

Developed in collaboration with Conservator James Bernstein and Golden Artist Colors, Inc.

## Stretcher/Strainer Frame Options for Canvas Painting

### Selection of Wood

Wood for stretchers or strainers should be perfectly straight, free of knots and relatively lightweight. An ideal wood for stretchers is basswood. It is a dimensionally stable hardwood of uniform grain that is soft, easy to cut and tool, does not splinter, sands nicely, and incorporates many of the benefits of both hard and soft woods. Another favorable quality is that it does not emit significant amounts of acidic resin. To guard against wood acidity migration from wood in general to canvases over time, it is generally a good idea to seal off any strainer or stretcher with a thin isolating coat of a resin sealer. GOLDEN MSA Varnish w/UVLS (Gloss) may be used diluted (one part stock solution to 2 parts VM&P Naphtha solvent) and brushed liberally onto the wood members. When sealing wood, wear a protective respirator (one with charcoal-activated cartridges that absorb organic vapors), work under well ventilated conditions with no open flame or heat sources, and be sure to allow a day or two for the sealed wood to dry fully.

### Strainer vs. Stretcher

A strainer is a fixed, wood-grid frame fabric support that is glued and fastened



*A variety of custom-made strainers and panel strainers (courtesy of John Annesley Co.).*

shut, so that expansion of the frame is not possible at a later date.

A stretcher is an adjustable wood grid frame that allows for expansion of the frame at such time as the fabric has become distended, distorted or slack, and is in need of pulling out of planar irregularities. Expansion is achieved by keying out mortise-and-tension joints, either by hammering wooden keys or by turning threaded bolt mechanisms.

Whatever design stretcher or strainer is to be used, it is essential to offset the fabric from the wooden support. Only the narrowest amount of wood should touch the canvas, that being the bead or bevel at the extreme outside edge. Flat-profile wood, such as 1" x 2" lumber stock put together to form a strainer, should never be placed in direct contact with a canvas. The rectangular face profile is sure to show through over time, also encouraging cracks along the inner strainer bar edge due to differentials between the open canvas and that backed with wood. Any wood edges that fall within the image region of a painting should be set back. If the wood is sharp and the danger exists of the fabric bouncing forward and back in transit and touching the wood, then protruding wood edges should be rounded and softened smooth with planing, filing, sanding and burnishing.

### Braced for Strength

A stretched and painted canvas is able to exert appreciable pull on a stretcher or strainer over time. If a stretcher/strainer construction is to maintain rectangularity and structural integrity, the outer wood members must be sufficiently substantial to resist inward bowing or breakage.

Substantial, internal bracing (set back from the face of the stretcher, of course) is needed in both the vertical and horizontal directions. Often under-utilized or ignored all together, bracing should appear every eighteen to thirty inches, depending upon



*Example of a dangerously under-braced large stretcher.*

the frame scale and wood stock weight. A well-braced stretcher/strainer will maintain rectangularity and planarity, resisting bowing (inward and frontal) and torquing (diagonal twisting). Attention to "in-square" construction, with all corners at a true 90 degree angle, will provide more even support for the canvas; it will also make framing and installation much easier.



*An evenly braced Knap & Vogt® Tite Joint® bolt expansion stretcher.*

If assembling individual manufactured (store-bought) stretcher members, place a few staples or a single dot of glue across the outer miter joints of each stretcher corner to help hold the frame together for stretching. These may then be removed afterwards, however only if they are inserted on the back (or outer) face of the stretcher; if set into the

underside of the stretcher, they will NOT be accessible for removal after the canvas is in place.

## Stretcher/Strainer Panels

There are also hybrid stretchers and strainers that introduce thin plywood panel skins close to the front painting plane. When a canvas is stretched over a panel stretcher or strainer, the fabric is supported everywhere, so an offset edge bead is not needed. A benefit of panel stretchers/strainers is that the canvas cannot be readily distended or distorted by pressure to the front or reverse, either during painting or afterwards.



*Detail of an individual bar control expansion panel stretcher (courtesy of John Annesley Co.).*

Some artists stretch their canvas over the panel support, tacking it at the edges or the reverse. Other artists look to glue the fabric down permanently to the face and sides overall. This can present problems if the glue is not evenly distributed, contains too much free water, or if contraction on the front face introduces distortion to panel planarity. Also, gluing down overall makes reversibility difficult if not close to impossible.

Still other artists forego a canvas skin, priming and painting the front panel skin directly. No matter what the painting plan, it is important to select plywood skins that have uniform grain distribution, no dramatic figuration that can lead to warping, and construction of wood and adhesive with minimal acidic resin or off-gassing. Traditional fir plywood available at most lumberyards is unacceptable for permanent painting. (The application of a non-aqueous sealer is recommended for any wood panel skin that will subsequently be glued with an aqueous dispersion adhesive).

## The Role and Abuse of Expansion Through Keying

Keying is appropriate only for making minor adjustments in canvas tension after-

the-fact. Expanding a canvas, already tacked to a stretcher is NOT the same as a true stretching of a canvas onto a stretcher. Keying introduces differential expansion, placing exaggerated tension and strain across the outside corners and edges of a painting.

## Wood Hammer Key Expansion

Wood key expansion joints are not the most elegant technology for spreading and controlling the opening of stretcher joints, but they are time honored and effective when used with care. Wood key stretchers

often have two key locations per corner, allowing for individual control of expansion direction. Typically, though, many of the keys are never inserted or replaced, so that keying occurs only with those keys in place.

Also, more often than not, wood keys are inverted during insertion so that the grain is running at the wrong angle. Upon hammering, this causes the keys to jamb, crush and split, sometimes splitting the mortise joint in the stretcher bar as well. Rather than running parallel to the grain of the outer member, the keys need to be inserted so that the grain runs at an angle.



*Incorrect traditional wood key insertion, with grain running parallel to outer member.*



*When hammered, a jammed key will often split along the grain.*



*An incorrectly inserted key jams and crushes as it is hammered to expand the joint.*



*A correctly inserted key, with the grain at an angle.*

With the hammer-key stretcher, the expansion is achieved by gentle, and then often more-sharp whacks of a tack hammer to the butt of the keys, sending shockwaves of vibration into the stretcher and painting structure. To prevent accidentally scraping the canvas reverse in the key regions a stiff cardboard or piece of 1/8 inch plywood, hardboard or acrylic glazing is inserted between the keys and the fabric until hammering is complete.



*A cardboard is inserted to protect the painting, the key is then gently tapped to expand the corner.*

Over time, the wooden keys may loosen or fall out of their slots (particularly during transit), so some method for securing the keys is recommended. A dab of wax, a wire, or a key bracket will help to anchor keys and prevent slippage or loss.

## Threader Expansion Mechanisms

A number of stretchers are manufactured with threaded bolts at the joins as the expansion mechanism. The benefit of a threaded expansion bolt is that joins may be opened by small turns in very exact increments. Also, there is no banging, hammering or vibration accompanying the expansion threads. When a bolt has been set, the position usually holds; wood keys are often observed to slip in position upon aging or transit.

Some expansion stretchers are designed so that outer members push off a central fixed strainer.

This allows for individual bar control, so the stretcher may be expanded in one direction without expanding the other. This is preferable to corner joins that expand equidistantly in both directions, allowing for more exact, directional adjustment of canvas tension.

For further discussion and resources regarding canvas preparation and stretching, see:

Bernstein, James. A Remarkable Way to Stretch Canvases (and other Essentials of Canvas Preparation).

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James Bernstein  
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[www.jamesbernstein.com](http://www.jamesbernstein.com)



*Detail of an individual bar control stretcher (courtesy of John Annesley Co.).*