For customers considering introduction of AOI

FuzzicalZ logic can detect the "Peak Ripeness" of Bananas, too.

A new logic totally different from the conventional inspection system is installed on the *SUNZ* AOI system.

To help our customers better understanding this new logic, *SUNZ* conducted "an inspection of peak ripeness of bananas".

The "Peak Ripeness" of bananas cannot be determined by the pattern matching method using color images.
Even the RGB (straight gaze / oblique perspective) irradiation method cannot detect even the "sugar spots."

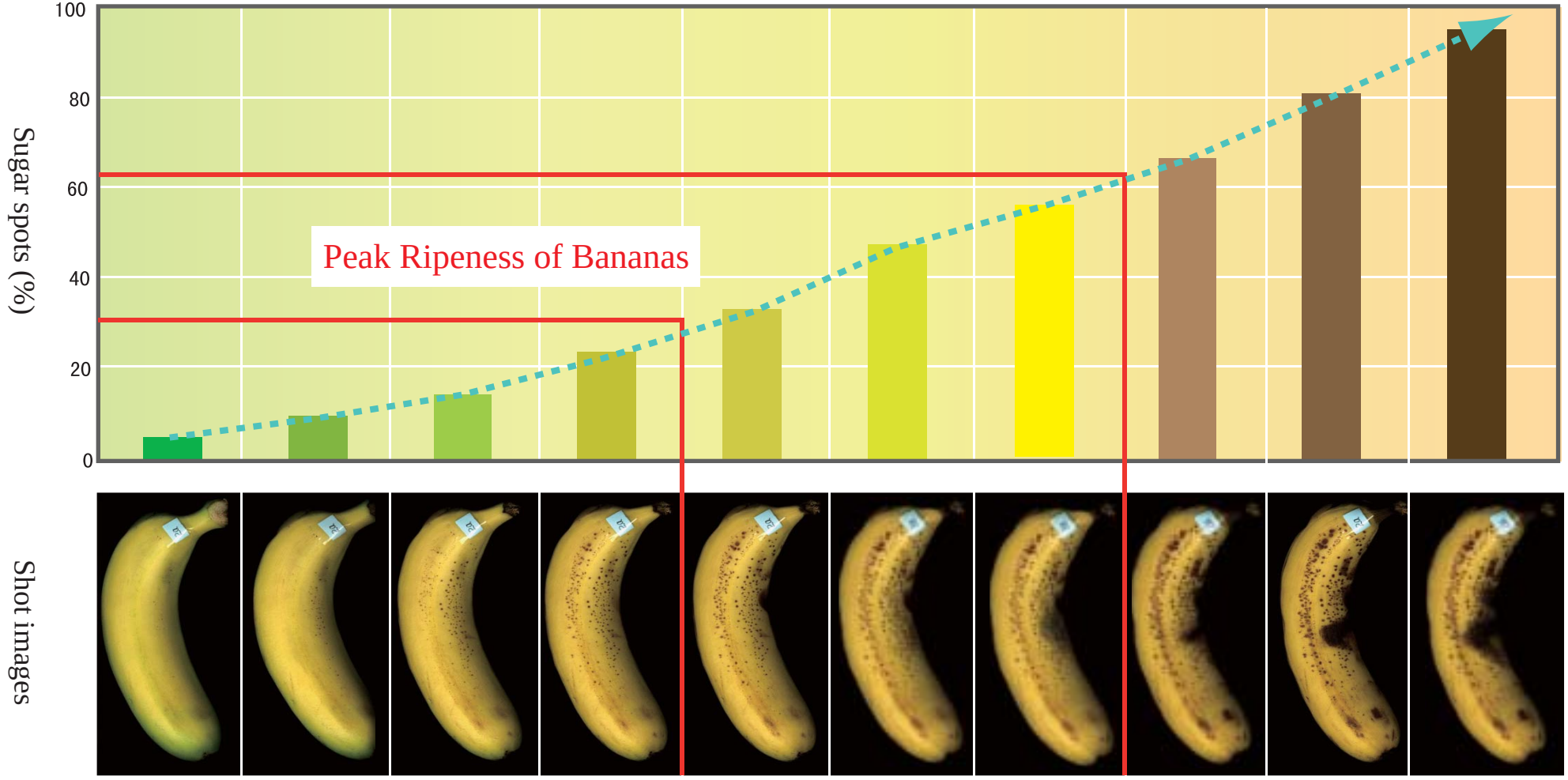
→Registration of the patterns of "sugar spots" which are considered the "ripeness indicator" would mean endless work.

→The colors and shapes of bananas vary considerably and adoption of RGB irradiation method is not practical.

FuzzicalZ, the new logic of ***SUNZ*** can detect the "peak ripeness" of bananas.

Principles of inspection Basic
The threshold values for sugar spots on bananas

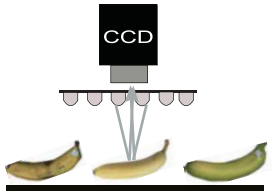
Graph of changes in sugar spots on bananas along time and shot images

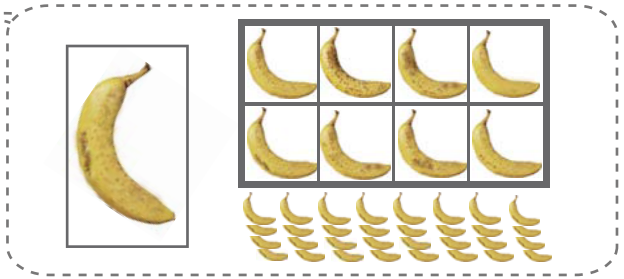


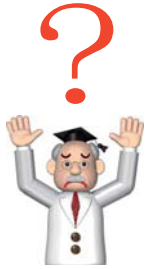
Changes in the number of days

Comparison between SUNZ inspection method and those of other manufacturers

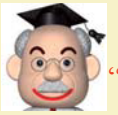
Pattern matching method







The work of endless collection and registration of pattern images will make the user give up.

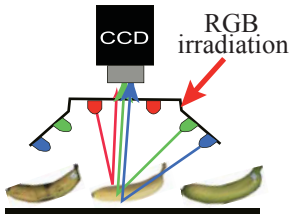


It is possible to inspect the "peak ripeness" of bananas.

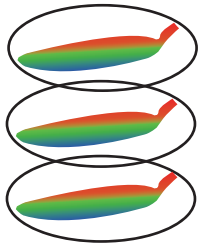
SUNZ appearance inspection system mounts a software program completely different from conventional inspection systems.

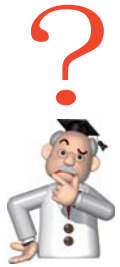
To help our customers better understand this difference, we conducted an inspection on peak ripeness of bananas.

RGB irradiation method



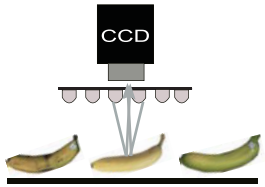
Even though the banana appears in 3 colors by RGB irradiation, only the shape (projections and depressions) becomes detectable and the small changes in color on surface cannot be detected.





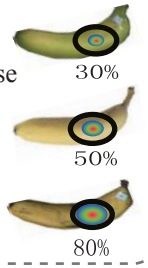
SUNZ newly developed FuzzicalZ (* Fuzzical = a coined word) logic, and addressed a sensuous judgment close to human eyes.
※ (* Fuzzical = A coined word combining Fuzzy & Physical)

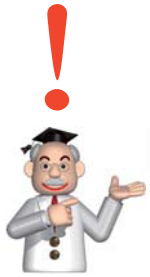
FuzzicalZ method



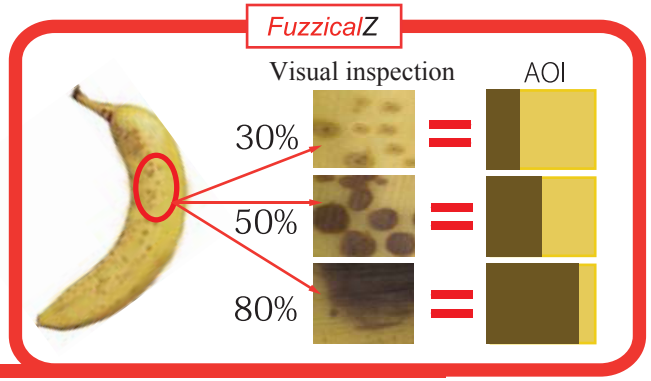
FuzzicalZ

Adopts a logic close to human senses newly developed without using the pattern matching method.



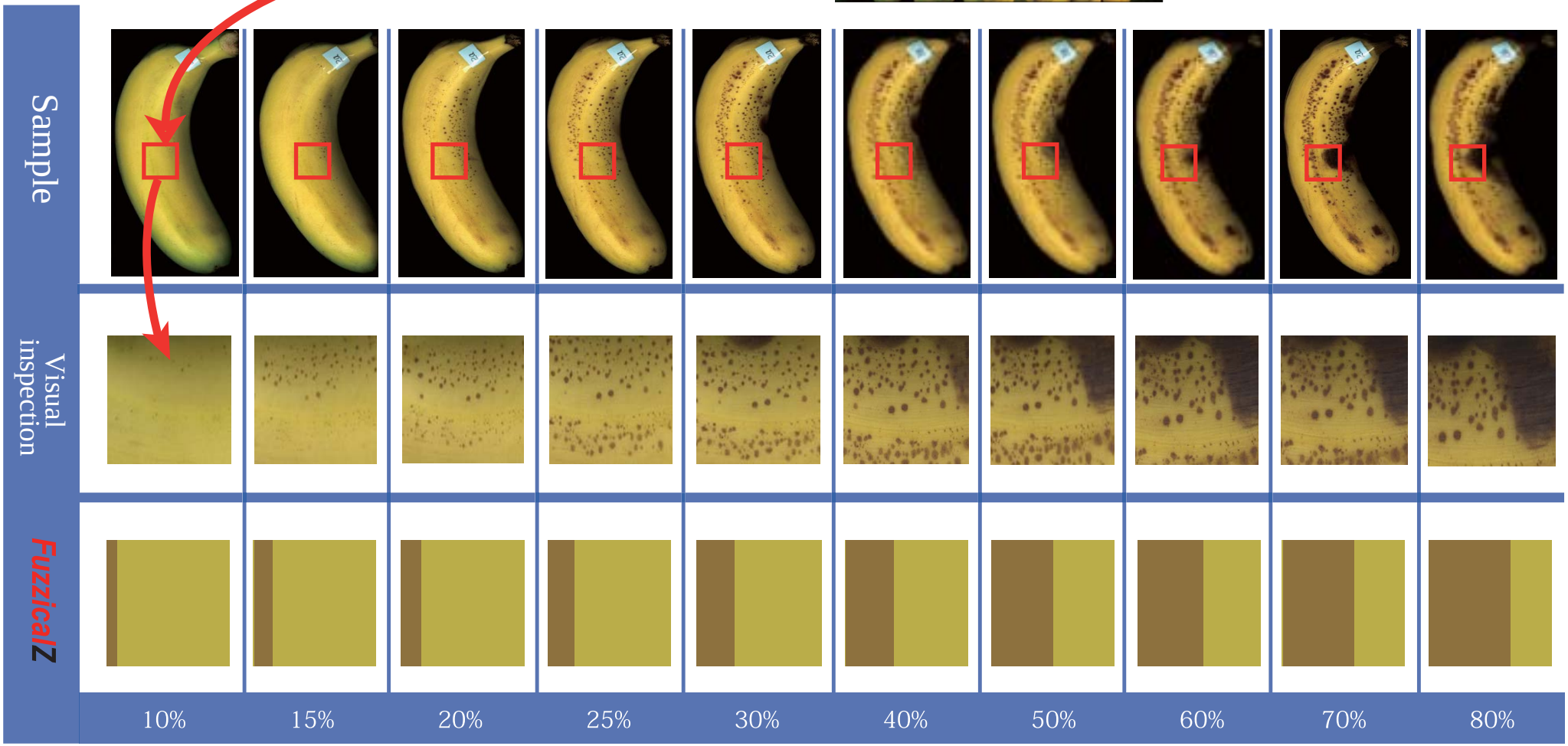


Detects the sugar spots within the selected region and judges by the content percentage (%).

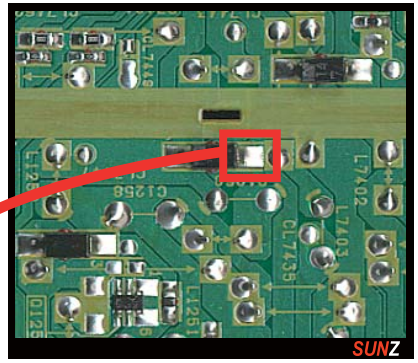


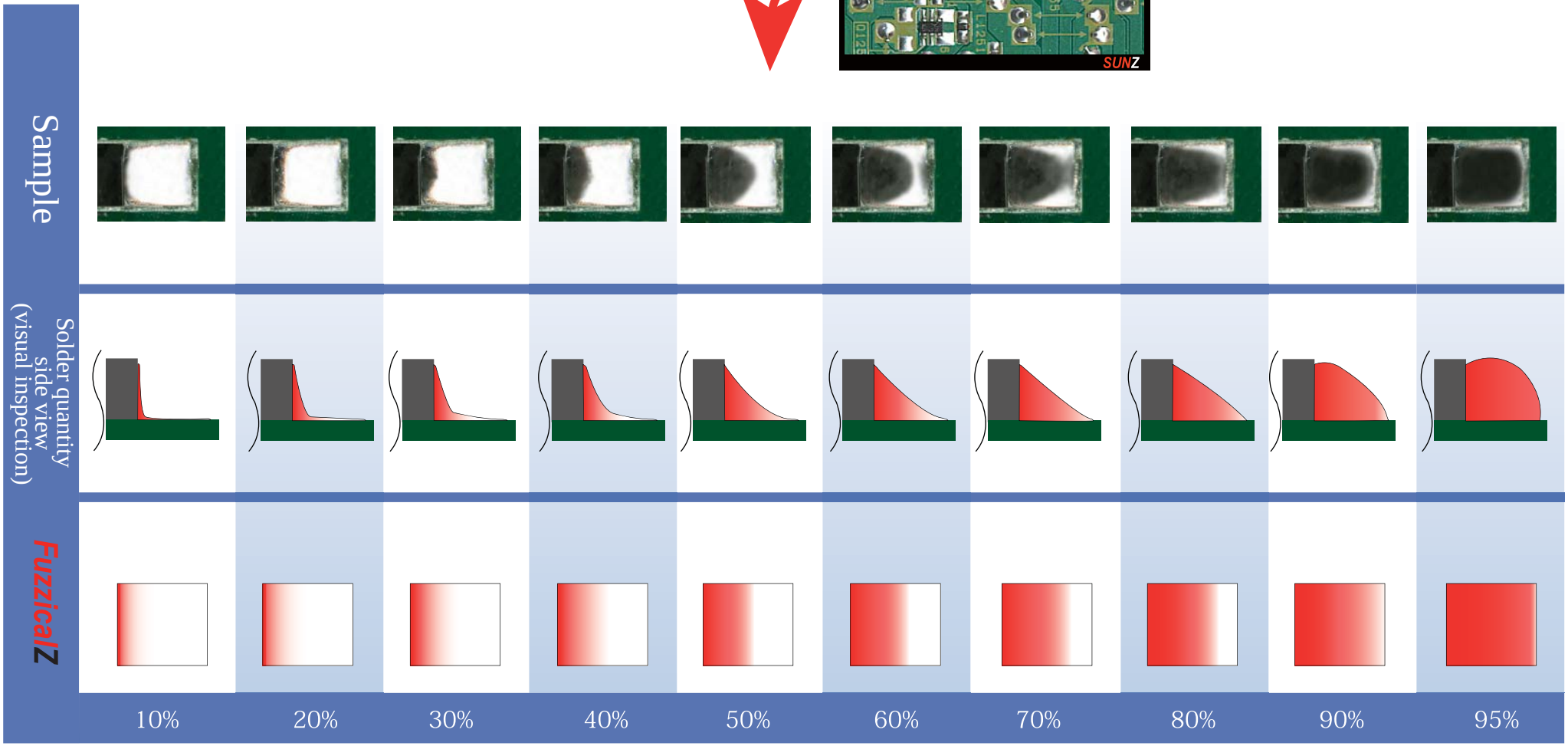
FuzzicalZ, the new logic of ***SUNZ*** can detect the "peak ripeness" of bananas.

Application of principles of inspection A
Inspection of banana peak ripeness



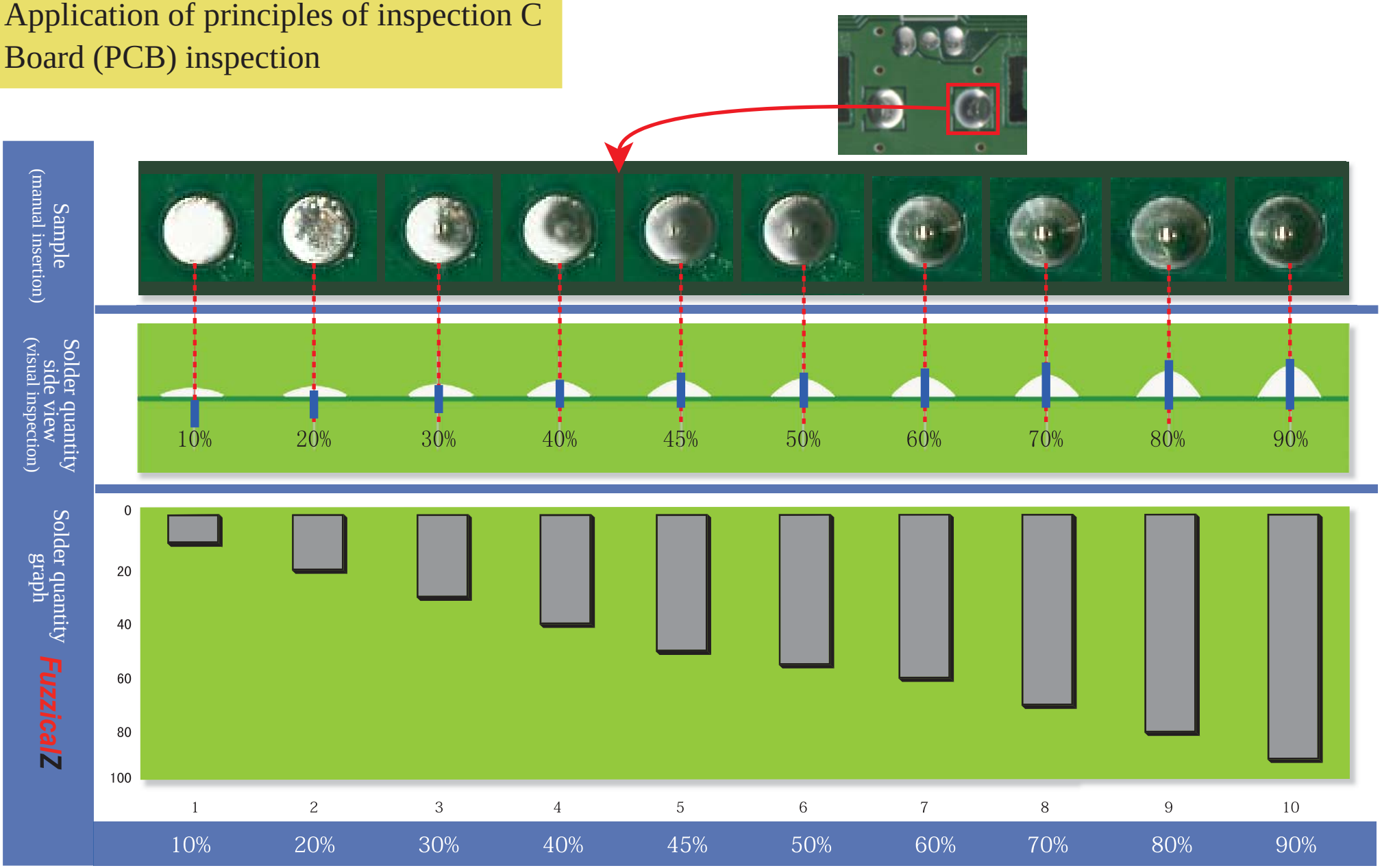
Application of principles of inspection B Board (PCB) inspection





FuzzicalZ, the new logic of *SUNZ* can detect the "peak ripeness" of bananas.

Application of principles of inspection C Board (PCB) inspection



Relationship between boards (PCBs) and bananas

What is the “special for DIP” ?

About ***FuzzicalZ*** logic (* Fuzzical = a coined word)

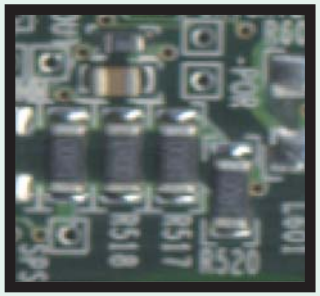
FuzzicalZ logic is a special logic (visual sense logic) special for DIP. By digitizing the processing of human visual sense, we have developed a software program that automates the judgment criteria close to human senses.
To simply describe its features, we conducted an inspection on peak ripeness of bananas.

* Fuzzical = A coined word combining Fuzzy & Physical

A group of PCBs of an identical model

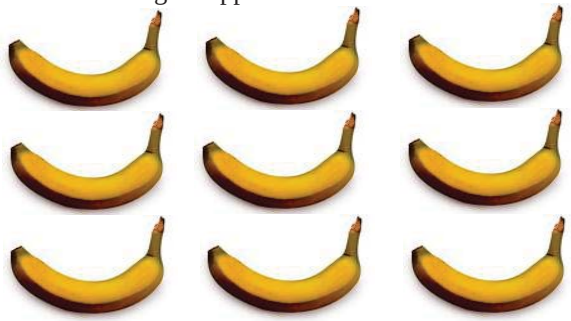
Is represented by bananas

SMTs

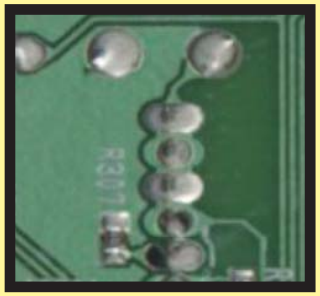


Characteristics:
Digital appearance.
Little warping, staining, etc. of boards and appearance is uniform.

Bananas with digital appearance that do not exist in nature



DIPs



Characteristics:
Analog appearance.
It varies dramatically with warping of the boards, staining with flux, variations of manual work and so forth.

Bananas in nature

Like DIP boards (warping, staining, etc.), bananas (its shape, color and sugar spot appearance) vary considerably by the environment.

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