
ROLLING OUT
100
YEARS OF INNOVATION
1917-2017
CARLISLE
SYNTEC SYSTEMS


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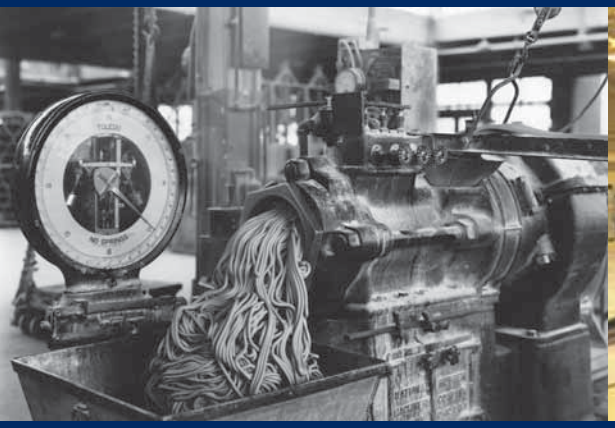

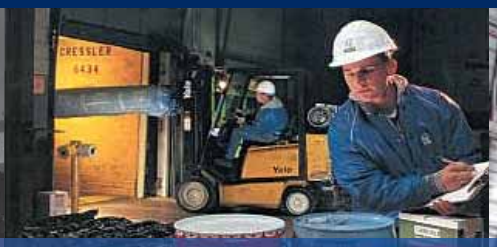
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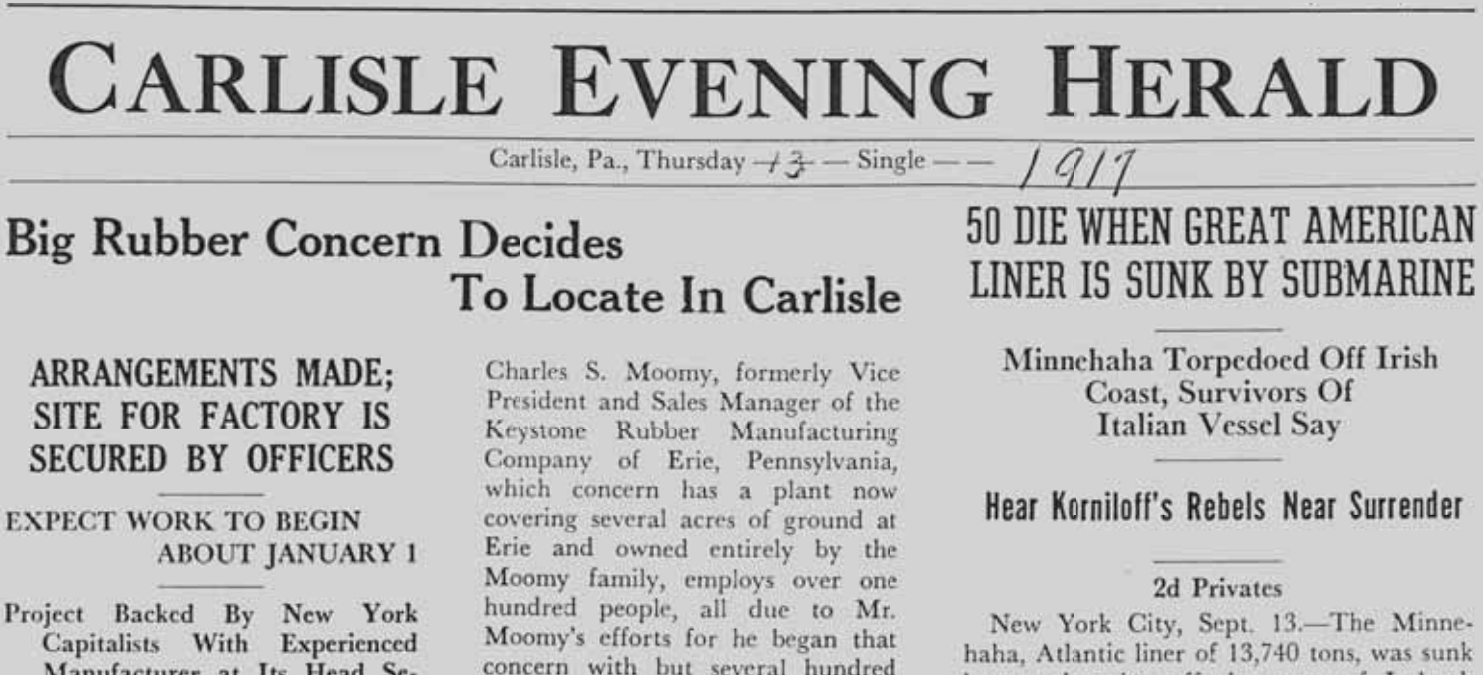


CARLISLE EVENING HERALD

Carlisle, Pa., Thursday 13 — Single — — 1917

Big Rubber Concern Decides To Locate In Carlisle

ARRANGEMENTS MADE; SITE FOR FACTORY IS SECURED BY OFFICERS

EXPECT WORK TO BEGIN ABOUT JANUARY 1

Project Backed By New York Capitalists With Experienced Manufacturers at Its Head Se-

Charles S. Moomy, formerly Vice President and Sales Manager of the Keystone Rubber Manufacturing Company of Erie, Pennsylvania, which concern has a plant now covering several acres of ground at Erie and owned entirely by the Moomy family, employs over one hundred people, all due to Mr. Moomy's efforts for he began that concern with but several hundred

50 DIE WHEN GREAT AMERICAN LINER IS SUNK BY SUBMARINE

Minnehaha Torpedoed Off Irish Coast, Survivors Of Italian Vessel Say

Hear Korniloff's Rebels Near Surrender

2d Privates

New York City, Sept. 13.—The Minnehaha, Atlantic liner of 13,740 tons, was sunk

A BIG RUBBER COMPANY COMES TO TOWN | 1917-1961

Wonderful news spread throughout historic Carlisle, Pennsylvania, on the afternoon of September 13, 1917, when the Carlisle Evening Herald trumpeted in a bold headline, ***"BIG RUBBER FIRM DECIDES TO LOCATE IN CARLISLE."***

The big, new firm was the Carlisle Tire & Rubber Company, whose first president and general manager was thirty-seven-year-old entrepreneur Charles S. Moomy. Lured to Carlisle by the Chamber of Commerce, Moomy had just arrived with $500 cash, $4,000 worth of machinery, and a contract with Montgomery Ward & Co. for the production of inner tubes for automobile tires. Moomy was an experienced rubber products manufacturer; having learned the trade from his father at the family owned Keystone Rubber Company in Erie, Pennsylvania, he was now aspiring to make his own mark on the industry. Moomy's partner was New York rubber broker James T. Johnstone, who invested $30,000 in the new business. Moomy and Johnstone had incorporated the firm in Delaware the day before, on September 12th, and leased a large brick building on the corner of B and Factory Streets to house the manufacturing plant. Formerly the Letort Carpet Mill, the site was known locally as the "old silk mill." Production was scheduled to start in January 1918. "All the men employed will receive good wages," the Chamber of Commerce promised, adding that "there is no reason why Mr. Moomy cannot increase its production and employ several hundred people eventually, which will make it the largest concern in the city."

With World War I raging and the American automobile industry rapidly expanding to meet both military and civilian demand, the Carlisle Tire & Rubber Company lived up to those early expectations. In 1919, Moomy hired the company's first chemist and superintendent, Jonas E. "Jonie" Warrell, a twenty-three-year-old World War I veteran and 1916 graduate of the Drexel Institute of Technology. By 1920, more than thirty employees were working in ten-hour shifts.

Citizens of Carlisle, Pennsylvania, learned on September 13, 1917 that the Carlisle Tire & Rubber Company was soon opening in the city at the former Letort Carpet Mill, under its first president and general manager Charles S. Moomey.

Two years later, as business took off, Moomy added a night shift. In 1927, the competing Twemo Corporation licensed Carlisle to manufacture the world's first "fully molded" inner tube using Twemo's equipment. Warrell's expertise improved Twemo's high-pressure air process, leading Moomy to build a new plant for the technology and extend the company's footprint from B Street to C Street and from College Street to Silk Alley. Montgomery Ward called the innovation "revolutionary" and advertised the cutting-edge product in its 1927 fall catalog before the first molded tube was ever produced. Within a year, Carlisle was producing more than 10,000 tubes annually, outpacing its competition by a wide margin.

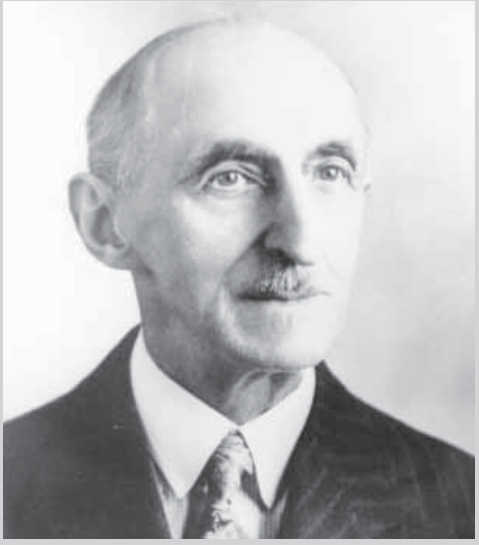
Carlisle's success enabled Moomy to buy out Johnstone and take sole control of the company. By 1929, the company was employing a record number of 388 workers and was seemingly well positioned for even more growth as public enthusiasm for automobiles continued to soar. But trouble loomed ahead. First, Jonas Warrell left Carlisle that year to work for the Pharis Tire and Rubber Company of Newark, Ohio, leaving Carlisle without a chief chemist. Then, on October 24th of the same year, the stock market crashed, triggering the Great Depression and marking the beginning of the darkest period in the company's history. Within a year of Black Tuesday, Carlisle's business had severely plummeted as the price of natural rubber dropped from a high of seventy-five cents to three cents per pound, while the stock value of Carlisle's chief customer, Montgomery Ward, collapsed from $83 per share to just $3 per share. Orders dried up throughout the industry, generating enormous losses and forcing many smaller competitors out of business. Carlisle survived in the short term by conducting lay-offs and reducing working hours, and, as debt mounted in 1931, the firm ended its royalty agreement with the Twemo Corporation.

In 1932, the U.S. government made matters worse by enacting a crippling excise tax on tires and inner tubes, damaging the market further and driving Carlisle deeper into the red. By 1933, employment at Carlisle had dropped to only forty-nine workers. The company remained solvent by taking advantage of New Deal legislation, which allowed the Federal

Reserve Bank to lend directly to industrial firms, and write off tax debts to the IRS. It was barely enough though, and plant superintendent and assistant treasurer Melvin L. Dunkleberger often took out private bank loans, using his personal assets as collateral to meet weekly payroll. Carlisle's credit finally ran out in December 1939, and Charles Moomy was forced to relinquish control of his company to the Federal Reserve Bank of Philadelphia. He withdrew from the rubber business a broken man and died six months later in June 1940. Dunkleberger meanwhile stepped up as acting general manager and kept Carlisle afloat despite the heavy odds against its survival.

From 1940 through 1943, the Federal Reserve operated Carlisle through a management firm called Stevenson, Jordan, and Harrison. After the federal takeover, the company negotiated a quarter-million-dollar settlement with the U.S. Treasury Department for past-due excise taxes. As a result, in 1941, Carlisle turned its first profit since the start of the Depression. America's entry into World War II gave Carlisle a much-needed boost, with the U.S. government becoming its biggest customer. As Carlisle's supply of East Indies natural rubber was disrupted by the war, the company experimented with synthetic rubber, which proved to be a superior material for inner tubes when compared to natural rubber.

Carlisle was not the only rubber products company to benefit from expanding its support of the war effort. In late 1943, one of Carlisle's competitors, the Pharis Tire & Rubber Company of Newark, Ohio, was overwhelmed with military orders and badly needed additional production facilities. Because of government restrictions on the allocation of construction materials and equipment, Pharis was unable to build a new plant, and acquiring another company seemed the best option for obtaining the needed capacity. Consequently, Pharis's energetic president, Furber I. Marshall, turned his eye to Carlisle, and in February 1944, he bought the firm from the Federal Reserve Bank of Philadelphia for $330,000. Carlisle thus became a wholly owned subsidiary of Pharis, with Marshall as its new president. Because Marshall wanted to stay in Ohio, he appointed former Carlisle chemist, Jonas Warrell, as Carlisle's vice president and general manager.



Plant superintendent Melvin L. Dunkleberger took out personal loans to keep Carlisle Tire & Rubber in business during the Great Depression, and became acting general manager following Charles Moomey's death in June 1940.

Competitor Furber I. Marshall (left) of the Ohio-based Pharis Tire & Rubber Company bought the Carlisle Tire & Rubber Company in 1944 to ease his backlog of wartime military orders. He appointed former Carlisle chemist Jonas E. Warrell (right) as vice president and general manager.

Melvin Dunkleberger, who had so faithfully served Carlisle since 1918 and had sacrificed much during the Great Depression, stayed on as a director and executive vice president until his retirement in March 1946. At a lavish dinner given in his honor, Marshall exclaimed, "When the Pharis people came here, we found a true friend and a real helper in Mr. Dunkleberger. He has meant a very great deal to the company…and he personally carried the load for many years." Warrell was equally effusive in his praise of Dunkleberger, declaring, "He had a hand in practically all the major decisions that had to be made through the years. . . . He has always kept his feet on the ground, although sometimes conditions made that hard to do." Dunkleberger remained a director of the company until his death in October 1950 at the age of eighty.

Under the new management team of Marshall and Warrell, the number of employees at Carlisle dramatically increased from eighty to 180 within a year. Significant improvements were also made at the plant. Among these were the closure of the obsolete Silk Alley buildings, the renovation of the laboratory, and the installation of the company's first Banbury industrial mixer, which could apply heat and pressure simultaneously and produce a higher grade of rubber products.

Business remained brisk after the war and, in October 1947, Carlisle adopted a new logo, which the company trademarked in January 1950. The original logo, dating from 1942, was the same Indian head logo that the Pontiac automobile company used on its camelback and tube price lists. Carlisle had chosen it to capitalize on the famous Carlisle Indian School and its well-known alumnus, Olympian Jim Thorpe. However, management had come to believe that the borrowed image was not symbolic enough for Carlisle's durable, high-quality merchandise, and Warrell replaced the cartoonish Pontiac Indian head with the more dignified Indian head from the venerable Buffalo nickel. This logo became the famous "Carlisle Indian."

Carlisle Tire & Rubber adopted the famous "Carlisle Indian" logo in October 1947, which was patterned after the 1913 Buffalo Nickel.

In May 1948, Pharis was crippled by a three-month labor strike at Newark. The company's board of directors was forced to close that plant and dissolve the company. In 1949, as part of the liquidation, Pharis moved its bicycle tire production equipment from Newark to the Carlisle Tire & Rubber Company, along with the assets and business of the Molded Materials Company, a brake lining factory previously located in Ridgway, Pennsylvania.

All of Carlisle Tire & Rubber Company's stock was then distributed to Pharis's stockholders and the restructured organization was renamed Carlisle Corporation, with two operating divisions: Carlisle Tire & Rubber and Molded Materials. Marshall became the corporation's new president, while Jonas Warrell became vice president and general manager of the Carlisle Tire & Rubber Division.

Tires and inner tubes remained a core part of Carlisle's business for many years; indeed, the company became one of only three bicycle tire manufacturers in the U.S. However, Carlisle began exploring new products in the 1950s to diversify its markets, including molded radiator hosing, brake blocks and linings, and wire insulation. One innovation pioneered by the Carlisle Tire & Rubber Division was butyl single-ply elastomeric sheeting, first produced in 1951. Carlisle began investigating the membrane's possibilities after western farmers asked the company to produce flexible rubber irrigation pipes.

While meeting the farmers' needs, Carlisle's management realized that a large, untapped market existed for other agriculture-related rubber sheeting products; the division seized an opportunity and began selling single-ply butyl membranes for lining irrigation ditches in several states, rainwater catchment basins in Utah, and salt pits in Texas.

Other applications for single-ply sheeting soon became apparent, from vapor barriers to foundation waterproofing to haystack covers, as Carlisle learned how to manufacture the material in large sheets of up to 145 feet by fifty feet. In 1959, Carlisle formally named the product "Sure-Seal®" and took its first large order for an eight-acre salt brine pit in Texas.

In 1961, Carlisle literally took Sure-Seal to the next level by installing it on the 190-foot-diameter, "floating" deep-dish roof of the circular restaurant building at O'Hare International Airport in Chicago.

This was the first time that a rubber protective membrane had ever been used in a roofing application. Until then, flat, non-residential roofing installations traditionally utilized molten asphalt, which was both labor intensive and time consuming. Moreover, due to its inherit rigidity, asphalt roofing generally lasted only ten to fifteen years before failing. Sure-Seal membrane, though, was easier to handle and promised greater durability and longevity, making its application on the rotunda at O'Hare Airport revolutionary. Carlisle had just changed the roofing world, but it would take many more years, many more successful projects, and an oil crisis for the industry to finally understand the superiority of Sure-Seal over the old way of roofing.

Carlisle Tire & Rubber installed Sure-Seal membrane on the roof of the rotunda at O'Hare International Airport in Chicago in 1961. This was the first time a protective rubber membrane had ever been used to waterproof a commercial roof.

Vandenberg Hall at the U.S. Airforce Academy in Colorado Springs, Colorado

BECOMING THE LEADING PRODUCT | 1962-1980

Sure-Seal quickly became the world's preferred roofing membrane application by the mid-1960s, installed at such prominent landmarks as Vandenberg Hall at the U.S. Airforce Academy in Colorado Springs, Colorado, New York University Towers in New York City, and L'Enfant Plaza in Washington, DC.

The trailblazing installation of Sure-Seal single-ply membrane at O'Hare Airport quickly caught the attention of the nationwide construction industry, as many builders and contractors grasped the material's architectural possibilities. Orders soon poured into the Carlisle Tire & Rubber Division of Carlisle Corporation for large amounts of the sheeting—so many, in fact, that by 1963 the division was able to report that Sure-Seal was "winning wide acceptance because of its outstanding qualities." In 1965, demand was so great that a 14,000-square-foot addition to the plant was completed in order to expand production capacity for the rubber sheeting.

Over the next few years, Sure-Seal continued to be specified as the preferred roofing, foundation liner, or water barrier application for some of the largest new buildings in the country. During the mid-1960s, Carlisle unveiled a revolutionary synthetic Ethylene Propylene Diene Monomer (EPDM) membrane. Developed jointly with E. I. DuPont de Nemours and Company, EPDM was a tough and flexible synthetic rubber with excellent thermal properties and outstanding resistance to ultraviolet rays, making it an ideal protective barrier for exposed applications. EPDM was an improvement over butyl rubber and became the industry standard for single-ply roofing membranes. Butyl sheeting remained a solid product for below-grade waterproofing applications.

New York University Towers in New York City (top) and L'Enfant Plaza in Washington, DC (bottom).

The Carlisle Tire & Rubber Company celebrated its 50th anniversary in 1967.

In 1967, while celebrating the company's 50th anniversary, the division boasted: "Although it is impossible to count the number of construction jobs where Sure-Seal products have been used during the last ten years, we can safely say that they were shipped into every state of the continental United States." The division further noted that the most "glamorous applications" of the membrane up to that point included those at O'Hare, the Equitable Building in Chicago, Illinois, the Humble Oil and Refining Building in Houston, Texas, the Cities Service Oil Company in Tulsa, Oklahoma, and the New York University Village Towers in New York City, New York.

International customers were equally as excited about Sure-Seal, with large waterproofing jobs completed in Belgium, Switzerland, Holland, Greece, Libya, Israel, Costa Rica, Antigua, and Peru. "This proves that Carlisle Sure-Seal materials fill a universal need in the waterproofing field regardless of weather and temperature conditions," the division concluded.

As the Carlisle Tire & Rubber Division grew, significant changes lay ahead, beginning with shifts in management. In April 1967, seventy-one-year-old Jonas Warrell was finally promoted to president of the Carlisle Tire & Rubber Division, although he retired a year later. More than anyone else, he had foreseen the potential in elastomeric sheeting and had pushed for the development and marketing of Sure-Seal membrane. He lived for another twenty-eight years before passing away in April 1996. His son, Carroll J. Warrell, succeeded him as president and general manager of the Carlisle Tire & Rubber Division in April 1968. Trained as an automotive engineer at Ohio State University, the younger Warrell had been with Carlisle Corporation his entire career, serving as vice president of the subsidiary Dart Trucking Company in Kansas City until 1959, then as vice president of Carlisle Corporation since 1960, and then as president of the subsidiary Indus Corporation of Indianapolis. Carroll Warrell, as insightful and visionary a leader as his father, would help guide the company into the tumultuous 1970s.

Carlisle's overall success, both in tire and tube manufacturing, as well as with rubber sheeting and other products, demanded further expansion, but there

New production and extrusion equipment came on-stream at the Ritner Highway location just as single-ply EPDM membrane sales were about to explode due to the Arab oil embargo in the mid-1970s.

was no room in the existing facilities. Consequently, corporate management built a new 10,000-square-foot headquarters on a 30-acre plot at 1285 Ritner Highway. The facility opened in July 1968, and the Carlisle Tire & Rubber Division relocated its executive offices there from 515 North College Street. Next, in January 1970, Carlisle broke ground on a $3 million, 68,000-square-foot plant on an adjoining fifty-acre plot. Later that year, Carlisle moved its bicycle tire and tube manufacturing operation into the new building, along with additional internal rubber mixing equipment, boosting production capacity by forty percent. The membrane plant remained at the old North College Street location, but its production was greatly enhanced by the new mixers.

By the early 1970s, Carlisle had become the town's second-largest industry, employing nearly 900 men and women. Meanwhile, the reputation of its superior-quality membranes continued to grow, as the company completed its largest sheeting job to date in 1971: a fifty-three-acre magnesium chloride concentrate holding pond for the National Lead Company near Salt Lake City, Utah. Management soon realized that more facilities were needed to stay abreast of ever-increasing demand for Carlisle products. Consequently, in late 1974, the Carlisle Tire & Rubber Division launched a $5.8 million plant expansion to increase its mixing capabilities. This expansion was completed in 1976, just in time for the rubber membrane's second big breakthrough in the roofing industry.

In 1975, an Arab oil embargo sparked a severe energy crisis and global recession. As a result, the price of petroleum-based asphalt shot up and the quality of available material dropped, impairing the performance of asphaltic roofs. Desperate builders and contractors who still relied upon asphaltic material for their projects turned to Carlisle's Sure-Seal as a more efficient and cost-effective alternative. Overnight, single-ply membrane became the hottest roofing product in the world. Sales rose by forty-three percent in 1976, leading the company to report that Sure-Seal "has developed into a major line for Carlisle with good potential for the years ahead." That proved to be an understatement, as sales increased again in 1977 by another sixty-two percent. Carroll Warrell was ecstatic.

Rubber's EPDM roofing membranes achieved even greater industry notoriety following high-profile installations on a variety of postmodern geometric configurations and structures of the 1970s, such as the Kline Athletic Center at nearby Dickinson College in Carlisle.

He predicted that "rubber membrane may well become one of Carlisle Tire & Rubber's leading products in the years ahead." While he was not wrong, he was modest in his projections. Sales more than doubled in 1978, and then rose again by eighty-six percent the following year. Future growth looked even better, limited only by capacity, as contractors had to buy on allocation and the lead time for deliveries extended to twenty-six weeks.

Carlisle helped itself during its breakout years by offering several new innovations that made Sure-Seal even more attractive to struggling builders and contractors. First, in the mid-1970s, the division began selling the product as a total system, complete with all components needed to finish a roofing job, including fasteners, flashings, and any necessary coatings or seam sealants. Next, the division implemented its first five-year watertight warranty, which could be extended, and also began conducting required installation classes for all certified Sure-Seal installation contractors. The division also began hiring and training a nationwide network of technical representatives, whose jobs were not only to oversee and advise contractors on all Sure-Seal jobs, but also to inspect the installed product for quality assurance. Additionally, Carlisle issued its first training and specification manuals, which standardized the installation process and greatly enhanced the training and technical knowledge of Carlisle employees, distributors, and roofing contractors.

Carlisle's success was tempered by the unexpected death of Carroll Warrell in October 1977. The division mourned his loss deeply, as expressed by its in-house newsletter Smoke Signals, which wrote that he "was universally recognized as an unusually knowledgeable, astute, and creative business leader." It continued, "He was more than that. He was a warm and friendly man who demonstrated concern for the welfare of all employees and their families as well as others with whom he came in contact…we all lost a great president—and a great human being." The division honored Warrell's memory by naming its Ritner Highway facility after him in December 1977.

Although Warrell's passing was a heavy blow, the company needed to move forward, so Carlisle Corporation selected Robert A. Brown in April 1978 to succeed Warrell as president of the Carlisle Tire & Rubber Division. Brown came to Carlisle with extensive experience in the rubber industry, having spent his entire career with the Firestone Tire & Rubber Company. He had graduated from the University of Minnesota in 1953 with a degree in Industrial Management, and was serving as vice president of Firestone, Canada, when Carlisle Corporation offered him the job.

Brown was a tough, no-nonsense executive who made sure that the transition was seamless while maintaining Carlisle's momentum in the exploding EPDM roofing market.

Former Firestone executive Robert A. Brown became president of the Tire & Rubber Division of the Carlisle Corporation in April 1978 following the sudden death of Carroll Warrell.

In December, he presented a plan to the Carlisle Board of Directors to build a second plant in Greenville, Illinois, dedicated solely to rubber membrane production. The plan called for the new 160,000-square-foot facility to produce 600,000 square feet of sheeting and 50,000 square feet of flashing per day. The Greenville location would also result in reduced shipping time and lower costs for Midwestern and West Coast customers. The board approved and construction began in early 1979. The Greenville plant was finished in July 1980 and was the first of its kind, devoted entirely to the manufacture of larger-scale EPDM waterproof membranes. It could produce massive single sheets as large as fifty feet by 200 feet, a far cry from when much smaller sheets were assembled by hand and fused together with the tread of a weighted wheel barrow.

The key to Greenville's enormous production capability was its Automated Sheet Building Machine (ASBM), which revolutionized the process by completely replacing manual assembly and fusing. This technological marvel was the brainchild of Carlisle's vice president of engineering, Jack Hollis. Described by colleague Tom Timmerman as a "consummate engineer," "a great idea guy," and a "visionary," Hollis had designed the ASBM "on the proverbial back of a napkin in a restaurant" and then put it all together in the new plant. "The ASBM gave us a huge advantage in the market because of the quantity of the sheet that was able to be built automatically versus building it manually," Timmerman said. "It was undoubtedly a watershed moment in terms of production."

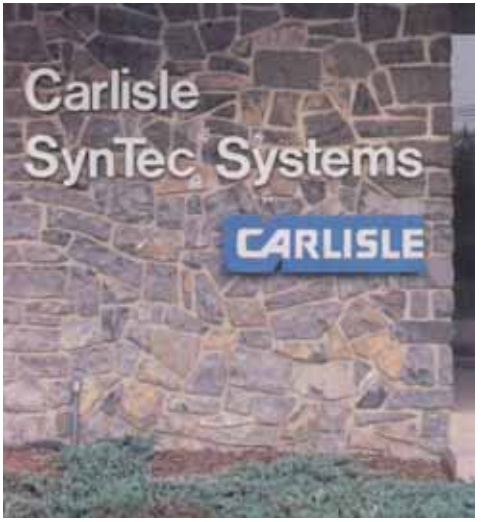
As Greenville came on-stream and rubber sheeting output more than doubled with the ASBM, the roofing world seemed to be wide open for the Carlisle Tire & Rubber Division, which then had few real competitors in the rubber membrane business. Sales had rapidly climbed from just four percent of Carlisle Corporation's total in 1976 to a full twenty percent in 1980, an increase that amounted to a compounded annual rate of about seventy-five percent. However, trouble loomed on the horizon that would force the division to adapt and innovate further—not only to survive but also to excel in a tightening market.

THERE IS NO EQUAL | 1981-1993

By 1981, the Carlisle Tire & Rubber Division's single-ply EPDM roofing business had eclipsed the tire and tube business.

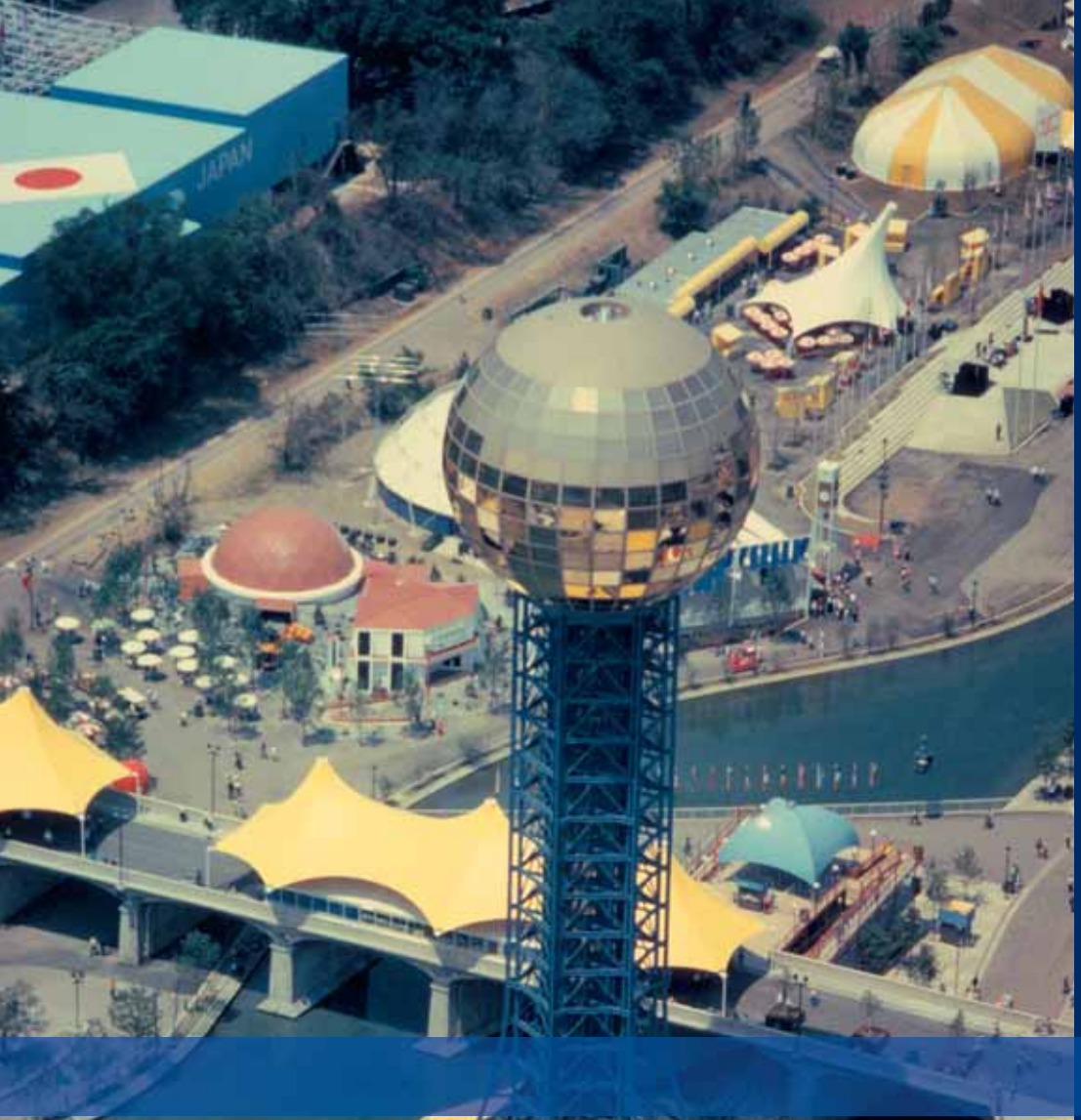
Sales that year amounted to twenty-seven percent of Carlisle Corporation's total, while recreational tires, tubes, and wheels made up only fourteen percent. The increasing divergence between the two product lines complicated marketing and finance. Therefore, in January, the Carlisle Tire & Rubber president, Robert A. Brown, announced a major reorganization, in which two separate and fully independent operating divisions would be created: one for tire, tube, hose, and pipe products, and the other for construction materials. The former would maintain the old Carlisle Tire & Rubber brand, while the latter was named Carlisle SynTec Systems ("SynTec" after synthetic technology). "In the view of management," Brown said, "having two organizations, each dedicated to the success of their respective divisions, will strengthen the overall company in the long run."

The official separation took place on August 17, 1982, with Brown becoming president of the new Carlisle SynTec. Not surprisingly, the split proved difficult for affected employees, many of whom had to part ways with long-time colleagues as staff reassignments were made. Once the transition was complete, Carlisle SynTec signaled its independence by creating its own distinctive branding and, beginning in March 1983, publishing its own monthly newsletter, saying goodbye to the venerable "Smoke Signals" newsletter which had served the old division since 1953. The well-known "Buffalo Indian" logo was also phased out by 1987.



In 1982, the Carlisle Corporation reorganized its Tire & Rubber Division and created Carlisle SynTec Systems to better manage its construction materials business, including Sure-Seal EPDM roofing membranes.

As Carlisle SynTec embarked on its own path away from Carlisle Tire & Rubber, its dominance as the world's premier manufacturer of single-ply synthetic rubber roofing systems was suddenly challenged during a severe economic recession that lasted from 1981 through 1982. The downturn hit the automobile industry particularly hard, driving down sales of car and truck tires.



Carlisle SynTec's distinctive EPDM roofing membranes drew international attention during the 1982 World's Fair in Knoxville, Tennessee, where they were installed on the various pavilions and other public venues.

To stay ahead of the new competitors who cramped the EPDM roofing membrane market during the 1981-1982, Carlisle SynTec Systems introduced a number of new innovations, a fifteen-year systems warranty, and improved quality enhancement measures, such as an extensive training program for contractors and architects, nicknamed the "University of Roofing Technology."

Facing plant closures and heavy layoffs, big tire companies such as Goodyear, Firestone, and General Tire converted their lines to protective rubber sheeting, both to keep their factories open and to attempt to emulate Carlisle's success in the roofing industry. Many other smaller companies followed suit, giving Carlisle its first serious competition since before the oil crisis of the 1970s.

Carlisle SynTec responded to the onslaught through a renewed focus on research and development, leading to the introduction of innovative new products and the improvement of existing ones throughout the 1980s. In June 1981, Carlisle SynTec opened a new dedicated research and development laboratory, located on College Street and adjacent to Plant #1. Two years later, in 1983, the division broke ground for a $10 million, state-of-the-art research and development center, dedicated solely to single-ply membranes, as well as a new systems engineering center. Both facilities, located at 1555 Ritner Highway in Carlisle, opened in 1984.

The division took a series of further steps in 1983 to confront the competition. Among these were the opening of new plant in Carlisle, dedicated to the manufacture of sealants and adhesives—a capability that added significantly to the bottom line—and the introduction of a fifteen-year systems warranty, the longest and most comprehensive warranty in the industry. The division also announced other new accessory products, including thermoplastic nailer and edging strips and a low-cost insulation fiberboard. Carlisle SynTec also engaged in aggressive marketing and further expanded its nationwide network of authorized applicators and dealers who were vital to building and maintaining the brand's reputation for quality. The division's sales team also collaborated with architects and contractors to ensure that Carlisle's roofing systems were written directly into building plans and specifications. Additionally, Carlisle opened its first regional distribution center in San Francisco in 1984, to better serve its West Coast customers by improving on-time delivery.

By 1985, Carlisle SynTec had responded to its upstart rivals, many of whom did not understand roofing technology and exited the market due to non-competitiveness and inadequate performance. Driven by the nation's economic recovery, sales had increased by thirty-six percent and earnings by sixty-one percent over the previous year. The division now commanded almost forty percent of the single-ply roofing market, and was projected to increase its share to forty-five percent that year, as five new distribution centers opened across the country. "There is no equal!" architects and building owners proclaimed, thereby establishing a new tagline for the division. And the best was yet to come.

From 1978 to 1986, Carlisle SynTec installed enough EPDM roofing membrane to cover more than 12,000 football fields.

In 1986, Carlisle Corporation was reorganized into a holding company called Carlisle Companies Incorporated. Carlisle SynTec remained a division of the new entity and little changed in its operations. Consequently, its string of innovations continued unabated that year, with the introduction of the Advanced Adhesive Technology (AAT) 432 roofing system. AAT 432 incorporated a non-flammable, acrylic, latex-based adhesive, specifically formulated for use in the installation of rubber membranes and a revolutionary splice tape. This system development proved to be ahead of its time and never materialized into meaningful sales. Meanwhile, the other roofing applications reached a record level that year, with president Robert Brown reporting that "with the amount of roofing we've installed, we could cover more than 12,000 football fields."

Carlisle SynTec's heavy investment in research and development and systems engineering led to the design and construction of the industry's first ten-foot EPDM extruder in 1987. Installed at Plant #4 in Carlisle, the machine used an innovative extruder roller head (ERH) to flatten the rubber prior to dusting—a critical part of the production process. It was the first of its kind to be used for roofing membrane production and enabled the division to produce ten-foot-wide seamless EPDM sheeting as well as the first polyester-reinforced EPDM membrane, which featured added strength, durability, and resistance to punctures and tears. Additionally, this new technology gave Carlisle SynTec the capability to manufacture the first white EPDM roofing system, under the name "Brite-Ply," which better suited sunnier southern climates than the traditional black rubber membranes.

With the ten-foot extruder on stream, Carlisle SynTec continued to grow sales and market share. That year, Carlisle SynTec also opened a new training facility, incorporating the latest training equipment with hands-on work stations and roofing mock-ups to better train roofing contractors and applicators in proper installation techniques and system specifications. The training center was a timely addition to the Carlisle SynTec organization, as the number of certified installers reached 1,300 nationwide.

By 1990, Carlisle SynTec was hitting its stride when it entered the realm of Cold War politics through a joint venture inside the Soviet Union. Called Krovtex, which was a Russian abbreviation for "roofing technologies," the joint venture was organized at the behest of the U.S. Department of Housing and Urban Development. Under the agreement, Carlisle SynTec teamed with a Soviet counterpart called Soyuzpromstrolkomplekt to supply and install high-quality EPDM roofing systems in Russia. The deal was complicated and became even more so when the Soviet Union split into separate republics in December 1991. Still, Krovtex survived the ensuing chaos and gave Carlisle SynTec a beachhead from which to develop future opportunities in Russia and Eastern Europe.

Just as Carlisle SynTec was making new inroads both at home and abroad during the early 1990s, another recession gripped the U.S. economy and the non-residential new construction market slowed. However, bolstered by its exports, especially to the Middle East, Carlisle SynTec held the line while other brands faltered. By 1993, the division was still growing despite a stagnant economy, expanding both its product lines and its geographic reach. In April, president Robert Brown retired after fifteen years of service. He had left an indelible mark on the division, taking it from a department-sized specialty product manufacturer to a multi-million-dollar,

Even greater success lay ahead as new leadership took the helm and steered the division into a vibrant new period of growth and success as the 21st century dawned at Carlisle.

New leadership stepped forward to lead Carlisle SynTec forward in a new era of innovation and growth when Kem W. Scott (middle rear) succeeded the retiring Robert Brown (left front) as president in April 1993.

internationally recognized innovator in the roofing systems industry, leaving mighty footprints from Carlisle to Greenville, and even into Russia. "His knowledge, enthusiasm, and wise counsel are missed," Carlisle Companies chairman Stephen P. Munn wrote, "and we wish him well in retirement."

Brown's departure marked the end of an era, but he left Carlisle SynTec well-positioned to dominate the market further in the 1990s and 2000s, based on the great strides made during his presidency by the division's research and development team, its sales and technical representatives, and its ever-expanding network of certified contractors and installers.

AN EXPERIENCE SO POWERFUL | 1994-2007

Despite a tough economy, Carlisle SynTec was still the undisputed industry leader when Kem W. Scott succeeded Robert Brown as the division's president in July 1993.

The former vice president of sales and marketing, Scott had been with Carlisle for some twenty years and had extensive hands-on experience with the roofing industry. He knew what the installation contractors wanted, so his priority was to continue exceeding their expectations. He also understood that the world marketplace was changing through globalization, which presented not only a potentially serious threat of foreign competition, but also an opportunity to enter previously untapped international markets. Furthermore, with the Cold War over, the public began demanding that companies pay more attention to the environmental impact of their products and to adopt "green" manufacturing practices. Therefore, to stay ahead of the changing market place, Scott directed his team to focus on new products that were "environmentally friendly," that sped up installation, and that improved quality. He also decentralized Carlisle SynTec's customer service functions, relocating them to regional centers so that staff were closer to customers. Under Scott, research and development would also remain a top priority for the division.

As globalization brought the international community closer together, Carlisle SynTec focused much of its attention on Europe in 1995, hoping to penetrate that awakening market with EPDM roofing systems. However, European roofers tended to prefer a white, plastic product called Poly Vinyl Chloride (PVC), and so Carlisle SynTec began offering it as a warm-climate alternative to EPDM.

Carlisle SynTec began offering Poly Vinyl Chloride (PVC) as a warm-climate alternative to EPDM.

Carlisle SynTec's research and marketing team introduced SecurTape, an innovation that offered a more consistent and efficient seam splicing technology than traditional liquid cements.

Meanwhile, the division signaled its commitment to the European market by moving its Brussels office to Zevenaar in the Netherlands. Asia and the Pacific Rim were on Carlisle SynTec's radar as well, with the opening of a new office in Hong Kong and the establishment of new distributorships in Australia and New Zealand.

Meanwhile in the U.S., more innovations began entering the domestic, non-residential roofing market after development and testing by Carlisle SynTec's research and marketing team. One of the most notable advances was the introduction of SecurTape, which offered a more consistent splicing technology than liquid cements. The old seaming glues had always been a potential weak link in EPDM roofing systems, as they depended exclusively upon proper contractor application and favorable weather conditions during installation. SecurTape removed those variables and thus improved the quality of seams and edges. The product was also much easier to apply, which improved efficiency and productivity. Feedback was immediate and positive—contractors and building owners simply loved it.

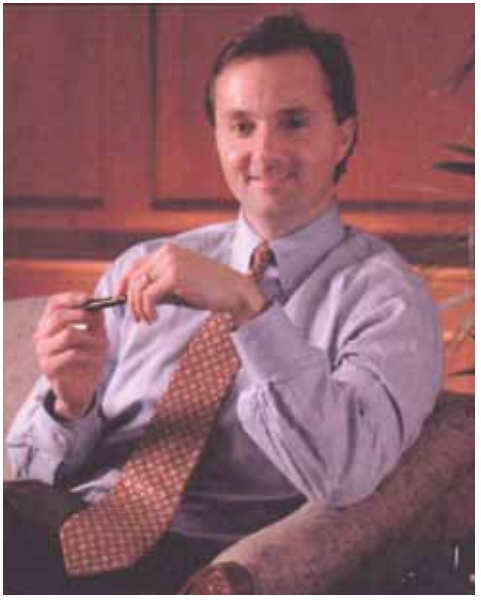
Carlisle SynTec discovered another revolutionary new product in 1995, when the marketing team learned of a small roofing contractor based in Herrington, Kansas called Roof Bond, which was buying unusually large amounts of Carlisle rubber for the Midwest market. An investigation revealed that Roof Bond had developed and patented a number of breakthrough innovations to speed up the installation of EPDM roofs. One of these innovations included the process of removing mica dust from EPDM membrane. The dust was used by manufacturers to keep hot, uncured rubber sheeting from sticking together after extrusion, and its application was necessary to roll fresh EPDM membrane for shipment. Installers however, disliked the need to remove the loose particles prior to splicing. Roof Bond had also improved EPDM by applying a polyester fleece backing to it. The fleece, when applied with a special two-component polyurethane called Foaming Adhesive Spray Technology (FAST™) Adhesive, made the membrane exceptionally tough and held it more firmly to the deck. The modified product offered the highest puncture resistance available in EPDM

Carlisle SynTec reintroduced the fleece technology as FleeceBACK EPDM membrane. After an innovative, portable FAST Adhesive spraying machine called "Heated Predator" was developed to improve adhesive application, sales went from about five million feet in 1997 to over fifty million feet in 2014.

and was an excellent alternative to low-cost asphalt built-up roofing, with installation labor reduced as much as fifty to seventy percent.

Carlisle SynTec's management team immediately grasped the system's importance and product market impact. In January 1996, Carlisle SynTec acquired Roof Bond's rudimentary process and re-engineered it to meet the nationwide demands of the commercial roofing industry. In 1997, Carlisle SynTec reintroduced these dual technologies as Pre-Cleaned EPDM membrane and FleeceBACK® EPDM membrane. After an innovative, portable FAST Adhesive spraying machine called "Heated Predator" was developed to improve adhesive application, sales went from about five million feet in 1997 to over fifty million feet in 2014.

In July 1997, Carlisle SynTec president Kem Scott transferred to the Carlisle Companies' European office to head up the expanding roofing operations there. Carlisle Companies chairman and CEO Stephen Munn selected the vice president of corporate development, John W. Altmeyer, to succeed Scott. A native of Syracuse, New York, and a graduate of Cornell University and the Harvard Business School, Altmeyer had been with Carlisle since 1989, when his former colleague Munn had brought him aboard from the Carrier Corporation. With his extensive background in administration and strategic planning, and his down-to-earth style of quiet leadership, Altmeyer was the ideal person to oversee Carlisle SynTec's continuing drive in the late 1990s to be the absolute best in the business.



John W. Altmeyer became president of Carlisle SynTec Systems in July 1997, when Kem Scott transferred to the Carlisle Companies' European Office. Altmeyer soon led the company into an incredible new period of growth and product innovation.

Carlisle SynTec's expansion into the thermoplastic olefin (TPO) "cool roof" membrane business under the Sure-Weld® brand during the late 1990s significantly boosted the company's market share in the South and West, leading to the construction of new TPO plants in Senatobia, Mississippi, and Tooele, Utah.

As he wrote in the 1997 Annual Report, "Our organization strives to make the customer's total 'experience' so powerful that it creates expectations and demands that the competition cannot match."

Despite his outward expression of confidence, Altmeyer worried that Carlisle SynTec was in danger of losing its competitive edge. Many employees believed that Carlisle would always remain on top because it had invented the single-ply industry and still manufactured the best products three decades later. But Carlisle's chief competitor, Firestone, was coming on strong, especially with its insulation products, and Carlisle's market share was dropping. Altmeyer decided that there was no time for complacency, so he made key management, marketing, and production changes, declaring later that "Our overall game had to improve significantly for us to become a leader again."

A big part of the game plan was an expansion of the thermoplastic polyolefin (TPO) membrane business. TPO was a light, flexible, and durable polypropylene-based thermoplastic polymer that could be heat-welded. The material was resistant to heat, ozone, ultraviolet light, and algae, was environmentally friendly, and could be installed very quickly with minimal labor and few components. Moreover, its reflective white color made it ideal for "cool roof" applications in hot and sunny southern climates, where air-conditioning consumed much generated energy.

To meet the overwhelming demand for TPO, Carlisle SynTec tripled the size of the Senatobia plant to 180,000 square feet and added a twelve-foot extruding line in 2001.

The cool roofs were an excellent alternative to the darker asphaltic roofs that had been common in southern markets. TPO had been used previously in automotive applications and Goodyear's roofing products division had done some research into the material as a non-reinforced roofing membrane before Carlisle Companies acquired that operation in 1993. Building upon Goodyear's prior work, Carlisle SynTec re-engineered the product and developed its first TPO roofing membrane in 1993, branded as Sure-Weld and intended initially for the European market.

Consequently, in 1997 Carlisle SynTec began building a 60,000-square-foot production facility in Senatobia, Mississippi, to manufacture Sure-Weld TPO membrane. The new plant came on-stream in 1998 with a single ten-foot extrusion line. Demand for Carlisle SynTec TPO was overwhelming and soon outstripped capacity. To meet this demand, in 2001, Carlisle SynTec tripled the size of the Senatobia plant to 180,000 square feet and added a twelve-foot extruding line. That was still not enough, and in 2004 the division began building a third line in Tooele, Utah. Opening in 2005, the Tooele plant was the first TPO manufacturing facility in the Western U.S. and provided a springboard for future growth in that vast region.

Sure-Weld TPO roofing systems ultimately provided the boost that Carlisle SynTec needed to stay ahead of Firestone, becoming the fastest-growing segment of the commercial roofing market by 2005. Despite its success, however, the division felt that its customers were still having a hard time differentiating Sure-Weld from its competitors. Since Sure-Weld's integrated weather package was far superior to its competitors, Carlisle SynTec chose to brand that feature as OctaGuard XT™ in August 2009. The name came from the eight performance-enhancing, anti-weathering ingredients that went into the Sure-Weld system. With the introduction of OctaGuard XT, customers now had a specific brand for which to ask in terms of durability and longevity. Furthermore, as TPO marketing manager David French later explained, "they know that we're not just giving them the same TPO product that everybody else makes, with the same performance and quality, but much more."

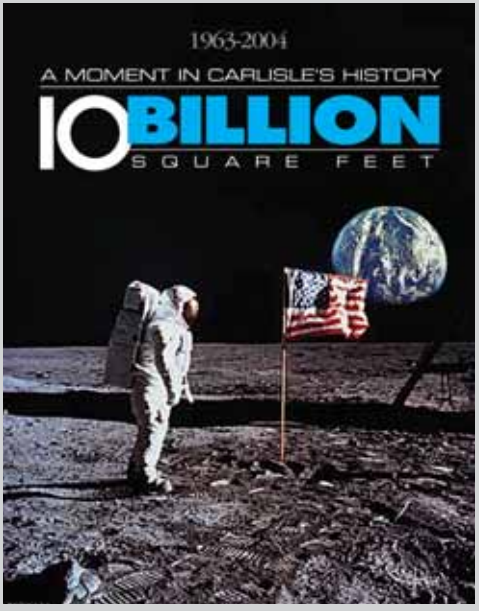
Within a different market, an improvement to SecurTape™, called Factory-Applied Tape™ (FAT), gave the Sure-Seal brand a competitive advantage in the market while further enhancing the division's reputation for innovation.

As the next step in the evolution of splicing tape, FAT made installation even easier through the pre-application of tape to EPDM membranes at the point of manufacture. It was conceived in 1998 by EPDM marketing manager Ron Goodman, who had made the original breakthrough of applying pressure-sensitive adhesives to the products he developed and patented over the years. Goodman was then in charge of FleeceBACK and noticed that the product's selvage edge—the small area where the fleece ended but the rubber extended for splicing—fit SecurTape almost perfectly. "That offset is about the thickness of the tape," he said to himself, "so why don't we try to factory-apply the tape on the edge there and then sell the roll with the tape already on it?"

The idea was deceptively simple, but Goodman encountered significant pushback from cost-conscious management. To make his point, he had the EPDM plant manufacture thirty rolls of FleeceBACK membrane using his prototype FAT and then tested them on a nearby company warehouse that was having a new roof installed. The contractors were amazed, telling Goodman, "This is making our life so easy...can we get the rest of the rolls like this?" Goodman later recalled, "You could just see the roofers' reaction…I knew right then we had a winner."

Working out the engineering, mass manufacturing, and packaging processes took four years, but when Carlisle SynTec released Sure-Seal FleeceBACK with FAT in 2002, it was an instant hit. Customers discovered that FAT increased both their productivity and installation quality because the tape was now aligned perfectly on the membrane edge without any air bubbles. All installers had to do was prime one side of the sheet, peel off the protective film from the tape, and then splice the pieces together. Goodman soon converted all FleeceBACK EPDM to FAT, and Carlisle SynTec subsequently marketed it as an option for the other non-FleeceBACK membrane products. Sales were so brisk that by 2005, Carlisle SynTec reached a milestone of ten billion square feet of manufactured membrane, which amounted to about 1,893,930 miles of sheeting, or eight times the distance to the moon and back. Moreover, warranty claims in the following years dropped significantly as building owners realized and appreciated the benefits of the new seam tape technologies.

Carlisle SynTec released Sure-Seal FleeceBACK with Factory-Applied Tape (FAT) in 2002 amd it was an instant hit with customers.



Carlisle SynTec reached a milestone of ten billion square feet of manufactured membrane, which amounted to about 1,893,930 miles of sheeting, or eight times the distance to the moon and back.

During this time period, Carlisle SynTec also moved to broaden its product base outside of roofing membranes by acquiring the insulation firm, Hunter Panels, headquartered in Portland, Maine. Hunter Panels was created in late 1997 by the dynamic, female entrepreneur, Alma Garnett, who was backed by a small group of investors, including Carlisle SynTec. Hunter Panels was the first start-up company to enter the polyiso industry since 1975, and in 1998 it began manufacturing high-quality polyiso roof insulation panels at a single plant in Kingston, New York. In 1999, while Hunter Panels was building a second plant in Franklin Park, Illinois, near Chicago, Garnett entered into an agreement with Carlisle SynTec that made Carlisle a majority stakeholder, and in January 2002, Carlisle SynTec bought Hunter Panels in its entirety.

Until that point, Carlisle SynTec had not manufactured its own insulation but had bought the product from other companies, such as Hunter Panels, and then relabeled it for sale under the Carlisle brand. John Altmeyer immediately understood the value of Carlisle's new in-house polyiso manufacturing capability and the market independence it provided. He therefore agreed to build as many polyiso plants as necessary, and over the next two years, Carlisle brought three new facilities on-stream in Lake City, Florida; Terrell, Texas; and Tooele, Utah. The rapid construction was a major achievement because, at the time, "No one knew that you could put plants up that fast," as Hunter Panels vice president of sales and marketing, Jim Whitton, later recalled.

By 2017, Carlisle became a national leader in the polyiso insulation industry, building new plants in Montgomery, New York; Smithfield, Pennsylvania; and Puyallup, Washington.

Carlisle went on to become a national leader in the polyiso insulation industry, building new plants in Montgomery, New York; Smithfield, Pennsylvania; and Puyallup, Washington, along with eight laminators. Whitton attributed the success to Carlisle's efficient business model and management. "We cover the entire industry from discretionary to OEM to systems work," he said. "All of that is covered by the different divisions, the different brands, and it has really, really worked very well."

While the new products were becoming dominant within their respective industries, Carlisle Companies was realigned in 2005 into a leaner, more focused corporation. The corporate structure was streamlined from five to three operating groups, and Carlisle Construction Materials was created as the largest of them—with Carlisle SynTec, Versico, Carlisle Coatings and Waterproofing, Hunter Panels, and EcoStar as its operating divisions. John Altmeyer became the group president.

As a division of Carlisle Construction Materials, Carlisle SynTec's standing as the world's premier commercial roofing systems manufacturer was confirmed in 2007 by J.D. Power and Associates and the McGraw-Hill Construction Report, which conducted an inaugural customer satisfaction study during April of that year. The study was based on nearly 500 contractor evaluations of the industry's "big four"—Carlisle SynTec, Firestone Building Products, Johns Manville, and GAF Materials—

Carlisle SynTec's standing as the world's premier commercial roofing systems manufacturer was confirmed in 2007 by J.D. Power and Associates and the McGraw-Hill Construction Report, which conducted an inaugural customer satisfaction study during April of that year. The consumers had spoken—they were extremely satisfied with the quality of the division's people, its products, and its services, and were committed to maintaining that excellent relationship.

and ranked each company according to seven criteria: 1) sales, marketing, and support; 2) warranty and repair service; 3) product rating; 4) credit/billing process; 5) placing orders; 6) delivery; and 7) price. In every category, Carlisle SynTec outranked its competitors in satisfying customers. Carlisle Construction Materials' vice president of sales and marketing, Nick Shears, later commented on the findings, stating, "It was a nice independent validation that we're doing the right things for our customers."

The J.D. Power/McGraw Hill survey revealed that John Altmeyer's stated goal of providing customers with a powerful total experience had paid off. The consumers had spoken—they were extremely satisfied with the quality of the division's people, its products, and its services, and were committed to maintaining that excellent relationship. As a result, sales of EPDM and TPO roofing systems reached record levels once again, with above-average growth, and the division was expected to do even better in 2008.

However, it was not to be, as economic forces outside of Carlisle SynTec's control intervened, not only disrupting previously stable markets but also forcing the division to adapt and innovate even further to withstand an unprecedented global recession that would bring the construction industry to a virtual halt.

WEATHERING THE STORM | 2008-2017

After a decade of unbridled growth, Carlisle SynTec's Sure-Weld TPO roofing system had become the dominant roofing membrane product by 2008, seizing more and more share from the traditional asphaltic roofing market.

Sure-Weld now made up the largest segment of the commercial roofing market for Carlisle SynTec, but capacity still lagged. To meet the demand, Carlisle SynTec opened a second TPO line at the Tooele, Utah, plant early that year. It was the company's fourth line, including the two at the Senatobia, Mississippi plant. The division also added new accessories such as walkway pads and flashings to its TPO business. Meanwhile, Sure-Seal EPDM and its accessories likewise remained strong in the market, particularly in central and northern climates where EPDM's black color made it ideal for enduring harsh winters.

However, in September 2008, a global economic storm broke, shaking the construction industry to its foundation. Financial services collapsed, credit evaporated, and residential construction ground to a halt virtually overnight. This was the beginning of a recession that was unlike any other since the Great Depression. At first, it seemed that the U.S. commercial roofing market could withstand the turmoil, but during the last quarter of 2008, the country's financial troubles began exerting a "daunting influence," as described in Carlisle's 2008 annual report. Wild fluctuations in the cost of oil and natural gas led to "unprecedented volatility" in raw material pricing. Carlisle SynTec implemented several price increases but the rising costs outpaced them, hurting its overall profit margins for the year.

Carlisle SynTec opened a second TPO line at the Tooele, Utah plant in early 2008 to meet the demand for TPO.

The financial picture became more bleak in 2009, with key markets plummeting by an unprecedented thirty percent. With no end to the drop-off in sight, Carlisle SynTec retrenched, like many other businesses caught up in the global economic meltdown, aggressively reducing overhead, staff, and support functions. The cuts were painful but necessary. Management did not know how long the downturn would last or how severe it would ultimately get, but resolved "to navigate through the economic storm of 2009 and exit the year in a very strong financial position." "Exit Stronger" thus became the watchword for Carlisle SynTec and the rest of CCM.

The pressure was somewhat eased by the corporate-wide implementation in 2009 of the new Carlisle Operating System (COS), a waste-reduction philosophy based on the principles of "lean manufacturing" and "continuous improvement." Lean manufacturing was first conceptualized by industrialist Henry Ford in the 1910s and then adopted by Japanese automobile manufacturers after World War II. The strategy was aimed at providing the greatest potential value to customers through the most efficient production processes possible with zero waste. Simplicity was a hallmark for lean manufacturing. Continuous improvement, on the other hand, strove to perfect a company's products, processes, and services incrementally over time, with the goal of reducing waste to achieve complete efficiency. This concept went hand-in-hand with lean manufacturing, and as corporate management observed in 2007 when Carlisle Companies first explored the philosophy, "The benefits of this system will be experienced in 2009 and beyond, as it will allow us to more quickly integrate acquisitions and drive improvement across all operating divisions." Hence, the arrival of the lean model in Carlisle was timely.

In 2009, Carlisle SynTec Systems implemented the new Carlisle Operating System (COS), a waste-reduction philosophy based on the principles of "lean manufacturing" and "continuous improvement."

CARLISLE OPERATING SYSTEM

People. Process. Productivity.

While slashing costs and "leaning" its operations, Carlisle SynTec also reevaluated and redirected its marketing strategies. New roofing construction had been at the heart of Carlisle SynTec's growth in the 1990s and 2000s. Orders were very brisk during those years in the thriving big box and industrial markets, with the sales team focused primarily on filling them. Retrofitting or re-roofing older buildings was a more demanding market, as customers typically had other less-expensive options to repair worn-out roofs, leaving little incentive for Carlisle's sales force to engage in that business line. John Altmeyer later commented, "Our reps and management did not ignore re-roofing, but we hadn't gone after it either."

The great 2008 recession exposed the perils of that imbalance, prompting senior management in early 2009 to make a quick U-turn in Carlisle SynTec's marketing strategy, refocusing on the re-roofing market. Sales representatives were re-trained and given new tools and products with which to go after that neglected business segment. Among these was the proprietary Roof$ense software, which helped contractors demonstrate to their customers the economic advantages of investing in additional roofing insulation. Carlisle SynTec also developed Temporary Roofs, which were made of self-adhering membrane and designed to keep buildings watertight during the installation process of new, permanent roofing.

One other new Carlisle SynTec product that became a key part of its business line during this period was the Polyvinyl Chloride (PVC) roofing membrane system. PVC is a white thermoplastic commonly used in plumbing, siding, and window and doorway applications. Generally rigid, PVC can be made flexible through the addition of plasticizers, and its resistance to heat and chemicals make it an excellent covering membrane for factories, paint shops, hospitals, airports, and restaurants. Carlisle SynTec had been marketing PVC membranes since 2004, but found the market too fragmented for substantial growth. However, when the division re-directed its marketing strategy toward re-roofing, PVC proved to be an ideal membrane because it had a strong following in the replacement market. To surpass the competition, Carlisle SynTec sought to differentiate its product from competing brands.

Beginning in 2009, the Carlisle research and development team worked with DuPont to develop a total PVC system called Sure-Flex™ KEE (Ketone Ethylene Ester), using DuPont's patented and trademarked Elvaloy® solid plasticizer.

In 2013, Carlisle SynTec built a new PVC plant in Greenville, Illinois, making Carlisle the only U.S. roofing manufacturer that provided all three single-ply technologies—EPDM, TPO, and PVC.

KEE membranes provided superior weathering and chemical resistance when compared to other PVCs. The system included a solid array of KEE-based accessories as well as a FleeceBACK option. Although Sure-Flex KEE was high-end and more expensive than competing membranes, it offered the best value by far among PVC membranes through better performance, easy installation, and smokeless welding. Backed by the Carlisle name and marketed by a tenacious sales team that worked hard to get the product specified on re-roofing projects, Sure-Flex PVC instantly became a preferred option in every region of the country. Sales were increasing such that in 2013, Carlisle SynTec broke ground on a new PVC plant in Greenville, Illinois, which opened in December of that same year, making Carlisle the only U.S. roofing manufacturer that provided all three single-ply technologies—EPDM, TPO, and PVC. The division thus achieved a much better balance among its product lines and was well-positioned to capitalize on the innovations once new construction returned to pre-recession levels.

Although the great recession technically ended in mid-2009, the ensuing economic recovery was weak and the global economy remained challenging through 2013. However, that year, the new construction marketplace made modest headway and commercial roofing sales improved. The uptick in EPDM and TPO orders signaled that the worst was over and that Carlisle SynTec and its sister divisions had weathered the storm, leading John Altmeyer to report, "I can confidently say CCM is a much stronger company today than it was in 2008 as a result of the actions and investments made during the downturn."

Moving forward into 2014, Carlisle SynTec revised its marketing and investment strategy again to take advantage of the momentum flowing out of the storm. As anticipated, marketing shifted from the re-roofing market to a more balanced approach aimed at maintaining the division's Sure-Seal EPDM share, growing Sure-Flex PVC further, and expanding the Sure-Weld TPO line. Management believed that Sure-Weld TPO was particularly vital for Carlisle SynTec's future growth and supported it with additional resources. As Sure-Weld was selling beyond expectations in the Northeastern U.S., CCM refurbished

Carlisle SynTec's development of innovative products continued with the introduction of APEEL protective film to Sure-Weld TPO in 2014. The membrane would thus be shielded from dirt, asphaltic particles, debris, or tracks by the film, which would then be peeled off and thrown away during clean-up, leaving behind a pristine, white surface.

a 300,000-square-foot former tire and wheel distribution plant in Carlisle and installed another TPO production line—the division's fifth—to better serve that region. The new plant housed a state-of-the-art, twelve-foot extruder and was engineered to allow the installation of extra capacity if needed. When it came on-stream in 2014, Carlisle SynTec reinforced its position as the largest TPO manufacturer in the world.

Carlisle SynTec also pioneered Sure-Weld TPO with a Self-Adhering Technology (SAT™) option, which is a peel-and-stick system in which adhesive was pre-applied to the back of the membrane at the production plants. This eliminated the need for applying adhesive and sped up installation, reducing labor by up to seventy percent.

The latest innovation for Sure-Weld TPO is the introduction of APEEL™ protective film in October 2014, in response to feedback from contractors and building owners about heavily soiled or otherwise marred TPO surfaces following installation. The film is applied to the top of the membrane at Carlisle's production plants and then left in place by applicators while they installed the system. The membrane would thus be shielded from dirt, asphaltic particles, debris, or tracks by the film, which would then be peeled off and thrown away during clean-up, leaving behind the pristine, white surface that customers demanded. The solution is simple yet elegant, and has been well received in the market.

PVC likewise received more attention from Carlisle SynTec's chemists and marketers when the division upgraded its Sure-Flex KEE and FleeceBACK KEE membranes to high-performance (HP) grade, which included improved aesthetics, enhanced thermal performance, a wider window of weldability, and superior cold weather flexibility. Sure-Flex KEE HP became available in April 2014, and was followed in August by the introduction of reflective tan and grey colors to complement its traditional white—the color options requested most often by the industry.

Looking back over its long and distinguished history, beginning with Charles Moomy's original tire and inner tube plant in 1917, through its development of roofing membrane technologies, and followed by its rise as the industry leader, Carlisle SynTec has much of which to be proud.

Moving ahead in 2017 and beyond, the division is poised to achieve significant new growth in an ever-changing and highly competitive marketplace, based on its ingrained "culture of continuous improvement" and the "lean" philosophy of the Carlisle Operating System. Further, Carlisle SynTec recently announced that it is going to allocate more of its resources away from new plant construction and toward the development of its intellectual assets, beginning with the opening of new multi-million-dollar research and development facilities in Carlisle. "We've been building hard for twenty years," said John Altmeyer," and now it's time to build soft." Meanwhile, Carlisle SynTec stands poised to continue its solid tradition of innovation, performance, and reliability into the future, both in the U.S. and globally.

In 2017, President John Altmeyer announced that Carlisle SynTec's period of facility expansion was coming to an end, but that a new period of development for the company's intellectual assets was about to begin. "We've been building hard for 20 years," he said, "and now it's time to build soft." The new state-of-the-art training center opened in late 2017 and will be used for hands-on and classroom-style training for roofing contractors, architects, roofing consultants, and employees.

THE NEXT 100 YEARS | VISION 2025

VISION CARLISLE 2025

THE NEXT 100 YEARS

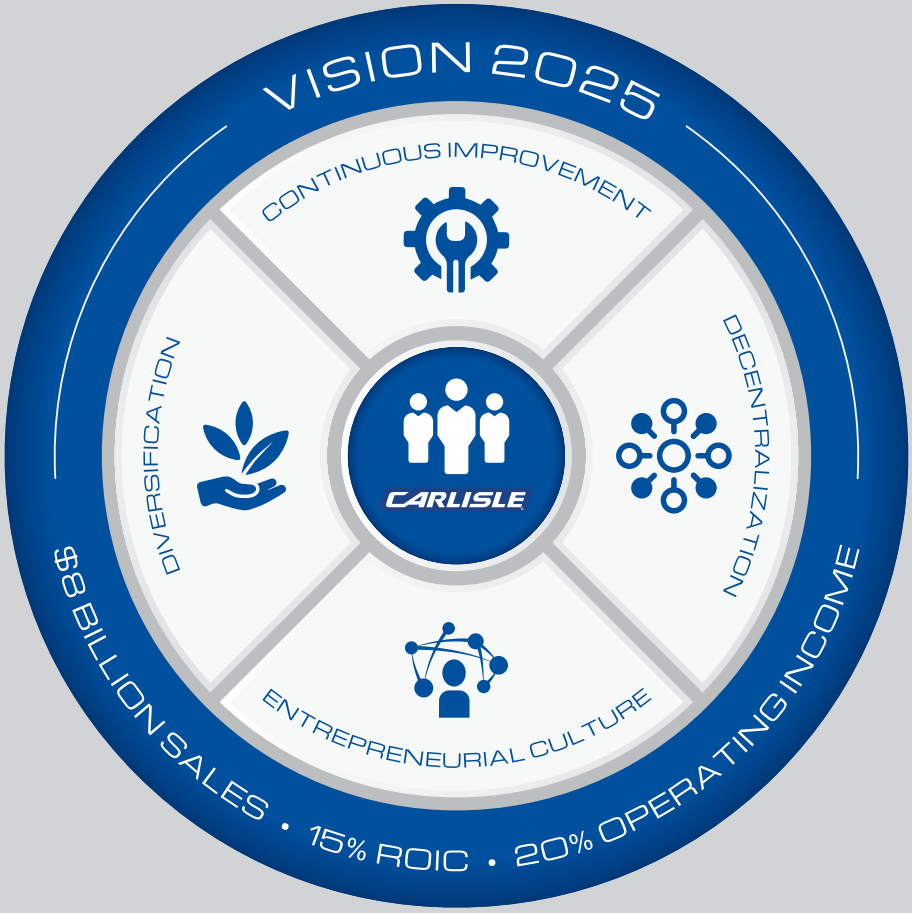
More than 100 years have passed since Charles Moomy arrived in Carlisle, Pennsylvania, with $500, some machinery, and a plan to make inner tubes for tires. In 1961, when Carlisle introduced the first synthetic roofing product to the market, total company net sales were $24 million; in 2017, Carlisle SynTec's parent company, Carlisle Companies, did $4.1 billion in net sales. It's exciting to envision what can be accomplished in the next 100 years.

The SynTec team is currently focused on implementing Carlisle Companies' Vision 2025 strategy, which promotes talent development, continuous improvement of products and processes, and investments in manufacturing, research and development, and education facilities.

Carlisle SynTec is fortunate to have an experienced senior management team and a deep bench of future leaders who all take great pride in the Carlisle Experience. As in the past, the development of innovative products and services will continue to be a key focus, as evidenced by the recent introduction of RapidLock (RL™) roofing systems, TPO with APEEL Protective Film, and the revolutionary CAV-GRIP™ III Low-VOC Adhesive/Primer.

Regardless of what the future holds, the company's foundational values – dedication to quality, innovation, and customer support – will remain unchanged for the next 100 years and beyond.

Carlisle innovative RapidLock (RL) roofing systems feature a membrane hook-and-loop attachment system that provides an adhered system without the use of adhesives.



Carlisle Companies used its accomplished past and core operating philosophies as inspiration for Vision 2025, a strategic plan that has set the tone for the next 100 years. Vision 2025 is based on five key elements:

1. Drive above market organic growth, and leverage that growth into superior operating margins.
2. Build scale by pursuing complementary acquisitions that provide measurable synergies.
3. Expand COS from the factory floor to include business processes.
4. Invest in attracting, retaining, and developing exceptional talent.
5. Enhance the corporate center.

Carlisle Construction Materials, LLC (CCM) is a diversified global manufacturer and supplier of premium building products and related technologies for the commercial and residential construction markets.

THE GROWTH OF CARLISLE CONSTRUCTION MATERIALS

HARDCAST	**1987**
VERSICO ROOFING SYSTEMS	**1993**
CARLISLE COATINGS & WATERPROOFING	**1994**
HUNTER PANELS	**2002**
CARLISLE WIP PRODUCTS	**2002**
WEATHERBOND ROOFING SYSTEMS	**2006**
INSULFOAM	**2007**
HERTALAN®	**2012**
RESITRIX®	**2012**
ARBO	**2017**
DREXEL METALS	**2017**
ACCELLA POLYURETHANE SYSTEMS	**2017**
PAC-CLAD PETERSEN	**2019**

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