THE ACRYLIC BOOK

A COMPREHENSIVE RESOURCE FOR ARTISTS

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CHAPTER 01

INTRODUCTION & HISTORY

Knowledge is power. The Liquitex® Acrylic Book is for artists, educators and students of all levels. The information in this book will help you better understand acrylic art materials and will expose you to innovative techniques and applications. The Liquitex® Acrylic Book is written by the people who have made professional water-based acrylics longer than any other manufacturer. This book is the result of many lifetimes of experience and expertise.

This easy-access Liquitex® Acrylic Book has six main chapters:
1. Essential Information
2. Liquitex Acrylic Products
3. Applications
4. Frequently Asked Questions
5. Health and Safety
6. Reference

The "Frequently Asked Questions" will help you solve common acrylic problems, while the "Applications" section offers fine art techniques and many ideas for projects and applications.

If you have any specific or technical questions that are not answered in this book:

- Visit **www.liquitex.com** for comprehensive technical information on all Liquitex® products.
- Email queries to **info@liquitex.com**.
- Call us at **1.888.4ACRYLIC** *(North America Only).*

It's our job to make sure that you have the information that you need to be successful.

A BRIEF HISTORY

In the long history of art materials, acrylics are fairly new. Oil colors date back to the fifteenth century. Tempera and encaustic have pedigrees that are counted in the thousands of years. And watercolor was the result when prehistoric visionaries developed the basic model for paint that still serves today: a combination of pigment (earth colorant), vehicle (for the earliest artists, saliva), and binder (prehistoric animal fat).

Acrylics were first developed as a solvent-based artists' color in the early part of the twentieth century. The first water-borne acrylic (the kind we use today) was developed and launched in 1955. In that year, a company in Cincinnati, Ohio called Permanent Pigments that had been milling oil colors since 1933 (and run by a man named Henry Levison, who lived, drank, slept, and breathed artist's colors) launched a new product. This new artists' color was formulated with an acrylic polymer resin that was emulsified with water. The new color could go from thick to thin and everywhere in between; it would adhere to just about anything—from canvas to paper to metal to wood to plastic– and it dried quickly for easy re-working, layering, and masking. Most important, it could be thinned and cleaned up with water.

Levison tried to come up with a name that would capture the essence of the medium and the fact that it could go from fluid liquidity to heavy texture. He called his new product "liquid texture," or **Liquitex®.**

Levison was able to encourage a number of artists to try the product, but acceptance was slow. Acrylics didn't gain full acceptance in the artist community until Levison figured out a principle that is still in place today: great information is as important as great materials. Based upon that principle, Levison launched a lecture demonstration program in which artists offered workshops and lectures on the use of acrylics to college students and professors. Within a few years, acrylics were being used consistently in colleges and universities across the country. And it wasn't long before Liquitex® was being used by some of the most important artists of the late 20th century: David Hockney, Helen Frankenthaler, Andy Warhol and others. Because of its durability and versatility, Liquitex® also became the medium of choice for large-scale public murals by artists such as Garo Antreasian and Thomas Hart Benton. In fact, it's fair to say that, without Liquitex® and the working properties of water-based acrylics, 20th century art would have been completely different.

By the 1980's, acrylics had become the most popular and widely used of all painting mediums, surpassing both watercolor and oil by a wide margin. The reason? The infinite variety of applications of acrylics coupled with the spirit of innovation first shown by Liquitex®.

Without question, there is no more versatile color system in the world. While both oils and watercolor require careful selection of surfaces and techniques to ensure success and stability, acrylics can be used with some simple guidelines on virtually anything, to achieve virtually any visual or sculptural result. They can be used on canvas, on paper, on fabric, on leather, on metal, and on wood. Acrylics can be brushed, troweled, sprayed, poured, splattered, scraped or carved. In short, with a little care and the right additive or medium, acrylics can do just about anything you can imagine.

Acrylics offer such great versatility because they do three great things:

1. **They stick.** To almost anything. Acrylics offer great adhesion to a wide variety of surfaces.
2. **They flex.** As they dry and age, acrylics tend to remain far more flexible than oils, allowing them to be used without cracking on a wider array of surfaces.
3. **They adjust.** Through the wonders of modern chemistry, the working properties of acrylics can be adjusted, altered, and managed in an infinite variety of ways.

To take advantage of this versatility it helps to understand the basic chemistry of how Acrylics work.

ESSENTIAL INFORMATION

WHAT IS ACRYLIC PAINT?

Water based acrylic paint is composed of pigment particles dispersed in an acrylic polymer emulsion.

COMPONENTS OF ACRYLIC PAINT

- **Pigment**

  A dry, powdery material that does not dissolve and remains suspended when mixed with acrylic polymer emulsion. Pigments can be organic, inorganic, natural and synthetic. They have little or no affinity for the surface to which they are applied.

- **Vehicle**

  A combination of water and acrylic polymer which create a polymer emulsion. Once the water leaves the system via evaporation or absorption the paint dries creating a stable film trapping the pigment particles.

- **Binder**

  Acrylic polymer without the water. Binder gives the paint its handling and durability characteristics.

DEFINITIONS

- **Polymer**

  A “polymer” is a long chemical chain made up of smaller, often identical molecules. When fully assembled, it has the potential for added strength and stability as it locks into a tightly ordered structure. The final acrylic paint film is made of a stable polymeric structure that locks the pigment into place.

- **Emulsion**

  A mixture of water and acrylic polymer. An emulsion is a stable mixture of components that do not normally mix well together. (Oil and water, for example, can be mixed together but will still settle out and separate.) Chemical emulsifiers are added to force the water and acrylic polymer into a stable mixture until the water either evaporates or is absorbed.

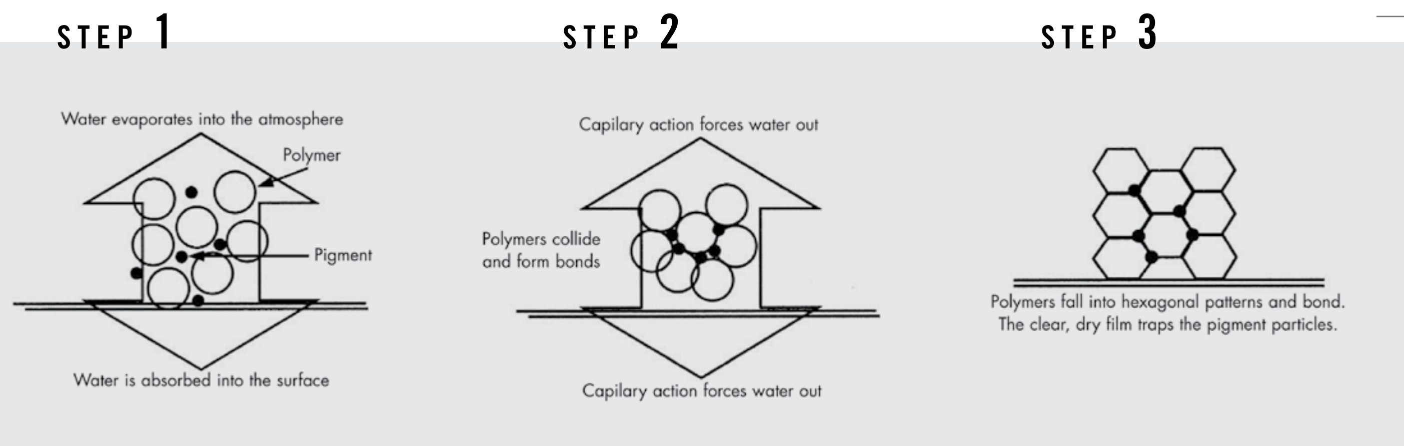
HOW ACRYLICS WORK

Acrylic colors dry as a result of water evaporation. Here's what occurs as pigment, water, and acrylic are transformed into a last-for-ages paint film:

Step 1. Squeezed from the tube, or scooped from the jar, acrylic paint is a finely balanced dispersion of pigment in an emulsion of acrylic polymer and water. The water serves to keep the emulsion liquid, and acts as a kind of chemical 'chaperone' preventing the acrylic polymer particles from getting close and personal and locking up before the artist is ready.

Step 2. When exposed to the atmosphere, water in the emulsion evaporates, or is absorbed into the painting support. That's when the acrylic polymer particles come into direct contact and fuse with each other.

Step 3. The polymer particlesorganize themselves into a stable, hexagonal structure, trapping the pigment in place. Bingo! The stable paint film!



It is important to note that acrylics should never be thinned with more than 25% water. Too much water will spread the acrylic resin thinly, and interfere with the formation of the stable film. Adding an Acrylic Medium, rather than water, helps maintain color brilliance and ensures that the paint film will remain stable

The acrylic/water emulsion has a slightly milky color when wet that clarifies as the paint dries. This milky appearance lightens (to a slight degree) the value of the color. As water leaves the emulsion, and the binder clarifies, the value of the color darkens. This color change is commonly called the wet-to-dry color shift and is most noticeable with dark transparent pigments (such as Alizarin) and less noticeable with light opaque pigments (such as Cadmium Yellow). As acrylic chemistry advances, Liquitex® continuously makes use of new acrylic resins from around the world that offer far better wet clarity than ever before.

CHARACTERISTICS OF ACRYLIC PAINTS

BASIC CHARACTERISTICS

- Water-soluble colors while wet.
- Permanent, water insoluble, flexible colors when dry. Built up surfaces will remain free of cracks and chips. Less flexible in cold weather. Softer in warm weather.
- Should be thinned with a minimum of water. To maintain the stability of the final film, use acrylic mediums or additives to adjust the flow and working properties.
- Do not mix with solvents, turpentine or oils. Mix only with other acrylic emulsion paints or mediums.
- Keep brushes wet. Clean up brushes, hands and palette with soap and water.
- Little odor, no fumes, nonflammable. Uses non-toxic thinners and mediums.
- NOTE on flexibility: While Liquitex® Acrylic colors and mediums will remain flexible over time, all acrylic paint films become increasingly brittle in cold weather. Do not flex, roll, or unroll acrylic paintings in temperatures below 45º F.

DRYING CHARACTERISTICS

- Acrylic paint dries by evaporation of its water component. Thin paint films will dry in 10– 20 minutes while thick paint films may take from an hour up to several days.
- On porous surfaces the water evaporates from both the paint as well as the underside of the support.
- Resin particles coalesce and trap pigments as the water evaporates. The polymer resin bonds and falls into roughly hexagonal patterns. The completed process yields a water insoluble, flexible, non-yellowing paint film.

CLEANING UP ACRYLIC PAINTS

- **From hands:** Wet or dried acrylic paint cleans with soap and water.
- **From brushes:** Clean wet brushes with soap & water. Clean dried acrylic brushes with acetone, denatured alcohol or equivalent product. These cleaning solutions are toxic. Care should be taken during use.
- **From clothing:** While paint is wet, clean with water and/or window cleaner. Dried acrylic paint is permanent on fabric.
- **From painting surface:** While paint is wet, wipe with damp rag, clean with water. When paint is dry, simply paint over surface with desired colors and motif. The surface of a dry acrylic painting can be cleaned by gently washing with soap and water.

TECHNICAL INFORMATION

All Liquitex® Paints and Mediums are manufactured to high quality and performance standards.

ATTRIBUTES

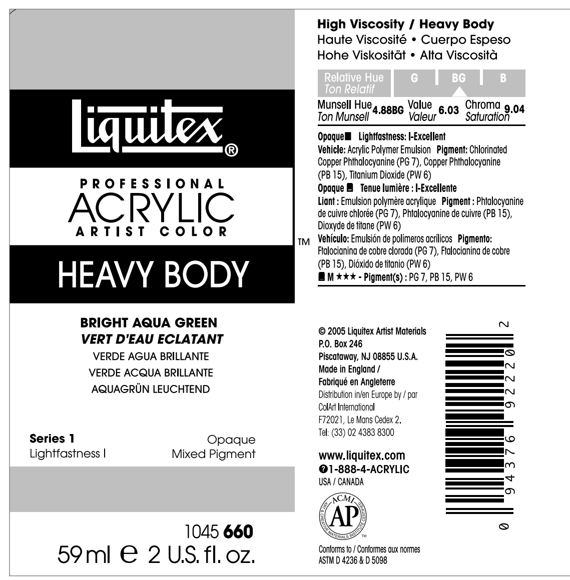
Liquitex® Acrylic Colors and Mediums are made using the highest quality acrylic resin to produce acrylic polymer emulsion colors and mediums. All colors contain pure pigments, in a 100% acrylic polymer emulsion. Liquitex® Acrylic Colors contain no fillers, opacifiers, toners, dyes, emulsifiers or additives that increase volume without imparting a positive attribute to the paint. Liquitex® Acrylic Colors have the greatest permanence and lightfastness possible.

All colors dry to the tightest sheen range of any acrylic, ensuring less shiny and dull spots in the finished painting.

All colors contain the highest pure pigment load, with high tinting "power" and maximum permanence of any acrylic.

LABEL INFORMATION

The following information is provided on labels of all Liquitex® Acrylic Colors.



Transparency/Opacity

The transparency, translucency and opacity of colors are based on the characteristics of the pigments used. All Liquitex® colors are labeled Transparent (TP), Translucent (TL), or Opaque (O) on the label of each product.

- **Opaque** — Opaque colors do not allow light to pass through the color layer. Best "hiding power" or coverage. Duplicates gouache effects.
- **Translucent** — In between transparent and opaque. Allows some light to pass through the color layer.
- **Transparent** — Transparent colors allow light to pass through their color layer. Least "hiding power." Allows underneath color to show through. Best suited for glazing and watercolor techniques.

Hue, Value, Chroma

Hue, Value and Chroma positions for each color are displayed on each label, for every Liquitex® color. These designations are based on the internationally recognized Munsell Color System.

MUNSELL COLOR SYSTEM

There are a variety of optical systems that can be used to measure the refractive and physical properties of color. One of the most commonly used in helping artists and scientists better identify the optical characteristics of color is the Munsell system. Liquitex® labels include Munsell notations for each color. The color system is broken down with the following identifying categories:

HUE

Color can be organized to follow the flow of hues or spectral family names. As organized within a color wheel, 12 hues are Red Purple, Red, Red Orange, Orange, Yellow Orange, Yellow, Yellow Green, Green, Blue Green, Blue, Blue Purple, and Purple. Within the spectrum, the three primary colors are Red, Yellow, and Blue. A hue is the precise identification of each color within a Hue Position Band. The specific hue of a color may be at center or lean toward one spectral neighbor or another. For example, Cadmium Red Medium carries a Munsell Notation of 6.3R, and is indicated as leaning toward the Red Orange hue column.

Complementary colors strongly enhance the character of the primaries. For example, placing green next to red will make both colors appear more intense and vivid. Green occupies the point directly opposite red on a color wheel, and is considered to be the complement of red. Orange is the complement for blue, and violet is the complement for yellow.

Split-complementary colors are those that reside directly to either side of the complementary color. Working with split-complements allows the artist to explore relationships in which the target color can be enhanced by being placed next to or near a split-complementary but not with the same degree of intensity that comes with being paired with its straight complementary color. In addition, the mixing of a split-complement with the original target color will yield a well-balanced gray.

Triadic color selections allow the artist to select colors that serve as unique ‘primaries’, each of which are evenly spaced in thirds around the color wheel.

Tetradic color selections allow the artist to select colors that are balanced and harmonious by virtue of their equal spacing in quarters around the color wheel. More complex relationships with both triadic and tetradic systems can be explored through defining unique complementaries and split complementaries within the user’s uniquely defined palette.

VALUE

All colors vary in value (the range from light to dark). Value numbers on the label give the light and dark measure of a color. There are, in fact, 10 theoretical value steps ranging from pure black (level 0) to pure white (level 10).The higher the number, the lighter the color.

CHROMA

By their very nature, some colors are quite bright (like crimson) while others are naturally dull (like yellow ochre). The relative brightness or intensity of colors can be identified systematically. Chroma, or color intensity, is identified by a number that ranges from 0 to 20. Neutral gray is rated 0, having no trace of chroma or hue. This is called, "zero chroma, zero hue." The brighter the color, the higher the number. Cadmium Red Light Hue, for example, has a chroma notation of 13, while Burnt Sienna has a chroma notation of 4.

PERMANENCY

Lightfastness I, II, III identify the rating of a color and its ability to withstand any color shifting or fading when exposed to ultraviolet light (i.e. sunlight). The lightfastness of all Liquitex® colors are listed according to standards established by the American Society for Testing and Materials (ASTM).

Category I	Excellent lightfastness. The color will exhibit no appreciable color change after the equivalent of 100 years of indoor museum exposure. Best suited for outdoor installations (murals).
Category II	Very good lightfastness. Colors are suited for all indoor applications, but not exterior painting that may receive heavy exposure to ultraviolet light.
Category III	Marginal permanence. "Fugitive" colors that may fall below the level of permanency for artist's colors. Not recommended for permanent work.

PIGMENT DESIGNATIONS

Pigment and Color Index Names are listed for all Liquitex® colors. For specific color information, please see the reference section on page 112.

MIXING COLOR: MINERAL AND MODERN PIGMENTS

In order to mix color well, it is essential to understand the properties of the pigments used to make each color. Every pigment has different characteristics, which ultimately influence how they interact with each other. The unique optical properties of each color can range from transparency to complete opacity. Some pigments have strong tinting strength which creates color mixes that are crisp and bright, while others tend to gray down when mixed.

Knowing the difference between mineral and modern (organic) pigments is the key to choosing colors that will blend together to create the desired results. Three general rules govern the differences between their working properties:

- When mixed, mineral colors tend to more closely replicate the tonalities of the natural world. Because of the nature of reflected light and shadow, we live in a world of pure colors that combine into rich shades of gray. The physical and optical properties of inorganic colors, quite often, more closely capture those qualities of natural light and shadowed color.
- Modern colors are brighter, and tend to make brighter mixes. Because of their purity, natural translucency and tinting strength, organic pigments produce mixed colors that tend to remain closer to the high chroma of their "parent" primaries.
- The two can be used together with good results. For example: adding a small amount of a modern color to a mixture of mineral pigment that has gotten muddy will help restore lost chroma, without losing the natural character of the mix.

Remember the above are only general guidelines. The uniqueness of each pigment sometimes causes "modern" qualities to show up in "mineral" colors and vice versa.

Historically mineral pigments such as yellow ochre and raw umber have been used since pre-historic times. During the nineteenth century a wide array of other mineral pigments became available when the industrial revolution and developments in chemistry made it possible to combine metals like cadmium, or cobalt with other compounds. The results were highly stable, far less prone to fading, and could be ground into a suspension within a vehicle for oil paint. More recently, pigment chemistry was revolutionized as modern organic colors were born in the laboratory. This has given rise to pigments like anthraquinones, dioxazines, pyrroles, phthalocyanines, and benzimidazalones, which make possible the wide variety of colors available to artists today.

LIQUITEX® COLOR PALETTES

Below are suggested color palettes for use with all Liquitex acrylic color ranges.

LIQUITEX® PROFESSIONAL ARTIST ACRYLIC COLORS

3 Color Primary Palette:
Quinacridone Crimson (Primary Red)
Yellow Medium Azo (Primary Yellow)
Phthalocyanine Blue (Primary Blue)

6 Color Palette:

Hue Based	Pigment	Cadmium Based	Pigment
Quinacridone Magenta	single	Quinacridone Magenta	single
Cadmium Red Light Hue	mixed	Cadmium Red Light	single
Cadmium Yellow Medium Hue	mixed	Cadmium Yellow Medium	single
Phthalocyanine Blue (Green Shade)	single	Phthalocyanine Blue (Green Shade)	single
Ivory Black	single	Ivory Black	single
Titanium White	single	Titanium White	single

12 Color Palette:

Hue Based	Pigment	Cadmium Based	Pigment
Quinacridone Magenta	single	Quinacridone Magenta	single
Cadmium Red Medium Hue	mixed	Cadmium Red Medium	single
Cadmium Red Light Hue	mixed	Cadmium Red Light	single
Cadmium Yellow Medium Hue	mixed	Cadmium Yellow Medium	single
Burnt Umber	single	Burnt Umber	single
Permanent Green Light	mixed	Light Green Permanent	mixed
Phthalocyanine Green	single	Phthalocyanine Green	single
Phthalocyanine Blue (Green Shade)	single	Phthalocyanine Blue (Green Shade)	single
Ultramarine Blue (Green Shade)	single	Ultramarine Blue (Green Shade)	single
Dioxazine Purple	single	Dioxazine Purple	single
Titanium White	single	Titanium White	single
Ivory Black	single	Ivory Black	single

Note:

- *"Hues" are used as replacements for cadmium, cobalt and other colors, when they are either unavailable, too expensive, or fugitive. Liquitex® "Hue" colors generally yield higher intensities than the color they imitate.*
- *The "Hue Based Systems," because they are based upon modern organic colors, will tend to mix with greater brightness and clarity.*
- *The "Cadmium Based systems" will tend to yield mixes that more closely approximate natural light, and that may be considered more suitable for traditional landscape, portrait, or still life representations.*