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National Roofing Contractors Association

May 1982



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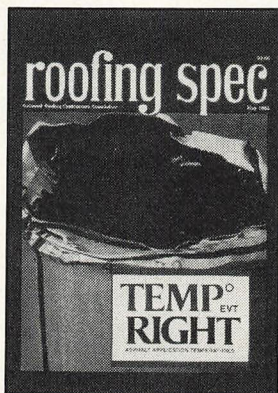
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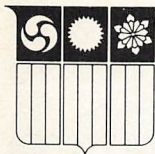


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Chances are it won't be long before all cartons of roofing bitumen are stamped with the local equiviscous temperature.



NATIONAL ROOFING CONTRACTORS ASSOCIATION

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(312) 693-0700

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Comment

Decision Time For Asphalt Heating

Back in 1972, in one of his first Technical Reports, NRCA's Technical Director Dr. Ed Mertz, wrote:

"So a good asphalt from NRCA's view is one which can be safely heated to a point where it is readily mopped or applied, gives topflight adhesion, can be expected to stay in place on the roof, and last for the expected roof life. In addition, it should be readily available."

Fair enough, said the roofing industry. It then proceeded to identify the characteristics of asphalt that were important in achieving these results. The result of that effort—five years later—was the concept of Equiviscous Temperature (EVT) which said simply for every asphalt there is an optimal heating temperature. Further, when we know that temperature and heat to it, the end results Mertz cited are likely to be achieved.

Fair enough, the industry said again. It then embarked on a course that has resulted, five more years hence, in . . . confusion.

Confusion because not all roofing contractors insisted on buying asphalt that had its EVT identified. Confusion because roofing mechanics weren't getting the necessary training. Confusion because some asphalt producers and roofing material manufacturers have been less than thorough in putting the concept into action. And confusion because the whole subject is, well, confusing.

Happily, there is progress to report, as you can see elsewhere in this issue. But it's still like the overweight mountain climber who looked up to see, to his horror, that his rope was frayed and about to break. He looked down and saw nothing to break his fall except for jagged rocks several hundred feet below. He knew he had to make a decision. He decided he needed heavier rope. As decisions go it was a good one, but his timing was terrible.

We all agree that the proper heating of roofing asphalt is important, and we all agree that an appropriate industry stance is desirable. What's more, we're not faced with quite such critical imperatives as the mountain climber. The time has come to get on with it.

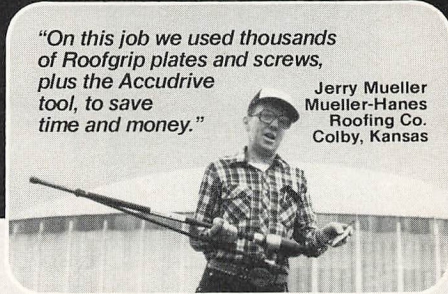


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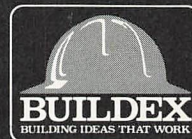
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Ideas, notes and random thoughts

In this issue of *Roofing Spec* we'll examine the oldest form of roofing—the built-up roof. Each feature article focuses on a particular component of the conventional roof whether it be adherence of aggregate or the correct temperature for asphalt application. And one thing remains clear regardless of what it's made of—layers of built-up plies, a single ply, sprayed foam, tile, metal or composition shingles—every roof needs constant care, an intelligent inspection program and periodic maintenance.

m.b.

It's never too early to announce a keynote speaker for the next NRCA Convention & Exhibit. The 1983 edition will be held in San Antonio and former President Gerald Ford has agreed to address the Convention's Opening Luncheon. Some of you may remember that the popular President was scheduled to speak at the 1982 convention, but had to withdraw because of commitments to the National Republican Party.

In other NRCA news, Alan D. Grayson has been appointed Director of Education, effective June 1. Grayson, 37, was with the International Association of Assessing Officers for the last nine years. His NRCA responsibilities include strengthening and broadening educational conferences and the development of worker training programs with the Contractor Certification Committee. Welcome aboard!

What's all the talk about federal tax cuts being too generous? According to an article, "The Case of the Vanishing Tax Cut," by Stephen A. Meyer, a senior economist at the Federal Reserve Bank of Philadelphia, and Robert J. Rossana, assistant professor of economics at Pennsylvania State University, most families will pay the same or even higher federal taxes in 1983.

"Our estimates indicate that for most people the total tax rate on any given real income will not fall from 1980 to 1983," they wrote. "When Social Security taxes are added to personal income taxes, we find that most families will ac-

tually wind up facing the same or higher federal tax rates in 1983 than they did in 1980, if their dollar incomes keep pace with inflation."

Edwin Meese III, counsellor to President Reagan and one of his closest advisers, notes that when inflation comes down, as now is the case, government tax revenues fall as well. That helps make federal budget deficits larger.

But Meese also notes that federal entitlement programs, or income transfer payments to individuals, keep growing as more people become eligible. He adds: "So at a time when the cost of living is stabilizing and coming down, the cost of these programs is actually increasing, and this is what gives rise to a great extent to the budget problems and the deficits you hear about . . ."

Sacred words of wisdom from economists are being taken with an extra grain of salt these days at the White House, reports *The Wall Street Journal*. A recent joke making the rounds recently tells of a depressed businessman who jumped out his office window. A split-second later, his economist rushed to the window and yelled, "Don't worry. A turnaround is near."

"A man in debt is so far a slave."—Ralph Waldo Emerson

NATIONAL ROOFING FOUNDATION UPDATE

The National Roofing Foundation is pleased to welcome the support of its newest friend:

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Stanley M. Gerson
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Thanks to the support of our Friends, our latest development—The Roofing Technology Course is now complete and ready for insertion into the curriculum of colleges and universities throughout the U.S. For more information on the National Roofing Foundation, please write 8600 Bryn Mawr Avenue, Chicago, Ill. 60631.

Letters To The Editor

RIC/TIMA Active Group

I am writing in reference to the article which appeared in the January issue of *ROOFING SPEC* titled, "All Rigid Urethane Insulations Are Created Equal . . . Or Are They?" by Toby Nadel.

Contrary to what Mr. Nadel stated in his article, the roof insulation industry is vitally interested in the many issues facing its manufacturers today. It was this concern and interest that led to the creation of the Roof Insulation Committee of the Thermal Insulation Manufacturers Association (RIC/TIMA) in 1978.

Since its inception, RIC/TIMA has been an active industry group that has launched an ongoing testing program on the reported roof blistering phenomenon; worked with the National Roofing Contractors

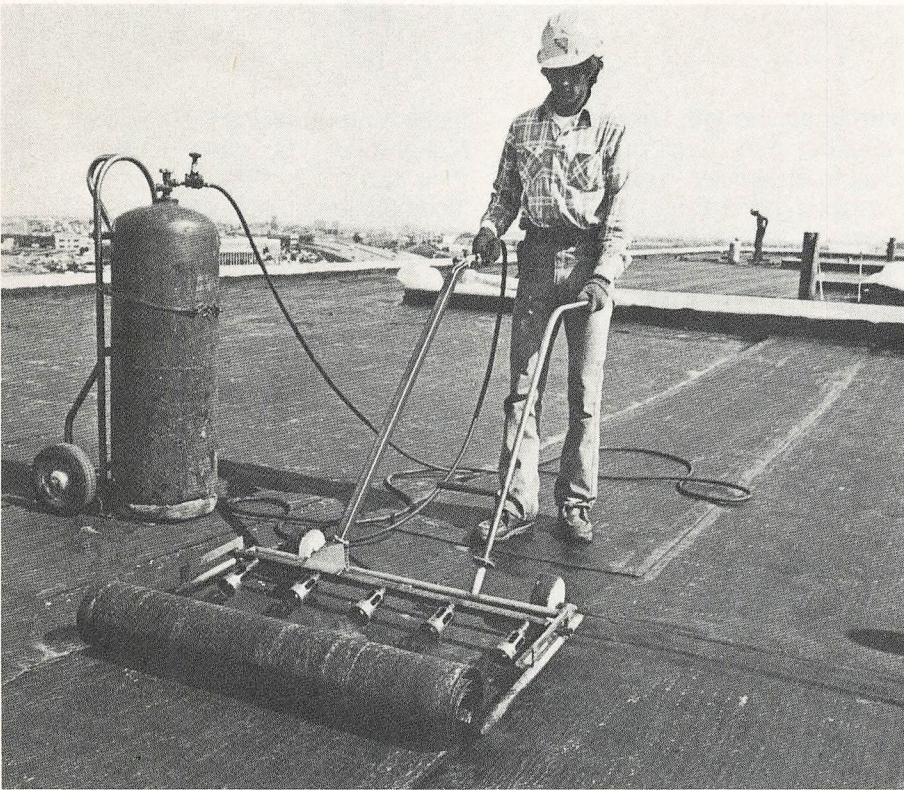
Association to produce a joint statement on thermal aging; participated in an industry symposium that was convened to discuss issues of importance to the built-up roofing industry; and participated in industry conventions.

Ironically, some of the Committee's most recent initiatives are covered in the same issue that carried Mr. Nadel's story. NRCA's endorsement of the RIC/TIMA Thermal Conditioning test procedure is covered in a story in the yellow membership section of the January issue. And the new NRCA/TIMA liaison committee is mentioned by Bob LaCrosse in his first column of "Tech Talk."

Recently, the Committee developed a RIC/TIMA Thermal Conditioning Procedure Certification label, based on the above mentioned conditioning procedure. It is RIC/TIMA's aim to have this adopted across the board by local and state regulatory agencies as well as by code groups as a standardized product conditioning and labeling program. Currently, the Committee is working on the development of a standardized performance specification for the production of urethane insulation.

Clearly, RIC/TIMA's research, testing and standardization efforts coupled with its continued involvement in industry programs exemplify the Committee's deep commitment to the urethane roof insulation industry. Furthermore, these responsible actions refute, beyond all doubt, Mr. Nadel's conclusion that the urethane industry is "in shambles."

Jack Barnhart
Executive Director
TIMA



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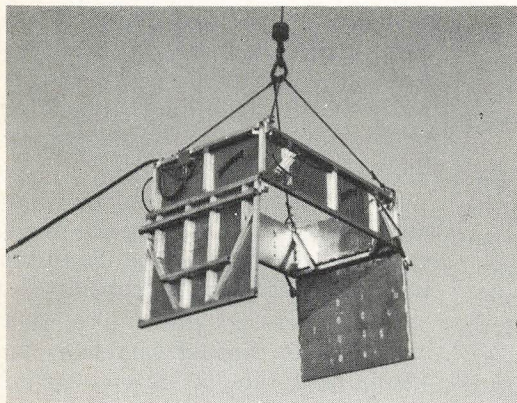
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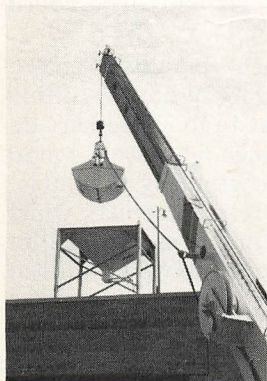


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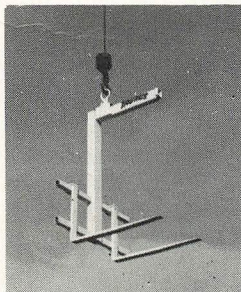
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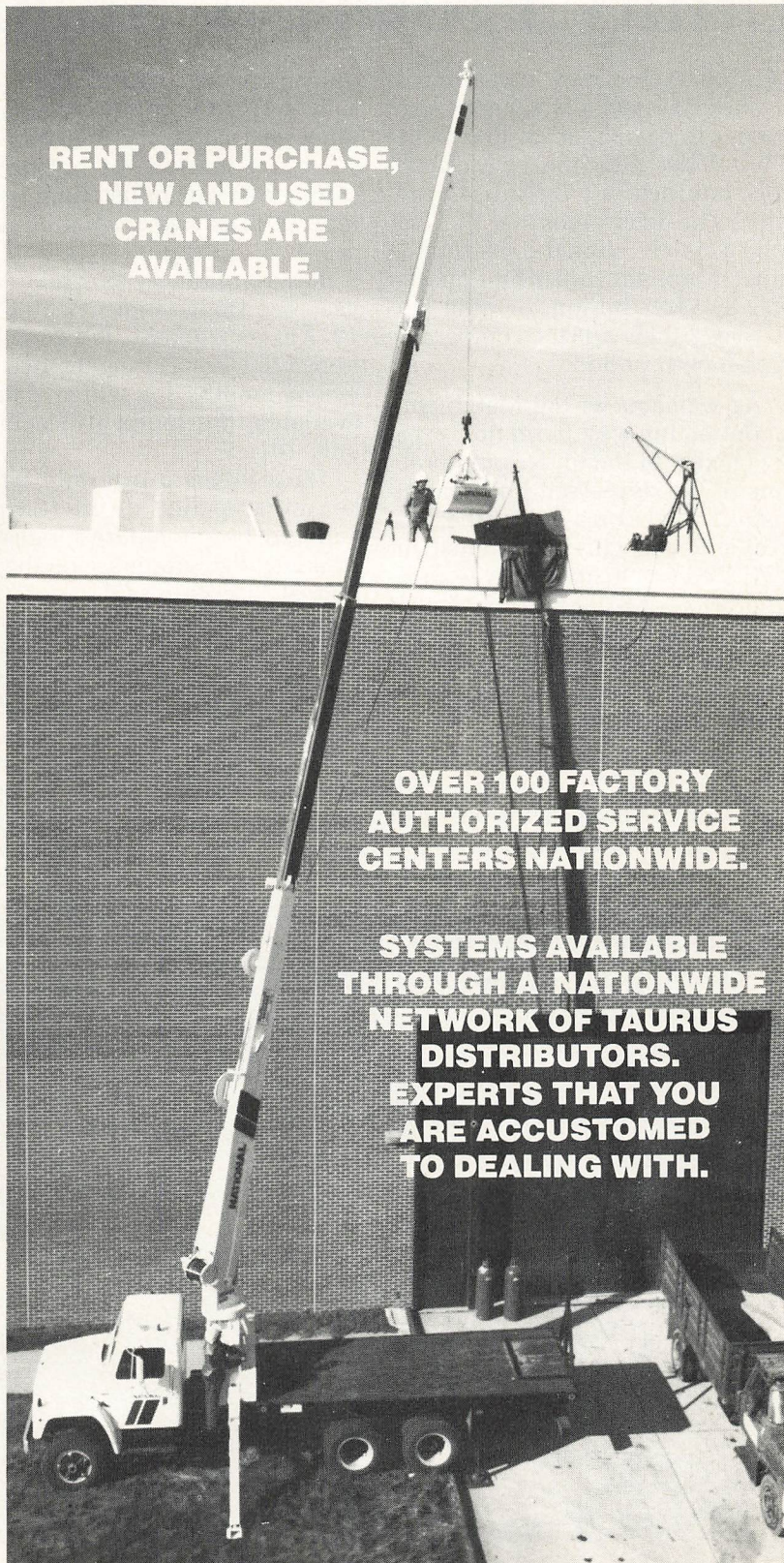
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NATIONAL NEWS

March Construction Contracts Up: Utility Project A Major Factor

Contracts for new construction advanced a seasonally adjusted eight percent in March, according to the F. W. Dodge Division of McGraw-Hill Information Systems Company. The latest month's \$13 billion of newly started construction projects brought 1982's first-quarter total to \$32.1 billion, or nine percent less than 1981's comparable three-month period.

"As welcome as the March gain in contracting was, it did not reveal any change in the underlying problems of the depressed building industry," said George A. Christie, vice president and chief economist for F. W. Dodge. "Instead, it was a single project—a \$700 million electric power plant to be built in upstate New York—that was responsible for most of the latest month's increase."

"For a little more than a year, the Dodge Index of construction contract value has been saying only two things," Christie said. "One is that construction activity fell sharply

during the first half of 1981, a period of severe credit tightening. The other is that ever since the construction market hit bottom last summer, the sustained high level of interest rates has prohibited recovery."

Between January and July of last year, the Dodge Index, which uses 1977 as its 100 base, fell 23 percent from 128 to 99. During the two most recent months for which data are available, the Index still averaged only 101.

"This impasse can only be broken by a decline in interest rates, and the key to interest rates is a meaningful compromise on the 1983 budget," Christie said.

Contracts for nonbuilding construction, including the large utility project, totaled \$3.2 billion in March. The month's 14 percent gain over February's contracts, adjusted for seasonality, was entirely due to the \$700 million power plant, according to Christie. The remaining total of highways, sewer and water facilities and other public works

construction that make up non-building construction declined in March.

March's \$5.3 billion total of contracts for nonresidential building improved nine percent over February, in seasonally adjusted terms.

"Commercial building perked up in March with gains in shopping centers and offices," Christie said. "It is expected that over the next year or two a revival of retail building will help to fill the void of a waning office building cycle. Meanwhile, the latest contracting data show that there's still some life left in the office building boom. Nine major projects were started around the nation in March."

Contracts for industrial building fell sharply in March, as the deepening recession left manufacturers with additional excess capacity.

The depressed housing market limped along through March, as the annualized rate of newly-started dwelling units remained below one million for the eighth consecutive month. The value of March starts, at \$4.6 billion, was a meager two percent improvement over February.

"The prospect remains for a second-half recovery of homebuilding, but every delay in the necessary decline of mortgage rates erodes more of the year's dwindling potential," Christie said. "That potential, which was once as much as 1.4 million units, is now only about 1.2 million at best."

Following is a summary of the latest month's Dodge construction contract statistics. These contract-award statistics measure the value of newly started construction that will be brought to completion over the months ahead. They indicate the amount and direction of future expenditures of this major sector of the economy.

MONTHLY SUMMARY OF CONSTRUCTION CONTRACT VALUE

Prepared by F. W. Dodge Division
McGraw-Hill Information Systems Company

	March, 1982 Construction Contract Value (000,000)	Seasonally Adjusted Percent Change From Previous Month
Nonresidential Building	\$ 5,272.7	+ 9
Residential Building	4,599.6	+ 2
Nonbuilding Construction	3,163.8	+14
Total Construction	\$13,036.1	+ 8

	3 Mos., 1982 (000,000)	3 Mos., 1981 (000,000)	Cumulative Percent Change
Nonresidential Building	\$12,219.7	\$13,158.9	- 7
Residential Building	10,554.5	14,361.1	-27
Nonbuilding Construction	9,352.3	7,937.7	+18
Total Construction	\$32,126.5	\$35,457.7	- 9

DODGE INDEX

(1977 = 100, SEASONALLY ADJUSTED)

January, 1982	118
February, 1982	97
March, 1982	105

ARMA Backs OSHA Protection Efforts

The Asphalt Roofing Manufacturers Association (ARMA) has endorsed a proposal from the Occupational Safety and Health Administration (OSHA) for voluntary protection efforts in plants and businesses.

ARMA represents manufacturers of asphalt shingles, roll roofings and other roofing products.

ARMA, responding to OSHA initiatives, pointed out that employee health and safety is one of the industry's major concerns.

The premise for the OSHA initiatives is that labor and management can improve workplace safety and health by means not available to OSHA.

ARMA's recent statement to OSHA noted that ARMA member companies are aware of the importance of ongoing employee protection programs and have some exceptional in-plant programs already in place. ARMA also encouraged its members to respond individually to

the OSHA proposal.

The proposed OSHA program is divided into three suggested safety and health protection efforts:

□ Employee participation programs, to encourage employers to comply voluntarily with OSHA standards and to involve employees in their own safety and health protection.

□ Management incentive protection programs, for employers who have demonstrated success in their efforts to provide improved safety and health protection and to stimulate interest in achieving positive results through management initiatives.

□ Private sector support for small business, utilizing trade or professional associations.

ARMA offered its assistance to OSHA in furthering the proposed voluntary protection effort, pointing out that industry looks to OSHA for motivation and encouragement rather than actual implementation.

Brotherson Gets Appointment To Illinois State Post

Donald E. Brotherson, AIA, has been appointed Director of the Small Homes Council—Building Research Council of the University of Illinois.

Brotherson's primary areas of interest have been in roofing materials, electric heating, fallout and blast protection of houses, and insulation and moisture control in buildings. His current work includes preparing a course in roofing technology for architectural schools and colleges. Since 1961, he has also maintained a limited general architectural practice and consulting service on roof failure investigations.

A native of Chicago, Brotherson received both a bachelors and mas-

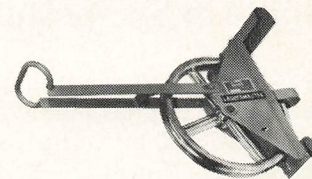
ters degree in Architectural Engineering from the University of Illinois. He has been a member of the council staff since 1959.

He conducted a series of research projects on the causes of built-up roofing failures from 1959 to 1970. In 1970, he acted as a consultant for the Building Advisory Board of the National Academy of Engineering—National Academy of Sciences. He was a 1980 recipient of the Award of Merit from the American Society of Testing and Materials (ASTM).

Brotherson also assisted with the preparation of the **NRCA Roofing and Waterproofing Manual**.

National News continued, page 10

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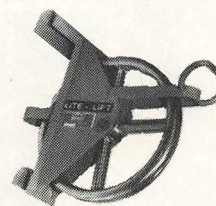
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NATIONAL NEWS

Continued

RSTC Issues Booklet on Built-Up Symposium

The Roofing Systems Technical Committee (RSTC) has made available a condensed transcript of its symposium on "Built-Up Roofing Systems: The State of the Art."

This 16-page reprint in question and answer form airs the principal issues in BUR: performance, quality of materials, problem areas, inspections, flashings and other roof details, design pitfalls, insulation and roofing, single-ply roofing, and related matters.

RSTC is a joint committee of the Asphalt Roofing Manufacturers Association (ARMA) and the National Roofing Contractors Association (NRCA).

The symposium was held last year in Chicago. Panelists included architects, consulting engineers, plant engineer/owner representatives, roofing contractors, manufacturers'

representatives and asphalt suppliers.

Individual copies of "Built-Up Roofing Systems: The State of the Art" are free. Write RSTC, c/o Sumner Rider & Associates, Inc., 355 Lexington Avenue, New York, N.Y. 10017.

New General Counsel Appointed

Elliot Ross Buckley recently became the General Counsel of the Occupational Safety and Health Review Commission (OSHRC), appointed by OSHRC Chairman Robert A. Rowland. The Review Commission is an independent federal agency which rules on job safety and health disputes arising from work place inspections of the Labor Department's Occupational Safety and Health Administration.

As General Counsel, Buckley's duties include responsibility for all phases of the decisional process. He represents the Review Commission before the courts, Congress and other

federal agencies, as well as the general public.

In addition, Buckley counsels the OSHRC Chairman regarding administrative matters and shares responsibility with the agency's executive director for executive branch liaison.

'Substitution' No Help

by Thomas J. McGlone
President, American
Subcontractors Assn.

The January enactment of a California law permitting prime contractors on state jobs to substitute deposits for retainages has sparked controversy over New York's own "substitution" statute.

The California measure permits prime contractors to deposit bank securities in lieu of retained percentages. All draws are paid in full, while the contractor simultaneously earns interest on the securities.

According to counsel Terrence Burke of the Albany-based Northeast Subcontractors Association New York's 29-year-old State Finance Law § 139(3) "has not been the panacea for subs' retainage ills."

Burke noted, "The general contractor does not consider substitution as a payment of retainage and, accordingly, does not feel obligated to remit any (benefit) to his subs" in the absence of a legal flow-down requirement.

"Substitution," continued Burke, "has also added to the delay in acquiring retainage funds."

He points out that when a general contractor is receiving full draws himself, while holding retainage against his subs, he accumulates a large pool of interest-earning capital.

In light of his windfall, "the general contractor has no incentive to complete final punch lists and release retainage monies properly due his subs."

NESCA believes the answer is "line item release of retainage and (escrowed) interest on retainage distributable to subs." Legislation the group has introduced would establish line item release (S1917-A and A2533-A) and escrowed interest (S191-5A) and A2532-A).

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EVT—

The Right Temperature For Applying Built-up Roofing Asphalts

by Mike Beightol

In a business world increasingly crowded with symbols, the busy executive is sometimes at a loss to keep things in perspective.

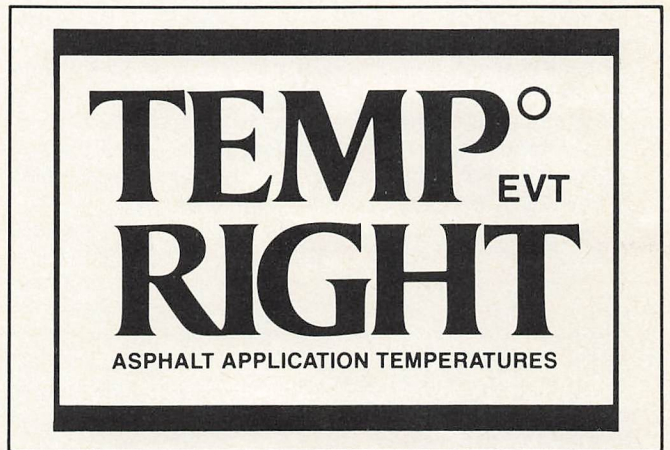
As an industry, the roofing world is no different. In fact, it might even rival the federal bureaucracy for its penchant at sometimes disguising the true meaning of things in a sea of alphabet soup.

Admittedly, most symbols, abbreviations and acronyms do condense cumbersome, confusing terminology to simple, readily-recognizable terms. It's a lot faster to say 'BUR' rather than the more formal 'built-up roofing'. 'PVC' and 'EPDM' are infinitely easier to remember than 'polyvinyl chloride' or 'ethylene propylene diene monomer'. And, while 'rye eye' may sound like the mysterious concoction of a South American bistro, it is certainly easier to remember and say that instead of the more correct 'Roofing Industry Educational Institute' (RIEI).

But what about EVT? Has the abbreviation for equiviscous temperature added to the industry's state of confusion on this topic? The answer is yes, but only to a limited extent. According to a panel of roofing industry experts, the problem with the EVT concept is far more complex.

EVT is not that hard to comprehend, but a little background is necessary. In 1973, NRCA began a technical program to look into the behavior of asphalts used by roofing contractors. The association's goal was "to identify and measure the key properties, make industry aware of our information and hopefully change industry practice to reflect the best up-to-date technology, so that, as applicators, we may have the best materials possible for use." Nine years later, the industry is on the threshold of widespread acceptance of the EVT concept.

During the 1982 NRCA Convention & Exhibit a panel of six prominent roofing professionals from both



sides of the fence—the contracting and manufacturing segments—met quietly to discuss EVT and its implications. The panel—NRCA President Johnny Zamrzla, NRCA Senior Vice President and President-elect John Bradford, NRCA Past President Melvin Kruger, Trumbull Asphalt's John Hopkins, Manville's Robert K. Hawkes and Peter C. Nazaretian of The Celotex Corp.—agreed unanimously that all segments of the roofing industry must make a concerted effort at gaining industry-wide acknowledgement of the EVT concept.

The temperature of built-up roofing asphalt influences many facets of the application phase. Asphalt that isn't hot enough is difficult to apply. Applicators find it strenuous spreading the material. Mops become heavy, the bitumen doesn't properly "wet" the felts, adhesion is poor. The material is "over-applied" which may result in splitting, slippage, and consequently poor membrane performance.

Overheating the asphalt certainly makes the applicator's job easier as far as mopping is concerned, continued, page 12

Temp Right

continued

but the material may end up being "under-applied." Asphalt applied too hot can cause incomplete film coverage, voids, and potentially poor waterproofing properties. The end results would be similar to applying asphalt that is too cool. And callbacks and the resulting loss of profits would be the same.

The principal reason asphalt is used in a built-up roof assembly is because when heated and applied properly it "sticks" the plies of felt together with a waterproof or at least a water-resistant adhesive. If the felt plies are not "stuck" together correctly, contractors are wasting time and money. And building bad roofs.

"EVT is the application temperature needed for any built-up roofing asphalt to achieve what the industry believes to be the ideal application viscosity . . . for the best end results," said Hopkins, Trumbull's

manager of customer relations and export sales.

In other words, "EVT is the temperature at the point of application at which given asphalt will easily spread and yield an uniform wetting on the roofing felt," said Celotex's Nazaretian.

The key to asphalts spreadability is its viscosity—the scientific measure of a material's flow. While all asphalts are different, a viscosity of 100 to 150 centi Stokes (cS) ensures good mopping properties making for easy application and proper adhesion.

A point important to remember is that the asphalt's EVT relates to the temperature at the point of application. Asphalt obviously cools down while it is being transported from the tanker on the ground below to the roof above. Therefore, EVT pertains to asphalt while in the mop bucket, felt machine or between plies.

The best way to determine whether the asphalt is being applied at the EVT is to use a 250° to 750° thermometer (preferably a mercury thermometer) and check the temperature in the mop bucket, felt layer or be-

BULLETIN 2A CLARIFICATION OF BULLETIN 2 (12/15/77) Equiviscous Temperature (EVT)

Since the issuance of Bulletin 2, we have received numerous requests for a clarification of the EVT concept.

Equiviscous Temperature (EVT) is defined as the temperature at which asphalt will attain a viscosity (flow and adhesion) of 125 centistokes. This is the practical and optimum temperature for wetting and fusion at the point of application. (For practical purposes, the point of application is defined as the mop bucket or felt machine.)

A tolerance range is added for practical applications in the field to accommodate the effects of wind chill, sunshine, or ambient temperature. This range is expressed as a temperature, plus or minus 25°F. Good practice indicates the use of the EVT range as the temperature range at which asphalt should be applied.

Asphalt should be sufficiently heated in the kettle/tanker and allow for typical handling procedures so to allow for and achieve this optimum viscosity/temperature range (EVT) at the point of application. Asphalt heating is subject to two restraints:

- It should NOT be heated to or above the actual COC Flash Point (ANSI/ASTM Method D 92, Test for Flash and Fire Points by Cleveland Open Cup).
- It should NOT be heated and held above the Finished Blowing Temperature (FBT) for more than 4 hours.

This concept emphasizes that the temperature of asphalt at the point of application is the main consideration and that kettle/tanker heating should, therefore, be based on reaching the desired application temperature.

The Roofing Systems Technical Committee, a joint committee of the Asphalt Roofing Manufacturers Association and the National Roofing Contractors Association, endorses and recommends the following identification system for mopping grade asphalts. This information should now be printed on all asphalt packages or bills of lading.

- **The Softening Point (SP) Range.** The temperature ranges of the asphalt determined in accordance with ASTM D-312 and D-36. (General)
- **The Flash Point (FP).** The flash point of the asphalt as determined by ASTM Method D 92. (Actual for specific run)

- **The Equiviscous Temperature (EVT) Range.** The temperature range at which a viscosity of 125 centistokes is attained, plus or minus 25°F. (Actual for specific run)

- **The Finished Blowing Temperature (FBT).** The temperature at which the blowing of asphalt has been completed. (Actual for specific run)

In the event EVT information is not furnished by the manufacturer, the following maximum heating temperatures should be used as guidelines. The same two restraints for asphalt heating previously listed (i.e. **Flash Point** and **Finished Blowing Temperature**) pertain to these temperatures:

- | | | |
|-------------------------|----------|---------------|
| ■ Dead Level Asphalt | Type I | 475°F Maximum |
| ■ Flat Grade Asphalt | Type II | 500°F Maximum |
| ■ Steep Grade Asphalt | Type III | 525°F Maximum |
| ■ Special Steep Asphalt | Type IV | 525°F Maximum |

Coal tar roofing bitumens are produced by a limited number of manufacturers and have fewer material variations than asphalt. Although EVT has not been applied to coal tar bitumens for this reason, the same concept is applicable. Heating and application temperatures for coal tar are slightly lower than asphalt bitumens.

Most manufacturers recommend a kettle temperature of 425°F with application temperatures ranging from 325°F to 400°F. As with asphalt, higher heating temperatures may be necessary to attain the proper application temperature, but higher heating temperatures should be maintained only for short periods of time.

[Editor's Note: Contractors should keep in mind that the two most important numbers are the **Flash Point** and **EVT**.]

tween the plies. [For more detailed information, see Bulletin 2A].

Every member of the panel agreed that serious problems are likely to occur when the EVT is not properly followed. These problems include mop drag, improper between-ply bonding, over or under application, splitting slippage, low tensile strength, blisters, and lack of uniformity. The principal problem, and the one most affecting roofing contractors, is the owner will be dissatisfied with the job.



The "EVT panel" met in Los Angeles to discuss the yearlong program. The panel members are (left-to-right) NRCA President Johnny Zamrzla, Peter Nazaretian (Celotex), NRCA Senior Vice President John Bradford, Robert Hawkes (Manville), NRCA Past President Melvin Kruger and John Hopkins (Trumbull Asphalt).

If the EVT is not followed, confusion in the industry will continue to persist, said Zamrzla, president of Western Pacific Roofing Corp., Lancaster, Calif.

"EVT should be used if for no other reason than the possible elimination of those potential problems that may be created if it is not used," Zamrzla said.

"EVT should be used and understood by every roofing contractor," said Bradford, president of Bradford Roofing & Insulating Co., Billings, Mont. "If it is not followed, we'll return to the old maximum temperature concept which causes slippage and splitting or it could cause overheating and the asphalt breakdown that results from that abuse."

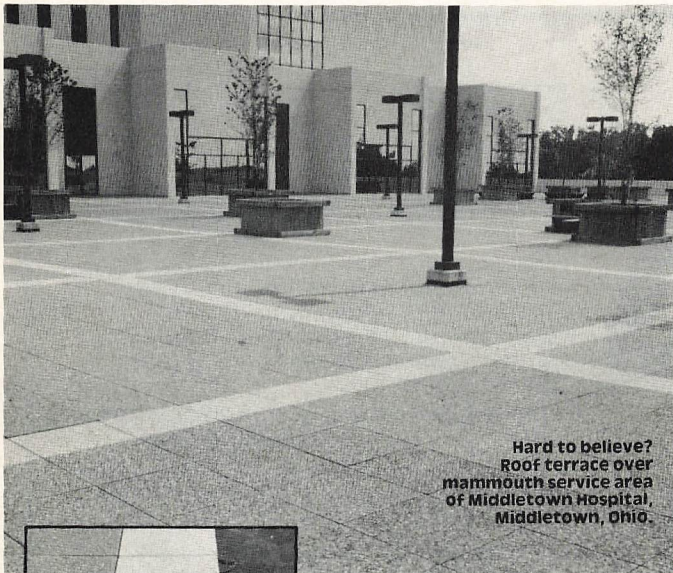
But if there is not a single correct EVT for all types of asphalt, how does the roofing contractor know which temperature is correct for the type of asphalt he is using on any particular job? That question now needs to be answered by the asphalt producers.

Trumbull Asphalt, the country's largest supplier of roofing asphalts, has recently begun printing on each carton of asphalt the local equiviscous temperature and the asphalt's flash point.

"Many, if not most, roofing manufacturers not only endorse that EVT concept, but make mention of it in their manuals, and require adherence to the EVT principle," Hopkins said.

But few asphalt suppliers actually print the EVT directly on the cartons. Most manufacturers now make mention of EVT on shipping invoices or bills of lad-

continued, page 14



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Temp Right

continued

ing. The panel would like to see uniformity of EVT labeling on the part of all manufacturers. The panel is agreed that for this to happen, specifiers and contractors will have to continually ask the manufacturers to print the EVT on appropriate packaging.

"If the roofing industry is committed to quality

If the roofing industry is committed to quality and performance of BUR systems, contractors should demand EVT on all bitumen used . . .

and performance of BUR systems, then contractors should demand EVT on all bitumen used," Zamrzla said. "All bitumen manufacturers should be supplying the EVT."

"Manufacturers of BUR systems should demand, promote and support the use of EVT on all BUR systems," Zamrzla added. "The concept of EVT should be promoted by the entire industry to all users, architects and specifiers and contractors."

Nazaretian pointed out that while EVT has been

around for sometime, "progress in any endeavor is rarely made in one single, giant step."

"The EVT concept is nothing really new, but more of a gathering and labeling of information gained through years of industry experience," he said. "The task ahead is to educate all segments of the built-up roofing industry regarding the benefits, at a lesser cost, that are available to all through the use of the EVT concept."

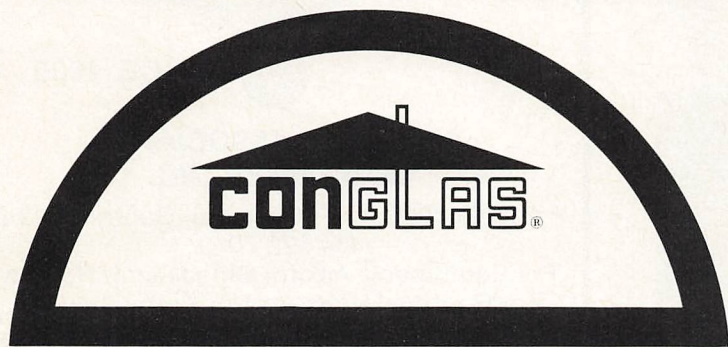
Hawkes and Hopkins said that progress won't be made if the roofing contractor keeps this important information to himself without properly instructing his crews.

"Everyone needs EVT, but the ones who most need to understand it and use it most are the men on the roof top," Hopkins said. "There is no point in a contractor attending a presentation or seminar on EVT and then keeping his knowledge a secret. He needs to explain it along with its value to his field people."

Adherence to the EVT concept should greatly assist the roofing contractor. Foremen and superintendents will have a real reference for determining proper asphalt application temperature, and owners can have increased peace-of-mind knowing that their roofs are being built to professional standards.

"EVT is the best way to achieve satisfactory built-up roof performance," said Kruger, president of L. E. Schwartz & Son, Inc., Macon, Ga.

"It is up to all of us to make the EVT concept a way of life to all elements in the construction industry."



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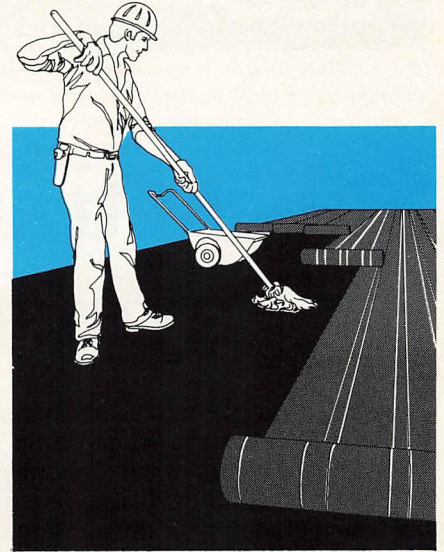
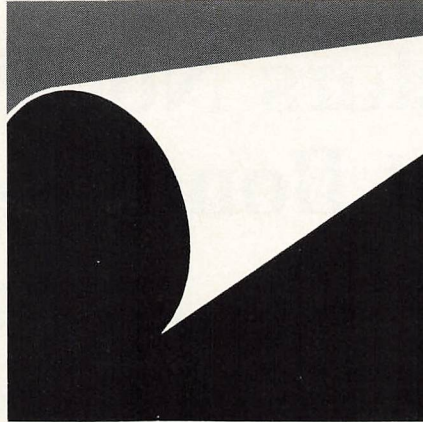
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This monthly column is prepared for *Roofing Spec* by the law firm of Summers, Hendrick, Spanos, Phillips & Grant. The column presents information of legal matters of general interest. The text is necessarily generalized, and you are advised to consult with a professional legal advisor before taking any action.

Subcontractors Not Protected By Payment Bonds—Lien Laws

Construction contractors and suppliers need to know when they are too far down the distribution chain to assert lien rights or sue on a payment bond so that they can take additional steps to ensure payment when the financial vitality of the party with whom they have contracted becomes questionable. Each state has its own specially tailored laws to deal with the question of who may assert such rights, and the answer to this question on federal projects is controlled by the provisions of the Miller Act. However, most of these laws follow the same general pattern, that is, *subcontractors and suppliers beyond the second tier have no lien rights and also may not sue on a payment bond*. This is the rule under the Miller Act.

As used in this article, a "first tier" subcontractor or supplier is one who has a direct contractual relationship with a prime or general contractor. A "second tier" subcontractor or supplier is one who has a direct contractual relationship with a first tier subcontractor. In addition to the general rule that subcontractors or suppliers beyond the second tier are unprotected, *second tier suppliers who have a direct contractual relationship with a first tier supplier (as opposed to a first tier subcontractor) generally have no lien rights and may not sue on a payment bond*. This is true even though a second tier subcontractor, who occupies the same position in the chain has such rights. The rationale behind this apparent inconsistency is that second tier suppliers are viewed as more remotely removed from the construction project in that they do not have a contract with a party who is actually performing work on the job site.

In summary, if you find yourself occupying the third tier of the distribution chain or are a supplier to a supplier, you generally cannot rely upon lien rights or the existence of a payment bond on a job to insure payment.

A few qualifications to these general rules should be noted. First, while the above rules are generally true for payment bonds issued in connection with public projects governed by either the federal Miller Act or similar state statutes (commonly referred to as Little Miller Acts), they will not necessarily hold true on a private project. On a private project, which subcontractors and suppliers can assert a claim on a payment bond depends upon the language of the bond, rather than any statutory law. Therefore, a remote sub-

contractor or supplier may have a right to sue on a private payment bond, depending upon the particular language used in the bond, though he has no corresponding right to sue on a public payment bond and no lien rights. The converse is also true and a private payment bond could contain language barring all second tier subcontractors and suppliers from coverage. Accordingly, before starting work on a private job, you should always request a copy of the payment bond if it is a bonded job before beginning work.

Second, statutes granting lien rights are interpreted much more strictly than statutes or contracts granting a right to sue on a payment bond. Consequently, in some states second tier subcontractors may not have lien rights even though they generally are permitted to sue on a payment bond. In any event, if you are working in a jurisdiction where it is not clear whether second tier subcontractors have lien rights, it would be prudent to assert that you are both a second tier subcontractor and a materialman should you run into payment problems on the job. This way, should a court rule that second tier subcontractors have no lien rights, you may still be able to establish lien rights as a materialman, even though as such you may be limited to the recovery of the value of only the materials furnished.

Assuming that you are a remote subcontractor or supplier and have neither lien rights nor the right to sue on a payment bond, you may want to consider taking one of the following additional measures to protect yourself from non-payment:

- Sale of materials or services c.o.d.
- An agreement with the party to whom you are furnishing labor and/or materials that it will request payment from the party with whom it has contracted in the form of joint checks, made payable to both of you and the party with whom you have contracted, in an amount equal to what is due and owing for labor and services rendered.
- Direct payment to you by the general contractor or owner (which is subtracted from sums owed the party with whom you have a contract.)
- Obtain some form of security agreement from the party with whom you have contracted, such as a bank letter of credit, escrow or guarantee from another party.



Negotiating As An Art

Like the man who was astonished and proud to learn that all his life he had been speaking Prose, we spend so much time in **negotiation** that we do not think of it as a conscious activity. We negotiate daily with our employees, our suppliers, our union business agents, and our own jobsite personnel as well as with our more obvious competitors and adversaries. The constant usefulness of the techniques and skills of negotiation makes it worthwhile to cultivate these skills consciously.

The subject of negotiation cannot be treated adequately in a short article, but we submit the following brief comments as food for thought.

- Your side of any dispute, however true, must be presented in a compelling, clear, logical manner, otherwise its merit may not be apparent. The truth simply does not speak for itself.
- Any offer in negotiation must be backed up by the threat of an alternative which is less desirable for your opponent. In a business transaction, you must appear determined that the deal be made on (or very close to) your terms, or not at all. If you appear to need the deal worse than your opponent, you will not likely get the deal you want. In the context of a dispute, you must appear able and willing to pursue the case through the legal process.
- You must carefully evaluate your own position, and appraise just as carefully the value of your opponent's position. The more clearly you understand the strengths and weaknesses of both sides, the more effectively you can make them work to your advantage.
- While a negotiator inevitably operates according to his own personal style, skillful negotiation requires **versatility**, the ability to take aggressive postures in

some cases (or at the proper moment in any given case), while taking more conciliatory, cooperative postures in other cases, where appropriate.

- Consider each element to be negotiated a bargaining chip. This approach gives rise to two guidelines: (1) Never give away a bargaining chip, even a small one, for nothing in return. There is simply no point to it, although this is done with astonishing frequency by persons involved in negotiation. (2) Recognize which of your chips are the small ones and which you can't afford to trade away. When you do make a concession, give away a chip which, however valuable it may appear to the other side, actually costs you as little as possible.
- Find ways to test your opponent; find out how badly he needs a settlement. When you see an advantage, do not fail to (subtly) **press** it.



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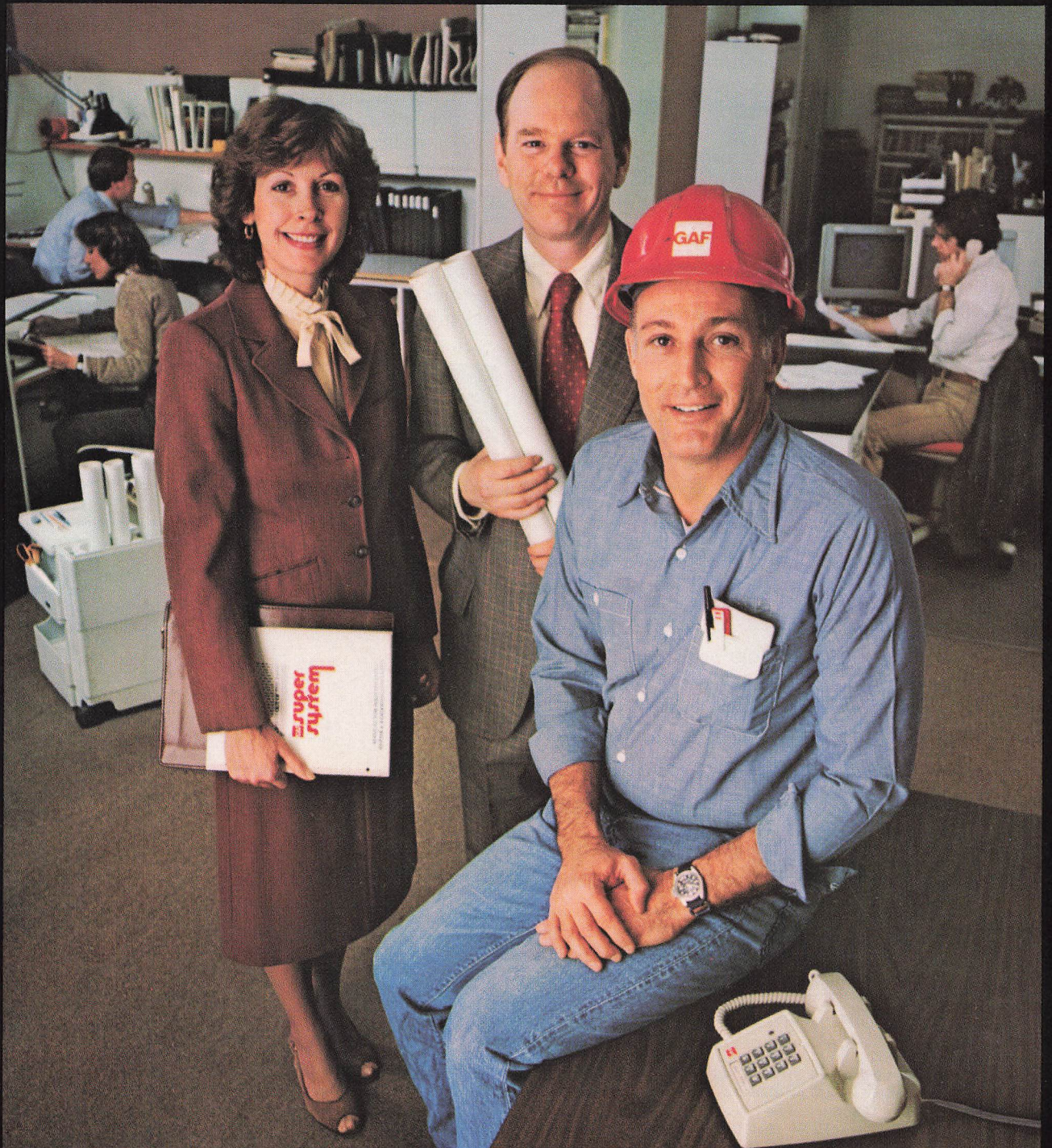
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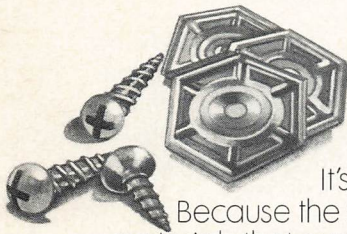


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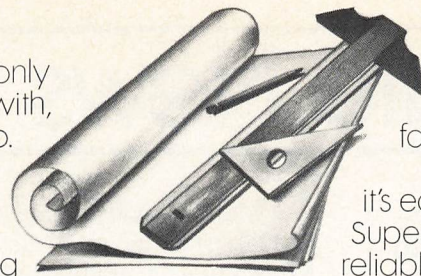
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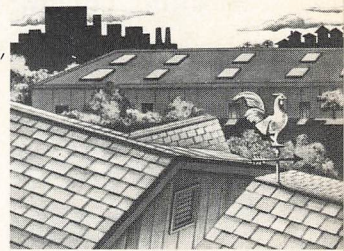
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Associate News

Manville Chairman Asks Reagan For Housing Help

Manville Chairman John A. McKinney recently met with President Reagan seeking administration support for the housing industry. McKinney was a member of a small contingent of industry officials representing the National Association of Home Builders and the National Forest Products Association.

Reagan was told that restoring the housing industry could serve the President's economic program by putting 700,000 persons back to work and adding significant tax revenues.

The industry leaders urged immediate support by the President for action and legislation to boost home buying.

"The industry's position was well prepared and well presented," McKinney said. "The President and other officials listened intently to our message."

Samuel Pierce, Jr., Secretary of Housing and Urban Development told reporters after the meeting that "we hope to have housing up and going soon."

Among the administration officials attending the meeting in addition to the President and Vice President George Bush were Murray Weidenbaum, chairman of the Council of Economic Advisors; David Stockman, head of the Office of Management and Budget; the secretaries of Housing and Urban Development, Labor, Treasury, Health and Human Services, and Agriculture; and James Baker, White House Chief of Staff.

Carlisle and Dow to Market Systems Together

A formal marketing agreement was reached recently between Carlisle Tire & Rubber Co., a large manufacturer of single-ply material, and Dow Chemical, maker of the Insulated Roof Membrane Assemble system.

The marketing agreement will provide commercial building owners with a one-source warranty on two protected membrane roofing systems.

Carlisle has been a single-ply membrane manufacturer for many years. Its first rubber roof application was in 1961 at Chicago's O'Hare Airport. Frank Poley, Carlisle's national sales manager, said the O'Hare roof is still performing well.

Carlisle will promote the IRMA system, a patented design of the Dow Chemical Co., utilizing either Sure-Seal EPDM sheet membrane or cold applied Sure-Seal LiquiSeal waterproofing membrane.

"The convenience that this type of agreement provides to the building owner enhances Carlisle's competitive edge," said Kem Scott, director of marketing. "By providing this one-source responsibility for the entire roofing system from the deck up, we eliminate the confusion and frustration a building owner might normally face should be encounter a problem."

GAF Roofing Plants Reopen To Meet Summertime Demand

GAF Corporation has begun reopening most of its roofing plants around the country as fair weather sparks renewed demand by the construction industry.

A number of GAF's 17 roofing materials plants were shut down when winter weather and a slumping housing market combined to slow construction and swell inventories of finished goods.

"We've been extremely successful at selling off excess inventories," said John A. Brennan, senior vice president for building materials. "Now we are looking forward to the seasonal pick-up in construction."

The company's Fontana, Calif., and Mt. Vernon, Ind., plants just reopened. GAF also expects to resume production at Erie, Pa., Millis, Mass., Minneapolis, Minn., Mobile, Ala., Savannah, Ga., and St. Louis.

Brennan acknowledged that full recovery would be slow, but said he believes that the building industry recession has been through the worst.

*"Rhett, why are you leaving?
Is it because I didn't know just who made ONLY fiberglass
roofing materials and have NEVER, EVER made anything else?
Is it because I didn't know about their Class A ratings, 20-year
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NRCA Member Profile

Changing of the Guard for Detroit's Wright-Brown Roofing Co.

Wright-Brown Roofing Company, based in Detroit, (Mich.) is celebrating three decades of service and three generations in the roofing trade with appointments of key personnel. Thomas E. Brown, Jr., recently assumed the position of president along with full ownership of the business, and Thomas E. Brown, Sr., has been named Assistant to the President. These announcements were made by Richard W. Brown, Chairman of the Board and co-founder of the company.

Tom Brown, Jr., has served with Wright-Brown Roofing in various capacities for 16 years. He holds a degree in Automotive Marketing from Northwood Institute. In addition to being president of Wright-Brown, he is currently serving a second term as president of the Southeastern Michigan Roofing Contractors Association. He is also a director of the National Roofing Contractors Association, Chairman of (its) Safety Committee, a faculty member of the Roofing Industry Educational Institute and Chairman of the Wayne, Oakland and Macomb Counties Joint Apprenticeship Committee.

Tom Brown, Sr., C.P.A., has served on the Board of Wright-Brown since its founding. He is a graduate of Antioch College. Prior to his recent appointment at Wright-Brown, he served as Controller at the Ford Motor Credit Company. As Assistant to the President, Brown is responsible for special projects.



An unbroken family tradition in the roofing contracting business traces its roots to the Philip Carey Co., a prominent roofing material manufacturer and contractor at the turn of the century. In 1900, William Brown opened the Detroit office for the Carey Co. Recently, Thomas Brown, Jr. was named president and owner of the Detroit-family business. Brown, an NRCA Director, is the grandson of William Brown (pictured here).

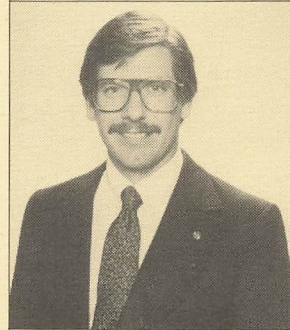
Member Profile

continued from page MS1

It is the senior Tom Brown's brother, Richard Brown, who is Chairman and co-founder of Wright-Brown Roofing. The Detroit native is a Business Administration graduate of Dartmouth College.

The father of Dick and Tom Brown, Sr.—Detroit business pioneer William Brown—was the first of the Brown family to become involved in the roofing industry. In 1900, he opened the Detroit office of the Philip Carey Co. (a prominent national manufacturer/contractor) to sell asphalt, insulation and roofing products in southeastern Michigan. Bill Brown retired in 1946 and died at the age of 79 in 1955.

The Wrights joined the Carey Company in 1925, and in 1951 the two families formed their own roofing



Tom Brown, Jr.

contractor's franchise.

Today, Wright-Brown Roofing Company continues the tradition of complete service in commercial, industrial and institutional roofing. The company specializes in providing built-up roofing, single-ply membrane roofing and long term maintenance contracts for virtually all kinds of structures throughout Michigan, northern Ohio and northern Indiana.



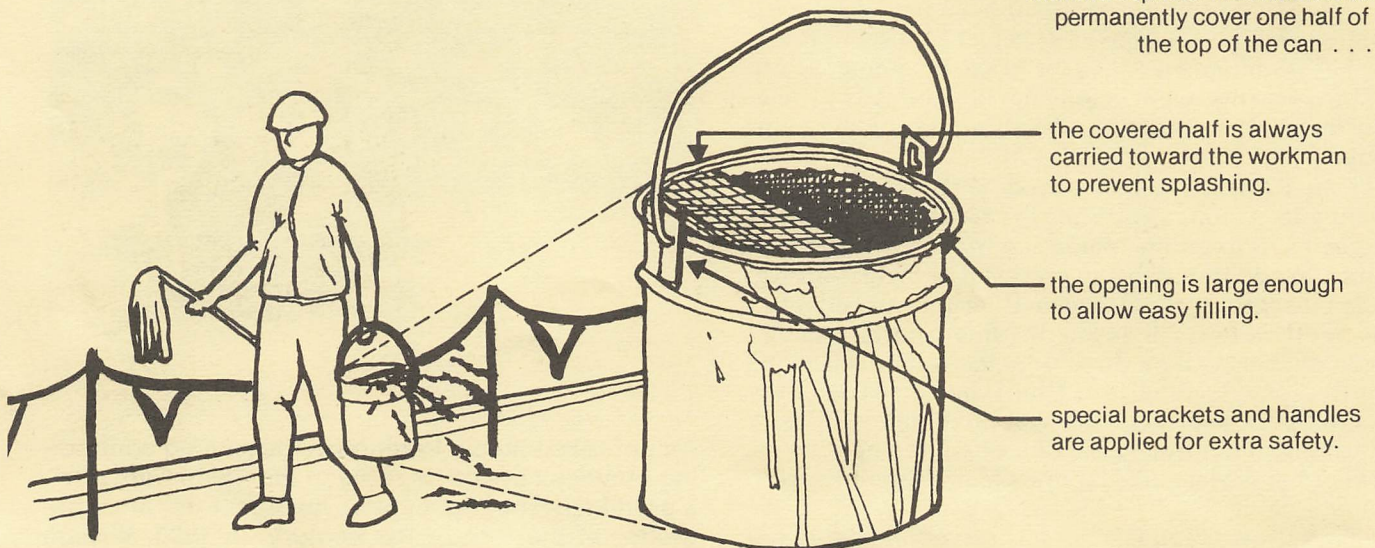
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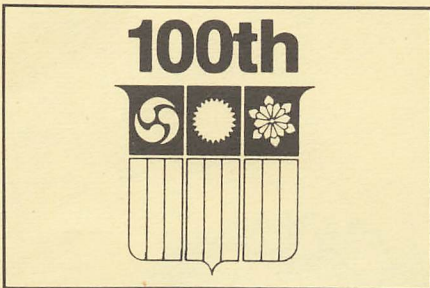
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NRCA Needs Your "Historical" Photos

As NRCA prepares to celebrate its 100th Anniversary, contracting members are urged to submit any photographs of historical interest. Photos for submission should depict any activity of interest to the roofing contracting community.

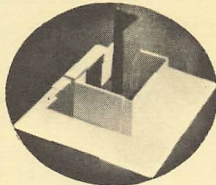
The photos, with appropriate



credit, will be published in *Roofing Spec* from time to time. In addition, photos may also be used in a proposed NRCA 100th Anniversary Commemorative booklet.

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opened it up, we couldn't possibly use all the gravel that conveyor could move in one hour."

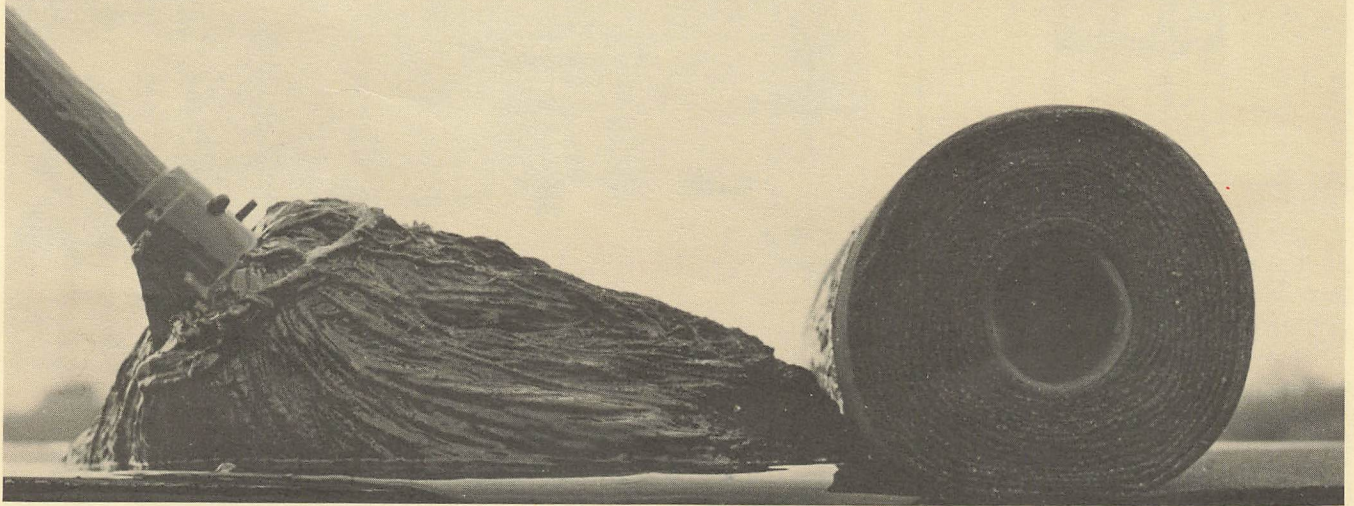
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Asphalt or Coal Tar Pitch?

Roofing Expert Calls it A Toss Up

by Bill Cullen
Research Associate

Since the early 1920s, roofing technologists have debated the merits of coal tar pitch and asphalt as the waterproofing component for low slope roof, i.e., 0 to ¼ inches per foot, multi-ply bituminous membranes. To compare the performance of various types of built-up roofs, a comprehensive survey of over 200 roofs was made by the National Bureau of Standards in the late teens and early 1920s. The author stated that the majority of roofs inspected were constructed using coal tar pitch and they gave excellent service. He further stated that many asphalt roofs also performed adequately and predicted that asphalt roofs properly surfaced with slag or gravel should give as long or possibly longer service than coal tar pitch roofing. This is the first indication found in the literature that asphalt may be an acceptable substitute for coal tar pitch.

For the next 30 years, claims had been made and generally accepted that coal tar pitch roofs gave the better service on level decks where water collects and stands. However, for various reasons such as health, availability and cost, the question frequently arose as to the adequacy of asphalt as an alternative to coal tar pitch in relation to the performance of these roofs in service. In an attempt to arrive at an objective answer to the question, the Army, Navy and Air Force asked

the National Bureau of Standards (NBS) to undertake a research program. In 1955, in response to this request, NBS conducted a comprehensive laboratory study as well as a field investigation involving the examination of over 100 roofs to determine if asphalt was a suitable substitute for coal tar pitch on roofs where water collects and stands.

In a 1957 report, NBS concluded from the results of the program that it was its strong opinion that good service could be attained from either coal tar pitch or asphalt built-up roofs assuming the roofing was properly applied and subsequently maintained in accordance with good roofing practices. In other words, dead level asphalts were acceptable substitutes for coal tar pitches. The asphalts referred to are similar to those essentially conforming to the current softening point requirements of ASTM Standard D-312, Type I.

I was the principal investigator of the 1955-56 program and after 25 additional years of laboratory research and in-service roof performance experience, I feel more strongly now than ever that the conclusions of that study were and still are valid. This opinion prevails in spite of the claims that the roofing industry is not getting the same quality of asphalts today as was available in the 1950s.

I have seen no technical evidence that those claims are valid. Coincidentally, similar claims may be made about quality of coal tar bitumen (ASTM D-450, Type III), which has been marketed only since the 1970s as opposed to the quality of traditional coal tar pitch (ASTM D-450, Type I), in use for over 100 years. It is indeed unfortunate that neither criteria nor standards are available to describe the quality of asphalt, coal tar pitch or coal tar bitumen. Currently available standards for both asphalt and coal tar pitches and bitumens are based largely on physical characteristics which merely indicate that the materials can be handled well, will stay in place on the roof, etc.

In summary, at the current state-of-the-art of roofing technology, there are strong arguments based on performance history which convince me that ASTM D-312, Type I asphalt is an acceptable option for coal
continued on following page

Asphalt or Coal Tar

continued

tar pitch described in ASTM D-450, Type I, and probably more acceptable than coal tar bitumen. The option of choosing one over the other should be left to the discretion of local engineers, contractors or specifiers who have had extensive experience with the performance of the various bitumens for low-slope roofing in their geographical area.

My opinions and foregoing comments are largely based on my personal experiences and confirmed by the following analysis. First, there is unanimous agreement among roofing technologists that the bitumen in a built-up membrane has two and only two essential functions. One is a waterproofing function. The second is an adhering function to ensure membrane integrity initially and over the lifetime of the roof. Next, most technologists agree that the bitumen in order to fulfill and maintain these functions, should possess the following primary performance characteristics:

- Water resistance.
- Ability to cold flow.
- Sufficient rigidity at roof temperatures to resist slippage.
- Surface wetting ability to provide adequate adhesion.
- Sufficient durability to maintain waterproofing integrity of membrane over the service life of the roof.

Although health and safety are not necessarily per-

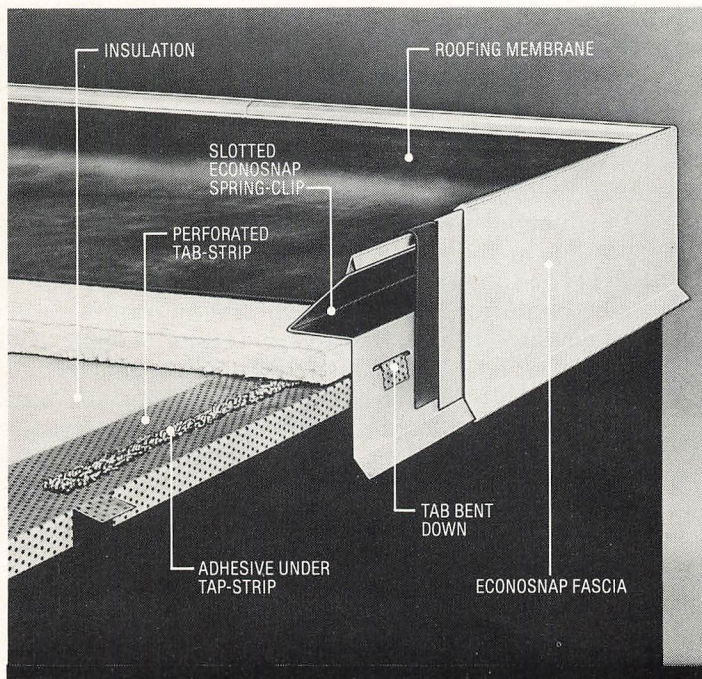
formance characteristics, the materials should not provide unreasonable injury or health hazards to workers applying them.

I have accepted these as desirable performance characteristics for bitumens which must perform their required function on low-slope roofs. I will now attempt to compare the properties of asphalts and coal tar pitches (not coal tar bitumens) as found in the published literature to these performance characteristics.

Resistance to water is of primary concern. Experimental results show that any bituminous material in permanent contact with water will absorb it in varying amounts. Data from NBS tests which involved 14 asphalts and three coal tar pitches completely submerged in water for one year indicated the average absorbance for coal tar pitches to be 5.3 ounces per 100 square feet per year as opposed to that of asphalt which was 7.7 ounces per 100 square feet per year. The amounts are infinitesimally small and the differences are insignificant.

Cold flow for self healing purposes is a distinct advantage. Coal tar pitches have long been acclaimed for their self-healing characteristics. This is a valid claim as NBS test results have shown. However, contrary to the opinions that asphalts don't self-heal (correct opinion for most oxidized or blown asphalts of Types II, III and IV, ASTM D-312), the NBS Laboratory tests on 14 ASTM D-312, Type I asphalts showed that these asphalts self-heal almost as readily as coal tar pitches. Experimental outdoor results indicated that both the asphalts and coal tar pitches self-healed within

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24 hours during the warmer months of spring and summer, but little or no self-healing was evident from either during cold weather. Although coal tar pitches have a slight edge here, the performance of the low-slope asphalts is certainly more than satisfactory in this category.

Rigidity at roof temperatures to resist flow comes into play only when the slope of the roof is such that slippage is of a concern. Here the asphalt has the definite advantage since laboratory tests have shown that they are much less susceptible to viscosity change over service temperature ranges than are coal tar pitches. The Susceptibility Indexes, which are a measure of this viscosity change, are in a range of three and 12, for asphalts and coal tar pitches, respectively.

Surface wetting ability is a primary requirement of a hot roofing bitumen in order to provide adequate and permanent ply adhesion. The extent to which a bitumen provides this wetting of the felt or fabric is indicated by its contact angle. When the angle is low, the bitumen easily spreads over the surface and good adhesion is obtained. Conversely, a high contact angle will generally be indicative of poor adhesion. Assuming the proper application temperature is used (the Equeviscous Temperature) and the surface is clean and dry, the contact angle of either asphalts or coal tar pitch is sufficiently low to obtain the desired results. This generally occurs at a lower temperature for coal tar pitch.

Durability is the ability of the bitumen to retain its desirable performance characteristics over the service life of the roof. Since there are no criteria or test methods to indicate the durability of a bitumen, be it coal tar pitch, coal tar bitumen, or asphalt, we have to rely on theoretical approaches to assess this properly.

In the case of asphalt, two conditions are necessary to initiate and maintain the degradation process. One is radiation in the ultraviolet and visible regions of the spectrum which through a photo-oxidation reaction in the asphalt produces water soluble degradation products at the expense of the oily constituents (the plasticizers) of the asphalt. Water is the second necessary condition which if present, dissolves and carries away the water soluble photo-oxidation products leaving the asphalt exposed to continue the degradation cycle. The elimination of either of these conditions, for example, the radiation by shielding the asphalt with opaque gravel or slag surfacing prohibits this process from taking place, so the asphalt retains its original properties indefinitely.

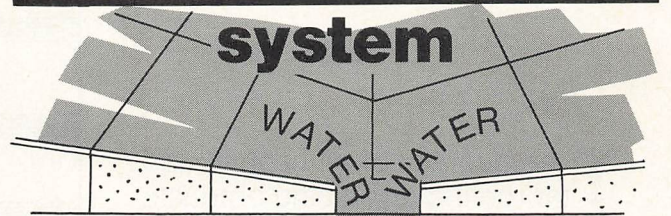
In the case of coal tar pitch, information on degradation mechanism is not easily found in the literature. It is generally accepted, however, that coal tar pitch loses volatile constituents as it is exposed to roof temperatures and becomes harder (more brittle) as evidenced by an increase at its softening point. Again coal tar pitch must be protected by an opaque surfacing. Based on data found in the literature and extensive experience with the performance of low slope roofs, I have concluded that the durability aspects of either coal tar pitch or Type I asphalts are conducive to good performing roofs even where water collects

continued on following page



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Asphalt or Coal Tar

continued

and stands. As far as durability goes, it is my opinion asphalts have the distinct advantage.

The health and safety aspects are not directly related to performance. Therefore, I do not plan to dwell on them here. It has been well documented that under certain conditions, the fumes from heated coal tar pitch and asphalt can have serious consequences on those exposed. Certainly as far as the workers are concerned, coal tar pitch has been by far the more irritating. The key point I wish to make here is that, due in part to health and safety concerns, a new coal tar product was marketed during the 1970s. Reportedly, research investigations coupled with new technology uncovered a new coal tar bitumen, which substantially decreased the evolution of fumes.

This development has raised two questions:

- What is coal-tar bitumen?
- How can the user be assured that the new product will provide at least as good service over the service life of the roof as his coal tar pitch which has had a good service history for over 100 years in the US? I don't believe these questions have been answered.

In conclusion, I reiterate my strong opinions that:

- Equally good serviceable roof performance on flat

decks can be obtained using either Type I Asphalt or Coal tar pitch.

□ The ultimate decision as to which should be used should be made by competent personnel based on knowledge and experience of flat roof performances in their geographical area.

□ A laboratory investigation and field survey must be undertaken to provide data and information on the new coal tar bitumen and its performance in service.

References Used:

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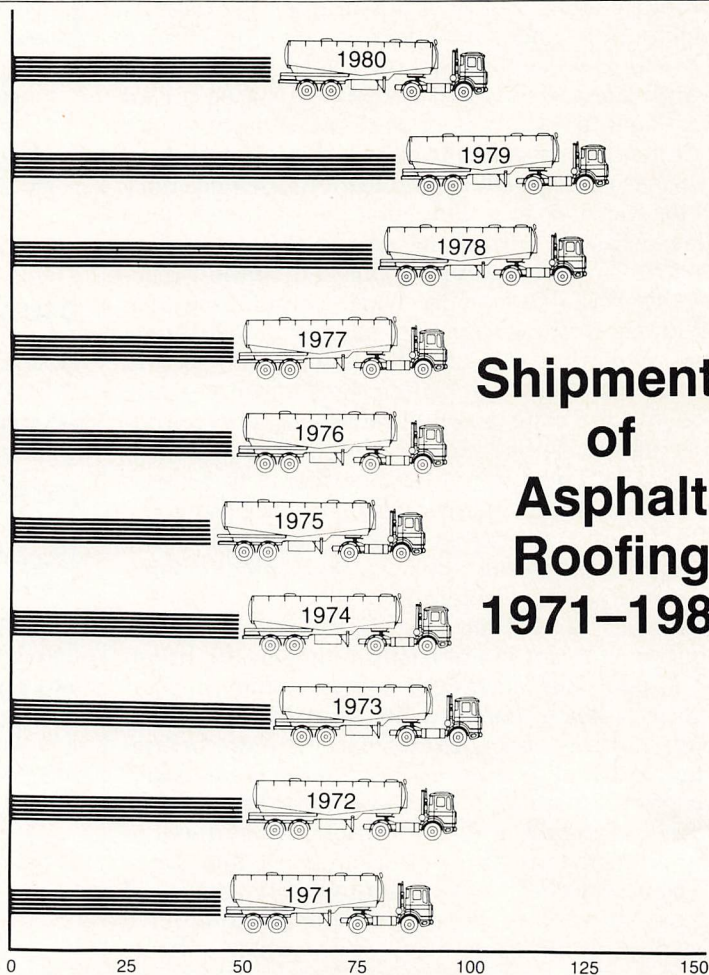


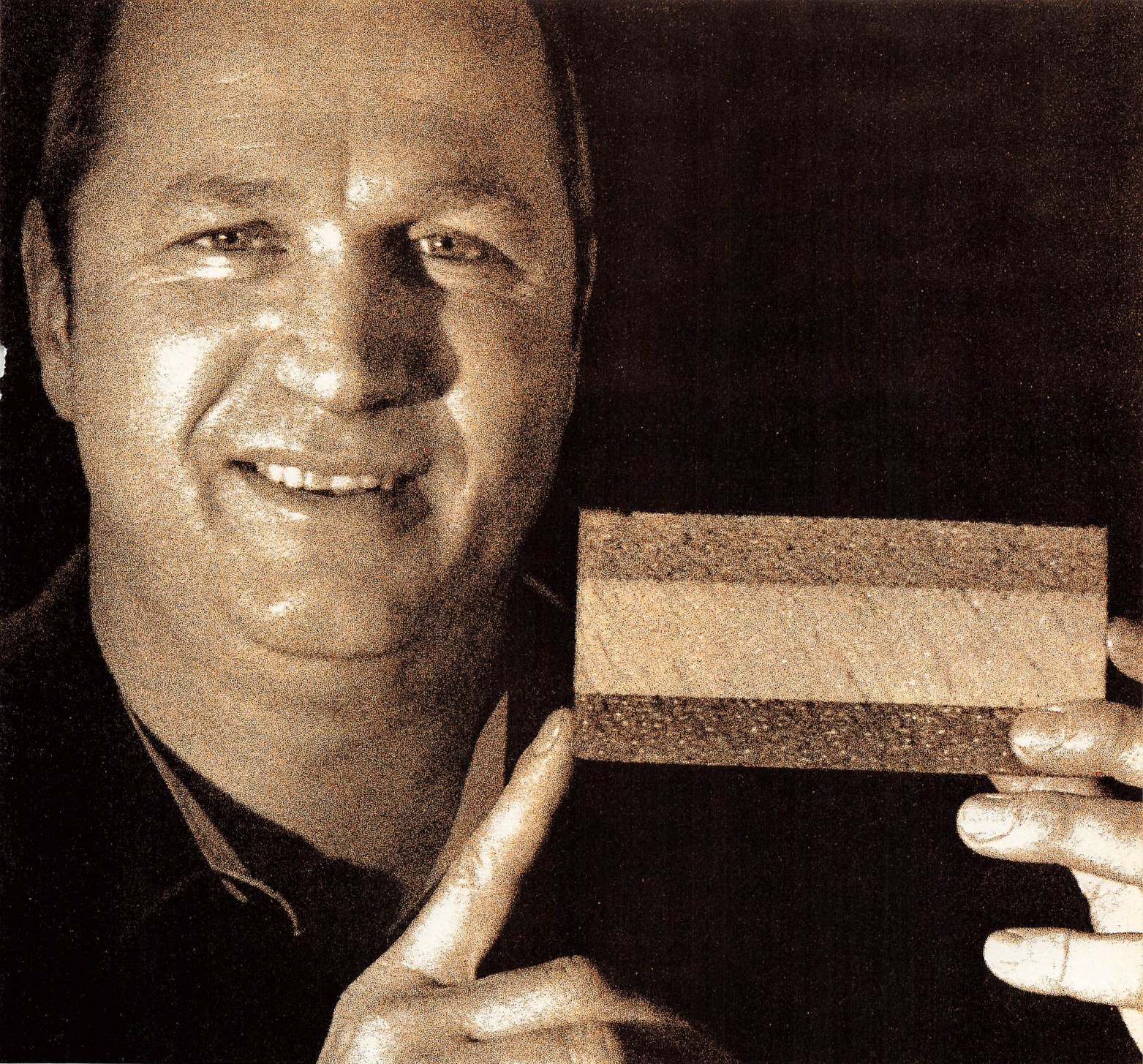
The quantity of all asphalt and tar roofing and siding products shipped in 1980 amounted to 9.1 million short tons. Asphalt roofing represented 93 percent of the 1980 total and saturated felts 7 percent.

Asphalt roofing shipments for 1980 were 23 percent lower than the 11.0 million short tons for 1979. Felts were 30 percent lower than the 956.8 short tons for 1979.

Fiberglass base products accounted for 19 percent of the total short tons.

(U.S. Dept. of Commerce)





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An NRCA Study of Asphalt Impregnated Glass Mats

by Bob LaCosse,
NRCA Director of
Technical Services
and Bill Cullen,
Research Associate

The Test Program:

The NRCA Technical Operations Committee requested the Technical Services Department to conduct a test program on samples of Type IV glass fiber roofing mats which represented the current production of these materials available in the United States. Fourteen samples, each consisting of two rolls, representing nine manufacturers were obtained by NRCA members at preselected locations. The samples were sent to the Chicago Testing Laboratory where they were tested for conformance to the requirements of ASTM Standard D-2178, Type IV (1).* (*Numbers in brackets refer to references at the end of this paper.)

The Program Objectives:

The purpose of the test program was threefold:

- To provide an indication as to the quality of glass fiber roofing mats available to NRCA members and others in the United States with respect to the requirements of ASTM Standard Specification D-2178, Type IV.
- To test the practicality of the proposed NRCA recommended changes to ASTM Standard D-2178, Type IV as given in Table 2 (2).
- To provide test data to assist and encourage the membership of ASTM Committee D-8 on Roofing and Waterproofing in upgrading the requirements of ASTM Standard D-2178, Type IV to increase the current state-of-the-art of bituminous roofing technology.

The Test Results

The test results as reported by the Chicago Testing Laboratory, Inc. are given in Table 1 (3). An analysis of these results in view of the program objectives was made. Further, the NRCA results for breaking strength before and after the 24 hour water soak were compared with the results obtained in the MRCA Glass Mat Test Program (4).

The Conclusions and Recommendations:

- The fourteen samples which were tested essentially met the requirements of ASTM Standard D-2178, Type IV. Small deviations on the part of two samples (Nos. 5 and 11) for breaking strength and two samples (Nos. 7 and 12) for adherent comminuted surfacing from the limits specified were noted. However, in our opinion the deviations were not sufficient to cause rejection.
- In comparing the NRCA test results for breaking strength with the MRCA test results (4) the following conclusions may be made:
 - The NRCA results were somewhat higher with mean values of 58 lbf. (pounds per foot) and 53 lbf. for longitudinal and transverse directions as compared

TABLE 1.
ASPHALT IMPREGNATED GLASS FIBER ROOFING MAT
ASTM D-2178, TYPE IV

Sample No.	1	2	3	5	6	7	8	9	10
CTL No.	80076	80102	79642	79992	79683	80104	79538	80097	79529
Net Dry Mass of Asphalt Impregnated Mat, lb/ 100 ft ²	11.45	10.23	11.23	8.02	12.21	15.71	8.52	11.00	10.78
Detached Comminuted Surfacing lb/100 ft ²	0.10	0.01	0.11	0.22	0.36	0.58	0.02	0.07	0.08
Moisture as Received, %	None	0.85	Trace	0.54	0.10	Trace	Trace	Trace	Trace
Breaking Strength @ 77F, lbf:									
Dry Mat:									
Longitudinal	58.9	54.6	55.7	*46.1	63.9	57.1	58.7	55.8	66.1
Transverse	67.6	*45.4	*44.3	**40.2	68.2	*49.6	51.0	*48.8	61.1
Conditioned in Water									
24 hr. @ 140F:									
Longitudinal	42.7	31.2	48.0	17.4	31.2	39.2	35.1	18.1	49.4
% of Dry	*72.5	*57.1	86.2	*37.7	*48.8	*68.5	*59.8	*32.4	*74.7
Transverse	41.7	25.1	31.4	10.0	36.3	35.8	30.9	14.8	49.2
% of Dry	*61.7	*55.2	*70.9	*24.9	*53.2	*72.7	*60.6	*30.3	80.5
Pliability @ 30F, 1/2" Mandrel	10 Pass	*10 Fail	10 Pass	*8 Fail	10 Pass	10 Pass	10 Pass	10 Pass	10 Pass
				2 Pass					
Mass, lb/100 ft ² :									
Desaturated Mat	2.15	3.00	2.00	2.86	2.07	2.66	2.42	2.83	2.64
Adherent Surfacing	1.16	0.62	0.56	0.74	2.86	**4.38	0.47	0.22	0.56
Asphalt Saturant	8.02	6.59	8.55	4.20	6.93	8.10	5.55	7.83	7.50
Ash of Desaturated Mat, %	78.6	77.6	75.0	76.7	77.0	85.0	78.9	80.6	82.4

*Fails NRCA Proposed Specification Requirements. **Fails ASTM D-2178, Type IV Specification Requirements.

to the mean values reported by MRCA of 51 lbf. and 49 lbf. in similar mat directions.

■ The decrease in mean values (21 lbf. and 18 lbf. for longitudinal and transverse direction) of breaking strength of the NRCA test samples after the 24 hour soak test at 140°F was considerably greater than those reported by MRCA (5 lbf. and 10 lbf. for longitudinal and transverse directions). The significant difference may be explained by the different conditioning periods after soak. In essence, the NRCA specimens were tested in a set condition while the MRCA specimens were air dried 48 hours before testing. The pertinent point here is that although there is a considerable loss in strength of a mat which is wetted, that upon being dried it regains some of the strength it lost.

■ The 24 hour soak test at 140°F may be related to on-the-job storage conditions and such a requirement should be considered for inclusion in the next revision of ASTM Standard D-2178.

■ The 30°F pliability test results may be an indication of the cold temperature handleability characteristics of glass fiber roofing mats and should be included in the next revision of the ASTM Standard D-2178.

■ The proposed requirements of the NRCA recommended changes in D-2178 are not realistic with respect to the materials currently available in the marketplace.

■ The test data show that in most cases the currently available materials easily meet the requirements of ASTM Standard D-2178. Therefore, in order to upgrade the current state of bituminous roofing technology and to reduce the possibility of marginal products being introduced into the marketplace, it is strongly recommended that the next revision of D-2178 include the changes given in Table 2.

Note:

Since the requirement for breaking strength water soak and cold temperature pliability are new requirements, it is suggested that ASTM Committee D-8 consider running a round-robin test series using procedures described in the Chicago Testing Laboratory report.

References:

- 1—ASTM Designation: D2178-76, Standard Specification for Asphalt-Impregnated Glass Mat Used in Roofing and Waterproofing, Type IV-Heavy Duty Ply Sheet.
- 2—Proposed NRCA Specification for Type IV Asphalt-Impregnated Glass Fiber Mats.
- 3—Chicago Testing Laboratory, Inc. Report on Glass Fiber Roofing Mat, February 4, 1982.
- 4—Type IV Fiberglass Felt Test Results, Midwest Roofing Contractors Association, November 1981.

Table 2. Proposed Changes in ASTM D-2178, Type IV

	Current	Proposed Revision
Net dry mass of asphalt-impregnated glass mat. min., g/m ² (lb/100ft ²)	342(7.0)	390(8.0)
Detached comminuted surfacing max., g/m ² (lb/100ft ²)	34(0.7)	39(8.0)
Breaking strength, min., N(lbf)		
Longitudinal	196(44)	223(50)
Transverse	196(44)	200(45)
*Breaking strength after 24 hours soak @60°F (140°F) min., N(lbf)		
Longitudinal	—	158(35)
Transverse	—	135(30)
*Pliability at -1°C (30°F) Bend over 90° over 0.5' radius edge 10 specimens	—	7 of 10 pass
Mass of desaturated mat., min., g/m ² (lb/100ft ²)	83(1.7)	98(2.0)
Adherent comminuted surfacing max., g/m ² (lb/100ft ²)	122(2.5)	146(3.0)
Bituminous saturant (asphalt) min., g/m ² (lb/100ft ²)	146(3.0)	194(4.0)
*New requirements.		

	Specifications						
	11	12	13	14	15	D-2178-IV	NRCA
	79657	80014	79166	79548	79583		
	9.41	9.30	13.05	8.47	12.91	7+	—
	0.06	0.33	0.58	0.22	0.05	0.7-	0.7-
	Trace	Trace	Trace	Trace	Trace	1.0-	1.0-
**42.3	69.9	60.0	62.0	62.2	44+	50+	
*45.7	66.2	*47.1	76.9	54.9	44+	50+	
	22.1	50.2	40.5	41.9	35.0	—	—
*52.2	*71.8	*67.5	*67.6	*56.3	—	80+	
	24.5	61.0	29.4	52.6	34.0	—	—
*53.6	92.1	*62.4	*68.4	*61.9	—	80+	
*4 Pass 6 Fail	10 Pass	*10 Fail	10 Pass	*7 Pass 3 Fail	—	10 Pass	
	2.48	2.42	2.58	2.63	2.41	1.7+	
	0.33	**3.20	1.51	1.12	0.80	3.0-	
	6.52	3.34	8.37	4.50	9.65	3.0+	
	81.9	78.6	75.0	78.0	79.4	75-88	75+

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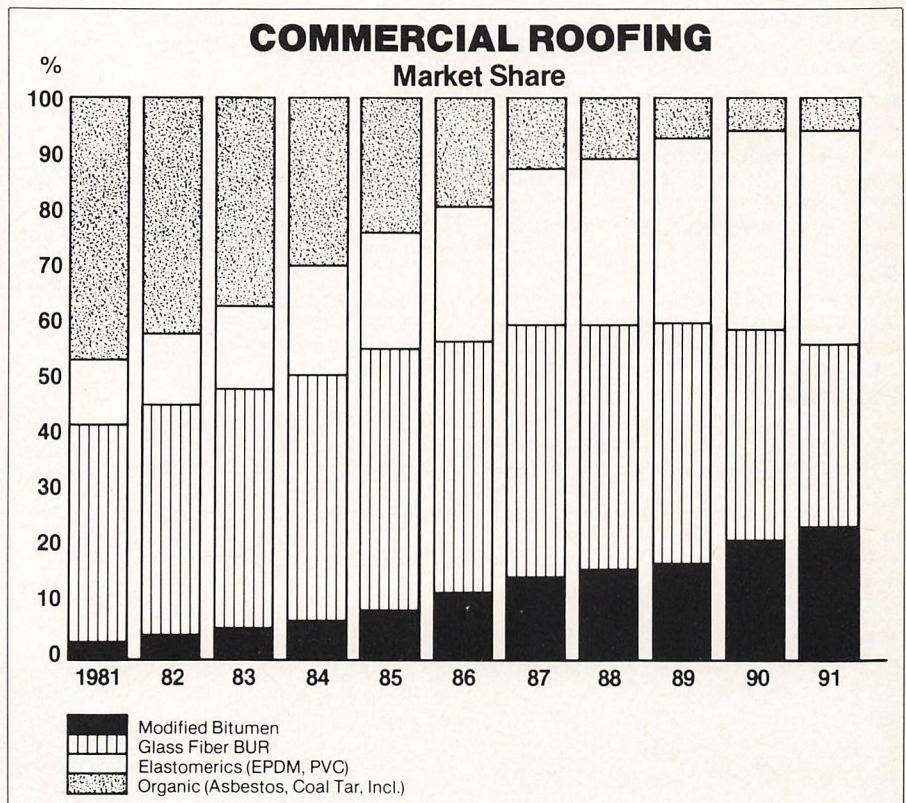
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Study Shows BUR To Retain Majority of Total Roofing Market

The best roofing system is one that performs well over the long run and can be installed at the lowest, most cost-efficient price. Owens-Corning Fiberglas Corp. (OCF), one of the leading makers of fiber glass roofing materials, recently completed a private study that revealed the use of single-ply systems will continue to grow, but conventional roofing systems will maintain a leadership position in the total commercial roofing market.

The OCF study was conducted with assistance from faculty members of the Harvard University Business School. The study results were unveiled by several OCF officials to two groups of business publication editors in New York and Chicago.

Gregory T. Faherty, OCF vice-president and general manager of the Commercial Roofing Division, told the editors that although single-ply systems are riding a wave of popularity, conventional BUR systems—including glass fiber felts and modified bitumens—will maintain its lead by balancing high performance with cost effectiveness.



This chart demonstrates the growth and/or decline of four different types of applied roof systems. The biggest gains predicted by Owens/Corning Fiberglas are in the areas of glass fiber roofing systems. The biggest losers will apparently be built-up roofs manufactured with organic felts. (Chart from Owens/Corning Fiberglas.)



Officials from Owens/Corning Fiberglas recently addressed two groups of construction industry publication editors in New York and Chicago. (Left photo) George Norman—center—and Greg Faherty—(Right photo, fourth from left) are pictured with several editors in attendance at the Chicago session. The OCF officials discussed recent roofing industry trends and unveiled new OCF products and services.

"We believe that conventional (glass fiber) BUR systems, including modified bitumens, can retain a 60-to-70 percent share of the overall roofing market," Faherty said. "This is especially true if you combine these systems with high-performance, low-cost products."

The study—conducted by Harvard Professor Michael Porter with staff assistance from Associate Professor John Wells—examined all areas of commercial roofing. The study findings indicate that while rubber and plastic single-ply systems will continue to gain widespread acceptance, conventional systems will maintain a majority position.

Built-up roofs made with organic felts will decline dramatically, ac-

The future of the roofing industry lies in modified bitumens.

ording to the study. Consequently, most built-up roofs will utilize glass fiber felts.

Faherty said one of the main reasons the use of single-ply systems has blossomed is because the materials can be applied at a low-installed cost by combining "high priced single-ply materials with low-cost insulation such as bead board."

By 1991, when the US roofing contracting industry is near an applied level of three billion squares, 30 to 35 percent of all commercial/industrial roofs will be constructed of EPDM or PVC materials, Faherty said.

The "future of the roofing industry," however, lies in modified bitumens, Faherty predicted.

"Modified bitumens are basically just modified conventional roofs," he said. "A big part of the growth in single-ply roofing will be in modified bitumens."

Faherty also predicted that by

1986 modified bitumens will capture about 40 percent of the total single-ply roofing market. The biggest single-ply casualty will be materials manufactured from PVC, he said.

"We've analyzed the rubber and plastic roof market," Faherty said. "We don't see anything attractive about it for Owens-Corning Fiberglass." He added that the makers of rubber and plastic materials don't have enough experience in the roofing industry.

"Too many people are jumping on the bandwagon expecting to make a fast buck and then get out of the business," he said.

Faherty also said that OCF is "doing what we can in order to stay ahead in the roofing game."

The OCF study was conducted in an effort to plot the firm's marketing strategy in the coming months. Presently, there are no plans to release further information for public dissemination.



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Bitumen Burns: Minimizing The Pain

*Editors Note: The following article—co-authored by Col. Basil A. Pruitt, Jr., Fort Sam Houston, Tex., and Dr. Richard F. Edlich, University of Virginia, Charlottesville, is reprinted here from the March 19, 1982 issue of **The Journal of the American Medical Association**.*

Thermal injury as a consequence of contact with hot pitch and tar represents one of the five safety problems accounting for 62 percent of all injury cases and 76 percent of all workers' compensation costs in the roofing and sheet metal industry. Burns from hot materials, the second most frequent injury after "strains and sprains," constitute 16 percent of all accidents involving roofers and sheet metal workers, with 17 percent of those injuries being of sufficient severity as to cause "lost time" (in approximately one sixth of the injuries, the "lost time" exceeds ten days). In the state of California alone in 1979, 366 roofers and slaters sustained burn injuries.

The United Union of Roofers, Waterproofers, and Allied Workers, at the direction of their international president Roy E. Johnson and in the interest of instructing and training their membership in first aid for bitumen burns, has solicited recommendations from numerous physicians involved in burn care, both in the United States and abroad. The following represents a summary of the comments received from the physicians respondents to the Union's inquiries.

Immediate on-site care:

■ Cool the bitumen with available water (preferably cold) to limit tissue damage and prevent further spread of the bitumen.

■ Cooling should be carried out until the bitumen has hardened and cooled, and body hypothermia must be avoided.

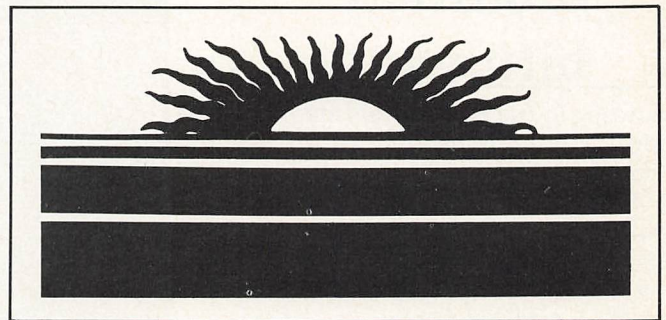
■ Adherent bitumen should not be removed "in the field" but only at a medical facility by qualified personnel.

Definitive care by medical personnel:

■ Bitumen, which after cooling is adherent to skin blisters, should be removed with the blister epithelium in the course of initial cleansing and debridement.

■ Bitumen adherent to unblistered tissue should, in general, be left in place and covered with a liberal application of a petrolatum or animal fat-based material (petrolatum, lanolin, mineral oil, and antibacterial ointments have been used by various respondents to the questionnaire). The antibiotic-containing ointments, which may limit bacterial proliferation on the burn, have been most widely used by the respondents.

■ The adherent bitumen should then be dressed and the dressing removed on a daily or more frequent basis. Repeated ointment and dressing applications should be carried out until the bitumen is emulsified and totally removed—a process usually requiring 24 to 72 hours.



■ Following bitumen removal, the wound is treated as any other burn.

■ The risk of suppuration beneath adherent bitumen precludes leaving such in place.

■ The use of other solvents must be avoided, since they may cause further tissue injury or systemic toxic effects.

These guidelines are submitted to assist those providing first aid and initial care for patients with bitumen burns in reducing tissue injury, decreasing pain, preventing infection, and minimizing the complications and disability resulting from this common occupational injury.

[The opinions or assertions herein are the private views of the authors and are not to be construed as official or as reflecting the views of the Department of the Army of the Department of Defense.]



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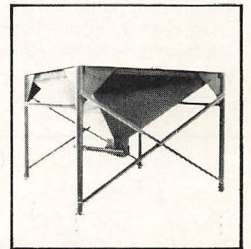
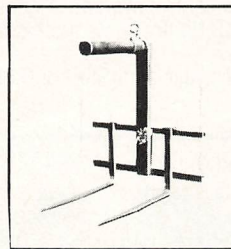
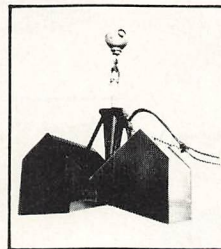
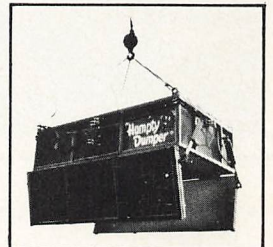


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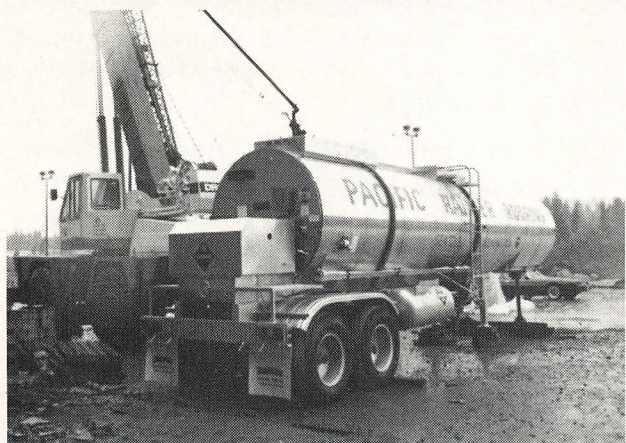


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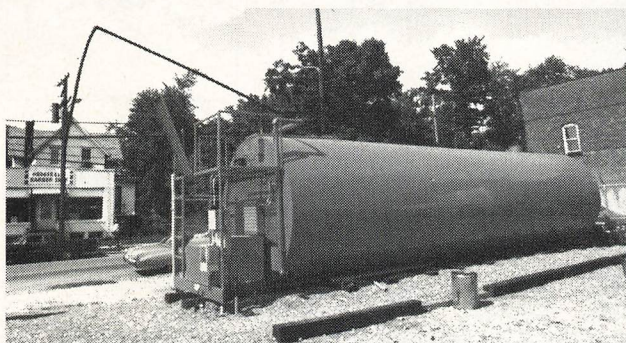
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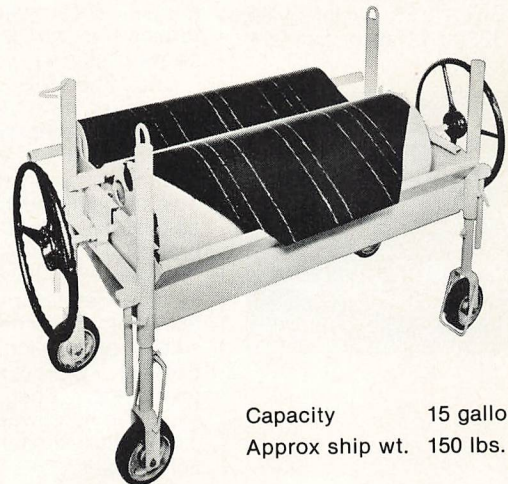
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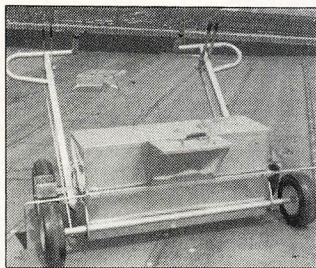
Feltlayer Brooms Automatically

The Julien P. Benjamin Equipment Co. has added a new item to their REDDI line of Roofing Equipment—The Broomin' Feltlayer. The Reddi Broomin' Feltlayer has many features that high production contractors look for.

It's constructed of aluminum for light weight and easy maneuverability; it goes forward, so the operator can safely and easily monitor the hot stuff flow and watch where he is going. The felt is supported on rollers so it loads faster and comes off the machine easier.

Another feature of the Broomin' Feltlayer is the Broomin' attachment which, while operating as an integral part of the feltlaying operation, allows one man to distribute hot stuff, felt and broom it in. Brooming the felt in by this method insures even brooming all over the roof, from the start of the job to the finish.

For more information on the Broomin' Feltlayer write Julien P. Benjamin Equipment Co., P.O. Box 41166, Jacksonville, Fla., 32203-1166, or call 904/387-5581.



Celotex Unveils New Specification Ply

The Celotex Roofing Products Division has introduced a new roofing felt . . . Specification Ply. This glass fiber felt joins the company's broad line of commercial roofing products and systems.

"What makes Specification Ply or 'Spec Ply' different from any other glass fiber felt is a process which encapsulates and fully covers the glass fiber with a modified bitumen," said a company spokesman.

Because the modified bitumen coating is compatible with low melt point bitumen, such as Celotex specification pitch, or deal level asphalt, the superior self-healing characteristics of low melt point bitumen can be combined with the strength and moisture resistant properties of glass fiber felts.

In addition, 1/4-inch venting holes perforate the felt to provide positive venting of vapors resulting from mopping bitumens. These venting holes reduce the chances for membrane blistering.

The "Spec Ply" sheet is designed so that the interply moppings cannot be absorbed by the felt, thus reducing the quantity of bitumen required. This allegedly reduces the overall cost of a "Spec-Ply" membrane.

"Spec Ply" is available at various Celotex plants, Celotex commercial roofing wholesalers nationwide, and approved Celotex roofing contractors. "Spec Ply" is also available worldwide through Jim Walter Research International Sales.

For further information regarding "Spec Ply," contact a local Celotex sales representative or write Celotex Roofing Products Division, P.O. Box 22602, Tampa, Fla., 33622.

Metal Building Roof Curbs Offer Complete Flexibility

Custom Curb pre-fabricated Metal Building Roof Curbs are designed and manufactured to mate with any panel configuration and roof pitch and are sized to match all manufacturers' skylights, fans, vents, intakes, air conditioning units and other rooftop equipment.

Curbs are constructed from mill-finish aluminum or galvanized steel which is completely spray coated with an aluminum-based paint and welded watertight to assure permanent, leakproof installation. Design includes a diverter area to provide positive water runoff and to eliminate ponding.

Standard construction includes heavy gauge galvanized steel, fully welded and mitered corner seams and integral base plate. Models CMB-1, 3, 5 and 7 offer 1 1/2 inch thick rigid fiberglass insulation.

Available options include height additions, heavier metal gauges, aluminum or stainless steel construction, prime painting or special coating, damper trays, pitch or ridge mounting and water diverters.

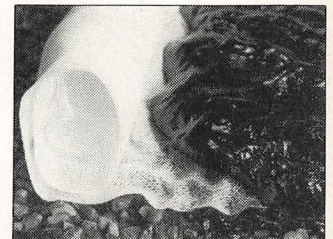
For additional information or specification sheets write CUSTOM CURB, INC., 2311 E. 28th St., Chattanooga, Tenn., 37407. Or telephone 615/629-6241.

Fabric Membrane Presented by Technicote

TechniCote Corp., announces the introduction of a new roofing membrane by DuPont for use with cold roofing jobs on gravel, metal or transite roofs.

SONTARA*, spun-laced fabric is a flexible, clothlike roofing membrane that is extremely lightweight. TechniCote spokesmen are emphasizing SONTARA's conformability to gravel surfaces, thereby helping eliminate air pockets which could cause blisters.

SONTARA is available from TechniCote, Corp., Memphis, Tenn. Call toll free 1-800-238-5348. In Tennessee call 901/527-0301.



Tall Hoist Available From Aeroil Products Co.

A telescoping roofers hoist capable of reaching 110 feet has been announced by Aeroil Products Company, Inc., South Hackensack, N.J., called the Aeroil/Bocker Model TAH-110. This hoist features a hydraulic powered telescoping aluminum boom and a material carrier which unloads automatically upon reaching the roof. A single lever control powers loads up and powers trash and debris down.

The TAH-110 comes complete with a felt and insulation carrier which quickly detaches for installation of a gravel carrying bucket. The boom is mounted to a swivelling turntable permitting precise positioning of hoist for best roof access.

The TAH-110 is mounted on a rugged trailer unit with high speed undercarriage permitting the hoist to be towed at turnpike speeds.

The boom may be angled to match roof slope or to reach over mansards, balconies, or other obstructions.



GAF Introduces New Computer Service For The Building Industry

The ESE (energy saving estimate) computer service offered by GAF Corporation is a new computerized system to expedite the design of the most energy-efficient roof for commercial, industrial and institutional buildings.

Through the use of this service, architects, building owners and roofing contractors will be able to calculate the highest R-value quickly and allow them to see maximum return on investment in roof insulation. It provides all the information required to compute cost differentials between various thicknesses of insulation such as 1" Perlite vs 1.9" Urethane.

For more information on the ESE computer service and a copy of bulletin #2219-026, please write to GAF Corporation, Building Materials Group, 140 W. 51st St., New York, N.Y. 10020; or call 212/621-5000.

Owens-Corning Introduces Perma Plus-2

A new state-of-the-art roofing system has been introduced by Owens-Corning Fiberglas. Perma Plus-2™, an alternative to conventional three-and four-ply systems, requires less asphalt, no aggregate and less labor.

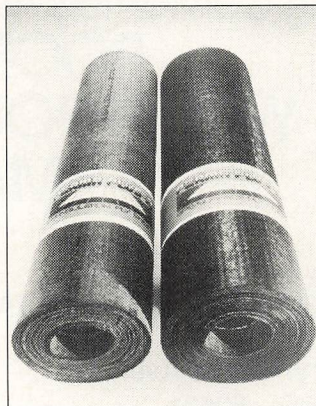
A porous top sheet, called Perma Plus-2 SPS/Surface Ply Sheet, is designed to vent gases and vapor during application to provide a monolithic type construction.

The bottom ply, called Perma Plus-2 IPS/Insulation Ply Sheet, has a heavier asphalt coating. Its denser construction maintains inter-ply asphalt integrity.

Owens-Corning's new Perma Plus-2 roofing system is made possible through the use of a tougher, stronger version of its proprietary continuous strand mat which has been proven in use with Perma Ply-R® roofing felt for over 17 years.

A ten-year warranty is available on Perma Plus-2 roofing systems when installed by an Owens-Corning Fiberglas Certified Roofing Contractor.

More information on Perma Plus-2 is contained in a brochure (Pub. No. 5-RW-11044) available from Owens-Corning. Write: N.T.M. Meeks, Owens-Corning Fiberglas Corporation, Fiberglas Tower, Toledo, Ohio 43659.



1982 Built-Up Roofing Manual Available From J-M

Johns-Manville, a subsidiary of Manville Corp., has issued the 1982 version of its "Manual for Built-Up Roofing Systems." The expanded, 64-page booklet offers comprehensive information on the selection and installation of built-up roofing systems. It will be included in 1982 Sweet's General Construction, Industrial Construction and Renovation and ICR Extension files.

The major portion of the manual covers specifications on the installation of built-up roofing materials on various roof decks. The booklet also contains details on the basic types of built-up inorganic roofing systems, reroofing, roofing materials, fasteners, cold weather precautions and roofing system guarantees.

For a copy of J-M's "Manual for Built-Up Roofing Systems" (BU-275), contact the Manville Service Center, 1601 23rd. St., Denver, Colo. 80216.

Classified Ads

Place a classified ad in *Roofing Spec* for 25 cents per word. There is a minimum charge of \$10.00. Boxed or display advertisements are available in the classified section for \$20.00 per inch (one inch minimum). Ads using blind boxes available at no additional charge to NRCA members; non-members add \$5.00 to total order. Send ad copy and payment to: Advertising Manager, *Roofing Spec*, 8600 Bryn Mawr Ave., Chicago, Ill., 60631

MANUFACTURERS REPRESENTATIVES

Established sales organizations, architecturally-oriented and knowledgeable in the roofing industry, required to represent the PAVE-EL Pedestal system used for the elevation and spacing of paver stones on water-proofed and/or insulated roofs. A nationally-advertised product rapidly gaining acceptance due to its unique application in pedestrian plaza deck construction. Exclusive territories still available. ENVIROSPEC INC., Ellicott Station Box 119, Buffalo, N.Y. 14205.

ESTIMATOR WANTED

Experienced, market oriented, Commercial and Industrial Roofing Estimator needed by rapidly growing Colorado roofing contractor. Excellent compensation and fringe benefits. Apply to, Box 5A, NRCA, 8600 Bryn Mawr, Chicago, Ill. 60631

1982 WORLD'S FAIR KNOXVILLE, TENNESSEE

Townhouse apartment, three bedroom, available for daily occupancy—May 1 through October 31. Fifteen blocks from Fair. On bus-line. Call Ed Wilson at Roof Systems Company, 615/521-6519.

CONVEYORS

Atlantic Asphalt & Equip. Co. Inc. Leading national distributor of conveyors for all types of applications. Sales & rentals. Backed by expert service. Call 617/289-6788 (Mass.). Call 305/463-5190 (Fla.).

TANKER FOR SALE

Taurus 50 ton Bulk Storage Gas Fired Fully Automatic \$8000. Skyline Roofing & Sheet Metal Inc., Manchester, N.H. 603/669-0131

PERSONNEL WANTED-ROOFING CONSULTANTS

Engineering consulting firm with 13 offices in the Southeast has opening for roofing consultants. Candidates must have at least 2-5 years experience in all aspects of roof design and/or construction and familiarity with roofing products. Must have experience in client development and have the capability of becoming registered. Submit resume with confidence to Soil and Material Engineers, Inc., P.O. Box 18169, Greensboro, N.C. 27419.

PERSONNEL WANTED

Seeking experienced Built-up, Single Ply and Metal Roofing Estimators; Architectural Sheet Metal Manager/Personnel for one of Florida's leading roofing contractors specializing in larger Commercial, Industrial, and Institutional Buildings. Send resume outlining qualifications to Roth Bros. of Fla., Inc., P.O. Box 15676, Tampa, Fla. 33684, Attn: Sanford Roth. 813/885-5811.

ROOFING SUPERINTENDENT

Established Commercial and Industrial roofing firm located on the Florida West Coast is seeking a highly experienced, production oriented roofing superintendent. Reply with resume outlining job history and qualifications to Box 5B, *Roofing Spec*, 8600 Bryn Mawr, Chicago, Ill. 60631.

FOR SALE

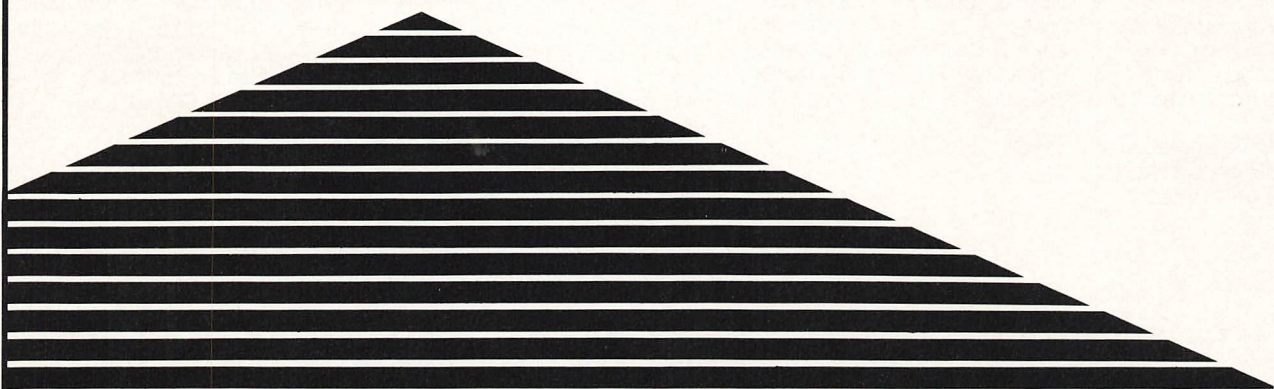
American Paus Telescopic Elevator 70 ft. reach. Used less than 30 hours. 20 percent less cost. 901/362-6240.

COMMERCIAL ROOFING GENERAL FOREMAN

Commercial Roofing Contractor with various offices is seeking a general foreman with strong background in single-ply systems to supervise field operations for its Midwest operation. Candidates must be experienced with new and reroofing of commercial, industrial, and public buildings. Travel required. Excellent salary, incentive compensation, and insurance benefit package. Send resume and salary history to Vice-President, C.E.I. Industries of Iowa, Ltd., 120 Bryant, Dubuque, Iowa 52001.

ROOFING CONTRACTORS

Successful roofing contractor wants to communicate only with the best in the business. Candidates must have a very successful experience in industrial and commercial reroofing sales. Opportunities available on West Coast that are unique and lucrative. Send work history and objectives to Speranza Management Consultants Company, 12 Johns Canyon Road, Rolling Hills, Calif. 90274



The National Roofing Contractors Association ROOFING & WATERPROOFING MANUAL

For a free brochure on the
NRCA ROOFING & WATERPROOFING MANUAL,
call or write: NRCA
8600 West Bryn Mawr Avenue
Chicago, Illinois 60631
(312) 693-0700

Now 5 separate manuals have been combined into one dynamic reference. 1) Built-Up Roofing Manual 2) Construction Details 3) Handbook of Accepted Roofing Knowledge (HARK) 4) Steep Roofing Manual 5) Waterproofing Manual to make it the most important roofing reference in the world! The one manual everyone in building design and construction, real estate management and government building code departments needs.

The New NRCA Roofing and Waterproofing Manual is indexed and departmentalized so it's easy to prepare specifications and duplicate construction details. It's written with clear instructions, easy to understand installation methods, simplified calculations, and accepted industry standards and practices. You'll learn the latest on how good roofing plus insulation is combined for increased energy efficiency, only \$68



Tech Talk

continued from page 42

been an exchange of recommendations and agreements on the proposed revisions to the Uniform Building Code Chapter 32 on "Roof Construction and Covering," Chapter 32 on "Re-Roofing in the Uniform Building Code," Uniform Building Code Section 1707 on "Flashing and Counter-Flashing" and revisions to the Chapter Eight on "Roof Coverings" in the Council of American Building Officials One & Two-Family Dwelling Code. With regard to the latter, the Department of Housing and Urban Development is phasing out its Minimum Property Standards and is preparing changes for adoption in the One & Two-Family Dwelling Code to include its requirements as the basis for health, safety and welfare requirements when constructing homes on which it issues mortgage insurance. Also, an Ad-Hoc Committee was recently formed to revise the "Standard for the Installation of Roof Coverings" published by SBCC. The Task Force will be working with that group, along with representatives of the ARMA Code Committee to update this standard.

Contacts have been made with the three model building code groups with the request that they adopt

the *NRCA Roofing & Waterproofing Manual* as a reference document for good roofing applications. Also, as a result of a meeting during the recent NRCA Convention in Los Angeles, NRCA Research Associate Bill Cullen and I met with the ICBO staff in their offices in Whittier, Calif., to discuss liaison and future efforts between ICBO and NRCA. As a result of that meeting, the NRCA staff will prepare an article for inclusion in a future issue of the ICBO Building Standards Magazine on the *NRCA Roofing & Waterproofing Manual*, not only explaining its contents, but how it correlates with the building codes relating to recommended good roofing practices.

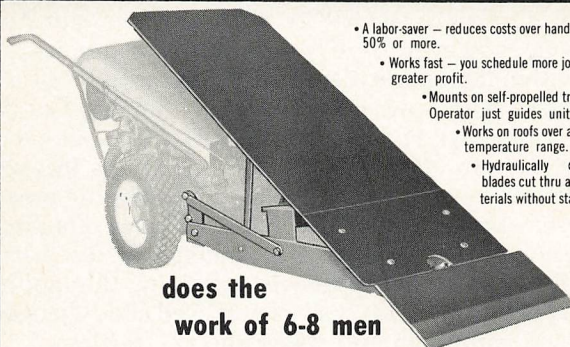
Twelve to fifteen states have or will shortly adopt mandatory state building codes.

Even though NRCA building code activities are less than a year old, we feel much has been accomplished. With the liaison established with the NRCA Affiliate Associations, ARMA and the model codes groups, we see greatly increased activity in the near and distant future by becoming involved in the code change procedures of the model code groups at their hearings in areas involving roofing contractors.



Nieman Power Roof Remover...*

*Patent No. 3,779,605



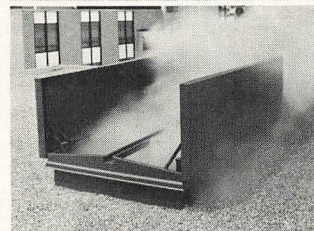
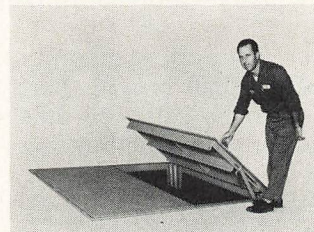
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POWER ROOF REMOVER is equipped with two cutting tools to remove roofing down to the insulation or down to the decking, even if the insulation is solid mopped. A toothed blade (left) is used on most roof removing jobs when job conditions require its bull-dozing action. The wide cutting blade (above) is used mostly when removing fiberglass insulation and when removing roofing down to the insulation.

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MANUFACTURING COMPANY, INC.

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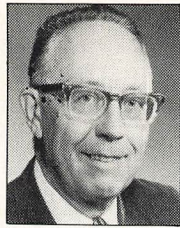
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Tech Talk

By Bob LaCrosse, CAE
Director of Technical Services

NRCA Ventures Into New Territory —Building Codes

First of all, what is a Building Code? For those who do not regularly work with them, a brief explanation should be helpful in comprehending the great extent to which building codes affect many industries and products, as well as the roofing contractor.

A building code is a legal document written to provide an organized set of minimum requirements that apply to the design, construction, location, repair, demolition, and occupancy or use of buildings. It is enforced by a municipal or county building department.

The purpose of a building code is to protect the lives of people and provide for their safety and welfare while in or near buildings. The adoption and use of building codes is authorized through the police powers of the states and is usually extended to their counties and cities.

This tendency, however, is rapidly changing. Twelve to fifteen states have adopted or will shortly adopt mandatory state codes and roughly 25 others are presently considering enabling legislation to establish state building codes.

Although over 18,000 building jurisdictions exist in this country, three-fourths of them adopt by reference or closely follow one of the four model building codes. These are: The National Building Code published by the American Insurance Association (AIA) and predominantly used in the eastern part of the country; the Uniform Building Code published by the International Conference of Building Officials (ICBO) and primarily used in the western states; the Southern Standard Building Code published by the Southern Building Code Congress (SBCC) and primarily used in the southern states; and the Basic Building Code published by the Building Officials and Code Administrators International (BOCA) and strongly supported in the Midwest.

The National Building Code stresses protection of

property from fire and can be or is changed only by AIA staff engineers. The other three model building codes are written by building official organizations and are updated annually through established code change procedures based upon input from building officials, trade associations, professional groups, material suppliers, users and government agencies. Although each of the model building codes uses a different format and numbering system, a Model Code Standardization Council was formed in the early 1970's to resolve differences that are not regionally oriented, such as definitions, occupancy, descriptions, etc. Following that cooperation, BOCA, ICBO, and SBCC collaborated on preparing a One & Two-Family Dwelling Code, a Residential Rehabilitation Code, and Standard Criteria for Construction and Inspection of Factory-Built Components and Modules.

The general trend among the model building code groups is away from a specification type of code (material and construction standards) to a combination specification and performance code, with growing emphasis on the functional capabilities of materials. This trend toward performance codes will broaden opportunities to qualify products on a merit basis. It will also place more responsibility on suppliers to provide impartial data and performance tests.

Since forming the NRCA Building Task force on June 1, 1981, NRCA and the roofing industry were not

The trend among model building code groups is away from a specification code to a combination specification and performance code.

involved in building code activities on a nation-wide basis. A number of the NRCA Affiliate Contractor Associations, however, have been active for a number of years within their particular geographical areas. Chaired by Richard Rosenow, Hans Rosenow Roofing Co. of Chicago, the Task Force has been active in seeking the assistance from NRCA Affiliate Associations in specific building code changes in their geographic areas on present proposed building code changes affecting roofing contractors. Affiliate associations have also been asked for help on code changes involving the model building code groups, as well as proposed code changes of the city, suburban and state code authorities.

One of the major efforts of the NRCA Task Force is the liaison established with the Building Code Committee of the Asphalt Roofing Manufacturers Association (ARMA). Chairman Rosenow and I have met twice in the last year with the ARMA Code Committee to discuss mutual code problems affecting our two industries. From this liaison with ARMA there has

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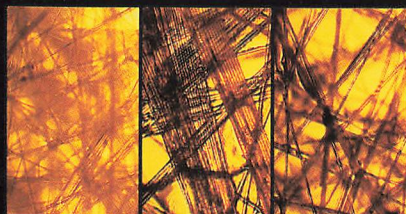
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1 Independent Test Report

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Wet Process

As shown in the 20x magnifications above, TAMKO's special wet process uniformly distributes fibers in a 360° multidirectional orientation. This *isotropic* characteristic permitted the TAM-GLASS felts to demonstrate average breaking strength of 57 (lb/in) in *both* the machine and cross-machine directions—29.5% higher than required for Type IV felts.

As further demonstrated in the membrane test, isotropic strength helps the finished membrane to perform more evenly under the stresses encountered in actual use.

3 Membrane Performance

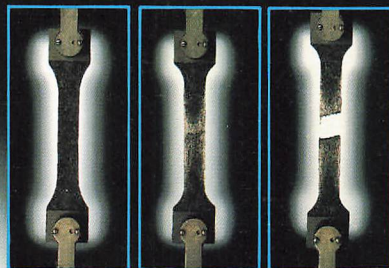
Standard ASTM dogbone samples exhibited three-ply ultimate strength of 246 (lb/in) in the cross-machine, or weakest, direction at 0°F—46 pounds in excess of the 200 (lb/in) NBS suggested minimum.



"TAMKO TAM-GLASS Type IV felts and membrane samples exceeded all applicable ASTM and NBS suggested performance criteria.

"For the felt sampling portion of the test sequence, SRI developed a special microcomputer program to generate a more random sampling than required by ASTM D 146"

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