

E2IP TECHNOLOGIES

From Ideation to Fabrication

ABOUT E2IP

e₂ip technologies specializes in Human Machine Interface (HMI) Solutions and Printed Electronics technologies. Our vision is to simplify how we interact with our environment by transforming the surfaces we touch in our everyday lives. Our mission is to create new possibilities in printed electronics through advanced material science. We carry out scientific research to create new materials and processes and work at the intersection point of electronics and material surfaces.

From manufacturers that leverage technology, to technology innovation leaders, we carry out more than 30 years of experience and have world class manufacturing capabilities.



TURN-KEY PRODUCT DEVELOPMENT AND MANUFACTURING



427 employees



5 certifications



EES – ENGINEERED ELECTROMAGNETIC SURFACES

EES CREATES OPPORTUNITIES FOR NEW MARKET APPLICATIONS.

WHAT IS EES

Engineered Electromagnetic Surfaces (EES) are thin, semi-transparent structures that offer uncommon electromagnetic properties capable of re-shaping electromagnetic propagation. This technology is capable of manipulating (reflect, diffuse, reflect at a certain angle, etc.) radiofrequency waves without the need for small cell antennas or a source of energy. EES technology improves the environment (surfaces) with which the RF signals interact.

Whilst the concept of EES is not new, the idea of developing printed versions using printed electronics technology and employing them as telecommunication products is relatively new. By manipulating the 28Ghz signals in a desired way, the coverage of mm-waves can be extended to zones that were previously dead. In the 5-6 Ghz (Wi-Fi) range, the printed EES can be used to selectively block the unwanted signals, thus reducing the interference and enhancing the security of the network.

e₂ip is creating a self-contained ecosystem, which includes strong IP, technology partnership with the National Research Council Canada (NRC), design and manufacturing facilities that supports our strategy.

BENEFITS

Low-cost technology compared to building a new cell tower for wireless transmissions

Easy to deploy as can be placed directly onto walls, buildings; indoors or outdoors

No source of energy required to reflect the radio waves and improve coverage, providing an environmentally friendlier solution

APPLICATIONS

5G, which offers faster connections, more reliability, and greater capacity at lower costs, will enable the development of Smart Cities to better connect infrastructure, devices, and people.

5G is the next advancement in broadband wireless connectivity. It provides **100 times faster data speeds** than 4G while supporting low-latency applications and making it possible for multiple devices to **be highly responsive, and better connected simultaneously**.

However, providing necessary infrastructure for 5G, specifically the millimeter wave (mm-wave) spectrum, is a huge challenge for 5G infrastructure providers. While mm-waves can provide ultra-high-speed data transfers, the signal distance is much shorter and is highly susceptible to propagation loss, thus significantly increasing the required number of antennas to provide better coverage.

The EES technology developed by e₂ip can streamline and improve indoor and outdoor wireless access within a 5G network. Depending on the design of the surface, i.e. the configuration of the elements, EES can act as a band-stop, band-pass structure; reflect signals at varying angles, or act as a diffusing or as a focusing instrument. These properties of EES can then be used to mitigate against Wi-Fi interference at the 5GHz band or enhance the propagation of mm Wave signals.

The printed ESS has been successfully demonstrated in both indoor and outdoor applications and could be installed on surfaces such as **billboards, windows, walls, paintings** etc. and it neither requires a back-haul system nor emits RF energy, thus providing a more efficient solution to enhance the mm-waves coverage.

Technical Demonstration

