

# Raman Plastic Sorter

Operational plant, Up to 5mm plastic particle size.



shredder-dust form  
Household appliances

High quality collection is possible

PP	98%
PS	95%
ABS	95%

Return to **bran new**  
Household appliances

# Portable Raman Plastic Identifier



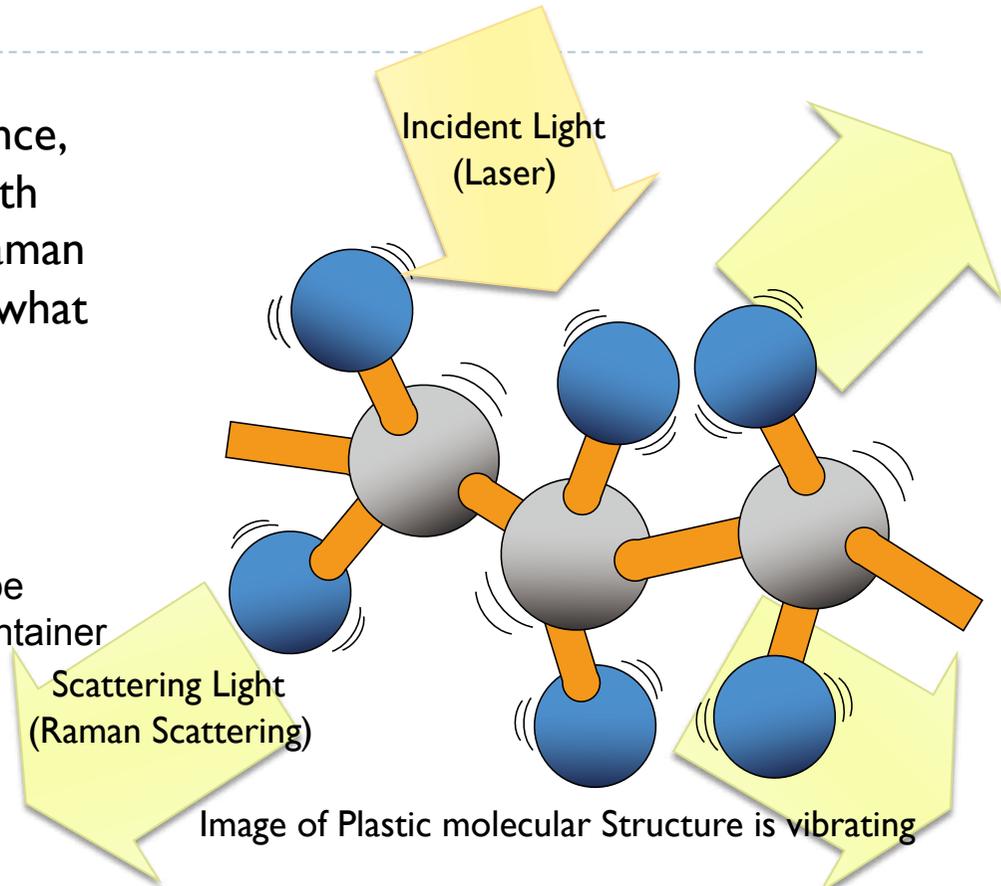
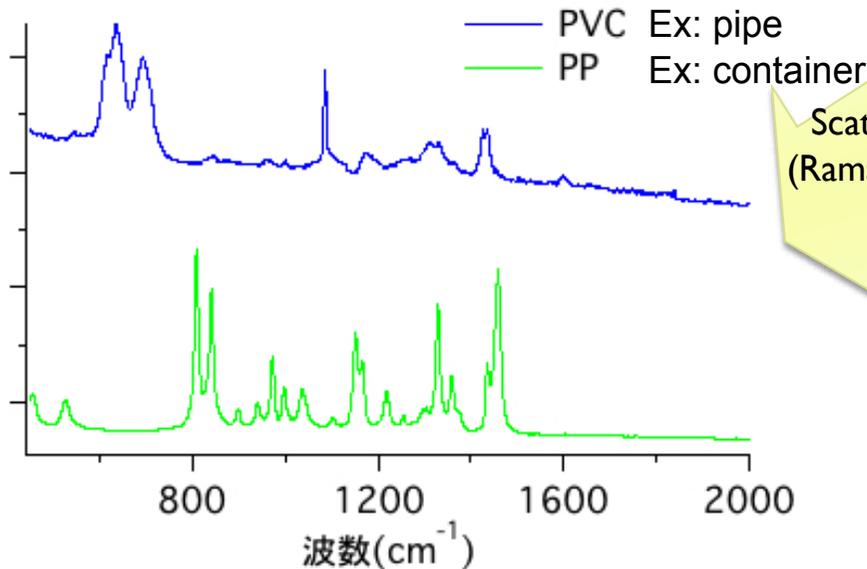
- ❑ Able to detect Additive
- ❑ Able to work with any color
- ❑ Fast and Precise
- ❑ Able to add your own type

Desktop also Available

# Our Technology

When the light shine to some substance, Some of the light change its wavelength effected by its molecular vibration. Raman spectroscopy uses this to determine what substance is.

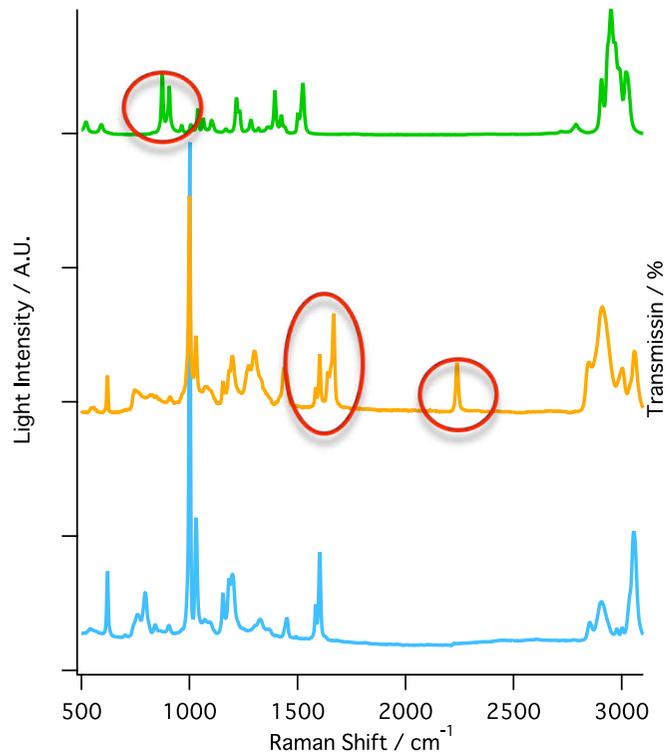
The spectra data with Raman Spectroscopy:  
Each peak directly link to molecular structure.



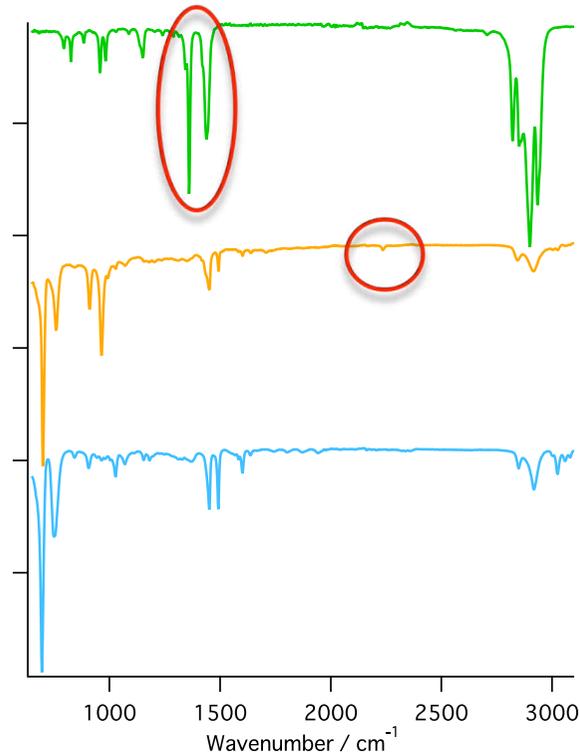
With Raman Spectroscopy, Laser light irradiate to some substance, and observe the wavelength change with high resolution spectrometer. Therefore, it is precise and much easier to measure compared to NIR.

# Feature

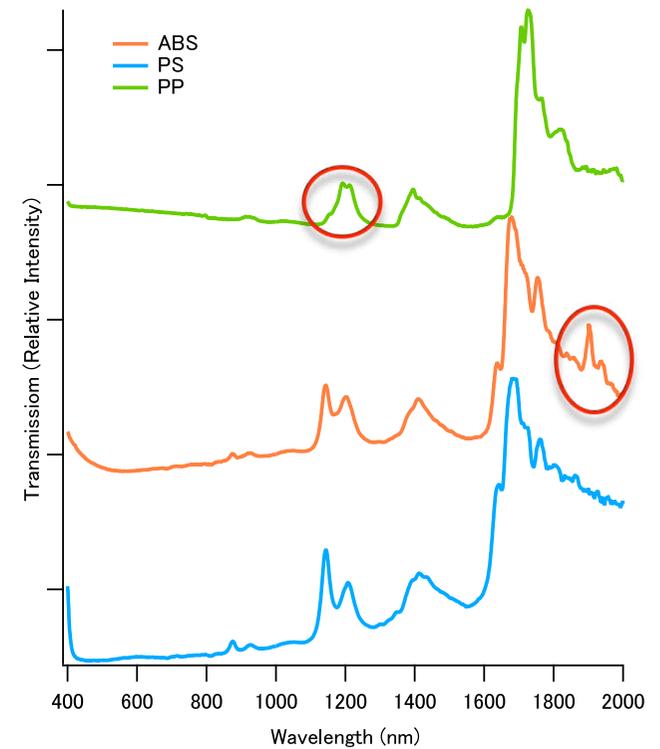
## 1. Excellent SNR Over other spectroscopy



Raman Spectroscopy:  
Lab use spectra quality. And  
much fast response.



Infrared Absorption:  
Detection speed is slow.  
Need to contact to sample.



Near-Infrared Absorption:  
Well known,  
but hard to analyze.



## 2. Better purity & efficiency over NIR

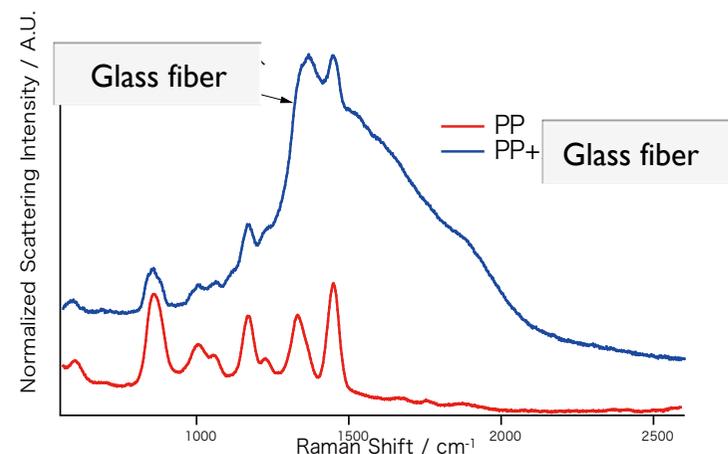
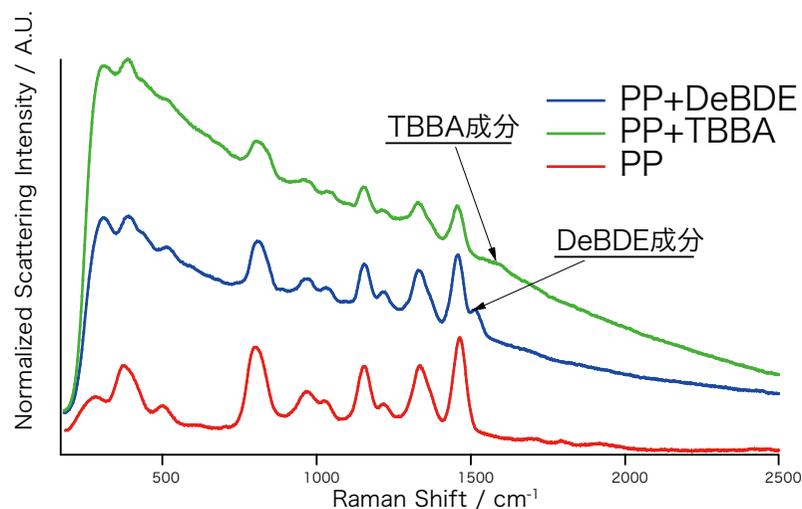
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- ▶ **Raman is better in purity & efficiency.**  
Ex. our Osaka plant
  - ▶ Purity of 95-98%;
  - ▶ Efficiency of 90-95%.
- ▶ **The causes of lower purity & efficiency in NIR**
  - ▶ Dust;
  - ▶ Shape of object;
  - ▶ Wet sample;
  - ▶ Other surface conditions.

# Feature

## 3. More precise over X-Ray

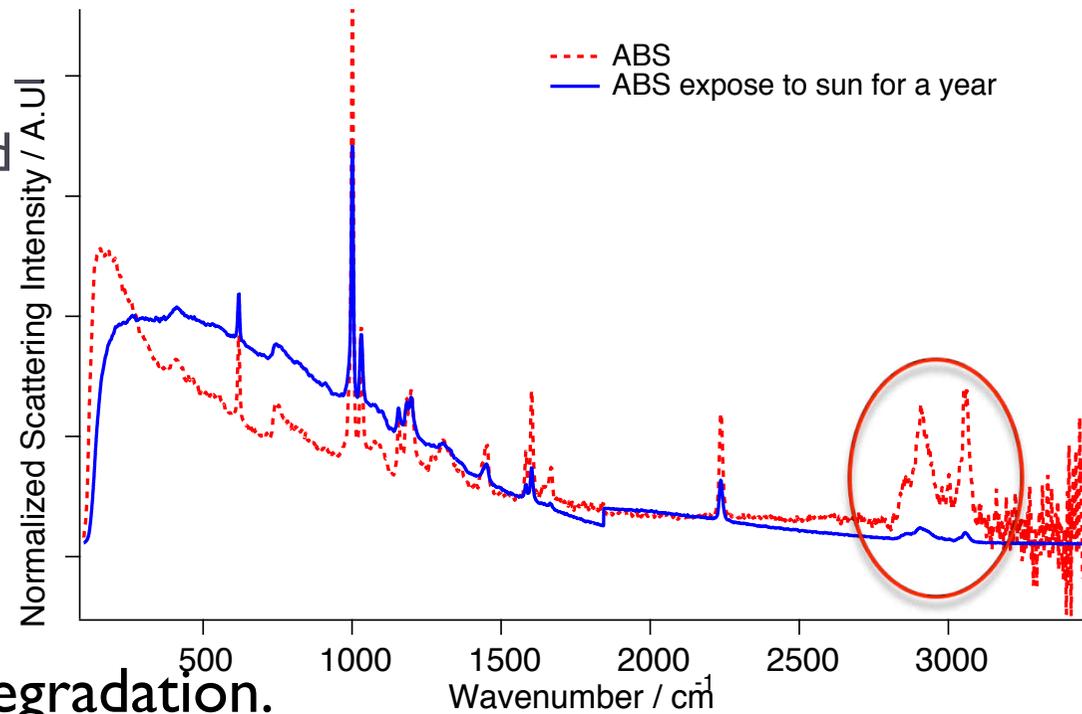
- ▶ Raman can identify each additive and determine its amount.
  - ▶ Flame-retardant: DeBDE, TBBPA.
  - ▶ Filler: Talc, CaCO<sub>3</sub>.
  - ▶ Reinforcement: Glass fiber.
- ▶ Raman can identify plastic and additive at same time.



# Feature

## 4. More precise over LIBS (Spark)

- ▶ Raman:
  - ▶ Direct molecular analysis  
no conversion needed
- ▶ LIBS:
  - ▶ Element analysis



- ▶ Raman can determine degradation.
- ▶ Raman can detect bio-additives in plastics
  - ▶ PLA, cellulose, cotton,
- ▶ Able to add more plastics in your own database.

## 5. Dark color sorting (near future)

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- ▶ Raman can sort black plastics such as
  - ▶ PET, PVC, POM, PC, PMMA, PE, HiPS, PC/ABS, ABS, PS, PP, PPS, PA6/6.
- ▶ However
  - ▶ The technology is still available for laboratory use;
  - ▶ Development is needed up to industrial use;
  - ▶ Carbon-black coloring needs more development.
- ▶ Nevertheless, our Osaka plant can sort
  - ▶ ABS and PS with Ferrite based black coloring
  - ▶ PP with carbon-black and talc.

# Specification Raman Plastic Sorter

Target	Shredded Plastic
Target size	5 ~ 15mm Shredded
Process Amount <sup>※1</sup>	100 ~ 400 Kg/H
Belt Width <sup>※1</sup>	250 mm
Belt Speed	100m/min (1.6m/s)
Detector	Raman spectroscopy
Sorting	Compressed Air
Target Material	・PET・PVC・POM・PC・PMMA・PE・HiPS * I・PC/ABS・ABS・PS * I・PP * I・AS・MS・テフロン・PA6・PA6/6・PA12・PVA・PPE/PPO・PBT・PPS・ * I Detect DeBDE and TBBA (able to register 10 kind)
Purity and Recovery	Purity 99%: Recovery 95%(社内テストでの結果) Our factory condition: Purity keeps over 95%. And recovery rate is 80%.
Change setting by user	○
Wet Sample	No Problem

# Specification

## Raman Plastic Sorter

Raman Sensor	
Light Source	CLASS 4 Height Power Laser
Wavelength	785nm
Max, Power	2W
Utility	
Compressor	0.6Mpa
Air Dryer	dew point temperature below -20 degree cent,.
Cooling Water	Setting 20 °C±5°C, control within±1°C, Water
Power	3phase 200V 、100V、 2 earth
	Order made

# Specification Portable Raman Plastic Identifier



	Portable (PT) / Desktop (DT)		
<b>Model</b>	□□L-785-512HS	□□W-785N-1024LE	□□B-785N-1024LE
<b>Target</b>			
Black Plastic <sup>※3</sup>	×	×	・PET・PVC・POM・PC・PMMA・PE・HIPS・PC/ABS・ABS・PS・PP・PPS・PA6/6
Other Colors <sup>※2,3</sup>	・PET・PVC・POM・PC・PMMA・PE・HiPS *   ・PC/ABS・ABS・PS *   ・PP *   ・AS・MS・テフロン・PA6・PA6/6・PA12・PVA・PPE/PPO・PBT・PPS *   Able to detect DeBDE and TBBA		
Additives	Talc, CaCO <sub>3</sub> , Glass Fiber,		
<b>Measurement time</b>			
Black Plastic <sup>※3</sup>	—	—	約10s
Other Colors <sup>※2,3</sup>	約100ms		
<b>Other functionality</b>			
Able to add your own type	○		
Effect from water	NO PROBLEM		