

# Charles & Ray Eames

*by Cameron Hickman*





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Inside cover, title page  
and throughout: Eames  
dot pattern, Eames Office  
  
Wire chairs, Eames  
Office, via *The World of  
Charles and Ray Eames*

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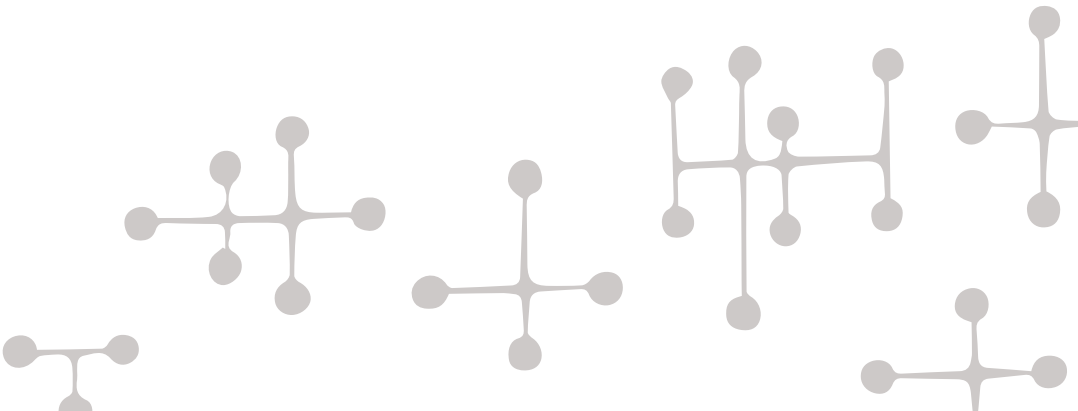
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# Principles & Style

Charles and Ray Eames were designers whose works span across many disciplines—from industrial design, architecture, and graphic design, to fine art, photography, and film. Though the individual works occupy separate spheres, they reflect not a hodgepodge of works but a unified vision and design sense. The work of this influential couple reflects not merely a style but a dedication to a set of strong principles of design.

*“What works is better than what looks good. You know, the looks good can change, but what works, works.” —Ray Eames*

Sketch for Eames room at the Detroit Institute of Art, Eames Office, via *The World of Charles and Ray Eames*

The Eameses were proponents of true design solutions: projects that emphasized practicality over physical beauty. The aesthetic appeal stemmed from the usefulness of the design. Describing what

she valued in design, Ray Eames said, “What works is better than what looks good. You know, the looks good can change, but what works, works.”

The furniture that came out of the Eames studio was designed with attention to practical use and look, but also thought as to the manufacturing, distribution, and marketing. The final product was accessible to the average consumer because it was designed to be so.

One particular feature of Eames furniture was its adaptability and modular nature. The pieces were designed to be affordable and useful in multiple contexts, including home, office, and public spaces. Furthermore, the pieces consisted of different parts in different colors that could be combined and customized even as they were mass-produced. These principles of customizable furniture were further expanded in the public sphere when the Eameses created seating arrangements for large public spaces.

The warehouse studio of Charles and Ray Eames at 901 Washington Boulevard in Venice, California was a space where anything could be created. Employees took on varied roles in order to complete a wide array of vastly different projects. Instead of outsourcing work when they were unfamiliar with a new technique, the workers of the Eames studio took it upon themselves to learn these new skills. The Eameses were crafty and creative jacks-of-all-trades.

*“[T]he most of the best for the greatest number of people for the least.”*

The Eameses belonged to a group of creatives who ultimately shifted the contemporary style to what we know as modern in the period following World War II. Their dedication to design and functionality over physical beauty is undoubtedly what has kept their designs in the public consciousness. To this day, their furniture remains in style and has permeated the American aesthetic sensibility and popular culture. For example, their aluminum airport terminal seating is still a staple of airports across the country, and their furniture can be seen in movies, television, and more to this day.

The creations of Charles and Ray Eames have touched the lives of many, but none are so iconic and recognizable as their furniture. The stars of the show are the iconic series of Eames chairs, accompanied by a series of corresponding tables as well as several storage systems.

Charles and Ray Eames







# Life

Charles Eames was born in St. Louis in 1907, the second and middle child of Adele Pauline Lambert Eames and Charles Ormond Eames. He excelled in high school: he was a track star, the football team captain, the class president, and the valedictorian. As an adolescent, he worked a series of jobs to support his family, from printmaking to hard labor (and a bit of engineering) for Laclede Steel Company. Following the death of his father, Charles discovered his father's old wet plate photo supplies and honed his skills as a photographer. After high school, he studied architecture at Washington University in St. Louis while working at the architecture firm of Trueblood and Graf. Charles excelled at the *essique*, an exercise where students were expected to solve a design problem in a short period of time. However, he did not complete the program because he was asked to leave following his continued insistence that the works of Frank Lloyd Wright be studied in the more traditional architecture program at Washington University. He married another Washington University architecture student, Catherine Dewey Woermann, had a daughter, Lucia, and opened a firm with Charles Gray to support his young family as the Great Depression hit. Following a long trip to experience the visual culture of Mexico, Charles once again went into practice as an architect, this time with Robert Walsh. His work with Walsh earned him the attention of Eliel Saarinen, a professor of architecture at Cranbrook Academy of the Arts in Michigan, where Charles went to continue his studies and found the design program.

Ray Eames was born Bearnice Alexandra Kaiser on December 15, 1912 to Alexander Kaiser and Edna May Burr. As a child, Ray was active both socially and artistically. She was a part of girls' clubs at her high school, but she was especially passionate about art club, drawing constantly and learning representational techniques. Ray was a good reader and a charming girl. From Sacramento High School, she went on to Sacramento Junior College and then to the May Friend Bennett School in upstate New York. After graduation, she moved to New York City and began to study art with painter Hans Hoffman. She studied and worked with Hoffman for six years, all the while engaging with the culture of New York City and its enclave of influential creatives. Eventually, though, she grew tired of her lifestyle and began to butt up against the creative limits of painting, so she applied to Cranbrook Academy of the Arts to audit basket-weaving courses.

Charles and Ray Eames in their case study house, Julius Schulman, via *The Work of Charles and Ray Eames*

Charles and Ray Eames, Eames Office, via *Eames Design*

Charles and Ray Eames





At Cranbrook, Ray was instead captivated by the newly formed design department and its students. Ray and Charles developed a series of shared projects and interests at Cranbrook, including Charles' Organic Design collaboration with Eero Saarinen. It was immediately evident that theirs was a creative as well as romantic partnership. By the spring of 1941, they were planning for their future in California. Charles divorced Catherine and resigned from Cranbrook. On June 20, 1941, Charles and Ray Eames married in Chicago and drove to California. They moved into the Strathmore Apartments and Charles worked for MGM as a set designer while Ray painted.



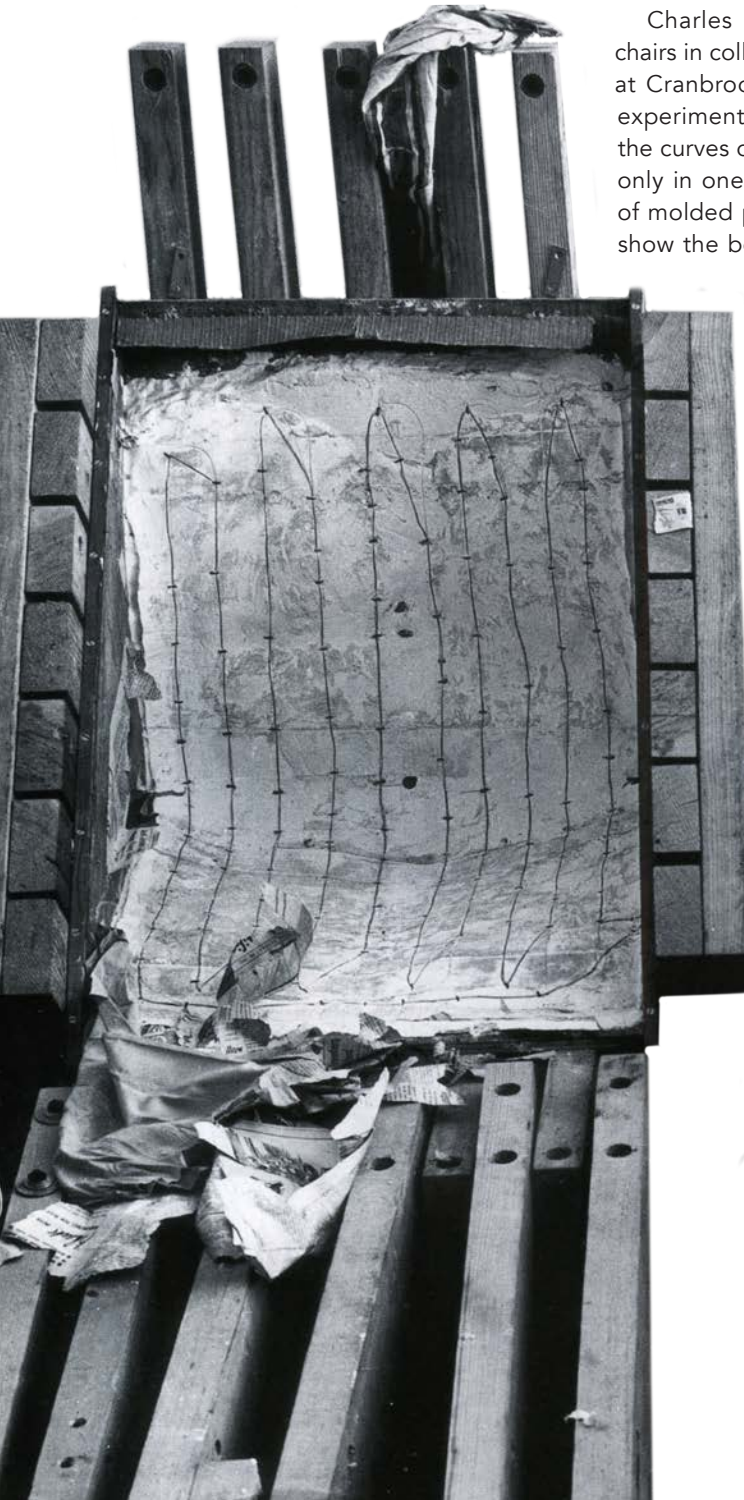
**Opposite: 1949 Eames demonstration room at the Detroit Institute of Art, Eames Studio, via *The Work of Charles and Ray Eames***

**Photocollage, Herbert Matter, via *The Work of Charles and Ray Eames*.**





# Plywood



Charles Eames began to create molded plywood chairs in collaboration with Eero Saarinen during his time at Cranbrook. Known as the Kleinhans chair, this first experiment with curved plywood was designed to fit the curves of the human body in a seated position—but only in one dimension. It featured a rectangular sheet of molded plywood that curved gracefully, exposed to show the beauty of the wood. Later, Charles and Eero entered the Organic Furniture contest by the Museum of Modern Art, which promised manufacturing and distribution for the winning designs. The pair designed the winning chair, an upholstered molded plywood armchair whose curves compounded, creating a truly organic feel. Additionally, Eames and Saarinen's case goods entry, which featured rectangular modular storage units that sat atop a bench, won as well. However, the chair was never manufactured on a large scale because of the difficulty of creating the chairs on a large scale—they would have been too expensive for the intended middle-class customers.

This failure to design with thought as to the mass production of a product prompted Charles and Eames to experiment with molding plywood in their new home at the Strathmore Apartments. They would learn to work with molded plywood before determining the look of their products. They designed a contraption, known as the “Kazam” for the magic it performed, to create the molded plywood shells they desired. The Kazam consisted of a curved plaster mold laced with electrical wires, a clamp, and a bike pump and balloon. The Eameses would place a sheet of thin wooden veneer on the machine, apply glue, and then repeat

**The “Kazam” machine,**  
Eames Office, via  
Eames Design

this process four to ten more times. Then they would clamp the Kazam shut, inflate the balloon to give a curved shape, and climb atop the power pole to siphon power to cure the wood. Through this process, they attempted to create a shell that would cocoon the seated human body with a single piece of wood, but ultimately they found they had to cut holes or slits in order to relieve the tension of the plywood.

Though they had not found success creating a single shell chair, the Eameses found a practical wartime application for the molded plywood technique they had worked so hard to develop. Charles and Ray learned from a doctor that the metal splints used to transport the wounded in the ongoing battles of World War II amplified vibrations to the wounded legs of the injured, in effect making the injuries worse, so they explored the possibility of using plywood as an alternative to metal. The Eames splint was designed to conform to the curves of a human leg. The holes on the sides served a dual purpose: to release tension inherent in the curved plywood form, and to allow doctors to thread bandages through the splint, a perfect example of how the Eameses used the constraints of materials to their advantage in their innovative design work.

In order to manufacture the splints, the Eameses partnered with Evans Products and formed the Molded Plywood Division. In addition to the wood leg splints, the Eameses made additional plywood wartime goods for Evans Products, including arm splints, body litters, airplane stabilizers, nose cones and even an airplane fuselage. This work represented the first time Charles and Ray had created a practical product that could support itself financially.



**Plywood splints and litter,** Eames Office, via  
*The World of Charles and Ray Eames*



Later, Charles and Ray found a solution to their problem of creating a form-fitting molded plywood chair with complex curves: splitting the chair into two parts, back and seat. This meant they were able to release the tension in the wood while still creating a three-dimensional, curving chair. This chair represents the best design solution, the result of years of studying the plywood material and technique. It was unveiled in 1945 to great success and critical acclaim. The chairs were available as lounge or dining chairs with wood or metal bases. The Eameses also made a round molded plywood coffee table to accompany the chairs. Here the Eameses had succeeded in creating a chair that fully embraced the strengths and limitations of its material.

These plywood pieces featured a unique Eames invention: the shock mount. Shock mounts were rubber discs that attached the molded plywood shells to the base of the chair. This made it unnecessary to drill through the thin shell pieces. The shock mount also reduced the stress placed on the chair when it was sat upon, making the chair more flexible and durable.

Suite of molded plywood furniture, Thomas Dix via *The Work of Charles and Ray Eames*

## Fiberglass

Still in pursuit of a single-shell design for a chair that would cradle the human body, the Eameses attempted to make stamped aluminum chairs with the single-shell design for a Museum of Modern Art show on affordable furniture. Their prototypes were accepted to the show; however, there were serious issues with the manufacturing of these chairs. The chairs were made with a sort of guillotine fitted with expensive male and female molds that squished sheet aluminum into the shape of the chair. However, the metal presented issues on multiple fronts: attaching the base, the cold feel of metal against skin, and the actual process of stamping the chairs. The expensive molds broke after only a few uses, rendering the chairs impractical for a show on affordable design.

In search of a practical way of manufacturing these single-shell chairs, Charles Eames turned to a recent innovation in plastic: a type of fiberglass that cured at room temperature. With the help of fiberglasser John Wills, the Eameses created the prototype for their newest chair: a single-shell armchair. The armchair represented a major success: finally the Eameses had created a chair that was extremely affordable to produce and form-fitting for comfort. The chairs adapted well to a variety of uses and environments and became popular in schools, restaurants, and public spaces in addition to the home. Originally, the chairs were offered in neutral colors that were chosen to avoid discoloration in the manufacturing process, but later the color range was expanded.

The Eameses designed further variations on the single shell fiberglass chair idea. One included "La Chaise", whose irregular, gentle curves were inspired by Gaston Lachaise's Floating Sculpture. Later, upholstered versions became available, allowing the Eames studio to reuse the discarded chair shells with imperfections. The shell chairs were eventually developed as stadium seating, placing multiple shells on a single base.

Fiberglass chairs, Thomas Dix, via *The Work of Charles and Ray Eames*





# Metal

After the fiberglass chairs, Charles and Ray Eames experimented with wire mesh, translating some of their single-shell fiberglass designs into the new material. Wire mesh has a unique set of physical properties that intrigued the Eameses. A physically strong chair could be achieved with only a small amount of volume and weight, and the interwoven nature of the wire mesh gave it a graphic and somewhat sculptural silhouette. The Eameses later applied their wire mesh technique to sofas.

Later, the Eameses pivoted away from the single shell designs that had made them famous for their affordable and accessible furniture, instead experimenting with a new material, aluminum, and a new principle, tension. The challenge that came with cast aluminum was not its constraints but its lack of constraints. There was nothing that dictated the form an aluminum chair should take, because it could be cast into any shape. Instead of creating a fully aluminum single-shell chair as they had attempted earlier, in the Aluminum Group chairs, the Eameses, alongside Alexander Girard, instead crafted aluminum frames that stretched soft upholstered to cradle the human form. The chairs had a thin profile that evoked minimalism and simplicity.

This use of an aluminum frame and soft seat was brought to a public context in the Eames Tandem Sling Seating collection. These seating arrangements were designed for public spaces, and were originally installed in the Dulles and O'Hare airports. The aluminum frame could hold two to ten vinyl seats. These seats are still widely used to this day.

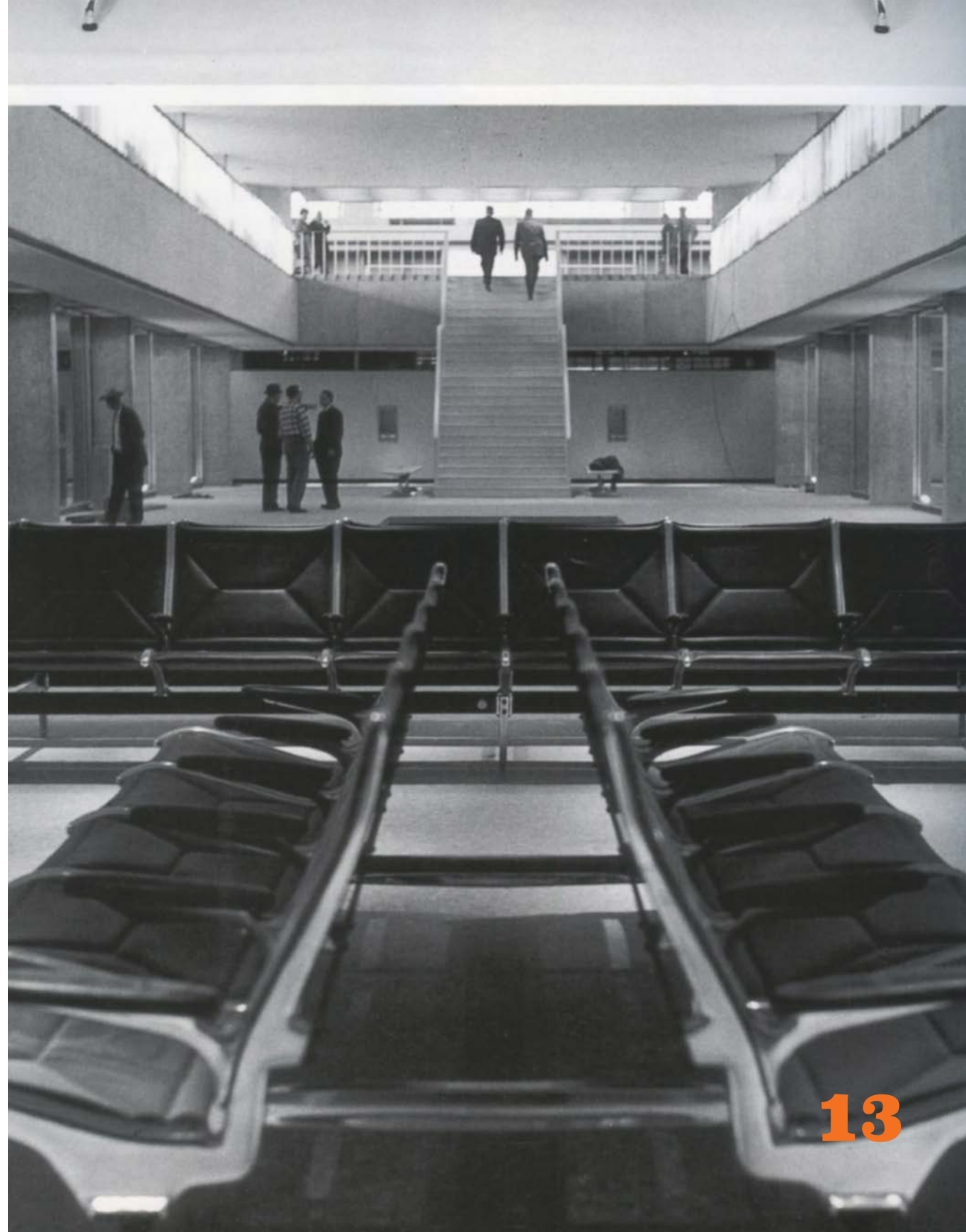
**Aluminum Group desk chair, Thomas Dix, via *The Work of Charles and Ray Eames***

**Opposite: Eames Tandem Sling Seating, Eames Office, via *Eames Design***

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Charles and Ray Eames

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# Beyond

With their legacy in creating affordable, practical furniture established, the Eameses turned their attention to a more luxurious project. Returning to their work with plywood, Charles and Ray sought to play with the concept of a luxury chair that “fit”: the cushion would fit into its shell like one hand fits into another. The designers produced a multitude of iterations in an attempt to perfectly capture a sense of “quality, comfort, luxury, and good design.” The Eames lounge chair and ottoman was manufactured in 1956 and remains a vibrant symbol of style and luxury and, indeed, one of the most iconic designs of the Eames studio.

To this day, the design work of the Eames studio remains in the popular consciousness. Eames furniture has a longstanding presence in the media and it wields a dual-edged sword: it evokes both a retro, mid-century sensibility as well as a futuristic, modern aesthetic.



Eames lounge and ottoman, Thomas Dix via *The Work of Charles and Ray Eames*

# Bibliography

Albrecht, Donald, Beatriz Colomina, Joseph Giovanni, Alan Lightman, Helene Lipstadt, Philip Morrison, and Phyllis Morrison. *The Work of Charles and Ray Eames: a Legacy of Invention*. New York: Harry N. Abrams, 2005.  
Dachs, Sandra, Laura Garcia Hintze, and Patricia de Muga, eds. *Charles and Ray Eames: Objects and Furniture Design*. Barcelona: Ediciones Poligrafa, 2007.  
Demetrios, Eames. *An Eames Primer*. New York: Universe, 2013.

Ince, Catherine, and Lotte Johnson, eds. *The World of Charles and Ray Eames*. London: Barbican, 2015.  
Neuhart, John, Ray Eames, and Marilyn Neuhart. *Eames Design: The Work of the Office of Charles and Ray Eames*. New York: Harry N. Abrams, 1989.  
“Official Site of Designers Charles and Ray Eames.” Eames Office. Accessed November 20, 2019. <https://www.eamesoffice.com/>.

# Colophon

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