

THERMAL TRANSFER RIBBONS

Thermal transfer ribbons are typically made with pigment-based colorants that are mixed within a coating applied to one side of the polyester based ribbon. Thermal transfer ink coatings usually contain one or more fusible substances (i.e. waxes and/or fusible synthetic materials), a coloring substance, color pigments, and varying additives. Carbon black is the most desirable pigment in black ribbons. Carbon black is a very light-stable pigment. Images produced with carbon-black based colorant will not fade readily when exposed to either indoor or outdoor UV light.

With the advent of colored ribbon use, more and more thermal transfer printed bar codes are being printed in color. This can potentially cause a problem due to the contrast ratio requirement of bar code scanners. Acceptable combinations include: black, blue, green, and dark brown ribbon images on white, yellow, or red colored substrates. Other combinations may result in poor contrast ratio and unreadable bar codes. As with other printing colorants, blue and green colors are more stable when exposed to UV light than yellow, red and orange colorants.

TYPES OF RIBBONS

There are three types of thermal transfer ribbons. Each type of ribbon has a range of grades providing different levels of suitability with substrates. These materials contribute to the melting point of ribbons that affect the amount of energy necessary to print. Confer with your ribbon supplier to determine the specific suitability of each particular ribbon available to you. It is crucial that the ribbon used is compatible with the properties, both chemical and physical, of the substrate surface. The following lists general guidelines about ribbon suitability and performance:

1. **Wax** ribbons typically contain a high percentage of wax-based materials in the colorant substance. Since waxes generally have lower melting points than resins, printing with wax ribbons typically requires less energy than printing with wax/resin or resin ribbons. Since most waxes used tend to be softer than resins used, image durability is typically less with wax ribbons than wax/resin or resin ribbons. Most wax ribbons are made with only one colorant layer.

Wax ribbons are appropriate for general-purpose applications with uncoated substrates, matte coated substrates, and low-end films like polyethylene and polypropylene films. These ribbons are acceptable for applications where little physical contact with the printed image is likely to occur or where image life is short term (i.e. when durability isn't an issue). Generally wax ribbons have a print speed range of 8 to 12 inches per second. They are best considered for use in general purpose labeling, shipping labels, address labels, warehouse applications including shelf and bin labels, retail tag and label applications, compliance labeling, and textile/apparel applications. Wax ribbons are the least expensive of thermal transfer ribbons. The absorption capability of the substrate surface is a prerequisite for good ink anchorage with wax-based ribbons.

Recommended Ribbon: B220/W90 Resin Enhanced Wax Ribbon – Multipurpose bar code ribbon that yields excellent results on a broad range of media. B220 is an economical solution for most general use applications.

2. **Wax/resin** combination ribbons usually have a higher percentage of resin materials. Resin content contributes to a higher melting point of the ribbons. Printing with these ribbons requires more energy than printing with wax ribbons. Since resins are harder than waxes, image durability and chemical resistance for wax/resin ribbons better than that of wax ribbons. Wax/resin ribbons are

usually made up of two or more layers. These ribbons are most suitable with matte coated and gloss coated paper and synthetic including polyethylene, polypropylene, polyester films. Wax/resin images will perform satisfactorily where moderate scratch, abrasion resistance, or mild chemical durability is required. Wax/resin combination ribbons have a print speed range of 8 to 12 inches per second. They should be considered for use in all of the applications in which wax ribbons are used as well as outdoor applications such as lumber and nursery tags. Wax/resin combination ribbons are midrange price ribbons.

Recommended Ribbons:

B128/M95 Durable Extreme Series MidrangeT (ESRT) Wax/Resin – B128 wax/resin thermal transfer ribbon provides super-sharp imprints and clean edge definition. B128 is a logical choice for applications where extra durability of the printed image is required, as it is UV-resistant and offers strong abrasion and environmental resistance in demanding environments.

B112/M99 Flexible Techno-EdgeT Wax/Resin – B112 wax/resin ribbon is specifically designed to work in high volume labeling applications, and can be used on a wide range of paper and film media. B112 features superb scratch resistance and is UV resistant.

3. **Resin** ribbons contain the highest percentage of resin materials. Most resin ribbons are made of two or more layers. Printing with resin ribbons requires more energy than printing with other ribbons. Most resin ribbons work best within a maximum print speed of 6 inches per second. Since resins are harder than waxes, resin images have excellent abrasion, scuffing, heat, and chemical resistance. They provide the best performance in harsh environmental conditions. They are best suited for use with gloss-coated materials. Resin ribbons are best for retail applications, textile/apparel uses, tags and labels used outdoors (i.e. lumber and nursery applications), chemical exposure uses (i.e. drum labels), medical and pharmaceutical labeling, as well as industrial and automotive applications. Resin ribbons are the most expensive of thermal transfer ribbons.

Recommended Ribbon:

B324 Durable Extreme Series ResinT ESRT – B324 is a multi-purpose thermal transfer resin ribbon that can be used on a wide variety of paper and film media. UL approved, this ribbon is designed to withstand harsh work environments in a wide range of high end market sectors.

Thermal transfer ribbons perform differently with true edge, corner edge, near edge and flat-type print heads due to different peel-off times. This can impact printing performance. Furthermore, different ribbons may perform at different print speeds. This can be a critical issue, particularly in high demand environments.

Pointil Systems manufactures a variety of products on a multitude of substrates for use in thermal transfer printers. To facilitate complete ribbon and media use, the media (i.e. thermal transfer labels and/or tags) should be packed in lengths equal to that of the ribbon being used. Pointil Systems provides media/ribbon packing (see Econo-packing).

Ribbon Information Resources

Ribbon/Printer Cross Reference Guide:

<http://www.itwthermalfilms.com/LinkClick.aspx?fileticket=ZpWH%2br8IDPY%3d&tabid=104>

Ribbon/Label Compatibility Reference:

http://www.itwthermalfilms.com/Portals/0/PDF/CompatibilityMatrices/ITW_Media_and_Label_Cross_Reference.pdf

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