CTLpack

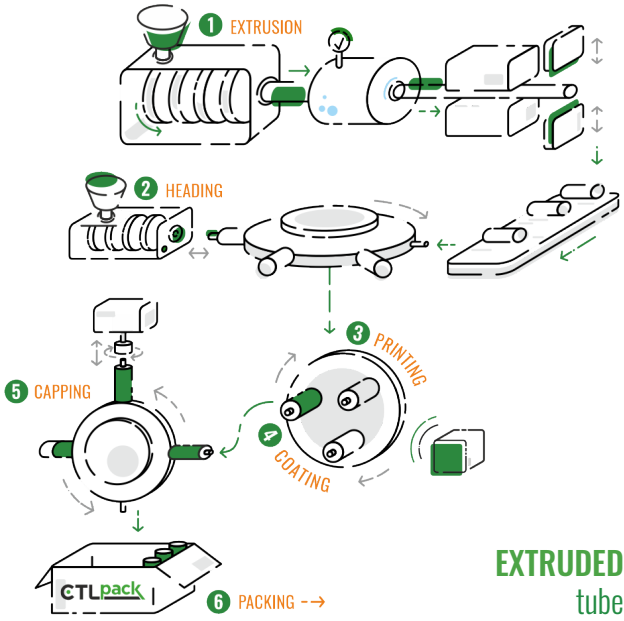
CHARACTERISTICS of the ESTube

TECHNOLOGICAL DIFFERENCES

Extrusion

The PE (polyethylene) plastic compound in granular form is melted inside the extrusion machine until it emerges through a nozzle that defines the final diameter and thickness of the tube.

The head is added by injection using PE (polyethylene) material. It allows multiple decoration options and can be manufactured in a wide range of diameters.



EXTRUDED tube

ESTube (IML)

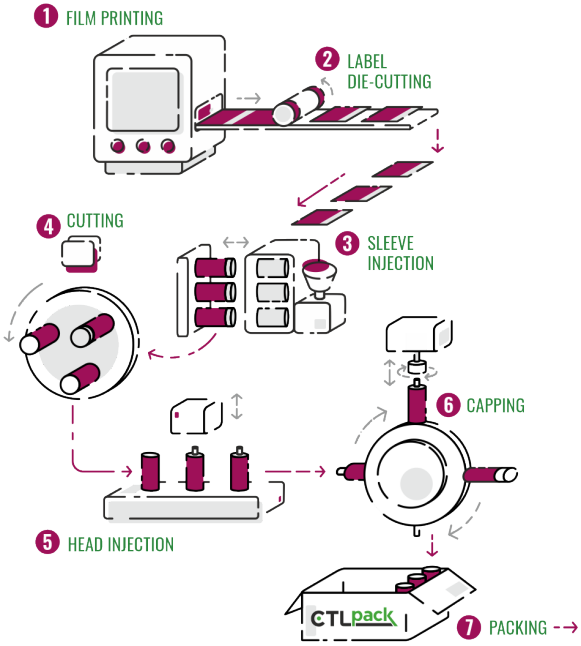
INJECTED
tube

Unlike extrusion, ESTube is distinguished by the injection moulding of the sleeve, flat printing and the use of a PP material.

The decorated label becomes an integral part of the final product thanks to the total fusion of the label with the packaging itself during the injection process.

The result is stunning, high-quality decoration.

One of the great advantages of IML is that the label and the packaging are made from the same material (polypropylene), making the packaging 100% recyclable.



	PE Tube	ESTube Tube
Technology	Extrusion	Injection
Printing	Offset	Flexo or Digital on flat foils
Material	PE	PP

FILLING and WELDING

Due to the difference in ESTube materials, the following aspects must be taken into account:

1. Filling exclusively with hot air machines.
2. Adapt the welding parameters to each order:
   - Temperature.
   - Pressure.
   - Cups adapted to tube format.
   - Label closing line 8 mm from the side of the tube.
   - Etc.

These conditions are set out in a document available on our website (X.00.00032 - ESTube - Recommendation guide - Hot air welding).

Possible consequences

GRIPPER MACHINES

EXCESS TEMPERATURE

INCORRECT CUPS

COLOUR and MEASUREMENT

The ESTube is characterised by a flexographic or digital printing process.

As a result, the measurement of the colour and its variations is carried out objectively

- With a spectrophotometer
- With a value of ΔE
- The production of a colour cardis not possible.

General concepts

INKS

Substance, material (e.g. pen cartridge)

COLOUR - TONALITY

Perception given by the ink deposit.

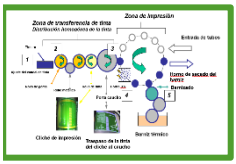
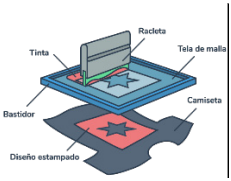
For example, in the picture: it is the same ink, but the 'tonality' is different because of the intensity of the 'scratches'.

In the case of extruded tubes, direct ink is used, i.e. ink formulated with the final colour/shade.

This may be a mixture of several base colours.

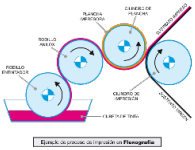
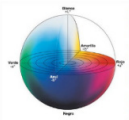
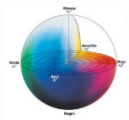
ESTube tubes, on the other hand, use four-colour CMYK (Cyan, Magenta, Yellow and Key (Black), which combines different ink dots to obtain the final shade.

Different processes with risks of colour variation

COMPARISON OF EXTRUDED PRINTING	
PROCESS	**DRY OFFSET**
Process	 
Conceptos	By direct ink formulated  • 1 ink per plate • All inks on one blanket • From blanket to tube • Subsequent drying of all inks
Element for defining shade variation capability	• Colour Card • Ink variation
Measurement of variation	 

PRINTING TYPES

ESTube PRINTING

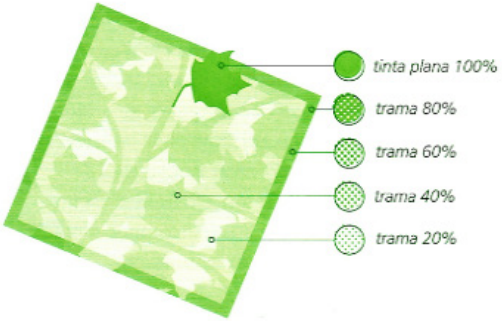
FLEXOGRAPHY	DIGITAL
	
By CMYK dots	By CMYK dots + Green + orange + violet
	
• 1 tinta por cliche / anillox • Secado de cada tinta *Opción de tinta directa	• 1 archivo de colores • Depósito de tintas por tramado via carga electrostática • Secado de cada tinta
Measurable Spectrophotometer (ΔE)	Measurable Spectrophotometer (ΔE)
3D dimension of the colours on their axes	3D dimension of the colours on their axes
	

Colours based on four-colour process ‘CMYK’.

Colour is defined according to three main concepts:

1. Dot size

From 0% [white] to 100% [solid

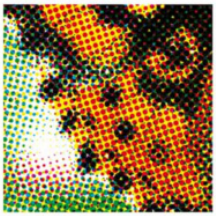


2. The mix of CMYK colours

40% yellow dots + 60% cyan dots ==> green tone (bluish)

60% yellow dots + 40% cyan dots ==> green tone (yellowish)


FINAL CMYK


DETAIL VIEW

3. Density

Optical density (OD): quantity of ink contained in a dot.

CMYK colour measurement

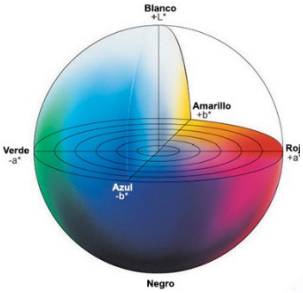
The characteristics of dot-based printing mean that it is not possible to work with colour cards, as the variations are generated in a colour space and not with linear variations (where the colour variation of an ink is generated by adding more or less ink and enables a colour card to be produced).

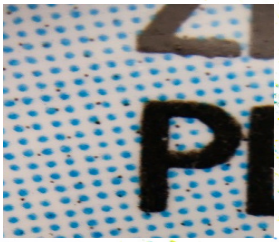
A colour space can be described as a method of expressing the colour of an object using a certain value.

The "Commission Internationale de l'Éclairage" (CIE) has defined 'CIE L*a*b*' colour spaces to communicate and express colour objectively.

The CTLpack group uses CIELAB.

Different colours depending on the angle





CMYK colour measurements

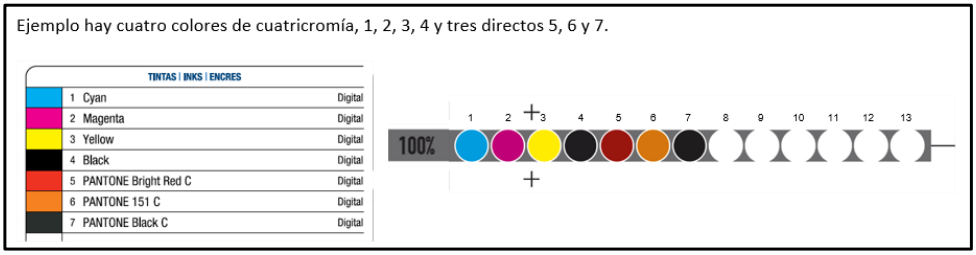
∆E (‘delta E’) is the difference between two colour samples, namely the BAT and the production sample.

The ∆E represents the distance between different colour points in a three-dimensional space, CIELAB.

IDENTIFICATION AND REPRESENTATION OF COLOURS SUBJECT TO CONTROL:

Each colour must have a specific measurement location called a ‘control point’. These ‘control points’ represent the control colours for the entire tube.

They appear on the printing copy and on the printed IML labels.

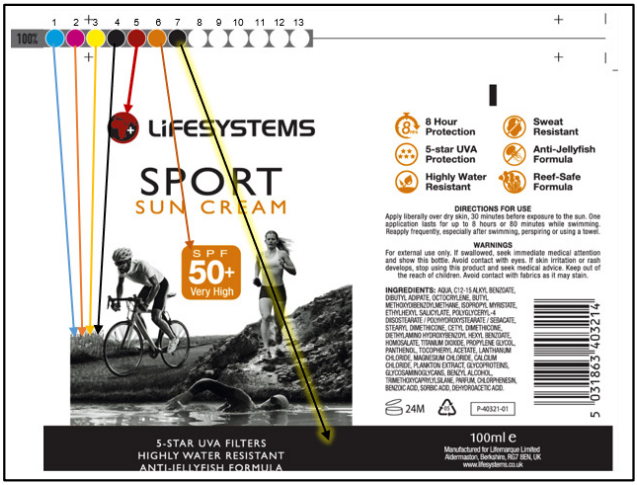


Example of a computer copy

These ‘control points’ appear only on the label.

- For quality control, CTLpack measures exclusively on these ‘control points’ on the label (not on the tube).
- The ∆E between two productions is measured on the ‘control points’ on the label of the production sample compared to the ‘control points’ on the label of the BAT.

Example of an IML label



In our specifications, we have defined ΔE values according to design type and text size.

Remember that the ΔE is measured in the 'control points' of the label corresponding to the different types of design:

Predominant background: ΔE >3 Non-dominant background: ΔE >4 Text or graphics ≤ 1,5 mm: ΔE >4,5 Text or graphics > 1,5 mm: ΔE >4	Major Defect
FonPredominant background: ΔE ≤ 3 Non-dominant background: ΔE ≤ 4 Text or graphics ≤ 1,5 mm: ΔE ≤ 4,5 Text or graphics > 1,5 mm: ΔE ≤ 4	Acceptable

Predominant Backgrounds

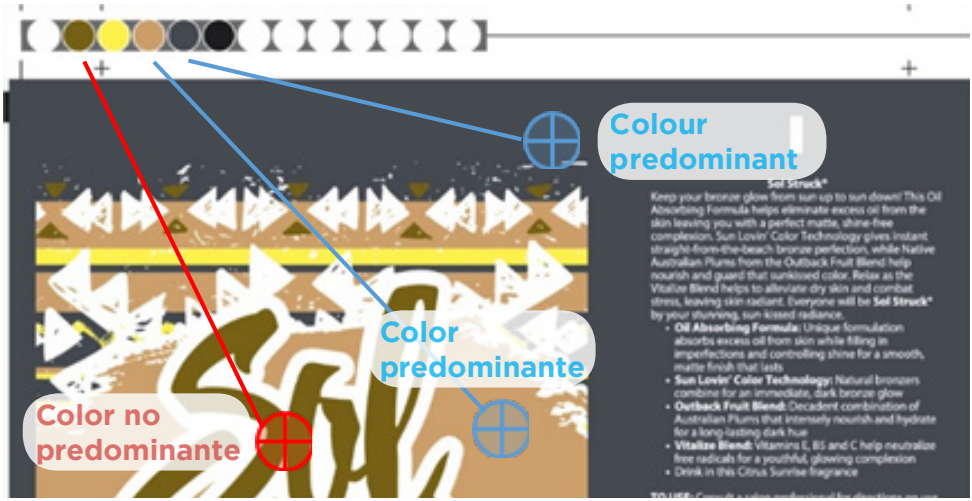
Any constant background and colour with gradient as long as the bounding dimensions are both greater than 9 mm.

Acceptable **ΔE of the 'control points' ≤ 3**

Non Predominant Backgrounds

Any constant background and colour with gradient as long as one of the dimensions that enclose it does not exceed 9 mm.

ΔE acceptable of the 'control points' ≤ 4



Graphical example of spot colors.

Texts and graphics whose thickness is

≥ 1.5 mm.

ΔE acceptable of the 'control points' ≤ 4

< a 1.5 mm

ΔE acceptable of the 'control points' ≤ 4,5

SPECIFIC CHARACTERISTICS

Label overlap area

This area is a characteristic of the manufacturing process for this tube.

The ESTube manufacturing process includes the following steps:

- Label manufacture
- Tube injection

During the injection process, the label is placed in the mould and overlaps at its ends, creating a ‘line’ along the length of the tube.

Position of the label	Gap	> 1mm	Major Defect
		>0,5 y ≤ 1 mm	Minor Defect
	Overlap	>0,5 y ≤ 1 mm	Minor Defect
		≤ 0,5 mm	Acceptable

Crenel IML Label

The label is designed with crenels at the end of the tube to absorb any deformation of the label during the injection process, so that any alteration does not aesthetically affect the rest of the tube.

Image of crenels on an ESTube.

BEFORE welding, there may be gaps:

IMAGE 1

IMAGE 2

IMAGE 3

IMAGE 4

IMAGE 1 - The crenels are exceeding the height of the tube.

IMAGE 2 - The crenels are under the height of the tube.

IMAGE 3- Wrinkels or 'waves' form along the crenels.

IMAGE 4- The label detaches from the surface, causing a 'cracking' of the label.

AFTER welding the tube, you can see that the previous gaps disappear or are ‘integrated’ inside the weld area.

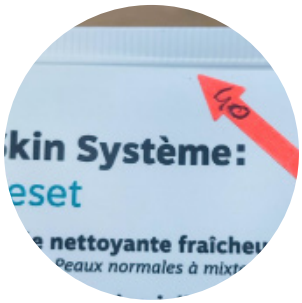


IMAGE 1

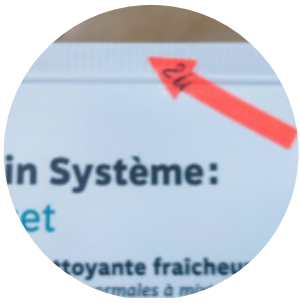


IMAGE 2

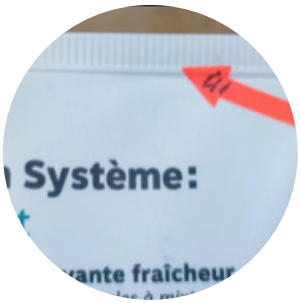


IMAGE 3

Thread at the base

Excess material on the base

During the injection process, the label is placed in the mould.

When the material is injected with the mould closed, the pressure with which the material is injected causes the label to stretch inside the mould (it stretches to a greater or lesser extent depending on the slip generated between the coated surface and the mould cavity).

It is at this point that the crenels act to absorb the deformation.

If the crenels are deformed, the material can flow beyond the label.

This is when excess material is generated.

This excess material always remains outside the tube.

Rough edges in the base	If it hinders operation • operation • use	Critical Defect
	If only aesthetic	Acceptable

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