



## HISTOLOGY FIXATIVES

**FORMALDEHYDE 37%: FORMALIN 10%: N. BUFFERED 10%: CONCENTRATE:**  
VFM-128 (128 oz.) VFT-128 (128 oz.) VFB-128 (128 oz.) VFC-128 (128 oz.)  
VFB-640 (640 oz.) VFC-640 (640 oz.)

**BOUIN'S FIXATIVE:** VBF-016 (16 oz.)/ VBF-032 (32 oz.)/ VBF-128 (128 oz.)

Order online at [www.volusol.com](http://www.volusol.com)

**SUMMARY AND PRINCIPLES:** When a tissue is removed from a living condition, several changes happen within the cell. Autolysis (self-digestion) begins and is carried on by the reverse action of the enzymes, while bacteria multiply destroying the cells.

Tissues must be placed in fixatives as soon as possible after death. If a delay is unavoidable, specimens should be refrigerated until fixative can be applied. Most fixatives (with the exception of formalin) are a combination of chemicals, as a single chemical is rarely a good fixative. The combinations are designed so that each chemical compensates for the disadvantages of another.

Bouin's Fixative utilizes formaldehyde for cytoplasmic fixation, picric acid for fixation of chromatin, and glacial acetic acid to compensate for the disadvantages of the two other components. The end result is a fixative with excellent preserving qualities, making it very useful for routine use.

Formaldehydes (formalin) 37%, 10%, and neutral buffered 10%, utilizes formaldehyde gas dissolved in water. Formaldehyde 37% is treated as a 100% solution in making other solutions. Formalin 10% is recommended for short term fixation or storage of tissues. Neutral buffered 10% is a general all-purpose fixative and preserves protein without precipitating other constituents of the cell. The buffering eliminates the natural oxidation of formaldehyde to formic acid making it an excellent short or long-term fixative or storage solution.

**SPECIMEN PREPARATION:** Tissues should be trimmed to as small a size as is practical to allow rapid and complete penetration. Very small specimens may be wrapped in filter paper or lens paper before fixation to prevent loss.

**PROCEDURE:** Cover tissue with fixative equal to ten times the tissue volume. Fixation time depends on the type and size of tissue. The following times are meant only as guidelines: 1) BOUIN'S FIXATIVE: 24 hours- several weeks, 2) FORMALDEHYDE (BUFFERED 10%): 2-4 hours.

**EXPECTED RESULTS:** Microscopic examination should show minimal distortion and artifact. 1) BOUIN'S FIXATIVE: Large vacuoles may form in tissue. The yellow color must be extracted before staining. A treatment of 70% alcohol plus 3 drops of saturated lithium carbonate will facilitate extraction color. 2) FORMALDEHYDE (FORMALIN): Long storage in buffered formalin 10% improves the resultant fixation. \*NOTE: Only necessary to briefly wash formaldehyde and formalin solutions in water.\*

**STORAGE AND EXPIRATION:** Store reagents at room temperature (70-77.9 °F/ 20-25.5 °C). Maximum intended shelf life is printed on the label.

**WARNING:** Danger! Flammable. Vapor Harmful. For in vitro diagnostic use only. May be fatal or cause blindness if ingested. Cannot be made nonpoisonous. Keep away from heat and open flame. Avoid repeated or prolonged breathing of vapor. Use only with adequate ventilation.

### REFERENCES:

1. Humason, Gretchen L., Animal Tissue Techniques; 1962: W.H. Freeman & Co.
2. Lillie, R.D., Histopathologic Technic and Practical Histochemistry; 1965; McGraw Hill, Inc.
3. Armed Forces Institute of Pathology, Manual of Histologic Staining Methods; 3rds edition; McGraw Hill, Inc.