

Flatness

An informational guide regarding the nature of paper and other natural materials, their relative flatness, what effects flatness, and techniques for flattening materials.

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Paper and cloth are some common materials used as substrates for works of art. Both are most commonly manufactured from natural substances; paper being made from wood pulp or other natural substances such as cotton fibers and cloth from plant life. Being natural substances, paper, wood and cloth are affected by changes in the relative humidity of the environment in which they reside.

Relative **humidity** is the key factor in the issue of **flatness**, as a humid environment may cause paper or cloth to become *rippled* or *wavy* in varying degrees according to the make and thickness of the paper or material and the levels of humidity.

The **framing of artwork does not by itself negate the problem of flatness**. While a piece of art is somewhat protected within a frame, the effects of humidity may still occur. Two common misconceptions about framing are the ideas that “sealing” art within a frame will “lock out” all moisture and that having glass directly on top of art will keep artwork “pressed” flat. Being a natural material, paper fibers readily absorb moisture and will continue to expand and contract within a frame. Framing does provide *some* protection for art but the art is not *hermetically sealed* in a frame and therefore the art is still subject to atmospheric influences. The restriction of art within a frame is, in reality, something to be avoided. Glass “pressing” on art or art that has inadequate room to expand within a frame will often cause rippling and waviness of the art.

Other causes of waviness, rippling and cockling

The moment an artist or printer applies media (ie: paint, ink, collage, etc.) to paper, he will change the dynamics regarding how the paper will react with the environment. The areas of paper that contain media are now *more dense* than the adjacent paper that is devoid of media. This causes a dynamic wherein the paper responds to moisture (humidity) different in these adjacent areas. The less dense (devoid) areas are more sensitive to humidity than the (denser) areas with media. This may cause some *cockling* (wrinkling) of the paper. The greater the contrast in density in the adjacent areas, the more the chance of cockling. While some owners of works on paper or canvas may find it challenging to accept cockling, the fact is that there is little that can be done to counteract these issues. The genesis of the issues is with the artist and his choice of materials and the application of his media.

Keeping it flat: mounting

Mounting artwork is the most common method to *keep paper as flat as possible*. There are 2 main methods of mounting paper: **wet mounting** and **dry mounting**. In **wet mounting** (aka: linen-backing), the art is typically bonded to acid-free, buffered paper with wheat starch that has been made into a paste. A heavy-weight canvas is added to the back of the paper for extra rigidity. The modern linen-backing industry was developed to create a more durable way for vintage posters to be handled as well as to provide a useful substrate (backing) that can be used for paper replacement and color restoration. Being a wet process, a benefit of this process is that fold lines and wrinkles will relax and flatten. Also, if desired, the poster can be returned to its original, pre-mounted state without any adverse effects. In the process of **dry mounting**, art typically is *permanently mounted* to board material. This makes it extremely difficult (if not impossible) to remove. New advances in the field of dry mounting have brought to the industry better materials and processes such as acid-free boards, acid-free adhesives and *reversible* adhesives. While any kind of mounting involves risk to the artwork, it is the dry mounting process that is the most risky and therefore *typically reserved for art that is replacable or without much monetary value*.

Making it flat (without mounting)

Flattening works on paper (ie: making *existing* ripples and waves flatten out) is a process *sometimes* done by picture framers. Works on paper are many and varied and assessing the properties of paper takes a vast amount of experience. In some cases the services of a more qualified professional paper conservator may be necessary. A common misconception is that simply “putting weight” atop paper will make it flat. Another misconception is that “ironing” will flatten paper. While both of the above techniques *can* help some paper, typically neither is infallible or wholly effective. The best (and safest) way to “relax” rippling, waviness and fold lines is by the carefully controlled humidification of paper. This process is followed by the controlled drying of the paper under adequate pressure (weight). Considered a more delicate process, these techniques are most often performed by **professional art conservators**, as they fall outside the normal realm of expertise of most picture framers.