

## Tips and tricks from Armstrong DLW

If you are trying to solve a tricky problem, or need the advice of our technical advisors, do not hesitate to contact our Technical Advisory Department. The team will be happy to help you.

### **Armstrong DLW**

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### **Subject no. 1: The history of linoleum**

The history of linoleum

The precursor of linoleum was the wax or "oil" cloth, the invention of which is described in a patent dating from as long ago as 1627. More than 100 years later it was also being used as a floor covering. It is described in detail in Nathan Smith's patent application dating from 1763: "A mixture of resin, tar, Spanish Brown, bee's-wax, and linseed oil is attached as a coating to woven material by applying it at a high temperature." The basic substance of "oil-cloth" was mixed, kneaded, dyed, and pressed or rolled onto cloths or metal plates. The use of cork meal was mentioned for the first time in 1843, and that marked the birth of the direct predecessor of linoleum, in those days called Kamptulicon (from the Greek word *kàmpto*, "I bend"). Kamptulicon initially sold well, but soon became uneconomical to produce because of the rising price of rubber?

Linseed oil and linseed oil varnish finally replaced this expensive raw material, and were soon followed by oxidised linseed oil or "linoxyn", for which Frederick Walton, who is regarded as the inventor of linoleum, was granted a British patent no. 109/1860. In order to avoid any confusion with the earlier product, Kamptulicon, he called the new product "Linoleum", deriving the name from its main raw material, linseed oil (the Latin name of which is *oleum lini*).

The first company ever to be established for the purpose of producing linoleum was set up in Staines, near London, in 1864 under the name of "Walton, Taylor & Co." During the years that followed, meaning mainly from 1871 to 1879, further improvements were made and patented in the field of linoxyn processing and in plant technology. The first German factories for producing linoleum were built in 1882 in Delmenhorst (near Bremen), and in Köpenick and Rixdorf (suburbs of Berlin).

In Delmenhorst, a centre of the cork-processing industry, no fewer than three linoleum factories were set up between 1882 and 1899, and in 1926 they merged together with linoleum factories in Rixdorf, Maximiliansau (near Karlsruhe), and Eberswalde (near the present-day Polish border) to form the "German Linoleum Works Company of Berlin". Production grew continuously for a few years during

which linoleum was improved in many respects and adapted visually to keep up with the changing taste of the times, while the technology used in its production was also steadily improving.

Up to 1892, the linoleum produced in Germany had been mainly of a single colour, its own natural brown, but these were joined over the years by olive green, terracotta, and dark red. However, there is evidence dating from as long ago as 1880 of a machine for producing “inlaid” linoleum, which was patterned. A further variant was printed linoleum, onto which patterns were printed in oil-based paint with the help of wooden printers. This production process called for a great deal of skill and knowledge from craftsmen, and the product was correspondingly expensive. However, there were also differences in the wear-resistance of the various different kinds of flooring; single-colour linoleum could be laid in any room without any worries, but the printed version very soon showed signs of wear in the areas with the highest traffic, and these spoiled the overall impression and militated against the widespread use of this material.

In Great Britain, the production of “granite” linoleum started back in 1892, with a surface design reminiscent of this stone and impregnated into the whole layer of linoleum right down to the textile backing. As a consequence, further processes were developed for producing a wider spectrum of variants and patterns. Of these, the one that met with the greatest reception was “in-laid” linoleum, on which a pattern was printed by a process similar to silk-screen printing onto the single-colour, fine-grain linoleum base with its textile backing. Flat presses were used here instead of Calander rollers, and they compressed the linoleum coating down to the required thickness from its initial 1 to 2 cm.

The years from 1901 to 1914 brought inlaid linoleum, also known as stencil-laid, to its highest flowering. Linoleum manufacturers vied with one another with floral patterns, edgings, and ornamentation, and in developing new and ever more eye-catching designs.

Whereas the patterns first produced were made to look like planks, stone, or Persian carpets, a new style started to establish itself from the beginning of the century onwards in flooring patterns and in almost everything else as well: Art Nouveau. Well known artists such as Professor Bruno Paul and Friedrich Adler designed various patterns, many of which came to be included in the Collections of the various linoleum factories.

At the beginning of the 20<sup>th</sup> century, the art nouveau also started to appear in linoleum designs. Numerous famous artists designed patterns which were used in the Collections of the linoleum factories. Only a few months after the outbreak of the first world war the industry collapsed, because it had been dependent on imported raw materials, and it was not until the early 1920s that it was able to return to its pre-war volumes. “Inlaid” production was resumed but a different technology was used. The patterns now most in demand were tiles, parquet, and planking, but imitation Persian carpet patterns were also still enjoying great popularity.

The second world war brought about a similar collapse in the linoleum industry, especially in Germany, and it did not start to recover until 1949. Manufacturers tried to gain a foothold in the market again with the top-selling products of earlier years, and in 1957 once again a Collection was brought out that had been designed by architects; their designs were christened “Confetti” and “Mikado”. The boom was short-lived, because in the 1960s linoleum lost its leading role in the market and, in its place, stragula and balatum (printed bitumenised paper), PVC floor coverings, and tufted carpets gained in importance. It was not until the 1980s that people started thinking seriously about the product again, produced as it is from renewable raw materials. Linoleum started to enjoy a fresh renaissance.

Nothing of any significance has changed since 1863 in the raw materials used for the manufacturer of linoleum: linseed oil, resins, cork, wood, and powdered chalk are still the main ingredients in the coating. However, the oxidisation processes for linseed oil have been constantly improved and accelerated, and the processes for mixing resin and linoxyn have been improved as well. On the basis of plain linoleum, called “Uni-Walton” in memory of the inventor of DLW, new processes have been developed over the course of decades for applying the decorative design, and these have laid the way for the successful future of this highly traditional floor covering.

- Jaspé: flamed, longitudinally orientated grain
- Moiré: broken-up longitudinally orientated structure
- Marble: marble pattern with virtually no overall direction

There are also speckled designs and other variants based on these types.

Gratin patterns and stencil-inlaid made from a coloured basic coating, and other inlaid stamped from “hides” of various different colours and made into grain patterns again, were very expensive to produce. For this reason, their production was dropped in the 1950s. Table linoleum, for furniture, and also cork linoleum for gymnastics led only a shadowy existence for a long time, but have been enjoying a revival in recent years.

#### **“Oil-cloth” – the predecessor of linoleum**

- 1860: Frederick Walton applies for a British patent over his “Linoleum”
- 1882: Start of linoleum production in Germany, in Delmenhorst, Köpenick, and Rixdorf
- 1926: Merger of three linoleum firms to form the “Deutsche Linoleumwerke Aktiengesellschaft, Berlin”
- 1892: In addition to single-colour natural-brown linoleum, ever greater quantities of olive green, terracotta, and dark red variants are also produced
- 1892: Production of “granite linoleum” in Great Britain
- 1901-1904: Heyday of Inlaid linoleum