[Z] ZOBEL
Coating Systems

Version 2.3

Zowo-tec®

Water-based coating systems for dimensionally stable wooden building components – windows, doors

[Z] ZOBEL
Coating Systems

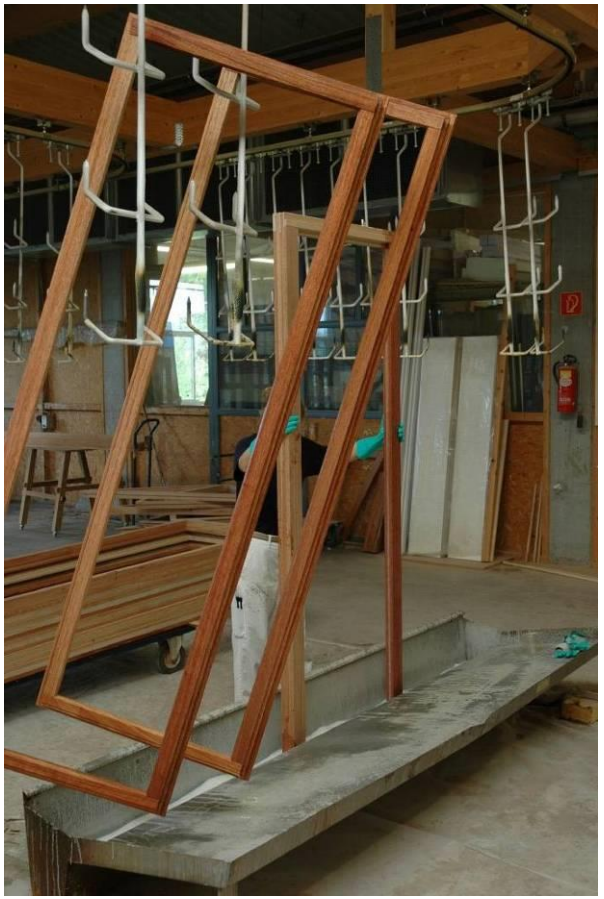
ZOBEL Zowo-tec®

Zowo-tec® „range of article numbers“

100 – 199	Impregnations	colorless
200 – 249	Primers	colorless / glazing
250 – 299		white opaque
300 – 349	Intermediate Coatings	colorless / glazing
350 – 399		white opaque / metallic
400 – 449	Final Coatings	colorless / glazing
450 – 499		white and colored opaque

Zowo-tec® Protective Wood Impregnation

- **preventive against blue stain, wood destroying fungi and insects**
- **fast drying**
  ⇒ reworkable after ca. 2 hours
- hybrid system with fine-seized alkyd resin
  ⇒ high penetration
- **very good sandability**
- **mild odor,** excellent defoaming
  ⇒ **especially suited for flow coaters**
- equalizes uneven suction behavior of the substrate
  ⇒ improves color uniformity of the primer
- colorless transparent



Blue stain is *at first* an optical defect

- growth at high wood moisture (> 20%)
- favoured by structural defects (open V-joint, insufficient gluing)
- concerned: many conifers, but also Meranti (if density < 500 kg/m³)
- blue stain grows beneath the coating and permeates the cellular membrane

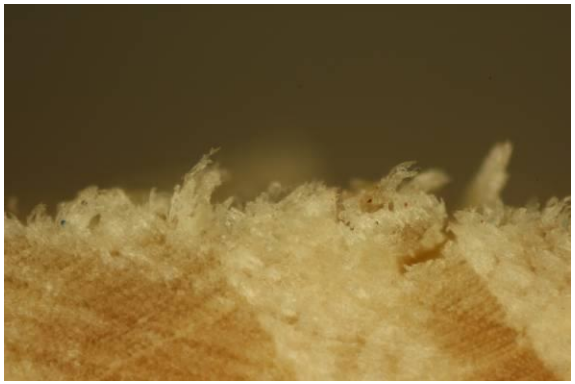
Blue stain facilitates moistening

- concerned woods are more absorbent
- paves the way for other fungi

Zowo-tec® 245 Transparent Wood Binder

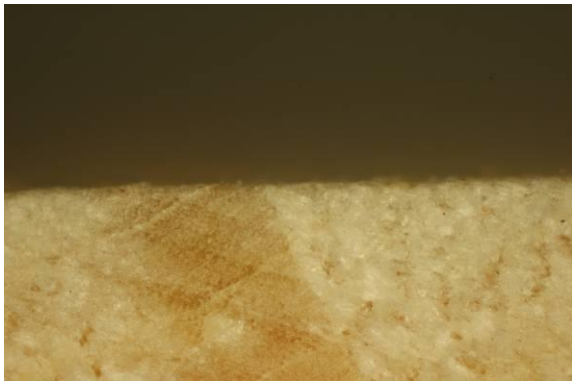
- **preventive against blue stain and insects**
- **fast drying** – reworkable after ca. 1 hour
- hybrid system of alkyd and acrylate
- **preallocation of fibres for homogeneous color distribution of the following primer**
  ⇒ adjustment of the different suction performance after microbic attack
- **simplifies sanding**
  through fiber fixation
  ⇒ for a particularly smooth surface

Zowo-tec® 245 Transparent Wood Binder



Raw wood

Zowo-tec® 245 not yet sanded



Zowo-tec® 245 sanded

» Zowo-tec® 245 reduces the sanding effort required in the overall system. «

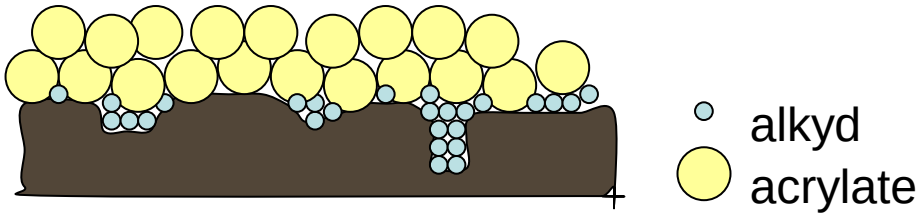
Zowo-tec® 246 Protective Wood Impregnation

- **preventive against blue stain and insects**
- **colorless transparent or pigmented**
- integrated in **ZOBEL Color Mixing System**
  ⇒ Basis GL
- **homogeneous coloring of problematical wood**
  ⇒ especially for finger-jointed areas or microbial infestation
- **solid rich**
- **makes sanding easier**

» Zowo-tec® 246 pigmented - for a more uniform coloring of problematical wood qualities, when treated with levelling tones. «

Zowo-tec® 200 Glazing Primer

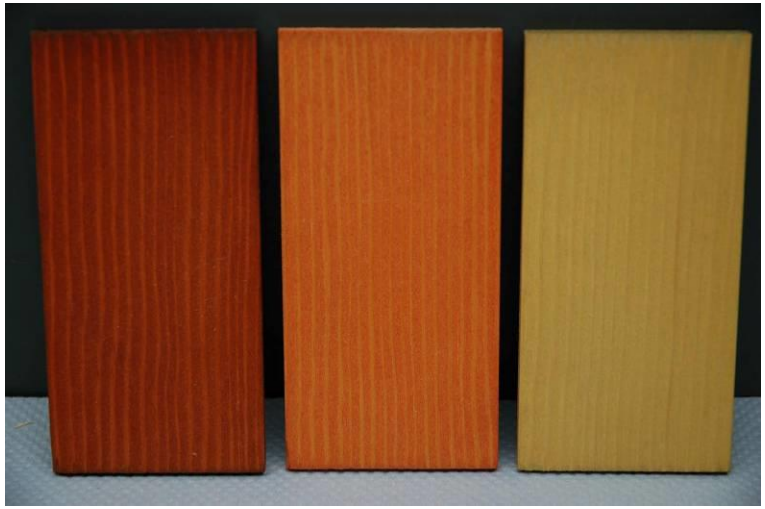
- bonding bridge between substrate and intermediate and final coating
- hybrid of alkyd and acrylate



- **excellent wetting**
- excellent penetration depth
  ⇒ Color depth
- **even flow** and **uniform color distribution due to** „spreading action“
- **easy to sand**
- **quick drying**

Zowo-tec® 200 Glazing Primer

- micronized pigments on iron-oxide basis for **high light fastness** and **high transparency**
- integrated in **ZOBEL Color Mixing System** ⇒ Basis GL
- colors: Color-Line Nature* and special colors
- coloring always in connection with intermediate and final coating



*also as T2: primer with more pigments, final coating with less pigments

Zowo-tec® 203 Protective Primer Glazing

- **preventive against blue stain, wood destroying fungi and insects**
- **impregnation and primer in one product**
  ⇒ added value: saves material and a working step
- multifunctional hybrid system
  ⇒ fine-part alkyd resin fixes active agent in the substrate
  ⇒ acrylate for adhesion promotion and good sandability
- product characteristics similar to Zowo-tec® 200
- Integrated in **ZOBEL Color Mixing System**
  ⇒ Basis GL

» ... time- and cost-saving impregnating primer, offering a large diversity of colors. «

Zowo-tec® 260 Insulating Primer white, opaque

- **excellent pore wetting** and **very good pore closure**
  ⇒ optimal basis for a coating result with closed pores
- **insulation effect** against water-soluble constituents of deciduous and coniferous woods
- ready for use
- high solid for **high opacity**
- **excellent drainage**
  ⇒ no time-consuming grinding of stretchers
- **good sandability**

» Zowo-tec® 260 highly contributes to a stainless coating result. Substances like tannin are durably bound. «

Zowo-tec® 263 Insulating Protective Primer white, opaque

- **impregnation and primer in one product**
  ⇒ added value: saves material and a working step
- **preventive against blue stain, wood destroying fungi and insects**
- high solid for **high opacity**
- **excellent pore closure**
  ⇒ as ideal preparation for a coating result with closed pores
- excellent **insulating effect** analogous to Zowo-tec® 260
- **good sandability**

» You can save with Zowo-tec® 263. «

Zowo-tec® 320 Intermediate Flow Coat, insulating, colorless

- for **process-optimized work**
- **excellent wetting and closure of pores**
  ⇒ as ideal preparation for a coating result with closed pores
- **insulating effect against discoloring wood constituents**
- for both, glazing and opaque coating systems
- **excellent draining properties**
  ⇒ no time-consuming sanding of paint drips
- for **filling power** and **moisture protection**

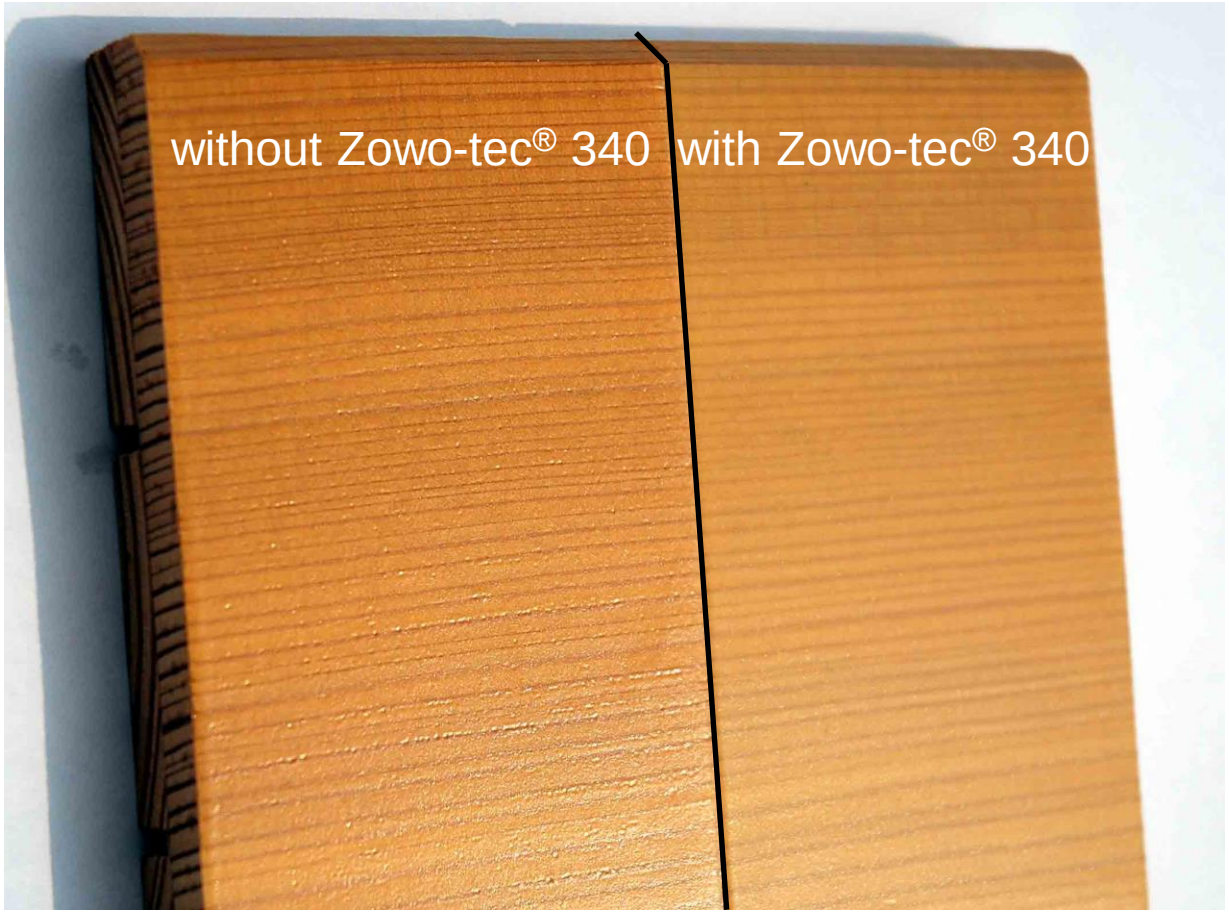
» Zowo-tec® 320 is predestined for industrial processing. «

Zowo-tec® 340 Intermediate Coat for Larch, colorless

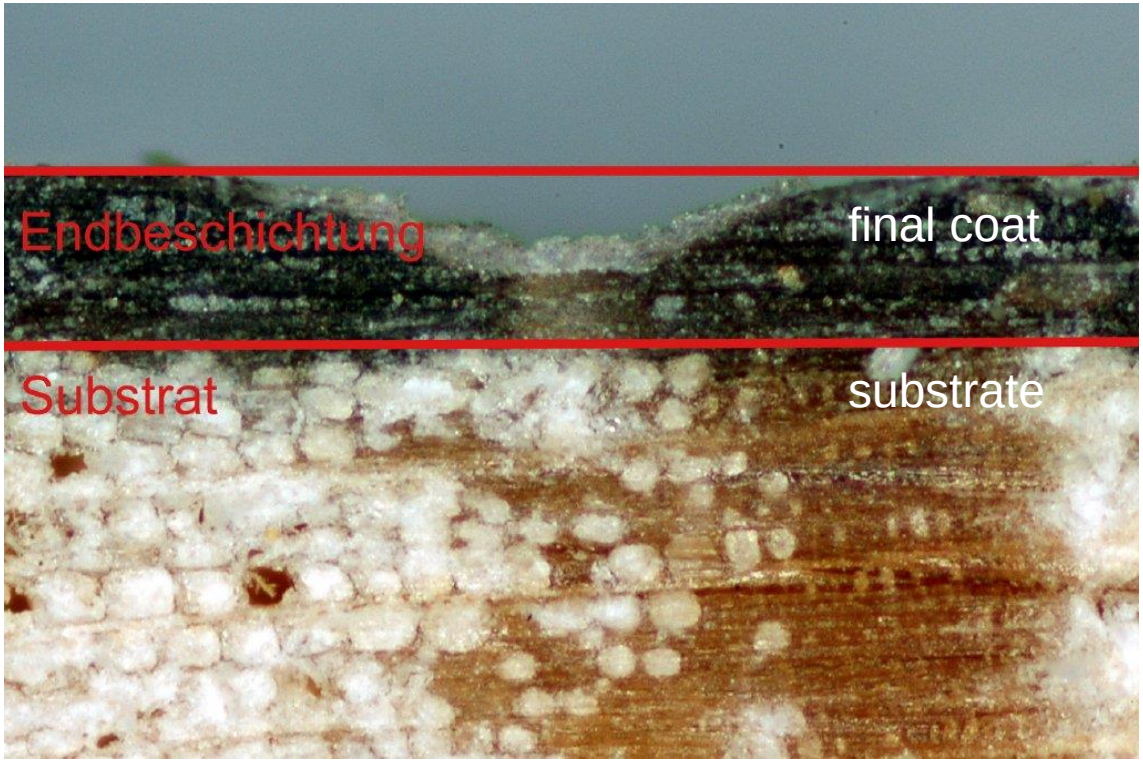
- **avoids surface imperfections of the final coating**, such as they can be caused by solvent properties of resin constituents
- **diffusion barrier** due to special, surface-treated filling material
- **for glazing and super transparent coating systems**
- simple processing since **one-component**

» .. for perfect larch surfaces. «

Zowo-tec® 340 Intermediate Coat for Larch, colorless



Zowo-tec® 340 Intermediate Coat for Larch, colorless



microscopic shot of a coated larch microsection

▶ the thick-layered glaze, here applied without Zowo-tec® 340, “caves in”

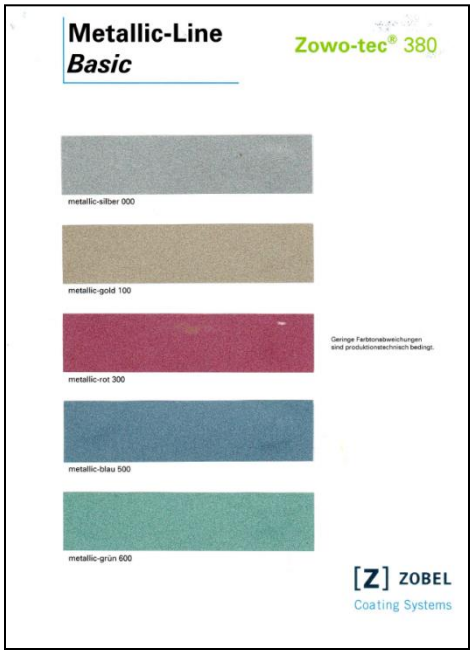
Zowo-tec® 360 Intermediate Coat insulating white opaque

- **insulation of resinous woods**
  ⇒ prevents surface defects of the top coat caused by solvent properties properties of resins
  ⇒ minimizes danger of discoloring caused by resins
- **stops water-soluble discoloring wood constituents**

» With Zowo-tec® 360 there is no chance for discoloration. «

Zowo-tec® 380 Intermediate Coat, metallic

- **even, intensive metallic effect**
- for protecting the metallic pigments, always in coating structure with Zowo-tec® 441 Finish-Coat
- integrated in **ZOBEL Color Mixing System** ⇒ Basis D
- Color collection **Metallic-Line Basic**



Zowo-tec® 384 Intermediate Coat insulating, white opaque

- insulating effect against discoloring wood constituents
- **excellent filling power**
- **excellent sandability**
- **especially suited for MDF**

» … Zowo-tec® 384 in coating structure with Zowo-tec® 484 1C-PUR Colored Top Coat for Doors and for MDF. «

Zowo-tec® 420 Thick-layered Glaze

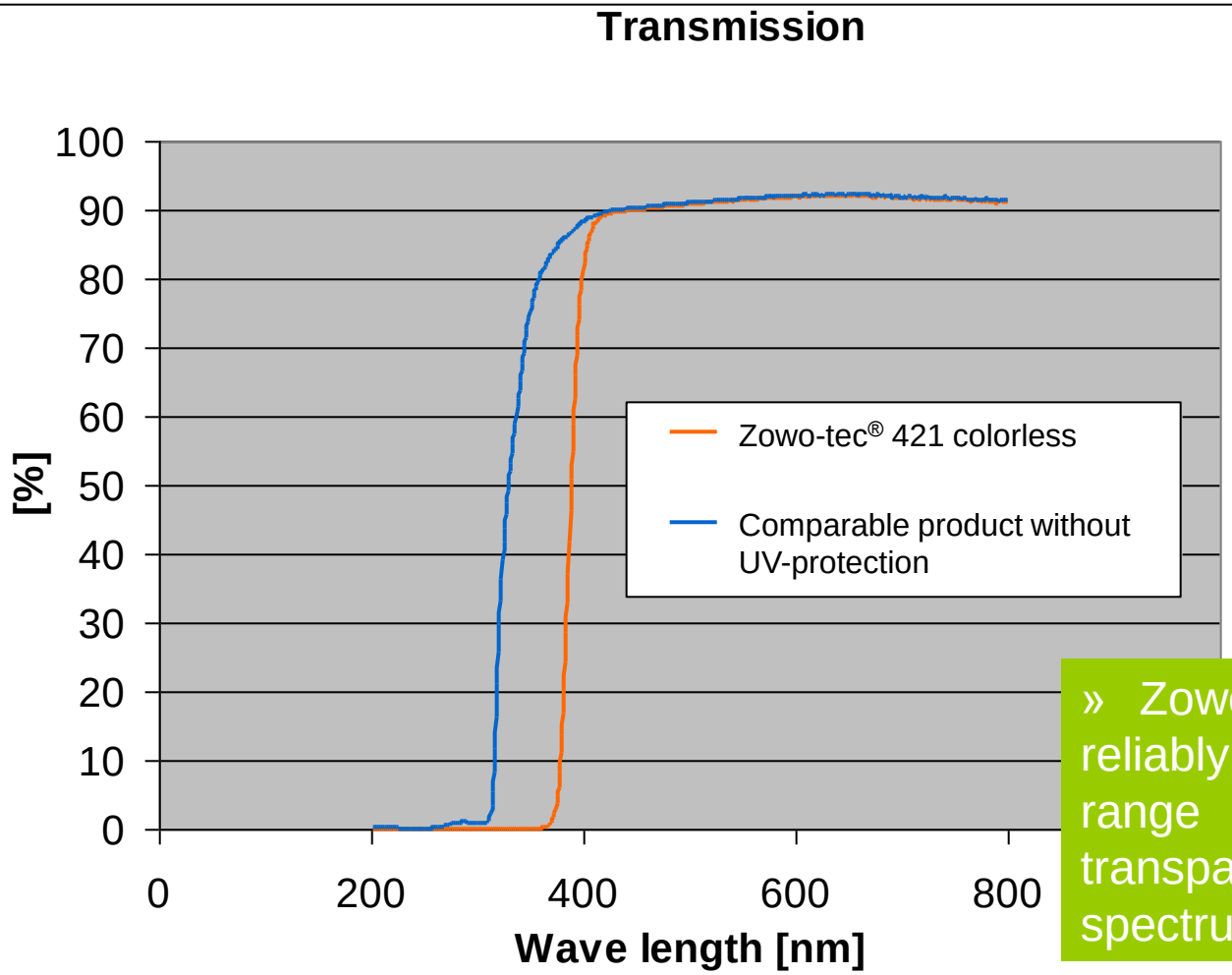
- **excellent transparency and color brilliance**
- silk gloss (ca. 35 gloss units), matt (ca. 20) or half gloss (ca. 55 gloss units)
- integrated in **ZOBEL Color Mixing System** ⇒ Basis EL
- Color-Line Nature* and special colors
- color results in the interaction with coloring primer
- „**almost haze free spraying**“ ⇒ wet-film thickness must be checked!

*also as T2: final coat with less pigments, primer with more pigments

Zowo-tec® 421 Glaze UV+, colorless

- applied as **colorless intermediate and final coating in coating structure with colored primer**
- protection of coating and wood surface through **high-dosed UV absorbers and radical scavengers** and the pigments of the primer
- classification of Glaze UV+ into the category „medium colors“
- **highly transparent and brilliant**
- **can be pigmented** for maximum protection
- silk gloss (ca. 35 gloss units) or matt (ca. 20)
- **wood preparation is relevant for painting success**
  => colorless glaze UV+ does not “level / mask“!

ZOBEL Zowo-tec®



» Zowo-tec® 421 Glaze UV+ reliably protects in the UV range and offers highest transparency in the visible light spectrum. «

Zowo-tec® 430 Wood-Aluminum Clear-Coat

- **highly transparent surface finish**
- gloss: silk-mat setting, ca. 20 gloss units
- **coloring of coating structure possible via primer**
- very good defoaming for high production rate
  ⇒ wet-film thickness up to 250 µm
  in one working step
- **predestined for industrial processing**
  ⇒ two-layer structure in connection with drying channel

» Zowo-tec® 430 emphasizes the noble character of the wood-aluminum window.«

Zowo-tec® 431 Wood-Aluminum Middle Layer Varnish

- for a **most natural appearence of the coated timber surface**
- normally applied in one spraying pass with a wet-film thickness of 175 µm*
- **offers pleasant surface feel**
- excellent transparency
- colorless
- coloring of the coating structure can be achieved via a colored primer
- silk matt setting, ca. 15 gloss units

*On visible areas a minimum dry-film thickness of 60 µm for glazing systems, as recommended in VFF-Guideline HM.01, is not achieved.

Zowo-tec® 441 Finish-Coat, colorless

- **protective clear coat for Zowo-tec® 380 Intermediate Coat, metallic**
- **most modern UV protection technology**
- excellent accentuation of the intermediate coat
- **excellent transparency and defoaming**
  ⇒ important for application on larger areas
- gloss: semi gloss (50 – 60 gloss units)

Zowo-tec® 444 1C-PUR Glaze for Doors

- thick-layered glaze based on polyurethane
  for **high mechanical loadability**
  ⇒ **scratch resistant but flexible**
- improved resistance
  against scratches caused by keys
- integrated in **ZOBEL Color Mixing System**
  ⇒ Basis EL
- gloss: silk gloss, ca. 35 gloss units

» … for extra scratch and abrasion resistance. «

Zowo-tec® 480 Top Coat white and Colored Opaque Lacquer

- **high solid system** for high opacity
- glaze-like high elongation at break
- excellent flow for elegant wood surface
- gloss: silk gloss, ca. 35 gloss units
- colors:
  ⇒ RAL 9016 traffic white, RAL 9010 pure white
  ⇒ integrated in **ZOBEL Color Mixing System**, Basis A and C

Zowo-tec® 484 1C-PUR Colored Top Coat for Doors

- based on polyurethane
  for **high mechanical loadability**
  ⇒ **scratch resistant but flexible**
- improved resistance
  against scratches caused by keys
- integrated in **ZOBEL Color Mixing System**
  ⇒ Basis C
- gloss: silk gloss, ca. 35 gloss units

» … for extra scratch and abrasion resistance. «

Zowo-tec® 485 Top Coat white

- **excellent moisture protection for more product safety**
  e.g. in buildings with high humidity levels (“winter construction sites")
  ⇒ **early water resistance**
  ⇒ **low water absorption**
- **rich in solid and binder**
  ⇒ ca. 49% solid content
  - good opacity
  - glaze-like high elongation at break
- good flow characteristics, starting from ca. 100 µm
- gloss: silk gloss, ca. 35 gloss units
- Colors: RAL 9016 traffic white, RAL 9010 pure white

» Closed pore top coat with excellent moisture protection. «

Typical characteristics of Zowo-tec® final coatings

▶ high elasticity	⇨ high mechanical loadability, e.g. in case of hail
▶ early anti-blocking	⇨ quicker further processing
▶ emphasis of the natural wood grain	⇨ the „wood character“ is maintained by efficient lining of the pores
▶ excellent flow	⇨ shorter flash-off phase
▶ early water resistance	⇨ reduced danger of water-whitening with early moist strain
▶ improved alkali resistance	⇨ better protection against spotting in case of short-time soiling with plaster or mortar

» A significant improvement of the coating properties. «

Zowo-tec® Product Characteristics

Characteristics „tailor-made“

The binder decisively influences the paint characteristics.

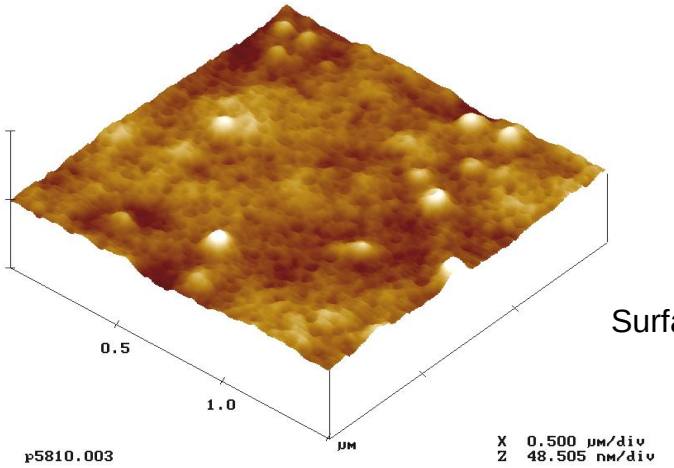
The binder causes characteristics such as

- **stick-resistance**
- **elasticity**

Zowo-tec® acrylic binders are usually self-curing multiphase polymers

e.g. „A-A-A-B-B-B-A-A-A-B-B-B“

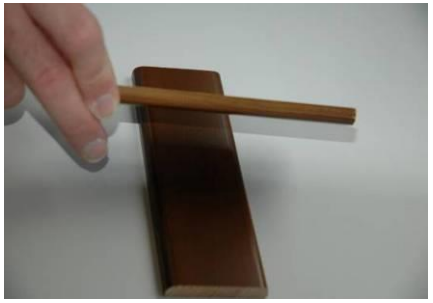
A = hard phase
B = soft phase



Surface picture by AFM

Zowo-tec® Product Characteristics

Early anti-blocking



Application with 400 µm Rakel on foil, followed by 24 hours drying at room temperature (RT) and interlocking for 24 hours at RT with a load of 800 g/cm²

Zowo-tec® Product Characteristics

Elongation at break

- following DIN 53504
- free film, no influence of the substrate

High elasticity, flexibility for

- mechanical loadability
  ⇒ hail resistance
  ⇒ temperature variations

Zowo-tec® Product Characteristics

Elongation at break*

(mean values of several individual measurements)

▶ opaque white and colored coatings

Product	Elongation at Break [%]
Zobel Zowo-tec® 480	153
Competitor C	30
Competitor B	17

VFF leaflet HO.03 demands an elongation ≥ 20%

*application method, amount and drying using the Zobel test method 01

▶ clear coats and glazes

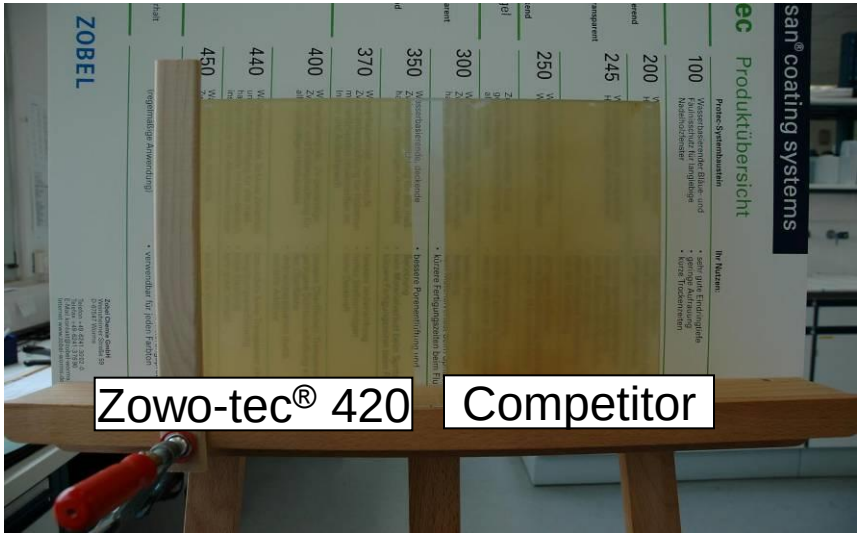
Product	Elongation at Break [%]
Zobel Zowo-tec® 420	174
Zobel Zowo-tec® 421	222
Zobel Zowo-tec® 430	200
Zobel Zowo-tec® 441	246
Competitor C	98
Competitor D	64

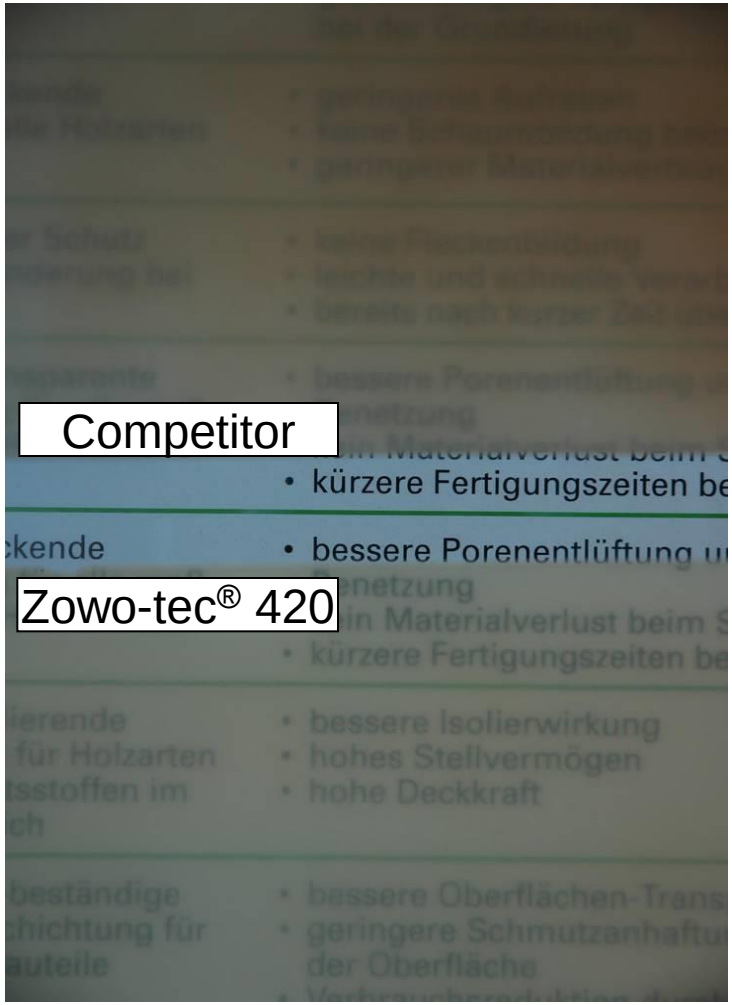
» The highly flexible films allow high mechanical loadability. «

Zowo-tec® Product Characteristics

High transparency and brilliance

- due to highly transparent binding agent and und micronized iron-oxide pigments
- for better visualization of the wood grain
- for more color depth

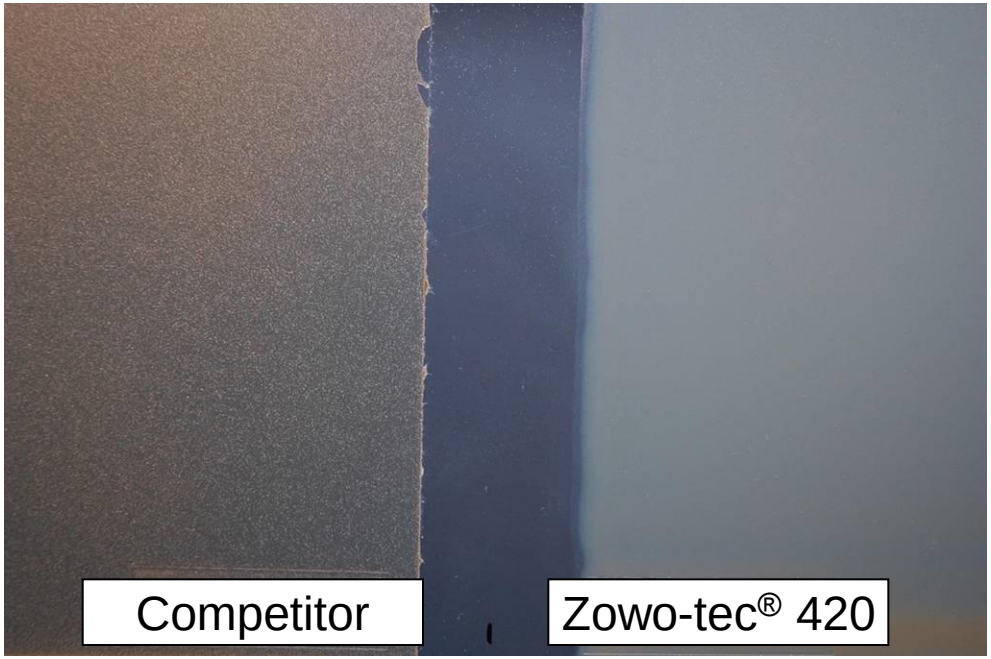




Zowo-tec® Product Characteristics

Influence on micro foam

- ▶ application method, conditions
- ▶ wet-film thickness
- ▶ room climate
- ▶ production process ✓
- ▶ defoaming ✓
- ▶ binding agent ✓

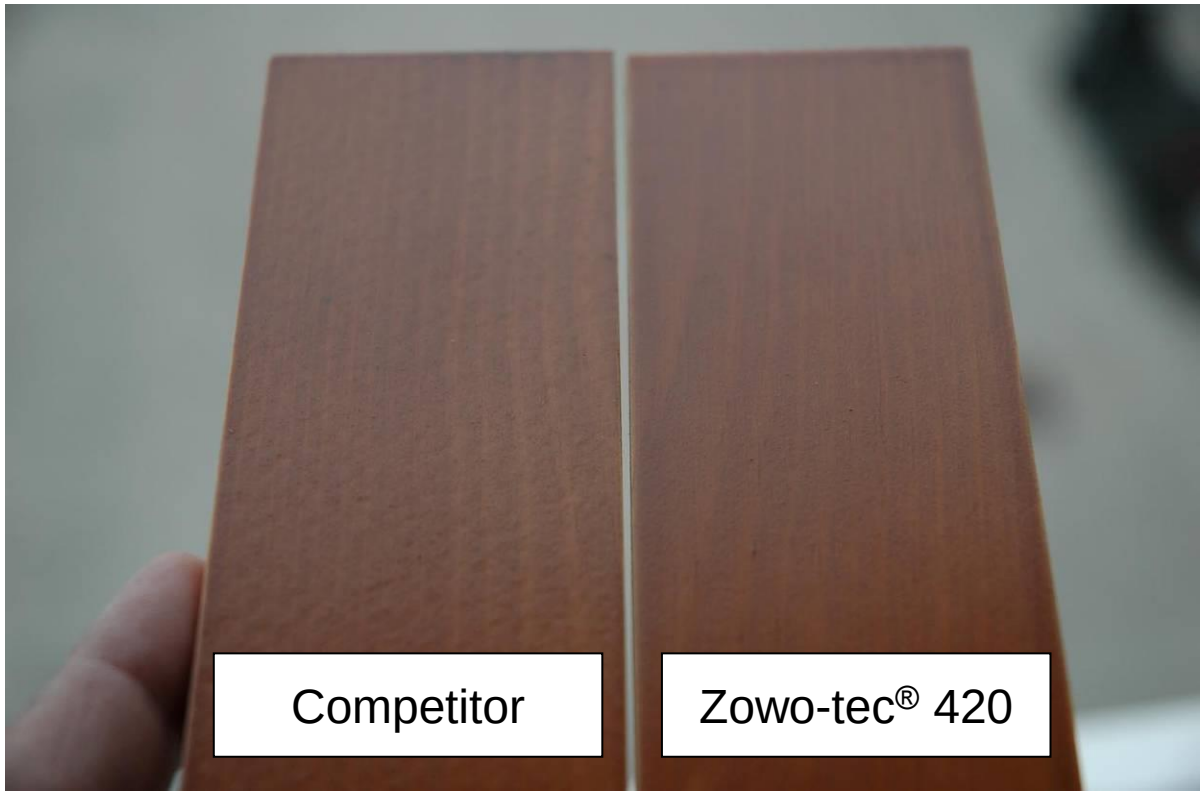


» Zowo-tec® coatings and glazes are optimized through most modern binder technology and defoamers. «

Zowo-tec® Product Characteristics

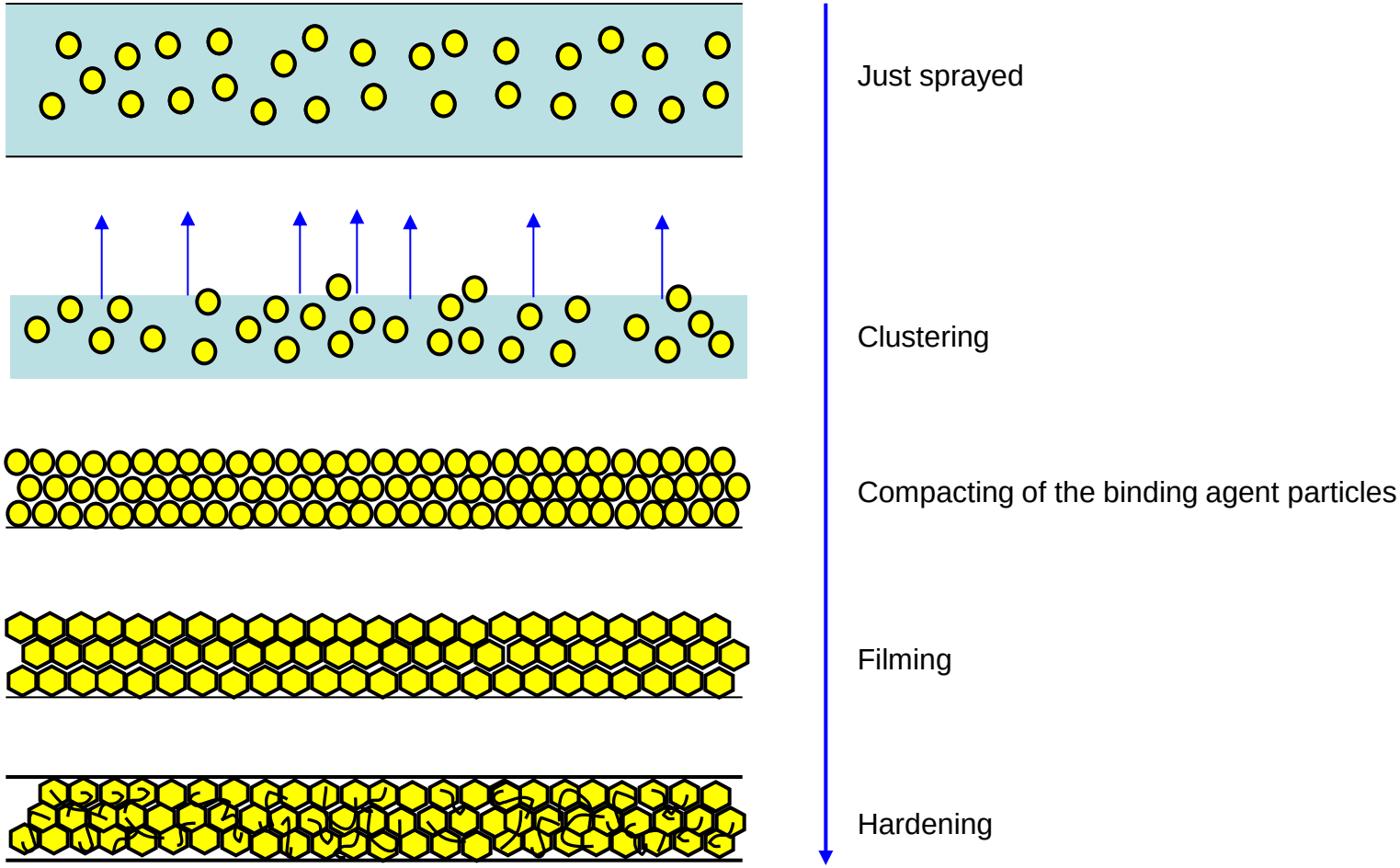
High profitability

- excellent flow at 150 µm,
  thus, lower consumption than previous products



Zowo-tec® Product Characteristics

What happens during drying?



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Zowo-tec® Product Characteristics

Drying at room temperature

- reworkable after ca. 4hrs*
- stackable after drying over night

* Zowo-tec® 444 and 484 require longer drying times

Drying in the drying channel

- excellent coating surface due to excellent flow
- short flash-off time
  => keep 5 – 10 min flash-off time
- forced drying 40 °C / 30 min*

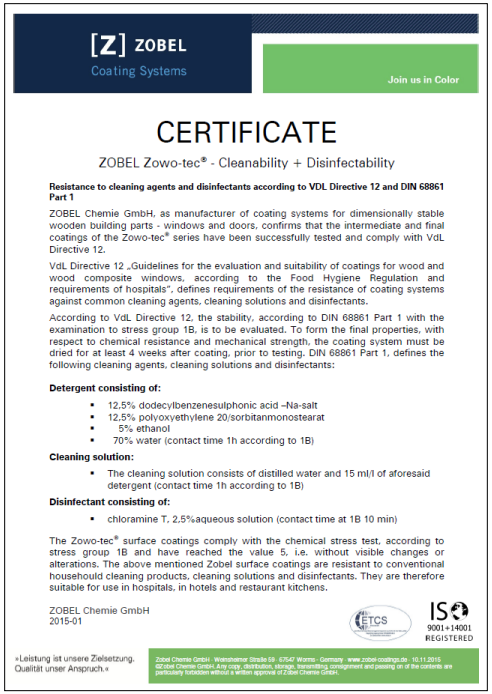
» Zowo-tec® coatings and glazes enable short cycle times. «

Zowo-tec® Product Characteristics

Resistance against cleaning agents, solutions and disinfectants

- **tested according to VdL* guideline 12** (window coatings in hospitals) and DIN 68861 part 1 (behaviour of furniture surfaces under chemical stress)
- **Zowo-tec® coatings and glazes comply with load group “1 B“** ✓

*German Paint Industry Association



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Join us in Color

CERTIFICATE

ZOBEL Zowo-tec® - Cleanability + Disinfectability

Resistance to cleaning agents and disinfectants according to VDL Directive 12 and DIN 68861 Part 1

ZOBEL Chemie GmbH, as manufacturer of coating systems for dimensionally stable wooden building parts - windows and doors, confirms that the intermediate and final coatings of the Zowo-tec® series have been successfully tested and comply with VdL Directive 12.

VdL Directive 12 „Guidelines for the evaluation and suitability of coatings for wood and wood composite windows, according to the Food Hygiene Regulation and requirements of hospitals“, defines requirements of the resistance of coating systems against common cleaning agents, cleaning solutions and disinfectants.

According to VdL Directive 12, the stability, according to DIN 68861 Part 1 with the examination to stress group 1B, is to be evaluated. To form the final properties, with respect to chemical resistance and mechanical strength, the coating system must be dried for at least 4 weeks after coating, prior to testing. DIN 68861 Part 1, defines the following cleaning agents, cleaning solutions and disinfectants:

Detergent consisting of:

- 12,5% dodecylbenzenesulphonic acid –Na-salt
- 12,5% polyoxyethylene 20/sorbitanmonostearat
- 5% ethanol
- 70% water (contact time 1h according to 1B)

Cleaning solution:

- The cleaning solution consists of distilled water and 15 ml/l of aforesaid detergent (contact time 1h according to 1B)

Disinfectant consisting of:

- chloramine T, 2,5%aqueous solution (contact time at 1B 10 min)

The Zowo-tec® surface coatings comply with the chemical stress test, according to stress group 1B and have reached the value 5, i.e. without visible changes or alterations. The above mentioned Zobel surface coatings are resistant to conventional household cleaning products, cleaning solutions and disinfectants. They are therefore suitable for use in hospitals, in hotels and restaurant kitchens.

ZOBEL Chemie GmbH
2015-01

ETCS

ISO 9001+14001 REGISTERED

»Leistung ist unsere Zielsetzung, Qualität unser Anspruch.«

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» Zowo-tec® coatings and glazes are well suited for being used in hospitals, in kitchens of hotels and restaurants. «

Decopaint Regulation (ChemVOCFarbV)

- Zowo-tec® easily fulfils VOC limit values
- VOC-approved ✓

Product*	**VOC [g/l]**	**Product category acc. Annex I**	**Limit value VOC [g/l] stage II since 2010**
Zowo-tec® 420	42	e	130
Zowo-tec® 421	41	e	130
Zowo-tec® 430	37	e	130
Zowo-tec® 441	36	e	130
Zowo-tec® 480	24	d	130
Zowo-tec® 484	79	d	130
Zowo-tec® 485	30	d	130

Zowo-tec® is integrated in ZOBEL Color Mixing System

- based on base coats and colorants

Product	Glazing Colors		Metallic Colors		Opaque Colors	
	Color-Line Nature	Special Tones	Metallic-Line Basic	Special Tones	RAL	Special Tones
Zowo-tec® 200	Basis GL					
Zowo-tec® 203	Basis GL					
Zowo-tec® 380			Basis D			
Zowo-tec® 420	Basis EL					
Zowo-tec® 421	Basis EL					
Zowo-tec® 444	Basis EL					
Zowo-tec® 480					Basis A und C	
Zowo-tec® 484					Basis C	

- glazing colors always consist of the color of primer, intermediate and final coating

ZOBEL Color Mixing System

» Colors are mixed within minutes and can be reproduced after years. «

▶ manual colorant dosing

▶ automated colorant dosing
with EDP supported recipe selection

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Our competences

ZOBEL Zowo-tec®	Water-based coatings for **dimensionally stable** wooden building components – windows, doors
ZOBEL [Z] Deco-tec®	Water-based coatings for **not dimensionally stable** wooden building components in- and outdoors
Zobel Zowo-plast®	Water-based coatings for PVCu in- and outdoors