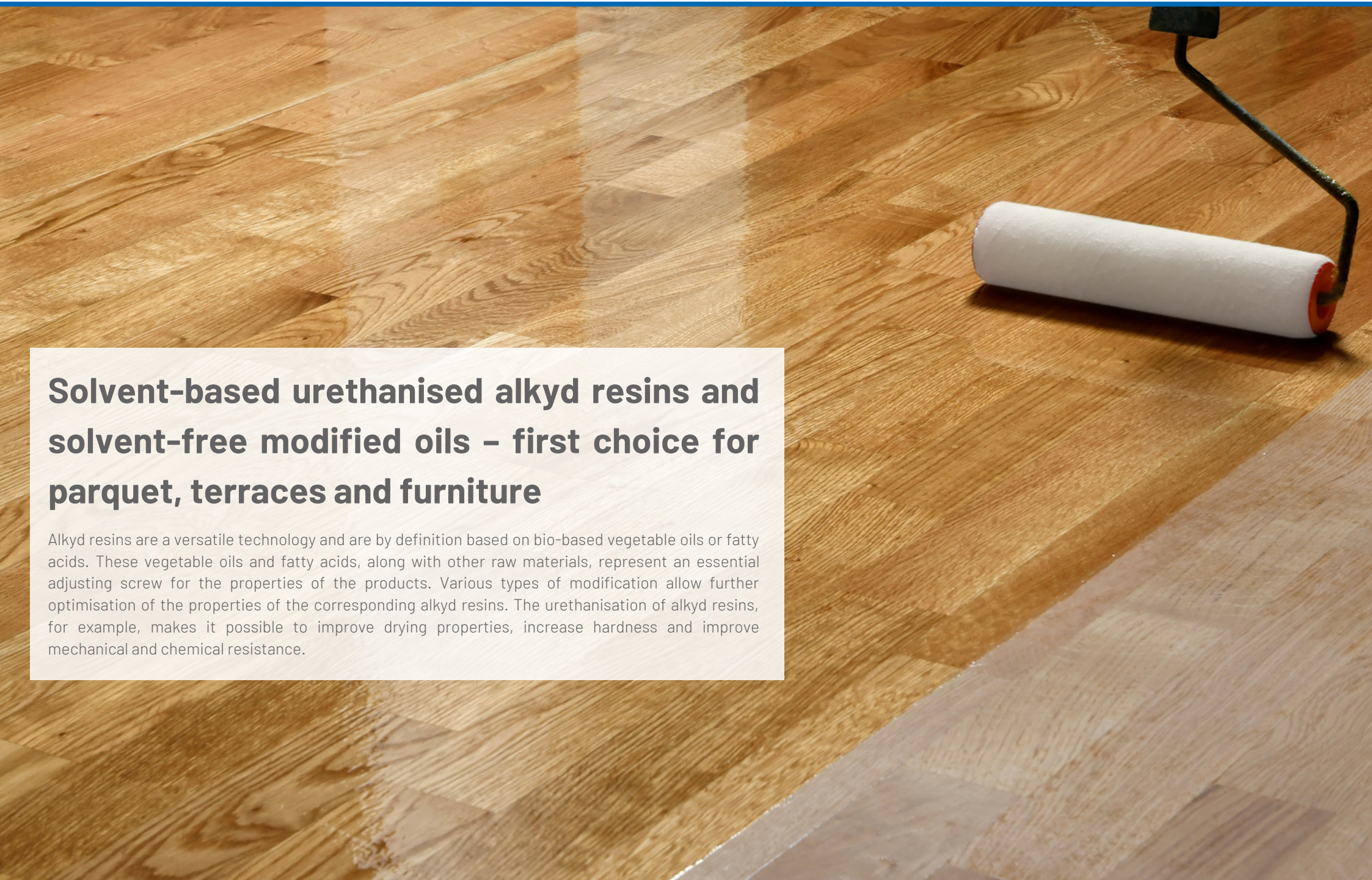

Solvent-based urethanised alkyd resins and solvent-free modified oils – first choice for parquet, terraces and furniture

Alkyd resins are a versatile technology and are by definition based on bio-based vegetable oils or fatty acids. These vegetable oils and fatty acids, along with other raw materials, represent an essential adjusting screw for the properties of the products. Various types of modification allow further optimisation of the properties of the corresponding alkyd resins. The urethanisation of alkyd resins, for example, makes it possible to improve drying properties, increase hardness and improve mechanical and chemical resistance.

Alkyd resins for application on wood surfaces

Alkyd resins are often used on wooden surfaces such as wooden floors, terraces or even wooden furniture. Systems based on such alkyd resins penetrate deep into the wood, anchor there optimally and protect the wood from a variety of influences. The undesired straightening of wood fibres after application is usually not observed with solvent-based or solvent-free systems. They are easy to apply, have excellent wood-warming properties, good water-resistance and resistance to colouring substances such as coffee, red wine or mustard. Overcoating is normally possible with a wide variety of solvent-based, solvent-free and waterborne paint systems.

Urethanised alkyd resins for high-quality coating systems

The variation possibilities for urethanised alkyd resins are very diverse. In addition to the vegetable oils or fatty acids used, the type of isocyanate monomer, the amount added can be varied or other modifications can be introduced into the alkyd resin.

Product overview

Product	Delivery form	Technology	Special properties	Bbc*
WorléeKyd AC 4903	58% in dearomatised HC 160-200	Acrylated and aliphatic urethanised alkyd resin	Very fast drying, low yellowing, very good weather resistance, good adhesion to various substrates	46%
WorléeKyd S 5703	55% in dearomatised HC 160-200. 55% in dearomatised HC 180-220	Aliphatic urethanised alkyd resin	Fast drying, low yellowing, good weather resistance, good adhesion to various substrates	55%
WorléeKyd S 6003	51% in dearomatised HC 160-200, 50% in dearomatised HC 180-220	Aliphatic urethanised alkyd resin	Very fast drying, very high hardness, high mechanical resistance	53%
WorléeKyd S 6103	50% in dearomatised HC 180-220	Aromatic urethanised alkyd resin	Very fast drying, very high hardness, high mechanical resistance, high bio-based content	74%
WorléeKyd B 865 U	55% in dearomatised HC 160-200, 55% in dearomatised HC 180-220	Aromatic urethanised alkyd resin	Fast drying, good mechanical strength, good balance between hardness and flexibility, good outdoor resistance	56%
WorléeKyd V 5241 U	100%	Urethanised oil	Sole binder or combination partner for various paint systems, high mechanical and good chemical resistance, good outdoor resistance, high permanent elasticity	83%

** Bio-based content on binder solids*

Depending on the type of modification and the proportion, urethanised alkyd resins achieve different pendulum hardness values. These values are usually higher than those of unmodified alkyd resins. WorléeKyd S 5703 is aliphatic modified and therefore achieves the lowest hardness of the urethanised alkyd resins. WorléeKyd B 865 U and Worlée Kyd S 6003 are aromatic modified alkyd resins. WorléeKyd S 6003 has a significantly higher urethane content compared to WorléeKyd B 865 U and is therefore also significantly harder [Figure 1].

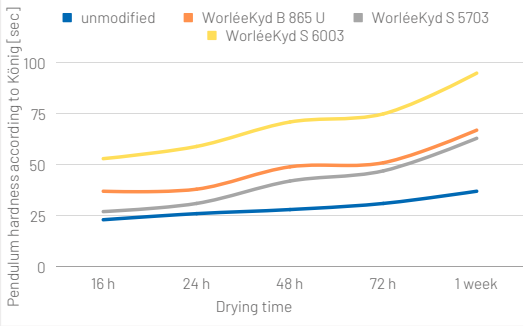

Figure 1: Pendulum hardness development in comparison

WorléeKyd AC 4903 is a specially acrylated and aliphatically urethanised medium-oil alkyd resin. The acrylation does not take place at the double bonds of the fatty acids, which means that it still exhibits unrestricted oxidative drying. The combination of the two types of modification enables a product that combines the properties of aliphatic urethanised alkyd resins with those of aromatic urethanised alkyd resins. The product has good weather resistance for urethanised alkyd resins. It also yellows less than the usual types. On the other hand, the product dries very quickly and has a high hardness and mechanical resilience. Besides the application on wooden surfaces indoors and outdoors, it can also be used well for metal surfaces. Here, it has a broad adhesion to various substrates.

WorléeKyd S 5703 is also an aliphatic urethanised alkyd resin. It allows the formulation of fast-drying, viscoelastic clear lacquers and parquet oils with less yellowing and good outdoor resistance. In addition to its application on interior and exterior wood surfaces, it can also be used well on metal surfaces. Here, it exhibits broad adhesion to various substrates.

WorléeKyd S 6003 has a very high degree of urethanisation. This enables for rapid drying, very high hardness, high abrasion resistance and excellent chemical resistance. It also shows very good drying properties on hard woods such as oak. Furthermore, it is very suitable for industrial use on parquet floors, as sufficient post-cross-linking can take place even after stacking and packing of the applied woods.

The properties of WorléeKyd VP S 6103 largely correspond to those of WorléeKyd S 6003. However, the product contains a significantly higher proportion of bio-based raw materials. This is 74% calculated based on the binder-solids content.

WorléeKyd B 865 U has a higher oil length and lower degree of urethanisation compared to the previously mentioned products. A special combination of different vegetable fatty acids was also chosen to achieve a good balance between drying, hardness and especially elasticity. Despite the aromatic urethanisation, the product enables the formulation of, for example, clear lacquers for high-quality woods, which must have good gloss retention and long-term flexibility in exterior applications. Applications include varnishes for yachts. Here, the additional use of long-oil alkyd resins, such as WorléeKyd L 7904, is recommended to achieve excellent permanent elasticity. Parquet varnishes and oils based on WorléeKyd B 865 U are particularly pleasant to apply and have a longer open time, which simplifies necessary corrections and allows optimised penetration.

For systems with a higher solid content, WorléeKyd V 5241 U is a good choice. This is a solvent-free, linseed-oil-based polyurethane with a high proportion of bio-based raw materials. It is used as a sole and combination binder with many different urethanised alkyd resins. Here, it enables the increase of the non-volatile content, improvement of the penetration, the elasticity and also the exterior resistance. In doing so, it achieves high viscoplasticity and good chemical resistance.

Aliphatic urethanised alkyd resins such as WorléeKyd S 5703 and WorléeKyd AC 4903 usually achieve better resistances in alternating climate tests, such as QUV A 340 rapid weathering. The special modification coating in WorléeKyd AC 4903 further increases the resistance. Based on these results, an increased outdoor resistance can also be assumed.

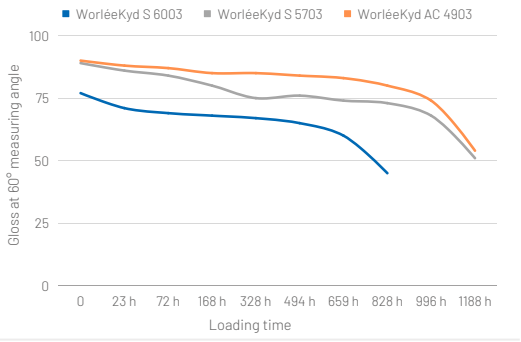

Figure 2: QUV A 340 rapid weathering

WorléeKyd RL 1290 for 2 K parquet oils

WorléeKyd RL 1290 is used on high-quality parquet floors. It is an extremely low-viscosity, specially modified alkyd resin based on a very high proportion of bio-based raw materials. It is primarily used in high-quality two-component parquet oils where it is cross-linked with solvent-free, low-viscos lacquer isocyanates. In this case, the two-component oil can serve as a base for further recoating with, for example, water-based two-component systems or can be used as a stand-alone system. In both cases, the oil is applied as a non-layer-forming system, penetrating deeply into the wood and without causing wood fibres to stand up. In this case, the oil provides a good wood warming and thus emphasises the appearance of the wood surface. Due to the very small application quantities and deep penetration into the wood, the oil anchors perfectly, optimally fixes any pigments used and maintains the natural feel of the wood. Nevertheless, you get very durable surfaces that withstand the usual chemical and mechanical stresses.

Product	Delivery form	Technology	Special properties	Bbc*
WorléeKyd RL 1290	100%	Specially modified oil	Extremely low viscos sole binder or combination partner, can be used in one- and two-component parquet oils, improves penetration, very high bio-based content	95%

** bio-based content on binder solids*

When testing the resistance to various substances, systems based on WorléeKyd RL 1290 achieve very good results. Solvents, ammonia and even colouring substances such as coffee, red wine or mustard are no problem [Figure 3]. Even though the binder usually plays a major role in the formulation of high-solids coating systems, other raw materials also have an influence on the properties. For example, siccatives or catalysts are needed for good drying properties.

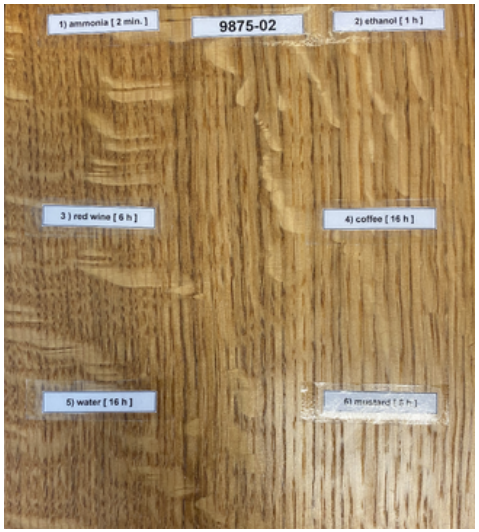

Figure 3: Chemical resistance on wood

Suitable additives/supplementary products

Category	Product	Function
Dispersing additive	WorléeDisperse VP 8100 S	Facilitates incorporation and stabilisation of pigments, matting agents and fillers
Defoamer	WorléeAdd 370 / 372	Defoaming and deaeration with different application types
Surface additive	WorléeAdd 3545	PDMS-based additive to improve scratch resistance and optimise flow without increasing smoothness too much
Siccative	WorléeAdd 2560	Cobalt-free siccative for accelerating the oxidative drying of alkyd resins
Anti-skin	WorléeAdd 4415	Oxime-free anti-skin agent for improving the storage stability of systems based on alkyd resins
Modifying binder	WorléeCryl L 2380	Very hard, thermoplastic acrylate to accelerate drying and increase the hardness of systems based on alkyd resins
Matting agent	Köstropur products series	High-quality silica-based matting agents with and without post-treatment
Thixotropy	WorléeThix series	Thixotropic alkyd resins to control rheological properties, improve stability and reduce penetration
Rheology	WorléeAdd 800 series	Organically modified smectite derivatives and high-purity smectites for rheology modification of aqueous and solvent-based systems

Let's work together

Do you have any ideas for product developments? Feel free to contact us. We would be pleased to collaborate or work on a joint project with you.

Sustainable product development

The development of sustainable products has accompanied us for a very long time. Even without legal or societal pressure, it has always been our ambition to offer better and more durable products and solutions for a wide range of applications. Developing high-quality products in collaboration with our customers remains our primary focus.

Over the decades, we have gained a lot of experience in developing various resin technologies based on different raw materials to make products more sustainable from different perspectives. Sustainable product development must ultimately benefit the environment and society, but also take into account economic aspects.

The entire supply chain must benefit. Already in our proven developments, we can take many of these different aspects into account and make resins and additives ever more sustainable. For example, we can determine factors such as the proportion of renewable raw materials, the proportion of secondary raw materials, regionality and longevity, the hazard potential of our products, and the competition of our raw materials with the food industry.

Technologically, we are well positioned with our creative departments in research, development and application technology to continue to move towards sustainable products in collaboration with our customers and partners. Every new development is related to sustainability factors such as climate change and resource conservation.

Our corporate values by which we act

Since our founding in 1851, the principle of sustainability with its three core themes of economy, ecology and social issues has been at the heart of our corporate philosophy. As a family business, Worlée-Chemie is committed to social responsibility and fair dealings with business partners and employees. We are committed to forward-looking and prudent environmental protection as well as preventive and comprehensive occupational health and safety as a corporate goal.

We are convinced that the natural resources of water, air and soil must be treated with care as part of our responsible actions. In this way, the ecosystem of which we are a part can be preserved as the basis of our living conditions for future generations. This also applies in particular to the economical and efficient use of energy and natural resources.

We stand by our responsibility for safety in production, storage and transport. We ensure that our products are handled conscientiously along the entire value chain.

Compliance with human rights due diligence is part of our company's self-image. Integrity, fairness, responsibility and a high degree of transparency are the basis for a trusting and long-term business relationship. We expect our suppliers to adhere to these principles in the wider supply chain and to recognise our Supplier Code of Conduct or provide an equivalent guideline.

Solvent-based binders
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