

IQ Structures Fuses Sound and Vision

Vinyl records have experienced a resurgence in popularity in recent years, fuelled by a renewed appreciation of analogue sound quality and tangible music experiences. Amidst this resurgence, IQ Structures has unveiled an innovation in vinyl record production: IQ Vinyl.

Decorating the surface of a vinyl record has long been a way for record companies to announce a special re-issue or limited edition. Think of Pink Floyd's 'The Dark Side of the Moon' reissue on solid blue vinyl or the 50th anniversary edition of The Beatles' seminal album 'Sgt Pepper's Lonely Hearts Club Band' – released on red and black swirl vinyl.

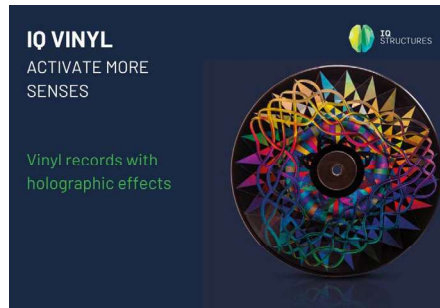
But now, IQ Structures is taking the concept to the next level. At the core of IQ Vinyl lies the process of holographic embossing, a technique that presses holographic nanostructures directly onto the surface of vinyl records. Unlike traditional methods for decorating vinyl records, which rely on labels or surface coatings, holographic embossing creates holographic images that appear to move, morph and float above the record as it spins on the turntable.

The vinyl holographic embossing process begins with the creation of a master, designed to encode the desired holographic image or pattern. This master serves as the template for embossing the holographic nanostructures onto the vinyl surface. Using precision machinery, the master template is replicated onto a stamping tool, which is then used to imprint the holographic patterns onto the vinyl substrate.

Maintaining sound quality

Several elements of the process for creating a vinyl record are very similar to holographic embossing, albeit at a much lower spatial frequency. The process starts with mastering the audio and transferring it onto a lacquer disc. A cutting lathe engraves the audio onto the lacquer, creating a master copy of the music with grooves that represent the audio waveform.

The lacquer master is then used to create a metal stamper. The stamper is made by electroplating the lacquer with a thin layer of metal, usually nickel. This creates a negative image of the grooves, which will be used to press the records. Vinyl (full name polyvinyl chloride) pellets are heated and melted to form a slab of vinyl which is pressed between two metal stampers, applying heat and pressure to deform the surface, causing the vinyl to flow and fill the grooves of the stampers, creating a replica of the music in the vinyl.



IQ Vinyl (© IQ Structures).

One of the primary concerns with introducing holographic elements onto vinyl records is the potential impact on sound quality. Putting it bluntly, won't the holographic embossing simply destroy or degrade the music grooves? IQ Structures has addressed this challenge through extensive research and development, ensuring that IQ Vinyl maintains the highest standards of sound fidelity.

Central to this part of the process is the precise control of the holographic embossing. By carefully optimising the depth and density of the holographic nanostructures, IQ Structures minimises any deterioration of the grooves that encode the audio signal. This ensures that IQ Vinyl delivers clear, distortion-free sound reproduction.

Durability

Another critical aspect of IQ Vinyl is its durability and longevity. Despite the addition of holographic elements, IQ Vinyl is engineered to withstand the rigours of repeated playback without degradation. Through advanced materials science and manufacturing techniques, IQ Structures has developed a vinyl substrate that is both robust and resilient, ensuring that the holographic patterns retain their clarity over time.

Petr Franc, CEO of IQ Structures, reflected on the potential of IQ Vinyl: 'while our expertise lies in security solutions, the applications of our technology transcend traditional boundaries. IQ Vinyl represents a fusion of craftsmanship and innovation – a marriage of sonic excellence and visual artistry. It is an invitation for artists and listeners alike to explore new frontiers in the world of vinyl records'.

Gietz Invests in Vinfoil

Supplier of hot-stamping machinery, Gietz, has announced it has invested strategic venture capital in the Netherlands-based Vinfoil in order to strengthen the long-term stability of the company and its product portfolio.

Vinfoil is a small family-run business specialising in the development and manufacture of cold transfer printing equipment. The investment is designed to maximise Vinfoil's innovative strength and competitiveness to ensure sustainable and robust success, both in the current market landscape and for future challenges.

According to the companies, the financial support from Gietz will not only secure Vinfoil's immediate capital base but will also serve as a catalyst for accelerated development, which is crucial to gaining a clear competitive advantage in a dynamic and ever-changing market environment, and to strengthen the position of Vinfoil as a pioneer in the industry.

In 2021, the two companies joined forces to create Gietz-Vinfoil Americas to bring cold transfer and hot foil technologies to the North American market. The deal has allowed the companies to offer US customers a complete range of foil solutions.

