

Appendix

Appendix A

Definition of Terms

Accelerated Aging: exposing paper to high temperatures and varying humidity to simulate natural aging.

Acid Books: books whose pages have a pH of less than 7. The pages are not yet brittle, but because of their acidity they will become brittle in time.

Acid-Free: paper or books made with paper produced by alkaline manufacturing processes. Although the paper may not be totally free of acid, its pH is nearly neutral.

Aqueous Solvent: water or watery substance used to dissolve chemicals.

Autocatalytic: a self-sustaining decomposition of a chemical compound, often accompanied by a very rapid release of energy.

Brine Seal Tanks: seal pots that use brine to neutralize DEZ.

Brittle Books: books whose pages have become so fragile that they cannot be circulated.

Cellulose: primary plant fiber used to make paper.

Compatible: indicates that a chemical or process has no adverse reaction with the various materials or chemicals found in books (e. g., the paper's cellulose, sizing, fillers, pigments, inks, glues, labels, covers, etc.).

Dew Point: temperature at which vapor condenses into liquid.

Distributive Control System (DCS): a computer system that monitors and helps to operate chemical processes.

Fold Endurance: the number of folds a piece of paper (under tension) can withstand before it breaks (see TAPPI standard - T511.50-69).

Hemicellulose: a substance like cellulose, but less complex.

Inert Gas: gas such as nitrogen, having few or no active properties.

kPa: kilopascal, a unit of pressure roughly equal to 1/100 of atmospheric pressure.

Lignin: unstable constituent of wood pulp that leads to rapid deterioration of paper.

Load Cells: devices used to measure weight.

Loss Time Accidents: industrial mishaps that result in worker(s) not being able to return immediately to work.

Mass Deacidification Process: chemical treatment to neutralize acids in paper and provide an alkaline buffer that can handle several closed books at one time.

Metal Alkyls: a chemical compound linking a metal atom or atoms with a hydrocarbon radical of the form CuH_{2n+1} ; very reactive.

Nonaqueous Solvent: chemicals (other than water) used to dissolve other chemicals. Nonaqueous solvents used in deacidification techniques include methanol.

Paper Brightness: ability of a paper to reflect light.

Paper Durability: relates to the physical and mechanical properties of paper and its ability to resist wear and tear.

Permanent Paper: paper that is usually acid-free and is made to resist the effects of aging to a greater degree than ordinary paper.

TAPPI Standards:

Type I - Maximum Permanence

pH = 7.5 -9.5 + 2 percent MgCO_3 or CaCO_3

Type II - High Permanence

pH = 6.5 -8.5

Type III - Medium Permanence

pH greater than 5.5

Paper Permanence: ability of paper to maintain any or all of its properties over time.

Permissive: a specified set of process parameters (including interlocks) that must be met before starting the next process step.

pH: a measure of acidity (or alkalinity). On a log-scale from 0 to 14, a pH of 7 is neutral. A pH less than 7 indicates the presence of acids, a pH greater than 7 indicates the presence of alkaline materials.

Plant Commissioning: starting up and checking out, both individually and as a system, the various pieces of equipment to be used in a processing plant.

Polymerization: the process of joining two or more like molecules into a more complex molecule whose molecular weight is a multiple of the original and whose physical properties are different.

Preelection: screening to determine which books can be safely treated.

PSIG: pounds per square inch gauge; pressure measured relative to atmospheric pressure which equals 14.7 pounds per square inch.

Pyrophoric: chemical that spontaneously ignites when exposed to air.

Safety Interlocks: a specified set of positions for various pieces of equipment (e. g., on/off or open/closed) that must be met before another operation can occur.

Seal Pot: tank containing agents that can neutralize DEZ; used to remove DEZ vapors from effluent vapors before releasing them to the atmosphere.

Sizing Agent: material added to paper during manufacture to reduce penetration of liquids and prevent inks from blotting.

Specific Heat: the heat required to raise the tempera-

ture of one gram of a substance one degree Centigrade.

Strengthening techniques: methods for restoring brittle papers so that they can be handled.

Surfactant: a chemical used in a liquid dispersion to keep other particles equally dispersed within the liquid.

TAPPI: Technical Association of the Pulp and Paper Industry.

Thermochemical Properties: characteristics dealing with the interrelation of heat with chemical reaction or physical change of state.

Thermodynamic Properties: characteristics dealing with mechanical action or heat.

Threshold Limit Value (TLV): a maximum level of exposure set by the American Conference of Governmental Industrial Hygienists (ACGIH) for various industrial substances.

Titration: chemistry method for determining the strength or concentration of a solution,

Torr: a unit of pressure equal to 1/760 of atmospheric pressure.