



Tempil[®]

An Illinois Tool Works Company

Health Care Sterilization Products



Accurate indication.

Reliable results.[™]

The background of the advertisement is a photograph of a surgical team in an operating room. The scene is dominated by a large, crumpled green sterile drape that covers the patient and the surgical table. In the foreground, various surgical instruments are visible, including a pair of forceps, several long-handled probes or retractors, and a pair of scissors. A gloved hand is seen reaching into the field. The overall atmosphere is clinical and sterile. The text is overlaid on the top portion of the image.

Accurate and Reliable Indication Solutions for Sterilization Processes

Since 1938, Tempil has been a leader in the development of innovative and accurate temperature indication technology for a broad range of temperature-critical applications across many markets. Our products are developed to meet the specific needs of the industries we serve.

As the world leader in the formulation and manufacture of indicating inks designed for the confirmation of the sterilization process, we offer a variety of unique solutions that consistently monitor and confirm the end of time sensitive processes used for the various forms of sterilization. Today Tempil offers a variety of solutions in the form of heat and chemical-sensitive inks. Packaging printed with these inks provides a quick and easy verification that the packaged material has been subjected to the proper sterilization process.

Tempilink® Sterilization Process Indicating Ink

Designed to change color* indicating the completion of a sterilization process, Tempilink® is uniquely formulated with chemically-reactive materials sensitive to specific heat levels and/or the presence of certain chemicals used in the sterilization process. The Tempilink product line includes inks formulated specifically for Steam Autoclave, Ethylene Oxide Gas, Hydrogen Peroxide (Plasma), Formaldehyde Gas, Radiation or Dry Heat sterilization procedures. Special formulations such as Dual-purpose Inks are available which provide confirmation of multiple-step processes, such as the use of Steam Autoclave and EO Gas. The color change is permanent and irreversible so the package remains identifiable as having been properly sterilized for the length of its shelf life.

Available in both water and solvent-based formulations, Tempilink is suitable for printing on most conventional packaging materials including Autoclave Kraft Paper, Tyvek®, polyester, polypropylene, polyimide, as well as pressure-sensitive tape and cloth. Most Tempilinks can be stored at temperatures lower than 80°F/27°C for up to six months and can be applied using conventional flexographic printing equipment. Tempilinks are capable of conforming to ISO 11140-1 Standards for Class 1 process indicators.



Typical Applications:

Tempilink can be printed flexographically and used in virtually any application where a permanent, tamperproof means of confirming the successful completion of the sterilization process is required.

Hospital and Medical Facilities:

Printing of peel-pouch packaging for reusable and single-use devices, decontamination bags, and lid stock are common applications. Labels, tags, pressure-sensitive tapes, and dots can also be printed for use during on-site sterilization processes.

Pharmaceuticals & Medical Devices:

Printing of packaging, pressure-sensitive labels, tapes and dots allow for a dramatic color change confirming that the pharmaceuticals and medical devices have completed the sterilization process.

Food Processing:

Printing of packaging, pressure-sensitive labels, tapes and dots provide an irreversible color change assuring that the products have completed the prescribed sterilization process.

Typical Sterilization Procedures:

DRY	Dry heat at 320°F/160°C for 40 minutes
EO	Ethylene Oxide Gas 600 mg/l concentration at 130°F/54°C for 20 minutes
FORM	Formaldehyde Gas 1,0 mol/l concentration at 158°F/70°C for 15 minutes
IRRAD	E-beam & Gamma radiation 10kGy (1.0 megarad)
STEAM	Long Cycle – Saturated steam at 250°F/121°C for 10 minutes Short Cycle – Saturated steam at 273°F/134°C for 2 minutes
VH202	Vaporized Hydrogen Peroxide (Plasma) systems

**Note: Tempilinks are intended to change color as proof that the packaging has been exposed to specific sterilization conditions. It is not intended to replace biological monitors that directly measure spore kill, bacteria kill or other pathogens.*

Tempilink® Color Guide

Original Color Signal Color	Blue Brown	Blue Green	Blue Red	Green Purple	Green Red	Pink Brown	Pink Green	White Blue	White Black	White Cocoa	White Red	Yellow Cocoa	Yellow Red
Series Designation:	AC	AG	AR	GP	GR	RC	RG	WA	WB	WC	WR	YC	YR
Formaldehyde							PR TG						
Steam Autoclave	PR TG			PR LS		FM PR LS TK				FM FL LS PR TP	PR		
EO Gas	PR TK	PR TK				PR TK				PR TK		PR TK	
Hydrogen Peroxide (Plasma)			TK										
Radiation (E-beam & Gamma)													TG TP TK
Thermal 160°F/71°C - 170°F/77°C					PR TK			PR TK	PR TK		PR TK		PR TK

FM = Film FL = Foil LS = Labels PR = Paper TG = Tags TP = Tape TK = Tyvek®

Signal color brown or cocoa covers shades from tan to black, depending on the specific Tempilink® selected.

Tempilinks cannot be matched to commercial ink color matching systems such as PMS or Pantone. The actual color of the ink after processing depends on many factors including the substrate on which it is printed, the density of the ink applied in the printing process, and the exposure conditions during the sterilization process.

Standard Packaging: Inks are sold in 1-gallon bottles and 5-gallon pails. This is equivalent to:

	1-Gallon Bottle	5-Gallon Pail
Steam Ink	9 lb/4.1 kg	45 lb/20.4 kg
Thermal Ink	8 lb/3.6 kg	40 lb/18.1 kg
EO Ink, Hydrogen Peroxide (Plasma), Formaldehyde & Dual-Inks	7 lb/3.2 kg	35 lb/15.9 kg
Radiation Ink	10 lb/4.5 kg	50 lb/22.7 kg

Tempilinks are sold by the pound, reflecting actual weight sold and may also be subject to an additional surcharge.

Mixing: Water-based inks are supplied as a two-part system which are combined and mixed by volume following the package directions. Tempil Extender and Tempil Thickener are recommended for the modification of the final viscosity when using Series 200 inks.

Coverage: Intensity of signal color depends on the amount of ink applied to the surface of the substrate being printed. A heavier application of ink will result in a more dramatic color change during use. It is recommended that pre-production samples be subjected to the intended sterilization process using prescribed procedures to determine the actual color transformation result. Coverage can then be adjusted to meet the desired level of color transformation prior to actual print production.

Dilution: Water-based Series 200 inks may be diluted with Tempil Extender. For solvent-based inks, use the solvent specified on the container label.

Drying: Water-based inks can be dried at 110°F (43°C) to 125°F (52°C). Solvent-based inks are shipped ready for printing, and can tolerate up to 10% propylene glycol ether retarder (Downanol PM) added to the ink prior to pouring into the fountain.

Shelf Life: Shelf life of two-part water-based systems in original separate containers is 12 months. Once the product is mixed for use,

the shelf life is only one to two days. Therefore, the product should only be mixed just prior to use. To achieve maximum shelf life, store inks following recommended practices. The shelf life of solvent-based inks is four to six months, when stored in their original container. To achieve maximum shelf life, store inks following recommended practices.

Storage: Store inks in their original containers in a dry location with their temperature maintained between 60°F/15°C and 80°F/27°C. Refrigeration can extend their shelf life.

Clean-up: Water-based inks clean up with standard warm water and soap procedures similar to latex paints. Please consult the label on the original container for recommended solvents when cleaning up after using solvent-based inks.

Water-Base: Available for Steam Autoclave, Hydrogen Peroxide (Plasma), Radiation and Ethylene Oxide Gas, Formaldehyde & Thermal applications.

Environmentally Friendly: Series 200 Steam inks are lead, copper and bismuth-free. All EO, Formaldehyde, Hydrogen Peroxide (Plasma), Radiation & Thermal inks are heavy metal-free.

VOC Free: Water-based inks are completely free of VOCs (ASTM D 2369-87).

To Order:

Specify the following:

- (1) Sterilization Method: Steam Autoclave (S), Dry Heat (H), EO Gas (G), Formaldehyde Gas (FG), Gas Plasma (GP), Radiation (R), Temperature (T)
- (2) Color Change: See Color Chart above for full range of options available

Example: S-FGP-202 is a fluid, heavy metal-free, steam autoclavable ink which turns from original color green to signal color purple.



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