Sustainable materials: Let’s talk about waste!
24th February 2021

Insights from our ‘Sustainable Production Innovation Network’ (SPIN) series of events.

Benefits of post-industrial waste

There are currently 37.2 billion tonnes of waste produced each year in the UK alone. Waste produced by commercial and industrial activity (also known as post-industrial waste) accounts for 18% of all waste produced (source).

Post-industrial waste is, in general, of higher quality than consumer waste. It is consistent, quality controlled and traceable. All these factors make it a prime candidate for reuse and reprocessing into new materials, and this presents unique business opportunities.

Supporting sustainable systems

Plastic has had bad press over the past few years. But Sally Beken, Head of the Circular Plastics Network at the KTN, explains that plastic is highly versatile, lightweight and cheap to produce, and the real issue is how its sourced and treated at the end of its life.

Currently, 98% of plastics come from non-recycled sources and just 14% are collected for recycling at the end of their life, with the remainder ending up in landfill, leaking into the environment or incinerated. There are many opportunities for innovation to tackle these problems, for example:

- Designing packaging made of a single plastic type (known as mono materials) to increase ease of recycling.
- Using new joining techniques that allow for easy plastics separation.
- Developing new ‘super’ polymers, that can be recycled multiple times without degrading.
- Changing behaviour by reducing single-use plastic, coupled with increased reuse and recycling.
- Using sustainable sources in manufacture, such as hydrocarbons derived from recaptured greenhouse gases.
- Implementing digital technologies, such as AI, in recycling plants to improve identification and segregation of different plastic types.

Sally points out that if we were to remove plastics altogether and substitute them for traditional materials such as glass or metal, they would generate 61% more greenhouse gas emissions, due to intensive production methods and energy consumption in transporting these heavier materials. Therefore, plastic should be valued as an important material, and tackling plastic waste as part of a sustainable system is in the interest of both businesses and consumers.

Trash to treasure

Jake Solomon, Managing Director at Lunts Castings, described how his company, a bronze foundry in Birmingham, seized the opportunity to create a high-value product out of industrial waste streams.

Back in 2017, they started making terrazzo, a timber-based material for flooring and wall coverings, using a mixture of waste material from the joinery industry (in the form of wood shavings) and waste from their own foundry.
Initial uptake by market innovators has demonstrated its viability and laid the groundwork for wider market acceptance. Jake explains that good communication is vital when convincing the wider market of the terrazzo’s quality and performance. For example, words like “waste” can be misleading and imply an inferior product. Communicating their company journey and the origins of their materials is very important.

One component of this is traceability. Naturally, the material from their own foundry can be easily traced, but the wood shavings also come with full documentation regarding their provenance and origin. With chemical analysis, Jake and the team have been able to understand the properties of both materials, as well as how they interact with each other and with binding agents. Furthermore, extensive stress and heat testing has provided detailed information on the performance and quality of the finished material.

“Understanding the material has allowed us to grow from where the business started in 2017,” Jake says. “We are just now starting to have the full suite of information around the waste streams we are looking at.”

The next step is to establish consistent supply chains and robust production methods before scaling up further. Their aim is to become a completely waste negative business and find uses for more industrial waste streams, demonstrating the considerable opportunities in this space.

**Find out more**

Our next SPIN event is: [EVENT INFORMATION HERE]

Interested in embracing sustainable manufacturing? Join our SPIN programme and become part of a cohort of SMEs and big business to share knowledge, implement change and grow.

Contact Helena Simmonds for more information on how we can help at: H.C.C.simmonds@warwick.ac.uk

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