

## **ARL 304 – Working guideline for coating dimensionally stable and limited dimensionally stable construction elements**

Windows – Front doors and Shutters – Garage doors

### **Maintenance and Renovation**

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## 1 General

Wood is a hygroscopic material, i.e. if uncoated it absorbs moisture from the air and expands. If the air is dry, the wood releases moisture and contracts. By coating with transparents or opaque pigmented systems this process is significantly reduced preventing the wood from losing its dimensional stability.

To prevent paint damage to the windows and mould formation due to excess indoor humidity during and after the construction phase, intensive airing is necessary several times a day. Condensation on the window panes must be avoided also during the heating period, which can be prevented by sufficient ventilation (for detailed information see our **ARL 300 – Working guideline for coating dimensionally stable and limited dimensionally stable construction elements - General part** or our **Maintenance Manual Windows & Doors**).

## 2 Cleaning & Maintenance

Maintenance and preservation of wooden windows and doors is a significant prerequisite for long durability of the surface. In order to minimise the cost and effort for this purpose, ADLER has developed an appropriate preservative system that can be used easily and efficiently:

The ADLER WinDoor Care-Set is a maintenance system for coated doors and windows made of wood, aluminium and PVC as well as garden furniture. Has a water-repellent effect and gives the surface protection against contamination. The gloss or matt finish of the surface is retained. We recommend cleaning and maintenance with the ADLER Windoor Care-Set once a year.



The ADLER Windoor Care-Set, consists of ADLER Top-Cleaner, ADLER Top-Care, two cleaning cloths and two spray heads (**Fehler! Verweisquelle konnte nicht gefunden werden.**).

Fig. 2.1: Windoor Care-Set

## 2.1 Application

### 2.1.1 ADLER Top-Cleaner

Apply ADLER Top-Cleaner over the whole surface with the cleaning cloth and wash the surface with warm, clean water and finally wipe dry.

### 2.1.2 ADLER Top-Care

**Front doors and garden furniture** Apply ADLER Top-Care thinly with the spray bottle and wipe with the maintenance cloth.

**Windows:** Spray ADLER Top-Care directly onto the maintenance cloth (blue), apply and wipe down.

ADLER Top-Care has a water-repellent effect and gives the surface protection against contamination. The gloss or matt finish of the surface is retained.

We recommend a single thin application per year for windows and two thin applications for front doors. This significantly extends the durability of the coating. Recoating at a later date is easily possible.

## 3 Checking the coating

Regular visual inspection of the coating by the end customer is important. At least once a year windows must be checked on mechanical damage to the coating. Through quick and easy repair of minor mechanical damage caused during the construction phase or by hail (**Fehler! Verweisquelle konnte nicht gefunden werden.**), extensive late damage can be easily prevented. It is absolutely necessary that manufacturers of the windows or front doors inform their customers of this.



Fig. 3.1: Hail damage to the window

During this check, the V-joints of the windows must also be checked for closedness (see **Fehler! Verweisquelle konnte nicht gefunden werden.** and **Fehler! Verweisquelle konnte nicht gefunden werden.**).

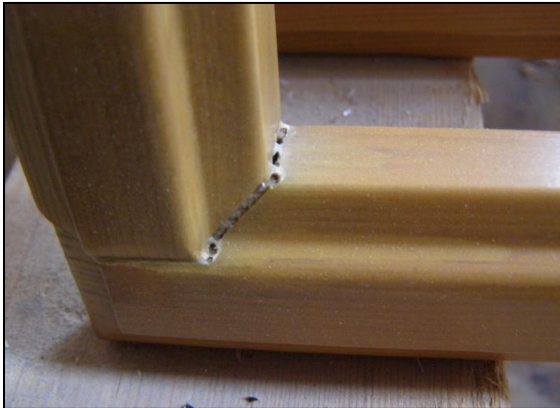


Fig. 3.2: Opened V-joint



Fig. 3.3: Opened V-joint

Extreme change of humidity causes intense swelling and contraction. Such dimensional changes can lead to open V-joints. If joints open up, they must be sealed with ADLER V-Fugensiegel.

## 4 Renovation

Due to the effects of UV radiation from sunlight in combination with constantly changing moisture levels, coatings are subject to high stress and require regular maintenance. Annual maintenance can save both working time and material. If you wait until there is already weathering or damage to the coating, you will have to repair the problem areas and apply a renovation coat, which is much more expensive than maintenance.

### 4.1 Repair of small mechanical damages



Fig. 4.1: Repair of damage

#### Windows:

Minor mechanical damage can be repaired with a pointed brush and ADLER Pullex Aqua-DSL (transparent coating) or ADLER Varicolor (opaque coating) (**Fehler! Verweisquelle konnte nicht gefunden werden.**).

#### Doors:

Minor damage can be repaired with original material Aquawood Protor D oder L.

## 4.2 Repair of major mechanical damage

Major mechanical damage such as flaking of the coating, cracks or greying, make it necessary to apply a layer of varnish to the damaged window element in order to fully restore the coating and thus its protective effect.

### 4.2.1 Renovation coating for transparent coated windows

#### a) With water-based products

Sand the damaged paint film down to the raw wood. Start with grit size 80 and re-sand with grit size 100 and 120 to regain a smooth, low-absorbent wooden substrate.

Prime with Pullex Aqua 3in1-Lasur (FS) or Pullex Aqua-Deco in the colour of the coating, which has not been sanded. After a minimum drying time of 4 hours apply 2 – 3 coats of Pullex Aqua-DSL brush application formula in the colour Hanf or Natur to the primed areas (approx. 3 hours intermediate drying time, intermediate sanding with grit size 280).

Then sand slightly the whole window with grit size 280 and recoat with Pullex Aqua-DSL brush application formula in the colour Hanf (hemp) or Natur (natural).

If the renovation coat is applied properly there is practically no obvious difference in colour between the renovated and not renovated part of the window. We recommend the following method for heavily damaged windows with extensive glaze flaking, extensive greying and wood cracks that have already occurred:

#### b) With solvent-based products

- **Softwood windows**

Sand the damaged wood down to the raw wood. Grinding of intact surfaces with grit size 120 in longitudinal direction. Paint the entire outside of the window 1x with Pullex Renovier-Grund (wood preservative impregnation) in the desired colour shade. Apply by brush 2 x coats (“wet in wet”) to highly absorbent wood parts and a thin coat to the parts that are intact. Smooth sanding with a fine abrasive fleece. Apply 2 x coats of Pullex Fenster-Lasur W30 blended to the desired colour shade to the entire window. Intermediate drying time: approx. 6 hours

**Note on the choice of colour:** It is best to compare the stock with the samples in the ADLER Holzfarbtonkarte (ADLER wood colour shade chart).

- **Hardwood windows**

Carry out pre-treatment as described for softwood. Colour matching of the sanded areas to the colour of the intact, unpolished old coating with a thin coat of Pullex Plus-Lasur or Pullex 3in1 Lasur (FS). Allow a drying time of about 12 hours and then sand smoothly using fine abrasive fleece. Apply by brush 2 x Pullex Fenster-Lasur W30 blended to the colour shade “Natur für Laubhölzer” (natural colour for hardwoods) to the entire window.

### 4.2.2 Renovation coating of opaque coated windows

Sand the damaged paint film down to the raw wood. Start with grit size 80 and re-sand with grit size 100 and 120 to regain a smooth, low-absorbent wooden substrate. To protect against blue stain, fungal and insect infestation, paint raw wood 1x with Pullex Aqua-IG. After drying for at least 4 hours, sand with grit size 280. Apply 1 – 2 coats of ADLER Aqua-Isoprimer PRO

to primed areas (at least 4 hours intermediate drying time). First top coat application with ADLER Varicolor in the required colour. After drying for at least 5 hours, sand the entire window with grit size 240 and topcoat again with ADLER Varicolor in the desired colour shade.

In the case of severely damaged windows, the renovation is carried out with the solvent-based renovation system consisting of Pullex Renovier-Grund and Pullex Color.



Fig. 4.2: Before renovation coating



Fig. 4.3: After renovation coating

#### 4.2.3 Renovation coating of front doors

Analog procedure as for windows.

##### Transparent:

1 x Pullex Renovier-Grund and 2 x Pullex Fenster-Lasur.

##### Opaque:

1 x Pullex Renovier-Grund and 2 x Pullex Fenster-Lasur.

#### 4.3 Practical tip:

##### 4.3.1 General advice before starting the renovation

- Only use brushes suitable for water-based paint (soft acrylic brushes). For solvent-based products, please use the ADLER HS brush.
- Do not paint over silicone or seals.
- The processing and object temperature must not be less than + 10 °C. High humidity and/or low temperatures delay drying.
- Do not paint in direct sunlight.
- Clean tools with water immediately after use to prevent paint residues from drying.
- Do not close wooden windows until they are completely dry (approx. 12 hours).
- Grease moving parts of the fittings with long-term lubricating grease once a year.
- We recommend installing window flashings, which reduce the risk of mechanical damage and protect the severely weathered lower part of a window.
- The renovation of constructionally unprotected windows and front doors is preferably carried out with solvent-based products.
- Please observe the relative technical data sheets of the products.

## 5 Hail damage repair

ADLER transparent systems (for example Aquawood Finatop 40 or Aquawood Finapro 20) or ADLER opaque pigmented window systems (for example Aquawood Covatop XT 20 or Aquawood Covapro 20) have viscoplastic characteristics and can withstand light hail without damage. More severe hail impact causes damage to varying degrees, which is also determined by the species of wood (density, hardness). For example, experience has shown that the effect of hail on Oregon is smaller than on spruce.

Hail damage on transparent coated windows is more difficult to repair than on opaque coatings. According to our experience, the following applies:

**If transparent coated wooden windows are so severely damaged by impact of hail, that cracks appear in the wood, renovation is only possible using opaque coatings!**

Four typical situations after the impact of hail on a transparent coated wooden window are described in the following including the appropriate renovation. The renovation of severely damaged opaque coated windows is carried out according to point 3 or point 4, for slightly damaged windows refer to point 1. Alternatively, situations 2 and 4 can also be carried out using the above renovation methods for heavily damaged windows with solvent-based Pullex products.

### 5.1 Dents under 1 mm depth, no flaking and wood ruptures, no greying (due to excess time delay), fine cracks in the coating

- Clean windows with ADLER Top-Cleaner, rinse with warm water and wipe dry.
- Fill dents 1 x with Arteko-Elastik Farblos (colourless), immediately remove using a rubber or plastic spatula.

Note: If the appearance is not important and only the protective function is to be fully restored, this step can be omitted.

- Apply by brush 1 x coat of Pullex Aqua-DSL in the colour Hanf (hemp) or Natur (natural) to the entire window. Apply 1 – 2 x coats of ADLER Varicolor in the desired colour shade to opaque coated windows.

### 5.2 Dents under 1 mm depth as under point 1, but greying and flaking of the coating due to excess time delay between the hail damage and renovation

- Sanding the damaged transparent film and greying down to the raw wood with grit size 80/100/120 (entire frieze).  
Practical tip: Pre-abrading with a cutter knife shortens the grinding work.
- Prime with Pullex Aqua 3in1-Lasur (FS) or Pullex Aqua-Deco in the colour of the unsanded coat, light intermediate sanding after at least 4 hours drying with grit size 280.
- Apply by brush 2 x coat of Pullex Aqua-DSL in the colour Hanf (hemp) or Natur (natural) to the primed areas. Intermediate drying time: at least 4 hours
- After a minimum drying time of 8 hours: Resand the entire window with grit size 220-/240 applying low pressure.

Fill dents 1 x with Arteko-Elastik Farblos (colourless), immediately remove using a rubber or plastic spatula.

**Note:** If the appearance is not important and only the protective function is to be fully restored, this step can be omitted.

- Apply by brush 1 x coat of Pullex Aqua-DSL in the colour Hanf (hemp) or Natur (natural) to the entire window.
- Renovate opaque coated windows according to point 3 or 4.

### **5.3 Wood ruptures caused by severe hail impact, but no greying (due to excess time delay)**

- Prime the ruptures with Pullex Aqua-IG Farblos (colourless). Intermediate drying time: at least 4 hours
- Fill ruptures 1–2 x with ADLER Acryl-Feinspachtel Weiß (white). Drying time: at least 2 hours. Smooth the filled areas with grit size 220/240.
- Apply by brush 1 x coat of ADLER Aqua-Isoprimer PRO to filled areas. Drying time: at least 4 hours
- Slight sanding of the entire window with grit size 220/240 applying little pressure.
- Apply by brush 1-2 x coats of ADLER Varicolor in the required colour to the entire window. Intermediate drying time: at least 5 hours

### **5.4 Wood ruptures caused by severe hail impact with greying and flaking of the coating due to excess time delay between the hail damage and repair**

- Sanding the damaged glaze film and greying down to the raw wood with grit size 80/100/120 (entire frieze).  
Practical advice: Pre-abrading with a cutter knife shortens the grinding work.
- Prime sanded areas and ruptures with Pullex Aqua-IG Farblos (colourless). Intermediate drying time: at least 4 hours
- Fill ruptures 1-2 x with ADLER Acryl-Feinspachtel Weiß (white). Drying time: at least 2 hours. Smooth the filled areas with grit size 220/240.
- Apply by brush 2 x coats of ADLER Aqua-Isoprimer PRO Weiß to primed and filled areas. Intermediate drying time: at least 4 hours
- Overnight drying prior to applying the topcoat significantly improves the insulating effect!
- Slight sanding of the entire window with grit size 220/240 applying little pressure.

Apply by brush 1–2 x coats of ADLER Varicolor in the required colour to the entire window. Intermediate drying time: at least 5 hours



## 6 Oiled wooden windows – Maintenance and renovation

Oiled surfaces do not meet the standards for ready-coated wooden windows. If customers insist in this kind of surface, the following verifiable written information must be transmitted to them (duty to warn and advice of the producer).

If a wooden or wooden/aluminium window has been impregnated, coated and finished with Aquawood Terra-Finish, Aquawood Lärchenöl or finished with Pullex Holzöl or Pullex Holzöl TQ, only occasional cleaning with warm water and sponge cloths is necessary for interior maintenance. The addition of mild neutral cleaners to the washing water is possible.

Regarding the external parts (traditional wooden windows) there is only a limited suitability of the coating with oil. The product does not correspond to the ÖNORM B 3803 regarding thickness of the layer and UV-protection. The dimensional stability of thick film glazed surfaces will not be reached.

Because of the influence from sun and rain the oil will be degraded on the surface and due to this the windows have to be maintained regularly. Due to the different weathering intensity at the window, the lower third of which is much more exposed to the weather, while the upper part is normally much better protected from the effects of water by the installation depth, uniform weathering is not possible! According to the intensity of weathering on the installation location maintenance with Pullex Holzöl 1–2 x a year is absolutely necessary. For that purpose a thin layer of the product has to be applied with a cotton cloth. If the absorption is high capacity this has to be repeated after overnight drying.

**An oil coating for traditional wooden windows is therefore only possible under the condition of regular and targeted care, so that the natural wood character is preserved for as long as possible. Greying of the wood substrate is prevented in the long term.**

If the surface needs to be repainted due to slight damage to the exterior, the old coating must be sanded off completely with abrasive paper, grit size 80/100/120, and then recoated with Pullex Holzöl. A slight sanding with grit size 280 after drying of the first layer is suggestive.

If the maintenance has been failed and there is wood that has been partially greyed and/or infested with wood discolouring fungi, it is very difficult to restore an optically even surface and is no longer possible with an oiled surface.. The damaged area must be sanded back to the healthy wood using abrasive paper with grit size 80/100/120 . Intact parts must be sanded slightly in longitudinal direction of the window frame using grit size 180. The entire window is then painted 2x with Pullex Silverwood in the possible colours Altgrau (old grey), Silber (silver) or Graualuminium (grey aluminium). A change to other coating products may cause adhesion problems (blistering). This has no value for the recommended method of repair.

**Attention:** Attention: With cloth, which have been soaked with oxidative oils there is the danger of self-ignition! Spread soaked cloths out and let them dry; it is necessary to store them in sealed metal containers or under water.

## **7 Treatment of window shutters, coated with medium layer glazes – Maintenance and Renovation**

Alternatively to thick-film coatings for window shutters with Aquawood Finatop 40, Aquawood Finapro 20 or Aquawood Covatop XT 20, Aquawood Covapro 20 also the medium-layer coating systems Aquawood Fineline L and D can be used. Advantages: particularly high water-vapour permeability and easy to renovate.

### **7.1 Maintenance**

Apply ADLER Top-Cleaner over the whole surface with the cleaning cloth and wash the surface with warm, clean water and finally wipe dry. Spray ADLER Top-Care directly onto the maintenance cloth (blue), apply and wipe down.

### **7.2 Maintenance – Transparent surfaces**

Depending on weathering intensity and and necessity, recoat with one thin coat by brush of Pullex Aqua 3in1-Lasur (FS) or Pullex Plus-Lasur every 2 to 4 years. The optimal time for a maintenance layer can be recognised by the loss of gloss on heavily weathered surfaces and the reduced roll-off effect when it rains, but at the latest when small cracks appear.

### **7.3 Maintenance – Opaque surfaces**

Depending on weathering intensity and and necessity, recoat with one coat by brush of Pullex Aqua-Color or Pullex Color in the original colour shade every 2 to 4 years. . For the optimal time for maintenance please see Maintenance – Transparent surfaces.

### **7.4 Renovation – Transparent surfaces**

Brush off weathered, grayed wood, old paint residues, dust and dirt with a brass wire brush and then sand with abrasive paper grit size 60 – 100.

Prime 1x with Pullex Renovier-Grund, paint highly absorbent wood areas 2x wet-on-wet. After drying overnight, apply two coats of Pullex Fenster-Lasur.

### **7.5 Renovation – Opaque surfaces**

Pre-treatment and priming as for transparent surfaces. Top coat either 2x with Pullex Aqua-Color (dry for approx. 48 hours) or 2x with Pullex-Color.