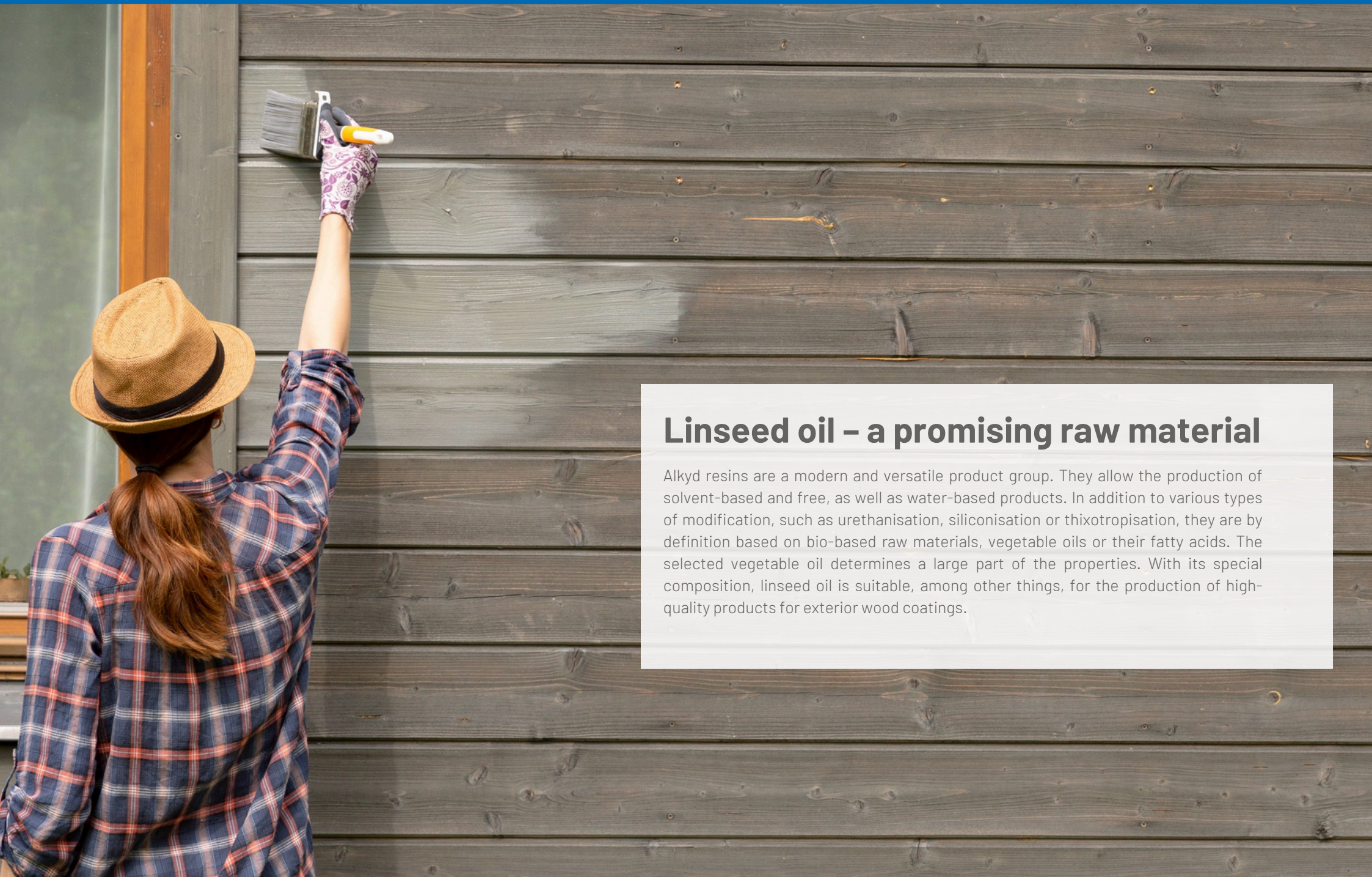




Linseed oil – a promising raw material

Alkyd resins are a modern and versatile product group. They allow the production of solvent-based and free, as well as water-based products. In addition to various types of modification, such as urethanisation, siliconisation or thixotropisation, they are by definition based on bio-based raw materials, vegetable oils or their fatty acids. The selected vegetable oil determines a large part of the properties. With its special composition, linseed oil is suitable, among other things, for the production of high-quality products for exterior wood coatings.



Alkyd resins, solutions and emulsions based on linseed oil

Linseed oil has been used for centuries to protect wood. It provides a water-repellent, vapour diffusion-open surface and penetrates deep into the wood. Its high elasticity makes it suitable for use on dimensionally unstable woods in outdoor areas. We also use linseed oil as a raw material for our modern binders for wood stains, impregnations, stains and maintenance oils and refine it according to the desired properties. For example, drying, even in thicker layers, thermal stability and rheological properties can be improved. In addition, we have also developed high-quality aqueous systems based on linseed oil, which are in no way inferior to solvent-based products. All products are characterized by a high proportion of renewable raw materials and are therefore also ideally suited to wood as a building material. All products contain little or no solvents and can therefore be formulated in many different ways.

Product	Delivery form	Technology	Special properties	RRM*
WorléeSol 31 C	45% in water / Dowanol PNB	Water-dilutable linseed oil polymer	Very good penetration and weather resistance	89%
WorléeSol NW 474	60 % in water	Externally emulsified alkyd resin	Amine- and co-solvent free	70%
WorléeKyd L 7904	100 %	Isophthalic acid modified alkyd resin	Good penetration, high elasticity, good thermal stability and weather resistance	80%
WorléeKyd L 8004	100 %	Isophthalic acid modified alkyd resin	Comparable to WorléeKyd L 7904 with lower viscosity and thus, among other things, better penetration	78%
WorléeKyd V 5241 U	100 %	Urethanized oil	Improved drying and hardness compared to WorléeKyd L 7904 / L 8004	79%
WorléeKyd RL 1290	100 %	Specially modified alkyd resin	Extremely low viscosity, thus improved penetration, reduces the need for solvents	>95%
WorléeThix L 8050	100 %	Polyamide-thixotropic alkyd resin	Pleasant soft thixotropy, easy matting, good drying properties	78%

*renewable raw material content on binder solid content

Aqueous systems

[WorléeSol 31 C](#) is suitable for use in wood impregnations, wood oils and glazes for wood protection due to its excellent penetration properties. When used as a primer [WorléeSol 31 C](#) can significantly increase the lifetime of glazes. Due to the water dilutability of the product, formulations with lower VOC are possible. No additional neutralization step is necessary.

[WorléeSol NW 474](#) is even completely co-solvent and amine free and with its high percentage of renewable raw materials of 70% allows the formulation of particularly ecological glazes and wood care oils. Due to its very good compatibility with [WorléeSol E 150 W](#) it can also be used as a combination binder to improve penetration and open time.

Solvent-based systems

[WorléeKyd L 7904](#) and [WorléeKyd L 8004](#) are suitable as a base for wood stains, impregnations, stains or maintenance oils. Both products are based on about 80% renewable raw materials. They are suitable as sole binders for thinlayer or in combination with thixotropic alkyd resins for the formulation of thicklayer applicable glazes. Compared to [WorléeKyd L 7904](#), [WorléeKyd L 8004](#) has a lower viscosity and therefore a stronger penetration.

[WorléeKyd V 5241 U](#) is also based on approximately 80% renewable raw materials. In addition, however, it contains urethane groups, which ensure significantly better drying and higher hardness. Especially in harder woods such as Bangkirai or teak, glazes cannot penetrate as strongly as in softer woods. In these cases, improved drying can be important.

[WorléeKyd RL 1290](#) contains more than 95% renewable raw materials and has an extremely low viscosity, making it particularly suitable for highly penetrating and extremely high solids systems. It can be used as a sole binder or as a combination partner. Even small quantities can reduce the viscosity considerably. In the interior it can be used for solvent-free 2K parquet oils.



Besides the possibility of using thixotropic binders in combination with the previously mentioned products, [WorléeThix L 8050](#) can also be used. The combination of an 80% share of renewable raw materials and direct chemical modification with special polyamide resins characterizes the excellent properties of the product. It is used as the sole binder in thixotropic glazes and achieves a pleasant thixotropy with low brush resistance, yet it penetrates and anchors well in the wood. In addition to the continued good drying, it can be easily matted.

Improve quality and properties by adding further raw materials

Certainly the binder used has the greatest influence on the properties of glazes. Nevertheless, additional products are needed for formulation. Matting agents give the systems a uniform matt or silk gloss appearance, regardless of how strongly they penetrate. Transparent pigment pastes enable the formulation of warm earth tones and increase lightfastness. Additions of defoamers, surface additives, substrate wetting agents or even dryers also facilitate application or further improve the quality of the systems. Many of these products can be found in our product portfolio to match the respective binders.

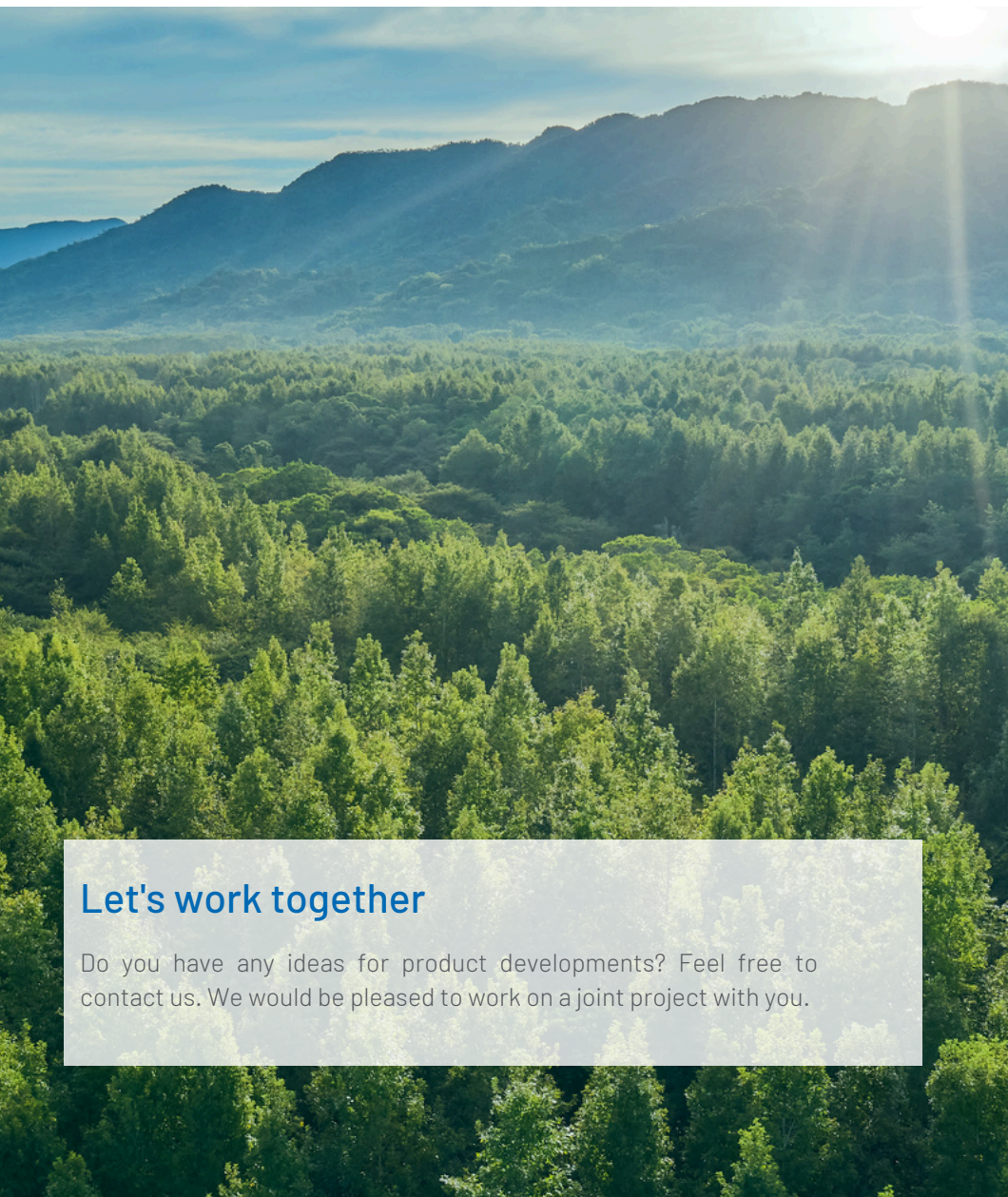


Suitable Additives

Category	Aqueous system	Solvent-based system
Dispersing additive	WorléeDisperse 8400 W	WorléeDisperse VP 8100 S
Defoamer	WorléeAdd 6410	WorléeAdd 373 N
Substrate wetting agents	WorléeAdd 3440	-
Surface additive	WorléeAdd 3520	WorléeAdd 373 N
Siccative	WorléeAdd 2700	WorléeAdd 2560

Complementary products

Product	Technology
WorléeTransoxid S/SF/W Yellow und Red	High quality water-based, solvent-based and VOC-free transparent iron oxide pastes
WorléeBlackpaste S / SF / W	High-quality water-based, solvent-based and VOC-free carbon black pastes
Köstropur	Silica based matting agents with and without aftertreatment
WorléeAdd 800er	Organically modified smectite derivatives and high-purity smectites for rheology modification of aqueous and solventbased systems



Let's work together

Do you have any ideas for product developments? Feel free to contact us. We would be pleased to 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 part of our proven developments, we can take many of these different aspects into account and make resins and additives even 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.

The corporate values that guide our actions

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 firmly believe 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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Any deliveries and/or services are exclusively subject to our general standard terms and conditions in their respectively valid version. We will be happy to provide you with the general standard terms and conditions upon your request and they can be downloaded online at <http://www.worlee.de/GSTC>.



Raw Materials from Worlée –
Modules to your Success

