**OPTOSKY**
Spectroscopy Solutions

| Dual-Band Portable Raman Spectrometer | **ATR3200** |

## Features

- Dual bands：532, 633, 785, 1064nm (optional dual wavelengths combination)；
- High sensitivity, SNR>3000:1
- High Stability
- Hamamatscu CCD, excellent performance；
- High performance spectrometer
- USB2.0 connect to PC

## Application

- Scientific Research
- Biology Science
- Forensic Science
- Material Science
- Medical Immunology
- Agriculture and food identification
- Water Pollution analysis
- Gemstones and inorganic mineral
- Environment Science

## Description

In many cases in lab is uncertain of wavelengths better for their application, ATR3200 dual-band Raman spectrometer integrate two wavelengths laser sources to detect small sample. It requires no contact, no treatment to make an undestructive detect. This instrument has advantages of high performance-to-ratio, smart size can detect liquids, including fabrics, biology, alcoholics, crystals etc.

ATR3200 built-in 532nm, 633nm, 785nm Raman spectrometers, all of them employs cooled high sensitivity Raman signal enhanced CCD, high efficient Raman probe with a laser power up to 600mW narrow linewidth lasers, combined with high reliable optical design, circuit design, structure design, detect result is very stable, and super SNR.

ATR3200 built in 1064 Raman, employs ultra high cooled semi-conductor lasers, 2nd class cooled ultra high sensitivity InGaAs linear array CCD. As a result, with high performance, high sensitivity can fit to scientific research, medical instrument industry.

## 1.1 Order guidance

| ATR3200-785+1064 | 785+1064 | 500 | 200 ~ 3500 | 3 ~ 8 |
|---|---|---|---|---|
| | | 500 | 200 ~ 2600 | 7 ~ 15 |
| ATR3200-532+633 | 532+633 | 100 | 200 ~ 3700 | 5 ~ 12 |
| | | 50 | 200 ~ 3800 | 6 ~ 11 |
| ATR3200-532+1064 | 532+1064 | 100 | 200 ~ 3700 | 5 ~ 12 |
| | | 500 | 200 ~ 2600 | 7 ~ 15 |
| ATR3200-532+785 | 532+785 | 100 | 200 ~ 3700 | 5 ~ 12 |
| | | 500 | 200 ~ 3500 | 3 ~ 8 |
| ATR3200-633+1064 | 633+1064 | 50 | 200 ~ 3800 | 6 ~ 11 |
| | | 500 | 200 ~ 2600 | 7 ~ 15 |

Book 1 ATR3200TW Built-in Raman Spectrometer Performance Parameters

| Excitation | Excitation/nm | Power /mW | Wavenumber/cm$^{-1}$ | Resolution/cm$^{-1}$ |
|---|---|---|---|---|
| 532 nm | 532 | 100 | 200 ~ 3700 | 5 ~ 12 |
| 633 nm | 633 | 80 | 200 ~ 3800 | 6 ~ 11 |
| 785 nm | 785 | 500 | 250 ~ 2700 | 3 ~ 6 |
| | | | 200 ~ 3500 | 4 ~ 8 |
| | | | 200 ~ 4200 | 5 ~ 10 |
| 1064 nm | 1064 | 500 | 200 ~ 2600 | 7 ~ 15 |
| Optional other wavelengths | | | | |

In many cases in lab is uncertain of wavelengths can better fit for their applications, such as 532nm, 785nm, 1064nm have their own characteristics：

| Excitation | Advantage | Disadvantage |
|---|---|---|
| 532nm | High excitation efficiency, short detect time | Greatly disturbed by fluorescence |
| 1064nm | Fluorescence Resistance | High cost, low laser excitation efficiency, long detect time |
| 785nm | High comprehensive, low cost, high excitation efficiency | |

## 1.2 Technical parameters

| Types | ATR3200-532nm | ATR3200-633nm | ATR3200-785nm | ATR3200-830nm | ATR3200-1064nm |
|---|---|---|---|---|---|
| Interface | USB 2.0 | USB 2.0 | USB 2.0 | USB 2.0 | USB 2.0 |
| Integration Time | 1ms - 120s | 1ms -64s | 4ms - 120s | 4ms - 120s | 4ms - 120s |
| Power Voltage | AC 220V(+/-5%) | AC 220V(+/-5%) | AC 220V(+/-5%) | AC 220V(+/-5%) | AC 220V(+/-5%) |
| Working Temperature | -10~40 ℃ | -10~40 ℃ | -10~40 ℃ | -25~50 ℃ | -10~40 ℃ |
| Working Humidity | < 95% | < 95% | < 95% | < 95% | < 95% |
| Size (L*W*H) (mm) | 800*500*300 | 800*500*300 | 800*500*300 | 800*500*300 | 800*500*300 |
| Channels No. | 100 | 100 | 100 | 100 | 100 |
| Rail Accuracy | 0.625μm | 0.625μm | 0.625μm | 0.625μm | 0.625μm |
| Weight | 27 Kg | 26 Kg | 25Kg | 25 Kg | 27Kg |
| **Reliability** | | | | | |
| Spectral Stability | $\sigma/\mu < 0.5\%$ (COT 8 hours) | $\sigma/\mu < 0.5\%$ (COT 8 hours) | $\sigma/\mu < 0.5\%$ (COT 8 hours) | $\sigma/\mu < 0.5\%$ (COT 8 hours) | $\sigma/\mu < 0.5\%$ (COT 8 hours) |
| Temp Stability | shift $\leq 1$ cm$^{-1}$ (10-40 ℃) | shift $\leq 1$ cm$^{-1}$ (10-40 ℃) | shift $\leq 1$ cm$^{-1}$ (10-40 ℃) | Shift $\leq 1$ cm$^{-1}$ (10-40 ℃) | Shift $\leq 1$ cm$^{-1}$ (10-40 ℃) |
| Spectral intensity change (in 5 ~ 40 ℃) | $<\pm5\%$ | $<\pm5\%$ | $<\pm5\%$ | $<\pm5\%$ | $<\pm5\%$ |
| **Optical parameters** | | | | | |
| SNR | >1500:1 | >3000:1 | >3000:1 | >3000:1 | >3000:1 |
| **Detector** | | | | | |
| Models | High sensitivity Cooled CCD | High sensitivity Cooled CCD | High sensitivity Cooled CCD | High sensitivity Cooled CCD, Raman signal enhanced back-thinned CCD | High sensitivity 512 pixels InGaAs detector |
| Detector cooled Temp | -10 ℃ | -10 ℃ | -10 ℃ | -10 ℃ | -20 ℃ |
| Detector Range | 200-1100 nm | 200-1100 nm | 200-1100 nm | 200-1180 nm | 900-1700 nm |

| Dynamic Range | 50000：1 | 10000：1 | 50000：1 | 30000：1 | 80000：1 |
|---|---|---|---|---|---|
| **Excitation** | | | | | |
| Central Wavelengths | 532nm±0.5nm | 633nm±0.5nm | 785nm±0.5nm | 830 nm±0.5nm | 1064±0.5nm |
| PWHM | ≤ 0.1 nm | ≤ 0.1 nm | 0.08 nm | 0.1 nm | 0.1 nm |
| Max. Power | ≥100 mW | ≥100 mW | ≥500 mW | ≥500 mW | ≥500 mW |
| Power Stability | σ/μ <±0.5% | σ/μ <±0.5% | σ/μ <±0.2% | σ/μ <±0.2% | σ/μ <±0.2% |
| **Raman Probe** | | | | | |
| Working Distance | 6 mm | 6 mm | 6 mm | 6 mm | 6 mm |
| OD | OD>8 | OD>8 | OD>8 | OD>8 | OD>8 |
| NA | 0.3 | 0.3 | 0.3 | 0.3 | 0.3 |
| Aperture | 7mm | 7mm | 7mm | 7mm | 7mm |
| **Operation System** | Android | | | | |
| Interface | WIFI, 4G （optional） | | | | |

| System parameters | |
|---|---|
| Interface | USB 2.0 |
| Operation Mode | Touch screen, PC |
| Power supply | 110V-220V，0.5A |
| Integration Time | 4ms - 120s |
| Power Voltage | DC 19V(+/-5%) |
| Power | Max. Power：50W |
| Working Temp. | -10~50 ℃ |
| Working Humidity | < 95% |
| Size (L*W*H) | 350(d) x 296(w) x 172(h) mm |
| Weight | 12 Kg |

## 1.3 Application
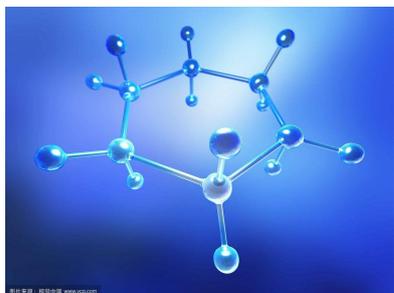
**Chemical**

- Material come in/out test and certification
- online detect of in-process analysis technology
- Analyze physics/chemistry performance relative relationship（Molecular mass, Viscosity, glass transition Temp. etc）
- Petrol product identification and analysis
- Resin, petrol chemical products, daily products identification
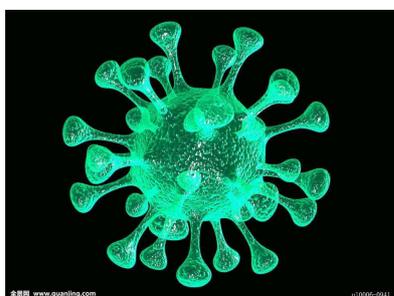
**Biology**

- In-situ, tissue cells non-contact detect, nondestructive, free sample preparation.
- Chemical imaging of internal cell
- Lipid content of Biofuel
- Detect bacterial
- SERS of low energy organism

**Land safety defense**

- IED/HME explosives detect
- Unknown materials
- Forensic analysis
- Border patrol and check

**Pharmacy**

- Drugs polymorph/solvent detect and classification
- Drugs crystals identification
- Tablets, capsule, liquid content analysis
- Additives and excipients quality guarantee and control
- Fast analysis tool of high throughput screen

**Evident Identification**

- Non-destructive, safe drugs and tranquilizer identification, save evidences
- Explosives identification
- Forensic identification analysis, including fibers, hairs, pigment, ink, fiber fabrics
- Toxic solvent identification

**Food Safety and Agriculture**

- Gutter oil detects
- Pesticide residues
- Food additives
- Port of entry check
- Pesticide & Herbicide
- Wetland check
- Bacteria pollution

**Geology**

- Nondestructive identification geological materials
- Fake gemstones
- Identify minerals and gemstones origins
- Evaluate mining prospect and change minerals

**Semi-conductor and thin-film**

- Wafer defect check
- Thin-film coating
- Online process
- Quality safety and control

## 1.4 Attachment



Fig 1 Liquid sample cell（similar to Thermo）

Fig 2 Liquid sample cell（Liquid chromatogram bottle, micro）**(optional)**



Fig 3 Gun-type Raman probe（**Optional**）



Fig 4 XY probe holder（solid & powder）（**optional**）



Fig 13 Long distance（2meters）Fiber Raman probe（**Optional**）

**Product data information is current as of publication data. Products conform to specifications per the terms of Optosky Standard warranty.**

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# 2 Application & Advantages



1 Raman Application & Advantages

# 3 Optosky Raman Technology Milestones
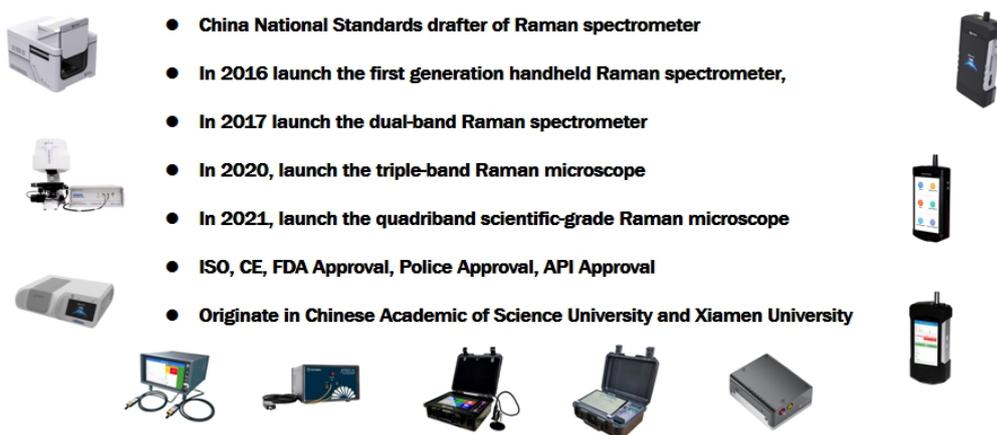


2 Optosky Raman Spectrometer Milestones

# 4 Raman Spectrometers Family



3 Raman Models Selection

# 5 Company Profile

Optosky company is a first-class spectroscopy solution provider, with the headquarter locates in the 7th floor of the research institute of the Chinese Academic of Science at an area of 2500 square meter in Xiamen city where successfully held the international 9th BRICK summit in 2017.The subsidiary company locates in Wuhu city with an area of 2035 square meters.

The company founder Dr.Hongfei,Liu graduated Docter degree from the Chinese Academic of Science and postdoctoral degree from Xiamen University, by integrating both of top Universities' spectroscopy technology background into Optosky company aiming at developing the leading spectroscopy equipment in the world.

The company bases on unique technologies of Optomechatronics, Spectroscopy Analysis, Process Weak Optical and Electrical Signals, Cloud Computing, and have been developed wide products line of the competitive Raman spectroscopy instruments, micro spectrometer, hyperspectral imager, field spectroradiometer, fluorescence spectroscopy, LIBS etc. Driven by advanced technologies and products, Optosky brand has been well-known to customers all over the world.

Optosky company base on technology innovation, market-driven direction, customer first, provides first-class products and services, and one-stop solutions to many fortune 500 companies in many industries. The company received praise from different industry companies, as well as many innovative intellectual properties, software copyright, qualification certification, and winner awards over hundred numbers.

Optosky receives top class A introduced the high-tech company to international Xiamen city, the national high-tech and new innovative technology company award. The founder Dr.Hongfei Liu receives the innovation talent award by the ministry of science and technology.

The company is currently conducting the exclusive project of major industrialization national oceanic administration with a total fund of five million us dollars. The company in charge of drafting national industry standard of VNIR and SWNIR Field Spectroradiometer, and six national standard drafters, including China National Standard Drafter for Hazmat detector based on Raman spectroscopy, China National Standard Drafter for Buoy-type Monitor eco-environment, China National Standard Drafter for water quality monitor in the unmanned boat, China National Standards drafter for online water quality monitor by spectroscopy, China National Standard Drafter for UV-absorbent measure fabrics.

The company has over 70 IPs and over 20 innovative patents.

The company received ISO9001:2015 certification, CE certification, Police Administration Certification, FDA approval compliant, IQOQPQ compliant.



Figure 1 Optosky (Xiamen) Photonics Inc. Company Headquarter

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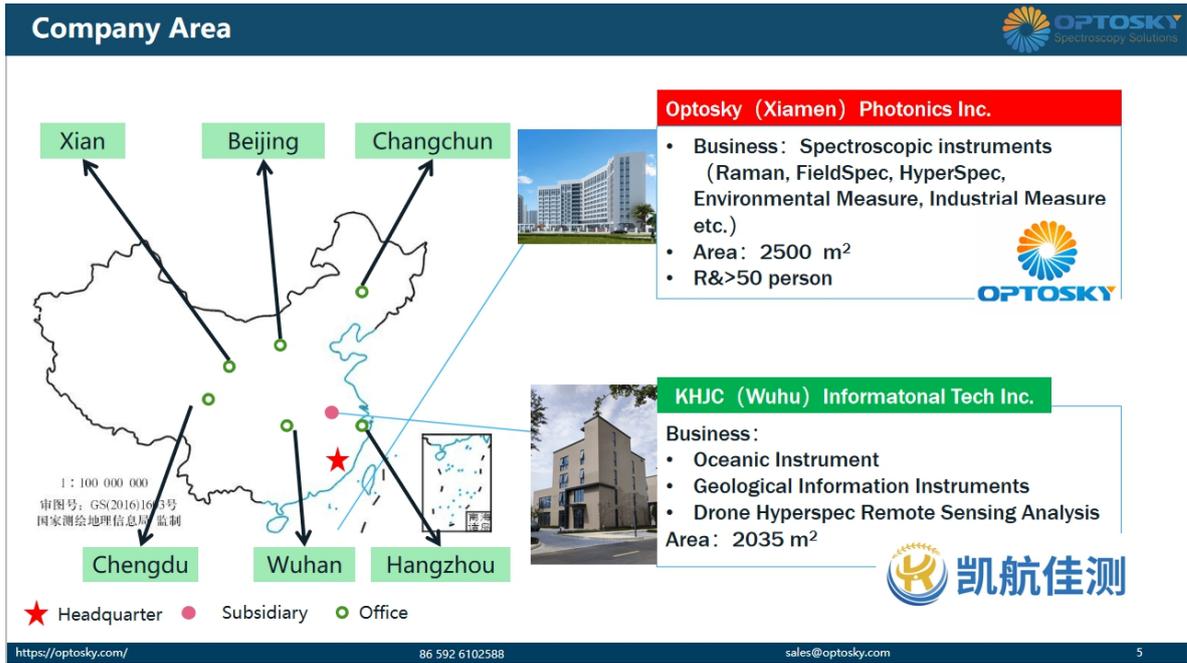
Figure 2 Optosky Company Area
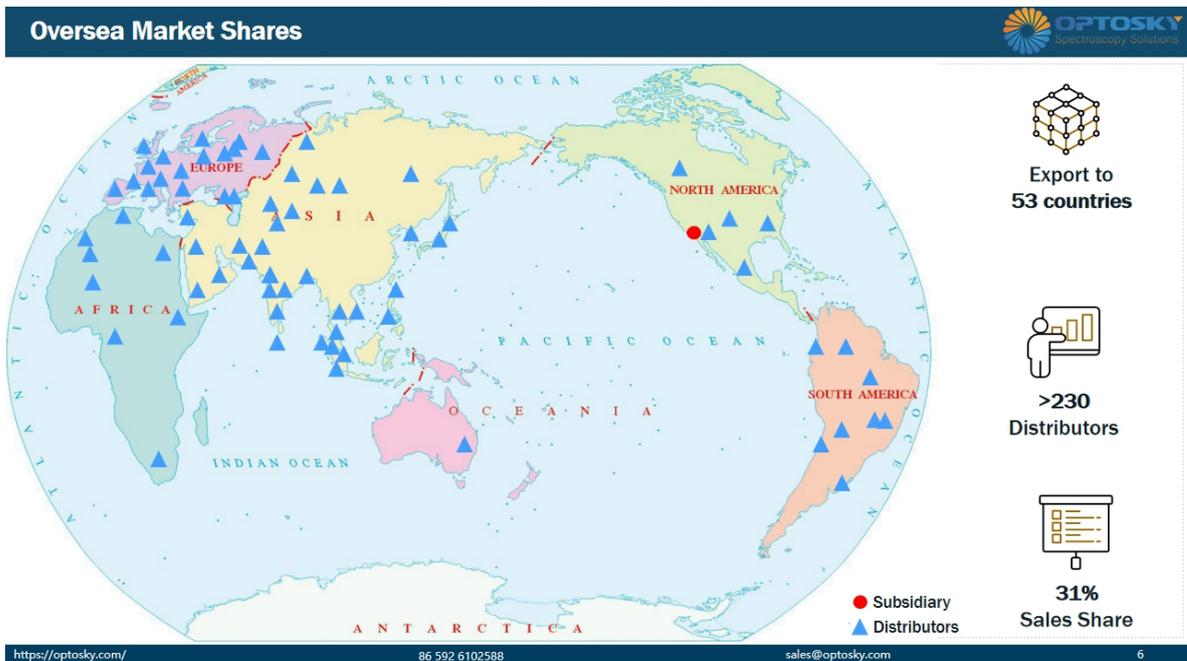


Figure 3 Oversea Market Shares

Figure 4 Optosky Chair and Draft National Standards Lists.



Figure 5 Qualification

## Informationization & Industrilization Fusion Management System
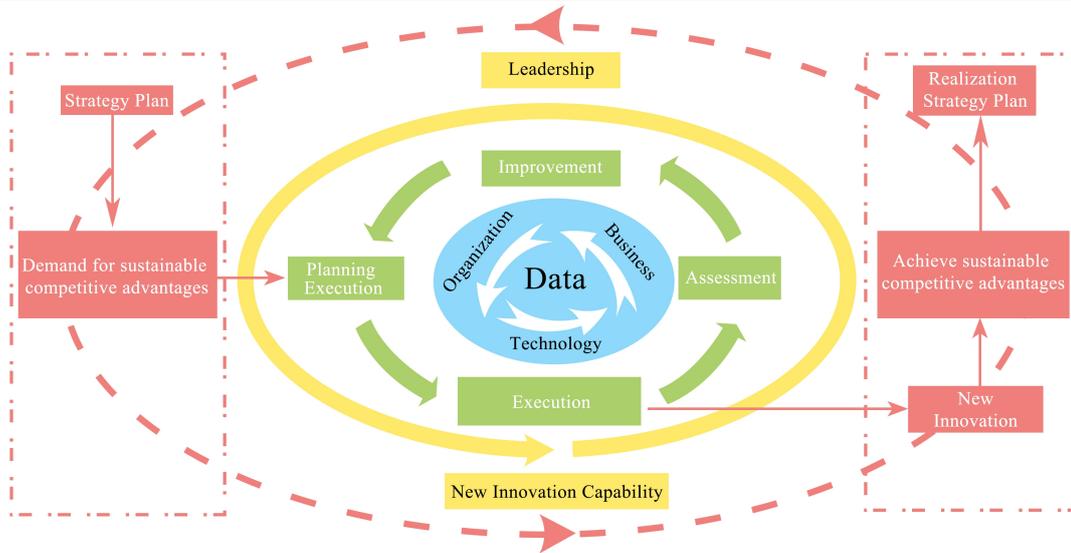


Figure 6 GB/T 23001_Informationization & Industrilization Fusion Management System



Figure 7 Optosky's Co-founder_Dr. Hongfei Liu

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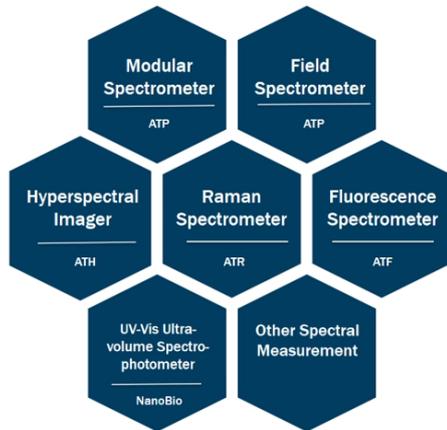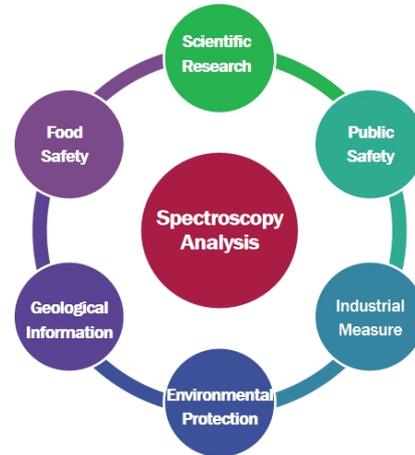
**Category & Application**

## Category



## Application

Figure 8 Category & Application

## Model Name Rule

**Model Name Rule:**

- Prefix
- Category
- Model
- Suffix
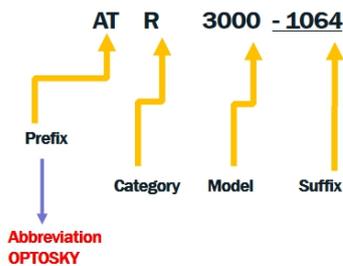


- **ATR** – **R**aman Spectrometer
- **ATP** – Micro **S**pectrometer
- **ATH** – **H**yperspectral Imager
- **ATF** – Micro **F**luorescence Spectrometer
- **ATL** – **L**IBS
- **ATW** – **W**ater
- **ATE** – **E**nvironment **P**rotect
- **ATFD** – **F**ood Safety
- **GA** – Public Safety （**G**ong **A**n）
- **GF** – Gas Monitor （**G**as **F**inder）
- **GY** – Industrial Monitor （**G**ong **Y**e）

eg：
- Raman Microscope：ATR8300MP-1064
- Hyperspectral Imager：ATH9500

Figure 9 Model Name Rule

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