Guitar

Recommendations for use

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The design, acoustic characteristics and entirely manual construction of the guitar give rise to certain physical and mechanical features that it is important to bear in mind when using and looking after your instrument.
The structure of my guitars is very light (around 1.1 kg including strings and machine heads), but this does not mean that it is weak. The materials are sized according to necessity, eliminating anything superfluous, the result being an instrument that combines strength and balance.
Various precautions are nevertheless necessary, in addition to a good dose of common sense and due concern for a vulnerable object such as a handmade guitar. We list below a number of points that it is important to remember.

LOCKING THE CASE

It may seem unnecessary to stress something so obvious, but putting the guitar back in its case, closing the lid without locking it, lifting the case by its handle and watching the instrument fly out of it to the ground is one of the main causes of serious damage.

LEG SUPPORTS

Handmade guitars are not suited to the use of supports with suction cups to raise the guitar on the leg. Suction cups do not work well on shellac varnish, which is porous, while the lightness of the ribs is not suited to withstanding a concentration of pressure at that point. The Murata Guitar Rest (or Aria Guitar Rest) or leg cushions, on the other hand, are highly recommended.

HEAT

Excessive heat can be a problem for handmade instruments. The varnish (see the section on varnish below) softens and becomes imprinted with whatever comes into contact with it. Bone glue is

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reversible and can therefore soften under excessive and prolonged heat, allowing parts to become unglued. Heat is also directly linked to humidity (see the section “Relative humidity” below) and therefore to the risk of cracks developing in the wood. Never place the instrument (even when inside its case) close to a direct source of heat (such as a heater or radiator) or leave it exposed to direct sunlight for any length of time.

HUMIDITY

Handmade instruments are extremely sensitive to ambient conditions, and in particular to humidity, thus requiring care and attention (see the section “Relative humidity” below). Be careful about the use of air conditioning in the summer, which has a powerful dehumidifying effect and if used without proper attention can create problems.

CLEANING

The instrument should be cleaned using very soft cloths and products intended specifically for natural shellac varnishes, or using a slightly damp tissue and then drying immediately with a cloth. See also the section on varnish below.

KNOCKS AND SCRATCHES

Shellac is not a varnish in the sense now generally understood. It is a very fine layer of an organic substance used for its acoustic and aesthetic properties, and does not protect against knocks and scratches: a fingernail is all it takes to score the wood.

CONTACT WITH THE BODY

Pay attention to points of contact between the guitar and the body. In summer, do not rest your bare arm against the instrument, and protect the part that rests against the chest or on the leg: shellac is an organic substance and can be damaged by perspiration. Be careful also about buttons, buckles and zips, which can make deep marks in the instrument.

TRAVELLING BY PLANE

In an aeroplane it is good practice to loosen the strings so as to reduce the stress on the structure caused by low cabin humidity. Placing the guitar in the hold is not recommended, but if unavoidable the strings should be loosened fully.

CHANGING THE STRINGS

Change the strings one at a time; do not cut them but loosen them by hand. When tightening a string, do it either by hand or very slowly using a string crank, as tightening a new string too rapidly can cause it to go out of tune. For the use of the String-Plates, see the instructions contained in the blister-pack enclosed with the guitar. As a general rule, the instrument should be stressed as little as possible; that is to say, variations in tension on the soundboard should be minimal and as gradual as possible. After a variation in tension (as a result of changing the strings, loosening them for travel, repairs, etc.) the guitar will always take one or two days to regain its normal sound.

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THE VARNISH

Many different kinds of varnish are currently found in instrument making, but natural varnishes are the only ones that should be used. These may be based on wax, resin, shellac or drying oil.

Shellac is a substance that has been used since ancient times to varnish wood. It is secreted as a form of protection by an insect belonging to the cochineal family that is found in the Indian subcontinent. Once suitably treated and purified, it is usually sold in the form of fine, translucent, amber-coloured flakes, and forms the basis of many kinds of varnish used in instrument making. Various other substances are often added to the shellac (according to very diverse criteria), including dyes, resins and waxes, the whole being dissolved in alcohol.

The varnish is applied with a buff (a wad of cotton or wool wrapped in a piece of fabric made of cotton or mixed linen), using a very ancient technique that is difficult to learn and laborious to effect, and that is now employed only for handmade musical instruments or finely crafted pieces of furniture.
French polishing with shellac plays an important part in defining an instrument's sound as well as greatly improving the appearance of the wood, enhancing the beauty of the grain and the pattern of the fibres. Only varnishes based on drying oil are superior to it in this respect. A minimal amount of varnish is used, the effect of the polishing being all the finer the less varnish one manages to apply. Unfortunately shellac varnish is very delicate and therefore susceptible to scratching, heat and perspiration, requiring regular maintenance to preserve its sheen and to keep the instrument protected. It is thus very different from the synthetic varnishes that are now often used for guitars, which are applied in thicknesses that might be as much as ten times that of shellac, becoming comparable even to the thickness of the soundboard itself. These varnishes are certainly very resistant to scratching and general wear, but they have the disadvantage of causing a marked deterioration in the quality of the sound and of failing to impart sufficient beauty to the woods to which they are applied.

Because of its delicacy and special nature, it is necessary to know at least something about the characteristics of shellac in order to keep it in the best possible condition over time, especially considering that it is very different from the concept of varnish to which we have become accustomed. It is in fact a natural substance that is totally compatible with the wood, and that, when applied, binds with it to form a single body. In time it is actually "absorbed" by the wood, in such a way as to make it look like "glossy wood" rather than "varnished wood".

Proper attention should be given to the temperatures to which the guitar is subjected. The shellac and resins of which the varnish is composed are very sensitive to heat: in high temperatures they soften and become imprinted with whatever comes into contact with them. Thus it can all too easily happen that we open the case when it is still hot after a stop in the car in the sun and find the texture of the lining fabric faithfully reproduced on the guitar's beautiful glossy back. On the hottest days of the summer, the

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same thing can happen simply by playing the instrument: at the points of contact with the body (chest, legs, right forearm) the varnish is all too easily marked by our clothes. In such cases it is advisable to separate the instrument from the body with a chamois leather or soft cloth. It is crucial to remember that the varnish is sensitive to perspiration and to all the various acids and salts it contains, which can have completely unpredictable effects on it – opacity, shrinkage, changes in consistency. Protection is thus essential during the summer months.

Should the varnish become damaged, however, all is not lost: another of the advantages of this kind of varnish is that it is reversible, a property that is indispensable when it comes to repair work and restoration.
The dissolving of the resins and shellac in alcohol is a process that can be repeated any number of times. The varnish may be reapplied, retouched and polished, with a final result that is just as good as – sometimes even better than – that of the newly made guitar. For local retouching it is not necessary to revarnish the whole guitar, as the existing varnish may be retouched and reworked. Synthetic varnishes, by contrast, being completely irreversible, are of course very tough and resistant to scratches, high temperatures and perspiration, but create many problems for repair work, necessitating the devarnishing and revarnishing of at least a whole section of the instrument (back, soundboard, ribs, etc.).
It should also be remembered that wear in the parts most often touched (the neck, the part of the back in contact with the chest, the parts of the ribs in contact with the legs or the arm) is perfectly normal, forming part of the regular maintenance that is required if the visual beauty of the instrument is to be fully maintained. Every so often the guitar should be taken to a luthier so that the varnish can be reapplied where necessary. This avoids exposing the wood to aggressive substances in the skin and in dirt that would stain it irreparably. The only part that is not usually revarnished (for acoustic reasons) is the soundboard, which also happens to be one of the least resistant parts, spruce being a very soft wood. For this reason great care should be taken to avoid scratches and marks in this area: these will remain, and while they may not look unattractive if nothing more than minor signs of use, they will look much less attractive if deep and very visible. To clean the guitar always use a soft cotton cloth, preferably fleecy, and suitable products. If nothing else is available the instrument may be wiped over with a slightly damp paper tissue or soft cloth, drying it immediately with another cloth.

Never use spray or liquid furniture cleaners, silicone polishes, oils, or especially alcohol. If the instrument is cracked or damaged the use of detergents is to be absolutely avoided, as this could create serious problems when the time comes to repair it.

Always remember that the varnish is basically a resin, that it binds with the wood to form a single body, that it makes it more beautiful and enhances its sound, but that it is very delicate and requires care if it is to maintain its exquisite sheen over time.

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RELATIVE HUMIDITY

Relative humidity (RH) is the ratio between the amount of water present in the air and the greatest amount of water that the air can absorb at a certain temperature before the water condenses into tiny drops, forming what we call mist. This point is technically referred to as the saturation point or dew point.
The ideal relative humidity for the guitar (or any other finely made instrument) ranges from 50% to 65%. The instrument can withstand variations in humidity outside these limits without adverse effect, as long as they occur slowly, giving the structure time to adjust. It is advisable to monitor ambient conditions carefully and constantly with the help of humidity-measuring instruments, as well as special humidifying appliances where necessary.

If the external environment is very humid (on foggy days, for example), the guitar will "swell" a little (even though its case isolates it very effectively and so slows down this process) and will perform slightly less well, but it will not incur serious risk, as long as it is not taken immediately afterwards into a very dry or excessively heated environment, such as a classroom. In such cases it would experience a rapid release of the abundant moisture it has accumulated, and thus be seriously exposed to the risk of cracking. When the instrument undergoes a sudden transition from humid to dry it may not be able to adjust in time: certain parts will dry out more quickly than others and the wood will inevitably crack. If the transition to a very dry climate is gradual, the risk of cracking is reduced, though is not altogether eliminated. By its very nature and construction the guitar is an instrument that is susceptible to variations in humidity, constant attention to which is therefore essential.

Environments that commonly cause problems for the guitar include the following:

- classrooms and other places that are excessively heated in winter can have very dry atmospheres
- in the sun, the interior of a car can soon reach temperatures of around 50°
- in winter, the interior of a car can easily reach temperatures close to zero
- in the cabin of an aeroplane there are sudden changes in pressure, but more importantly the special climate-control system produces extremely dry air
- in the baggage compartment of an aeroplane the climate control is reduced, and the risks increase

Sometimes, particularly when travelling by plane, it is advisable to loosen the strings in order to reduce the stress on the guitar and the risk of encountering problems.
Some of these situations are unavoidable. We need to be aware of them and of the possible consequences for the instrument in order to take the necessary action. It is very important, for example, to monitor humidity constantly. Simple devices for measuring humidity are now available, as are humidifiers both for the environment and for the interior of the guitar.
Instruments for measuring relative humidity are called hygrometers, and may be either mechanical or electronic. Using a hygrometer we can measure the ambient relative humidity and act accordingly. If

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the environment is too humid (constant relative humidity of above 75%) it will be necessary to dehumidify.
We are much more likely, however, to encounter the opposite problem (relative humidity of below 45%), in which case it will be necessary to use a humidifier.
In such situations an excellent solution is to humidify the interior of the guitar using a small but effective specially designed humidifier. This will raise the level of humidity inside the guitar, protecting it from the risk of cracking.

With little effort we can thus monitor and control the humidity of the environment in which the guitar spends most of its time (where we practise, for example), as well as protecting it in potentially risky situations.
It is a good idea to always carry a hygrometer and an internal humidifier with you. A minimum of prevention helps to maintain the guitar in optimal playing conditions, avoiding the risk of damage and the lengthy and difficult repair work that would ensue.

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