EINDHOVEN, Netherlands - It was Aug. 17, 1982, and row upon row of palm-sized plates with a rainbow sheen began rolling off an assembly line near Hanover, Germany.

An engineering marvel at the time, today they are instantly recognizable as Compact Discs, a product that turns 25 years old on Friday — and whose future is increasingly in doubt in an age of iPods and digital downloads.

Those first CDs contained Richard Strauss' Alpine Symphony and would sound equally sharp if played today, says Holland's Royal Philips Electronics NV, which jointly developed the CD with Sony Corp. of Japan.

The recording industry thrived in the 1990s as music fans replaced their aging cassettes and vinyl LPs with compact discs, eventually making CDs the most popular album format. The CD still accounts for the majority of the music industry's recording revenues, but its sales have been in a freefall since peaking early this decade, in part due to the rise of online file-sharing, but also as consumers spend more of their leisure dollars on other entertainment purchases, such as DVDs and video games.

As the music labels slash wholesale prices and experiment with extras to revive the now-aging format, it's hard to imagine there was ever a day without CDs.

Yet it had been a risky technical endeavor to attempt to bring digital audio to the masses, said Pieter Kramer, the head of the optical research group at Philips' labs in the Netherlands in the 1970s.

"When we started there was nothing in place," he told The Associated Press at Philips' corporate museum in Eindhoven. The proposed semiconductor chips needed for CD players were to be the most advanced ever used in a consumer product. And the lasers were still on the drawing board when the companies teamed up in 1979.

In 1980, researchers published what became known as the "Red Book" containing the original CD standards, as well as specifying which patents were held by Philips and Sony.
Philips had developed the bulk of the disc and laser technology, while Sony contributed the digital encoding that allowed for smooth, error-free playback. Philips still licenses out the Red Book and its later incarnations, notably for the CD-ROM for storing computer software and other data.

The CD's design drew inspiration from vinyl records: Like the grooves on a record, CDs are engraved with a spiral of tiny pits that are scanned by a laser — the equivalent of a record player's needle. The reflected light is encoded into millions of 0s and 1s: a digital file.

Because the pits are covered with plastic and the laser's light doesn't wear them down, the CD never loses sound quality.

Legends abound about how the size of the CD was chosen: Some said it matched a Dutch beer coaster; others believe a famous conductor or Sony executive wanted it just long enough for Beethoven's 9th Symphony.

Kramer said the decision evolved from "long conversations around the table" about which play length made the most sense.

The jump into mass production in Germany was a milestone for the CD, and by 1982 the companies announced their product was ready for market. Both began selling players that fall, though the machines only hit U.S. markets the following spring.

Sony sold the first player in Japan on Oct. 1, with the CBS label supplying Billy Joel's "52nd Street" as its first album.

The CD was a massive hit. Sony sold more players, especially once its "Discman" series was introduced in 1984. But Philips benefited from CD sales, too, thanks to its ownership of Polygram, now part of Vivendi SA's Universal Music Group.

The CD player helped Philips maintain its position as Europe's largest maker of consumer electronics until it was eclipsed by Nokia Corp. in the late 1990s. Licensing royalties sustained the company through bad times.

"The CD was in itself an easy product to market," said Philips' current marketing chief for consumer electronics, Lucas Covers. It wasn't just the sound quality — discs looked like jewelry in comparison to LPs.

By 1986, CD players were outselling record players, and by 1988 CDs outsold records.

"It was a massive turnaround for the whole market," Covers said.

Now, the CD may be seeing the end of its days.

CD sales have fallen sharply to 553 million sold in the United States last year, a 22 percent drop from its 2001 peak of 712 million, according to Nielsen SoundScan.

Napster and later Kazaa and BitTorrent allowed music fans to easily share songs over the Internet, often illegally. More recently, Apple Inc. and other companies began selling legal music downloads, turning the MP3 and other digital audio formats into the medium of choice for many owners of Apple's iPods and other digital players.

"The MP3 and all the little things that the boys and girls have in their pockets ... can replace it, absolutely," said Kramer, the retired engineer.

CDs won't disappear overnight, but its years may be numbered.
Record labels seeking to revive the format have experimented with hybrid CD-DVD combos and packages of traditional CDs with separate DVDs that carry video and multimedia offerings playable on computers.

The efforts have been mixed at best, with some attempts, such as the DualDisc that debuted in 2004, not finding lasting success in the marketplace.

Kramer said it has been satisfying to witness the CD’s long run at the top and know he had a small hand in its creation.

"You never know how long a standard will last," he said. "But it was a solid, good standard and still is."

Associated Press Business Writer Alex Veiga contributed to this report from Los Angeles.