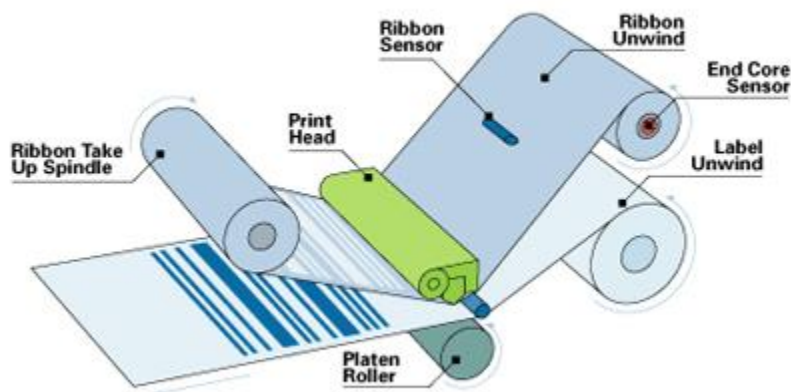


How Thermal Transfer Printing Works



RIBBON UNWIND

The Ribbon Unwind serves one primary function—hold the TTR roll in place while the thermal printer is running. TTRs are wrapped around Fiberboard Cores (see TTR Components) that fit perfectly into the Ribbon Unwind. Usually the Ribbon Unwind is located in front of the Label Unwind and both are pulled under the Thermal Print Head by the movement of the Platen Roller.

LABEL UNWIND

The Label Unwind holds the roll of labels in place while the thermal printer is printing. The labels are placed on the Label Unwind and fed through the Platen Roller along with the TTR. As the thermal printing process continues, the Labels are pushed out of the printer by the force from the Platen Roller.

RIBBON TAKE-UP SPINDLE

After the TTR has been pulled through the Platen Roller and Thermal Print Head it must be manually attached to the Ribbon Take-Up Spindle. The Ribbon Take-Up Spindle rotates in the opposite direction of the Ribbon Unwind to collect the TTR after it has passed through the thermal printing process. The Ribbon Take-Up Spindle allows for easy disposal of the used TTR.

RIBBON SENSOR

The Ribbon Sensor is an important component of the thermal transfer printer it senses if a TTR is in place. This sensor also detects the end of a TTR roll by notifying the printer's internal computer when it has reached the Trailer film. Not all thermal transfer printers use a ribbon sensor—some thermal printers use an End Core Sensor (see description of End Core Sensor). Both sensors have similar functions—to detect the end of a TTR roll. Detecting the end of a TTR roll before it reaches the thermal print head is important for protecting the thermal print head.

RIBBON UNWIND

The Ribbon Unwind serves one primary function — hold the TTR roll in place while the thermal printer is running. TTRs are wrapped around Fiberboard Cores (see TTR Components) that fit perfectly into the Ribbon Unwind. Usually the Ribbon Unwind is located in front of the Label Unwind and both are pulled under the Thermal Print Head by the movement of the Platen Roller.

END CORE SENSOR

The End Core Sensor is located inside the Ribbon Unwind. Its primary function is to detect a lack of motion from the Ribbon Unwind. This process works closely with the TTRs End Film and adhesion to the Fiberboard Core. The End Film of a TTR is loosely attached to the Fiberboard Core. When the TTR reaches the end of its roll, the constant rotating motion will detach the End Film from the Fiberboard Core and the Ribbon Unwind will cease its rotations. The End Core Sensor will detect this lack of motion and notify the thermal printer's internal computer to stop printing.

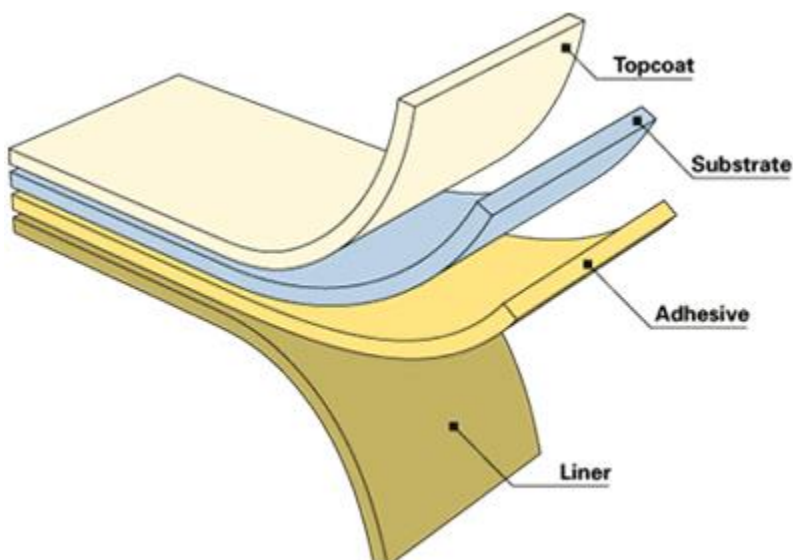
THERMAL PRINT HEAD

The Thermal Print Head is the most important mechanism of a thermal transfer printer. The Thermal Print Head consists of a fixed number of heating elements corresponding to the thermal print head's printing resolution. When fired, these heating elements transfer heat through the TTR and onto the label substrate. This combined with pressure completes the printing process by transferring the melted ink to the label substrate.

PLATTEN ROLLER

The Platen Roller is usually a stationary roller centered directly under the thermal print head and serves as a multi-functional component in the thermal printing process. A small motor spins the Platen Roller into motion and guides the TTR and label through the thermal printer and more importantly under the thermal print head for printing. The Platen Roller is also used to help feed the TTR and label into the thermal printer.

SUBSTRATE COMPONENTS



LINER

The liner is almost always a paper material with a silicon coating. Its primary function is to promote easy handling of the label from pre-print to print and protect the adhesive layer. The liner is removed at the end of the printing process when the label is ready to adhere to its intended object.

ADHESIVE

This layer forms a bond between the printed substrate material and the object to which it will adhere. There are many types of adhesive, each designed to meet specific application requirements. When determining what type of adhesive is required, there are many things to consider, including:

- if the label needs to be permanently affixed to a surface or easily removed;
- whether the surface to which it will be applied is rough or smooth;
- if the label will be used in any extreme environments, e.g. high temperature or high humidity.

SUBSTRATE

Substrate layers for thermal transfer printing are made of paper or one of many different types of synthetic material, depending on the desired durability of the application. The substrate is the actual material that carries the printed image.

TOPCOAT

The Topcoat layer is almost always present for thermal transfer receptive labels. This layer encourages adhesion of the various thermal transfer inks to the substrate layer.