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Our Evolving Relationship with Plastic

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We have a complex relationship with plastic. Plastic has long been viewed as a 'wonder material' due to its useful durability, moldability, and low cost. The commercialisation of plastic products began in the early 1900s with the invention of Polyoxybenzylmethylenglycolanhydride which will be known by many as Bakelite. The method of making Bakelite was patented in the USA in 1909 (US 942699). Since Bakelite's humble beginnings, plastic has found its way into almost every aspect of modern lives. For example, it is likely that you are reading this article on a device that includes at least some plastic components.

The very advantages provided by plastic also make it problematic as it is able to persist in the environment for hundreds of years. A report published by the United Nations Environment Programme in 2021 estimated that 8.2 billion tonnes of plastic has been produced between the material's inception and 2018. Around 7.2 billion tonnes of this material is estimated to remain in existence with only around 8.5% of total plastic production (about 700 million tonnes) having been recycled into other useful forms. Public awareness of the environmental damage that can be caused by persistent plastic waste is at an all-time high and there is a consensus that a solution must be found. However, the exact form of this solution is the subject of some debate.

One perspective is that the best solution to plastic waste is to stop using plastic altogether. The challenge with this solution is that plastic is now used in in all manner of applications including consumer goods, medical applications, vehicles, packaging, and more. Removal of plastic from these applications requires a replacement material with many, if not all, of the same beneficial properties but none of the disadvantages.

SGMA is one company with big plans to replace plastic waste in this way. SGMA have developed a material technology platform using silica to enable replacement or elimination of plastic and perfluoroalkyl and polyfluoroalkyl substances (PFAS) in products such as packaging and single use consumables. SGMA's silica sol gel technology allows waterproof and/or oilproof coatings and barriers to be formed in products such as food packaging that would typically include a plastic barrier to prevent water or grease from passing through the packaging. SGMA are seeking patent protection for their technology and more information is available in the publications of their patent applications.

Other companies are focussing on alternative replacements for plastics such as plant-based materials and biodegradable composites. Many patent applications have been published in this field in recent years with a few examples including US2022033542 which uses sugar cane and CN113185848 which utilises rice, straw, starch, bamboo, and seaweed as the raw materials for forming polymeric and plastic-like substances. These materials are chemically similar to fossil-fuel derived plastics and instead use sustainable feedstock sources to improve the environmental impact of the supply chain whilst also including degradation promotors and accelerators as part of the material to dramatically reduce the lifespan of the material if it is released to the environment.

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The capability to produce plastics from renewable feedstocks with biodegradable properties is part of a growing desire to live alongside plastic by changing our perspective and relationship with plastic consumption. Some companies aim to increase the ease with which established plastics are recycled. One example is **Ecoflexibles**, who have developed an alternative packaging film using common plastics that is more easily and effectively recycled. **Patent applications** for this technology are currently pending in a number of countries with the UK IPO recently granting a patent following use of the "Green Channel" to accelerate prosecution of the application due to the environmental benefit of the invention. (For more information on the "Green Channel" and other schemes to accelerate prosecution of environmentally beneficial technology see Lucy O'Brien's article **here**.)

Other companies such as London-based start-up Tangible Technology are seeking to address the issue of existing and future plastic waste by using plastic that cannot otherwise be recycled to replace even more environmentally damaging materials in sectors such as the construction industry.

Whether companies seek to replace or reduce plastics, improve plastics, or find ways to better reuse or recycle plastics, technology in this area is advancing at a rapid pace. Intellectual property filings in the area are also increasing year-on-year as inventors seek to protect the most effective commercial solutions to a problem that impacts us all.

The attorneys in AA Thornton's Clean Tech group are proud to support technologies in this area. We are enthusiastic in ensuring that exciting developments in this sector are protected so that they can secure the funding and recognition that they need to succeed. If you are interested in discussing any aspect of plastics or plastic replacement technologies with an IP professional then we would be happy to hear from you.