



Performance Comparison of types of Thermal Printer Ribbon

Thermal printer ribbon inks are composed of a mixture of wax and resin in varying proportions to provide different performance characteristics suitable to different types of materials and applications. These can generally be summarised as follows:

	Wax	Wax/Resin	Resin	Premium Resin
Transferability	V. High	High	Moderate	Moderate
Print Density (darkness)	V. High	High	Moderate	Moderate
Print Speed	High	Medium	Low	Low
Smudge Resistance	Low	Medium/High	V. High	V. High
Scratch Resistance	Low	Low	High	V. High
Heat Resistance	Low	Low	High	High
Solvent Resistance	Low	Low	Medium	High
Suitable for Outside Use	No	Yes	Yes	Yes
Suitable For (Materials)	Paper	Paper, Semi-Gloss	Gloss	Gloss
Not Suitable For (Materials)	Semi-Gloss, Gloss	Gloss	Paper, Semi-Gloss	Paper, Semi-Gloss
Performance	Gives solid black print on all materials but easily scratches off or smears on non-porous materials.	Gives solid black print and smear resistance on most materials but easily scratches off on gloss materials.	Smear and scratch resistant on most materials but gives poor coverage on porous materials.	Smear and scratch resistant on most materials but gives poor coverage on porous materials.
Suitable For (Applications)	Limited direct handling.	Frequent handling but limited direct abrasion.	Frequent handling and likelihood of abrasion.	Frequent handling and/or abrasion and exposure to chemicals/solvents.
All of the above characteristics are generalisations and may vary according to the actual label material being used.				

Key to Materials
Paper – Uncoated paper.
Semi-Gloss – Synthetic material or coated paper with a porous or semi-porous, semi-gloss finish.
Gloss - Synthetic material with a non-porous, glossy finish.

Key to Formulations
Wax – High wax, low resin formulation.
Wax/Resin – Balanced formulation of wax and resin.
Resin – High resin, low wax formulation.
Premium Resin – V. High resin, low wax formulation.

Why is it important to use the correct ribbon type for the label media?

Because you need to match the qualities of the ribbon to the qualities of the label media, and its intended usage, in order to get the best results. The considerations are as follows:

- Pure or High Wax ribbons transfer readily onto all types of print media but have generally poor qualities of adhesion, and so are most suitable for printing onto porous materials (where the wax can be held by the pores). On semi-gloss, and especially on gloss material, the print may scratch or rub-off easily.
- Pure or High Resin ribbons transfer less readily to the print media but, once transferred, adhere much more strongly. They are strongly resistant to smearing and scratching on most media (as well as having good resistance to heat and/or solvents) but have a low print density making them unsuitable for use with porous materials (where seepage into the pores leaves poor surface coverage). Because they have a high melting temperature, they are also not suited to high-speed printing.
- Wax/Resin ribbons contain a mixed formulation of wax and resin and combine the properties of the two types. They typically give clear print and strong resistance to smear on most materials but may scratch readily, especially on high gloss materials.



OTHER CONSIDERATIONS:

- BS5609 Compliance** Can generally be achieved by using Wax/Resin ribbons on Semi-Gloss materials, or Resin ribbons on Gloss materials (rule of thumb only). Wax ribbons and/or paper labels are not generally suitable for BS5609 applications.
- Colours** Coloured ribbons are available in most grades. Red, Green and Blue are standard colours. Other colours may be available to order.
- Widths** All ribbons are available in a variety of widths to suit your label size and printer. Ideally, the width of the ribbon should be slightly more than the width of the label so that the ribbon overlaps a little at each side (helps reduce wear and tear on the print head).
- Inside/Outside Wound** Describes whether the ribbon film is wound on the core with the inked surface on the inside of the roll or outside of the roll. Some printers, ie. the Citizen CLP621, can accept ribbons that are inked on either side (requires different method of loading), but most require a specific alternative.
Generally (of the most popular printer brands):
 Inside Wound = Sato, Datamax
 Outside Wound = TEC, Citizen, Zebra
- Edge Head/Flat Head** Describes the two basic print head technologies. Thermal ribbons are generally interchangeable between different makes of printer that employ the same print head technology, but NOT between the two technologies. The two different head technologies require different ribbon formulations because they operate at substantially different temperatures.
- Core** Thermal printer ribbons are wound onto a cardboard or plastic core and this also determines which printer types and/or models they can be used on. By far the most common is the one-inch flush core (ie. a core with a 1 inch internal diameter cut flush to the width of the ribbon material) which can be used on a variety of different printers. Some smaller printers use a half-inch core, and a few printer models (like most of the TEC range) require a specific unique type.
- Recommended Shelf Life** Six (6) months maximum.
- Storage**
- a) Store ribbons in their original unopened boxes until required (unless the box has become damp or otherwise contaminated).
 - b) Whenever new supplies are received, cycle existing stock to the front to be used first.
 - c) Store in a cool, dry environment. Avoid strong direct sunlight, excess heat, cold or damp.