



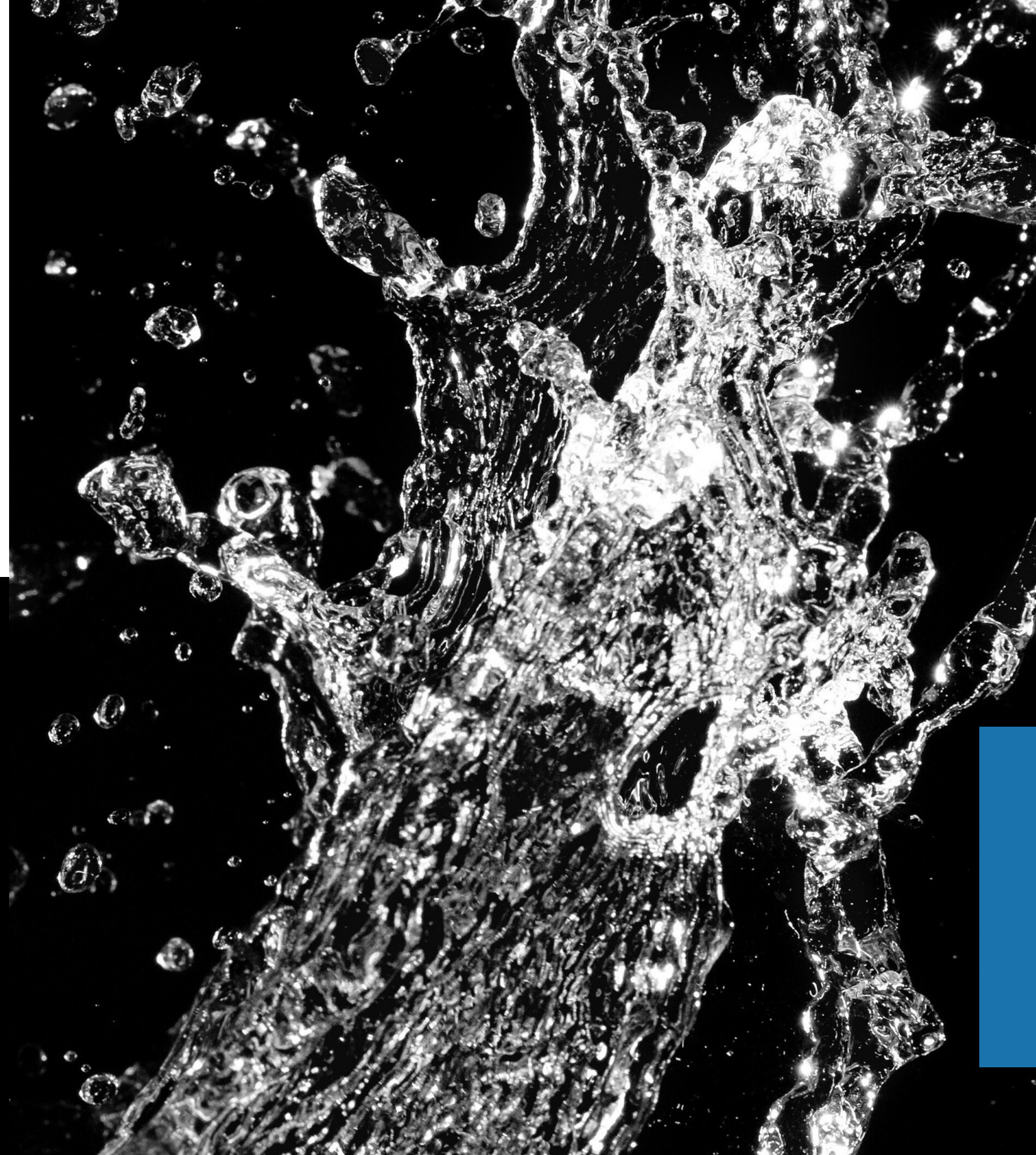
J.M. FRY INKS
A FAMILY COMPANY

THE BASICS OF INK, PH & VISCOSITY

JAKE WANDREY

WHAT ARE WATER BASED INKS?

Water based inks are a stable dispersion in water of very small solid particles in a resinous vehicle and the action of surfactants and other performance additives.



WHAT IS INK MADE OF?





RESIN

VEHICLE OR EXTENDER

The system dictates the primary properties of a printing ink; product resistance, adhesion, printability, etc.

The vehicle or extender is how the pigment travels from inking system, anilox, and plate to the board.



PIGMENT

Either dry powder or pre-dispersed into a solution. This is the colorant in an ink.

Typically, the most expensive raw material portion of a printing ink.

There are many different grades and shades of pigment.

GENERAL RULE

The more you want it to do, the more expensive the pigment thus the more expensive the ink will be.

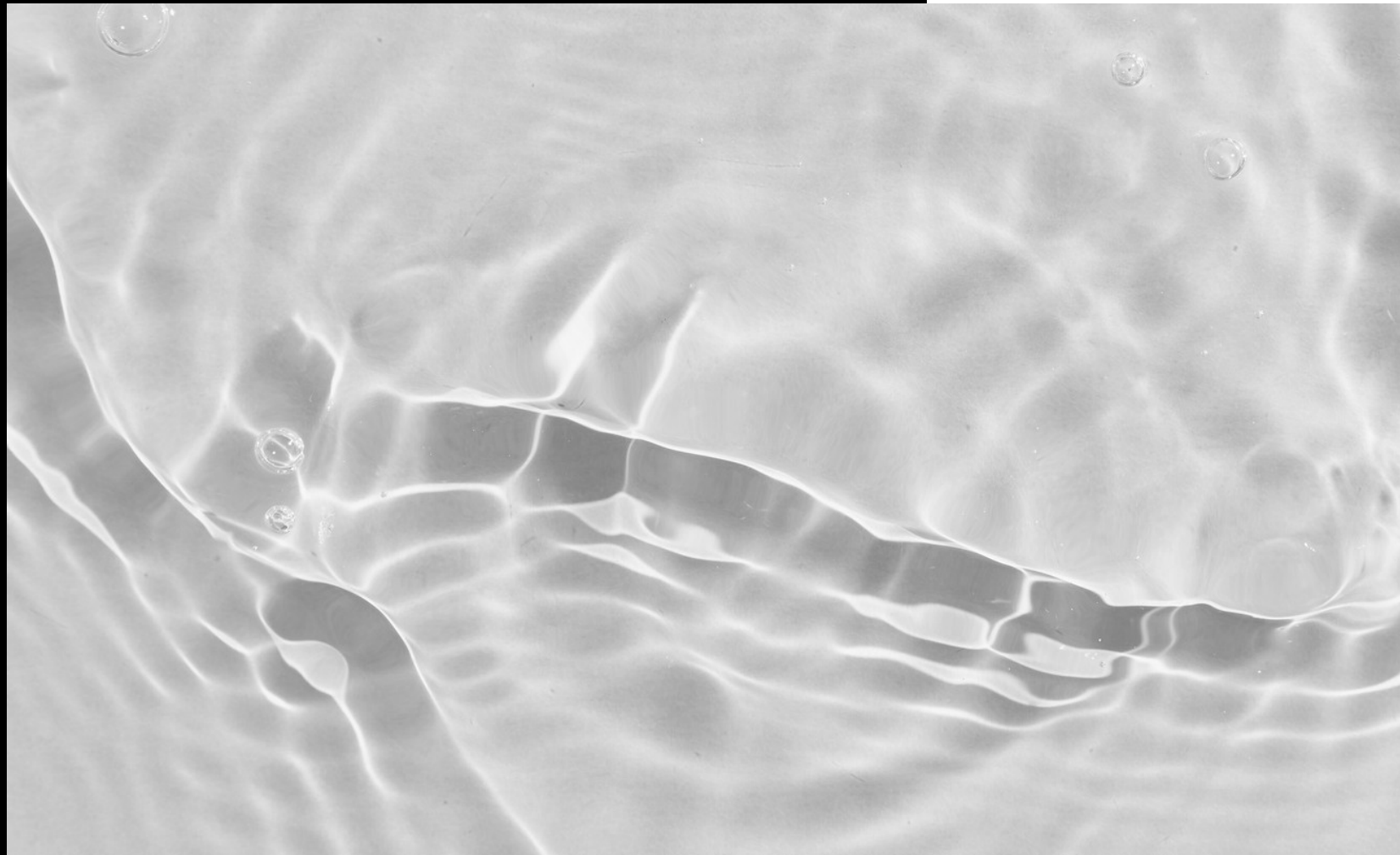


ADDITIVES

Waxes, transfer aids, defoamer, surfactants, silicone, etc. These are used to enhance the performance properties of an ink system.

Examples are improved rub resistance, printability, adhesion, etc.

More is not better!

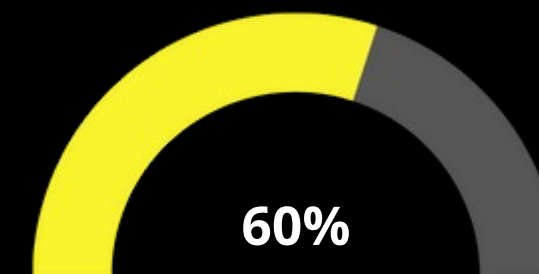


SOLVENTS & VOLATILES

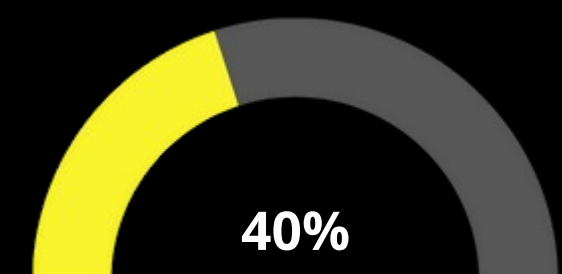
In a water-based ink, water is the primary solvent, but alcohol can be used to accelerate the drying speed.

Water and amines, about 60% of a typical ink, providing solubility and re-solubility.

TYPICAL WATER BASED INK OR COATING



WATER

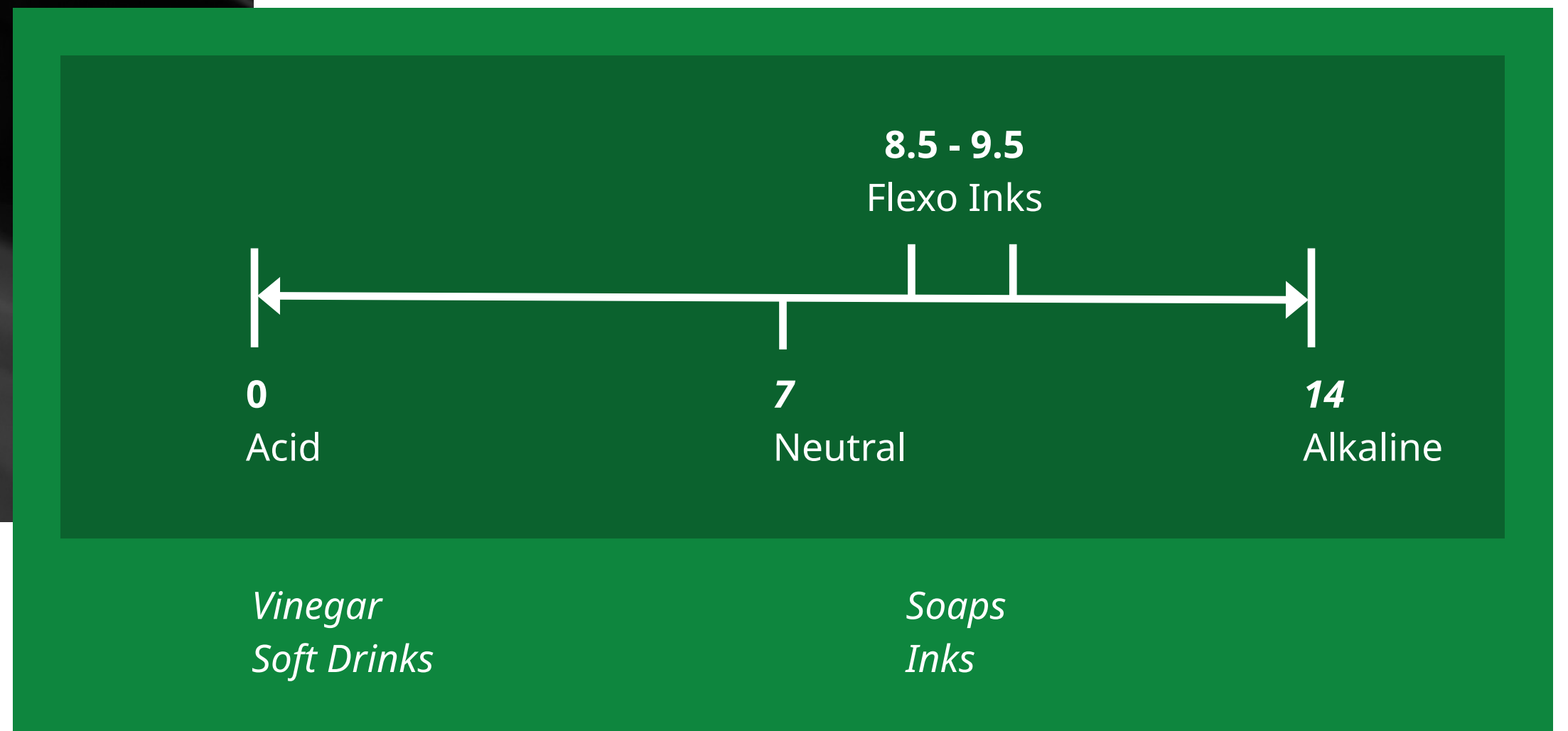


SOLIDS

Combinations of
pigment, polymer,
and/or filler.



UNDERSTANDING PH



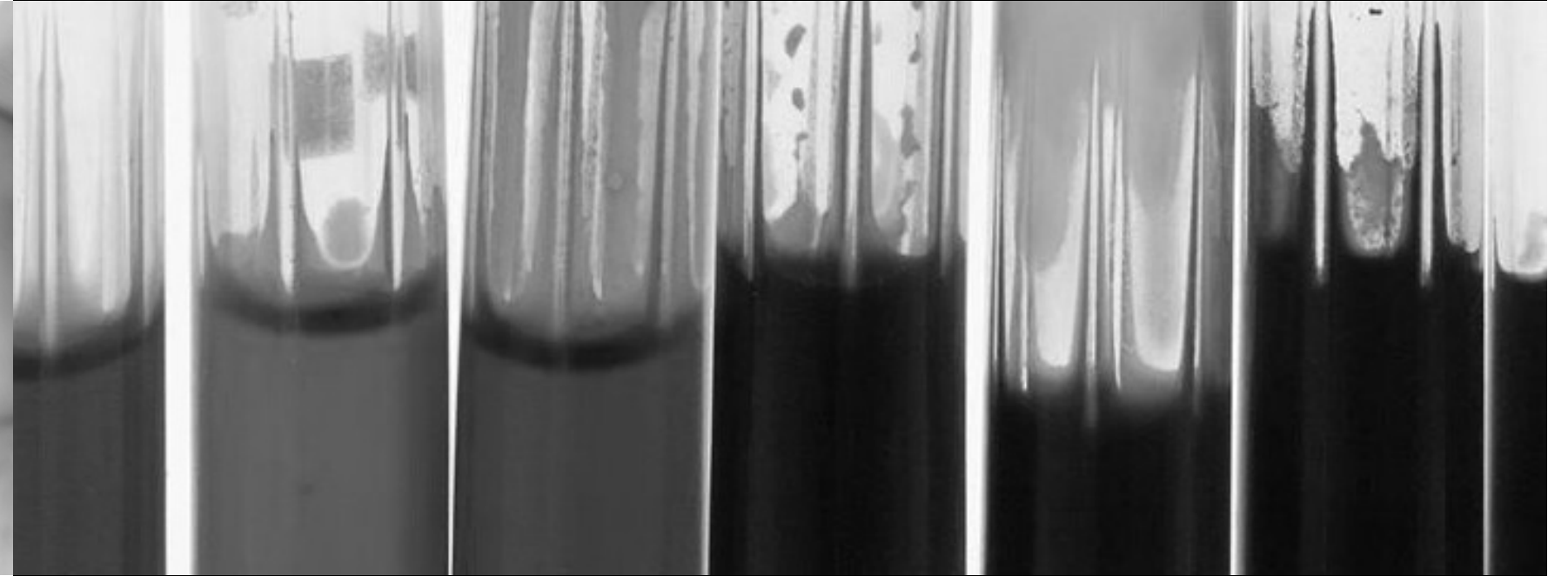
HOW CRITICAL IS PH CONTROL?





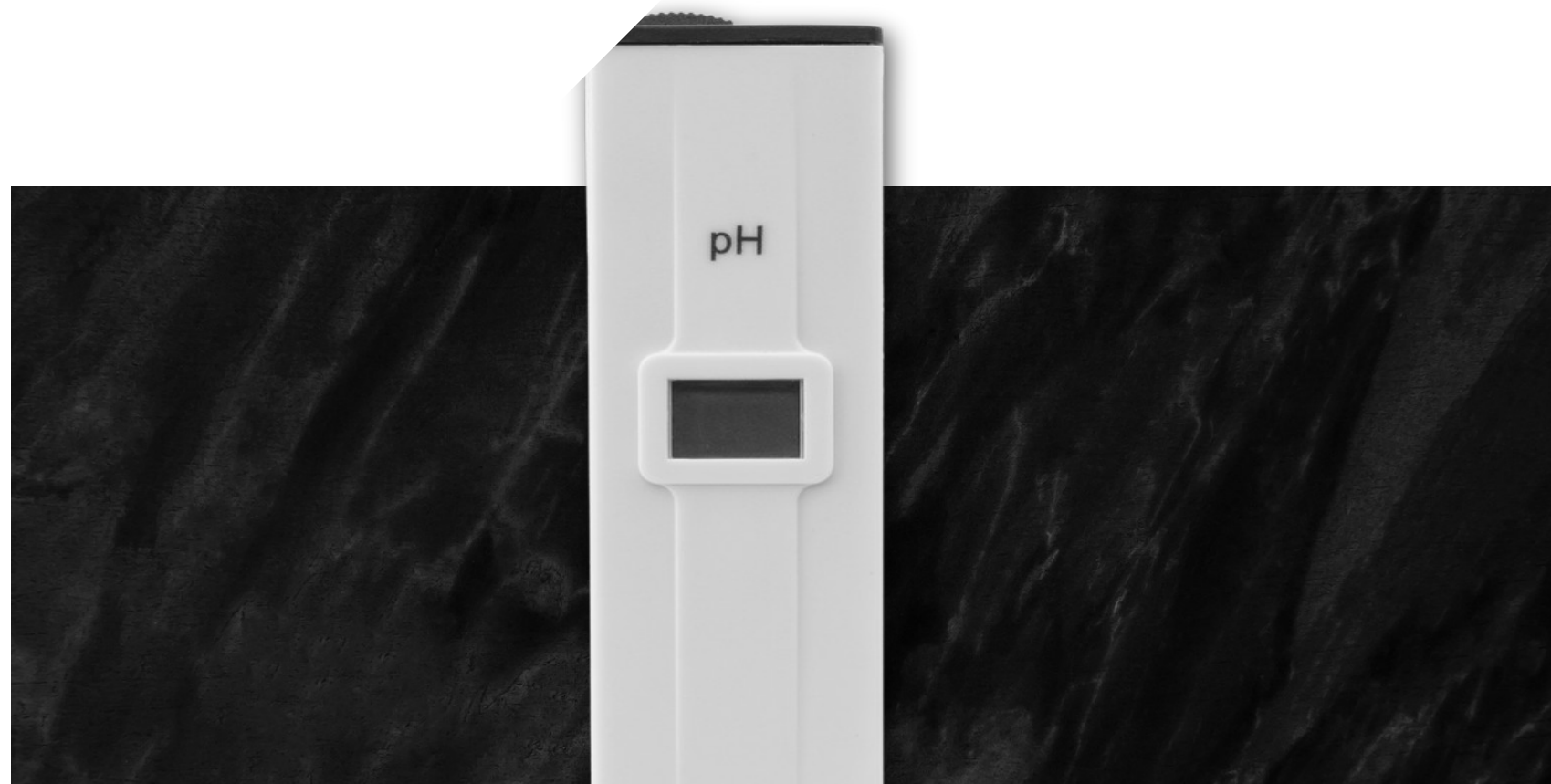
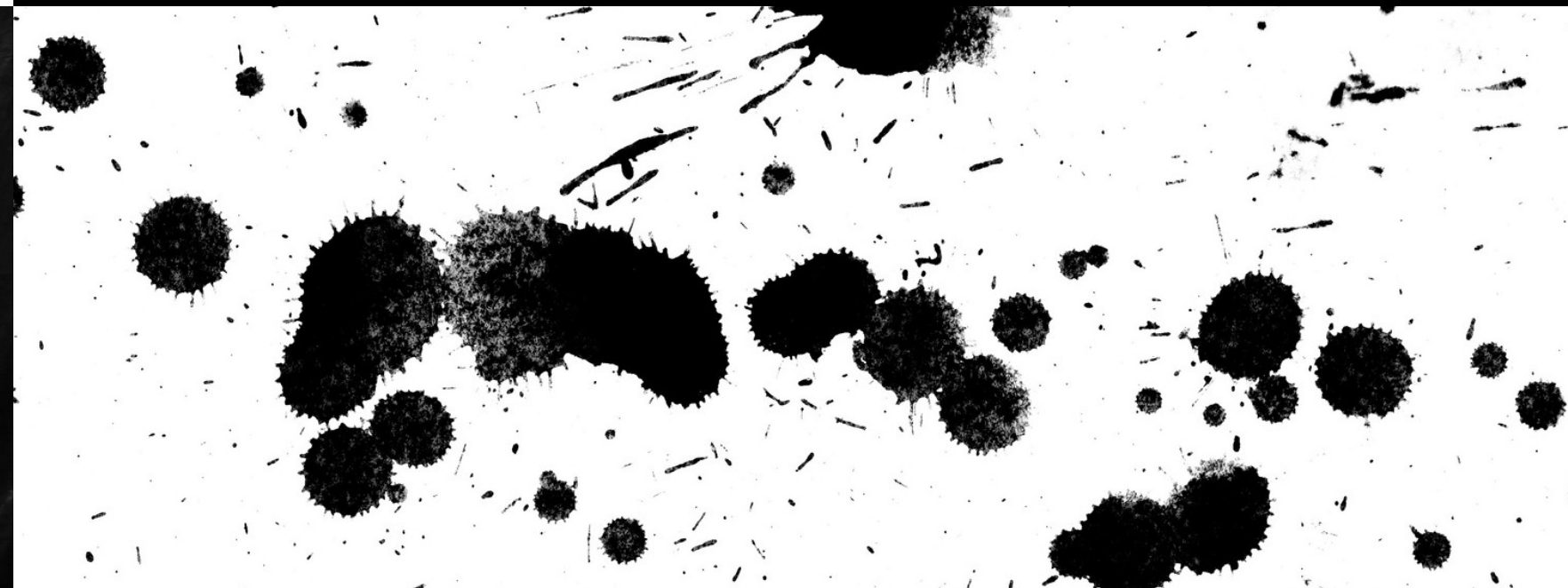
VARIABLES IMPACTING PH STABILITY

Pressroom Environment — heat and lack of humidity
Friction/heat from Doctor Blade Shear
Over agitation of inks
Uncovered ink kits



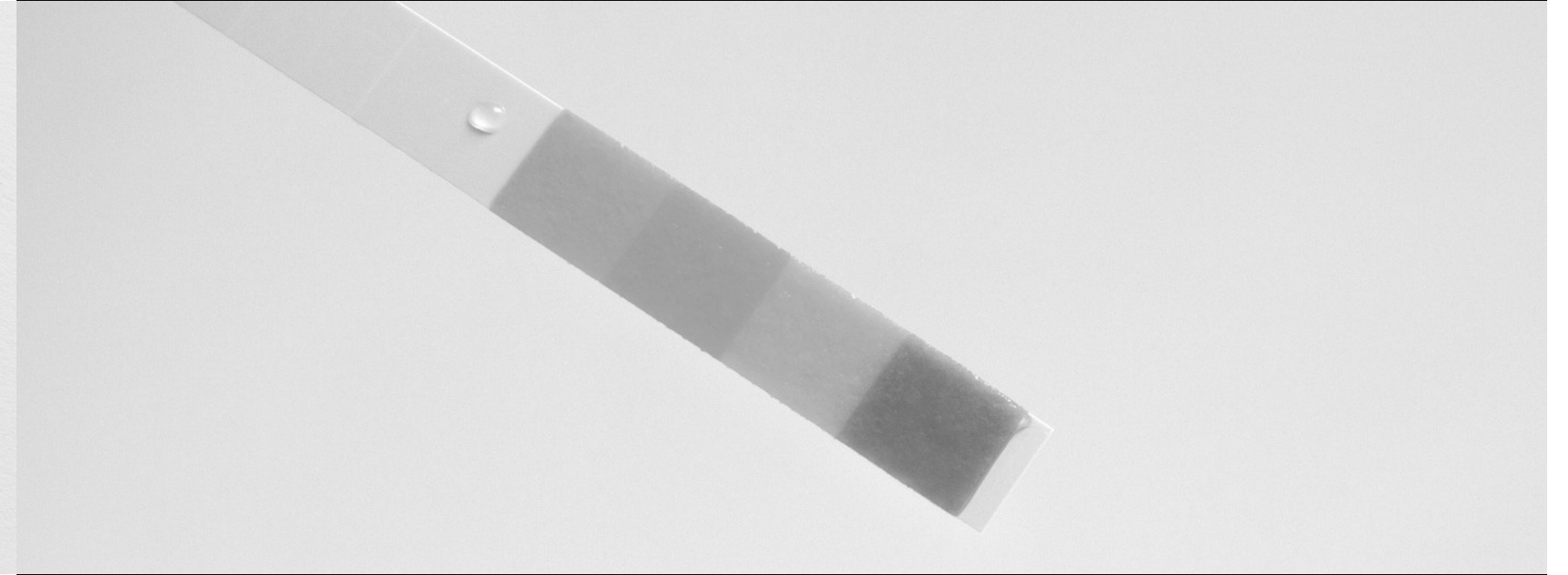
IMPACT OF LOW PH (<8.8)

- Dries too fast on anilox roller, plates, or linerboard
- Less stable on press
- Difficult to rewet on plate
- Unstable color
- Harder to clean up
- Viscosity increases > resin can “kick out”



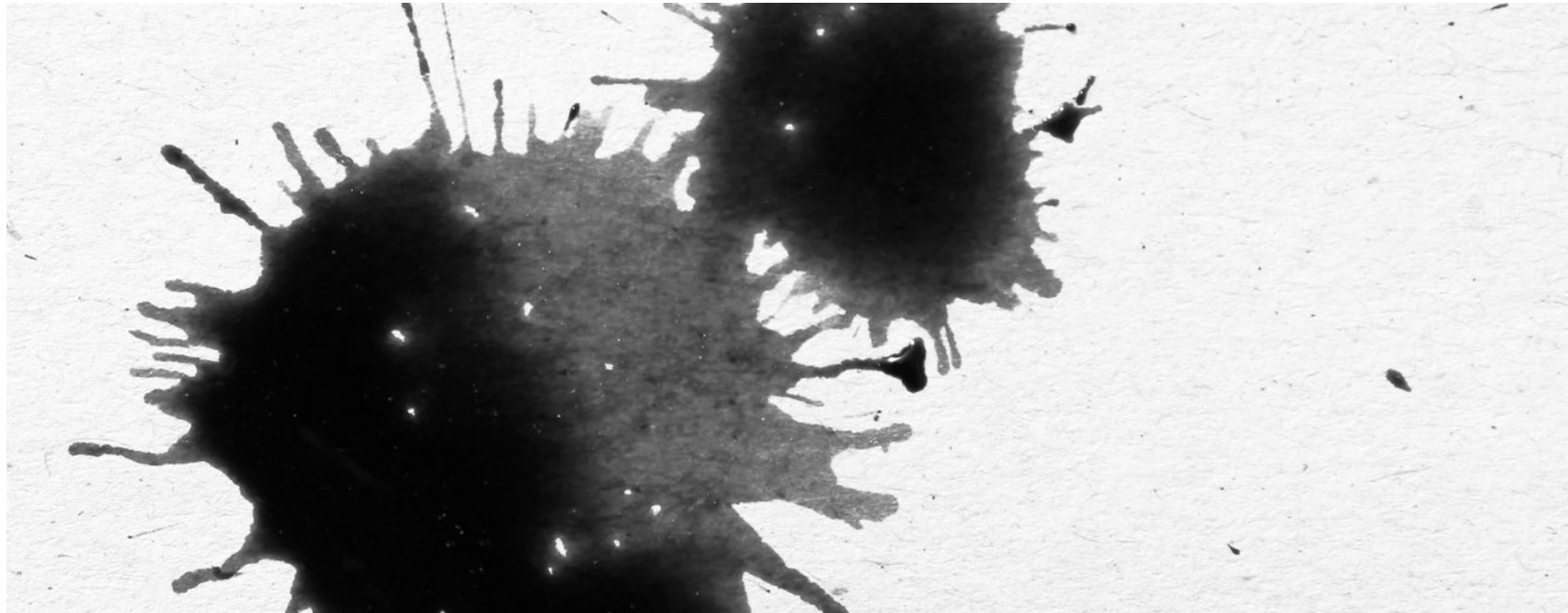
IMPACT OF HIGH PH (<9.6)

- Slower drying
- Softer film
- Color burnout
- Viscosity decreases
- Odor problems



CORRECT PH (8.8 - 9.6)

- Good resolubility on plates & roller
- Fewer stops to wash plates
- Easy clean up
- Stable viscosity
- Stable color



IF I TAKE CARE OF MY PH...

Plate and anilox clean up is much easier
Ink on the shelf doesn't come back as mud
Restore pH at the end of run as well as the beginning
All save time and money

WHAT IS VISCOSITY?

A measure of a liquid's ability to resist flow

The higher the viscosity, the less easily it will flow

An inks' pH influences its viscosity



HIGH VS LOW VICOSITY

The running viscosity affects the amount of ink that is transferred to the stock.

HIGH

Excess Ink Transfer

Tracking

Smudging

Slow Drying

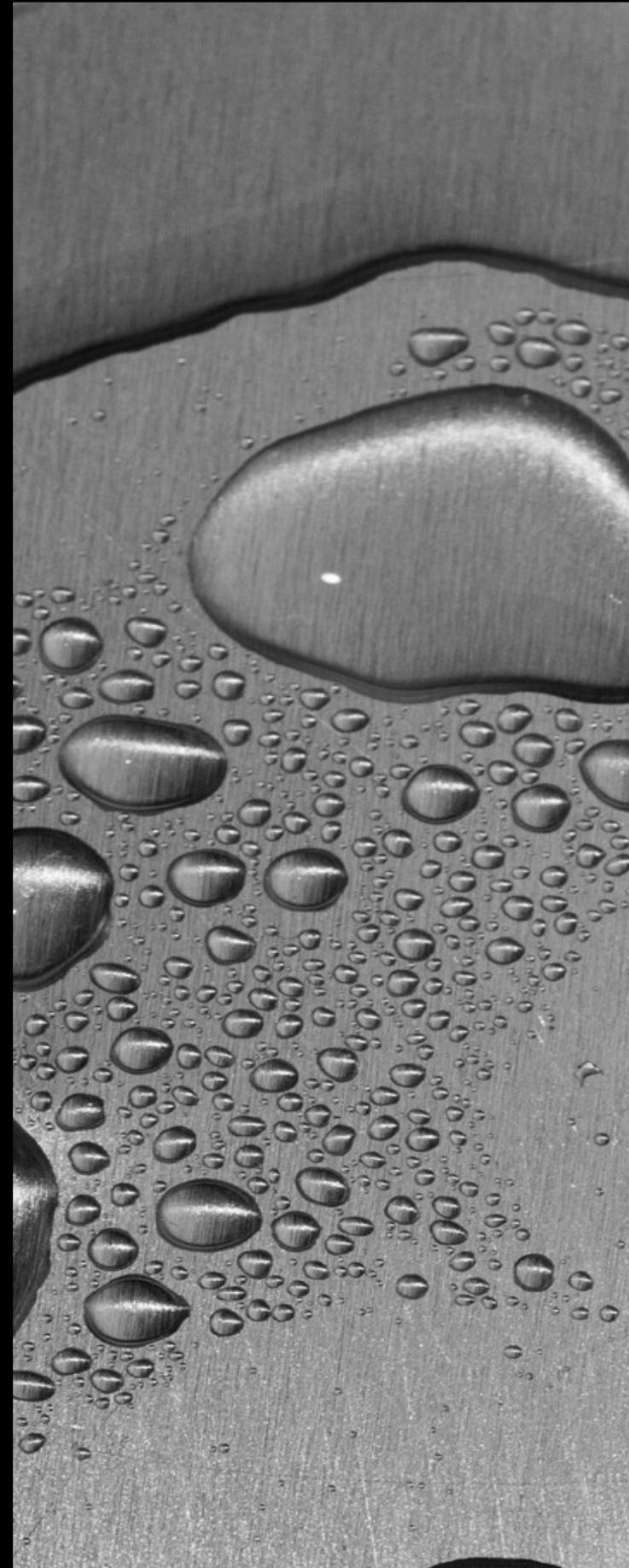
LOW

Weaker Print

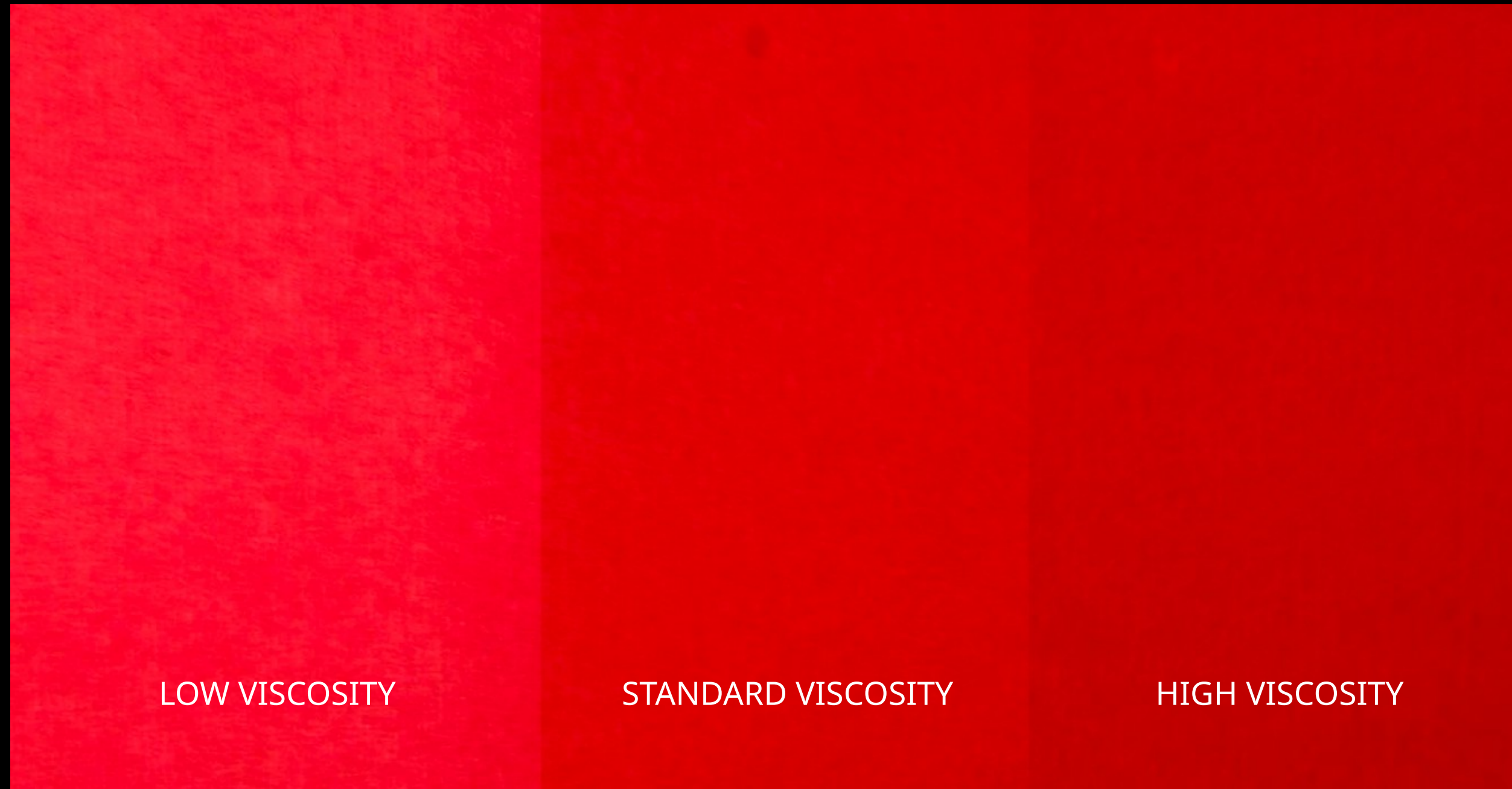
Dries Too Fast

Foaming

Poor Coverage



HOW DOES VISCOSITY IMPACT COLOR?





BEST PRACTICES

DOCUMENT PH AND VISCOSITY CHECKS:

Check / restore pH and viscosity before starting a new job.

Check the pH and viscosity every 30 minutes throughout the run

Restore the pH at the end of the run

DON'T LET YOU INK ENTER THE ***DANGER ZONE***

Keep your inks pH away from both the lower and higher end of the acceptable range:

8.8 - 9.6





QUESTIONS?

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