From the Ground Up

Words Kitya Mark Photographs Mathijs Labadie

Christien Meindertsma and Dzek's Flaxwood installation at Milan Design Week 2024, designed by Arquitectura-G (image: Federico Ciamei).

To hold linoleum in your hands: 1) collect linseed oil from flax seeds; 2) dry the oil and mix with plant resin to create lino cement; 3) add wood dust and chalk; 4) heat and knead the cement into dough; 5) press the dough using a roller machine.

A version of these instructions is printed on a label at the V&A in London, accompanying the third iteration of the museum's annual *Make Good: Rethinking Material Futures* exhibition. Above the label sits a catalogue of tiles and blocks – samples of discarded and re-moulded linoleum flooring that form part of designer Christien Meindertsma's research into the overlooked potential of the material. "Linoleum is really exciting to experiment with because it's so pliable," Meindertsma later tells me in a video call from the Netherlands. "When I'm in the factory I breathe in linoleum's distinct smell and I'm reminded of this material's endless shapes and possibilities."

A typical sheet of linoleum has a smooth and supple surface, backed by rough jute. It's made to be laid on the ground, and underfoot it feels cushioning and springy, as though if you tripped and fell, you'd be guaranteed a soft landing. The smell, meanwhile, is faintly earthy, like sawdust or damp pine. Inhale deeply. It's the sort of smell that stays with you, lodged in your memory.

Linoleum is made from solidified linseed oil, which was first patented in the 1860s as a hygienic floor covering and quickly became popular across Britain and beyond. The English manufacturer and inventor Frederick Walton noticed a pale skin forming over oxidised linseed oil and named his new material after the Latin for flax ("linum") and oil ("oleum"). "Linoleum could be laid over a dirt floor in a fisherman's cottage or over expensive marble in an under-inhabited palace to keep out the cold," explains Lily Barnes, curator of a new exhibition about the material at Kirkcaldy Galleries, a cultural space based in the Scottish town of Kirkcaldy. By the early 20th century, Kirkcaldy had become the global centre for linoleum production, flooring the world with a material that was easy to clean, water-resistant, draught-proof and affordable. "Many upper-class families would also use it to cover wood and stone floors to protect them when they weren't entertaining guests," Barnes adds. For a while, linoleum was an unexpected junction between different classes and geographies – like the seam between tiles laid side-by-side.

With this in mind, I take my granny to the V&A, wanting to know what – if anything – linoleum means to her. Together, we peer through protective glass at Meindertsma's lino samples. In recent years the designer has bought an entire plot of flax harvest from a farmer in the Dutch Flevopolder, setting a series of projects in motion in which she explores new futures for linoleum. Renoleum, a product made from recycled waste linoleum, is what's currently being shown at the V&A, but this year Meindertsma also debuted Flaxwood, an architectural tile produced in collaboration with materials company Dzek, using a simplified linoleum recipe. "There is so much life in linoleum's past and future forms," she says when we speak over Zoom about the projects. "I'm interested in the route this material has gone through, the interactions it has had, and where it will go next."

I lean in close to try and catch the smell, but a security guard pulls me up short. His co-worker visibly sniffs it, however, his nose and lanyard hitting against the Perspex. On our way home from the museum my granny recalls the brown linoleum floors in the house that my grandpa grew up in – the same house she moved into aged 21, and where my mom was later born. That brown linoleum could be considered an ancestor of Flaxwood and Renoleum; a material lineage unfolding through flooring. "I see products – and everything that surrounds us – as existing in a phase, in a temporary shape," Meindertsma reflected in her catalogue for Dzek's 2024 presentation of Flaxwood at Milan Design Week. "Matter is in transition, and we are all connected by this transition."

One reason for linoleum's early success was that the material lent itself towards different design treatments: a single pigment added to the manufacturing process could produce an inexpensive block colour, or, for a more extravagant design, eight colours could be swirled into an intricate pattern. Over time, manufacturers became adept at mimicking other materials and, like a mirage, squares of linoleum took on the appearance of porcelain or polished parquet. To achieve geometric parquet, for instance, factory workers would slice printed linoleum and fit the pieces together mosaic-style. The result was visual replicas of cold, hard floors that felt unexpectedly warm and soft to the touch. Linoleum fulfilled domestic space dreams – families who could never afford stone flooring suddenly had the option to roll out sheets of imitation Italian marble.

Above left: flax.

Above right: linseed oil.

Right: a linoleum puzzle made using blocks and tiles cut by woodworkers Kuperus & Gardenier.

Next page (left): wood granulate.

Next page (right): linoleum cement, a thickened linseed oil with a consistency like Turkish delight.

Linoleum samples from Dzek's Milan presentation about Flaxwood (image: Federico Ciamei).

Voicenoting me during my lunch break at work, my mom describes how, when she first moved to the UK, she lived in a house with a cold, dark kitchen and a window that looked onto a wall. She wanted to let the light in, so she bought linoleum. Rolls of canary yellow from the local hardware store that she cut and stuck. I imagine my mom with scissors in her hands, kneeling on the floor, measuring out sheets of sunshine five years before I was born. Lino for her was a household name, synonymous with vibrant, insulating, cost-effective flooring.

My mom, however, was late to linoleum. In the aftermath of the 1960s plastics boom, lino was largely superseded by vinyl: a lower-maintenance, petroleum-based alternative. Even the names we called these two floorings became interchangeable. In her book *Plastic: A Toxic Love Story* (2011), science writer Susan Freinkel recounts that, across the board, "plastics challenged traditional materials and won: taking the place of steel in cars, glass in packaging" – and the linoleum from under our feet. Polyvinyl chloride, otherwise known as vinyl, was versatile, new and highly desirable. It had all the design potential of lino, but could be bought at an even cheaper price. Unlike linoleum, vinyl was also fully waterproof and easier to mop shiny, squeaky clean. Our old floors became something that needed ripping up and replacing. In the landfills they biodegraded, smeared with epithets: outdated, old-fashioned, obsolete, tacky, tatty, dull, grimy, greasy, kitsch.

Yet, as Freinkel's book title highlights, plastics' success is toxic. While linoleum is made from natural materials and biodegrades, vinyl is widely considered to be the most environmentally damaging plastic currently manufactured. According to Greenpeace, vinyl's production, use, and disposal releases chlorine-based chemicals that amass in fatty tissues and cells, increasing the risk of cancer, infertility and impaired childhood development. Many of the factories that now export vinyl across the world are located in poor and racialised communities. Existing American vinyl plants, for instance, are primarily concentrated in states with the highest poverty rates, such as Louisiana, Kentucky and Mississippi. These factory workers and their environments are disproportionately contaminated. The shine and squeak of vinyl comes with unjustifiable human and environmental costs.

I want to reach out and shake us all: remember a time before all this? When our homes and public spaces felt and smelled like homes and public spaces, not polyvinyl chloride? For me, linoleum was a checkerboard canteen floor. Friday lunchtime at school, carrying heaped fish and chips on a plastic tray. Sitting at the same table each week, dolloping red ketchup on greasy plates, laughing (about something or nothing) before lessons began again. At the end of the week, I still find myself looking for that smell – cooking oil and malt vinegar mixed with the sawdust of linoleum. Deep-fried memories stored away, layered into smell, taste, material. Linoleum is a particularly apt material for such sedimentation: smells sink into it, dents and scuffs accumulate on its supple surface. This process of mark-making is a log of time inhabited in space; such floors are unintentional archives, keeping the leftovers of everyday life – the antithesis of plastic vinyl, which memories can't stick to, and smells only of lingering chemicals.

"To make Flaxwood," Meindertsma tells me, "we had to change linoleum's production method, but the original smell stays the same, because we use the same natural ingredients." To gain a more sensory understanding of this biogenic product, I visit Dzek, the company that is working with Meindertsma. Sitting in its studio just off Camden Road, in north London, I hold a sample of Flaxwood to my nose. Meindertsma was right. Warm and sawdusty; the perfume of oxidised linseed oil.

"We wanted to make a tile because it's an object that you can actually hold in your hand," explains Brent Dzekciorius, director of Dzek. "You can relate to it on a human scale. Unlike a giant roll of vinyl, this is something you can really touch." The Flaxwood tile in my palm has no added pigment, and is the colour of sunbaked soil. It looks, smells and feels like the natural elements it derives from – very different to linoleum's chameleon reputation of copying the appearance of other materials. As Meindertsma put it to me: "We want Flaxwood to be celebrated for its actual living ingredients, not to try and look like something else." In this spirit, she and Dzekciorius are aiming for their product to be fully traceable and non-extractive: it will use chalk dust drawn from the waste streams of water treatment plants instead of using mined chalk; wood dust taken from the surplus of that used in stable bedding; linseed oil harvested from local Dutch flax. I run my finger along the sample's gentle grain, inhaling its aroma. In my mind I am back at school again.

I wonder how many people would still recognise linoleum's distinctive smell – how many of us were

A linoleum house, made using tiles cut by Kuperus & Gardenier.

A mountain of sawdust.

raised in proximity to it. Over supermarket sandwiches, my colleague tells me about Machine Ball, a game he played as a child which involved kicking a football into a washing machine. “Bam! Goal!” he exclaims, arms spread wide like Tony Adams. All of a sudden he is 12 years old in the kitchen, slipping over the linoleum floor, tackling his friends until something or someone cracks. Did he keep tally of the goals he scored each week after school, jotting them down in the back of an exercise book? He doesn’t remember. Only the long scratch in the lino when he scored with studs on. A dirty challenge.

Machine Ball is a limited archive – a singular memory stored in a few metres of linoleum. Yet still, what if all our childhood linoleum floors were prised-up and glued together in one long, unending roll? I’m reminded of Meindertsma’s Renoleum project, how she collects second-hand linoleum scraps like artefacts. In her glass case at the V&A are heterogenous memories cached across a common material; a depth of unexpected and incalculable connectedness.

My colleague still lives in his family home, but the floor has changed. The fridge, the washing machine and the cream counters now sit on a plastic sheet of vinyl. The new flooring looks like his old flooring – it’s even a similar colour – but without that stud scratch in the corner of the room. He tells me he used to navigate his way around the kitchen in the dead of night just by feeling that scratch and the bumps and the parts of the floor where the edges curled up. If he slide-tackled now, would it leave any mark on this fresh, plasticky floor?

It’s a question Meindertsma cares about. Flaxwood deliberately imprints easily, and is even more malleable than traditional linoleum. “Flaxwood is a soft material and I think it would be nice if it retained its softness, because it makes our rooms softer if our floors are soft,” she tells me. “Maybe it’s not as resilient as other materials we are more used to, but I think that can be OK. The dents it will get over time, they will be part of its story.” I envision my colleague in his kitchen with future generations: a small leg extends and an even smaller foot with a boot laced-up tight goes in for the sliding challenge.

Can memories be re-fabricated? When linoleum is ripped up, what happens to the stories it stores? To produce Renoleum, Meindertsma experiments with rolling old lino flooring through a plying machine. Her photographs of the process show diptychs of faded offscourings next to pristine block tiles – the final product is both an archive of the past and a material for the future. “If I gave someone this new sample they would feel the old linoleum in it, even if they did not know it was there,” she tells me. I sense that her use of “feel” here has two meanings: feeling the texture of the old linoleum stratified into the new linoleum, and feeling the affective memories carried forward in those layers, too.

Type “where to buy linoleum” into Google today, and every search result will show vinyl. Google results like these suggest a deep and enduring relationship with vinyl, as though alternative materials never existed and never could exist. Projects such as Flaxwood and Renoleum, however, prove otherwise. One vision for Flaxwood is that, at the end of a tile’s life in a home or public space, it will be gently prised-up and returned to the plying machine, to be transformed into something else for someone else. Flaxwood tiles will accumulate lives like the layers in sedimentary rock: sunshine floors; fish and chips; football kicks; and on and on and on. **END**

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