

## 1700 System

1700 System is a simple and easy-to-apply process specifically developed by OLD WOOD for wooden instruments. It covers grounds, oil natural colours, and oil varnishes, and enables you to generate a wide spectrum of finishes adaptable to any technique using oil-based coatings.

1700 System helps to achieve a balance between the beauty of the instrument and its musical quality, ensuring that both will improve with age, and facilitating the luthier's task.

### ► 1. Protein Insulation → GELATINE solution (2 – 3%).

This consists of the application upon wood that is clean and ready to varnish of a solution containing one or more protein compounds. These may be of animal origin (glue, gelatine, albumin, casein, egg yolk, etc.) or vegetable origin (gum arabic, tragacanth, cherry tree gum, sarcocollin, fig tree sap, etc).

*\* L M: Condax, in research conducted in 1970 for the Mellon Institute of Pittsburgh, found that protein sealer (glue and albumin) was used as a primer. For his research he used microtome sections and varnish samples from a 1699 Guarneri, a Tecchler, and a Venetian instrument dated 1707.\**

OLD WOOD recommends that you begin by isolating the wood, applying a 2-3% gelatine solution, and adding a small amount of albumin (egg white). For spruce, apply three coats of this solution; for maple, one is enough.

It is best to apply the solution with a piece of sponge, and to use a hair dryer to dry each coat, in order to avoid internal tension in the wood. If the gelatine solution is increased with albumin, then when it is dry the instrument should be exposed to sunlight or ultraviolet light in order to boost the albumin's properties of coagulation and insolubility.

- **Albumin** is obtained from egg whites, which are 85% water, 12% albumin 0.2% fat and other components. It belongs to a group of proteins that have the property of coagulating under heat. When diluted, applied in a thin coat and exposed to the light, it acquires insolubility properties under normal humidity conditions.

- **Gelatine** is a pure form of glue made from delicate animal tissues and which is refined with greater care and purity than ordinary glue. It is sold in thin colourless sheets or in powder form.

From a chemical viewpoint, the complex proteins making up the glues can be divided into two classes.

- **Chondroitin**: Responsible for the glues' adhesive properties.

- **Glucosamine**: Responsible for their gelatinous nature.

Gelatine contains more glucosamine and chondroitin than glue. Its properties are more gellative than adherent.

Gelatine, glue or casein will degrade at temperature above 53° C, changing colour and losing a large part of their adherent properties.

- **Gum arabic and tragacanth \*\*\*** are used as a primer or undercoat with very good results, by means of an old formula employed in Cremona and in other Italian city-states, and are known as "Camisega" (■ *Tecnica Costruttiva Degli Antichi Liutai Italiani / Euro Peluzzi*).

*\*\*\* To prepare tragacanth it should first be soaked in alcohol, and then dissolved in water.*

- **Gelatine or glue + Alum\*\*\***: Successfully used since antiquity is the procedure of adding 4 -5 % de alum to the glue or gelatine, as a hardener and the make them less hygroscopic This method is used only with glues made from skin and pure gelatines. If added to bone glues, the solution will be cloudy.

*\*\*\* The alum should be dissolved in water and then be applied the to glue or gelatine solution. The resulting preparation should be disposed of after use.*

#### ■ Recommended books:

- *The Artist's Handbook of Materials and Techniques / Ralph Mayer*
- *Dictionnaire des matériaux du Peintre / François Perego*
- *Malmaterial und seine Verwendung im Bilde / Max Doerner*
- *Vernici in liuteria / Gabriele Carletti*

## ► 2. Italian Golden Ground 1700 → One or two applications.

The application of one or two coats of Italian Golden Ground 1700 (PH= 7) furnishes white woods like maple, spruce or poplar, with a remarkable interior light and a lovely colour –golden cinnamon—which arises from the interior without modifying or saturating the structure, giving it a warm aspect and producing an effect similar to the exposure of the wood to sunlight over a long period.

### ▣ See:

- **Italian Golden Ground 1700**
- **Application instructions.**
- **Application examples.**
- **Application video.**
- **References.**

## ► 3. Imprimitura Minerale 1700 → One application.

Imprimitura Minerale 1700 is a transparent ground that produces a very high refraction and enhances the acoustic properties of the instrument. It is used as a colourless primer for saturating the pores of the wood.

*\* In 1989 Dr. Barlow and Dr. Woodhouse published their research findings. They suggested that as a primer for antique Italian varnish, a coat of mineral particles was used in a medium of resin oil or linseed oil.*

*Their analyses of Stradivari instruments showed that the mineral layer was made of a mixture of minerals and other elements, but there were significant variations among instruments.*

*Their study did not examine self-cementing elements, puzzolana, creta, soluble glass (potassium silicate) or ground glass.\**

Imprimitura Minerale 1700 should be applied by hand (use nitrile or vinyl gloves) in a single, very thin coat. Its use will prevent the saturation of the structure of the wood with colour when Doratura Minerale 1700 is subsequently applied, and will ensure that the latter provides a high level of refraction and dichroism.

### ▣ See:

- **Imprimitura Minerale 1700**
- **Application instructions.**

## ► 4. Doratura Minerale 1700 → Two applications.

The minerals in Doratura Minerale 1700 are processed by hand to ensure a spectacular and warm, clean, and clear golden hue, which is stable under light (7), transparent, and highly resistant to oxidation and deterioration over time. Its use gives high refraction and enhances the acoustic features of the instrument.

Doratura Minerale 1700 should be applied by hand (use nitrile or vinyl gloves), in two extremely thin coats.

### ▣ See:

- **Doratura Minerale 1700**
- **Application instructions.**

## ► 5. Oil Classical Varnish 1700 → One application.

OLD WOOD's Classical Oil Varnish 1700 products are perfectly suited for this process, but we recommend the optimum properties of **Classical Amber Varnish 1700 – OW.**, one of the varnishes mentioned in the oldest manuscripts, and obtained from the heating of amber, unlike **Clear Amber Varnish** \*\*\* - which is not made or sold by OLD WOOD – and which at the end of the 19th century began to be made using the dangerous chloroform method\*\* and in the 20th century with rock salt \*\*\* and which was never included among the classical varnishes.

\*\* Berger, Ernst. *Beitraege zur Entwicklungsgeschichte der Maltechnik*. Munich, Callwey, 1897 – 1909. Folio 389.

\*\*\* *The Violin Makers Journal*, June, 1961, p. 4. Robert Hill.

**Classical Oil Varnish 1700 – OW.** products must be applied by hand (using vinyl or nitrile gloves) in a single, extremely thin coat. A brush or sponge may be used, but the best results are obtained using the hands.

This coat operates as an intermediate sealant between the last coat of **Doratura Minerale 1700** and the coat of **Oil Natural Colours – OW.** By isolating the colours; saturation is avoided, transparency is assured, and refraction and dichroism are augmented

### ▣ See:

- **Classical Oil Varnish 1700**
- **Application instructions.**

## ► 6. Oil Natural Colours + Oil Varnish 1700 → One or more applications.

OLD WOOD's wide range of **Oil Natural Colours** what developed specifically for application to wooden instruments.

The application of **Oil Natural Colours – OW.** is easy and simple:

The colours are mixed, and a few drops of and **Classical Oil Varnish 1700 – OW** are added as a medium. To make application easier, a few drops of linseed oil may also be added.

The general application is done by hand (use nitrile or vinyl gloves), and the colour is spread uniformly, in like a **glaze**, using a small paintbrush for the volute and other to remove excess colour from areas of difficult access.

• The colours can also be applied with a brush, but in this case more varnish should be used to make a more fluid solution.

For this application we recommend **Classical Amber Varnish 1700 – OW.**

Here follows the formula for obtaining excellent results in applying **OLD WOOD** colours:

A few drops of **Classical Amber Varnish 1700 – OW.** + A few drops of **Liquin** \*\*\*

– Winsor & Newton or similar. (± 50% of each).

\*\*\* *Liquin (W & N): This is a type of long oil alkylid resin in gel form, used as a medium of excellent performance in artistic painting.*

### ▣ See:

- **Oil Natural Colours – OLD WOOD**
- **Application instructions.**

## ► 7. Oil Classical Varnish 1700 → One or more applications.

Once the coat of Oil Natural Colours – OW is polymerised (dry) **any of the** Classical Oil Varnish 1700 – OW. varnish may be applied as a **glaze** by hand (use nitrile or vinyl gloves), in one single and very thin coat. The hands are best, but you may also obtain good results with a sponge or brush.

Depending of the desired objective, processes 6 and 7 can be repeated once or twice more, as indicated below:



## ► 8. FINISHING → Two or more applications

It is advisable to finish the instrument with two or more coats, as desired, with any product in the Classical Oil Varnish 1700 – OW range.

Remember that the coats must be as thin as possible for the best results.

### ■ See:

- *Classical Oil Varnish 1700*
- *Application instructions.*

## ► 9. POLISHING

A newly built instrument may be used by the musician in rehearsals and concerts at a good level, but only when the wood has attained its optimum degree of vibration and the varnish has fully hardened does it begin to develop in a state of maturity.

Finishing with oil-based varnish requires the utmost care, since the total polymerisation of this type of finish takes at least two years. The colour coats and varnish, even when dry (polymerised), remain delicate and should not be subjected to rough handling or friction. This is true of all oil-based varnishes.

### • Process of finishing and polishing the varnish:

1. The varnish should be sanded very lightly to remove any dust without damaging the varnish itself or the colour

- Use **Micro-mesh** or similar extra-fine emery cloth, soaked in deodorised liquid paraffins (which do not contain dangerous aromatic hydrocarbons) or mineral oil that does not attack the varnish or colour. Use nitrile or vinyl gloves.

2. Polish with **Super Nikco** on a piece of cotton or gauze. Alternatively, take a piece of cotton gauze to which **Super Nikco** has been applied, and add a little extra fine-grain **tripoli** polish compound. Polish with the utmost care, especially on the edges, the head, and rib joints, which are the areas most likely to lose colour.