



www.jstechwin.com



TECHNOLOGY TO PROTECT HUMANITY

Scintillator & Photomultiplier



JS TECHWIN ABOUT US

Scintillator & Photomultiplier

JS TECHWIN pursues to improve public health and quality of life, using the characteristics of radiation and radioactive isotopes for medical purposes to diagnose and treat the diseases.

We supply new material scintillator, core components of medical imaging equipment, photomultiplier tube (PMT), silicon photomultiplier (SiPM), which are high-performance ultra-fast radiation detectors.

Also, we are developing Radiation Portal Monitors, Conveyor Contamination Systems, Personnel Contamination Systems, PET, etc.

If the nuclear medicine imaging equipment is manufactured using cost-competitive core parts made with our developed technology, the burden on purchasers and patients is reduced, and the diagnostic equipment is used more, thereby increasing the hospital's profits and to more people.

The latest medical service can be provided, and after sales service can be done quickly with direct production.



HISTORY



2009-10

2009

- Mar. Established JS TECHWIN in business incubation center, Kyung-pook University
- Mar. Performed task of lab start-up support program by SMBA, the Small and Medium Business Administration (Success)
- Jun. Performed task of business incubating technique development by SMBA (Success)

2010

- Aug. Performed task of technical innovation development by SMBA (Success)

2011-14

2011

- Dec. Established corporation Acquired certification of quality management system ISO 9001:2008

2013

- Mar. Venture business certified by Korea Technology Finance Corporation

2014

- Oct. Performed task of Industry-University-Laboratory cooperation technological development (Success)
- Nov. Performed technical support project for ecological vitalization in IT convergence industry by Daegu-Gyeongbuk Medical Innovation Foundation (DGMIF) (Success)

2015

2015

- Mar. Research institute certified by KOITA (Korea Industrial Technology Association)
- Sep. CE EMC EN 61000-6-3:2007, EN 61000-6-1:2007 certification
- CE LVD IEC 60950-1 certification
- CE ROHS IEC 62321:2008 certification



Domestic patent
registration



European patent
registration



US patent
application



Utility model
registration



Trademark
registration



Domestic patent
application



PCT international
patent application



Utility model
application

< For medical imaging equipment and radiation detector >

2016–17

2016

Jun. Performed task of Industry-Academia Collaboration Technology Development Project (Success)

Nov. Investment from Government SBC (Small & Medium Business Corporation)

Dec. Performed task of DGMIF Joint Project (Development of Gamma Probe) (success)

2017

Feb. Moved headquarters & research institute to Daegu Medivalley

Dec. Completed the second factory in the INNOPOLIS Daegu Medical R&D District

2019–21

2019

Jun. Performed task of KIAT R & D project (~ 2020. 05)

Dec. Performed task of DGMIF Medi-frontier project (~ 2021. 12)

2020

Apr. Certified as an advanced technology and products - Ministry of Trade, Industry and Energy - Radiation detection technology using ultra-sensitive organic scintillation sensor

2021

Sep. Re-certification of Quality Management Certification System ISO 9001:2008 (~23.12)

2022–23

2022

May. Obtained “Inno-Biz” certification

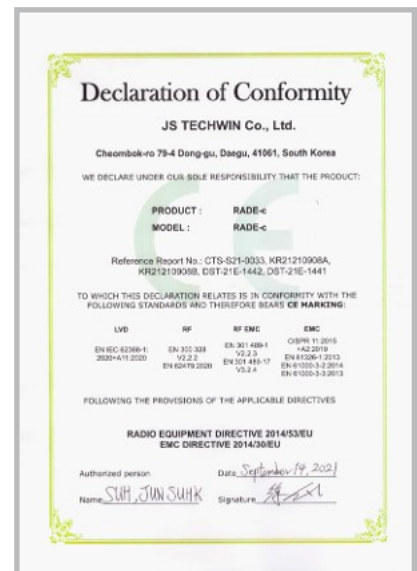
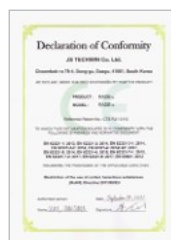
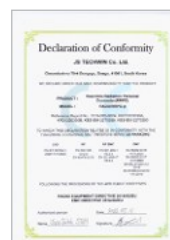
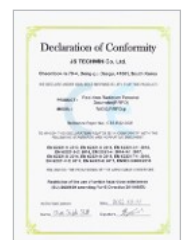
Oct. Designated as a high-tech company – Minister of Science and ICT

2023

Apr. Designated as a “Global IP star company” – Korean Intellectual Property Office

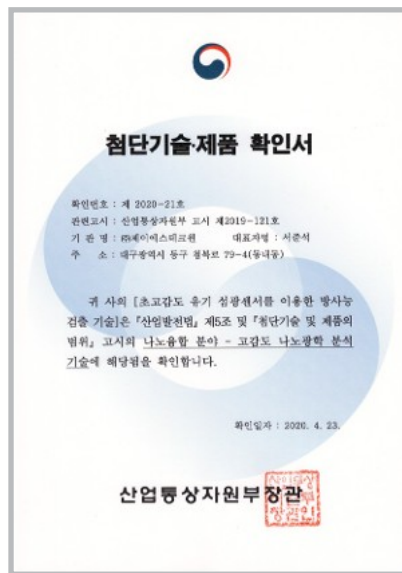
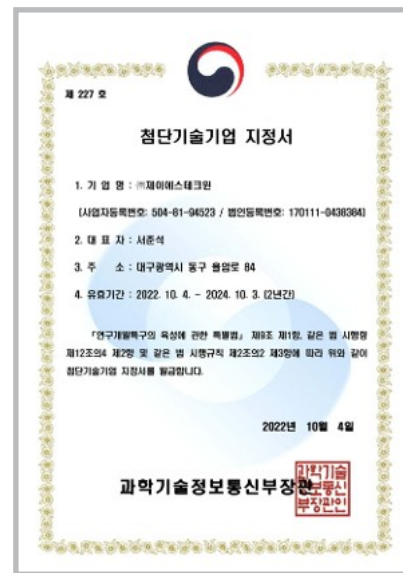
Designated as one of the “1,000+ global company” – Korea SMEs and Startups Agency

PATENT & CERTIFICATE





JS Techwin holds various certifications required for product quality, safety, and performance.

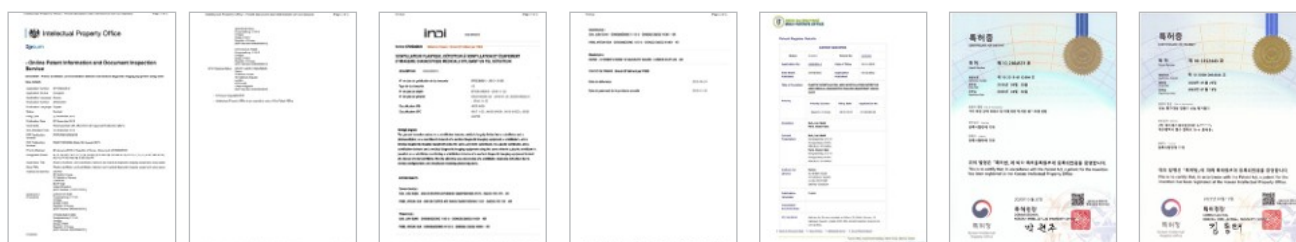


PATENT & CERTIFICATE





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RADIOACTIVITY

01 What's radiation?

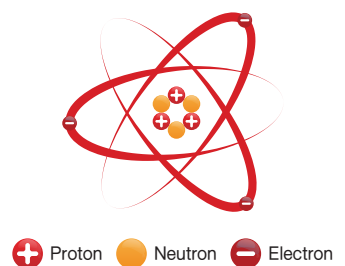
Every material Earth is composed of atoms, and electrons rotating around a nucleus made up of protons and neutrons. Some atoms are stable while others are unstable.

To reach a stable state, it removes its own protons, neutrons, and electrons by itself, a process called radioactive decay. In other words, radioactive decay can be defined as the spontaneous radiation emission of unstable atoms.

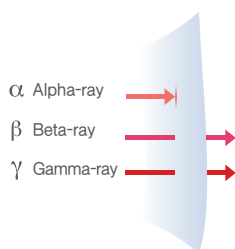
The ray produced by radioactive decay is called radiation. Radiation includes alpha-, beta-, gamma-, neutron- and X-ray used for patient diagnosis.

02 Characteristics of radiation

- The closer the ray approaches the radiation source, the stronger the intensity of the radiation is.
- The intensity of the radiation source decreases over time.
- Radiation exposure affects human body but does not pollute it. Contamination is caused by the ingress or contact of radioactive materials into the body.
- A significant part of the radiation can be blocked by using a suitable shielding material.
- The intensity and effect of radiation vary depending on the nuclide.



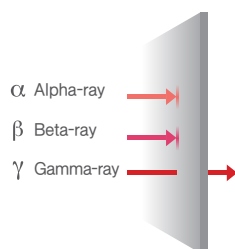
Paper



Paper

The alpha-ray can be shielded with even a sheet of paper as flow of helium atomic nucleus.

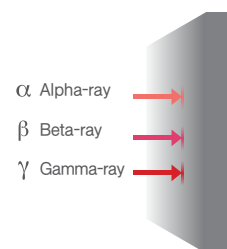
Metal plate



Thin metal plate

The beta-ray can be shielded with even a thin metal plate as flow of electron.

Concrete

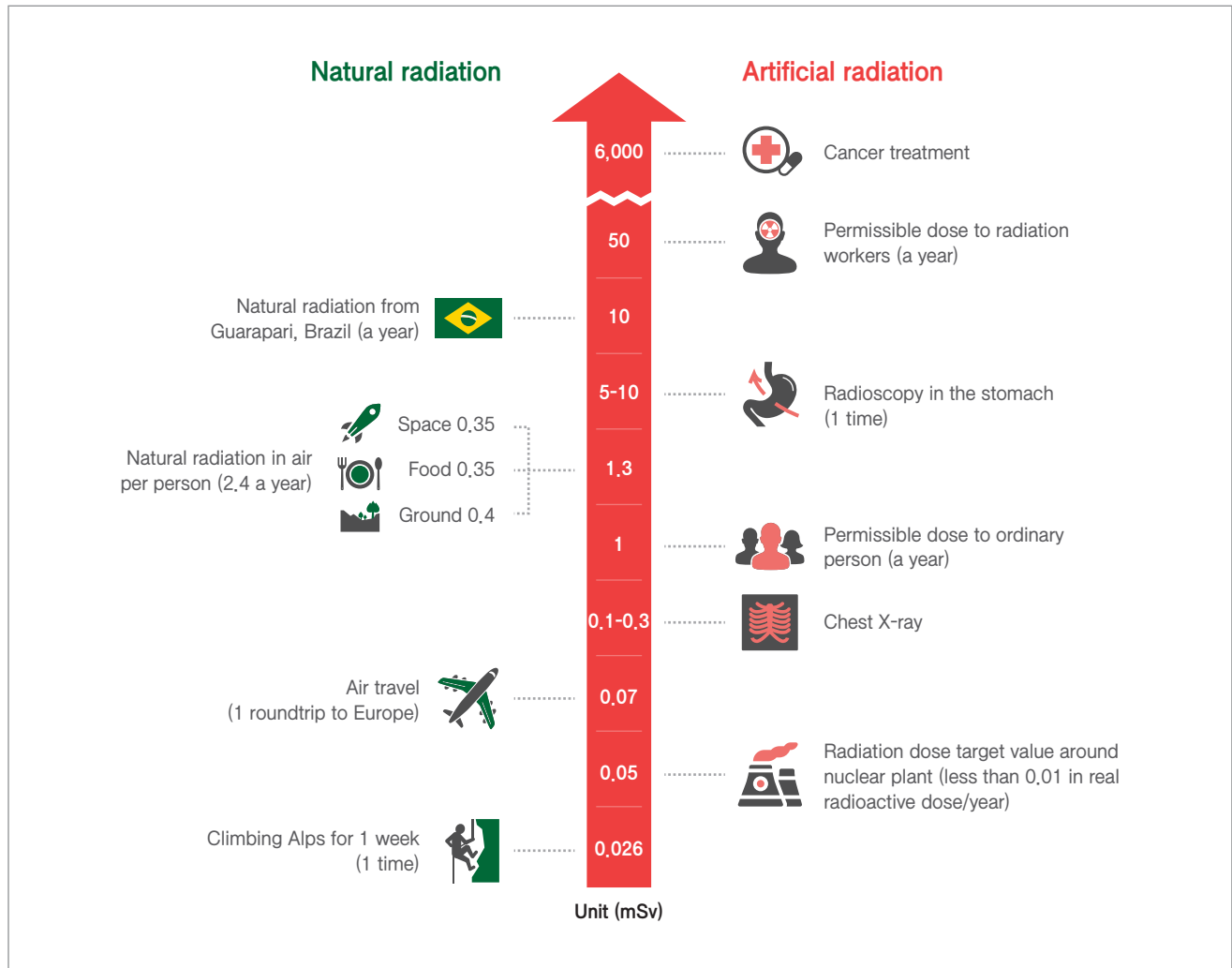


Thick concrete

The gamma-ray can be shielded with thick lead or concrete as electromagnetic wave with short wavelength.

03 Danger of Radiation

When the human body is exposed to radiation, it can damage DNA (e.g.cancer, infertility, birth defects) through physical and chemical reactions. Depending on the degree of damage, the effect on the human health may vary.



04 Effect on the human according to radiation dose

Radiation dose (mSv)	Body symptoms
100	Causes serious cancer to the body
More than 150	Temporary infertility
More than 250	Fetal deformities(14-18 days after pregnancy)
More than 500	Leukopenia
More than 1,500	Radiation sickness
More than 4,000	50% die from disorder of hematopoietic system within 30 days
More than 5,000	Hair Loss
More than 7,000	100% die within 2~3 weeks



RADIATION DETECTOR RADE



01 Product descriptions

It is a high-performance portable radiation detector featuring a fast-response scintillation sensor.

It is compact, cost-effective, and easy to operate in the field.

JS TECHWIN develops radiation measurement equipment using scintillators and SiPMs (Silicon Photomultipliers), a compact solid-state alternative to conventional photomultiplier tubes (PMTs).



02 Specifications

Model Name	RADE
Purpose	Radiation Contamination Detection
Operating Range	0.1 $\mu\text{Sv/h}$ ~ 9,999 $\mu\text{Sv/h}$
Type of Measurement Radiation	Beta, Gamma, X-ray, Muon
Energy Range	$< 3 \text{ GeV}$
Size & Weight	145.3mm x 68mm x 28.7mm, 242g
Battery	9V Battery x 2
Reaction Time	$< 1 \text{ sec}$
Accuracy	0.1 $\mu\text{Sv/h}$ ($\pm 10 \%$)
Sensor Type	Scintillator + SiPM
Display	Digital BW LCD
Audio	Internal Buzzer
Warranty	1 year





RADIATION DETECTOR RADE-c



01 Product descriptions

It is a high-performance portable radiation detector featuring a fast-response scintillation sensor.

It is compact, cost-effective, and easy to operate in the field.

JS TECHWIN develops radiation measurement equipment using scintillators and SiPMs (Silicon Photomultipliers), a compact solidstate alternative to conventional photomultiplier tubes (PMTs).



02 Specifications

Model Name	RADE-c
Purpose	Radiation Contamination Detection
Operating Range	0.1 $\mu\text{Sv/h}$ ~ 9,999 $\mu\text{Sv/h}$
Type of Measurement Radiation	Beta, Gamma, X-ray, Muon
Energy Range	< 3 GeV
Size & Weight	54mm x 180mm x 23.2mm, 112g
Battery	3.7 V Rechargeable battery
Reaction Time	< 1 sec
Accuracy	0.1 $\mu\text{Sv/h}$ ($\pm 10\%$)
Sensor Type	Scintillator + SiPM
Display	Digital color LCD
Audio	Internal Buzzer
Warranty	1 year





CONVEYOR MONITORING SYSTEM (RMS-F)

01 Product descriptions

RMS-F (Radiation Monitoring System for Food) can report accurately the radiation dose emitted from a test object as a numerical value through a sensor and photomultiplier tube when food enter the inspection table through a conveyor. RMS-F is a radiation measuring instrument that can be used in various fields such as agriculture, marine products, and food as it can measure large quantities of food quickly and conveniently.



02 Specifications

Detectors	<ul style="list-style-type: none">- Detector Type : Plastic scintillator- Efficiency : 10,000 cps / (μSv/h, Cs-137), 5,000 cps / (μSv/h, Co-60) or more- Sensitivity : 0.2 μSv/h BG condition, 0.1 μSv/h change detection (< 1 s)- Operating range : 30 keV ~ 3 MeV- Operating temperature : 5°C ~ 55°C
Alarm	<ul style="list-style-type: none">- Alarm type : Radiation detection- Alarm : Beeping, Conveyor stop
System specification	<ul style="list-style-type: none">- Operating system : Windows 11 Home- Storage : eMMC drive: 64 GB SSD drive: 128 GB- RAM : 8GB RAM
Display	<ul style="list-style-type: none">- Screen size : 10.5" PixelSense™- Resolution : 1,920 x 1,280 (220 PPI)- Graphics : Intel® UHD Graphics 615
Other specifications	<ul style="list-style-type: none">- HEAD(mm) : 1,050x400- CONVEYOR(mm) : 1,200x450- BELT(mm) : 2,230x348- BELT TYPE(mm) : 900207- ELECTRIC POWER : AC220-230, 50/60Hz





RADIATION MONITORING SYSTEM



01 Product descriptions

It is used to monitor the leakage of radioactive materials in nuclear power plants and major facilities using plastic scintillator radiation detector.

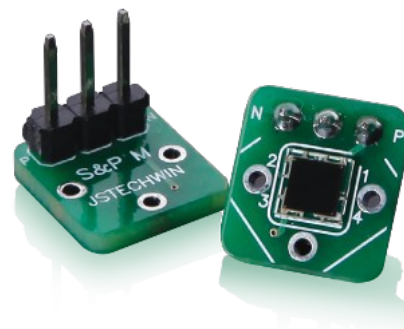
Industrial radiation monitoring system is a unique system that transmits signals to monitoring system when detecting radioactive materials using plastic scintillation and generates a warning siren.

02 Specifications

Detectors	<ul style="list-style-type: none">- Detector Type : Plastic Scintillation- Volume : 7.62 L (50 cm x 30 cm x 5.08 cm)- Sensitivity : 0.2 $\mu\text{Sv/h}$ BG condition, 0.1 $\mu\text{Sv/h}$ change detection (< 1 s)- Efficiency : 100,000 cps / ($\mu\text{Sv/h}$, Cs-137), 50,000 cps / ($\mu\text{Sv/h}$, Co-60) or more- Operating Range : 40 keV ~ 3 MeV (Gamma)- Temperature Operating : -20°C ~ 60°C
Alarm Equipment	<ul style="list-style-type: none">- Visual alarm : alarm light, electric sign board- Auditory alarm system : Siren- Alarm Types : Radiation, Sensor Failure, Instrument Failure
System Computer Specifications	<ul style="list-style-type: none">- Intel© Atom CherryTrail Processor- 4 GB RAM- Intel HD Graphics- 32 GB eMMC- 250 GB SSD- 10/100 Mbps Network Card- WiFi 802.11 b/g/n- Windows 10- 24 inch Monitor- Operating Software- Wired / Wireless Network Support- Remote Monitoring System



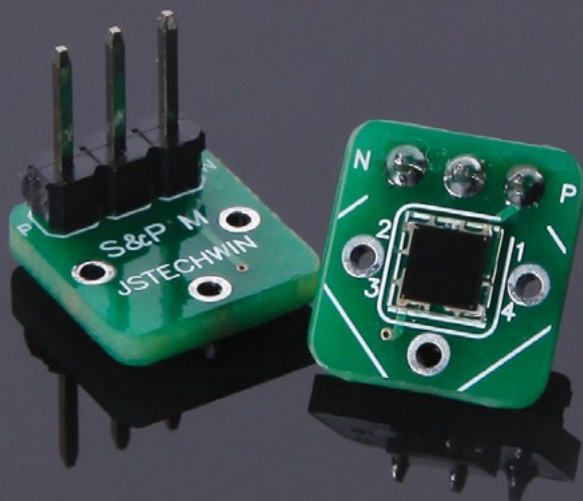
SiPM



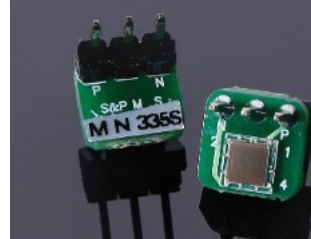
01 Silicon photomultiplier (SiPM : Silicon Photomultiplier)

It focuses on a wide range of applications using micro light detection. Due to the high cost, limited applicability, and complex engineering requirements of PMT (Photomultiplier tube), most of the next generation products are being converted to a new alternative component SiPM (Silicon Photomultiplier), which is a solid version, and we are developing and supplying it to meet consumer demand.

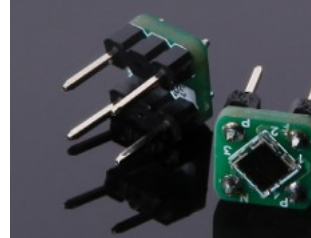
SiPM MN335S (10mmX11mm)



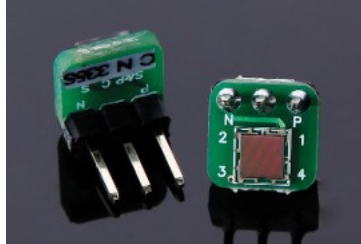
SiPM MN335S (8mmX8mm)



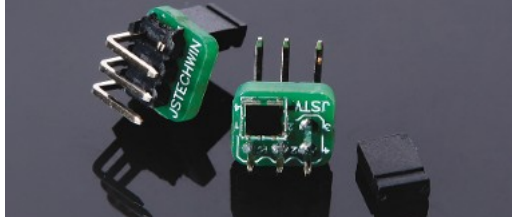
SiPM MD335 (8mmX8mm)



SiPM CN335S (8mmX8mm)



SiPM MN335A
(8mmX9mm, Signal speed is selectable using jumper)



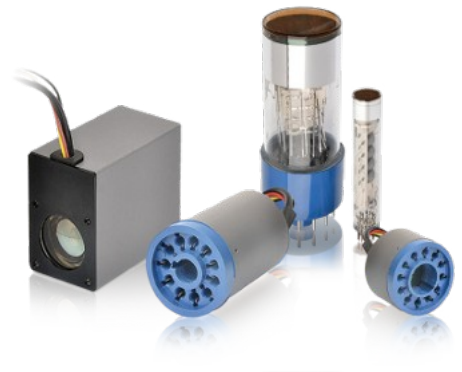
SiPM CD335 (8mmX8mm)



02 SiPM is applicable to

Medical imaging equipment	Flow cells measuring instrument	Fluorescence analyzer	LiDAR
Bio-photonix	Bio-imaging system	Danger and threat detector	Aerospace field

PMT



01 Photomultiplier Tube

It is a highly sensitive photodetector that provides a current output proportional to the intensity of the incident light. The photomultiplier is used to measure the process which emits light directly or indirectly.

Compared with other photo detectors, it has a large area light detection, high gain and the ability to detect single photons. It is very good. (The operation process of the PMT is shown in the picture on the top right.)



02 PMT is applicable to

Aerospace	Electronic microscope	Medical imaging	Radiation monitoring
Astronomy	High energy physics	Particle counting	Scintillation spectroscopy



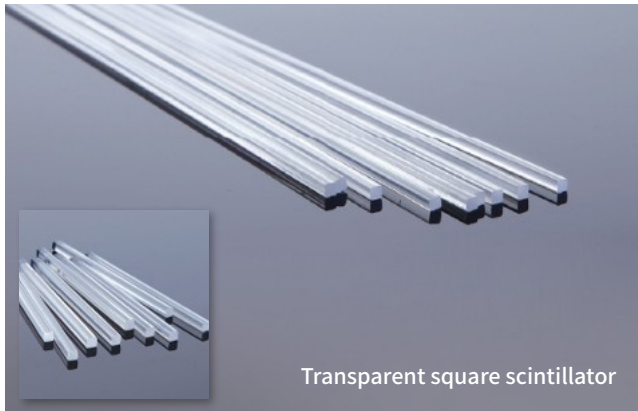
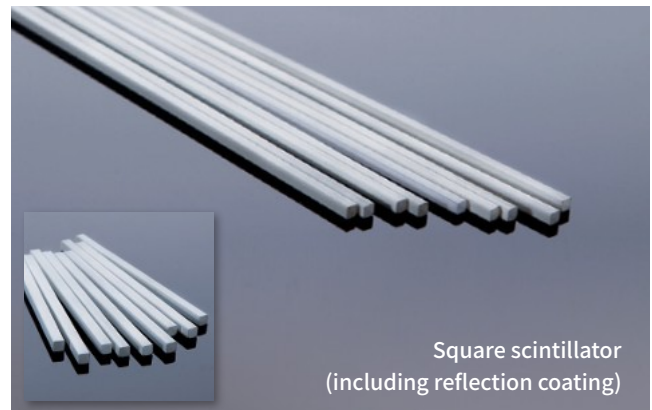
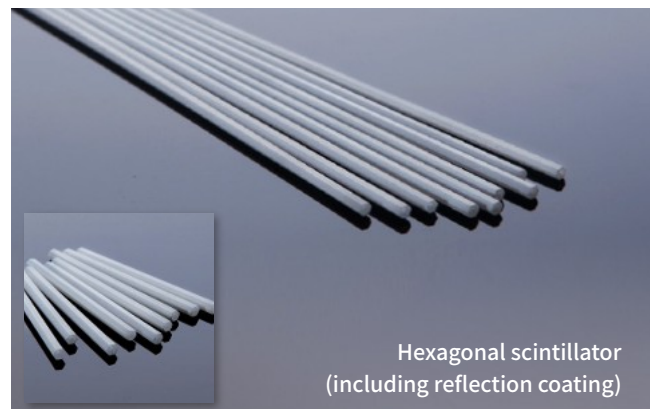
SCINTILLATOR



01 Plastic scintillator

It is a core part of a detector used to measure high-energy light (X-, Gamma-ray) using a photomultiplier and it is attached to a photomultiplier. This allows high-energy photons to react with the scintillator and turn them into bundles of photons in the visible region, which are measured by a photomultiplier. It exhibits a relatively high light output and relatively very fast signal with a 2-4 nanosecond decay time, and the ability to form almost any desired shape is the biggest advantage of plastic scintillators.

02 Scintillator formed in the various shapes

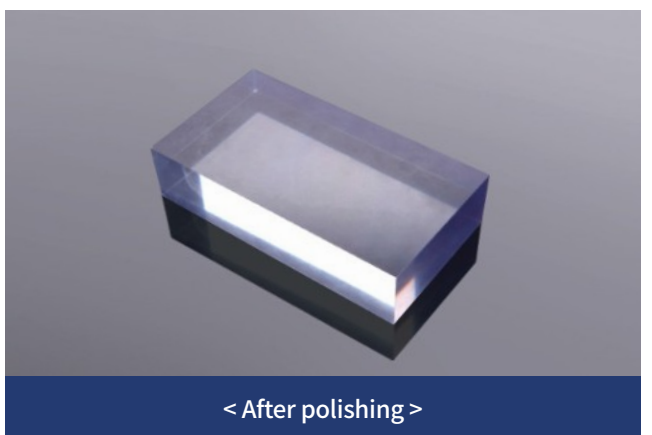


03 Plastic (acrylics) polishing, Scintillator processing

This is the polishing acrylic using an ultra-precision high-speed polishing machine that can polish at a max speed of up to 6000 Hz per second.

It can polish vertically and also at the angle of 0°~60°.

It is capable of polishing from 1,300mm long to 100mm thick.



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