## CLASS OF 2024

# INDUCTION CEREMONY

HONORING THE PEOPLE WHO HAVE Shaped the plastics industry

MAY 5, 2024





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## MISSION STATEMENT

The Plastics Hall of Fame's mission is to identify and honor individuals whose innovations and leadership have advanced the plastics industry and provided valuable solutions to societal needs.



## PLASTICS HALL OF FAME

The beginning of the Plastics Hall of Fame (PHoF)

grew out of a 1972 discussion between Sid Gross, the long-time, highly respected editor of Modern Plastics magazine, and the magazine's publisher, Stuart Siegal. The resulting concept was to establish a Plastics Hall of Fame that would honor and record the contributions of the living pioneers in the plastics industry whose

efforts significantly contributed to the growth of the plastics industry.

The inaugural induction ceremony was held on November 8, 1973, during the National Plastics Exposition (NPE). Eleven were inducted. Following the 1973 induction ceremony, the membership criteria expanded to include deceased industry members. Seven living and eleven posthumous members were inducted at the 1976 ceremony.

Responsibility for the PHoF transferred from Modern Plastics magazine to the Society of the Plastics Industry (SPI) in 1976. SPI conducted the 1979 and 1982 induction ceremonies.

Following the next induction ceremony in Atlanta, GA, on October 8, 1986, Jerome Heckman convinced the PHoF operating committee to establish the Plastics Academy, Inc., to undertake responsibility for administering the PHoF and its related activities.

By the turn of the century, the plastics industry had turned its attention to the larger international market. Many material suppliers, machinery builders, and processors became multinational companies. Responding to this situation, the PHoF started accepting international nominations in 2004.

As of May 2022, The Plastics Hall of Fame, Inc. is an international not-for-profit 501(c)3 Delaware corporation run by volunteers. The organization is 100% supported through sponsorships and donations.

## PROGRAM

RECEPTION 5:30 PM-6:30 PM DINNER 6:30 PM-7:30 PM INDUCTION CEREMONY 7:30 PM-9:30 PM AFTER PARTY 9:30 PM



#### OFFICERS

Dr. Maureen R. Steinwall President Vincent Witherup Vice-President Timothy W. Womer Sr. Vice-President

#### **BOARD OF DIRECTORS**

Jim Callari Fred Daniell Donna Davis Norm Fowler Daniele Fresca Gunther Hovt

Ulrich Reifenhauser Wylie Royce Hideo Tanaka

#### COMMUNICATION COMMITTEE

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#### **EVENT COMMITTEE**

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#### NOMINATION COMMITTEE

Jim Callari, Chair Norm Fowler, Vice-Chair Gunther Hoyt William A. Humphrey Jim Murphy Hideo Tanaka

#### CONSULTANTS

Glenn Beall Dr. Tom Brady Arlene Davis Dr. Bob Malloy

Dr. Steve Chum

## INTRODUCING THE PLASTICS HALL OF FAME

# $(LASS \overline{OF} 2024)$



## RAINER ARMBRUSTER Foboha Gmbh

Rainer Armbruster is known as the world's most innovative mold maker. He pioneered the idea and development of cube molds, an automated process for injection molding that improves quality, delivers tremendous cost savings, and greatly accelerates cycle times compared to separate injection molding and installation processes.

The economic advantages of cube molds for production of two- and three-component plastic parts are unparalleled. Volumes of more than 100 million components per year can be achieved. By having four rotating mold faces, additional processes are streamlined into part production on a smaller footprint.

Armbruster has repeatedly proven his incredible technical creativity and courage to bring even the most complex mold concepts into production. Armbruster's extraordinary talent and commitment to his innovations now enable the plastics industry to manufacture complex, multi-piece injection molded components in fewer steps and in less space on the shop floor.

Rainer Armbruster started his career in 1974 as a moldmaker at Dual GmbH in Hornberg, Germany where he made the company's first molds for plastic parts. In 1977 he became a moldmaker for injection molds at FOBOHA in Kinzigtal, Germany. Armbruster advanced to plant manager in 1982. He drove the conversion within the company to an industrial production of injection molds and was responsible for the implementation of automation within production.

In 1997 as Technical Manager for FOBOHA his innovative mind led to the invention of cube mold technology. He patented cube molding in 2001. Over the following decades he reinvented cube molding technology multiple times with concepts like the Compact Cube or the Reverse Cube, and by integrating other mold technologies such as CITI, which involves rotating inserts in a cube mold to produce multi-component parts.

As Managing Director for FOBOHA, Armbruster established the FOBOHA company in China and Switzerland. After 50 years with the company, he continues to push the limits of injection molds with his inventions. Armbruster holds 35 patents.

## **LUIGI BANDERA** Costruzioni meccaniche Luigi bandera spa

Luigi Bandera (1921 – 2003) began the history of plastic extrusion in Italy during World War II. He invented the first extruder, a 60 mm screw for PVC pipes and profiles. Under his leadership, the company he founded became a global leader in designing and manufacturing complete lines for the extrusion of plastic materials.

Mr. Bandera started working in the late 1930s as a design engineer while starting his own activity officially after World War II. He was one of the first to understand that switching from piston technology to screw extrusion allowed better control, efficiency, and flexibility in extruding different polymers.

In 1947, at 25 years old, he founded Costruzioni Meccaniche Luigi Bandera in Busto Arsizio, his hometown. The company originally focused on PVC and rubber extrusion systems.

In 1950 the business underwent remarkable expansion to reach industrial-scale production of thermoplastic resin extrusion systems, offering a wide range of products, such as pipe extrusion lines, profiles extrusion equipment, and sheet extrusion lines.

With the advent of coextrusion systems in the 1960s, Bandera led the way in designing and producing multilayer lines which included the largest five-layer coextrusion line for blown film application at the time, and the first high thickness membrane extrusion. A milestone in the success of Bandera came in the 1990s with their patented dryless technology for direct extrusion of PET. The idea completely revolutionized the industry.

Bandera's company is one of the world's most well-known manufacturers of plastic blown film and sheet extrusion machinery. In 1998 Bandera received ISO 9001 Quality Certificate. Currently there are 35,000 Bandera extruders running worldwide producing 54,000 tons of extruded polymers per day.

Luigi Bandera was awarded Cavaliere della Repubblica, one of the highest honors bestowed by the Italian Republic President. Bandera is remembered as a unique personality with a strong technical view and a charismatic leadership style. He was actively involved in the local community through numerous charity foundations and was famous for his philanthropy. Bandera held 26 patents.

## **DR. JOSEPH BIESENBERGER** POLYMER PROCESSING INSTITUTE (PPI)



Dr. Joseph A. Biesenberger (1935 – 1998) was best known as the founder of the Polymer Processing Institute at Stevens Institute of Technology in Hoboken, New Jersey. But he also was recognized as the top expert in the world on polymer devolatilization.

Biesenberger was an outstanding educator, an accomplished research scientist, and a pioneer in the application of basic chemical engineering principles to large-scale industrial plastics processing. He mentored thousands of engineering students that populate the plastics industry today.

Biesenberger earned his BS at the New Jersey Institute of Technology (NJIT) in 1957. He went on to Princeton where he earned his master's and doctorate in chemical engineering. He did postdoctoral studies in Milan, Italy with Nobel Laureate professor Julio Natta.

Biesenberger returned to the U.S. in 1971 to join the faculty of Stevens Institute as an assistant professor in the Department of Chemistry and Chemical Engineering. He advanced to associate professor and full professor and was chairman of the chemical engineering department from 1971-1978. During his tenure he raised the status of the Polymer and Chemical Engineering Programs at Stevens to an internationally recognized level.

In 1982 Biesenberger cofounded the Polymer Processing Institute (PPI) at Stevens along with Dr. Luigi Pollara and Dr. Costas Gogos. The group served as an independent, nonprofit industrial consulting corporation with extensive laboratory facilities on both campuses. After his passing, PPI moved to NJIT.

Biesenberger served as president of PPI from 1989 to 1995. He worked with Harold Wrede, chairman of PPI's Board of Trustees, to create a unique research organization that is known and respected by polymer professionals worldwide.

Professor Biesenberger's most important contribution to his profession was the creation of the field of reactive polymer processing, the result of his combining polymerization reaction engineering with polymer processing. Biesenberger made hundreds of presentations and published more than 150 books and papers. In 1983 he authored with D. H. Sebastian the important and unique "Principles of Polymerization Engineering." He later edited 'Devolatilization of Polymers.' He held two patents.



## **DR. JACQUE BRANDENBERGER** La cellophane sa and dupont

Jacques Edwin Brandenberger (1872 - 1954) was a Swiss chemist and textile engineer who invented cellophane in 1908.

Made from wood cellulose, cellophane was originally intended as a coating to make cloth stain resistant. Brandenberger wanted to develop a material that would repel liquid by spraying a waterproof viscose coating onto fabric. But the resulting fabric was too stiff, and the coating easily separated from the backing cloth, producing a thin transparent film.

Brandenberger abandoned his original idea when he realized the potential for the new material. He named his film Cellophane derived from cellulose and diaphane, the French word for translucent.

He designed equipment for large-scale production. In 1913, he formed La Cellophane Société Anonyme in Paris, France and patented the machinery and processes. Industrial production of Cellophane started in 1920 and has never stopped. For years after World War I, cellophane was the only flexible, transparent plastic film used for common items like food wrap and adhesive tape.

Cellophane was ideal for food wrap because it did not allow bacteria, water, greases, air, and oil to pass through. It revolutionized shopping by letting people see food without sacrificing hygiene or freshness.

Brandenberger sold the US rights to DuPont in 1923. Cellophane became a worldfamous brand, a landmark in the chemical industry. By 1938, cellophane accounted for 10 percent of DuPont's sales and 25 percent of its profits. It was an essential material during WWII where it was used as rain capes for U.S. soldiers and packaged their rations. Brandenberger earned the Franklin Institute's Elliott Cresson Gold Medal in 1937.

Although cellophane is a trademark in some countries, it is now a generic name in the United States. Brandenberger's original cellophane material was a bioplastic made from wood cellulose. Now much of what we call cellophane is plastic wrap derived from petroleum.

The Dr. J. E. Brandenberger Foundation awards grants to Swiss individuals who are committed to improving the living conditions of human beings.

### **J. MICHAEL CUDE** COEUR, INC. AND ITW MEDICAL



J. Michael Cude (1957-2024) was a driving force in the medical plastics industry for more than 40 years. Cude's extensive interaction with customers produced numerous medical device innovations. He also led the startup and operation of nine medical plastics manufacturing plants in the US, Mexico, and Ireland.

In 1979, Mike joined Hospital Disposables. Here Mike helped develop a family of plastic container products that replaced reusable stainless steel and glass in American operating rooms. These new products supported the growth of the surgical procedure pack market while reducing costs and improving patient safety. Designed to pack and stack efficiently, these unique products reduced the size of surgical kits, maximizing sterilization efficiency and reducing transportation and storage costs. These products still dominate the market today.

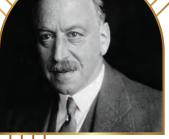
In 1983, Mike founded Atlantic Molds International, a toolmaking business in Portugal. Mike's experience in manufacturing led him to focus on tooling design that minimized production costs, maximized machine uptime, and facilitated ease of tool maintenance. His integration of automation, turbulent cooling, and quick changeovers created highly productive tooling and low manufacturing costs. Mike also championed a "design for manufacturability" approach. Here product design is optimized for manufacturing ease and production cost while meeting all performance requirements. Mike's deep experience in plastics manufacturing drove his integrated approach to product, mold, automation and even plant design.

From 1989 to 1999 Cude played an integral role starting or expanding three medical device plants as VP of Engineering for DeRoyal Plastics Group. Mike improved and expanded a product line of plastic medical devices used to administer contrast media during diagnostic procedures in the Cardiac Cath Lab and Interventional Radiology. He also patented a guidewire bowl design that solved procedural issues in the imaging labs. All these products continue to have significant market share worldwide today.

In 1999, Mike joined Coeur, Inc. Here he led the development of an entire product line of disposable plastic products for the imaging market. In addition to injection molded products, Mike expanded his resume to include a wide array of extruded tubing products. When automation opportunities were exhausted, Mike led the startup of a medical device assembly plant in Mexico. Mike was responsible for new tooling concepts, processes, and automation that gave Coeur a significant competitive advantage.

In 2012, Coeur was sold to ITW, and Cude became Global Director of Innovation and Engineering, responsible for the operations and engineering of six plants in three countries.

Michael Cude left ITW to form Cude Advising in 2019. Mike had a unique ability to translate a customer need into a tangible product design and to then develop the tooling, automation, and manufacturing processes needed to repeatably produce the product at a low cost while meeting high quality and regulatory requirements. Cude was author of nineteen patents.



## DR. ARTHUR EICHENGRUN Cellon-Werke

Arthur Eichengrün (1867 – 1949) was a Jewish chemist, materials scientist, and inventor who began his career with Bayer & Company in Germany in 1896. He is known for developing the highly successful anti-gonorrhea drug Protargol, for co-discovering aspirin, and for his pioneering contributions in plastics. Eichengrün co-developed the first soluble cellulose acetate materials in 1903, called Cellit, and influenced the early development of plastic injection molding.

He contributed to photochemistry by inventing the first process for the production and development of cellulose acetate film, which he patented with Theodore Becker in 1903. It was used to manufacture cinematographic film, which Eastman Kodak and the Pathé Frères began using in 1909. Cellulose acetate film became the standard, preferred over the highly flammable film produced from Nitrocellulose.

Eichengrün left Bayer in 1908 and started his own lab and manufacturing plant, Cellon-Werke. There he advanced the science of injection molding by developing the first injection molding press in 1919. He developed a type of flame-resistant plastic called Cellon, which was in great demand during World War I for pilots' goggles and soldiers' gas masks. The company also created a fire-resistant cellulose acetate coating for the fabric used on aircraft, making their wings water resistant.

Eichengrün and Becker invented the first soluble forms of cellulose acetate in 1903, which was much less flammable than cellulose nitrate. It was made available in a powder form from which it was readily injection molded. In 1939, Eichengrün patented the injection molding of plasticized cellulose acetate. The injection molding industry expanded rapidly in the 1940s because World War II created a huge need for inexpensive, mass-produced products.

In 1933, the Nazis forced Eichengrün to sell his company. Ten years later, he was imprisoned, and in 1944, was sent to Theresienstadt concentration camp. He was freed on May 8, 1945, when Soviet troops liberated the camp. He returned to Berlin after the war to continue his scientific work in private. Eichengrün held 47 patents.

### **H. JOSEPH GERBER** GERBER SCIENTIFIC, INC.



H. Joseph Gerber (1924 – 1996) was a prolific inventor, a successful entrepreneur, and a highly accomplished engineer. He was an inventor of industries. The innovative uses of plastics by Gerber and his engineers transformed apparel and furniture production, sign making, prescription eyeglass fabrication, commercial printing, and electronic products manufacturing. These advancements in film-based processes not only created significant new markets for plastic films but fostered a revolution in consumer and industrial products.

While in college, Gerber invented the Gerber Variable Scale, a graphical-numerical computing device. He founded the Gerber Scientific Instruments Company to manufacture his invention, known as "the greatest engineering tool since the slide rule".

Over the next five decades, Gerber presided over the growth of the organization from a single product company to a global supplier of intelligent manufacturing systems for nearly a dozen industries.

Gerber made exceptional contributions to the textile industry. His best known innovation uses plastic bristles to enable a computer-controlled knife to cut large quantities of fabric and other flexible material rapidly and accurately. This innovation is considered the industry's single most important advancement of the 20th century.

Gerber contributed greatly to the growth of the plastics industry as he and his company devised new uses for plastics, often pioneering new industries. Through his company, he introduced the first systems to create graphics under digital control and he became a leader in computer-aided design and manufacture (CAD/CAM). Gerber systems were instrumental in the development of UPC bar codes and printed circuit boards (based on imaging new plastic-based films) and basic steps in the processes of commercial printing (based on cutting plastic films).

His company's advancements in billboard manufacture and sign making generated a large demand for plastic-based billboards, store signs, and vehicle graphics. Gerber systems became the most widely used in the world for sign-making and related graphic arts applications. Gerber systems transformed the eyeglass industry by enabling quick local production of prescription plastic lenses instead of glass, and his innovations enabled mass customization for many other industries.

Joseph Gerber served as chief executive and principal inventor from the company's 1947 founding until his death in 1996. Three of Gerber's original engineering computation products and his cloth-cutting system are in the permanent collection of the National Museum of American History. He had 648 U.S. and foreign patents issued in his name.

## **ARTHUR HAAG** PURECHEM AND NEUTREX

Arthur P. Haag (1929 – 2023) was the "titanium man" of the plastics materials industry. His nearly 70-year career included leadership creating specialty chemicals for the plastics manufacturing industry and later the plastics molding industry.

From 1957 to 1986 Haag developed, produced, and commercialized titanium and organic catalysts for manufacturing plastics. He invented methods and equipment to manufacture high purity titanium catalysts earning him four US patents. In 1966, he founded PureChem in California, and built it into a top manufacturer of Titanium (III) Chloride, an important catalyst for the manufacture of polyolefins.

After selling PureChem to Dart Industries in 1970, Haag operated and greatly expanded the catalyst businesses of Dart-Kraft, including PureChem which he relocated to Texas, Aztec Chemicals, a major manufacturer of organic and magnesium catalysts based in Ohio, and a New Jersey R&D laboratory. Philips Petroleum acquired Dart Industries in 1982.

In 2014, H.T. Sears, former head of Phillips' worldwide chemical business, wrote that the company considered Haag to be the "king" of the catalyst business, and its decision to buy Dart-Kraft's catalyst division was "based in large part on our acquisition of Art's leadership and expertise."

Haag retired from Phillips in 1986. He soon became an entrepreneur again, developing three hi-tech ventures involving advanced temperature instruments, bio-medical diagnostic equipment and energy research. Then, while working at home, he invented the "Purgex" line of proprietary purging compounds to remove color and contamination from plastic molding machines. As a result, Haag had a remarkable second plastics career from 1992-2023 as the founder and head of Neutrex, which produces and sells Purgex on a global basis – twice winning Presidential awards for excellence. Haag was a strong advocate for using purging compounds to increase quality and efficiency in plastics molding.

Haag was an inspirational leader and speaker who enjoyed mentoring protegees, and was highly respected in the industry, even by competitors. He loved the plastics business so much he never retired. Haag passed away in 2023 just before he turned 94.

## **WENDY HOENIG** DOW AND H&H BUSINESS DEVELOPMENT



Wendy Hoenig is a results-oriented, global business and technology leader. Her direction, mentorship, and ability to choose winning technologies made major contributions to the plastics industry during her tenure at The Dow Chemical Company. There she held multiple leadership and executive positions in North America and Europe from 1986 to 2010, including Global Business and R&D Director for Ventures and Business Development for the Performance Plastics & Chemical businesses as well as Vice President of R&D for Dow Coating Solutions. Most recently, she served as Chief Marketing & Sales Officer of Peak Nano.

She and her global team launched new businesses and product lines that now contribute over \$1 billion in sales to Dow. Hoenig led the early-stage market development of INSITE Technology for use in medical, automotive, and packaging. Later she led the commercialization of INSPIRE™ Performance Polymers, Bluewave™ Polyolefin Dispersions, INCLOSIA which is now leveraged for solar panels, and INFUSE™ Olefin Block Copolymers for films and elastomeric applications.

For these career achievements, Hoenig was awarded the 2018 Women Breaking the Mold award from Plastics News and the 2018 Rice University Outstanding Engineering Alumni Award. For Leadership, she received the Dow Regional Genesis Award for outstanding people development. She and her Dow teams received four R&D 100 Awards. More recently, she and her team at Peak Nano were recipients of a 2021 R&D 100 Award, a 2022 Silver Edison Award, and a 2023 Gold Edison Award. She holds 15 US patents and has been published in more than 20 industry publications.

As part of her mentoring, Hoenig serves on the External Advisory Board for Rice University Brown School of Engineering and was President of Rice Engineering Alumni Board. She is President of the Plastics Pioneers Association, providing scholarships to students. She is a past member of the Georgia Tech external advisory board for engineering and the National Paint & Coatings Science & Technology Committee.

Hoenig founded H&H Business Development in 2010, a consulting firm that provides technology and business assessments for private equity, venture capital, and start-ups. As part of the business model for H&H, she serves at start-ups as an officer to assist with commercialization. She launched carbon nanotubes for elastomers at Molecular Rebar Design and recently retired from Peak Nano where she helped commercialize nanolayer films for optics and capacitors.



## **DR. WALTER KAMINSKY** UNIVERSITY OF HAMBURG

In the early 1980s, Professor Dr. Walter Kaminsky pioneered major new families of catalysts at the University of Hamburg that made a global impact on the production of plastics. Kaminsky's breakthrough discoveries sparked a revolution that has been utilized by nearly every polyolefin producer in the world. Today, more than 20 billion pounds of polyolefin plastics and elastomers are produced annually.

Before Kaminsky's discoveries, polyolefin plastics and elastomers were produced using difficult to control catalysts that had low efficiency and high cost. Kaminsky found that certain metallocenes could be activated using an aluminum compound called alumoxane. This new catalyst polymerized olefins with extraordinary high efficiency, generating millions of pounds of plastic for each pound of catalyst.

These "Kaminsky catalysts" have much better performance, enabling plastic fabricators to develop new applications and higher-value products for consumers. The polyolefin industry regards Professor Kaminsky as the father of modern metallocene technology.

Research into these new catalysts escalated in the 1990s and 2000s, with specialized scientific conferences drawing hundreds of scientific and management attendees every year. This level of enthusiasm continues today.

As an educator and a scholar for over 40 years at the University of Hamburg, Professor Kaminsky has guided more than 140 Ph.D. students and post doctorates to complete their degrees and training. His students are key contributors to the plastics industry throughout the world.

Kaminsky has been recognized by many institutions and has earned prestigious awards from all over the world including the Benjamin Franklin Medal from U.S.A. in 1999 and the Hermann Staudinger Prize from Germany in 2003. Having published more than 450 journal papers and patents, Kaminsky is one of the most active scientists in the field of polymer science. Cited more than 5000 times, Professor Kaminsky ranks among the top chemical engineering faculty members in the world.

In recent years, Kaminsky worked on plastic waste recycling technologies. New pyrolysis plants were built using his technology to recycle plastic wastes into oil and gas. For this, he received the medal for Most Excellent Contribution to Recycling of Plastics from Japan in 2011.

### DR. CHIHIRO KANAGAWA Shintech and Shin-etsu



Chihiro Kanagawa (1926 – 2023) was a champion not only of the polyvinyl chloride (PVC) industry but also of the global chemical industry. He accomplished great feats. One of them was the success of Shintech, Inc. which is now the world's largest manufacturer of PVC. Kanagawa was convinced of the excellence of PVC as a material and of its potential for growth because of its superb properties as well as of its contributions to preserving the global environment. He dedicated his career to developing and promoting the PVC business through the sustainable growth of Shintech, Inc. in Texas, USA.

Kanagawa graduated from the University of Tokyo in 1950. After starting his career at an international trading company, he joined Shin-Etsu Chemical in 1962 in Japan to develop business in its International Division. In 1973 Kanagawa proposed founding a Shin-Etsu Chemical's joint venture with an American company. This materialized as Shintech.

Shintech started its operations with a production capacity of 100,000 tons per year. After half a century since its foundation, Shintech's present production capacity is 3.24 million tons per year, nearly 32 times larger than its initial capacity. Shintech now represents 36% of North America's total PVC production.

Shin-Etsu Chemical purchased all Shintech shares held by its joint venture partner in 1976. As a result, Shintech became a wholly owned subsidiary of Shin-Etsu Chemical. Kanagawa became president of Shintech and managed it until 2022. He achieved steady growth by executing large-scale expansions as well as significant productivity improvements. Kanagawa's management policies were crystallized in such words as "full production, full sales" and "lean organization run by well-trained employees."

In 1990 Kanagawa was promoted to president of Shin-Etsu Chemical Co., Ltd. He focused on expanding the company's businesses and simultaneously introduced the rational management that he had practiced in Shintech into Shin-Etsu Chemical. What he did in Shin-Etsu Chemical was the same as in Shintech, that is, to expand the company's businesses by timely expansion to capture rising demand based on "full production, full sales." He implemented various innovations in the company and acquired domestic and overseas companies which became all important subsidiaries of Shin-Etsu Chemical. As a result of his dedication and strong leadership, Shin-Etsu Chemical could grow from one of the medium-sized Japanese chemical company into a global leader.

Kanagawa always paid attention to safety and the environment. He put into practice environmental protection and safety first into Shintech as well as in the Shin-Etsu Group. For instance, Shintech engineers pioneered unique processes to thoroughly minimize emissions that became recognized by the EPA as the "best available control technology." In 1998 Kanagawa became chairman of the Vinyl Environmental Council of Japan. He contributed to the sustainable growth of the PVC industry and provided scientific data and correct information related to PVC to industries and society.

Kanagawa wrote several books and gave many presentations on his management. He received various management awards for his remarkable management and accomplishments. He was declared an honorary citizen of the states of Texas, Washington, and Louisiana.



### DR. CATO LAURENCIN UNIVERSITY OF CONNECTICUT

Dr. Cato Laurencin is a brilliant engineer, surgeon, and leader whose work has led to groundbreaking discoveries in plastics, nanotechnology, biomedical engineering, and surgery.

He has achieved breakthrough approaches in the use of plastics in medical devices and biologics for musculoskeletal applications. His versatile use of polymers for medical purposes has resulted in many products that improve human health.

His engineered systems for bone and ligament regeneration brought innovative technologies that are widely available. Medical devices and biologics inspired by his research have benefited millions of patients. His papers and patents started an entire industry that utilizes polymer-ceramics for various uses. His work in the creation of soft tissues with polymers was highlighted in 2014 in National Geographics "100 Discoveries That Changed the World" edition.

His achievements created entire new fields of research. His key paper in the Journal of Biomaterial Material Research in 2002 was the first to apply the principles of nanotechnology to tissue regeneration and underscore the relevance of biomaterials science. The article is one of the highest cited in materials science papers of all time.

Dr. Laurencin's work is widely recognized. He is the first scientist-surgeon to be elected to the National Academy of Sciences, the National Academy of Engineering, the National Academy of Medicine, and the National Academy of Inventors. Dr. Laurencin has also been elected to National Academies across Africa, Europe, and Asia. President Obama awarded him the National Medal of Technology and Innovation, America's highest honor for technological achievement. He was named Inventor of the Year, by the Intellectual Property Owners Education Foundation.

Dr. Laurencin is a University Professor at the University of Connecticut and CEO of The Cato T. Laurencin Institute for Regenerative Engineering.

Grounded in fundamental engineering and materials science and dedicated to improving human health, Dr. Laurencin epitomizes the use of engineering, science, and technology for the benefit of humanity.

## **WOLFGANG MEYER** PLASTICS BUSINESS CONSULTANTS, LLC



Wolfgang Meyer is a German mechanical engineer who spent much of his career in the role of president at North American subsidiaries of three German equipment manufacturers, each recognized as technology leaders in their fields.

Meyer began his career in 1970 at Bayer in Germany where he developed the polycarbonate structural foam molding process and applications. In 1975 he joined Schloemann-Siemag and moved to the U.S. to work for Beloit Corporation, Schloemann-Siemag's licensee for structural foam injection molding machine technology. In 1977 Schloemann-Siemag acquired Battenfeld Maschinenfabriken and Meyer became Sales Manager for Europe at Battenfeld headquarters. He returned to the U.S. in 1980 and advanced to president of Battenfeld of America Corporation.

Under Meyer's leadership Battenfeld became a key supplier of small injection molding machines for precision parts. Battenfeld was also well known for very large machines with automation, including the largest in North America with 9,000 tons of clamping force.

Meyer joined SIG Kautex as president in 2000 when the company faced declining demand for industrial blow molding machines and needed to refocus. He successfully introduced 3D suction blow molding for automotive air ducts. Renamed Kautex Machines, Meyer led their shift toward German industrial packaging machines and smaller shuttle machines assembled by Kautex in China. Meyer expanded the sales territory to include Mexico, Central and South America, establishing a network of sales and service staff to support new business.

W. Müller's primary business consisted of retrofitting extrusion heads on existing blow molding machines. When Meyer became president of W. Müller USA in 2010, he successfully promoted tri-layer technology for processing recycled content, enhancing the sustainability of plastics in single-use bottle applications.

As principal of Plastics Business Consultants Meyer shares his half century of plastics industry experience with companies who need help with extrusion blow molding applications and machinery. He represents blow molding machine manufacturer Bekum America in the Northeastern U.S. and is a member of the company's board of directors.

Meyer earned Engineer of the Year Award from the Society of Plastics Engineers. From 2019-2021 he served as president of the Plastics Pioneers Association which he sees as being instrumental in encouraging future generations entering the plastics industry.

Meyer resides in Tewksbury, New Jersey and has become a board member of the Tewksbury Historical Society where he oversees the society's biannual garden and barn tour fundraising events.



## **DR. CHRIS RAUWENDAAL** RAUWENDAAL EXTRUSION ENGINEERING, INC.

Dr. Chris Rauwendaal has worked in plastic extrusion for more than fifty years. In addition to inventing new technologies and processes that significantly advanced the industry, Rauwendaal has taught seminars on extrusion and related topics to thousands of people in the US and 22 other countries throughout the world. He also made significant contributions to extrusion theory.

Rauwendaal earned his post graduate degree in Mechanical Engineering at Delft University of Technology, the Netherlands, in 1973 and completed his doctorate in Mechanical Engineering at Twente University of Technology in 1988.

He became a development engineer with American Enka Company, in North Carolina, the largest rayon fiber manufacturer in the US. There he received the President's Award for development of a new patented screw design. Rauwendaal developed several patented screw designs, mixing elements, and extruder components and designed thousands of extruder screws for extrusion and injection molding.

In 1977 Rauwendaal became Manager Process Engineering in Corporate R&D with Raychem Corporation in California. He was responsible for all sheet extrusion, wire coating, tubing extrusion, blown film extrusion, and coextrusion activities. He was also internal consultant on process related problems and activities.

Rauwendaal published over 300 papers, books, video training courses, interactive training courses, and book chapters. First published in 1986, his "Polymer Extrusion" book is one of the most successful and widely used books on extrusion.

Rauwendaal is currently President of REE, Inc., where he provides design services, problem solving, process and material analysis, custom designed extrusion equipment, and training for the polymer processing industry. REE also provides expert witness services.

Rauwendaal developed a new theory that allows die designers to predict shape changes in extrusion on non-circular products. This had been a troublesome problem for die designers for decades. He also invented the patent pending super degassing screw (SDS), a major development in extrusion technology. Rauwendaal holds nine other patents and is a fellow of the Society of Plastics Engineers.

## **DR. NICK SCHOTT** UNIVERSITY OF MASSACHUSETTS LOWELL



Professor Dr. Nick R. Schott made significant contributions to the advancement of plastics technology. His pioneering teaching, research, and consultancy in plastics processes led to groundbreaking developments that revolutionized the plastic industry.

Dr. Schott played a pivotal role in educating and inspiring thousands of students, many of whom are now leaders in the field. His passion for teaching and mentorship shaped the future of the industry by cultivating a new generation of plastics engineers and scientists.

Born in Yugoslavia, Schott was a refugee in Germany from 1947 to 1952, when his family moved to the United States. He completed an AA degree in Chemistry at City College of San Francisco in 1962, finished his BS in Chemical Engineering at UC Berkeley and earned an MS and PhD at the University of Arizona.

In 1971 after working briefly in the plastics industry, Schott was hired and an instructor in Plastics Technology at Lowell Technological Institute, known today as University of Massachusetts Lowell. He taught process control and process theory courses during his 40 years on the faculty and was research advisor to more than 100 graduate students. He advanced to Full Professor and served 18 years as the UML Plastics Engineering Department Chair before retiring in 2010.

Dr. Schott helped make Lowell's Plastics Engineering Department a leader in plastics engineering education and research. His vision and solutions evolved it from a regional program to an internationally recognized program.

When Schott joined Lowell, there were no accredited Plastics Engineering Programs in the United States. He coordinated an effort to apply for accreditation and the department's undergraduate program was granted ABET "Plastics Engineering" Accreditation in 1977.

Schott helped establish an exchange program with Technische Hochschule Rosenheim in Germany and fostered exchanges with Tamagawa University in Japan. A previous exchange program with Shenkar College has been more active since UML was granted the awarding of Doctoral degrees in Plastics Engineering.

Professor Schott has been a member of the Society of Plastics Engineers (SPE) since 1971. He was named a fellow of SPE in 1986 and is a founding member of the SPE Product Design and Development Division. He has authored or co-authored numerous papers and books about Plastics Engineering. He was extremely active in many engineering organizations and is a member of AICHE, ACS and ASEE.

## **DR. GEORGE VICTOR SAMMET SR.** EXTRUSION ENGINEERING, INC.

George Victor Sammet Sr. (1880 – 1958) was a pioneer in the early days of plastics. He provided leadership and financial support to the new industry for decades. Sammet was a significant innovator and an instrumental leader in plastics, molding, and industry association.

Sammet earned an undergraduate Chemistry degree from the Massachusetts Institute of Technology and his PhD in Chemistry from the University of Leipzig in Germany.

Throughout his life, Sammet fostered intellectual collaboration and social networking. As a senior in 1900 he was a founding member and first president of MIT's Senior Chemistry Society, established to collaborate and knowledge-share between faculty, students, and business leaders.

As a Post-graduate Researcher at MIT in 1903, Sammet co-published the first Physical Chemistry education materials in the United States. At the same time, he performed Chief Bacteriologist duties for the City of Boston. Sammet began his career researching new pesticide products at Merrimac Chemical Company (later purchased by Monsanto).

In 1907, Sammet co-founded Northern Industrial Chemical Company (NIC) an oleocoloring business in Boston. The company's oleo-coloring success allowed Sammet to self-fund plastics research and molding capacity expansions. Sammet researched phenol-resins which led to his co-invention of Roxite, a plant-based compound.

Around 1918, NIC expanded its molding material capabilities to include Bakelite, Condensite, and Redmanol. Over the decades, Sammet and his employees automated and perfected many molding processes which began with hand-jack presses and 12hour bake-times.

NIC became one of the largest molders in the Northeast, making a wide range of products including automobile parts, dinnerware, and communication device housings. NIC manufactured critical military components during both World Wars. Sammet retired and sold the company in 1956.

In 1937, he established the Society of the Plastics Industry, giving the first \$100 to fund the organization during the Depression. SPI was later renamed the Plastics Industry Association.

G. Victor Sammet Sr. helped charter the Plastic Pioneers Association in 1942 to preserve the histories of people who contributed to the plastics industry.

### **KURT SWOGGER** Dow Chemical and Molecular Rebar Design, Inc.



Kurt Swogger was a key technology and business leader during his tenure at Dow Chemical from 1972 to 2008. His leadership brought high-throughput catalyst research to Dow, which then spread across the plastics industry. The ripple effect of his work continues to make a profound impact on our world today.

In 1991, Swogger became the Global R&D director for Dow's polyolefin product business when it was losing money. He quickly realized the opportunities of the new metallocene catalyst technology. He and his research team linked the technology with materials science, process technology and marketing for new product innovations. Dow trademarked this new network as INSITE® Technology, which resulted in many new families of high performance and high value polyolefin plastics, plastomers and elastomers. These have provided extraordinary benefits to human lives as well as very high commercial value to Dow.

Many of Dow's polyolefin innovations have been enabled by INSITE technology, providing populations around the world with greater access to fresh foods, safe drinking water and medicines. Reduced food waste and hygienic materials for health care have directly resulted in four times lower environmental cost in the supply chain. Swogger represented the INSITE team to receive the Medal of Technology from President George Bush in 2002.

Swogger created a new R&D and business development philosophy named Speed Base to make this breakthrough product portfolio possible. Using Speed Base, Dow was able to innovate new products up to three times faster using 40% less resources than the industrial average. Speed Base later became a study case in many major business school MBA programs. For this, Swogger was granted the highest honor bestowed to technology development management by the American Chemical Society in 2002.

After retiring from Dow in 2008, Swogger founded Molecular Rebar Design. The company developed a new form of carbon-nanotubes for plastics and rubber reinforcement and for energy storage devices. Swogger is the inventor/co-inventor of over 33 US patents and more than 130 world patents.

## WILLIAM R. CARTEAUX LEADERSHIP AWARD

The Plastics Industry Association is proud to announce the William R. Carteaux Leadership Award. Honoring the values Bill Carteaux stood for–unity, dedication, perseverance, and selflessness–this new award goes to an industry professional who has achieved distinction working for the betterment of the plastics industry.

Prospective candidates are nominated by their peers, family, or friends.

## PAST AWARD RECIPIENTS

2022, Brad Crocker

2024 PLASTICS HALL OF FAME INDUCTION CEREMONY

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## TAD MCGWIRE

The Plastics Industry Association (PLASTICS) is proud to present the 2024 William R. Carteaux Leadership Award to **Tad McGwire**, President of Industrial Heater Corporation and Immediate Past Chair of the PLASTICS Board of Directors.



Tad's dedication to the plastics industry is unwavering, one of the many reasons cited by his peers who selected him for this honor. Tad embodies the essence of this award, exhibiting the qualities of unity, dedication, perseverance and selflessness, as shown by his friend and former PLASTICS President and CEO, the late Bill Carteaux.

An active member of PLASTICS for over 40 years, Tad has served on multiple committees and boards since 2005. Tad has offered leadership through years of challenges and transition, providing unwavering dedication to the Plastics Industry Association and the entire supply chain of our industry. His willingness to share his expertise and guidance throughout his community in multiple capacities, helping youth and supporting the needs of numerous organizations, is a testament to his overall character and generosity.

The Plastics Industry Association thanks Tad McGwire and offers our greatest congratulations to his entire family.

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## HALL OF FAME MEMBERS

Throughout our history, there are countless individuals who have made important, groundbreaking contributions to the growth and strength of the plastics industry.

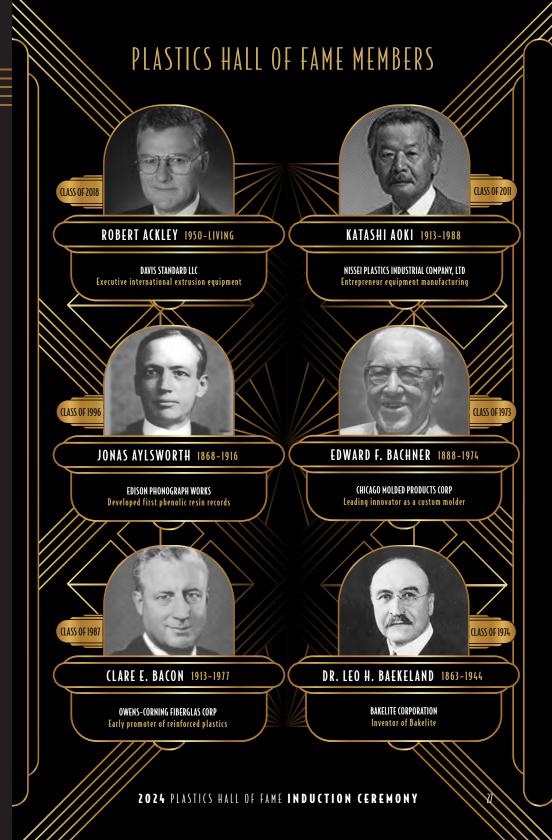
As our industry has matured to its role as a major and influential segment through innovation, technology and medical advances, it is critical we remember the dedicated work of these individuals.

Among the Plastics Hall of Fame members are a group of leaders whose contributions were so significant that without them the industry and our lives would not be where they are today.

## TROPHY HISTORY

The award trophy presented to each member of the Plastics Hall of Fame (or their surviving family) at the time of induction was designed by sculpture Gary L. Bowers. The work consists of three formed acrylic blades mounted circularly on an acrylic base to symbolize outstanding leadership in the everchanging plastics industry.

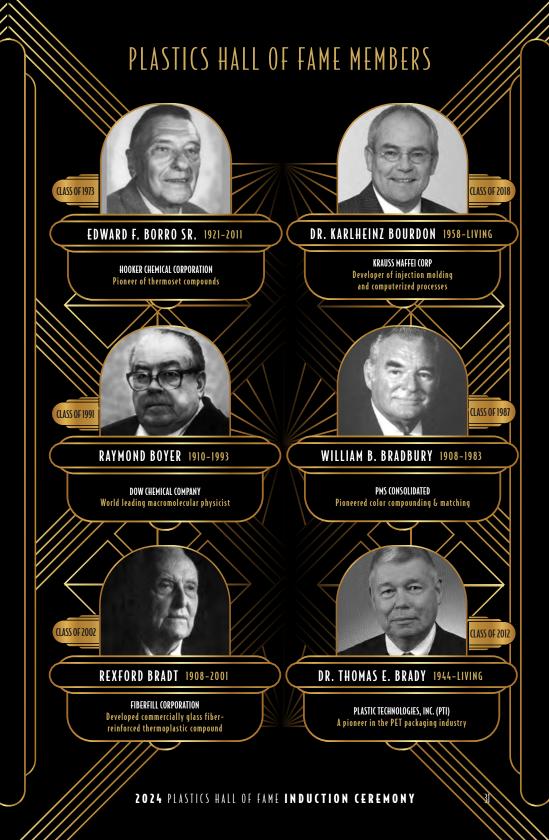
















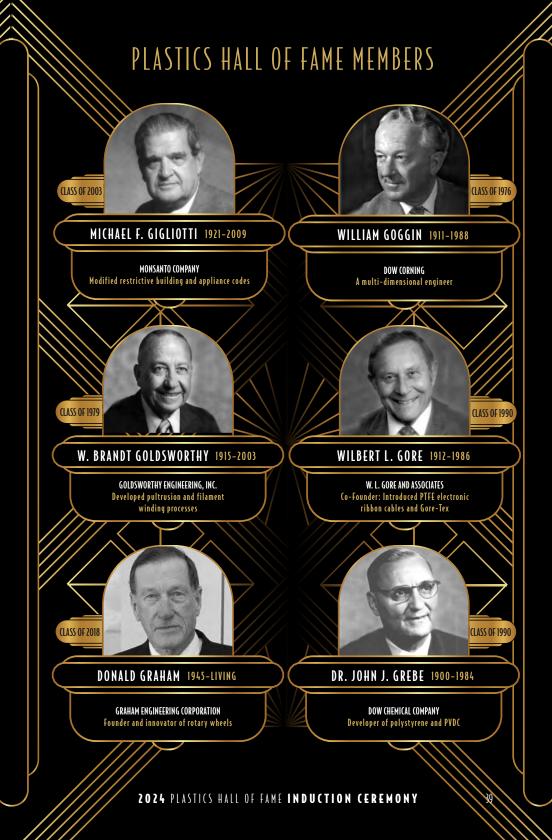




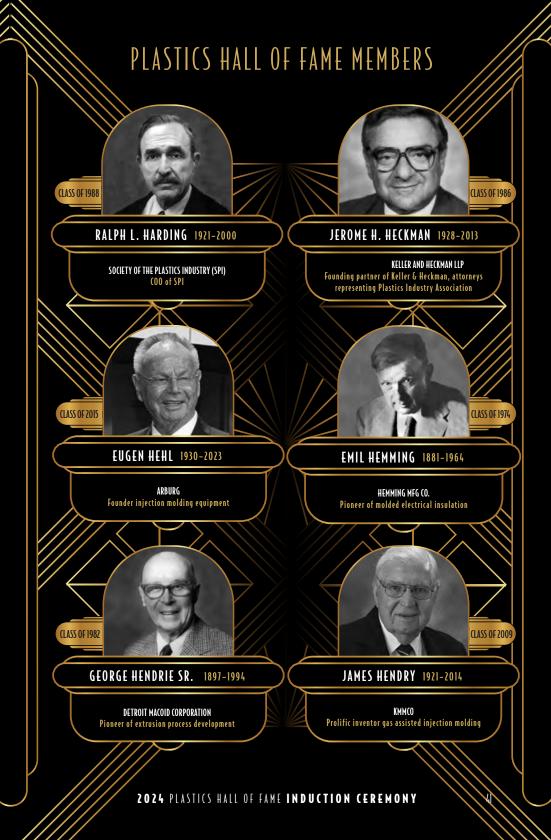




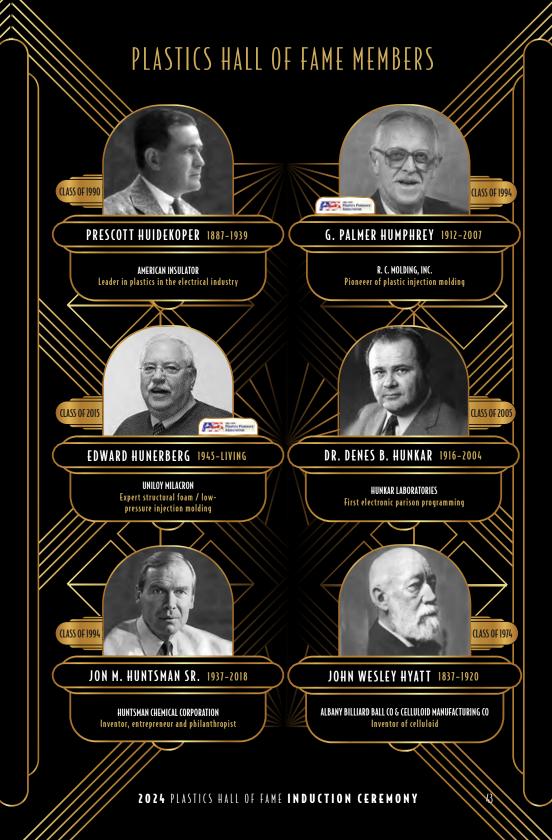








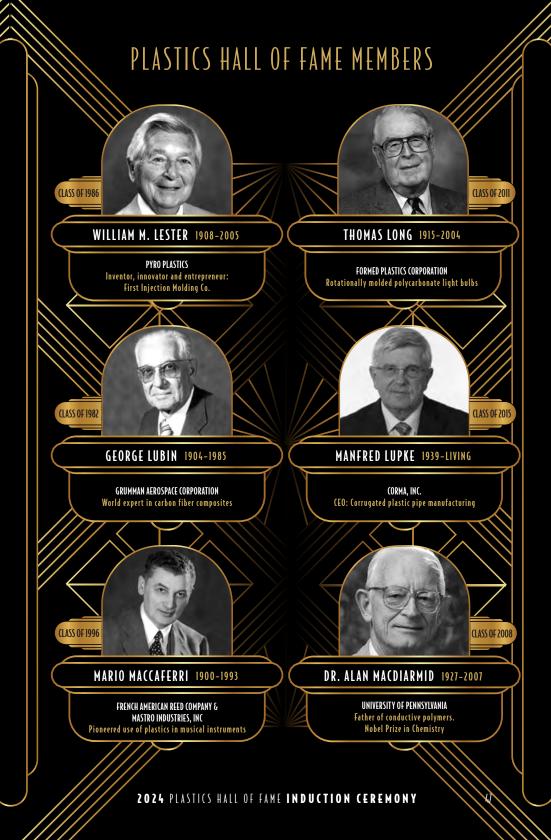








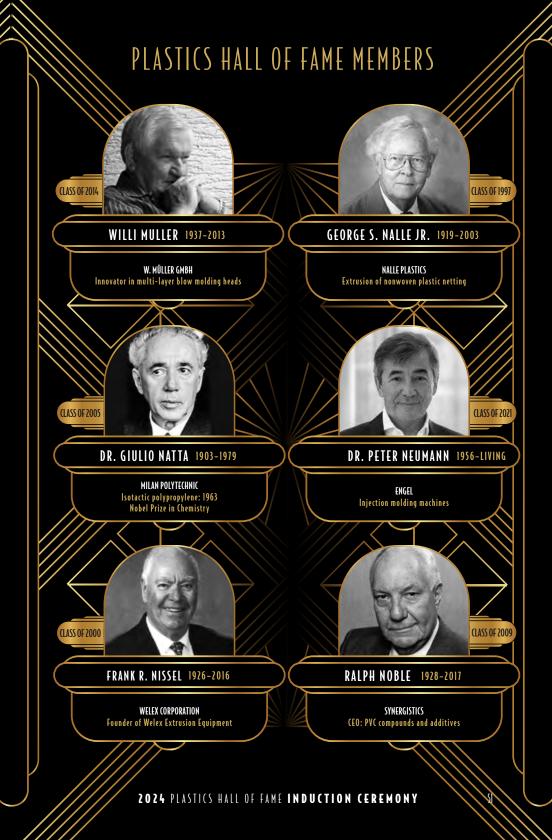












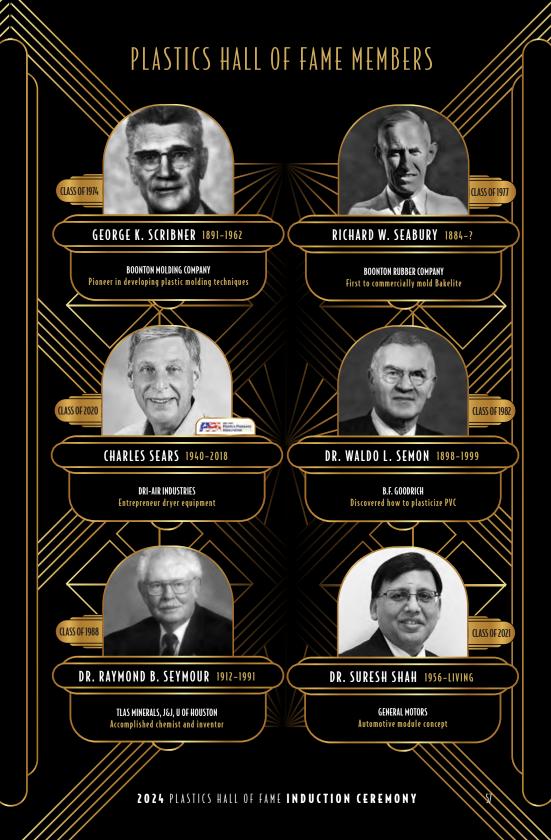




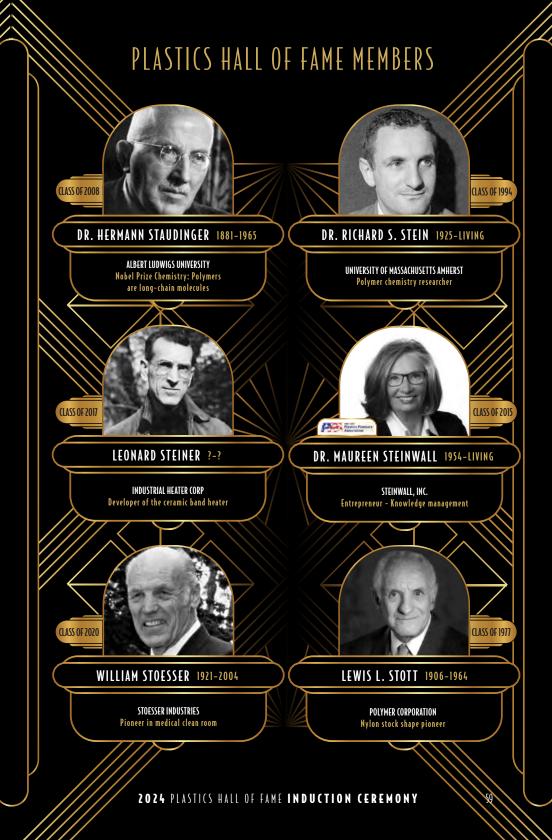




















2024 PLASTICS HALL OF FAME INDUCTION CEREMONY

# **THANK YOU!**

Thank you to our incredible sponsors for their generous support and dedication. Your contributions are invaluable in helping us achieve our goals and make a positive impact. We truly appreciate your partnership and commitment to our cause. Your belief in our mission inspires us to continue striving for excellence. Thank you for being a crucial part of our success story.

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#### PREMIER SPONSOR



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## INDUCTEE SPONSORS





















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#### **VINCE WITHERUP**

\*As of April 3, 2024

2024 PLASTICS HALL OF FAME INDUCTION CEREMONY

# NOMINATION AND VOTING PROCEDURE

Each nominee completes and submits the official nomination form at any time. The PHoF accepts nominations year-round. The nomination form includes sections that ask for educational background, employment history, plastic industry volunteering activity, publishing activity, presentations, patents, and awards. Submitting other items, such as letters of recommendation, is not required but will be accepted.

The deadline for a specific class consideration is six months before the scheduled ceremony. The nominating committee vets each nomination using a quantitative scoresheet specific to the nominee's industry segment. The segments are design, equipment, leadership, material, mold making, processor, publishing, sales, scholar, and sustainability.

The PHoF Board of Directors receive approximately 50% of the nominations as finalists for consideration. The board reviews and forwards a ballot to all living Plastics Hall of Fame members who vote.

Four months before the ceremony, the nominating committee reviews the completed ballots and locates a natural break in the votes. The goal is to induct fifteen individuals for each class.

Although most nominees are extremely qualified and worthy of membership, PHoF limits each class to provide proper attention to each inductee. Each nominee qualifies for consideration for two cycles.

In addition to the nomination process, the PHoF also inducts "industry giants." Historical pioneers, innovators, and entrepreneurs built the plastics industry. Many are recognized for their contributions as members of the Plastics Hall of Fame–however, a good number have not. The plastics industry has stood on the shoulders of these historical giants for over 100 years; we want to recognize their contributions.



Remember to silence your phone during the ceremony.

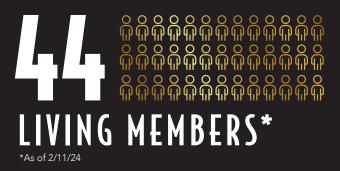




The winner will receive recognition and a nice gift at the end of our program.

2024 PLASTICS HALL OF FAME INDUCTION CEREMONY





### AVERAGE AGE AT INDUCTION RANGE FROM 49 – 192 WITH AN AVERAGE OF 81.3 YEARS



# **J** NOBEL PRIZE WINNERS IN CHEMISTRY



NATIONAL MEDAL OF SCIENCE

Members are from Austria, Canada, England, France, Germany, Italy, Japan, South Africa, Taiwan, and the USA. USA States Represented: CA, CT, DC, DE, FL, IL, IN, MD, MA, MI, MN, NJ, NY, OH, PA, TN, TX, UT, VA, WI.

The majority of the members spent their career in the material segment of the industry with equipment, processor, and scholar following in order. If you see any misstatements, errors, or omissions within this program or the website, please email msteinwall@plasticshof.org. We want our data to be a collective effort, so please assist in this journey.

#### CODE OF CONDUCT

The purpose of the Code of Conduct Policy is to protect the Plastics Hall of Fame, Inc.'s interest when members, guests, and paid or unpaid consultants/staff gather or communicate by prohibiting unprofessional behaviors. This policy is intended to supplement, but not replace, any applicable state or national laws governing behavioral issues to nonprofit and charitable corporations. This policy covers all the Plastics Hall of Fame members, guests, and all the Plastics Hall of Fame consultants and staff.

In any meeting, social gathering, or event, in person or virtual, of the Plastics Hall of Fame members, guests, consultants, or staff held under the sponsorship of the Plastics Hall of Fame, or in any the Plastics Hall of Fame document, note, writing, or other communication, there can be:

- No activity or communication which might be interpreted as harassment, abuse, assault, or bullying;
- No activity or communication which might be construed as illegal;
- No activity or communication which might be understood as discrimination; or
- No unprofessional activity, such as intoxication of any substance.

#### ANTITRUST POLICY

The purpose of the Antitrust Policy is to protect the Plastics Hall of Fame, Inc.'s interest when members, guests, and paid or unpaid consultants/staff gather or communicate by prohibiting anticompetitive behavior and unfair business practices. This policy is intended to supplement, but not replace, any applicable state or national laws governing antitrust issues to nonprofit and charitable corporations. This policy covers all the Plastics Hall of Fame members, all the Plastics Hall of Fame guests, and all the Plastics Hall of Fame consultants and staff.

Antitrust laws prohibit agreements in restraint of trade, monopolization and attempted monopolization, anticompetitive mergers and tie-in schemes, and, in some circumstances, price discrimination in the sale of commodities, products, or services.

In any meeting, social gathering, or event, in person or virtual, of the Plastics Hall of Fame members, guests, consultants, or staff held under the sponsorship of the Plastics Hall of Fame, or in any the Plastics Hall of Fame document, note, writing, or other communication, there can be:

- No discussion among members, guests, consultants, or staff, which attempts to arrive at any agreement
  regarding prices, terms or conditions of sale, distribution, volume, territories, or customers;
- No activity or communication which might be construed as an attempt to prevent any
  person or business entity from gaining access to any market or customer for goods or
  services or any business entity from obtaining services or a supply of goods;

#### AUTHORIZATION

I grant and authorize Plastics Hall of Fame, Inc. the right to take, edit, alter, copy, exhibit, publish, and make use of any and all photographs and video taken of me by a photographer hired by or associated with Plastics Hall of Fame, Inc., to be used in and/or for legally promotional materials including, but not limited to, flyers, brochures, advertisements, fundraising letters, websites, social networking sites, and other print and digital communications, without payment of any other form of consideration.

#### BOOTH **W2380**

# VISIT THE INNOVATION STAGE AT NPE

Take a journey through time with the Plastics Hall of Fame Walk of Fame at the Innovation Stage at the NPE Show! See the researchers, scholars, innovators and designers from all over the world that have created solutions that have impacted our everyday life. Enjoy the Innovation Stage speakers, too. Starting at 10 am on Monday, May 6, every hour until Friday, May 10 at Noon, we will introduce 26 speakers who will share the future of our industry. Witness the latest in electrification, Industry 4.0, thermoplastic alchemy, UV blockers, engineered thermoplastics, and other exciting topics.

STILL HAVEN'T REGISTERED FOR NPE2024? Use code **PHOF** to get free admission.



#### **NPE**2024 | May 6–10, 2024 The Plastics Show | Orlando, Florida



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