



TECHNICOLOR®

GLORIOUS TECHNICOLOR: AN ILLUSTRIOUS LEGACY CORPORATE HISTORY

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The rich 90-year history of Technicolor is a vibrant legacy of visionary leadership and technological innovation in the media and entertainment industries.

The Technicolor story begins with chemist and company founder Dr. Herbert Kalmus. Born in Chelsea, Massachusetts, on November 8, 1881, Dr. Kalmus studied physics and chemistry at the Massachusetts Institute of Technology (MIT), from which he graduated in 1904. He later earned his Ph.D. from the University of Zurich in Switzerland, and then returned to the United States to hold several faculty positions at his alma mater. In 1912, Dr. Kalmus formed the firm Kalmus, Comstock & Wescott in partnership with Dr. Daniel Comstock, a college classmate at MIT, and W. Burton Wescott, a mutual friend of both men and a mechanical genius. The company functioned as an industrial research and development council, and offered consulting services related to scientific problems. One of the firm's first clients was an independent group of abrasives manufacturers who felt threatened because they could not compete with a process used by the giant Carborundum Company. Dr. Kalmus and his partners developed a similar solution to Carborundum's, but one that did not infringe on any existing patents. The firm was rewarded with additional business from the consortium, and many others soon followed. Before long, the fledgling company had earned an outstanding reputation and enviable earnings.

At the end of 1912, the three gentlemen were approached by William Coolidge, a corporate lawyer and investor from Boston, to test a new movie projector, the Vanoscope, which purported to revolutionize motion pictures by taking the flicker out of "the flickers." After an exhaustive series of tests, the firm deemed the invention to be impractical. By then, Dr. Kalmus and his associates had become intrigued with motion pictures, and the trio began work on a new type of camera, one would which could film footage in color. Dr. Comstock developed a prototype which photographed scenes in two colors, red and green, simultaneously. After viewing a short test run of the new device, Coolidge advanced the firm \$10,000 to proceed with the ongoing development and manufacture of its color camera. In November of 1915, the Technicolor Motion Picture Corporation was officially established.

The name Technicolor was selected by Kalmus and Comstock as a tribute to "Tech," their alma mater. However, it was Dr. Kalmus who conceived the word. In his search for a name for the new corporation, he noticed the word "Technique" on the cover of his 1904 MIT yearbook. The word stayed with him as he reviewed his options, and he ultimately replaced the last three letters of "technique" with "color" to come up with the Technicolor moniker.

In 1916, Kalmus, Comstock & Wescott, Inc. developed and introduced Technicolor Process Number One, a two-component additive system for film processing. Subsequently, the firm began work in Boston on its first laboratory, a railway car fully equipped with a photochemical laboratory, darkrooms, offices, a fireproof safe, a power plant, and all of the machinery necessary to develop, process, and splice film. The following year, 1917, marked the release of *The Gulf Between*, a two-color, one-reel film produced on location in Jacksonville, Florida, and starred Grace Durmond, Niles Welch, and Herbert Fortier. This film was the first production serviced in the new Technicolor laboratory, a modest venture by today's standards with weekly operating costs of \$6,000. The film was plagued by a plethora of production problems, and was within 36 hours of shutting down before Dr. Comstock and others

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resolved the development issues. *The Gulf Between* debuted before an invited audience at the historic Aeolina Hall in New York City on September 21, 1917.

Subsequent screenings of the film led to the partners' decision to abandon the additive procedure which served as the basis for Technicolor Process Number One. In 1922, Dr. Kalmus and his partners introduced Technicolor Process Number Two, a two-component subtractive system. Achieved largely under the direction of Dr. Leonard J. Troland, Technicolor Process Number Two made two separate relief images, which were welded together dyed, dried, and loaded into a specially-equipped camera. This camera was designed to allow two exposures of the same scene to be made simultaneously through a single lens. Further improvements to the process, coupled with increase financial backing, eventually led to the production of Technicolor's first two-color feature film, *The Toll of the Sea*, in 1922. Adapted from the Chinese version of *Madam Butterfly*, *The Toll of the Sea* was filmed in Hollywood under the supervision of Joseph Schenk, who supplied the director, Chester Franklin, and the star, Anna May Wong, free of charge. Originally intended to be only a two-reeler, the film was resuscitated by cameraman Ray Rennahan, who found the footage too good to cut, and instead shipped five reels of film to Technicolor's Boston lab for processing into a feature-length film. Shown in thousands of theaters across the country, *The Toll of the Sea* was a moderate commercial and critical success. More importantly, the film garnered the attention of prominent film critics and motion picture industry players, including Adolph Zuker of Famous-Players Lasky Corp., Rex Ingram, D.W. Griffith, and Douglas Fairbanks, Sr., and it firmly established Technicolor's reputation in the film industry.

In 1923, Technicolor opened its first Hollywood laboratory to more effectively service directors and studio heads there who were becoming increasingly interested in producing color films. Filmed with artificially-lit interiors, Samuel Goldwyn's 1924 production of *Cytherea* was Technicolor's first experience in photographing an interior set on a dark stage. In 1925, Dr. Kalmus grew concerned with Technicolor's needed of an endorsement from a major movie star if its technologies were ever to reach a mass audience. He and his partners believed that this star would lend stature and marquee value to the concept of color film, capture the attention of the movie-going public, and command the respect of an industry reluctant to assume the risk of producing feature-length color films. Fortunately for the company, Fairbanks' role in *The Black Pirate*, released in 1926, provided Technicolor with precisely the boost it needed. *The Black Pirate* was a hit with audiences, but drew criticisms from theater owners because their projectionists were untrained in handling the special film prints.

The last half of the Roaring Twenties was a busy time for the company. In 1926, the firm introduced the third iteration of its color film technology, Technicolor Process Number Three, a two-component subtractive imbibation process. After developing a 12-film series of short subjects entitled *Great Events*, filmmaker Nicholas Schenck suggested to Technicolor in 1928 that it produce a feature film for MGM to distribute. The result was the first Technicolor picture with synchronized music and sound effects, *The Viking*, which cost \$325,000 to create and starred Donald Crisp and Pauline Stark. MGM chief Irving Thalberg was so impressed with the production that he bought the film outright for his studio. *The Viking* was one of the last films in Hollywood to be produced without audible dialogue. Following the release of the first Technicolor all-talking, all-color picture, *On With The Show*, in 1929, Dr. Kalmus and his partners suddenly found themselves swarmed by producers wanting access to the company's production techniques, and inundated with contracts for 36 feature-length productions.

To handle all of this business, the company ramped up the completion of its main Hollywood plant, which was finished in 1930. The following year, Technicolor associate Dr. Leonard Troland received patent protection for his multi-layer single film process, called Monopack, although he originally applied for the patent a decade earlier. In 1932, the company introduced Technicolor Process Number Four, a three-component imbibation process which was developed in conjunction with the first three-component camera. The two technologies faithfully reproduced any shade or hue, indoors and out, thereby making color films truly realistic for the first time ever. Following its release of the camera and Technicolor Process Number Four, Dr. Kalmus was forced to burnish Technicolor's image, which had become somewhat tarnished, although unfairly, by a glut of poor-quality color feature films that had hit the market. Technicolor alone could not be blamed for the declining quality of the films viewed by the public. The producers themselves had very little color sense, either from the standpoint of arranging aesthetic compositions, or acquiring proper tint techniques. Essentially, few producers realized that color films could not be shot in the same fashion as black and white productions.

Therefore, to prove the viability of the three-color process in Hollywood, Dr. Kalmus sought out the cooperation of notable cartoon animators, who were reluctant to adopt the new technology. Eventually, Dr. Kalmus met with Walt Disney, who was intrigued by Technicolor Process Number Four and wanted to apply it to an animated piece of his well into production, *Flowers and Trees*. Disney had to sell the idea internally to his associates, including his skeptical sales staff and brother Roy, who was the company's chief financial officer. Upon seeing a demonstration of Technicolor Process Number Four, Chinese Theatre owner Sid Grauman guaranteed Disney booking time for *Flowers and Trees* if Disney produced it with the new process. Disney agreed, and in 1932, *Flowers and Trees* premiered at Grauman's Chinese Theatre in Hollywood as the first film produced using Technicolor Process Number Four. In total, Technicolor's print output for 1932 totaled 5.5 million feet of film, an unprecedented level of activity. *Flowers and Trees* went on to become the first Disney production to win an Academy Award. The Academy also recognized Technicolor's contribution by honoring the company with a class II (technical) award for its color cartoon process.

Hollywood's first live-action, three-color picture, *La Cucaracha*, in 1934 served as a test of Technicolor's new process under actual production conditions for the newly-formed Pioneer Pictures, preceding its foray into the realm of live-action, feature film production. *La Cucaracha* went on to win the 1934 Academy Award for best short comedy. Bolstered by Technicolor's large slate of work and *La Cucaracha*'s positive reception, Pioneer selected Thackeray's classic, *Vanity Fair*, as the first color, full-length motion picture, later renamed *Becky Sharp*. Production on *Becky Sharp* began in December of 1934, and it was immediately impacted by a series of ill-timed events ranging from the death of the original director, Lowell Sherman, to problems with the audio recording. However, the most serious problem was the tendency of the red-colored props and costumes to upstage the actors.

The new director, Rouben Mamoulian, decided to rework the color schemes with costume and set designer Robert Edmund Jones and associate art director Wiard Ihnen so the use of color would heighten the human drama rather than exist for purely decorative effect. *Becky Sharp* was completed in March of 1935 at a cost of nearly one million dollars. Although the film was lambasted in critical circles, it was hailed as a milestone in screen entertainment by the public for its rich use of color. In 1936, the company organized its Technicolor, Ltd. subsidiary in London, and then in the following year, produced its first English feature film, *Wings of the Morning*. Technicolor reached another milestone in December of 1937 when it entered the non-theatrical film field for the first time with the release of *Snow White and the Seven Dwarfs*, Disney's first full-length animated feature. Despite widespread industry skepticism regarding its potential, the film earned critical and public praise, and it ushered in a new era of sophistication in the animation field.

In 1939, Technicolor was involved with two MGM film classics with which it will always be inextricably linked: *The Wizard of Oz* and *Gone With the Wind*. For MGM, surprisingly, *The Wizard of Oz* was only its second venture into feature-length Technicolor filming, even though it was not a full-length color production; the film opened and closed in sepia. The production was hailed as a masterpiece of imaginative design. Art director Cedric Gibbons was able to invoke a total illusion of fantasy by having artists combine painted backgrounds on film with the existing sets to create a stunning collage that brought the Frank Baum classic to life. *Gone With the Wind* was the first film to take advantage of Technicolor's newer and faster film, which slashed lighting costs by fifty percent and allowed smaller, less expensive lighting units to be used. Technicolor's introduction of the three-strip negative for use in cameras had an immediate impact on the film's high production quality. The film yielded better color retention, less graininess, and sharper definition, with greater depth of focus. It also decreased production costs, and increased flexibility in cinematographers' artistic creativity. Most importantly, it dramatically lowered the scorching temperatures symptomatic of the huge carbon arc lights previously needed to illuminate. The film won an Academy Award for best picture; *The Wizard of Oz* was the other nominee.

As the company entered the 1940s, Technicolor continued to garner industry-wide recognition for its continuous innovation in film production techniques. The brand name "Technicolor" was a major draw for film audiences, and the company became a star in its own right. In short, the phrase "In Technicolor" on a theater marquee created excitement, and usually a long line of customers. In 1940, Technicolor earned a special Academy Award from the Academy of Motion Picture Arts and Sciences for the development of its three-color process. The following year, in 1941, Technicolor finally introduced Monopack, its multi-layer, single-film process which was originally developed by Dr. Troland in the 1920s. *Dive Bomber*, released in 1941, featured extensive aerial shots captured with the new,

more compact cameras, footage which otherwise would have been impractical to secure with bulky, three-color cameras. By 1944, the company had improved the Monopack technology to the point that it was used entirely for interiors on *Thunderland, Son of Ficka*, the first all-Monopack Technicolor feature. That same year, Technicolor introduced its optical printer, which enabled fades, dissolves, and special effects to be printed in color. However, much of the company's research and development was interrupted during the early years of World War II because the Air Force and Navy converted much of the Technicolor laboratory into a top-secret plant. After World War II, the company introduced Technicrome, a special-purpose product, in 1948 for photography of the Olympic Games held in England. During the decade, the company saw its film print output increase almost 250 percent, from 130 million feet in 1939, to 320 million feet in 1950. Technicolor also became widely known for its work on films featuring a stable of high-profile actors and actresses known as "Technicolor stars." Film historians generally agree that Technicolor helped take these stars to the top, and, in turn, they became the major contributing force in "selling" the Technicolor process to the vast motion picture public. These stars included Betty Grable, Rita Hayworth, Maureen O'Hara, Carmen Miranda, Esther Williams, Lucille Ball, and Lassie.

As Technicolor headed into its next decade of operation, the company once again demonstrated its commitment to technological advances by introducing a three-step photographic system in 1950 which used uncorrected incandescent illumination with substantially lower light levels. Additional state-of-the-art developments were to come. In 1953, the company designed and manufactured a contact printer with additive color for use in wide-screen processes. The following year, in 1954, Technicolor set up printers with lenses from Superscope and Panavision, to make anamorphic prints from flat negatives, and flat prints from Cinemascope negatives. The ongoing developments resulted in major business volume for Technicolor. Between 1950 and 1953, the Technicolor name appeared on the vast majority of color feature films, with over 75 in 1951, nearly 100 in 1952, and over 125 in 1953. In 1954, Technicolor commemorated the manufacturing milestone of four billion feet of 35mm color motion picture release prints. That same year, Technicolor cameras were used for the last time on an American-made film, Universal's *Foxfire*, starring Jane Russell and Jeff Chandler. In 1955, the company introduced Technicolor Process Number Five, a method of achieving improved definition of imbibitions prints.

Later that year, it launched its Technicolor Italiana operation in Rome to service the growing filmmaking community there, and introduced Technicolor-Technirama, a multi-purpose photography and print system which provided flexibility in the preparation of negatives and a wide choice of high-quality color release prints suited to large screen exhibitions. The subsequent two years, 1956 through 1957, marked the development of the wet printing process, used to make high-quality reduced grain, dirt-free prints from 35mm and 16mm color-reversal films. The first full-feature, wet-printed film was *Pal Joey*, released in 1957.

The next decade proved to be an eventful one for Technicolor. In 1960, the company introduced Super Technirama 70, another heralded wide-screen development, and its founder, Dr. Kalmus, finally retired after 45 years of managing the growing operation. In 1961, Technicolor made Cinemiracle extractions from Camera 65 and Technirama. This technology was utilized on location shots for *How the West Was Won*, which was filmed in 65mm, and then converted to Cinerama for completion with the three-camera studio cinematography. In 1963, the company introduced Techniscope, as well as a new system for printing 35mm negatives in 70mm release prints for road show potential. Later that year, on July 11, Dr. Kalmus passed away at the age 81, but not before being honored as one of the few non-performers with a star on Hollywood Boulevard's world-renowned "Walk of Fame." Between 1963 and 1964, Technicolor built optical printers for making 70mm "rectified" prints from 65mm Ultra-Panavision negatives for Cinerama to be shown on a curved screen. The first pictures to hit the market with this process were *It's a Mad, Mad, Mad, Mad World* and *The Greatest Story Ever Told*. In 1964, Technicolor developed an improved method for traveling matte photography and processing, which enabled background scenes to be photographed abroad, with the action subsequently performed in Hollywood before a blue screen. In 1965, the Technicolor television film processing plant opened in Universal City. From 1965 to 1970, Technicolor designed and installed a triple-rank manufacturing system to produce super-8mm Technicolor dye transfer prints. In 1968, Technicolor was awarded the prime contract for all photographic work at the Air Force Eastern Test Range, the United States Air Force, and NASA at Cape Kennedy in Florida. The following year, in 1969, marked the development of a Pan-Scan printer for producing television aspect prints from anamorphic negatives, with effective overlay titles in one pass through the printer. In June of 1969, Technicolor cameras recorded the departure and early flight of Saturn V as it carried three astronauts to man's first landing on the moon, and Technicolor, Ltd. in London produced the first television spot commercial ever to be broadcast in Great Britain.

In 1972, Technicolor introduced Full-Vue color prints for the consumer market, while the years 1974 and 1975 heralded the installation and utilization of a process control computer for answer print scene-to-scene timing and conversion of light prints. In 1975, Technicolor closed a long chapter in its history when it produced its last domestic film in the three-strip process, a reprint order of Walt Disney's *Swiss Family Robinson*. The company subsequently shuttered its dye transfer plant in Hollywood after selling the equipment to Beijing Film and Video Lab in China, and then opened a new film processing facility in Universal City, California. The following year, in 1976, the company developed and engineered a new, high-speed continuous contact printing system. Its graphic service subsidiary also secured a long-term contract with the Department of the Interior to deliver technical services to the Earth Resources Observation Systems in Sioux Falls, South Dakota, bringing the company's government contract total in the U.S. and abroad to six. In 1977, Technicolor sold its Landmark Technicolor plant in Hollywood to Television Center Studios and then opened executive offices in Century City adjacent to Twentieth Century Fox.

The decade of the 1980s saw Technicolor turn its attention to another, but growing, component of the film industry. In 1981, Technicolor entered the video duplication industry in California, just as the market for home entertainment began to crystallize. Two years later, MacAndrews & Forbes acquired Technicolor, only to sell it to Carlton Communications, PLC, a U.K. corporation, just five years later in 1988. Following the acquisition, the company acquired CBS/Fox Video's duplication facility in London, and then assumed control of its high-speed video duplication facilities in the United States and the Netherlands in 1989.

Responding to increasing market demand for high-quality digital products, Technicolor began its foray into CD and DVD manufacturing in the 1990s. In 1993, the company expanded its duplication facility in Camarillo, California, and then created a state-of-the-art optical manufacturing plant there the following year to begin CD manufacturing. In 1995, Technicolor celebrated its 80th anniversary. In 1997, the company began manufacturing DVDs, and then merged in 1998 with Nimbus CD International to become the world's largest independent manufacturer of DVDs, as well as the leading supplier of all optical disc formats. Technicolor also opened a video duplication facility in Denmark, and acquired Central de Video, one of Mexico's leading videocassette duplicators, to further expand its worldwide home entertainment services operation. In 1999, Technicolor enhanced the film rejuvenation process and announced DVD-18 replication capabilities. The company also launched a strategic initiative to explore integrating digital imaging technology into the company's global business by unveiling its Technicolor Digital Cinema operating unit.

Already the world's largest independent DVD replicator and the largest film processor by 2000, Technicolor started to grow in new directions. In 2000, Technicolor and Texas Instruments jointly showcased digital cinema technology for the first time in New York City, and in 2001, Technicolor Digital Cinema created a program to provide, install, and maintain the first 1,000 digital cinema systems at select theaters across the United States. Later that year, Technicolor increased its lab capacity by acquiring Hollywood-based Consolidated Film Industries (CFI), which specialized in large formats and preservation and restoration services.

The most significant event for the company in the new millennium occurred in December of 2001, when Thomson Multimedia of France completed its acquisition of Technicolor for \$2.1 billion. Shortly thereafter, in 2002, Technicolor opened its facility in Mirabel, Quebec, Canada, the largest and most advanced film production operation in the world. Funded by its new parent company, Thomson, Technicolor continued to expand its offerings and geographical presence by acquiring some of the premier postproduction houses in the world and providing sound services, special effects, and digital postproduction services to clients. The company also launched an end-to-end media asset management service for managing and digitally archiving entertainment content.

By the beginning of 2004, Technicolor had 11 film labs and more than twice as many postproduction houses worldwide as its nearest competitor. It had also extended its integrated high-definition digital dailies service for filmmakers by providing digital playback capabilities. By providing worldwide access to dailies, Technicolor is now able to support global productions through its proprietary high-bandwidth production network, which enables executives in Hollywood to view dailies from Europe almost instantly. Later in 2004, Technicolor significantly enhanced its DVD capabilities, and completed the expansion of the world's largest DVD manufacturing facility in Guadalajara, Mexico. The additional capabilities have given the company the global capacity to produce more than 1.5 billion DVDs each year. Last year, Technicolor expanded its distribution facility in Memphis, making it the largest distribution center for packaged media in the world. Today, Technicolor has 19 DVD manufacturing and distribution locations worldwide across three continents.

In 2005, Technicolor launched its Electronic Distribution Services division, dedicated to providing digital cinema services and securely managed distribution of digital entertainment content to the home, theaters, and mobile devices. Technicolor Digital Cinema, an operating entity within Electronic Distribution Services, unveiled SkyArc™, the world's largest digital distribution network for cinema advertising. In the spring, the company also introduced its Technicolor Network Services division, which provides channel origination and broadcast playout services to the media and entertainment industries. The new division then expanded its global reach and infrastructure via a strategic alliance with SingTel, one of Asia's leading telecommunications companies; the acquisition of PRN Corporation, the world's leading television network at retail; and the acquisition of Convergent Media Systems Corporation, a leading provider of high-impact video and media-rich communications for digital signage, distance learning, and corporate communications enterprise applications.

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