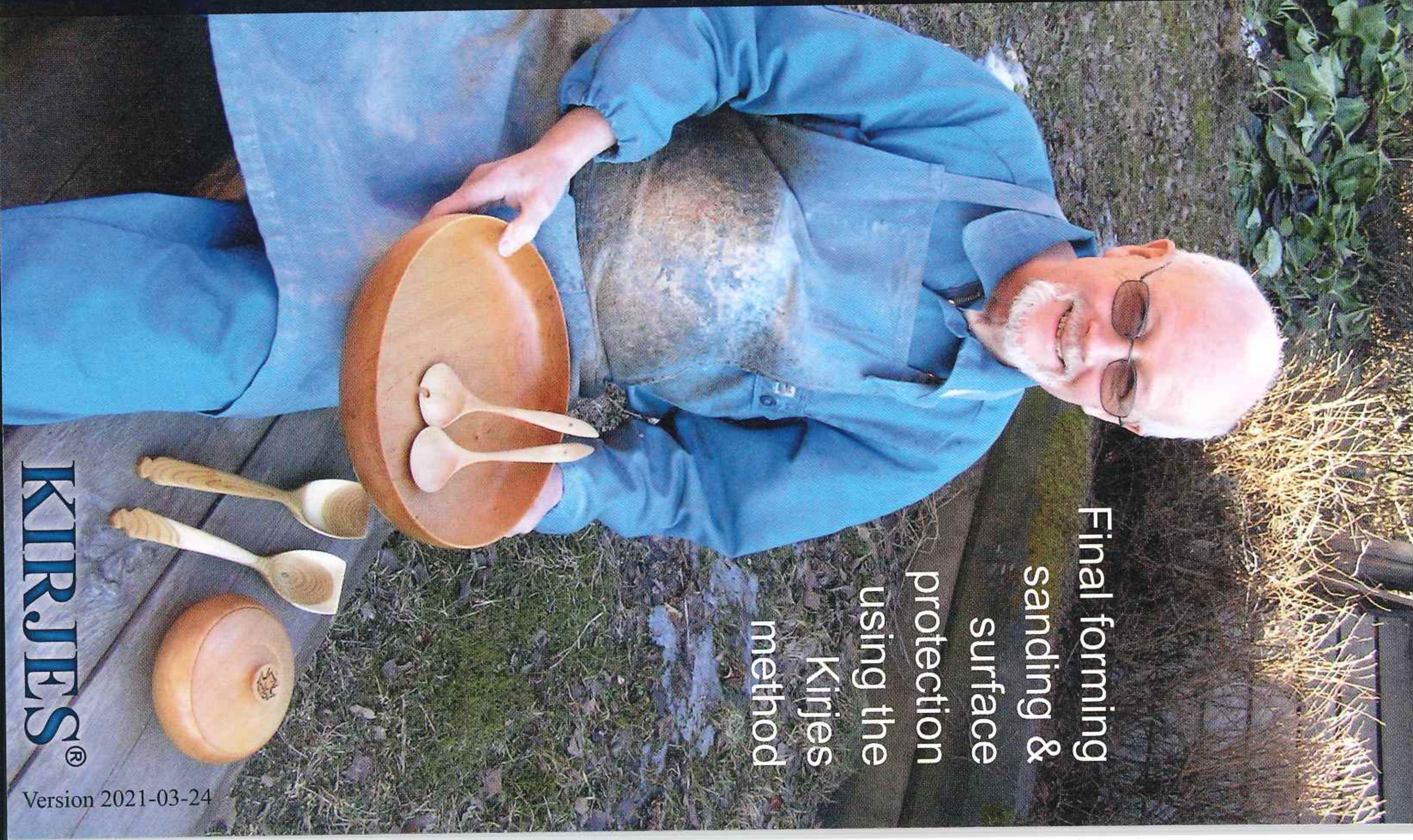
THE VELVETY WOOD SURFACE



Final forming sanding & surface protection using the Kirjes method

KIRJES®

Version 2021-03-24

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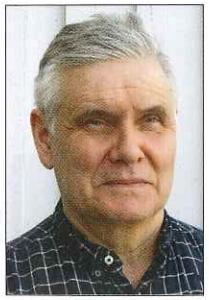


Peter Boman.
Author and
inventor of
the Kirjes system

A wooden object with a velvety surface fascinates everyone, even children. The appreciation of the beholder is not just in the eye but also in their hands. When your hands meets a velvety wood surface a positive sensation arises. Any wooden object, even the most simple ones, be it a bowl, a sculpture or a piece of Intarsia, can be transformed into art with a velvety surface!

This small booklet helps you to discover and describes the procedure to produce and preserve the velvety wood surface. We have choosen to divide this finishing procedure into three stages; final forming, sanding and surface protection. The procedure is described in detail e.g. how Gerhard step by step makes a pair of sallad spoons with a velvety surface. This work is normally very time consuming but is significantly shortened with the help of the Kirjes sanding and polishing system.

The Kirjes System has different kits for sanding and polishing

Visit our website www.kirjes.se for more information

Total Sanding System

FINISHING WORK USING THE KIRJES METHOD

INTRODUCTION

In my hand I am holding a small piece of untreated cherry wood that has undergone final sanding with a sanding cloth, grit 400. The touch reveals a velvety surface unique for wood. I just have to study the surface more closely, sense it, feel it, lift it into different lights.

- The velvety wood surface emphasizes the natural beauty of the wood, its structures and shades.
- The velvety surface protects against dirt and liquids and provides a good "hygienic surface".
- The velvety surface minimises all forms of surface treatment.
- The velvety surface gives a positive, warm and soft feeling when touched.

Maybe some wooden objects require a velvety surface more than others, for example, jewellery and the inside of bowls (hygienic surface). However, we normally regard the velvety surface on a wooden product as a sign of good quality whether it relates to the details on furniture, toys, a case, a bowl, a walking stick, a knife handle or sheath, a sculpture or a piece of art in 3D-intarsia.

Kirjes Flexible Shaft with a mounted sanding sleeve on a Kirjes Inflatable Sander mod.140.

Racoon pattern by Judy Gale Roberts.

Nappi by Knut Gustafsson

This small booklet describes in simple terms the procedure to produce the velvety wood surface with the help of the Kirjes' polishing and sanding system on the type of work we have mentioned above. This work mainly involves sanding according to a number of inescapable rules which are described in the booklet. However, when working with Kirjes over the years, it has become evident that this work is really about the process, of finishing work in three fairly distinct stages.

Sune Enoksson called me one day and virtually only ordered sanding sleeves in grit 80. This was in the very early days of our company and had only one product to offer our customers, an inflatable sander model 140. As Sune (master in Lapp woodwork) is a man that appreciates the velvety surfaces, I was forced to ask whether he also needed some fine sanding cloth. He then said that he used grit 80 on model 140 to form the outside of his "nappies" (large scoops made from birch burls previously used for milking reindeer).

As Sune is extremely particular when choosing his tools, I immediately became aware that here Kirjes worked better than other types of tools! In this case Sune had replaced file, rasp and knife with Kirjes for his finishing work to form his "nappie". Sune confirmed a phenomenon that I usually show in my demonstrations on different types of object, i.e. the final forming. The final forming has the task of removing material whilst sanding and aims to improve and eventually produce the velvety surface.

Burl by Benny Widmark

THREE STAGES OF THE FINISHING WORK

1) Final forming

Before the polishing is started complete the, final forming. Use the sanding sleeves **grit 60 or 80 and sometimes also grit 120** on our inflated sanders. As mentioned before, we have chosen to call this forming and not sanding for the simple reason that this is more a question of removing material than "improving" a surface. Another reason is that here Kirjes replaces a number of different tools such as rasps, files and cutting tools such as knives, chisels, etc. Forming work, using Kirjes inflated sanders, can in some cases take longer, but this time is made up easily when it comes to the sanding stage.

2) Sanding

The aim of the finishing work is to achieve the velvety wood surface. It is a job that primarily consists of sanding with Kirjes inflated sanders. What you need to understand, even at this stage, is that sanding normally takes time and not just a little time, but a great deal of time, or as one of my young apprentices said after I told him for the fourth time that he need to sand even more: "today I have understood what eternity is". The good news is that the Kirjes sanding system significantly shortens this time, when compared to the usual methods, in some cases several days' work to hours and sometimes minutes. With sanding we mean **work with abrasive material grit 150 and finer and sometimes also grit 120.**

3) Surface protection

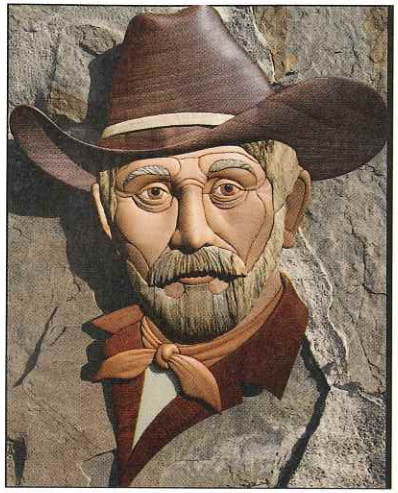
After the velvety surface has been produced with the help of sanding, comes the final stage of the finishing work; we have chosen to call this surface protection. **The beautiful velvety wood surface requires, as we mentioned earlier, a minimum of surface treatment!**

Nearly all wood surfaces require some surface treatment that protects against moisture and dirt. The idea behind Kirjes surface protection is to preserve the velvety surface as untouched and natural as possible. For this purpose we have developed Kirjes oil-based wax in a paste, which is enhanced with the wax from the bearberry plant (Arctostaphylos Uva Ursi).

Bearberry grows, among others, in extremely barren, and windswept mountainous areas where the summers are short and the winters long. The leathery, slightly glossy yet constantly green small leaves are filled with wax that protects the plant against its surroundings. Correctly applied, the oil penetrates down into the wood while the wax stays on the surface and protects against moisture and dirt and gives a silky matt finish. We use Kirjes brush sleeves and cloth sleeves to polish the oil-based wax. These soft and flexible sleeves are pumped onto the inflatable sander in the same way as the abrasive cloth sleeves. (See the section "surface protection with Kirjes").

APPLICATION

Kirjes can generally be used for all types of wood working including details in furniture making and also on some parts made of metal, horn and other materials. Over the years it has been shown that Kirjes sanding system is unusually well suited within certain application areas. By that we mean that apart from Kirjes, very few tools are needed to finish a product. Some examples:



3d-pattern by Judy Gale Roberts

Wood object by Judy Gale Roberts

3D-Intarsia

This form of intarsia, which is based on joining pieces of wood from different tree species in different dimensions together to form a three dimensional piece of art, has been developed by people such as Judy Gale Roberts (pictures to the left) and Jerry Booher in USA. To get an idea what this is about visit their nice website at www.intarsia.com

In principle, what's needed, in addition to the wood, is a pleasant pattern, a jig saw and the Kirjes sanding system. At the end of this booklet there are some links for further information and videos for those of you who would like to try their hand.

On the website www.intarsia.com there are many different patterns.

Object by Knut Gustafsson

Irregular bowls, trays and ladles

The irregular bowls are usually manufactured out of and follow the forms that nature has given the wood. We recommend our OrbiCut tools (page 34) or King Arthur's Tools for coarse work to remove the material before the finishing work with Kirjes. The two inflatable sanders that are most appreciated in these contexts are the Kirjes bowl sander and Kirjes model 140.

Guksi by Tore Sunna

Bowl by Knut Gustafsson

Wooden spoons and ladles

Spoons as well as other wooden cutlery are made all over the world. Scandinavians love to use salad spoons made of wood. Natural elements meet natural elements. These materials are often chosen directly in nature so that the direction of the grain follows the proposed form of the spoon. This then produces a very hard-wearing product. The rough form is produced using a bandsaw, jig saw or with an ordinary handsaw, for example a Japanese saw. You can then whittle out the form gently from the rough, undried material. (Of course, you can also produce spoons from dried wood!)

This is followed by the drying phase, which can cause some problems. The material must not dry too quickly as it can then crack or twist. A simple trick is to bury the material in moist sawdust in a plastic bag in which you have made small holes. Another very effective trick is to rub the material with cooked potatoes. This method works surprisingly well and does not discolour the material when sanding. The drying time varies depending on the material thickness and the ambient temperature and humidity. A spoon that is about 10 mm (3/8") at its thickest point can take between 1-2 weeks to dry. Preferably weigh the material when wet. Many species of wood lose half of their weight when approaching a moisture ratio of 10 percent (also see the "wet or dry" section). This is followed by the finishing work with Kirjes.

You can follow this work in more detail under the heading *Gerhard's Velvety Masterpieces*.

Salad spoons by Gerhard Spaarmann

Power Sanding

This is an expression frequently used in wood turning. Sanding is nevertheless required, even if you can achieve very fine surfaces especially using the cutting method. One of the reasons for this has to do with the composition of the wood and we have explained why under the heading "Cut or sanded". Another reason is that it is extremely difficult to produce a perfect surface by just turning. Normally a turner sands his products by hand while the material rotates in the lathe.

Bowl from Vännäs

Power Sanding involves sanding on the slowly rotating material with Kirjes' inflatable sanders fitted to a flexible shaft and the motor. The method is very effective! It is much appreciated when sanding materials that have been turned wet. When these dry the material has taken on a more or less irregular form, usually oval. If you now put the material in the lathe for sanding it must rotate very slowly (0-100 rpm) as the material wobbles, and sanding by hand is extremely time-consuming. With power sanding it takes no time at all! One problem however is the amount of dust produced. The turner will quickly look like a snowman even if using a local dust extractor. Kirjes has developed a dust extractor handle that snaps onto the handle of the flexible shaft to counteract this problem.

Boxes, cases and small furniture

Case

Cupboard and box
by Bengt Lindgren

Boxes, cases and small furniture usually require more advanced tools than the products mentioned above. Naturally if you have a fully equipped carpentry workshop it takes no time at all, but it is still possible to achieve good results using high quality hand tools in the form of planes, Japanese saws, chisels, knives, screw clamps, etc. There is a great deal of literature about the subject available from booksellers.

This type of product is of a size that tempts you to pick them up and handle them. It is therefore very important that you have invested time in the finishing work and especially the sanding. A velvety surface lifts this type of product to unimaginable heights. A beautiful box or case can be compared with a piece of jewellery and is fascinating not only to look at but also to touch. Even very simple boxes made by a beginner can be incredibly attractive with a velvety surface. The Kirjes sanding system is ideal to quickly sand this type of product.

An important function in this connection is that the inflatable sanders (especially model 140 on a flexible shaft) can finely polish small flat surfaces. When a Kirjes model 140 sander is applied to the flat wooden surface, the sleeve's contact face also becomes flat and because the edges of the sander are soft no sanding marks are created when sanding. In addition, the diameter of model 140 is significantly greater than the handle on the Kirjes flexible shaft and means you can sand large areas. It is important that you continuously move the sander back and forth evenly so that it does not remain stationary and create a hollow.

Knives

Knife by Per-Erik Nilsson

I nearly forgot knives in the list of application areas where Kirjes works unusually well. Many people make their own utility or ornamental knives for example, in Sweden, Norway, USA and Canada. This is probably because many people in these countries take pleasure in outdoor life where a knife is part of the basic equipment. Sune Enoksson, who I mentioned earlier, is a well known knife maker in Sweden and also bearer of the southern Lapp cultural heritage. The knife has always had a decisive significance in the daily life of the nomadic Lapps. I must also mention Jan Eriksen, well known knife maker from Sandefjord in Norway. In our infancy, i.e. when we only made model 140, Jan used to send me long lists of orders with a name and address in Norway. At the time I did not known, that there were so few knife makers and woodworkers that knew what an inflatable sander was, so really the response was very good. Different types of wood, horn and metals are used on knives. These three materials can all be polished with Kirjes original sanding sleeves. Furthermore, we discovered that horn could be polished superbly with polishing paste Dialux white applied to a Kirjes cloth sleeve.

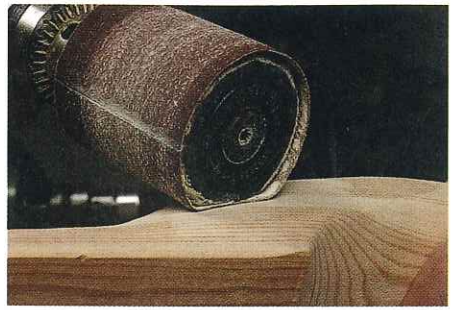
Wooden sculptures

Cat on pillow by Gerd Lövgren

Kirjes is ideal for certain types of wooden sculptures where the aim is to produce velvety surfaces.

LIMITATIONS

The whole point of Kirjes inflatable sanders is their extreme pliability, which goes right out to the end. This means that they mould themselves to the material to be sanded whether this is round, convex or concave. It is also possible to fine polish small flat surfaces without scratches as the sanding area on the Kirjes sander becomes slightly flat when pressed against the surface and the edges of the sander are soft.



This characteristic means that the inflatable sander 140 mounted on a flexible shaft can perform unique sanding tasks that other sanding tools just can not match. It also allows you to take on large sanding work that normally requires significantly larger sanders! Kirjes inflatable sanders are not suitable for large flat surfaces and we have yet to develop our equipment for the very small miniature details, but the basic principles for sanding described in this booklet are universal and also apply to other types of sanding tools and machines!

QUICK COURSE

Are you one of those who like to get started straight away and experiment your way to a velvety surface? There is however one thing you should know:

You must gradually change the grit size of the abrasive from coarse to fine **at least 4 times** before you can attain a velvety surface.

Grit 80 or 120–150–220–320 and/or 400.

On a really finely cut or planed surface, 2-3 changes in grit size may be enough, for example, grit 220 and 400. A material that is machined wet normally requires grit 120 or 150 with initial sanding. Before switching grit size the surface produced by the previous grit must be completely sanded down. Unfortunately there are no shortcuts. Final polish with at least grit 320 on softwoods and grit 400 on hardwoods.

ESSENTIAL KNOW HOW TO ATTAIN THE VELVETY WOOD SURFACE

Cut or sanded

Sometimes on really fine cut or planed wood surfaces it is possible to start sanding with P150 or P220. It addition to fibres, wood also consists of hollow sap conduits and diverse cavities, that are usually so small they are not visible to the human eye. The expression "pores" is usually used as a collective name for these small cavities in the wood. The sap conduits transport liquid from the living tree's pith out to the tree's outer layer and thus run square to the grains' and the tree's longitudinal direction. A cut surface contains an endless number of cut and sharp edges on the tubular like fibres and the sap conduits that continuously move in and out as the wood continually adapts to the surrounding humidity.

When the hand and fingers touch this kind of cut surface it feels smooth but vitreous. The finger can get caught on such a surface which can feel hard and cold. Sanding on the other hand rounds off these sharp edges and gives a warm and velvety surface.

In summary: a cut or planed surface can never be placed on a par with the velvety surface without having been sanded.

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Wet or dry

It is popular today to work with wet wood. It is an experience to go out into the forest, select the material for your product and on the spot start to whittle its shape.

As previously mentioned, the wood has a number of small cavities; even the wood's fibres are oval and hollow. The sap conduits are hollow and in addition there are, especially in hardwoods, large cavities that sometimes are visible to the eye e.g. beech and oak. When the tree is cut down its cavities are filled with water, the wood is wet. Eventually the water in the cavities dries and you reach the fibre saturation point. This means that there is water remaining in the wood, but this is bound to the cell walls with a moisture ratio at about 28–30 %. When the wood continues to dry it shrinks considerably in two directions, up to 10 % against the fibre direction, but only about 0.2 % in the fibre direction. This sometimes causes difficulties with cracks and twisting.

They say that wood is a living material, that it moves. These movements in the wood occur primarily when the water travels out of the wood and it shrinks, but also when the water travels into the wood and swells. The wood has the property that it tries to adapt to the surrounding humidity (wood is a hygroscopic material). Kiln-dried wood has a moisture ration of 7-15 % depending on the moisture content of the wood's surroundings. In other words, kiln-dried means the moisture ratio when the wood from now on will be most stable indoors and swells or shrinks as little as possible.

From this we understand that it is completely impossible to sand a velvety surface on wet wood as it continuously moves and changes. It may be possible to smooth the surface of the wet wood using a coarse abrasive (P40–P80). **A velvety surface can only be sanded on kiln-dried wood, preferably with a moisture ratio below 10 %.**

Soft or hard

As we mentioned, wood is a living material and each piece of wood has its own character and beauty depending on which species it belongs to, from which part of the tree-trunk it has come (usually the wood is darker in the core and lighter out towards the bark), but also depending on the environment and under which conditions the tree has grown – soil, water and nutrient supply, etc. Oak can be lighter or darker, more or less porous as well as softer or harder despite it being general known that oak is a hard and durable material. The experienced layer of oak flooring learns to choose his material with care.

All species of wood can mainly be divided into soft and hard species. The wood's smallest constituent parts, the cells, are mainly oval, thin and hollow and are usually summarized as fibres. The fibres in softwoods are about 1–3 mm long and have a diameter from 20/1000 (20 µm) to 0,035 mm while hardwoods have a fibre length of less than 1 mm and a fibre diameter of less than 0,020 mm. Our least known machining tool for wood is abrasive cloth and abrasive paper. FEPA (Federation of European Producers of Abrasives) in Paris has its "P" marking (P150 = grit 150) has decided that abrasive material marked P400 has a grit size with an average diameter of 0,035 mm, while P800 has a grit diameter of 0,021 mm.

Practical experience while producing the velvety wood surface has shown that it requires final sanding with at least P320 (grit 320) or P400 on softwoods and P400 or P600 on hardwoods.

Direction

The fibres principally follow the wood's longitudinal direction. They are woven together by diverse binding agents so that at times you can experience wood as fibrous especially in the softwood species. This means the wood is absolutely strongest in the direction of the grain, which has a great significance when choosing the material for your product. To take a very simple example, the fibres should follow the handles longitudinal direction.

When you sand you also follow the longitudinal direction of the fibres where possible. When you sand across the fibres these are cut off forming sharp edges. The eye perceives these as sharp scratches which are extremely difficult to sand out. This explains why sanding sleeves are preferable to discs especially when using the coarser grits. The floor sander only uses discs in exceptional cases and then in areas which can not be accessed with a belt sander. Efforts should be made with the end-grain to sand "downhill".

It is frequently difficult to determine the fibre direction on a piece of wood. Planks are always sawn in the fibre direction! The most attractive wood pattern is usually found in burls, knots, root systems and deformities. These are often ideal for bowl-shaped items. The fibres usually run in all directions in these materials and it is not important in which direction you sand.

Undulations

There are always some fibres that are livelier than others even when the final sanding has been done and the wood has been air-dried. This may be because they absorb water more easily than the others. It may also be due to sanding with a heavily clogged abrasive cloth whereby these fibres have then been pressed down in the belief that by pressing hard you improve the sanding result. These lively fibres usually protrude when you subsequently treat (oil or varnish) your product. In the worse case the product can be completely patchy, but normally the surface is slightly downy. The downy surface is hardly visible, but you can clearly feel it with the tops of your fingers. This undulation is sanded off using a fine abrasive cloth P320-400 or possibly P220 for lacquer work. You can entice out the lively fibres by applying warm water over the surface so it is slightly moistened. This moistening of the wood surface is important when you want a lasting velvety surface. This sanding requires some care so that only the raised fibres are sanded off. The moistening effect is lost if you sand more.

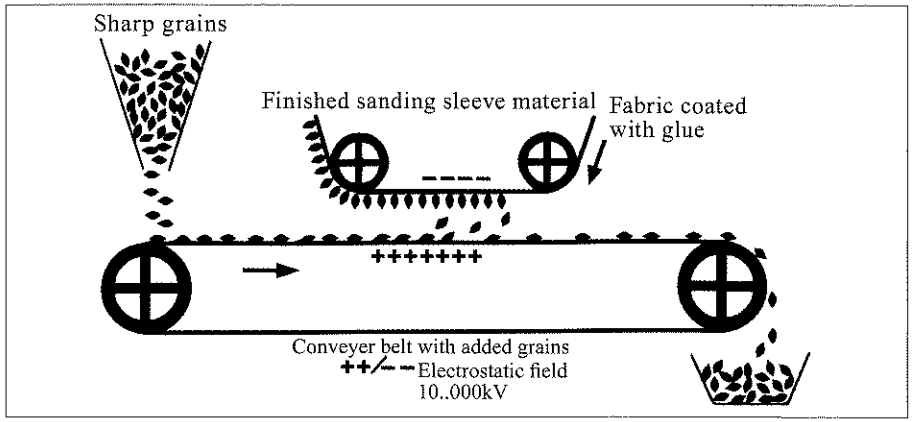
The small knives

Flexible abrasive material is a collective term for abrasive paper and abrasive cloth. Abrasive paper is usually used for flat surfaces (e.g. belt sanders and discs) and abrasive cloth for surfaces with curved, round or irregular shapes (i.e. on sanding drums).

Flexible abrasive consists of an endless amount of sharp grit that is bonded on paper or cloth. Originally the grit consisted of sand hence the name sandpaper. Today the production of flexible abrasive is a highly advanced industry with an unlimited number of grit types with different patterns (spacing between grit), types of adhesive and different paper and cloth qualities. In principle, there are specially manufactured abrasives for virtually every material.

The most common grit used to sand wood is aluminium oxide that is red in colour (black with antistatic treatment). The grit pattern also has a bearing on the sanding result. An open grit pattern refers to a thinly spread grit. This quality gives less thermal development and is usually better suited to softwoods. A denser abrasive is usually better suited to hardwoods.

You should be aware that there is a great difference in the quality of abrasive material. Cheap abrasive material easily releases the grit and quite often has a varying grit size. FEPA's P marking in front of the grit size (e.g. P150) guarantees that the grit maintains the correct size. Protruding grit on a P80 material can cause a thread-like scratch that is virtually impossible to remove. Remember you need to remove an equally thick layer of wood as the depth of the scratch to remove a scratch. Naturally, this is impossible if you continue o use an inferior quality abrasive! The heart of the manufacturing of flexible abrasive is when the grit is applied to the recently bonded cloth or paper and it passes through an electrostatic field. The grit lifts with its pointed, sharp end facing upwards.
This signifies that sanding is a cutting process using without a doubt the smallest cutting knives in existence.



Rotation speed (rpm = rotation per minut)

The speed of the abrasive material in relation to the object's surface has a major impact on the sanding result. The grit, the small knives, must have time to cut the wood and release the material. If this occurs too quickly, the cut material clogs and the material becomes warm, perhaps even hot and the wood burns. Oils and resins in the wood are heated and become hard and the abrasive then clogs. It is therefore essential that sanding wood is a low speed task.

It is not enough to know just the rotation speed of the motor, which needs to be set in relation to the diameter of the sanding sleeve to calculate the periphery speed, i.e. the abrasive material in relation to the material. If the material is mechanically fed in some type of sanding machine, then the feed rate must also be taken into consideration. When you hold and move the material to be sanded by hand, the feed rate is negligible and the formula to calculate the speed of the abrasive or the periphery speed will therefore be:

$$\frac{\text{Sanding drum diameter x 3,14 x motor rpm}}{60} = \text{Speed per second}$$

I have chosen to calculate the abrasive material's movement per second as this is a measurement that is possible to visualise. The optimal movement speed for sanding and polishing most species of wood lies between 3 – 12 m/sec (9' 10" – 39' 4"). The Kirjes sanding motor has a fixed speed of 3000 rpm (3600 rpm for the 115 V motor) and gives the following abrasive material speed for the different drums:

Abrasive material speed (with 230 V motor)

Kirjes drum	dia.	m/sec	feet/sec
mod.120	20	3,3	12'5"
mod.130	28	4,6	17'4"
mod.140	42	6,9	25'3"

Note that most motors on the market are high speed motors with 10,000-20,000 rpm. If you connect Kirjes model 140 to one of these motors that rotates at 15,000 rpm you will get a circumference speed of 33 m/sec or 108'4" per second!

As mentioned before, we recommend a drive unit speed of 3000-3600 rpm for Kirjes inflatable sanders. Although they can be run faster. Max speed lies at about 7000 rpm. Above this speed the thin rubber sleeve becomes deformed.

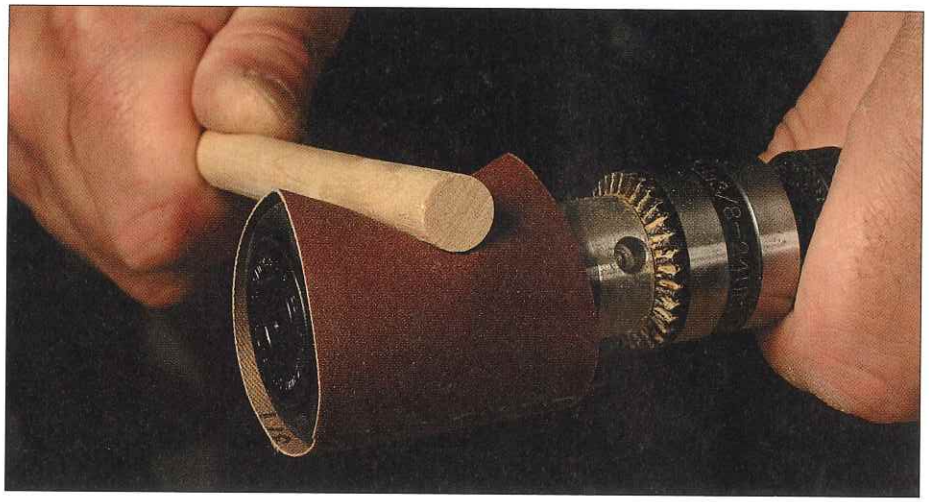
Air pressure

Unfortunately, the air pressure in Kirjes sanders can not be measured due to the design of the valve. Besides, a little extra air surge is required when inflating when the valve rubber is new. However, we know from our own measurements that the pressure in normal use is as low as 0.5 bar or 8 psi.

The correct air pressure in a Kirjes inflatable sander is crucial for the function and its unique characteristics. From experience we know that it is nearly always best to have as little air in the sanders as possible, i.e. so the sanding sleeves do not wander.

A simple **pliancy** test is to press the sander together using your thumb and index finger. It should be easy to press down the rubber and sanding sleeve against the inner spindle. An alternative test is to take a round bar about 10 mm in diameter and press it in the middle of the sander. It should be easy to press the sander together against the inner spindle.

Application pressure



The pressure used to press the abrasive material or sanding sleeve against the material affects the result. Normally the abrasive should not be applied too hard, and the abrasive must be allowed to cut at it`s own rate. Pressing too hard in the belief that sanding will be quicker is completely wrong. What happens is the abrasive material becomes filled with dust and resins and sanding generates heat. The resins react and harden due to the heat and the abrasive clogs. In addition, you can press down entire fiberous areas that later rise during surface treatment and leave patchy surfaces.

Using a Kirjes inflatable sander, at a normal inflation pressure (see the air pressure section), i.e. filled with very little air, it should be pressed against the material so that the rubber body forms itself according to the material to be sanded. This means that the rubber is pressed together from about 5 mm (3/16") on model 120 to about 10 mm (3/8") on model 140. om den ska putsa.

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GERHARD'S VELVETY MASTERPIECES

In order to better illustrate the procedure for the final work we shall follow Gerhard Spaarmann when he makes a pair of salad spoons.

We have chosen to describe the full manufacturing process for those interested in making their own salad spoons.

Works by Gerhard Spaarmann

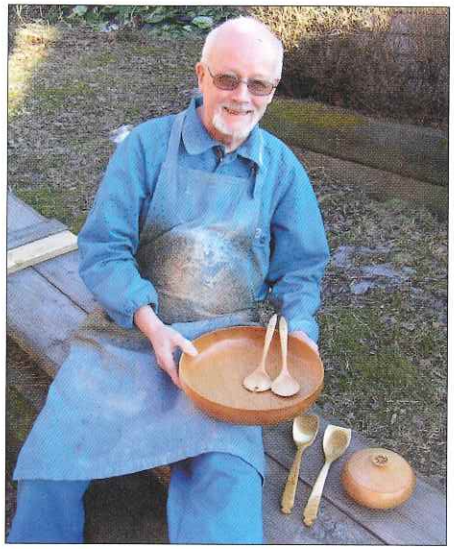
Works by Gerhard Spaarmann

Gerhard is the master of the velvety wood finish. To create Gerhard's works of art demands a good measure of care and concentration as well as a vast amount of time! It's the same every time I go past a stand or table where Gerhard is displaying his products. The eye is caught by how the beauty of the wood is revealed in his products together with the smoothness of the design. Well, you stop and look closer and then you can not help yourself, you have to touch. Gerhard gives his consent and you are caught. The experience of touching a wooden object with the velvety wood surface is extremely positive. And then come the compulsory question – "How do you do it Gerhard, what is the secret?" The answer is simple - "the secret is sanding".

I sometimes wonder whether you should not call Gerhard's butter knives, salad spoons or bowls therapeutical! I have seen those who have purchased spoons from Gerhard and have then left stroking it between the fingers of one hand, and they are still doing the same thing a few hours later!

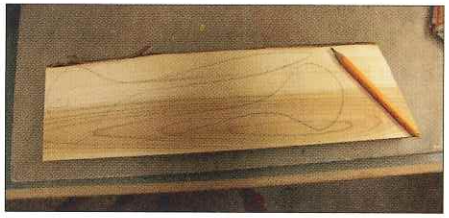
Coarse work

Master Gerhard Spaarmann with a salad bowl and spoons in alder.

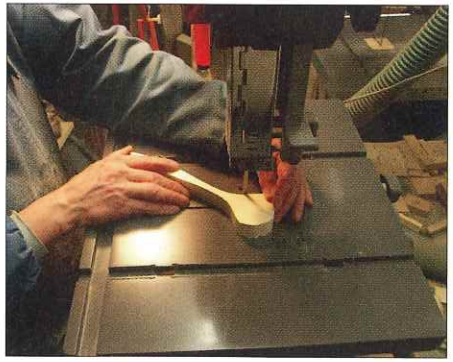


Gerhard preferably works with alder. Alder is a soft wood species and has a reddish brown colour similar to cherry. The salad spoons consist of two similar spoons with a drain notch in one of them. (See the picture of the salad bowl and spoons in alder on the previous page.)

Gerhard starts with a fine and dry plank section, length 300 mm (12"), width 120 mm (4 ¾"), thickness 30 mm (1 3/16").



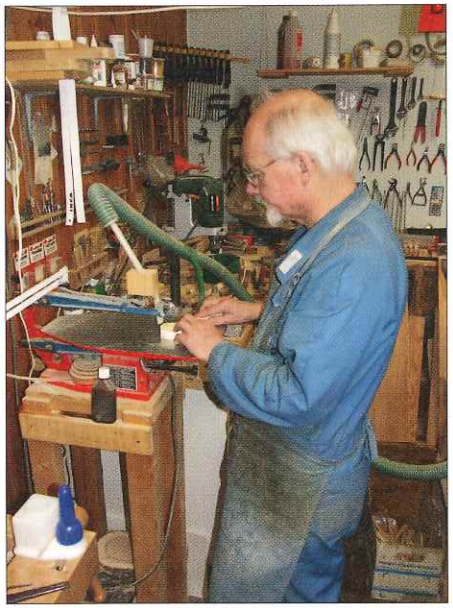
Gerhard draws the spoons from above on the plank section and cuts out the spoons on the bandsaw. Of course here you could use a fret-saw!



Gerhard then draws the spoon's form on the spoons from the side. As Gerhard makes many spoons in the same shape, he has manufactured templates using waste material from earlier projects.

Gerhard's spoons are made with a small ridge at the back of the spoons that can be used to hang them. Before he cuts the shape of the spoon seen from the side, he drills a 6 mm (1/4") hole in the bottom of the hanger. He uses a waste piece to use as a drilling support.

The side shape of the spoon is now cut on the bandsaw, followed by the shaping of the rest of the spoon.



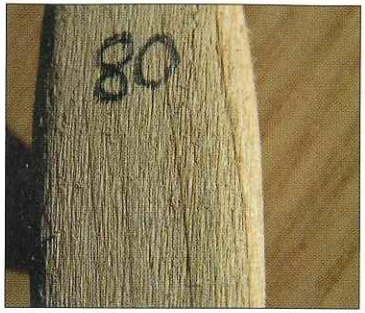
Fine adjustment is done using a contour saw.

FINISHING WORK

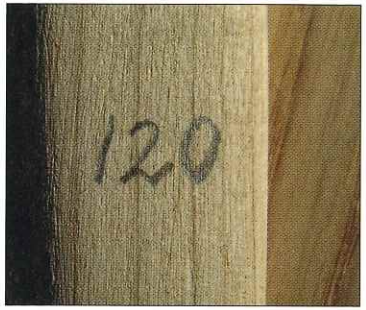
Now the finishing work starts

1) Final forming

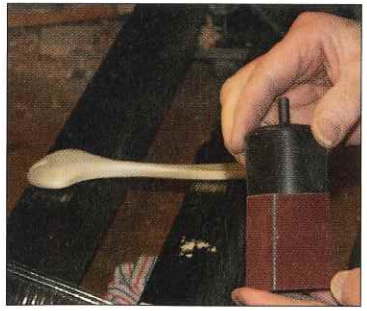
Gerhard final forms his spoons with abrasive cloth P120. He has chosen not to use a coarser abrasive cloth, which you think would be quicker. The reason is that the time required for sanding work with a finer grit size is shortened significantly.



Grit 80 is used for final forming on larger objects. If you work with hard wood species or horn it is even more important to avoid the really coarse abrasive grit (P40). There is a tendency for individual coarse grits to cut deep thread-like scratches that are virtually impossible to remove with a finer abrasive material.



He inflates a clean sanding sleeve P120 onto his Kirjes model 140 sander and ensures that it is soft.



All Kirjes sanders are inflated up using a hole in the drive shaft. This is a patented system. As a result there is no protruding valve at the other end and makes the Kirjes sander superior with regard to sanding areas that are difficult to access.

He performs a simple softness test by pressing together the sander between his index finger and thumb. It should be easy to press the sander together against the inner spindle. The valve rubber on a new Kirjes sander is usually a little tight and a distinct air surge is required from the pump to get an appropriate small amount of air inside the sander.

He then attaches the sander to a flexible shaft and carries out the final forming.

(As Gerhard at times manufactures a large number of spoon, he also final forms his spoons on a belt sander with P120 abrasive cloth.)

When he forms he presses the sander against the surface of the spoon just enough so that sander forms to the shape of the spoon. It is important to move the sander all the time using even and smooth movements. Over very uneven materials where you want an even surface, you should move the sander quickly back and forth so that the tops are successively cut down. With a little training you can hear the sanding sound when the surface starts to be smooth.

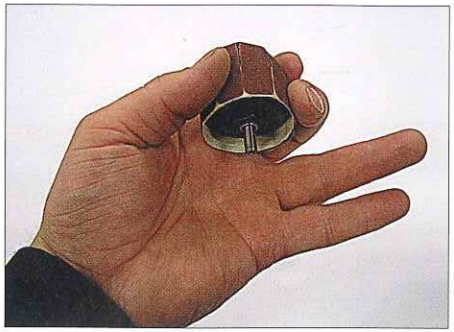
At this stage, during final forming, you should not attempt to achieve an absolute even final form. That is to say, there will still be some ridges, especially on the smaller radii. These are removed with a finer grit. The ridges are clearly visible to the eye, but hardly noticeable to the touch.

The inflatable sanders are surprisingly aggressive in comparison with other types of sanding sleeves and when sanding by hand. This means too much removal is an obvious danger. As soon as you feel the sander is removing too much switch to a finer grit instead in order to reduce the application pressure.

The Kirjes bowl sander with a P80 or P60 sanding sleeve is initially used for the spoon's dish shape. The P60 and P80 sanding sleeves are made in an overlapping design unlike the finer sanding sleeves which are slotted. This means you do not need to worry about the P80 cutting into the sharp edges.

Pumping

The Kirjes bowl sander must be inflated slightly more than the cylindrical inflatable sanders. There is a small centring boss on the end of the rubber body. This must be clearly visible and unmistakably inserted in the corresponding hole in the sanding sleeve. In addition, the rubber must lie against the abrasive material when the sander is inflated. The Kirjes bowl sander becomes somewhat pear shaped when inflated. This is very useful when there are steep and inwardly curved edges that you must avoid e.g. bowls.



Inflating a Kirjes bowl sander can be tricky for the uninitiated. One tip is to hold the Kirjes bowl sander and pump in the same hand while pumping with the other hand. Grip the Kirjes bowl sander with you thumb, index finger and middle finger. Insert the pump on the drive shaft and then grip the pump using your ring-finger and little finger. Pump with small distinct thrusts.

To release the air from model 140R, can bring about an unexpected banging noise. To avoid this and simplify the whole process when replacing the sanding sleeve proceed as follows: Grip the Kirjes bowl sander in one hand and squeeze it quite hard. While doing this, loosen the nut 2 turns with your other hand and using the hand, grip the drive shaft and waggle it to and fro. Continue to squeeze and the air is let out calmly and comfortably. Take extra care to ensure that the rubber comes under the edge of the washer before tightening the nut by hand. The sander is now ready for the next sanding sleeve.

Sanding

a) Gerhard now changes the sanding sleeve on the Kirjes sander model 140 from P120 to P150. Loosen the screw on the bottom of the sander using the supplied 3 mm allen key to release the air from the sander model 140. (To release the air from the other Kirjes sanders, loosen the nut.)

Using P150, Gerhard sands most of the surfaces of the spoon. Even now he presses the sander against the non-uniforme surfaces just enough so that the sander forms to the surface.

He attempts to sand in the direction of the grain at the same time as the rotational direction of the sander works from and not against sharp edges. This is especially important when he sands the spoon's dish shape with P120 on the Kirjes bowl sander. Once Gerhard has produced the bowl shape on the spoon with P80 he changes directly to a P120 sanding sleeve. As P120 is "slotted" he is careful not to sand towards the edges but, with or from the sharp edges. He starts to shape the middle of the spoon and runs the sander out over the edge. The slotted form of the sanding sleeves is superior with regard to efficiency, softness and pliability

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It is important that you press the sander so that it forms over the material and that you move the sander in soft and sweeping movements across the surface; you must not stop with the sander so that it's at a standstill and sanding on the same spot. Gerhard is very careful to ensure the whole surface of the spoon is sanded. Gerhard also use the Kirjes sander model 120 with P150 in areas he can not access with the model 140. To sand the inside of the hanger he has made his own sander. Of course you can tear off a 6 mm (1/4") strip of abrasive cloth and sand by hand.

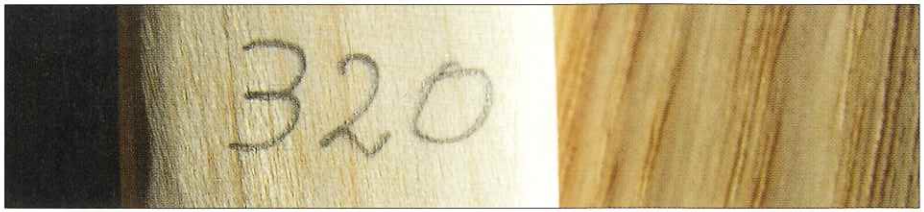
b) Gerhard continues to sand with P220. Sanding follows the same order as for P150 as set out in section **a)** above. Note that even with P220 you may feel that there are ridges on the cupped surfaces (see picture). These are visible to the eye, but can not be felt by the hand. Do not try to sand out these ridges with P220, but remember they disappear with P320.

Gerhard has discovered that just P220 is very well suited to alder. By that he means that P220 gives good removal at the same time as you achieve a fine surface not far from the velvety surface. This phenomenon means that he frequently bypasses P150 and goes direct from P120 to P220 when working with alder. I believe the answer to just why P220 is well suited to alder can be found in the relation between the grits, the small knives, and the size of the fibres. There are probably more ideal grits for other types of wood, but it is not normal to bypass grit 150!

c) Gerhard finishes with a worn P320 sanding sleeve or P400 also in the same order as in section a) above. Note that most types of wood require P400 for the final finish to attain the velvety wood surface!

Gerhard has now attained the velvety wood surface and he carefully inspects whether he has missed anywhere. Poorly sanded areas and scratches are exposed mercilessly when apply the surface finish with oil or wax.

You should exercise care when touching the surface before surface treatment. Fingers always have a natural layer of grease that can be rubbed into the spoon surface. Sanding dust should preferably be removed using a fine brush or compressed air to prevent blocking the now open pores with particles of dust.



ures on this side shows works by Gerhard Spaarmann

Surface protection

Salad spoons by Gerhard Spaarmann

Using a damp cloth, Gerhard moistens the spoon to entice the small last lively fibres out from the surface. He dries the spoons with the help of a hair dryer and lets them stand for a few hours to be completely dry. He then sands lightly with a sharp P400, but only enough to remove any last fibres!

Sanding dust should preferably be removed using a fine brush or compressed air.

The newly sanded velvety wood surface has open and clean pores at this stage, which means oil can penetrate a way into the wood and contribute towards bringing out the structure of the surface.

Gerhard mostly treats his spoons with Swedish cold-pressed linseed oil. He covers the spoons abundantly with oil and wipes off the surplus, which would otherwise form a skin. He then lets then dry/harden for about 2 weeks before polishing with a buffing wheel.

The surface becomes silky matt and hard-wearing.

You should avoid washing the spoons in a dishwasher. When washing you should avoid letting the spoons lay in water, but should wash and wipe immediately to keep the velvety surface for a long time!

This relatively simple surface treatment that Gerhard does is possible as the spoons have been sanded to a velvety surface. The velvety surface normally requires, as mentioned before, quite simple surface treatment, usually it is sufficient with oil, to produce a good hard wearing surface. We recommend a little wax in the oil and have developed Kirjes Oil-wax for this purpose. Read more about this further on.

SURFACE PROTECTION WITH KIRJES

Surface treatment in general and the background to Kirjes' Oil-vax

Surface treatment is a science in itself and I would like to claim that this is mostly because of poor sanding! Rough and poorly sanded wood surfaces require a great deal of surface treatment. A wooden surface can be treated in many ways. It can be painted, stained, varnished, steeped in lye, oiled, waxed, glazed, tarred, vitriol treated or French polished, the list can be made even longer.

Surface impregnation treatment

Surface impregnation treatment in liquid form penetrates into the wood and protects against water and other forms of attack on the wood in the form of decay. It is in this group you find the large majority of surface treatments that come directly from the vegetable kingdom and which we could call natural. This generally concerns different types of oils (linseed oil, walnut oil, etc). Stains are also found in this group as well as glazing and even tar.

We recommend Swedish cold-pressed linseed oil, which has very good protective qualities. This is pressed from the same type of linseed that we find in different types of food dishes - thus it is completely non-toxic and can also be used on bowls and on spoons that come into contact with different food. The cold pressed linseed oil is thin bodied and has small molecules and penetrates deep down into the wood. It is important to wipe off all surplus oil once you have saturated the wood with oil as linseed oil forms a skin. One disadvantage of linseed oil is that it has a long drying time/harden time. The Swedish cold pressed linseed oil contains a high content of linolenic acid which we use in Kirjes Oil-based wax has a relatively short drying time, about 5-8 days depending on the temperature and air humidity. Remember that different forms of treated oils offering short drying times have toxic additives which should not come into contact with foods.

Generally you can divide surface treatment into 2 groups, namely:
1) surface impregnation treatment and
2) film forming surface treatment.

Film forming surface treatment

Film forming surface treatment is, as the name implies, a surface treatment that settles like a film on the outside of the wood. High gloss surfaces require film forming surface treatment. Film forming surface treatment is either one that places itself like a tight lid on the wood surface or those that breathe. The tight forming ones are mainly synthetic and do not permit the wood to "breathe", for example, acid-resistant or polyurethane lacquers, coloured or uncoloured. Tight film forming surface treatments are when new, very strong and protect against moisture and dirt.

The disadvantage is that they also lock the moisture into the wood. Neither can the wood breathe – you break the wood's hygroscopic character, i.e. the wood's natural ability to adapt to the surrounding moisture. If the wood is not sufficiently dry it can rot from the inside. Small cracks occur sooner or later in the surface treatment through which moisture can penetrate into the wood and discoloration can then occur around these cracks. It is difficult to repair tight film forming surface treatments. These usually need to be sanded off and a new finish applied.

Film forming surface treatments that allow the wood to breathe are different forms of waxes and natural resins. They are not so resistant as the sealed surface treatments, yet significantly more durable and easy to maintain. Wax surfaces are usually polished up in several layers and with that the degree of gloss increases. The most common waxes are beeswax and carnauba wax and the most common resin is shellac.

Kirjes oil-based wax is reinforced with the wax from the arctic bearberry plant (*Arctostaphylos Uva Ursi*). Bearberry grows, among others, in extremely barren, and windswept mountainous areas where the summers are short and the winters long. The leathery, slightly glossy yet constantly green small leaves are filled with wax that protects the plant against its surroundings. The waxes are released using some form of solvent, usually turpentine, so they can be applied. The Kirjes oil-based wax is released by Swedish linseed oil and does not contain any harmful solvents at all! Another method to release the wax is through heating.

Vaxing or polishing

Waxing and polishing are two expressions used within surface treatment. Waxing is the name of the treatment when you do not fill the wood's pores and polishing is when you first fill the wood's pores.

Waxed surface

Polished surface

Polished surfaces are glossed/hardened by using buffing wheels, lamb's wool bonnets, normal cloths and the like as such surfaces are generally completely flat. The waxed treated surface is really rough and therefore you use brushes to shine and harden such a surface. Compare with how you brush up a shine on a pair of black leather shoes! Applying the Kirjes' oil-based wax is a form of waxing and shining/hardening can be done with the help of the Kirjes brush polishing sleeves.

Repair and pore filling with shellac

High gloss, French polished furniture is surface treated with shellac. Shellac is a resin that is secreted from different trees through pricking by the Indian tree louse. It is sold in light yellowish flakes that can be released in alcohol or melted to sticks. The shellac solution works well as a good pore filler on tree species where you consider it necessary and when you want a slightly higher gloss on the surface finish. Melted shellac from a shellac rod works well to repair cracks and knotting effects. Use e.g. a soldering iron to melt the shellac.

Applying Kirjes oil-based wax

Kirjes oil-based wax is primarily intended as a surface treatment on products that have undergone final finishing according to the Kirjes method. This is a relatively basic surface treatment method that gives a silky matt surface and emphasizes the woods own beauty. The oil-based wax contains Swedish cold pressed linseed oil (dries well) that penetrates into the wood and beeswax and wax from arctic bearberry (*Arctostaphylos Uva Ursi*) that forms a protective layer on top of the wood. The surface is waxed using Kirjes brush polishing sleeves. (Read the section "Waxing or polishing" above for a detailed explanation.) The oil-based wax is completely toxic free and can be used on objects that come into contact with food.

Arctic Bearberry Plant
(*Arctostaphylos Uva Ursi*)

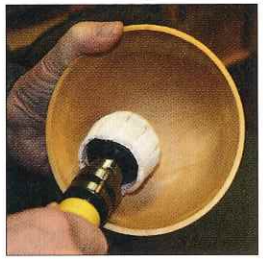
1) Final sanding with at least P320 or P400. Moisten the wood with a damp cloth to draw up any remaining fibres. Allow it to dry thoroughly sand off any last fibres with P400. Make sure that any sanding dust is brushed or blown clean from the wood surface.

2) Rub in the oil paste in a thin layer across the entire object preferably using kitchen paper or toilet paper. Heat the oil paste with a hair drier or hot air gun. Continue to rub in the oil paste and finally wipe off any surplus oil paste. The heating process has several purposes. It softens the paste so that it penetrates deeper into the wood and at the same time it significantly shortens the hardening time. If you do not have access to a hair drier or hot air gun the oil paste can also be melted by placing it in a jar, which is then placed in a saucepan with cold water. Heat the water in the saucepan and the paste will melt and becomes very easy to apply.

3) Let the oil paste cool off and dry for a couple of minutes and then carry out waxing using a Kirjes brush sleeve. The object of using a brush sleeve at this point is not to increase gloss but to evenly spread the oil paste over the entire surface. Remember that the surface still is rather uneven even though you cannot see this with the naked eye. To increase gloss, wax the surface with a brush sleeve when the oil paste has dried and hardened a bit.

The oil paste dries relatively quickly and objects can be used as soon as the surface feels dry. The actual hardening time is however longer, about 2 weeks. During this period, the surface dries gradually and gives a better and better protective surface.

4) To increase the gloss further, and to improve the surface protection you can apply the Kirjes oil-based wax in one or more additional layers. The layers should be applied thinly and left to dry for a couple of days before the next layer is applied. The amount of layers differs depending on type of wood. On wood that is not too porous a third layer of the Kirjes oil paste tends to settle as a film on the outside of the wood. Film formed surfaces surfaces should be polished with **Kirjes cloth sleeves** after they have dried and hardened.



Safety

There is a risk of cloths and paper saturated in linseed oil spontaneously combusting. You should flush any paper you have used when applying the oil paste down the toilet or burn it. Kirjes brush sleeves and cloth sleeves used to polished undried linseed oil/Kirjes oil paste should be kept in fully sealed glass jars.

Kirjes Polish Kit Art.no KJ908

THE VELVETY WOOD SURFACE

Inspiration & information from Kirjes

More information about our Kirjes´products at www.kirjes.se
Here are some links and info that can be of interest

3-D intarsia

Judy Gale Roberts, www.intarsia.com
https://www.dinbyggare.se/intarsia-pa-faner/ (pictures)

Books

intarsia-woodworking-for-beginners by Kathy Wise
(ISBN 9781565234420)

Knives

www.arcticshop.se

Video

Create a guksi, go to https://youtu.be/pIk1QH-6UqI
Peter Boman shows a Kirjes video at https://kirjes.se/videos

www.kirjes.se