

Terahertz Non-Destructive Testing Machine





Raytec, Ltd.

Based on terahertz wave (T-ray) imaging technology, Korea's first T-ray imaging nondestructive tester that can detect foreign substances in food and medicine and inspect bubble cracks in resin-based parts for the first time in Korea. Raytec is start-up company based on new technology Terahertz-wave developed and commercialized it for the first time in Korea.



Philosophy



New technologies make people a safe society.



Main technology

Terahertz Imaging Technology

- Inspection foreign substance in Food, medicine, cosmetics.
- Inspection industrial film, paper, fabric thickness

Utilize laser technology

- Inspection foreign substance liquid products such as food and beverage.

Infrared ray Imaging and Spectroscopy

- Inspection foreign substance in Food, Medicine, Cosmetic Raw Materials, Industrial raw materials.

Utilize Terahertz Technology

- Security inspection.
- NDT inspection of internal defects of resin parts such as automobiles and aircrafts

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Company History



2017

- 2017. 01 Selected as a customized technology development project
- 2017. 02 Established Raytech Co., Ltd. (2/15)
- 2017. 07 Selected as a 6-month challenge project for Gyeongbuk Creative Economy Innovation Center
- 2017. 10 Homepage production and opening
- 2017. 11 Selected and carried out the entrepreneurship growth technology development project by the Small and Medium Venture Business Department (~ 2018.10)

2018

- 2018. 01 Gyeongbuk Creative Economy Innovation Center G-STAR DREAMMER business selection and execution (2019.6)
- 2018. 03 Samsung Venture Investment seed fund investment attraction
- 2018. 07 Patent application for terahertz tester
- 2018. 08 Acquired ISO 9001, 14001 certification
- 2018. 10 Attraction of SAG Angel Investment
- 2018. 12 Attracted investment from Daegu Creative Economy Innovation Center

2019

- 2019. 01 Obtained Venture Business Certification
- 2019. 05 Credit Guarantee Fund startup NEST program selected
- 2019. 06 Completed commercialization of T-ray non-destructive image tester prototype
- 2019. 07 Korea Venture Association Investment Promotion
- 2019. 09 Daegu Seongseo Dream Town headquarters moved
- 2019. 12 Selected for PreTIPS project
- 2019. 12 Selected as a technology transfer project for Daegu R & D Special Zone
- 2019. 12 Awarded Innovation Venture Business by Daegu Gyeongbuk Venture Business Association



It can detect bugs that the X-ray tester cannot detect.

T-ray Ver1.0



[Basic principle of motion]

- Condensing and line beam formation using 0.1 Thz wave mirror

▪ [Specification]

- Beam width : 40 cm
- resolution : 1.5mm
- Detection speed : ~1m/sec
- Minimum detection size : 3mm
(Worm, plastic, rubber, stone, glass, metal)

[Industry application]

- Food & Beverage, Pharmaceuticals, Cosmetics
- Internal defect inspection for industrial resin parts

T-ray Ver2.0



[Basic principle of motion]

- Condensing and line beam formation using the t-ray wave

[Specification]

- Beam width : 40 cm
- resolution : 1.5mm
- Detection speed : 1~10m/sec
- Minimum detection size : 2mm

[Industry application]

- Food & Beverage, Pharmaceuticals, Cosmetics
- Internal defect inspection for industrial resin parts

T-ray Ver3.0



[Basic principle of motion]

- Line wave is made by applying a terawave with a galvanometer, Collimate Lens, and F-theta Lens.
- 3 times higher resolution & transmittance

▪ [Specification]

- Beam width : 40cm
- resolution : 0.5mm
- Detection speed : 1~10m/sec
- Minimum detection size : 1mm

[Industry application]

- Food & Beverage, Pharmaceuticals, Cosmetics
- Internal defect inspection for industrial resin parts

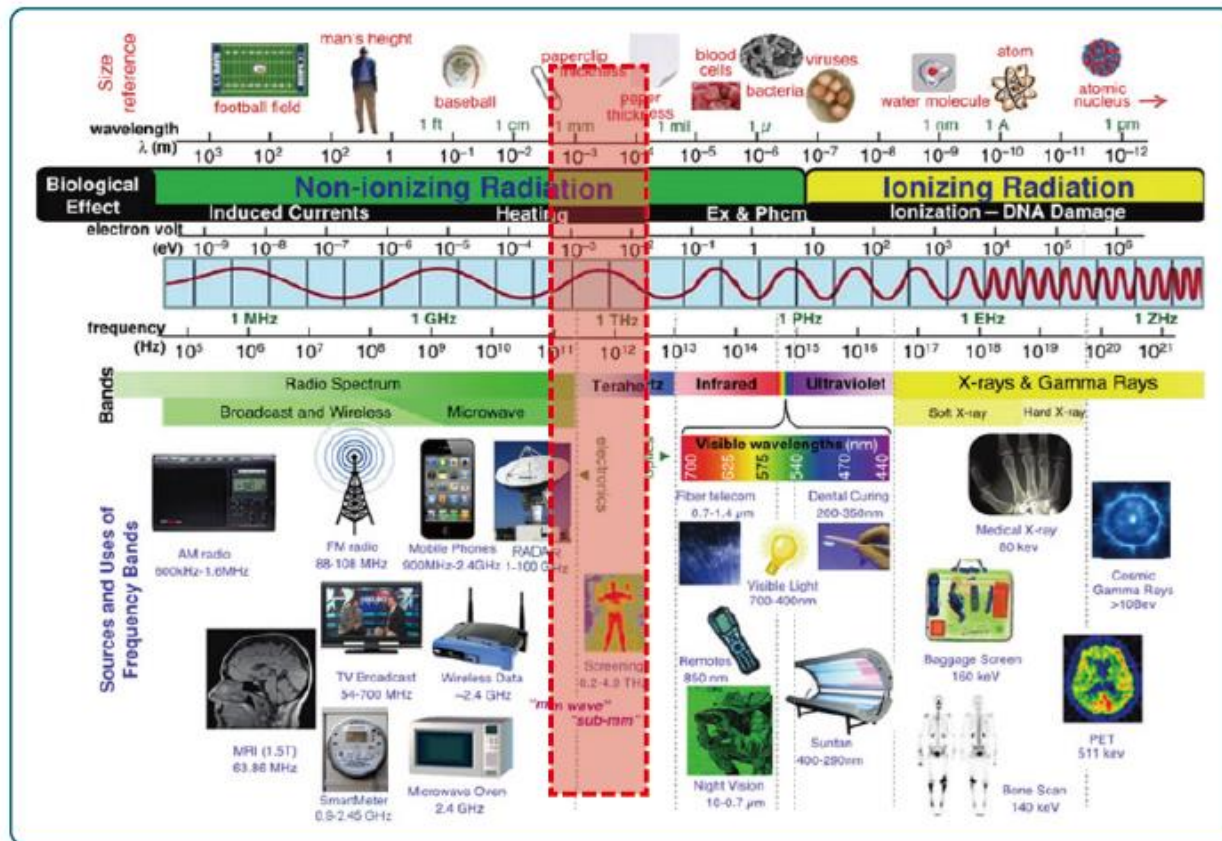
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Terahertz (T-ray)



Selected as 10 emerging technologies of advanced countries in the future –!!

- Electromagnetic wave in the middle of radio wave and light wave (0.1Thz~10Thz)
- Harmless to a human body



해외 미래유망 10대 기술로 선정

2004년 선정 미국 10대 유망기술

미래의 삶을 바꿀 10대 기술

T-ray(THz파) 차세대 의료 영상 기술

: X-ray에 비해서 안전, 고해상도, 병소 실시간 분석



2005년 선정 일본 10대 기간기술

향후 10년 동안 중점 추진할 '10대 기간 기술'

THz파 병리 조직 진단 기술, 우편물 속의 폭약

및 마약 탐지 기술 등 기술 명

THz 전자파 계속분석 기술
세계 최고 정밀도 전자현미경
페타플롭스급 슈퍼컴퓨터
차세대 방사광원
해저지형, 지질, 자원탐사 시스템
고도, 위치 파악 서비스 위성기술
지구규모 통합 관측, 감시 시스템
고속증식로 사이클 기술
우주수송 시스템
핵융합 실험로 건설

출처 : "제3기(2006~10) 과학기술 기본계획"
일본 문부과학성 보고서

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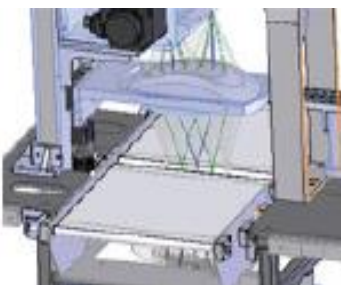
Real-time automatic detection



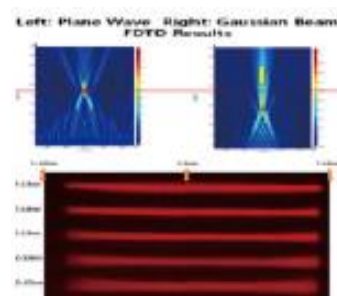
Useful for manufacturing process ~ !!

A system that can automatically classify and inspect foreign substances in real time using terahertz waves in products in the production process

T-ray imaging(scanning) technology

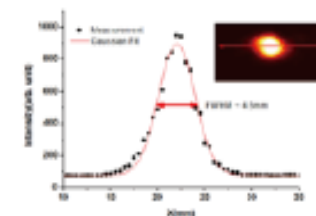


1. T-ray Line scanning

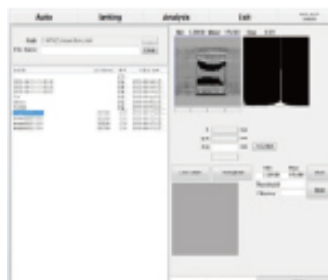


2. Beam Focusing, Line Beam

Beam Characterization



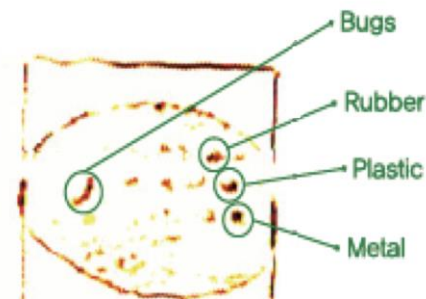
3. Decrease Noise, Increase Signal



4. Foreign object detection



5. Result of Screening




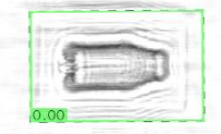
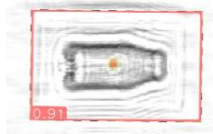
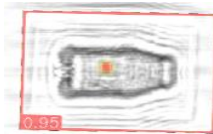


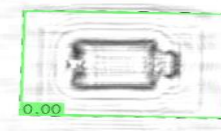

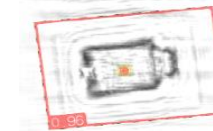


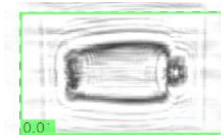

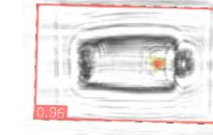
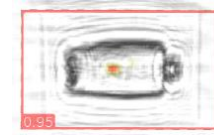

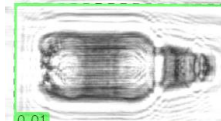
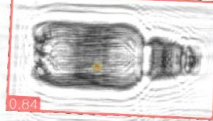
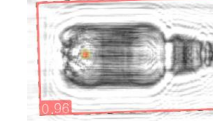
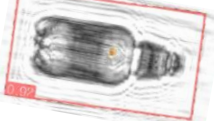
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Deep Learning
Detection Rate 99%



99% detection rate with AI system!

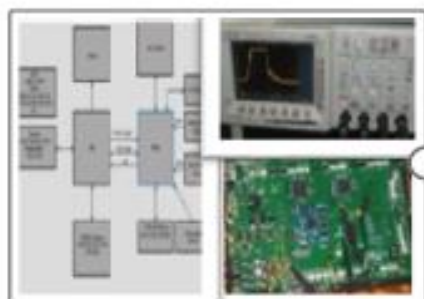
Pet-Bottle foreign substance test pictures.

	Sample bottle	Good	Rubber	Worm	Stone
					
for Drink					
for Medicine					
for Cosmetics					
for Beer					



In the production process, A system that detects foreign substances in real time using terahertz waves in products and then automatically sorts out.

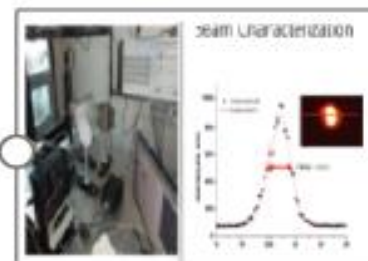
[System Core Technology]



Signal Amplification Circuit
Design Technology



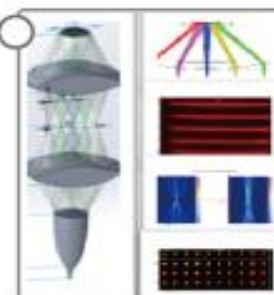
Instrument design
technology



Design Technology for
Radio Beam Performance



Foreign Object detection
algorithm, programming

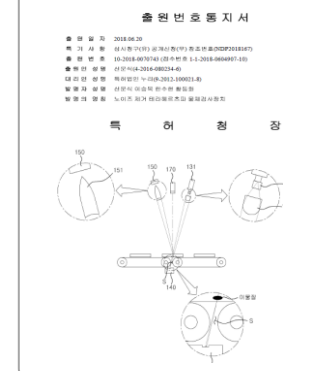
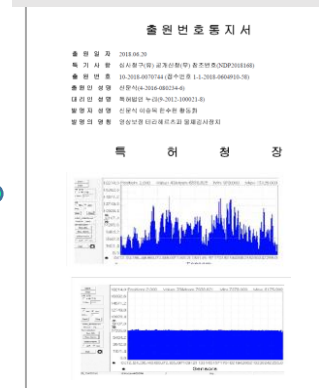
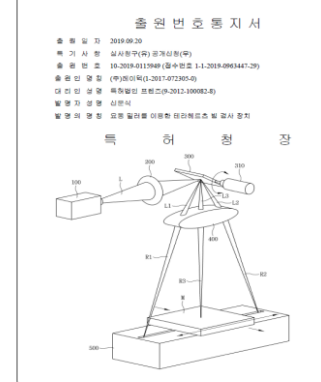


Optical Lens
Design Technology

8

Patent

2 patent registrations, 3 patent applications

Noise canceling terahertz wave
Object inspection device (10-
2018-0070743)Image correction inspection
device (10-2018-0070744)Oscillating Miller
Terahertz beam inspection
device 10-2019-0115949

Foreign substance inspection field

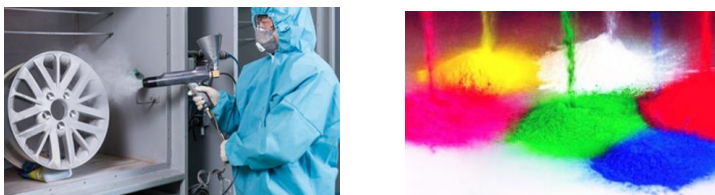
Foodstuff: Sugar, Salt, Seasoning, Powder



Medicine, red ginseng, cosmetics



Powder for Coating



Nondestructive testing

Clothing fabric, paper, film



Engineering plastic parts



10 Sales Activity Status

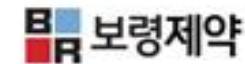
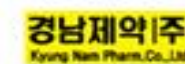
Sales of large domestic companies



Food and beverage



Medicine



Household goods



Branch



Domestic

Indonesia

Europe

China



B2B Online → Overseas agency establishment

YouTube

모든 면에서 앞서나가는 '갓튜브'

월 이용자 수 (만명)



자료: 닐슨노리얼릭

Czech Republic, Germany

eraview

유튜브 카카오톡 네이버 페이스북



TeraPulse 4000

The Pulsed Imaging and Spectroscopy

With units installed in over 25 countries the TeraPulse 4000 is a market leading signal-to-noise ratio with over 90 dB at peak. As standard, the TeraPulse offers a bandwidth of 50 GHz up to 1 THz.

The unit's modular design is configurable to your application. TeraView is able to supply the world's most advanced TeraPulse 4000.



China, Japan

Five Sub-Tera Body Scanner is a fully integrated system consisting of six parts: TeraPulse 4000, TeraView, TeraScan, TeraScan, TeraScan, and TeraScan. The system is designed for high-speed, high-resolution imaging and is used for a wide range of applications, including medical imaging, industrial inspection, and security screening.



USA



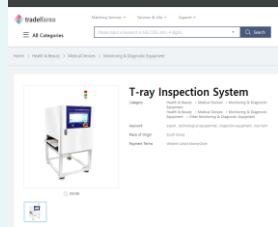
Ec21.com



Gobiz korea



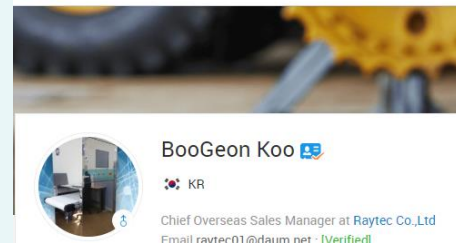
Trade korea



Buy korea



Alibaba.com Global trade starts here. My Alibaba



Korea's first T-ray image inspection company

- Food and drug foreign substance detector
- Non-destructive inspection equipment for industrial materials



Headquarter

#412 4th floor 37, SeongSeoGongDanNamRo, DalSeo-gu, Daegu, South Korea, 42718

Branch

#301, Founding Venture Hall, 61, DaeHak-Ro, Gumi city, GyeongSang Buk-Do, South Korea 39177

Contact

Tel. 053-584-4660 Fax. 0303-3443-6008

E-mail

raytec01@daum.net