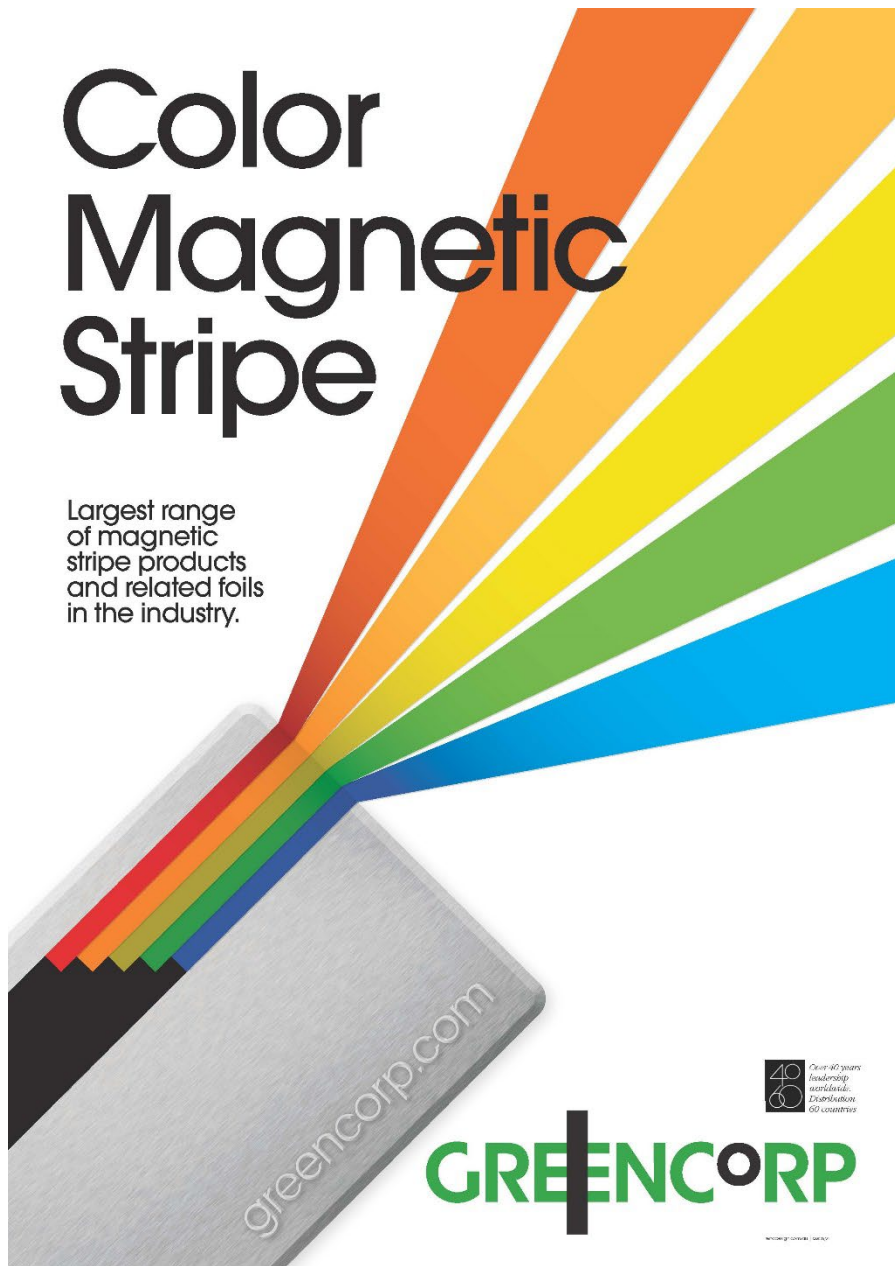


TECHNICAL DATA & PRODUCT GUIDE

February 2024

Color Magnetic Stripe

Largest range
of magnetic
stripe products
and related foils
in the industry.



Greencorp Pty Ltd

80 Perry Street Matraville NSW Australia 2036

T +61 2 9661 6511

Greencorp Magnetics Inc

4342 McDowell Road Grove City OH 43123 USA

T +1 614 801 4000

Greencorp Magnetics Deutschland GmbH

Rilkestrasse 72 Bonn D-53225 Germany

T +49 (228) 9737817

www.greencorp.com

info@greencorp.com

GREENCORP
ahead in service

Contents

| | |
|--|-----------|
| Introduction | 3 |
| Product Selection Matrix | 4 |
| The Greencorp advantage | 9 |
| Types of mag-stripe | 10 |
| What is Coercivity? | 12 |
| ISO Specification | 12 |
| Common Terminology | 13 |
| Magnetic Stripe Recommended Production Parameters | 14 |

Introduction

Greencorp Pty Ltd is a specialist producer of magnetic tapes since 1972 and is one of the few companies worldwide to master the technology of magnetic stripe for cards and tickets.

Because of Greencorp facilities for research and development, and its ability to manufacture to exacting standards, Greencorp magnetic stripe products are amongst the most respected in the world. With a philosophy of continual development, including specialised projects for customers, Greencorp products are being continually improved.



The manufacturing facility located in Sydney, Australia, is modern, efficient and strategically located for both domestic and international customers. Greencorp has a large production capacity and works with its customers to schedule timely deliveries to suit customer production requirements.

Greencorp has been accredited to the ISO 9001 quality system and rigidly enforces its quality policy. Greencorp believes the entire system from order entry to delivery should be quality based, thus assuring our customers the best combination of product, service and reliability. All Greencorp products are tested to ISO standards in conjunction with sophisticated magnetic and electronic testing equipment including a VSM, BH Meter and *Mag 3X*[®] analyser.

When you deal with Greencorp you will be impressed with our degree of technical liaison, something in which we pride ourselves as being unique in this industry. The highly qualified chemists and chemical and electrical engineers are at your disposal. You have access to the very people that developed the products.

If dealing with a reliable and innovative supplier of magnetic stripe is your goal, call Greencorp today.

Product Selection Matrix

Glue Down

| Product Code | Application Method | Coercivity Oe | Adhesive Type | Color | Application Temperature | Window Output | Special Features | Typical applications | Recommended Substrate |
|--------------|--------------------|---------------|---------------|-------|-------------------------|---------------|------------------|--------------------------------------|-----------------------|
| G2L | Glue Down | 300 | None | Brown | None | 110% | Reinforced | Tickets for parking & transportation | Paper |
| GNL 650 | Glue Down | 650 | None | Black | None | 110% | Reinforced | Tickets for parking & transportation | Paper |
| GNH | Glue Down | 2750 | None | Black | None | 125% | Reinforced | Tickets for public transportation | Paper |
| GNH 4000 | Glue Down | 4000 | None | Black | None | 105% | Reinforced | Tickets for public transportation | Paper |

Lamination

| Product Code | Application Method | Coercivity Oe | Adhesive Type | Color | Application Temperature | Window Output | Special Features | Typical applications | Recommended Substrate |
|--------------|--------------------|---------------|---------------|-------|-------------------------|------------------|--------------------|---------------------------|-----------------------|
| LAL J39 | Lamination | 300 | Plastic | Black | 110-160°C | 100% | Protective coating | Plastic cards, Bank cards | PVC |
| LAL J40 | Lamination | 300 | Plastic | Brown | 110-160°C | 100% | Protective coating | Plastic cards, Bank cards | PVC |
| LAL N39 | Lamination | 650 | Plastic | Black | 110-160°C | 100% | Protective coating | Plastic cards, Bank cards | PVC |
| LAH F39 | Lamination | 2750 | Plastic | Black | 110-160°C | 100% | Protective coating | Plastic cards, Bank cards | PVC |
| LAH E39 | Lamination | 4000 | Plastic | Black | 110-160°C | A-160% B-105% | Protective coating | Plastic cards, Bank cards | PVC |

Transfer

| Product Code | Application Method | Coercivity Oe | Adhesive Type | Color | Application Temperature | Window Output | Special Features | Typical applications | Recommended Substrate |
|--------------|--------------------|---------------|-----------------|--------------|-------------------------|------------------|--------------------|--------------------------------------|-----------------------|
| TAL J21 | Transfer | 300 | Plastic | Black | 140-160°C | 100% | Thinner Carrier | Plastic cards, Bank cards | PVC |
| TAL J23 | Transfer | 300 | Plastic | Brown | 140-160°C | 100% | Thinner Carrier | Plastic cards, Bank cards | PVC |
| TAL J26 | Transfer | 300 | Plastic | Black | 140-160°C | 100% | Protective coating | Plastic cards, Bank cards | PVC |
| TAL J28 | Transfer | 300 | Plastic | Brown | 140-160°C | 100% | Protective coating | Plastic cards, Bank cards | PET |
| TAL J29 | Transfer | 300 | Plastic | Brown | 140-160°C | A-100% C-115% | Protective coating | Plastic cards, Bank cards | PVC |
| TAL J41 | Transfer | 300 | Plastic/Paper | Brown | 140-160°C | 105% | Protective coating | Plastic cards, Bank cards | PVC/Paper |
| TAL J44 | Transfer | 300 | Paper | Brown | 130-150°C | A 110% C-115% | Protective coating | Parking and highway tickets | Paper |
| TAL K37 OD | Transfer | 300 | Paper | Brown | 130-150°C | 110% | Protective coating | Bank book laminated | Paper/PP |
| TAL K37 BOD | Transfer | 300 | Paper | Black | 130-150°C | 110% | Protective coating | Bank book laminated | Paper/PP |
| TAL K48 OD | Transfer | 300 | Paper | Brown | 130-150°C | 110% | Protective coating | Bank book single | Paper |
| TAL K48 BOD | Transfer | 300 | Paper | Black | 130-150°C | 110% | Protective coating | Bank book single | Paper |
| TAL J49 | Transfer | 300 | Paper / Plastic | Brown | 130-150°C | A-110% C-115% | Protective coating | Parking and Plastic cards | Paper/PVC |
| TAL J53 | Transfer | 300 | Paper | Black | 130-150°C | 110% | Black Colour | Paper Tickets | Paper |
| TAL N28 | Transfer | 650 | PET | Black | 140-160°C | A-100% | Protective Coating | Plastic cards, Bank cards | PET |
| TAL N29 | Transfer | 650 | Plastic | Black | 140-160°C | A-100% | Protective coating | Plastic cards, Bank cards | PVC |
| TAL N37 | Transfer | 650 | Paper | Black | 130-150°C | 105% | Protective coating | Bank Books | Paper/PP |
| TAL N43 | Transfer | 650 | Plastic/Paper | Black | 130-150°C | 105% | Protective coating | Tickets for parking & transportation | Paper |
| TAL N64 | Transfer | 650 | Paper | Black | 130-150°C | 105% | Protective coating | Tickets for parking and hotel | Paper |
| TAH F23 | Transfer | 2750 | Plastic | Black | 140-160°C | A-100% | Thinner Carrier | Plastic cards, Bank cards | PVC |
| TAH F27 | Transfer | 2750 | Plastic1 | Purple/Black | 140-160°C | 100% | Protective coating | Plastic cards, Bank cards | PVC |
| TAH F28 | Transfer | 2750 | Plastic | Black | 140-160°C | 100% | Protective Coating | Plastic cards, Bank cards | PET |

| Product Code | Application Method | Coercivity Oe | Adhesive Type | Color | Application Temperature | Window Output | Special Features | Typical applications | Recommended Substrate |
|--------------|--------------------|---------------|---------------|-------|-------------------------|------------------|--------------------|-----------------------------------|-----------------------|
| TAH F28-22 | Transfer | 2750 | Plastic | Black | 140-160°C | 100% | Protective coating | PC | PC |
| TAH F28-33 | Transfer | 2750 | Plastic | Black | 140-160°C | 100% | Protective coating | PET | PET |
| TAH F29 | Transfer | 2750 | Plastic | Black | 140-160°C | A-100% C-110% | Protective Coating | Plastic cards, Bank cards | PVC |
| TAH F37 | Transfer | 2750 | Paper | Black | 130-150°C | 105% | Protective coating | Laminated Bank book | PVC |
| TAH F41 | Transfer | 2750 | Paper PVC | Black | 140-160°C | A-105% D-105% | Protective coating | Cards / Tickets Press Polish | Paper PVC |
| TAH F43 | Transfer | 2750 | Paper | Black | 130-150°C | A-112% C-120% | Protective coating | Cards / Tickets | Paper/PVC |
| TAH F48 | Transfer | 2750 | Paper | Black | 130-150°C | 105% | Protective coating | Bank Book Single or AZ Machines | Paper |
| TAH F64 | Transfer | 2750 | Paper | Black | 130-150°C | A-112% C-120% | Protective coating | Tickets for public transportation | Paper |
| TAH E23 | Transfer | 4000/3600 | Plastic | Black | 140-160°C | A-160% B-105% | Thinner Carrier | Plastic cards, Bank cards | PVC |
| TAH E29 | Transfer | 4000/3600 | Plastic | Black | 140-160°C | A-160% B-105% | Protective coating | Plastic cards, Bank cards | PVC |
| TAH E41 | Transfer | 4000/3600 | Plastic/Paper | Black | 140-160°C | B-105% | Protective coating | Plastic Cards, Bank Cards | PVC/Paper |
| TAH E43 | Transfer | 4000/3600 | Plastic/Paper | Black | 130-150°C | B-112% | Protective coating | Tickets for public transportation | Paper |
| TAH E64 | Transfer | 4000/3600 | Plastic/Paper | Black | 130-150°C | B-112% | Protective coating | Tickets for public transportation | Paper |

Colors (small selection)

| Product Code | Application Method | Coercivity Oe | Adhesive Type | Color | Application Temperature | Window Output | Special Features | Typical applications | Recommended Substrate |
|--------------|--------------------|---------------|---------------|-----------------|-------------------------|---------------|--------------------|---------------------------|-----------------------|
| MDS | Transfer | 300/2750 | Plastic | Metallic Silver | 140-160°C | 100% | Protective coating | Plastic cards, Bank cards | PVC |
| MLG | Transfer | 300/2750 | Plastic | Metallic Gold | 140-160°C | 100% | Protective coating | Plastic cards, Bank cards | PVC |
| MLB | Transfer | 300/2750 | Plastic | Light Blue | 140-160°C | 100% | Protective coating | Plastic cards, Bank cards | PVC |
| MB | Transfer | 300/2750 | Plastic | Dark Blue | 140-160°C | 100% | Protective coating | Plastic cards, Bank cards | PVC |
| MDP | Transfer | 300/2750 | Plastic | Dark Purple | 140-160°C | 100% | Protective coating | Plastic cards, Bank cards | PVC |
| MR | Transfer | 300/2750 | Plastic | Metallic Red | 140-160°C | 100% | Protective coating | Plastic cards, Bank cards | PVC |
| MO | Transfer | 300/2750 | Plastic | Orange | 140-160°C | 100% | Protective coating | Plastic cards, Bank cards | PVC |
| MGR | Transfer | 300/2750 | Plastic | Metallic Green | 140-160°C | 100% | Protective coating | Plastic cards, Bank cards | PVC |
| Logo | Transfer | 300/2750 | Plastic | Custom | 140-160°C | 100% | Protective coating | Plastic cards, Bank cards | PVC |
| MDS | Lamination | 300/2750 | PVC | Metallic Silver | 140-160°C | 100% | Protective coating | Plastic cards, Bank cards | PVC |
| MLG | Lamination | 300/2750 | PVC | Metallic Gold | 140-160°C | 100% | Protective coating | Plastic cards, Bank cards | PVC |

Up to 60 colors available also custom colors with MOQ of 24 x 12.7mm or 36 x 8.4mm.

Roll On

| Product Code | Application Method | Coercivity Oe | Adhesive Type | Color | Application Temperature | Window Output | Special Features | Typical applications | Recommended Substrate |
|--------------|--------------------|---------------|---------------|-------|-------------------------|------------------|--------------------|---------------------------|-----------------------|
| RAL K103 | Roll On | 300 | Paper | Brown | 130-160°C | 105% | Protective coating | Paper Tickets | PAPER |
| RAL K128 | Roll On | 300 | Plastic | Brown | 130-160°C | 105% | Protective coating | Plastic cards, Bank cards | PET |
| RAL N101 | Roll On | 650 | Plastic | Black | 130-160°C | 105% | Protective coating | Plastic cards, Bank cards | PVC |
| RAH F107 | Roll On | 2750 | Plastic | Black | 130-160°C | 105% | Protective coating | Plastic cards, Bank cards | PVC |
| RAH E107 | Roll On | 4000 | Plastic | Black | 130-160°C | A-160% B-105% | Protective coating | Plastic cards, Bank cards | PVC |

Label Stock

| Product Code | Application Method | Coercivity Oe | Adhesive Type | Color | Application Temperature | Window Output | Special Features | Typical applications | Recommended Substrate |
|--------------|--------------------|---------------|---------------|-------|-------------------------|---------------|------------------|----------------------|-----------------------|
| G2L K200 | Label | 300 | None | Brown | None | 110% | Reinforced | Conversion | Paper |
| GNL N200 | Label | 650 | None | Black | None- | 105% | Reinforced | Conversion | Paper |
| GNH F200 | Label | 2750 | None | Black | None- | 105% | Reinforced | Conversion | Paper |

Hot Stamping

| Product Code | Application Method | Coercivity Oe | Adhesive Type | Color | Application Temperature | Window Output | Special Features | Typical applications | Recommended Substrate |
|--------------|--------------------|---------------|---------------|---------------|-------------------------|---------------|-------------------------------|--|-----------------------|
| SP JAT006 | Roll On/Hot Stamp | | Plastic | Matte Clear | 140-180°C | - | - | Signature Panel, Plastic cards, Bank cards | PVC |
| SP JAT008 | Transfer | | Plastic | Matte Clear | 140-180°C | - | - | Signature Panel, Plastic cards, Bank cards | PVC |
| SP JAW006 | Roll On/Hot Stamp | | Plastic | Matte White | 140-180°C | - | - | Signature Panel, Plastic cards, Bank cards | PVC |
| SP JAW008 | Transfer | | PET/Plastic | Matte White | 140-180°C | - | - | Signature Panel, Plastic cards, Bank cards | PVC |
| SPDB018 | Roll On/Hot Stamp | | PET | Matte White | 140-180°C | - | - | Signature Panel, Plastic cards, Bank cards | PET |
| SPSSB | Roll/Hot Stamp | | Plastic | Matte White | 140-180°C | - | Blue Adhesive | Signature Panel Safe Sig, Plastic Cards | PVC |
| SPSSPHS | Hot Stamp | | Plastic | Matte Printed | 140-180°C | - | Printed Safesig | Signature Panel Safe Sig, Plastic Cards | PVC |
| SPSSPHR | Roll On | | Plastic | Matte Printed | 140-180°C | - | Printed Safesig | Signature Panel Safe Sig, Plastic Cards | PVC |
| SPSSPHSB | Hot Stamp | | Plastic | Matte Printed | 140-180°C | - | Printed Safesig/Blue Adhesive | Signature Panel Safe Sig, Plastic Cards | PVC |

The Greencorp advantage

- A full range of products for most applications. The industry's widest.
- No matter what use you have for magnetic stripe - Greencorp has a product to suit. If you have a specialist need, we would be happy to talk with you about developing your requirements. Greencorp has the slitting capability for 3.15, 3.81, 4.5, 5, 6.35, 6.5, 7.3, 8.4, 9.6, 10, 11.7, 12.7, 16 and 25.4mm widths*
- In house research and development for those specialist needs.
- Comprehensive quality assurance program.
- International reputation for innovation and experience.

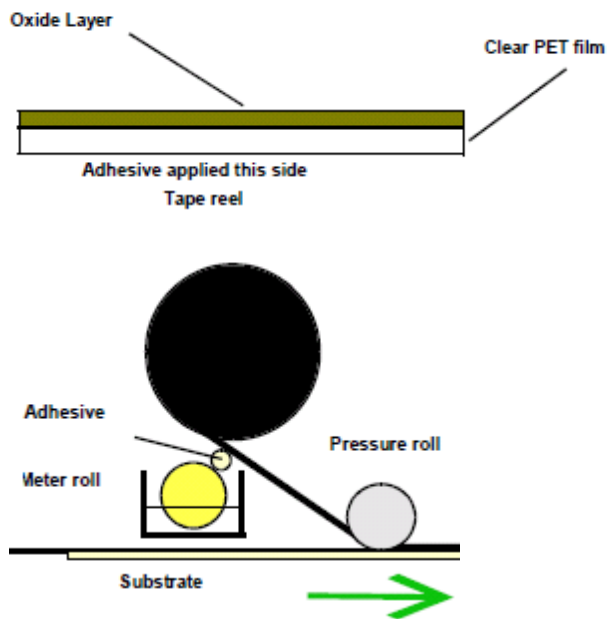


* Subject to minimum order requirements, all products can be manufactured in these widths for either PVC or Paper application

Types of mag-stripe

Glue-down lamination tape for Paper tickets

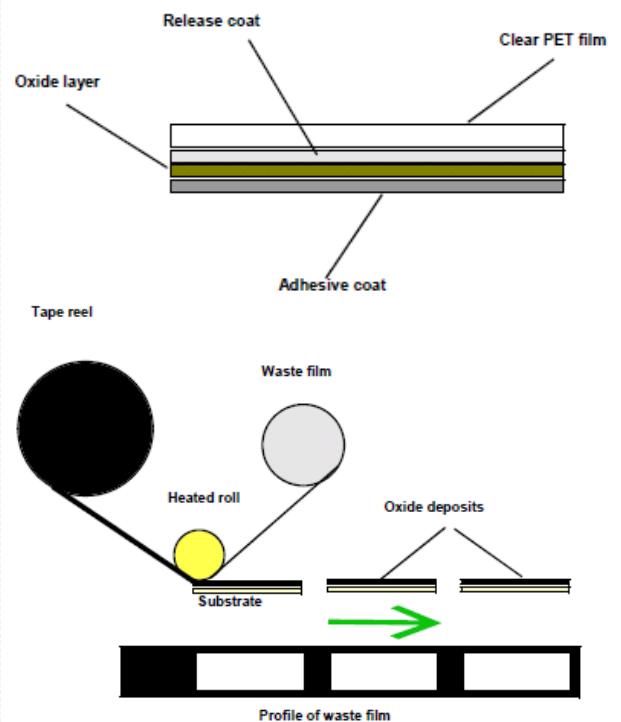
As the name suggests, this tape is glued to the substrate using an adhesive of the customer's supply. The adhesive, usually water-based, is applied to the reverse side (carrier film) and then rolled onto the product. The main use for this type of product is for paper tickets. Tape construction is as follows:



Franklin type, hot stamp or roll on transfer tape

Hot roll on tape is used on Franklin style or hot stamping machines. These machines use a heated roller with a width equal to the final mag-stripe width. The tape used is slightly wider than the heated roller and, only the area of tape touched by the roller remains on the substrate (see below):

The composition of the tape differs from the glue-down types, because it is coated with a suitable heat activated adhesive on the reverse side. It also has a release coating on top of the oxide layer to ensure that the PET carrier separates freely from the applied tape.

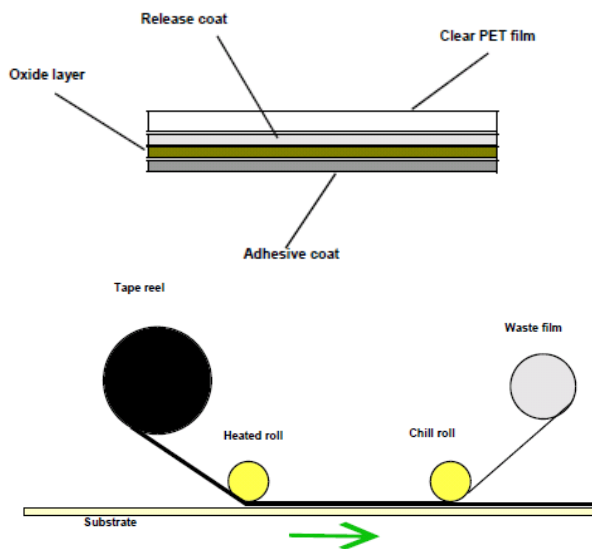


Types of mag-stripe (cont'd)

Heat Transfer (cold-peel) tape

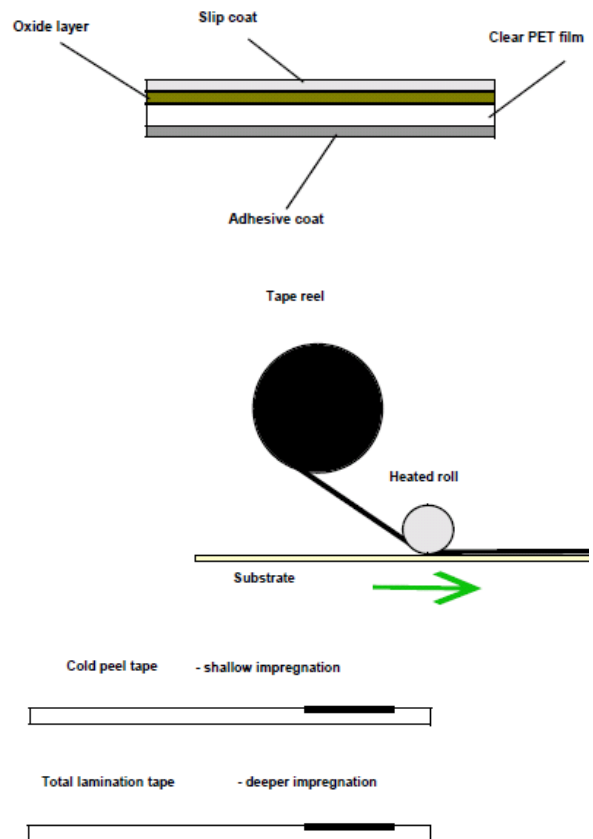
Cold peel tapes have the same construction as the hot roll on types, but they are designed to adhere to the substrate in a continuous “stripe” rather than discontinuous sections. The name cold-peel comes from the characteristics of the tape, which allow the PET carrier film to be “peeled” away once the adhesive has cooled. This carrier film is rewound on to a spool and discarded.

Various adhesive types are used, depending on the kind of substrate for which the stripe is required to adhere. The most common materials in use today are paper or PVC.

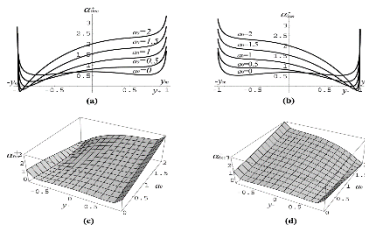


Total Lamination tape

Total lamination tape differs from the cold-peel tape in so far as the PET carrier film remains with the tape when it is adhered to the substrate. This type of tape has mainly been superseded by cold-peel types because the thicker overall material, when laminated in plastic transaction cards, produced weakness “compressions” along the tape edges (see below):



What is Coercivity?



Coercivity - in simple terms, it is a measure of the tape’s ability to resist erasure of data by external magnetic influences.

LoCo Tape - is moderately resistant to data erasure and is ideal for tickets, membership cards, and general use.

HiCo Tape - has a greater level of resistance to loss of data, which makes it ideal for higher security applications such as credit and ID cards.

Coercivity is measured in **Oersted**

The most commonly used **LoCo** tapes are **350 and 650 Oersted**. **HiCo** tapes are presently made at **2,750, 3500 and 4,000 Oersted**.

How can we verify Coercivity?

During the manufacture of magnetic stripe tapes, Greencorp selects the correct oxide materials and then checks the coercivity of the product throughout the various stages of production.

The “preferred” method, according to ISO Standards, involves testing of the final coating by using a Vibrating Sample Magnetometer (VSM). Greencorp has its own VSM, supporting various other important pieces of test equipment such as a BH meter.

ISO Specification

1. ISO is the International Standards Organisation. This body sets the standards for a wide range of products and services.
2. The most important standards for these products are the ones relating to mag-stripe performance **ISO 7811-2**, **ISO 7811-8** and **ISO 7811-6**.
3. Above 3 standards also set the required standard for testing of laminated stripes. Greencorp use industry leader Q Card’s *Mag-3*® analyser, to automatically test cards and ensure that the stripe will meet the customer’s needs. The *Mag-3*® tester provides detailed print-outs and “window” plots to verify performance. This information is shipped with each delivery of Greencorp tape for you to pass on to your customers as required.

Common Terminology

- Adhesive or size coat* Often not considered important but is critical to the mechanical performance of the tape. Different types are available for the various substrates - PVC and paper adhesives are generally not interchangeable and orders **must** specify the required substrate.
- Collator* Machine for cutting, aligning and stacking the three PVC card components, prior to lamination.
- Lamination plates* Flat, polished, sheets of metal which ensure good heat transfer and “shiny” finish to the stripe surface when laminating cards.
- Laminator* Machine which uses heat and pressure to “bond” the PVC “layers” used in plastic card manufacture.
- Magnetic Slurry* The main competition to mag-stripes in the low-cost paper ticket area. The slurry is “printed” as a stripe. Initial cost is lower than tape but the abrasiveness from the rougher surface can mean far more frequent reader head replacement costs.
- Over-coat* Coating applied over the stripe’s oxide layer to improve its durability and chemical resistance. Also referred to as a top-coat.
- Overlay* Clear film, laminated to both sides of the printed PVC sheet, to give “shine” and durability to plastic cards.
- Release coat* Coating applied to the stripe’s carrier film, in transfer or cold-peel tapes, to ensure ease of “peeling” away from the oxide layer.
- Tape layer* Machine designed to lay several continuous mag-stripes on to clear PVC overlay.

Magnetic Stripe Recommended Production Parameters for overlay

| Condition | <u>Tape layer</u> |
|-------------------|--------------------------|
| Temperature Range | 135°C - 155°C |
| Type of Die | Metal Roller |
| Traversing Speed | 3 – 20 metres per minute |

Physical properties

Storage: Recommended storage temperature (4.5°C to 32°C) and 40% - 60% RH. Greencorp tapes should not be exposed to excessive moisture.

Magnetic properties

Greencorp products meet or exceed all performances and physical specifications required by International Standards, ISO/IEC 7811/2 (LoCo) 300 Oe, ISO/IEC 7811/8 (LoCo 650 Oe and 7811/6 (HiCo) 2750 Oe and 4000 Oe. Greencorp Transfer tapes can be made in coercivity ranges of 300 to 4000 Oe.

Notes on measurements.

The magnetic measurements are performed on an LDJ VSM or BH meter model 7000A (LDJ Electronics, Inc., Troy, Mich. USA). The instrument generates a cycling magnetising field of known strength and measures the magnetic flux emitted from a sample placed in this field. The measurements quoted above are done using a maximum field of 1000 Oersted.

Coercivity is the field intensity required to reduce the induction from saturation to zero.

Remanence is the induced flux remaining in the tape after the longitudinally applied field is reduced from 1000 Oersted to zero.

Squareness is the ratio of the residual flux density (Br) and the saturation flux density (Bm).

These properties are most important in Magnetic Stripe cards in determining the response of a tape to square wave signal encoding.