

T.A.O. NEWSLETTER

Quarterly Company Newsletter



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Highlight

Print Inspection System

Print quality inspection with the camera and processing through the software with artificial intelligence enhances the artificial vision technology more efficiently. It can support the quality control of industrial printing, which has a long-run production and high volume in order to get 100% accuracy. The right selection of technology helps to operate more efficiently that affect the quality of product, which leads to the customer's satisfactions and their confidence of our service in terms of fast delivering, good competitiveness, and business growth eventually.

From Market Analysis and Insights: Global Print Quality Inspection System Market, the main production regions are Europe and United States. The key driver is increasing demand for print quality inspection systems to solve print quality problems with easy management and cost-effective for investment. The global Print Quality Inspection System market size is projected to reach US\$ 130.8 million by 2026, from US\$ 108.9 million in 2020, at a CAGR of 3.1% during 2021-2026.^[1] In the future, Asia-Pacific region show larger demand for Print Quality Inspection System.

Print Inspection System is a vision-based system capable of defect detection, using high-resolution camera technology, which can inspect precise and more accurate than using a human. It can be applied to check the quality in whole production process. The inspection process can be worked during production or at the end of production, depending on the features of each machine model.



Why do we need print quality inspection system?

Reduce the number of operators in production process, which helps control costs.

Increase productivity with fast operation. This reduces the time for inspection and reworking.

Limitation of the operator, who can detect errors throughout the manufacturing process. The efficiency of visually monitoring by human will be reduced as a result of fatigue from working continuously for a long time.

The ability of inspection is stable. With modern technology, it is more accurate than the human eye.

Reduce wastes with a notification system when defects are found. It can be fixed in time.

Characteristic of defect detection for print quality inspection system.



Clarity and blur of text, images, barcodes, logos, etc.



Common defects such as ink splashes, smudges, scratches, lack or excess of print.



Mis-registration



Color variation

Industrial and Application, the Print Quality Inspection System market is segmented into:



Food and Drinks



Medical/Pharmaceutical



Consumer Goods



Others

Applications

- Container, Tubes, Jars, Bottles
- Metal closure, Packaging
- Label, Flexible packaging



Substrates/Materials

- Plastic, Glass, Aluminum
- Metal sheet
- Films



Type of the Print Quality Inspection System:



In-line, system equipped with a line-scan camera and installed into all printing machines.



Off-line, stand-alone offline inspection machine or it can be installed at the end of the printing line.

Highlight

The comparisons between inspecting by human and using print quality inspection system



Printing system inspecting by human



QC operator > 1 person



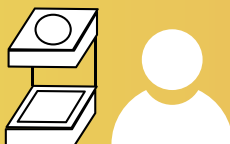
Human errors can be occurred.



May not be able to use the maximum speed of the machine, or if using the top speed, need more QC staff.



Some wastes or rejections may occur due to burning out of operators from long working hours.



Inspect by QC staff only

Requirement

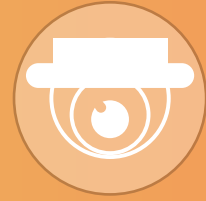
High-end products

Prints in various resolutions or languages

High speed printing

Continuous mass production for long times

Control the printing efficiency throughout the production



Printing system using print quality inspection system



QC operator = 0



With high resolution camera and high processing software, there will be no errors.



Get the full capacity of printer speed.



No waste or rejection from the customers. Reduce the cost of reworks.



The screen monitor shows the current print job, which can be zoomed in or out to see specific points. Help to promptly correct that defect.

Print Inspection System Solutions

DeCoSystem, Designer and producer of print inspection system since 2001 intending to develop artificial vision technologies for the quality control of printed and decorated products.

DeCoSystem has a continuous for R&D. that resulted to the products are always innovative and technologically advanced such as high-resolution cameras, customized lighting systems, and special image analysis algorithms. Compact size and easy installation, simplicity on the use, fast new job setting, and amazing accuracy in defect detection are the main characteristics of DeCoSystem.

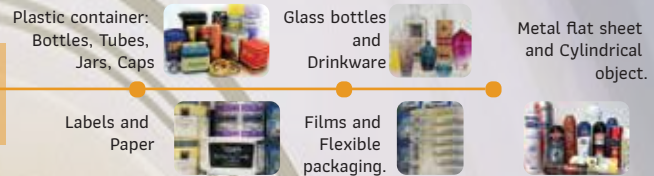
They are implemented in every step of the production process.

Pre-press elaboration
Product integrity control

Automatic position registration
Print inspection

Variable data control
Dedicated dimensional controls and surface inspection

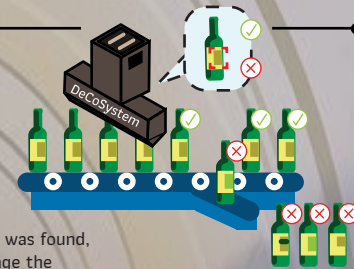
The systems inspect any printed and unprinted materials such as:



The inspection systems can carry out a 100% analysis of the typical defects produced by the printing, for example

- The printed image is incomplete (blurred, scratched, or dusty).
- The print position is not straight.
- There is a drop of water or oil on the print.

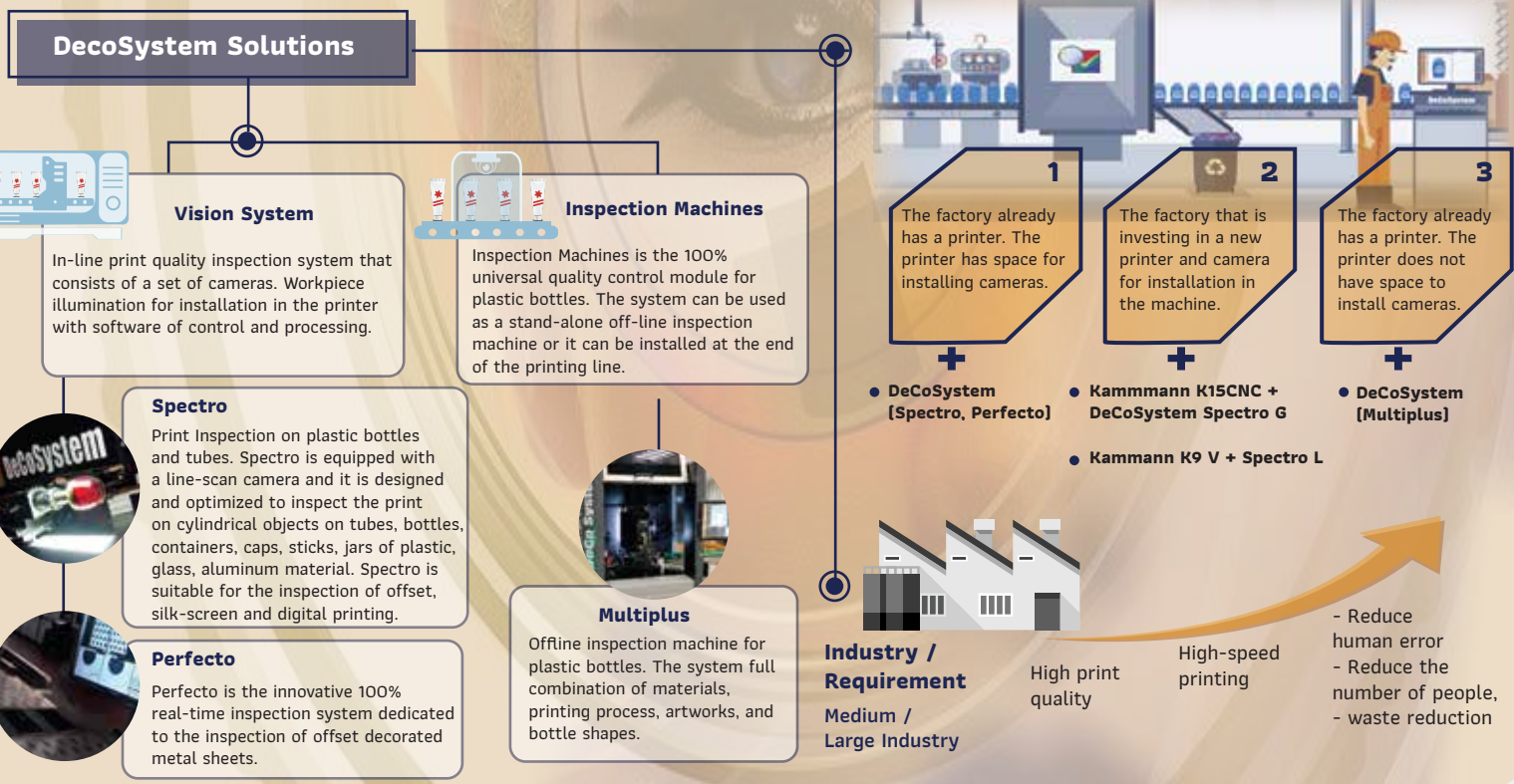
The system will show that such defect was found, or send a signal to the printer to manage the selection of non-standard workpieces.



The benefits of the inspection system

- Increase production efficiency.
 - Improve print quality 100% complete.
 - Minimize human error.
 - Waste reduction.
- These benefits result in cost reduction that drives profits up.

T.A.O. Company as an authorized distributor, presenting a product line of Print DeCoSystem inspection system for the plastic, glass, aluminum container industry and metal packaging industry, crown cap-screw cap as follows



SPECTRO

Spectro COLOR 4K, the innovative 100% print inspection system dedicated to cylindrical objects on tubes, bottles of plastic, glass, aluminum material. Spectro is equipped with a line-scan camera and suitable for the inspection of offset, silk-screen and digital printing.

Spectro can easily be installed into all printing machines. Our highly qualified engineers can design the best solution that fits any integration needs. The system is equipped with camera resolution of 4096 pixels. It can be installed directly on the printing machine and can assure a speed up to 400 pieces per minute.



Spectro-L	Plastic tubes and bottles
Spectro-G	Glass bottles
Spectro-AL [Metal]	Aluminum tubes and cans

Spectro-L

Spectro guarantees a powerful combination of print quality and waste reduction. Objectivity, repeatability, and high accuracy of the control improve your print quality and ensure a production without printing defects.



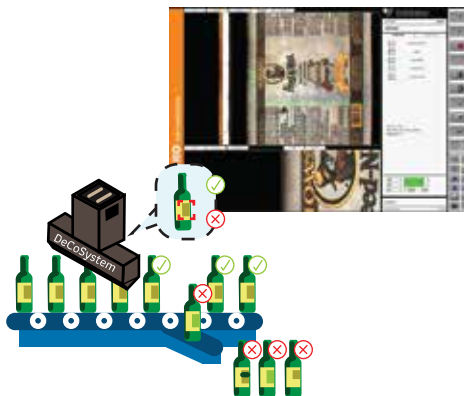
Specification	
Print	Offset, Silkscreen, Inkjet
Max field of view	250 mm
Max production speed	250 pcs/min
Camera resolution	Color 4096 pixel
Min defect size	Ø 0,20 mm
Operating	With touch screen interface
Typical defects	Lack or excess of print, blurs, smears, dirt, scratches, colour variation, mis-registration

Working Process of Spectro:

1 Prepare for printing



2 Printing process & inspection



3 Report system



1. Select the object diameter, specify the number of areas to be inspected (Parameter of areas).
2. Scan standard workpiece so that the system is set as a calibrator for good work.
3. Able to set up inspection areas and choose level of resolution for each area.
4. Draw a line and mark the area to check the print quality, select the level of resolution as a criterion for screening good and waste.
5. Start production and inspection.

- Spectro can carry out a 100% analysis of the typical defects produced by the printing process.
- When SPECTRO detects a faulty piece a dedicated rejection signal is provided to reject the faulty piece. In case of consecutive defects or in case of many rejections, an alarm signal is given to stop the printing machine.

The reports with the analysis of the detected errors can be graphically or digitally printed



PERFECTO

Perfecto is the innovative 100% real-time inspection system dedicated to the inspection of offset decorated metal sheets. Perfecto-Metal is easy to be integrated. It can be installed into any printing production line.

Characteristic

- The inspection of decorated sheets requires special LED lighting. This innovative illuminator is possible to emphasize all printing defects without generating false defects due to a light reflection.
- The non-uniform movement on the transport belt and imprecise positioning of the sheets during inspection process are compensated by dedicated features and special algorithm
- The software easy to learn and easy to use. The operator has nothing more to do except inputting or recalling the client's name and/or product code. A Supervisor is necessary only in case of 'tolerances' variation [these 'menu' need a password].

Display:

On the display monitor it is possible to see different display areas:

1) Overview windows: showing the complete sheet and the position of the last defect.

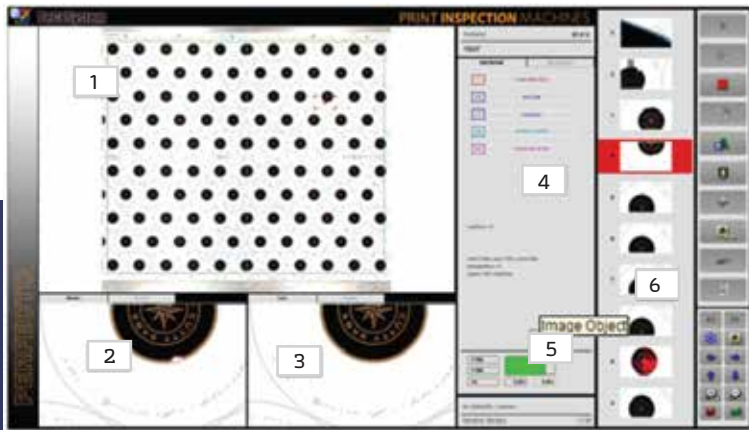
2) Defect Zoom Area: showing the magnified window pointed in the Overview Window. In this window it is possible to toggle between the master and the last defect.

3) Live Zoom Area: showing the magnified window pointed in the Overview Window. In this window it is possible to toggle between the master and the live image.

4) Data windows: giving the detailed report of defect counts and statistics.

5) Semaphore window: indicating the overall status of the control [OK, WARNING,ALARM]

6) Navigation window: to select the last defects.



Perfecto-Metal: Model Perfecto-4000, Perfecto-8000

Specification	
Print	Offset
Max field of view	1200 mm [PERFECTO 4000] /1400 mm [PERFECTO 8000]
Max production speed	6,000 sheets/hour
Camera resolution	One Line-scan colour camera 4096 pixel [PERFECTO 4000] Two Line-scan colour camera 4096 pixel [PERFECTO 8000]
Operating	With touch screen or mouse
Typical defects	Hickey, colour variation, lacks or excess of colour, splash, hazing, streaks, black specking, dirt, water or oil drop, mis-registration and defects of the substrate.



Inspection machine: Multiplus

Multiplus is a stand-alone offline print inspection machine for plastic bottles ensures reliable defect detection with a full combination of materials, printing process, artworks, and bottle shapes. The system consists of the following elements:

- Loading chute that can be connected to any printing line. [high adjustable belt conveyor]
- Air flow separator
- Loading pick and place with orientation
- Rotation device with brushless motor
- SPECTRO L-250 camera system for the print quality inspection
- Camera holding and micrometric adjustment for different bottles diameter
- Two output chutes [good bottles and faulty bottles]
- Rejection device

for additional option tooling's for bottle rotation: Oval / Rectangular bottle

Multiplus is suitable for factories that already have printers that do not have cameras installed, or need a machine to inspect the print quality especially.

The machine can be installed at the end of the printing machine.

Multiplus is easy to use:

The setup of a new job can be done in less than one minute. The benefit results in cost reduction and improved process efficiency that drives up profits and company reputation.

Specification

Mechanical details dimension:	1200 mm [L] x 2800 mm [W] x 1950 mm [H]
Standard bottles range Cylindrical	Max length : 250 mm Min diameter: 35 mm Max diameter: 70 mm Max speed for bottles up to 250 : 70ppm
Oval, rectangular and square	Max length : 250 mm Max wide: 120 mm Max speed for bottles up to 250 : 50 / 70ppm
Bottle range	Up to 250 mm lengths and 120 mm diameter
Machine speed	Up to 70 pcs/min [depending on the bottle diameter]
Spectro-L250 camera	High resolution color line-scan camera [tri-linear 4096 pixel]
Spectro-L250 light	LED dedicated illumination system with diffuse light and dark field light
Spectro-L250 features	Automatic setup, different login levels, powerful defect detection, easy setting, touch screen interface, full production report
Typical defects	Missing print, blurs, smears, color variation, mis-registration, scratches

We are pleased to provide consultation on products and models for the best fitting solution that you required with the engineering experts team.

Please feel free to contact our customer service or send inquiries to us at info@taobangkok.co.th.

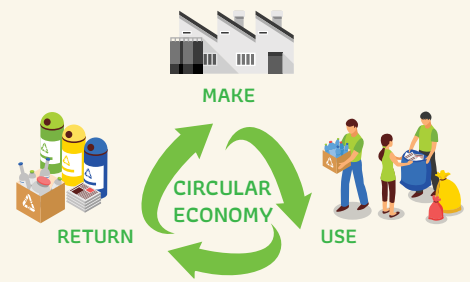
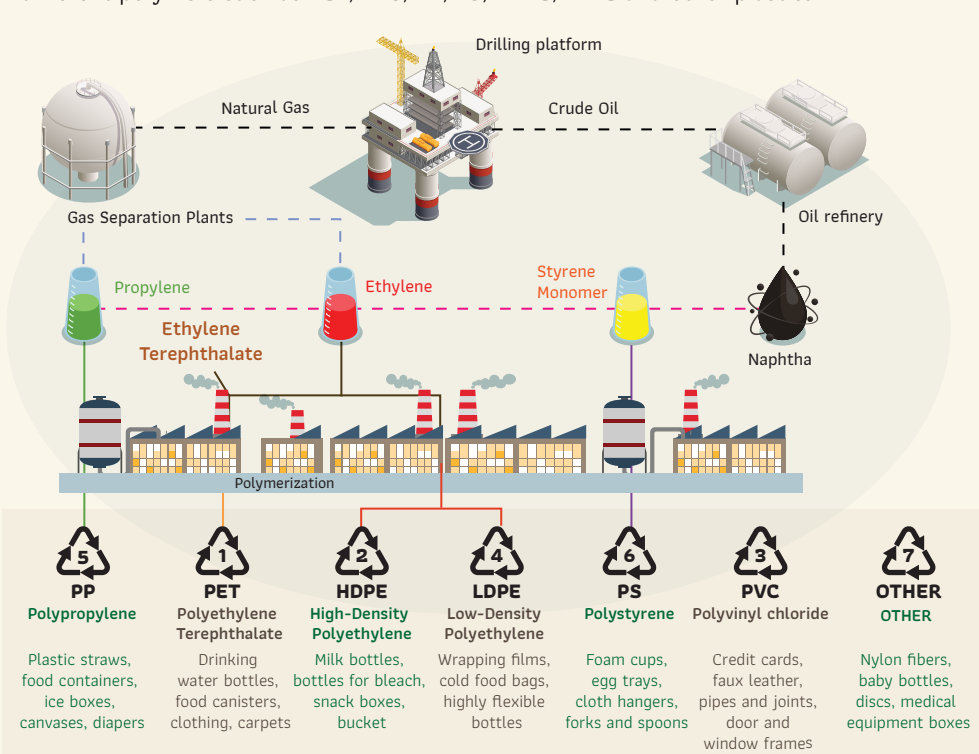
Let's Recycle PET (rPET)



credit photo: <https://www.plasticstoday.com>, <https://www.creativemechanisms.com>

How are Plastics Made?

Plastics are made from raw materials like natural gas, oil or plants, which are refined into ethane and propane. Ethane and propane are then treated with heat in a process called “cracking” which turns them into ethylene and propylene. These materials are combined together to create different polymers such as PET, PVC, PP, PS, HDPE, LDPE and other plastics.



While the issue of plastic pollution has become a major emerging risk and ecological concern for the industry, The ever-increasing amount of plastic, its impact on biodiversity and contribution to climate change.

The coronavirus pandemic has caused changes in the production, consumption, and waste of plastics. Plastic masks play a vital role in limiting the further spread of COVID-19. But the surge in plastic waste due to the demand for masks and gloves, plus changed production and use of single-use plastics products like food takeaway containers and plastic packaging for online sales.

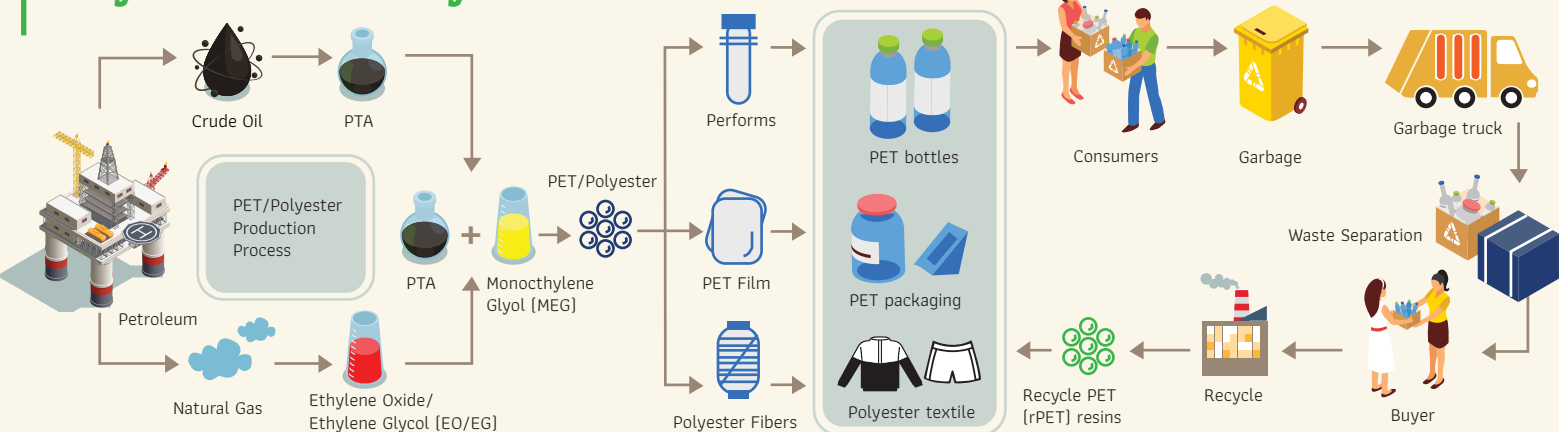
How to deal with it in a **circular economy** perspective. The best way is to shift to a fundamentally sustainable and circular plastics economy, where we use plastics much more wisely and better reuse and recycle them.

PET is completely recyclable, can be recycled again and again.

PET, the short-form for Polyethylene Terephthalate, is a synthetic compound from chemical reactions of ethylene glycol produced by crude oil and natural gas, and purified terephthalic acid (PTA). PET is clear, lightweight, durable, but flexible, and can be formed into various shapes. This is why it is widely used to make various packaging, food container, film as well as clothes (under the name “polyester”).

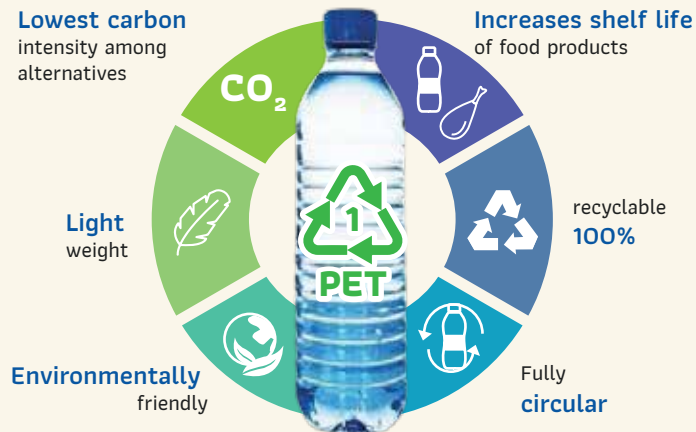
PET can be easily identified by its recycling code #1 in the triangular 'chasing arrows' code, which is usually found molded into the bottom or side of the container. PET can also be easily recycled into fibers which can then be used to make all sorts of things.

Recyclable PET Life Cycle



Go Green

PET | most preferred packaging material



Did you know that recycled PET bottles help save the earth?

PET bottles are made from non-renewable crude oil: therefore, recycling one ton of PET bottles will help save up to 3.8 barrels of oil [159.11 liters] and landfill space or up to 5.7 cubic meters. Every kilogram of PET bottle that is recycled therefore means less landfill is used, while also reducing the use of crude oil, and contributing to a cleaner environment.

We can do better!
The easiest way is to separate your waste!

Easy steps to recycle PET bottles

- 1 Check if the following symbol of "No.1" is at the bottom of the bottle.
- 2 Drain any remaining water or liquid.
- 3 Take off the cap.
- 4 Crush the bottle.
- 5 Throw it in the recycling bin.

Product sample: rPET



(A): Qualy

Qualy, World-class Thai brands. Environmentally Friendly Products with Creative Designs. Oasis Tray – Self watering Plant Tray This tray will take care of your plant for you. Material: RPET 56 bottles^(A)



(B): Coca-Cola

The **Coca-Cola Company** announced in the United States the introduction of a new 13.2oz bottle made from 100% recycled plastic material [rPET]. Challenges around plastic packaging waste and recycling, Make 100% of our packaging recyclable globally by 2025. Use at least 50% recycled material in our packaging by 2030^(B)



(C): GCShop

GCcircularlivingshop is a store that sells products to support sustainable use of plastics based on the Circular Economy concept by PTT Global Chemical Public Company Limited, or GC^(C)



(D): RECO

RECO Young Designer RECO, the largest upcycling design competition in Thailand hosted annually by Indorama Ventures, aims to raise awareness on using PET and polyester waste to create brilliant and inspiring design.^(D)



(E): Adidas

ADIDAS Primeblue Ultraboost 20 Men's Running Shoes Primeblue features Parley Ocean Plastic™ which is made from 100% recycled polyester Adidas partnering with Parley on a shared mission to use 100% recycled polyester in our products by 2024^(E)

Waste is not waste anymore. It is a resource to be managed properly, waste becomes a precious resource as seems gold.

Reference information: TIPMSE Packaging of Environment / Plastics Institute of Thailand / SCG Circular Way / Resources Management for Sustainability [3R] Foundation / GREEN NETWORK magazine to save the world / Indorama Ventures Public Company Limited. / www.petresin.org / www.eea.europa.eu / www.thisisplastics.com / www.learn.eartheasy.com / www.plasticseurope.org / www.omnexus.specialchem.com / www.pttgcgroup.com



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