

Renovation Guide





Economical and environmentally friendly renovation using quality waterborne paints!

Imprint

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Renovation Guide 2016/2, as of 14/03/2016

The trend toward sustainability and healthy living is becoming increasingly important in our lives. It's not just new items that are being purchased in order to retain the value of a house, apartment or furniture. On the contrary, valuable objects such as old doors, wooden stairs and well-loved furniture are being given a new lease of life through renovation, thus supporting the ethos of sustainability. This is where you, as a specialist in painting and renovation work, are in demand.

At Zweihorn®, an Akzo Nobel brand, sustainability is an important strategic objective and is taken into account in all product developments. Safety, health, environmental protection and clear user advantages are the key factors here. In this respect, we have accelerated the further development of waterborne paint systems that make work during processing easier and provide a perfect surface.

The high-tech waterborne paints from Zweihorn® are one step ahead of the future and are significantly better than traditional synthetic resin and door paints in many areas.

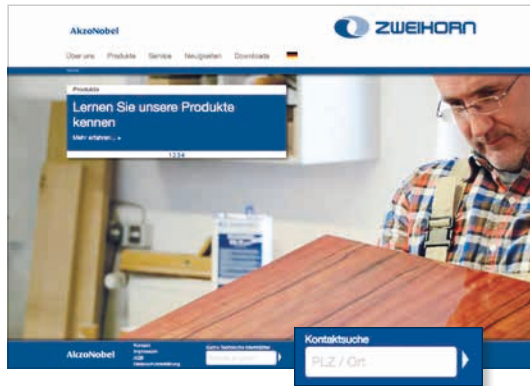
The advantages of ready-to-use Zweihorn® waterborne paints:

- VOC compliant products
- Colour variety, more than 16,000 mixable tones
- Simply paint, roll or spray
- No odour
- Several coats in one day
- Very good flow and high coverage

This guide provides you with comprehensive information and useful tips on processing using Zweihorn® waterborne paints. In the following you will find professional advice to support you in your renovation work as well as all of the information on the right products for each processing step right up to value retention.

Technical Advice

If you have any questions about the use and application of our products, please contact your local specialist consultant in the field. They will be happy to advise you on all questions regarding surface finishes. You can find the relevant telephone number by entering your postcode in the contact search on our homepage at www.zweihorn.com. In addition to the retailer's address, the Zweihorn® technical field service is also shown along with a mobile phone number.



Product Safety

For all questions regarding health and safety, please contact our product safety department:

Telephone +49 (0) 2103 77-253
 Fax +49 (0) 2103 77-475

General Inquiries

For all other questions, please contact our call centre:

Telephone +49 (0) 2103 77-800
 Fax +49 (0) 2103 77-577

General Emergency Number

Telephone +49(0) 30 1 92 40 - Poisons Emergency Number Berlin

Basic Information on Waterborne Paints



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Basic Information on Waterborne Paints

Waterborne paints are becoming more and more popular in processing for health reasons as well as for environmental, economic and practical reasons, which are of particular benefit to you in the case of renovation work. **Zweihorn®** waterborne paints are VOC compliant (also after 2010) and are the best on the market according to our customers. The products are ideally suited for renovations. You can easily complete all of the work on site at the customer's premises, because the products are odourless. Further decisive advantages are that **Zweihorn®** waterborne paints dry quickly and provide excellent coverage. This saves you valuable time during processing. Furthermore, they also provide other unbeatable benefits that your customers will appreciate too.

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Sustainable products - active environmental protection

Climate protection and the related issue of global warming are on everybody's lips. Ozone, fine dust and CO2 pollution not only threaten our environment but also humanity itself. The Zweihorn® brand from Akzo Nobel recognised the problems at an early stage and began systematically developing and improving environmentally friendly, waterborne products almost 20 years ago.

Waterborne paints are the paints of the future, because organic solvents are either completely or mostly replaced by water. The sustainability advantage: During processing, it is mainly water that is released, thus protects human health and the environment.

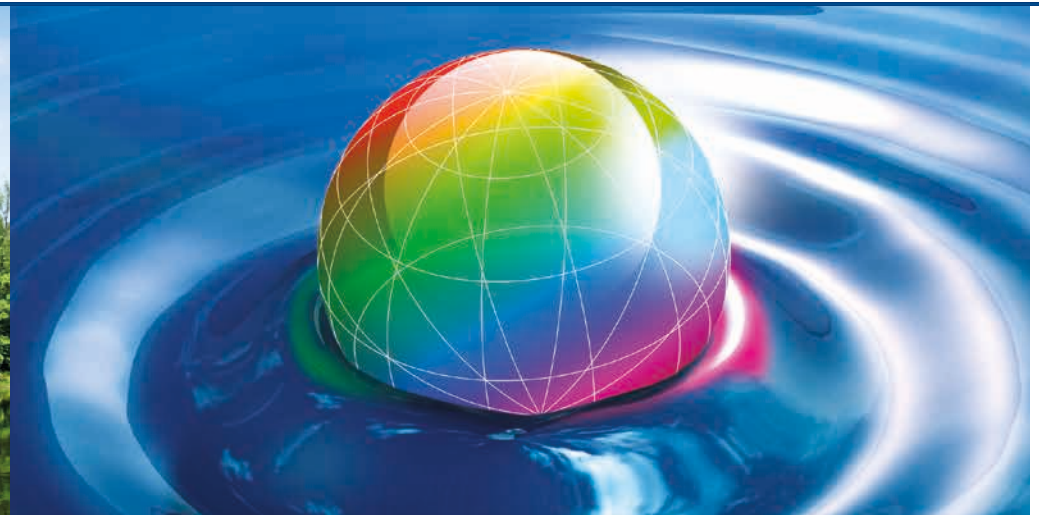
The VOC Directive

VOC (abbreviation for "Volatile Organic Compounds") is the generic name for organic substances, i.e. substances containing carbon, that evaporate or dissipate easily or are even in gas form at low temperatures (e.g. room temperature). In order to protect the environment through lower CO2 levels, ChemVOCFarbV [German Ordinance on the Limitation of Emissions of Volatile Organic Compounds by Restricting the Use of Solvent-based Paints and Varnishes] was adopted.

The 2004 EU Directive on the Limitation of Emissions from Volatile Organic Compounds (= VOC Directive) actually came into force with effect from 01/01/2007. Insofar as possible, paints with a high proportion of solvents were to disappear from the market. Limits defined which paints could still be sold. These limits were again tightened with effect from 01/01/2010.

In truth, no paints disappeared from the market as the directive only applies to buildings and parts of buildings (fixed installations). Nevertheless, we take joint responsibility for our world, especially for the sake of our children.

We support you in changing over to waterborne paints! In this way, you can also make an active contribution to environmental protection.



Waterborne paints - the alternative to synthetic resin paints

Synthetic resin paints

Advantages: Generally speaking, synthetic resin paints are easy to process and provide good coverage. They also flow well, thus ensuring uniformly smooth surfaces. The painted surfaces are very durable, because the paint is highly impact and abrasion resistant.

Disadvantages: However, synthetic resin paints come with the general disadvantage that they pollute the environment with their aromatised solvent and have a strong odour. This is also why more and more companies are using waterborne paints.

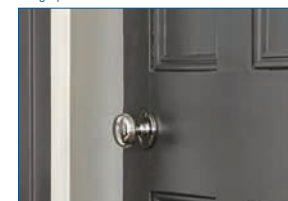
The alternative: Zweihorn® waterborne paints

With Zweihorn® waterborne paints, you are already prepared to face tomorrow's challenges today. Thanks to intensive development and the use of state-of-the-art raw materials, a system was created that is ahead of its time in terms of both application and robustness. Zweihorn® waterborne paints combine all of the advantages of synthetic resin paints and dry much more quickly, while still offering a long open time and providing excellent coverage without any odour. By switching to processing with Zweihorn® waterborne paints, you can save money and work in an extremely environmentally friendly manner.

Excellent filling and coverage



Long open time



Price-efficient and environmentally friendly





Variocryl® Color (VCC) - one-pack as standard or two-pack as an extremely hard, mark-resistant pigmented topcoat

The innovative Variocryl® Color pigmented topcoat VCC can be used either as one-pack or two-pack. By adding PUR waterborne paint hardener PWH 3200, the normal pigmented topcoat becomes an extremely hard, scratch-resistant and mark-resistant paint for all high-end applications. The coverage provided by Variocryl® Color is generally excellent! Over 16,000 colour formulations and the option of creating shades according to design mean that no wish goes unfulfilled! All shades are available in 1 litre pots - please speak to your Zweihorn® specialist consultant about this.

Excellent hardness



● Variocryl® Color VCC/yellow
● Competitive product

Very good flow



Excellent coverage



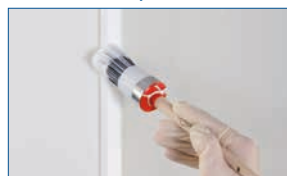
Processing right there on site

Variocryl® Color pigmented topcoat VCC can also be applied using a brush or roller- specifically for renovation work on site.

No odour



Several coats in one day



Variocryl® Color pigmented topcoat VCC is dry in 2 hours

Any application



Rolling Brushing Spraying

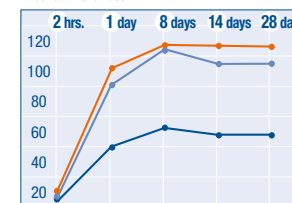


Variocryl® (VC) - one-pack as standard or two-pack as an extremely durable premium clear topcoat

The innovative Variocryl® clear topcoat VC can be used as either one-pack or two-pack. It convinces with its brilliant grain accentuation, impressive optics and smoothness as well as good chemical resistance according to DIN 68861 1B. By adding PUR waterborne paint hardener PWH 3200, the one-pack waterborne paint for normal demands becomes a two-pack waterborne paint in PUR quality for high demands (e.g. kitchens, tables, counters) - with significantly better chemical resistance, hardness, scratch resistance and cream and grease resistance. Variocryl® clear topcoat VC is available in silk gloss, semi-gloss, matt and dead matt (natural effect).

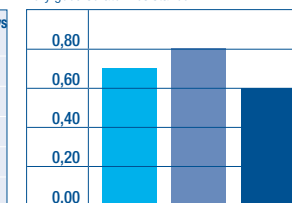
As with Variocryl® Color pigmented topcoat VCC, Variocryl® clear topcoat VC can also be applied easily on site using a brush or roller.

Excellent hardness



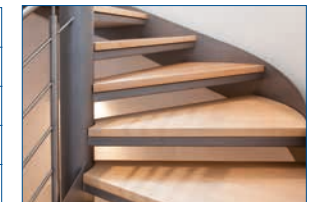
● Variocryl® one-pack ● Variocryl® two-pack
● Two-pack PUR solvent-based paint

Very good scratch resistance



● Variocryl® one-pack ● Variocryl® two-pack
● Two-pack waterborne clear topcoat from the competition

Good grain accentuation



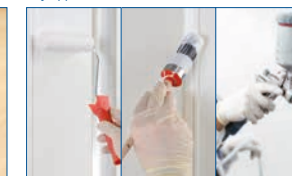
Good grain accentuation on most woods

Natural look



Variocryl® at dead matt gloss level looks like it is untreated

Any application



Rolling Brushing Spraying



Our colour tone service mixes your desired tone

Farben nach RAL

With Varioacryl® pigmented topcoats, you can choose from over 16,000 colours according to NCS, RAL, Sikkens, sanitary ware colours, etc. or have a special colour mixed according to a customer sample (plastics, fabrics, etc.). With the colour measuring software developed by us, almost anything is possible.

Our retailers offer this excellent colour service at your premises. In addition to plain colours, there are also numerous effects, 3D surfaces and glass paints in many colours. In the majority of cases, standard colours are delivered within 24 hours and often on the same day. This guarantees a fast turnaround during the project planning phase and shortens the overall project

Professional colour consultation

With the ColourFutures™ and WoodFutures compendium, each customer can create a perfect interior or design colour concept - without any special design training. At the Akzo Nobel Aesthetics Centre, the colour trends from around the world are analysed with renowned designers and architects. The trend colour for each year is selected from these and five colour worlds are developed to suit the different customer groups and capture the current zeitgeist. You can also take advantage of our experts' know-how!

Order your personal ColourFutures™/ WoodFutures directly and free of charge from your Zweihorn® specialist consultant!



Everything you need to know available around the clock

On the Internet, you can find product information, processing instructions and safety data sheets, more tips on processing and, under "Service", everything about the Zweihorn® waterborne paint system. So you can also buy our great products easily, there is a retailer directory on our homepage. These specialist retailers can also advise you on selecting the right product or help you with any questions regarding use.

We hope that the basic information pages have convinced you. On the following pages, you will learn how to use the products professionally and how to care for and protect the renovated objects.

All service offerings - including those specifically for painters - can be found on the Internet at www.zweihorn.com/en/service










Coating

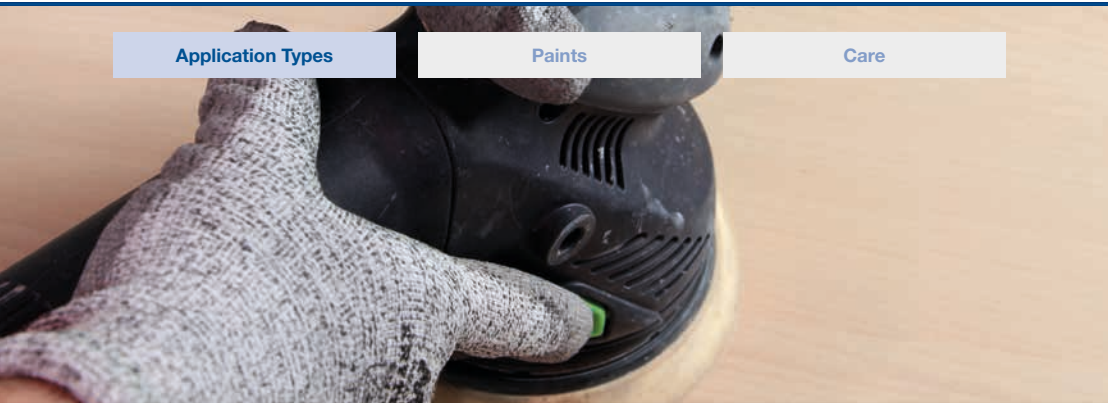
By coating with the Zweihorn® waterborne paint system, you can also score points in several areas with your customers. You work with environmentally friendly coatings and can carry out the renovation work on site - without odours or long drying times. You work in a very economical fashion because Zweihorn® waterborne paints are ready to use, allowing you to apply several coats in one day. When coating doors, stairs and furniture, you give the objects a new lease of life and ensure that the surface is durable and beautiful for years to come - much to the delight of your customers.

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		Coloured paints		Clear varnish		Cleaning & Care		
		Variocryl® Color VCC	Variocryl® stair varnish VC-T	Variocryl® clear topcoat VC	Duocryl clear topcoat DC	Furniture cleaner and care MRP		
 <p>Object-based product overview</p>		<ul style="list-style-type: none"> For normal (one-pack) and heavy-duty (two-pack) demands Excellent filling and coverage Very good durability Non yellowing colour pigments Extremely large variety of colours 	<ul style="list-style-type: none"> Creak-free (already in one-pack) Extremely abrasion, scratch and slip-resistant (two-pack) Can also be applied by roller or brush Good slip-resistance Also excellent for coating highly stressed components/furniture 	<ul style="list-style-type: none"> For normal (one-pack) and heavy-duty (two-pack) demands Non yellowing Very good filling power Very good scratch and abrasion resistance Suitable for PVC 	<ul style="list-style-type: none"> Non yellowing Very good filling power Very good resistance to chemicals Very good hardness and scratch and abrasion resistance Suitable for PVC 	<ul style="list-style-type: none"> Waterborne cleaning and care products with micro waxes Cleans, cares, removes micro-scratches and forms a protective film For all painted surfaces For all plastics and metals Silicone-free and hydrocarbon-free 		
Interior spaces	Coloured doors		●		●	●	●	
	Wooden doors with wood grain				●	●	●	
	Coloured stairs		●	●			*	
	Wooden stairs with wood grain			●			*	
	Coloured furniture		●		●	●	●	●
	Wooden furniture with wood grain				●	●	●	●

● Our recommendation * MRP is not suitable for stairs or parquet due to the danger of slipping! Here we recommend our special products, Procryl parquet cleaner and Procryl parquet care (instructions can be found in our parquet guide or on the Internet at www.zweihorn.com)



Application Types

Paints

Care

Preparation and application with a brush or roller

Substrate preparation

It generally applies that, when painting, the better prepared the surface is, the more professional and perfect the coating result.

During renovation work, it is important to gently remove old, loose paint with coarse abrasive paper or a scraper. First, the substrate must be dust and grease-free. Smooth cracks and uneven surfaces with wood glue or filler.

If the substrate is in poor condition, begin with a coarse sanding process using a grain of 80 or 100. In the case of old paint with firm adhesion, 180 sandpaper can also be used for sanding. In any case, the final sanding should be done using a grain of 220.

Painting with a brush

Now you can start to apply the paint with a brush. Start in the middle of the piece you are working on and paint to the ends and edges. Never paint when dripping wet. On a horizontal surface, you can apply a slightly thicker coat. On vertical surfaces, you must always apply thinner coats so the paint does not run or drip.

Because waterborne paints always dry very quickly, it is important to divide the area in sections and in general to paint wet into wet without breaks, in order to avoid visible beginnings.

WARNING: Paint must always be stirred well.

The result of the painted surface depends to a large extent on choosing the right brush and on skill. For smaller jobs, a 2.5 inch brush is sufficient; for large surfaces choose a 4 inch brush. A distinction is made between brushes with synthetic or natural bristles. There are also brushes that are suitable for waterborne paints here too. Your specialist retailer can advise you on site.



Application Types

Paints

Care

Painting using a roller

When coating larger flat surfaces, using a roller saves time. For waterborne paints, it is best to use a foam roller suitable for waterborne paints.

During application, small bubbles may form on the surface. In this case, you can simply roll over the surface lightly once more without dipping into the paint again. The bubbles burst and you get a perfectly smooth surface.



Application Types

Paints

Care



Painting with a spray gun

As an alternative to applying with a brush or roller, in the case of a high number of units or large-format surfaces, we recommend using spray guns. There are a number of different types and techniques, which we would like to present to you briefly here.

Application using a flow cup gun

A flow cup gun has a plastic cup that is filled with the material. The force of gravity and negative pressure - caused by the air flow - sends the material to be sprayed to the paint nozzle. If the extraction lever is activated, air flows through the air distributor into air nozzle. Then, the retracting paint needle releases the paint nozzle. The material comes out and is atomised.

In the case a suction cup gun, the colour cup is under the gun. Air flowing past the colour nozzle also generates negative pressure here, causing the paint to be sucked up. Accordingly, the air consumption of a suction cup gun is higher.

Pressure cup guns receive the paint via a hose line from a pressure tank, a paint container that is separate from the gun.

Another option is to attach a paint cup under the gun, to which some of the spray pressure air is fed. This forms a pressurised air cushion, which forces the coating material to the paint nozzle.



Thin viscous materials are atomised solely by the gravity and by the negative force of pressure at the nozzle. The figure shows a flow cup gun with the option of additional air pressure from above for highly viscose materials (photo: Walther Pilot)

Application Types

Paints

Care

Airless spraying

In the case of airless spraying, the coating material is very highly compressed (approx. 60 - 120 bar), and sent to the nozzle. In contrast to the flow cup gun, a much smaller nozzle size is used here. This creates a very fine paint mist. Spray losses and misting within the room are minimal. Other advantages include low paint consumption and high speed when painting large areas. As atomising air is not used, bubbles cannot form on the surface either.

The disadvantages include the high cost and cleaning effort. Furthermore, the quantity applied can be regulated by changing the nozzle size and the material pressure.

The airless system basically consists of a material pump, a high pressure hose and a spray gun. Sprays are available for high and low pressure operation.



In the case of airless spraying, the paint is atomised at the atomiser nozzle without the aid of compressed air (photo: SATA GmbH & Co. KG. In the case of this gun, compressed air can be optionally connected for even finer atomisation.)

Membrane pumps

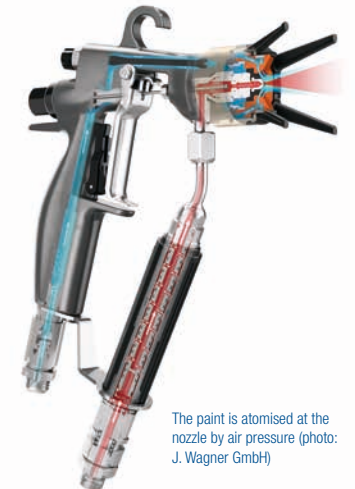
Professional membrane pumps are the best choice for economic coating on site and for using a range of materials in processing with just one device. At the same time, airless membrane pumps are powerful and maintenance-friendly. Devices are available for a wide variety of uses in different performance classes.

Complete mobile solution for painting work with built-in compressor (photo: J. Wagner GmbH)



Airmix spraying

Airmix spraying is similar to the airless spraying process. However, the paint is further atomised at the nozzle using air, forming a softer spray jet. Therefore, the device is also suitable for continuous spraying. The advantages of airmix-spraying are economic in nature, because less material is consumed in comparison to cup guns, as there is less overspray (less spray mist is formed, which misses the surface). Application is very fast and easy, especially on large surfaces. The disadvantages include the high cost and cleaning effort.



The paint is atomised at the nozzle by air pressure (photo: J. Wagner GmbH)

Application Types

Paints

Care

Variocryl® Color pigmented topcoat VCC

Product Description

Water dilutable, non yellowing, good coverage and a pigmented topcoat system with good filling capacity. Can optionally be used as a one-pack or two-pack product for heavy-duty demands. Colour mixing system for the creation of countless colours according to Sikken's, RAL, NCS, etc. or according to your own sample.



- One component for normal demands
- Two components for heavy-duty use
- Excellent filling and opacity
- Very good durability
- Non yellowing pigments
- Two component version mark-proof even without clear topcoat
- Vast array of colours

In the case of two-pack processing, mixture ratio of 10:1 (10%) with PUR waterborne paint hardener PWH 3200, thinner water or Variocryl® Optimizer.

Area of Application

Almost all woods and wood-based materials used indoors.



Information on the test standards can be found on pages 28/29.

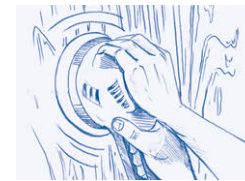
Application Types

Paints

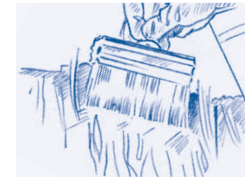
Care



1. Firstly, you should carefully check the object to be renovated for flaws. Holes, cracks and deep scratches can be filled easily. Using a suitable spatula, press the filler (e.g. Zweihorn® Correct wood spatula) securely into the flaw. Then wipe smooth so that there are hardly any protrusions. Too much filler creates more work when sanding.



2. Before the object can be painted, careful and well graded sanding is essential. Sanding the raw wood is recommended when renovating. Start with sandpaper grain P100 or P120. For top results, several sanding processes are necessary. We recommend refining the sanding grains in incremental grains of 60 to 80 (P180/P240/P320) up until the final sanding process. Then remove any wood dust from the area.



3. At the beginning, it is recommended that the paint be poured from the pot into a suitable clean container. Depending on the object, you should use a round or flat brush with clean, soft bristles. The paint is applied in the direction of the wood grain. This is followed by a coat in the transverse direction, which is then followed by a final coat in the direction of the grain.

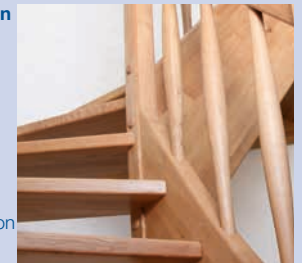
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Tip 1: Variocryl® clear topcoat VC - additional protection using clear topcoat

Protect your colour structure with an additional layer of Variocryl® clear topcoat

Tip 2: Variocryl® clear topcoat for stairs VC-T - creak-free stairs without adding hardener

Variocryl® stair varnish VC-T is ideally suited as a final coat over Variocryl® pigmented topcoat VCC. The one-pack version already ensured that the structure is absolutely creak-free on mortised or saddle wooden stairs. As a two-pack variant with the standard waterborne paint hardener PWH 3200, both the mechanical stress and the chemical resistance are further improved.



- VC-T is absolutely creak-free - even as a one-pack variant
- Cream and grease resistant even without hardener - ideal for handrails
- Extremely abrasion, scratch- and slip resistant as a two-pack-stair paint
- Also creak-free as a one-pack pigmented topcoat structure with Variocryl® Color VCC
- Can be processed using airmix, airless and cup guns or using a roller or brush

Application Types

Paints

Care

Variocryl® clear topcoat VC

Product Description

Water dilutable, non yellowing clear topcoat system. Can optionally be used as a one-pack or two-pack product for heavy-duty demands.

- One component for normal demands
- Two components for heavy-duty use
- Non yellowing
- Good grain accentuation on most woods
- Very good filling power
- When hardened, very good resistance to chemicals
- When hardened, very good resistance to cream and grease
- Very good scratch and abrasion resistance
- Suitable for PVC
- Also available as a dead matt

Generally speaking, Zweihorn® waterborne clear topcoat should be diluted by 5-10% when using a roller or brush. In the case of two-pack, we recommend a processing mixture ratio of 10:1 (10%) with PUR waterborne paint hardener PWH 3200, thinner Variocryl® Optimizer or tap water.

Area of Application

Almost all woods and wood-based materials used indoors. Use as a colourless multi-layer varnish or pigmented topcoat with Variocryl Color VCC®/colour.



Information on the test standards can be found on pages 28/29.

Available in 5 and 20-l pots.

Application Types

Paints

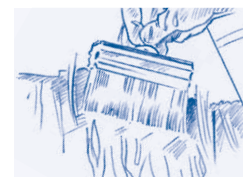
Care



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3. At the beginning, it is recommended that the paint be poured from the pot into a suitable clean container. Depending on the object, you should use a round or flat brush with clean, soft bristles. The paint is applied in the direction of the woodgrain. This is followed by a coat in the transverse direction, which is then followed by a final coat in the direction of the grain.

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Tip: Duocryl two-pack-PUR clear topcoat - the specialist for the highest demands

With Duocryl two-pack-PUR waterborne paint, Zweihorn® has achieved the absolute top class. As a true two-pack-PUR paint system, it will convince you with its brilliance and is significantly better than two-pack-PUR solvent-based paints in terms of scratch resistance and chemical resistance. For this reason, it is used in high-end interior design (shopfitting, kitchens, stairs).

- Significantly better grain accentuation
- Impressive optics, smoothness and pore wetting
- Absolute cream and grease resistance
- Extreme resistance to chemicals ÖNORMEN [Common Austrian Standards] EN1 2720 1B1
- Excellent hardness
- Outstanding scratch resistance
- Excellent abrasion values

Generally speaking, Zweihorn® waterborne clear topcoat should be diluted by 5-10% if applied using a roller or brush.



Application Types

Paints

Care

Furniture cleaner and care MRP

Product Description

Modern, waterborne cleaning and care products with micro waxes for paint, plastic and metal surfaces at all gloss levels. This product is free of silicones and hydrocarbons. Furniture cleaner and care MRP removes dust, dirt, fingerprints and micro-scratches and forms a protective film.



Area of application

For the cleaning and maintenance of all kinds of painted furniture surfaces such as doors, cabinets, tables, etc. The product is suitable for all gloss levels from high-gloss to dead matt. It cleans and seals the surface without leaving any cloudy residue. Also suitable for all plastics and metals in the living area.



Available as a 500 ml spray.

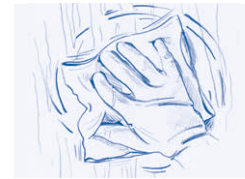
Application Types

Paints

Care



1. The product is sprayed directly onto the surface to be treated and then rubbed in with a clean, lint-free cloth.



2. The furniture cleaner and care product is then distributed over the entire surface by applying gentle pressure in a circular motion until it is completely dry. The product can be applied repeatedly until the area is cleaned and smoothly sealed. The micro wax only achieves its full effect when sprayed. Therefore, the product should only be applied with the spray head. Do not apply too wet!

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Important Notes:

Please note the following information in order to ensure that the desired appearance and durability of the painted surface of your object is retained for a long period of time:

- Never use sharp, strongly alkaline cleaning agents, cleaning agents containing solvents or scouring agents. Such cleaners attack the paint surface and can even remove it.
- Avoid standing moisture, e.g. from wet glasses, leaking flower pots or vases.
- Do not use microfibre cloths with seams to clean your object. These work like the finest sandpaper and will destroy the surface in the long term.
- We recommend seamless fleece wipes or chamois leathers.
- If possible, avoid using coasters with rubber or latex bases. These coatings may contain substances that leave marks over time.
- If your object shows heavy signs of use after a period of time, e.g. due to irregular care or excessive wear, it is advisable to have the surface renewed from the substrate up by your specialist company.

Test standards are very important for products used for coatings. Test standards evidence the quality and particular properties of the certified products and therefore ensure the necessary safety. The occasionally high demands (chemical demands, abrasion resistance, flame resistance etc.) from clients, architects or even tenders can therefore be fulfilled. All tests are exclusively performed on cured coatings. By clicking on the description, you can see all the Zweihorn® products (and test certificates) that meet the test standard.

In addition, you can download an overview here to see all the test standards for the various products.



DIN 4102 – applicable to Germany Reaction to fire/flame resistance ABP – General appraisal certificate

This standard refers to building materials and components for public and private building purposes (e. g., walls, ceilings, interior equipment, stairs, etc.). Validity: Paints/varnishes having a General Appraisal Certificate, may be used for building materials according to building rules list A, part 2, edition 2006/1, sub-par. 2.10.2. The GAC is the precondition for the application of components in public buildings. These varnishes/paints are subject to third-party monitoring. Hardly inflammable varnishes/paints according to DIN 4102-B1 must be used on wooden particle boards tested (according to DIN 4102-B1), also veneered or MDF boards tested according to DIN 4102-B1, in order to fulfil the testing criteria. On other substrates, only DIN 4102-B2 is considered to be fulfilled. The specified application quantity must be met exactly. Classification of flammability according to DIN 4102 Part 1:

- Building material class A = non-combustible
- Building material class B = combustible
- Building material class B1 = difficult to ignite
- Building material class B2 = normal combustibility
- Building material class B3 = easily to ignite



DIN EN 13501-1 – for Europe Applicable standard for reaction to fire/flame resistance

Classification of building products and construction techniques for buildings with regard to the reaction to fire (e. g., walls, ceilings, interior equipment, stairs, etc.). Applicable in all European countries. Especially for public buildings, such as airports, etc. In order to fulfil the testing criteria, hardly inflammable varnishes/paints according to DIN EN 13501-1 must be applied on the substrates specified in the test certificate. Other substrates are not permitted. The specified application quantity must be met exactly.



DIN 5510 - Preventive fire protection in railway vehicles, Part 2: Fire behaviour and fire side effects of materials and parts

This standard contains the requirements deemed necessary for the fire behaviour and fire side effects (smoke and burning droplets) for the materials and parts used in the construction of railway vehicles.



EN 71-3 - European standard – Migration of heavy metals / chemical elements (testing of children's toys, for example).

EN 71 part 3 determines the migration of harmful substances in coatings (heavy metals such as lead, chromium, cadmium, barium, etc.). A digestion process is simulated by means of extraction, which gives information about the solutes. The quantity of provable, extracted elements is determined. When doing so, the limit values of hazardous substances must not be exceeded.



According to Part 1 – DIN 68861 – Resistance of furniture surfaces: Chemical resistance

Stress groups – Classification:
 1A = highest/most resistant group
 1F = least resistant group
 Example: Chemically curing varnish/paint and hardener coats will be classed as stress group 1B. Varnishes/paints, which only dry physically/evaporating, will be classed as stress group 1C only. The tests are carried out with 26 different test substances, such as beverages, solvents, acids, common household detergents, etc.



DIN 68930 – Requirements to the surfaces of kitchen furniture regarding the resistance under changing climatic conditions.

Determination of the resistance under changing climatic conditions is made by means of a cycle test described in DIN 68930 in a climatic test chamber. The following cycle is carried out three times.
 Cycle:
 5 hours storage at 23 °C
 83 % relative humidity of air
 14 hours storage at 40 °C
 92 % relative humidity of air
 24 hours storage at 23 °C
 50 % relative humidity of air
 The substrate is a MDF board.



Tox Control - The label for low-emission furniture coatings

Due to the interaction of different pollutants indoors, already low quantities will cause afflictions such as headache, lack of concentration, irritation of the respiratory tract. Because many of these hazardous substances may also originate from furniture, the release of pollutants is examined by means of the test for the TÜV Tox Control label. The catalogue of testing criteria for furniture and all associated parts and cured coatings contains the following main point

- ▶ Formaldehyde content < 0.05 ppm after 28 days
- ▶ Phenol content < 14 µg/m³
- ▶ Isocyanate content < 0.1 µg/m³
- ▶ Solvent residues/volatile organic compounds (VOC) < 0.8 mg/m³
- ▶ Sum of all individual substances
- ▶ DIN 53160
- ▶ EN 71-3/9



For Zweihorn® products provided with the compliance mark (Ü), CE marking can be requested for structural components such as parquet, stairs, etc. This compliance mark (Ü) is only awarded to building products (parquet varnishes, wood flooring products, coating material and glues), which meet the health protection requirements made by the DIBT in the technical specifications.



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