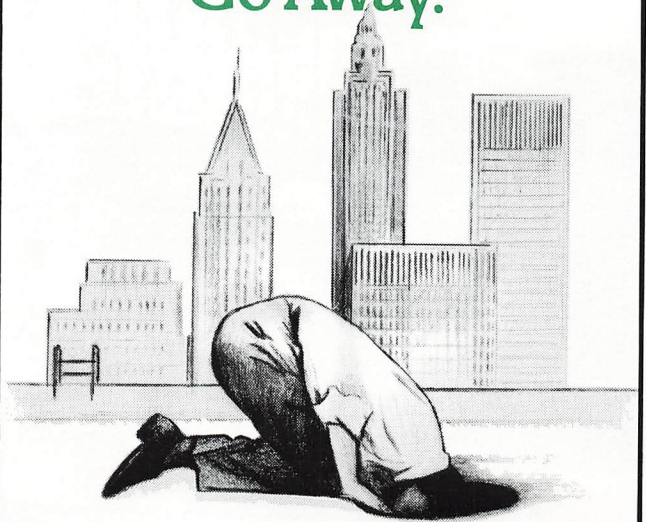
The Extenda-Deck may be rolled out at any elevation and may remain extended while the Mite-E-Lift units are moved from one location to another. The units are drivable and steerable at all platform elevations.

A brochure with information on the Extenda-Deck and Lift-A-Loft scissor-lifts is available.

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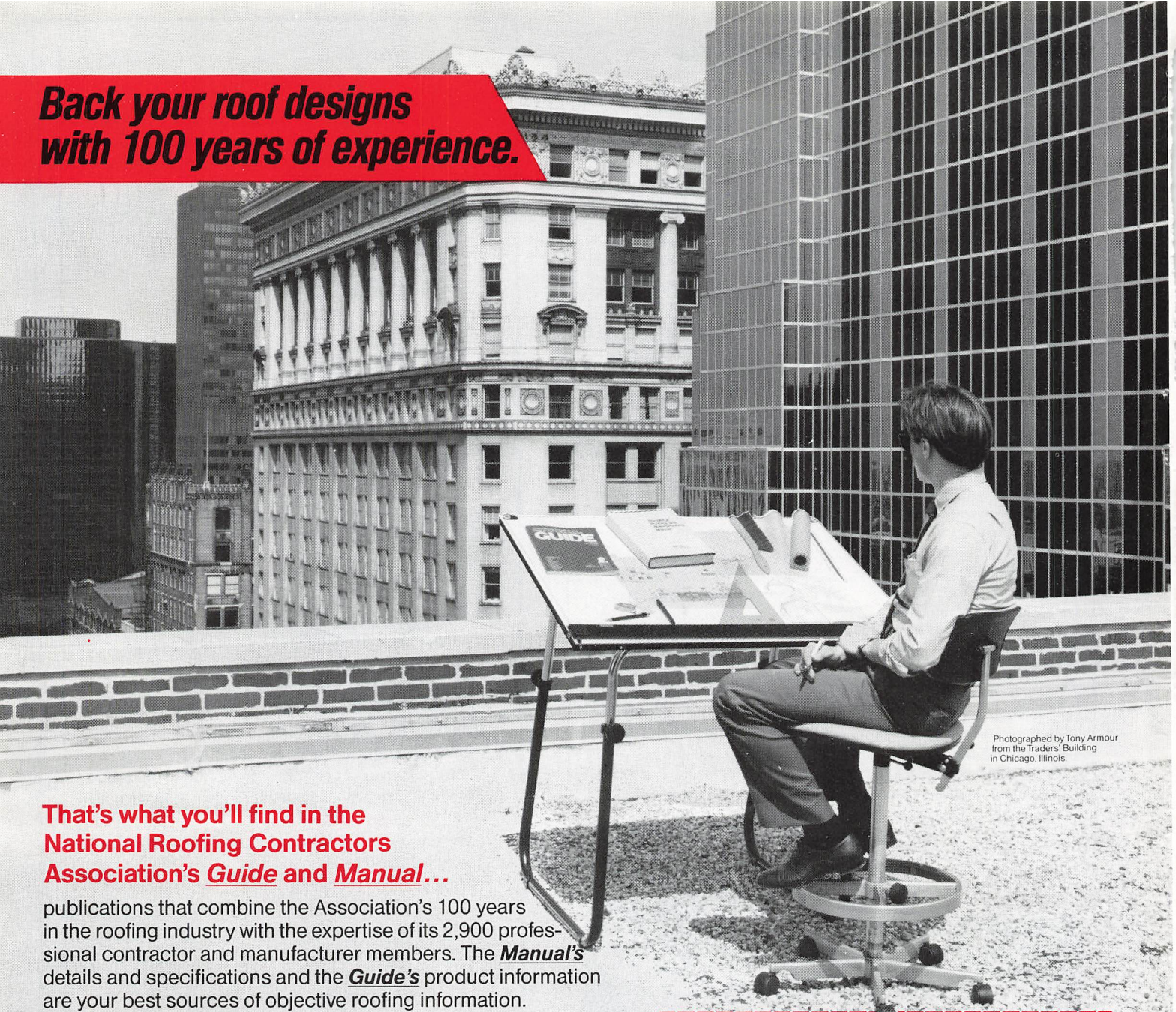
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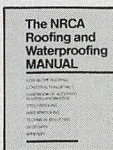
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Many in the industry have questions concerning the use of polyurethane and polyisocyanurate insulation in roof assemblies. To answer some of these questions the Roof Insulation Committee of the Thermal Insulation Manufacturers Association (RIC/TIMA) presented a program titled "Insulation: R's, U's, Do's and Don'ts" at last year's NRCA Convention.

During the program, representatives of the Committee presented the findings of a recently conducted study on the amount of thermal resistance polyurethane and polyisocyanurate insulation boards lose over time. Session panelists also fielded questions from the audience. Time ran out too soon, however, and many good questions went unanswered.

RIC/TIMA has requested space in this column to respond to some of the concerns that weren't addressed at the Convention program. The following questions, along with RIC/TIMA's answers, represent what the Committee believes are the most important issues raised by program attendees.

Regarding long-term, in-place testing, how long before the next results are available, and will test results for phenolic foam insulation be included?

The RIC/TIMA in-place test program is an ongoing project. The first in-place test roof project, located in the Atlanta area, is scheduled to end in 1987. It is expected that a formal report will be issued at that time. Meanwhile, additional testing is proceeding on a second test roof located in another region of the country. Plans for this project do include the testing of phenolic foam insulation.

RIC/TIMA tested five panels, yet disclosed the test results of only three of the panels. What were the results of the other two? How did polyurethane perform?

One board—a fiber glass/polyurethane composite—was lost due to test equipment failure. Test results of the other board—a perlite/polyurethane composite—were not reported due to inadequate pre-installation product data. However, in the

latest inspections the board has been providing a C-value of 0.10, which is equal to its original rated value. From the data generated to date, polyurethane has performed with an average k-value of 0.16. This is exactly what has been discovered in laboratory-aged thermal value tests.

Why are samples aged at room temperature? Six months at room temperature seems inadequate to predict five- or ten-year performance at the high temperatures seen in the field.

Room temperature was selected only to establish an average mean within extreme rooftop conditions. It is believed that the more critical criteria is the length of time it takes the boards to reach a state of equilibrium (six months) within the cell structure of the polyurethane and polyisocyanurate. Once this equilibrium is established, there is only minimum fluctuation, depending on actual ambient conditions.

What is the difference between polyurethane and polyisocyanurate?

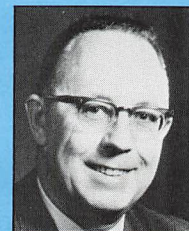
Technically speaking, pure polyurethane is a chemical compound containing equal amounts of polyol and isocyanurate. The chemicals react with each other to form polyurethane foam. Pure isocyanurate is made of isocyanurates that react with each other to form polyisocyanurates. However, it is extremely difficult to classify products on the market today as pure polyurethanes or polyisocyanurates. Modern chemical technology has produced polyurethane-modified isocyanurates that combine the best physical properties of both into a single product. These insulations should more properly be referred to as modified polyisocyanurates.

Does the gas polyurethane and polyisocyanurate insulation manufacturers use as a blowing agent have anything to do with blistering?

Probably not. Extensive gas analyses conducted in the laboratory and in actual field applications have revealed only trace quantities of freon. If the gas were responsible for the blistering phenomenon, it would have been found in much higher levels in the blisters that were examined.

RIC/TIMA responds to unanswered questions

by Bob LaCrosse



For further information on the questions answered in this column or polyurethane and polyisocyanurate insulations, please write to the Thermal Insulation Manufacturers Association, 7 Kirby Plaza, Mt. Kisco, New York, N.Y. 10549.

It is extremely difficult to classify products on the market today as pure polyurethanes or polyisocyanurates.

If all RIC/TIMA members use the same conditioning procedure, why aren't all R-values the same? Also, TIMA's two-year test showed the k-values of aged polyurethane and polyisocyanurate to be 0.16 (an R-value of 6.2 per inch). Why don't all members use this value?

Because each member company is free to develop its own foam formulation, the physical characteristics that ultimately affect aged R-values vary from product to product. Therefore, manufacturers achieve the same R-value with slightly different insulation thicknesses.

Have you checked the in-place R-value of sprayed-in-place foam?

No, RIC/TIMA is an association of rigid polyurethane and polyisocyanurate board manufacturers. It does not involve itself with spray-on products.

What requirements must a manufacturer meet to be a RIC/TIMA member?

RIC/TIMA's bylaws state that membership is limited to manufacturers or those engaged in the sale of rigid polyurethane and polyisocyanurate roof insulation boards. An associate membership has recently been established to include manufacturers of polyurethane and polyisocyanurate raw materials.

What can RIC/TIMA do about non-TIMA members' R- or k-value claims?

Legally there is nothing that the Roof Insulation Committee can do. RIC/TIMA is not a policing organization. However, they have corresponded with all non-TIMA insulation manufacturers, all relevant roofing and architectural associations and more than 900 roofing products distributors. In addition, RIC/TIMA has been waging an extensive publicity and advertising campaign to educate architects, specifiers and roofing contractors on the aged thermal value concept.

What is being done to provide stronger attachment of the facer to the core of the foam board stocks?

The Committee believes this question refers to products developed in the mid-1970s that are no longer produced. Today, this phase of the manufacturing process is not RIC/TIMA's responsibility. It is up to the individual manufacturers to develop foam facers and warrant their performance.

Would the use of a thicker mat facer on polyisocyanurate foam preclude the use of an additional layer of insulation or a venting base sheet?

It is not the function of RIC/TIMA to dictate facer standards to its membership because there is no ASTM standard or acceptable test method to reproduce or simulate the venting phenomenon. It is the individual manufacturers' responsibility to test and warrant their products and back their claims.

What research and testing has been done to evaluate the ability of new glass facers to stay laminated to polyisocyanurate over long-term moisture and thermal-cycle exposure?

Again, product performance is the responsibility of individual manufacturers.

What are TIMA's guidelines for torching membranes to polyurethane and polyisocyanurate insulation?

RIC/TIMA developed a position statement on torching that has been publicized in the trade media. The statement reads in part: "RIC/TIMA does not endorse torching directly to the foam insulation material. Rather, it is recommended that an interim base ply or layer of roof insulation, acceptable to the membrane manufacturer, be used to separate the foam roof insulation from the modified sheet and torch."

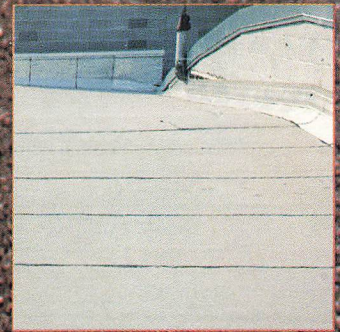
Does a mopped or nailed base sheet preclude the use of overlay board?

Assuming that this question refers to built-up roofing applications, the answer may be found in the joint RIC/TIMA-NRCA Bulletin #9, dated July 1981, which says either an overlay board or a venting base ply may be used.

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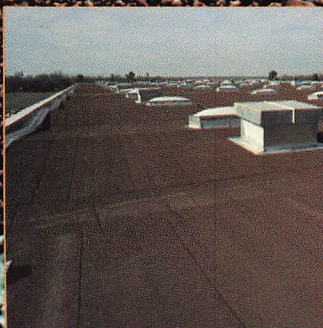


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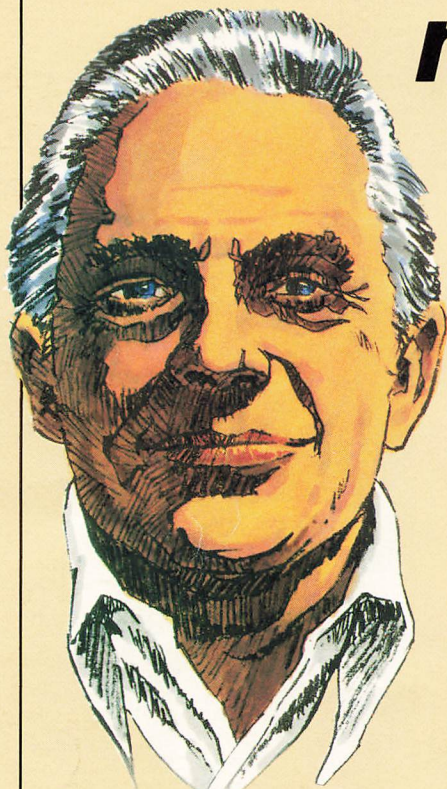
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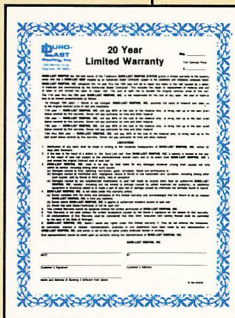
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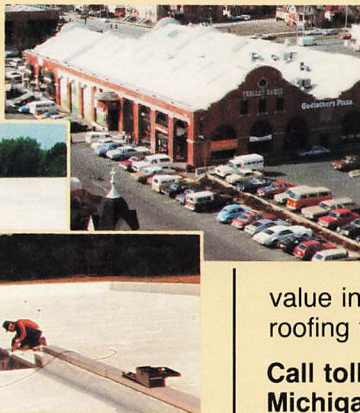


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