Lighting Design - Weekly Blog

Week 9

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Circular Economy

Stoane Lighting Manufactuers

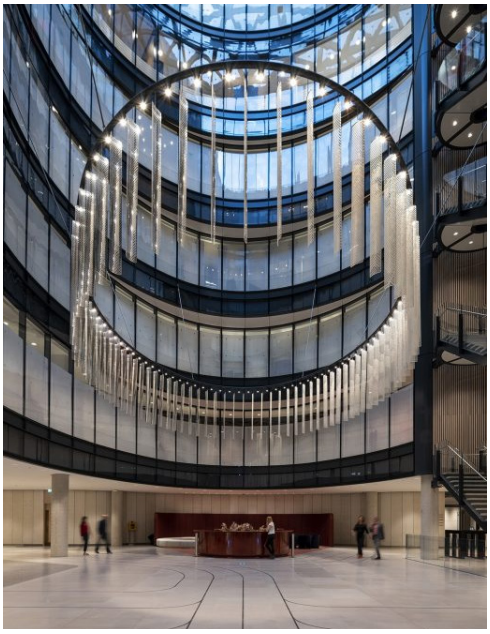
This week, Ruairidh M. from Stoane Lighting gave a lecture discussing the firm's sustainable practices, initiatives, and projects. During the workshop, we were able to see how their projects are composed and function.

STOANE LIGHTING

EQUIPMENT DESIGN + MANUFACTURE

100 Liverpool Street

Stoane Lighting is a Scottish manufacturing company that works on design and build projects, meaning their work is customised to the specific context in which they will be placed. They value working closely with lighting designers and bridging the communication gap that exists in the industry. They value creativity and innovative ideas that have not been



R7 King's Cross Interior

One of the top priorities of the company is to incorporate sustainability in everything they do. This includes product design, manufacturing, testing, and embodied carbon. They integrate a system called TM65 and TM66 that tracks the product's behaviour in the circular economy; ensuring the product is built to last to keep replacement and waste is reduced. It also includes aspects of materiality, manufacturing procedures, and the product's impact on the ecosystem.

Gardens of the Château de Versailles.

Not only does the firm prioritise environmental sustainability. They take responsibility for the social aspects of what it means to be a leader in the built environment. Stoane Lighting was certified B Corp in 2020. These are for-profit companies that use their business as a force of good and consider their impact on workers, customers, suppliers, the community, and the planet.

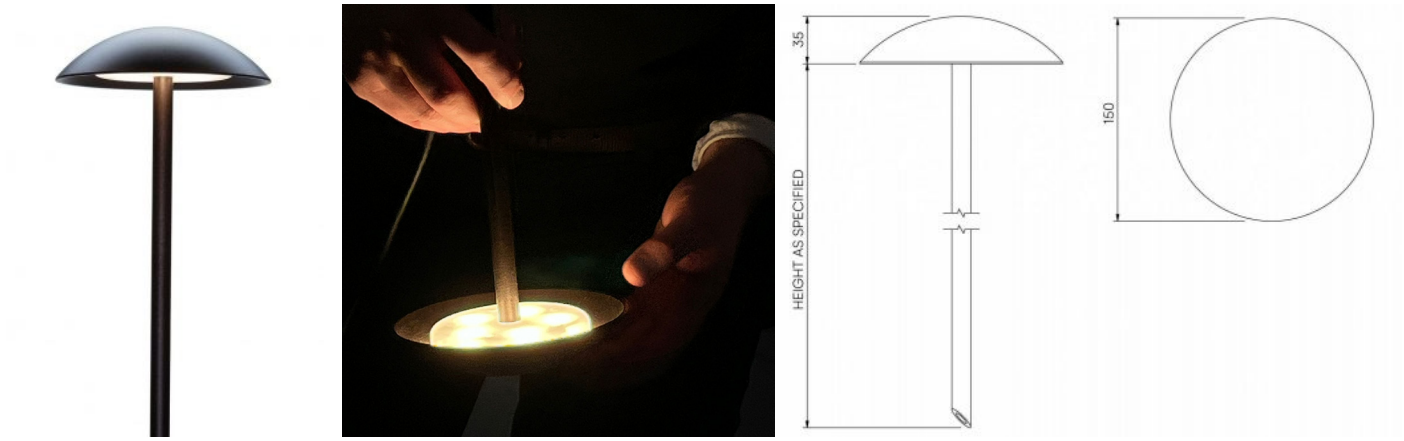
Certified B Corporation

Products

design intent turning to reality

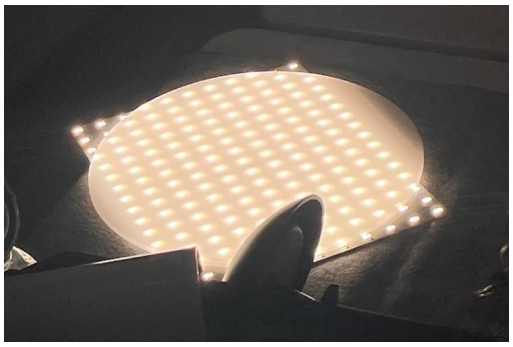
During the workshop, we were able to see many of their products in action. Ruairidh demonstrated a variety of their luminaires and explained how each was designed for a specific purpose and intent. The following are a few that I found the most interesting.

Mushroom



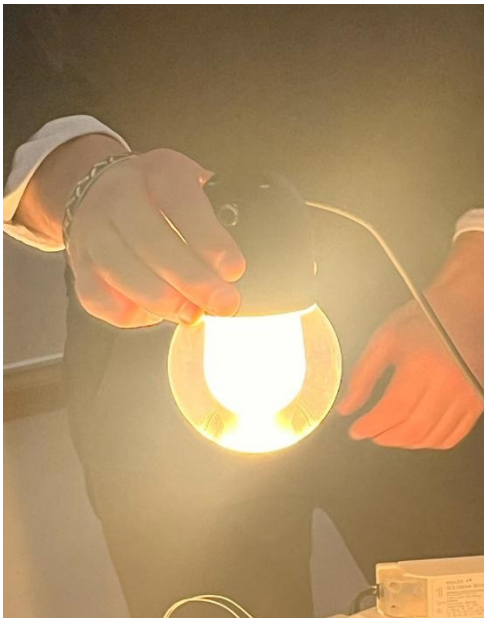
This luminaire is called the mushroom and is IP-rated for exterior use. It is composed of a circular formation of five lamps that are capped by a steel semi-sphere to cast the light down. The intended light source is and LED, and it comes in a variety of colour temperatures ranging from 2700 K to 4000 K. The image above uses a 2700 K, giving off a warm and welcoming light. The project it was intended for used them to light a path along a landscaped garden.

Plate



The intent for this luminaire is to provide diffused wall lighting to an office space. There is a surface with several tiny lamps, covered by a white opaque plate to spread the light evenly. The colour temperature and dimming effect is controlled by an iPhone app.

Hanging Bulb



The luminaire shown on the right is used for exterior lighting. In the project, a series of these fixtures are hung on a string that runs through a hole in the top of the luminaire, so they can hang in a desired formation.

They come in a variety of colour temperatures, and the one demonstrated in the workshop is 2400 K. The lamp is covered by a opaque coating that softens and spreads the source.

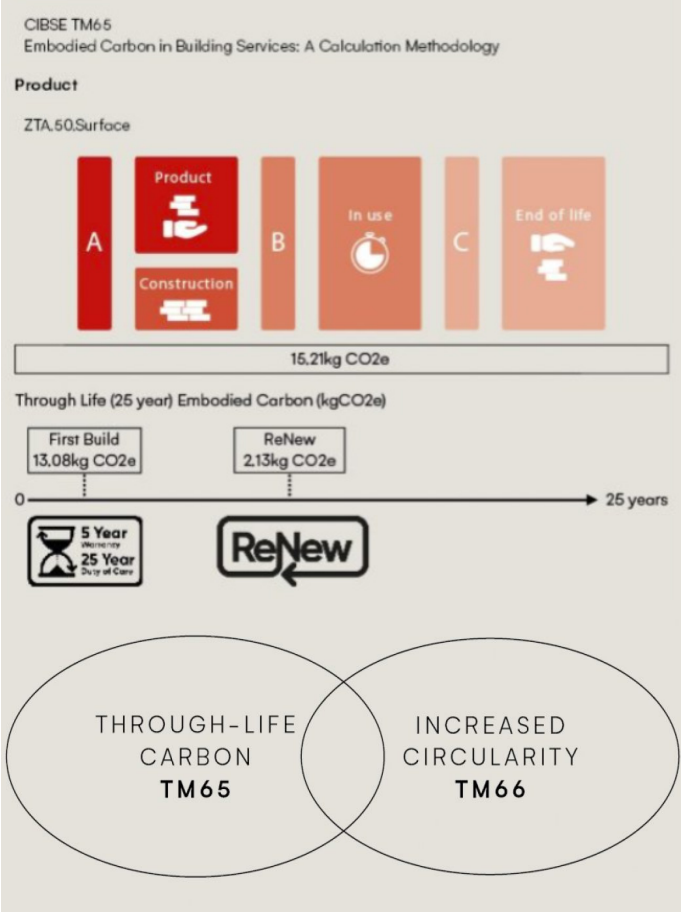
Lifetime Carbon Analysis

Materiality, EPDs, and Embodied Carbon

Something I found very interesting about Stoane Lighting is that they produce Environmental Product Declarations (EPD) for their products. EPDs are a third-party verified document that reports on the product's environmental performance and emissions over its lifespan. This includes emissions from raw material extraction, manufacturing, transportation, repair, to the disposal and end-of-life use. The carbon emissions associated with this are referred to as embodied carbon. To become a net-zero society, it is vital that embodied carbon is equally considered as operational carbon is in the industry. To measure lifetime carbon, Stoane uses a metric from CIBSE called TM65.

Stoane also sheds significant importance on the circularity of their products. Using CIBSE's TM66 metric, they ensure their product's lifespan is made to last in order to reduce repair, replacement, and waste.

Combining the two metrics results in the lowest possible environmental impact.



		LEED v4
Materials	A1010 Standard Foundations	✓
	A1020 Special Foundations	✓
	A1030 Slab on Grade	✓
	A2010 Basement Excavation	×
	A2020 Basement Walls	✓
	B1010 Floor Construction	✓
	B1020 Roof Construction	✓
	B2010 Exterior Walls	✓
	B2020 Exterior Windows	✓
	B2030 Exterior Doors	✓
	B3010 Roof Coverings	✓
	B3020 Roof Openings	✓
	C1010 Partitions	?
	C1020 Interior Doors	?
	C1030 Fittings	×
	C2010 Stair Construction	✓
	C2020 Stair Finishes	?
	C3010 Wall Finishes	?
	C3020 Floor Finishes	?
	C3030 Ceiling Finishes	?
	Groups D-G	×
Operating Energy		×
Operating Water		×

Consideration of embodied carbon is becoming more common in the industry. LEED is a building certification the USGBC awards to projects meeting sustainability criteria. One of the credits pertains to embodied carbon and lifetime carbon analysis (LCA). LCAs use EPDs to measure the embodied carbon of an entire building.

During my experience working as a sustainability consultant, I have performed many LCAs to obtain the LEED credit and certification. The required building components include the structure (beams, columns, slabs, footings, etc.), the façade and envelope (exterior wall/roof assemblies, exterior windows and doors, and details like floor constructions, elevator shaft/ shaft walls, stairs. However, lighting and MEP equipment are not required in the evaluation, even though they contribute 15-35% of the building's embodied emissions.

As this topic becomes more of an industry standard, I am interested in seeing how building regulations/certifications consider EPDs in their requirements, and how manufactures respond.