RAW **MATERIALS**

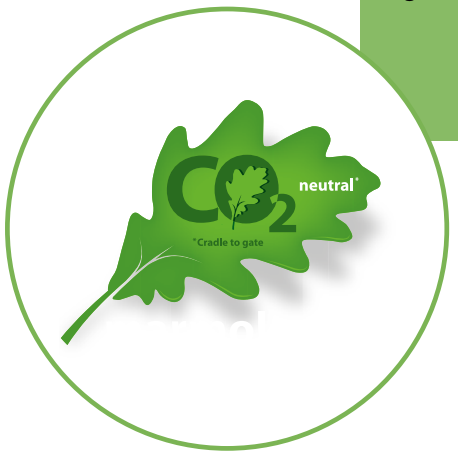
Natural by Nature

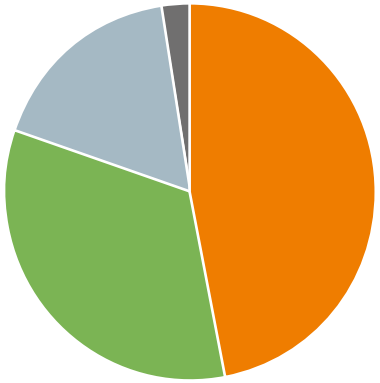
Marmoleum is made from natural and recycled materials.
More specifically, **62%*** are renewable and **29%*** is also rapidly renewable (crops at least every year). Supporting the circular economy principles, **44%*** of materials used in Marmoleum are recycled (tall oil, wood flour and Marmoleum).

Why renewable raw materials?

Renewable materials offer three distinct advantages over fossil-based ones:

- Abundance
- Biobased
- Uptake and capture of CO_2 during growth





Components

Marmoleum is made up of the following components.

Renewable raw materials – **62%***

Linseed oil, tall oil, gum rosin, wood flour, jute

- Linseed oil is obtained by cold-pressing the seeds of the flax plant. It is sourced mainly from Russia and Kazakhstan.
- Tall oil is a recycled waste stream from the paper industry. It contains vegetable oil and rosin obtained from pulping soft wood for paper manufacturing.
- Gum rosin is a solid form of resin obtained by tapping pine trees. The crude gum is extracted and separated into turpentine and rosin. A tree can be tapped for 30 years. Pine trees in tropical areas produce more rosin. Forbo sources its rosin primarily from Indonesia.
- Jute – also known as hessian or burlap – is a natural and important eco-friendly vegetable fibre. It is produced from the fibre in the stem of the jute plant and is sourced from India and Bangladesh. Woven jute is used as the backing for Marmoleum.
- Wood flour is milled using soft wood off-cuts from the wood industry. Wood flour is finely pulverised wood. Soft wood comes from renewable (re-planted) trees, such as pines or firs, which re-grow in about 20 years. Only wood off-cuts from certified PEFC sustainable forestry are used.

features:

- biodegradable and compostable
- rapidly renewable – 29%*: linseed, jute, rosin
- uptake and capture of CO_2 during growth
- recycled raw material
- highly supportive of circular economy

Recycled Marmoleum – **44%***

Marmoleum collected from Forbo's own factory (off-cuts, rejected rolls) and post-installation off-cuts returned from customers through our Back to the Floor programme.

Back to the Floor is our free, installation off-cut collection service. This circular-economy initiative also saves money and time for our contractors, avoiding landfill or incineration gate fees.

Besides Marmoleum, through the Back to the Floor programme, we also collect and take back Eternal, Sarlon and Sphera smooth vinyl, Allura LVT, Novilon cushioned vinyl, Flotex and Tessera carpet tile off-cuts.

features:

- recycled material
- less CO_2 consumption
- reduced landfill and incineration
- supportive of circular economy

Filler: limestone – **23%***

Limestone is one of the world's most abundant resources. After sand, it is the most available natural raw material on the globe. Forbo uses limestone sourced from Germany and mined above ground level, limiting energy consumption and environmental impact.

Non-renewable raw material – **3%***

The non-bio based materials in Marmoleum are the colour pigments and factory finish. The vast majority of pigments Forbo uses are iron oxide-based, resulting in durable, high quality pigments. Other pigments used are organic. Titanium White – the same white pigment used in paints, paper, foods, cosmetics and toothpaste – accounts for 2/3 of the pigments used.

** Typical value; may vary based on batch and/ or design*

The production process

STEP 1

Linseed oil and tall oil are mixed with rosin before being oxidised by air to create linoleum mass

STEP 2

The material is left for a couple of days to continue oxidising as more oxygen is absorbed

STEP 3

The material is then mixed with wood flour, colour pigments and limestone

STEP 4

Next, it is turned into granules

STEP 5

The granules are tightly pressed onto jute backing with a calender

STEP 6

The linoleum is left to 'dry' and harden in a 20-meter tall drying room. The natural curing process takes around two weeks

STEP 7

Lastly, a factory finish is applied and the rolls are cut, rolled up and transported to the warehouse.

Forbo FLOORING SYSTEMS

Example Marmoleum sheet 2.5mm

(individual product EPDs available)

Marmoleum ingredients	Check EPD for exact %	Linseed oil	Gum Rosin	Tall oil	Wood flour	Limestone	Jute	Recycled Marmoleum
Natural	97%	●	●	●	●	●	●	●
Renewable	62%	●	●	●	●		●	
Rapidly renewable (1 year)	29%	●	●				●	
Recycled	44%			●	●			●

Natural

Existing in or formed by nature.

Renewable

Materials which will be replenished within a period of 10 years.

Rapidly renewable

Materials mainly obtained from agricultural production. They regenerate crops every year, or far quicker than fossil resources.

Recycled

Material that has been reprocessed from recovered (reclaimed) material by means of a manufacturing process and made into a final product or component for incorporation into a product.

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