Brushes with paint

Paints protect materials from the environment while providing a decorative surface that allows easier cleaning. Originally made from plant and mineral extracts, technical and chemical sophistication now offer new possibilities for these surface coatings.

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Paints consist of a binder that forms a continuous film as the paint dries, natural or artificial pigments for colour, a liquid to transport the active components and additives such as driers, stabilisers, fillers and fungicides.

Ingredients for early paints

Early paints were based on vegetable-oil binders such as linseed oil (squeezed from flax seed and refined), tung oil (from fruit of the China Wood tree), poppy oil and even walnut oil. Natural pigments such as iron ore or oxides of lead were used with a thinner such as turpentine.

Factory-made products only date back to the 1790s, with the making of varnishes, pigments and resins to be blended on the job. There were few changes until the early 20th century, when film-forming products, including alkyd resins, and ready-mixed paints were developed.

Rock and body art

Maori knew how to use natural ores for paint, and Maori rock art can be found in many places around South Canterbury (see www.teana.co.nz). It is likely that the colour raw materials were traded around New Zealand, as they were used and found well away from the drawings.

John Carney Bidwill, writing about his rambles in the Waikato in 1839, reported on the use of kokowai for face and body paint and its extraction from a 'rusty spring' after which it was burnt and mixed with oil for use. Suitable minerals containing iron are found on Banks Peninsula, Golden Bay, Moeraki, Northland and Oamaru as well as in Taranaki and Rotorua. Blue paint could be obtained from a coloured earth called pukepoto, and black from charcoal. Plant seed, shark liver and whale oil were commonly used as binders.

Stirrers – still needed to ensure the paint components are well mixed.

Paint manufacture begins in NZ

From the 1870s, the New Zealand Haematite Company was making paint in Nelson from the Parapara haematite deposits in Golden Bay. After a number of changes in ownership, this formed the base of an iron industry (see *Build* 121, pages 90–91).

The plant used water from the Glengyle Stream to drive a large overshot waterwheel, which in turn powered the stampers and Berdan grinders. The fine paint dust worked through the storage bags, filling the air with dust and making 'everyone who worked at it spit red paint'. There were two standard colours – one used by the New Zealand Railways on goods sheds and railway wagons and the other brighter colour used on woolsheds and other buildings.

In August 1881, the Thames Paint Manufacturing Company advertised it was selling 'oxide of iron paint' or haematite paint as powder or ground in oil, promoting it for uses such as woodwork, machinery, ships, branding sheep, marking flour bags and priming. It was as durable as 'two coats of lead paint' and 'is not either a poison or injurious to health'. By 1899, a range of haematite paints in colours of dull and bright red, dark and light browns, brown greens and rich burnt and raw siennas was being made.

By 1885, the Cambria Paint Works, Cambria Place, Dunedin, had commenced the manufacture of paints. This company became the present-day Smith and Smith Ltd.

In the North Island, by 1899, the Waipu Paint Mill near Whangarei ground local deposits of manganese and haematite ores to produce bronze-black and 'a pleasing brown', to make 'a durable and useful covering for walls'.

Kauri gum and varnish

Originally varnish protected surfaces already treated with paint, stains or other materials to make the surface harder and more durable. Varnishes can be divided into four broad classes – natural, oil, spirit and water – with oil varnishes mostly used for buildings.

A few notes on varnish and fossil resins, published in 1891, reported that New Zealand kauri gum commanded 'a supremacy of the market', although the 'ever increasing demand is, without doubt, rapidly exhausting the known sources of supply'. Kauri gum was the easiest of the fossil gums to use – it 'unites with linseed oil quicker and at a lower temperature than any other resin resulting in a relatively pale varnish'. Kauri gum was first exported to America in the 1830s but was all but finished in the early 1950s.

The local manufacture of kauri gum varnish began in 1884, when SJ Best of Avondale, Auckland, opened his factory. On 2 May 1907,

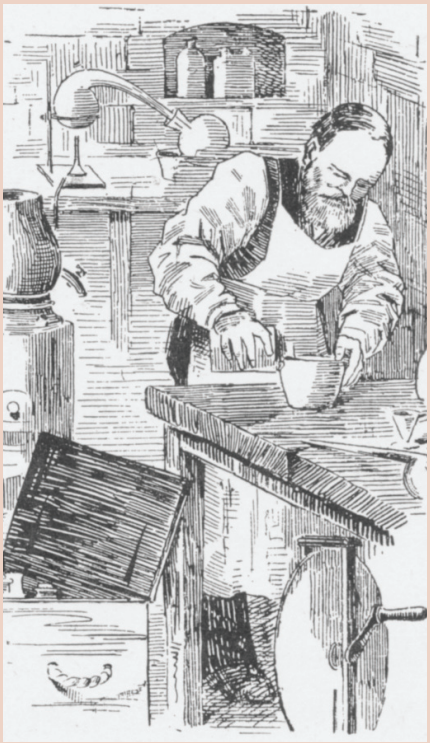
the factory burnt down, fuelled by the highly inflammable materials, fortunately with no injuries or loss of life.

Manufacture ramps up in NZ

Until World War I, most paint products were imported. Lewis Berger and Sons (New Zealand) Ltd were the first English paint company to enter the market, distributing imported paints until it started local manufacturing in 1922, the same year as Taubmans New Zealand. From 1923 to 1939, at least 12 paint-manufacturing companies started production. Stipplecote Products, now Resene Paints Ltd, started in 1946, launching its first waterborne paint in 1951.

Locally manufactured raw products included linseed oil, made in Dunedin from 1943 to mid-1954, and zinc oxide, made in Auckland from 1939. In late 1948, British Australian Lead Manufacturers (BALM – now Dulux) announced plans for a white lead plant and opened in 1951. White lead was used in domestic house paints until the mid-1960s, lead chromate (a yellow pigment) until the late 1970s, red lead (steel primer) until the 1980s, and while calcium plumbate galvanised steel primer is no longer made, it was in use from 1958 to the late 1970s. Lead products are still used in a few industrial paints.

Titanium dioxide has gradually replaced white lead and zinc oxide. It is a contaminant in West Coast iron sand, and research is under way to directly extract it for use in paint and other products.



Creating varnish. (From *A few notes on varnish and fossil resins*, 1891.)