

# EDXIR-Analysis System



## ■ Energy Dispersive X-Ray Fluorescence Spectrometer (EDX)

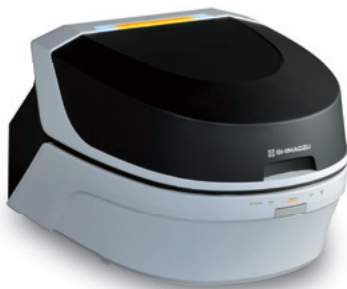
When a substance is irradiated with X-rays, characteristic X-rays (fluorescence X-rays) are emitted by each element in the substance. The types of elements can be determined from the energy of these fluorescence X-rays, and their concentrations can be determined from the X-ray intensities. An EDX can analyze samples in a variety of conditions including solid, liquid, and powdered form, without the need for chemical pretreatment, so it is the optimal instrument for the analysis of contaminants important to sample preservation.

### EDX-7000/8000

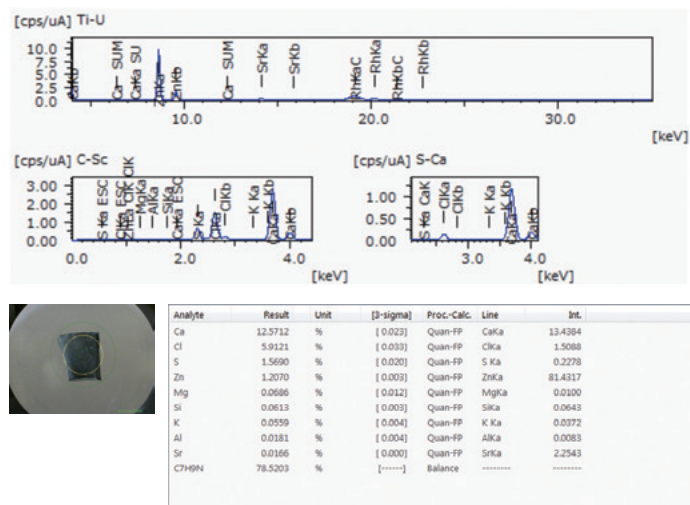
These are the flagship models of the Shimadzu EDX series. They are equipped with a high-performance semiconductor detector that does not require liquid nitrogen. They also contain a sample observation camera and can be used with collimators, which are effective for the analysis of microscopic and trace quantity samples. In addition, they are compatible with measurements in a vacuum environment\* and measurements with helium purging\*, which are effective for the high-sensitivity analysis of light elements.

\*These are options. Measurements with helium purging are only supported by the EDX-7000.

### ■ Example of Black Rubber Contaminant Analysis with the EDX-8000



EDX-7000 / 8000



## ■ Fourier Transform Infrared Spectrophotometer (FTIR)

Substances have their respective inherent infrared spectra. As a result, contaminants can be identified and qualified by comparing their infrared spectra measured by FTIR with data in a library. Measurement times range from a few seconds to a few minutes. This is mainly effective for the analysis of organic compounds.

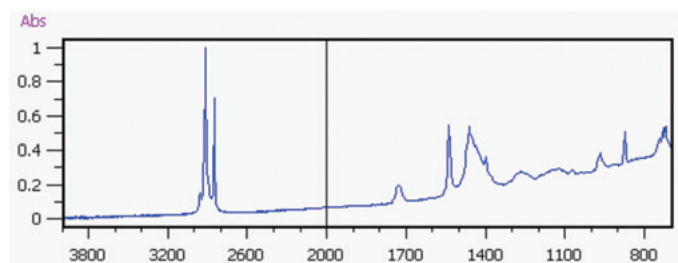
### FTIR + Single Reflection ATR

Pretreatment is almost unnecessary. Simply affix a sample to a prism with a diameter of approximately 1.5 mm to enable measurement. Samples in a variety of conditions such as powders, films, samples in bulk, liquids, and substances adhering to surfaces can be measured directly.

### Example of Black Rubber Contaminant Analysis with the FTIR



IRAffinity-1S+MIRacle10



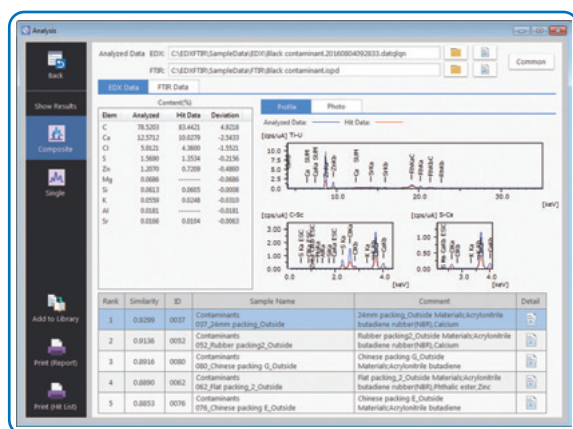
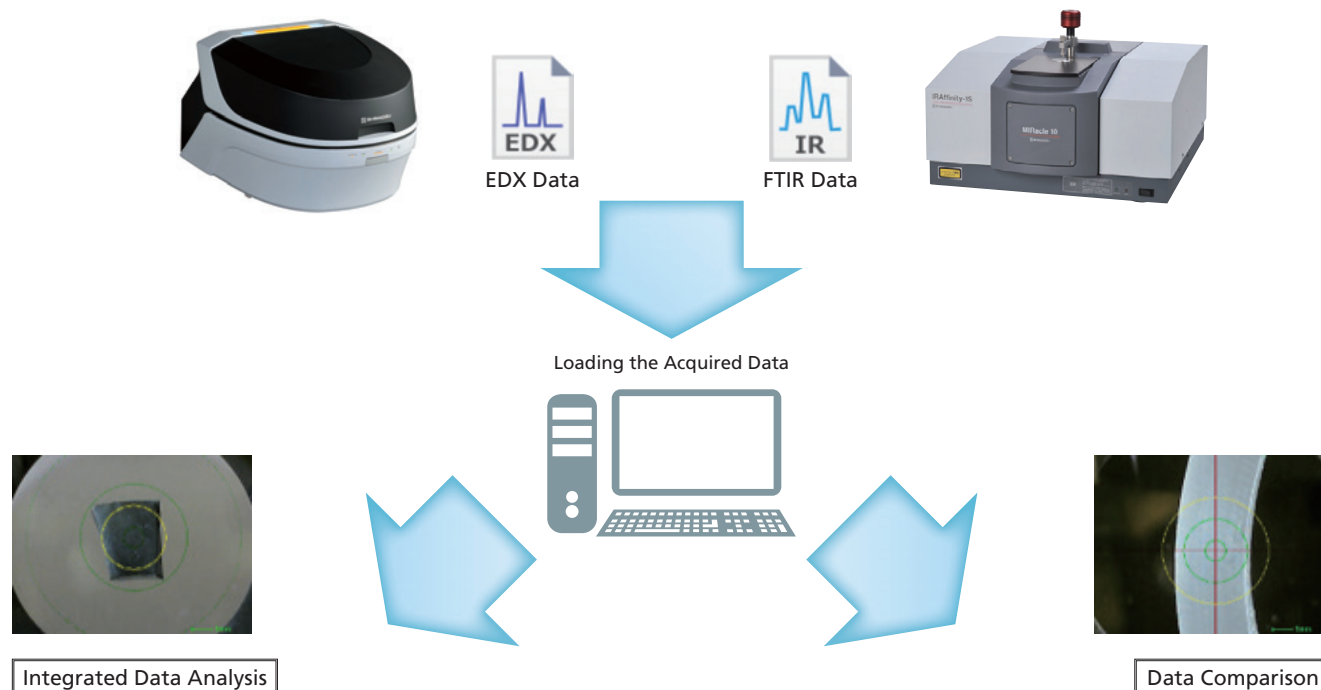
## EDXIR-Analysis System

Qualitative analysis can be performed automatically by selecting the EDX/FTIR data\*1. This heightens the efficiency of data analysis and provides strong support for contaminant analysis.

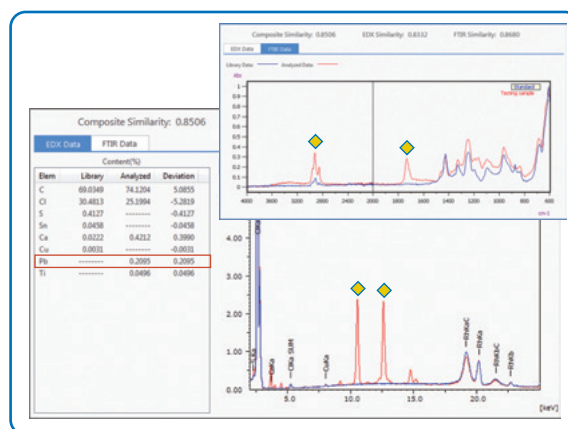
In addition, with the data comparison function, which calculates the degree of matching between the actual measured data and the data registered in the library, the software can be used for countermeasures against "silent change"\*2 and for other confirmation tests. The library used for data analysis (containing 485 data acquired as standard) is original to Shimadzu and was created through cooperation with water supply agencies and food manufacturers. Additional data can be registered, as can image files and document files in PDF format.

\*1: Using the EDX profile, data are classified as inorganic, organic, and mixture. Integrated data analysis is performed by applying priority levels to each classification. (Patent pending)

\*2: A term used in Japan to indicate changes to materials by suppliers without the knowledge of the manufactures.



Integrated Data Analysis Results for a Black Rubber Contaminant



Data Comparison Results for a PVC Examination Object and the Standard Product

The examples here show an integrated analysis of black rubber contaminant data acquired and a data comparison for a polyvinyl chloride (PVC) examination object and the standard product.

From the integrated data analysis results, it is evident that the black rubber contaminant is acrylonitrile-butadiene rubber (NBR), which contains calcium carbonate and zinc stearate.

In addition, from the data comparison, the degree of matching between the PVC examination object and the standard product is 0.8506. Lead (Pb) and acrylic were detected from the EDX and FTIR data, which were not detected in the standard product.

Accordingly, it is surmised that the examination object contains components different to those in the standard product.



Shimadzu Corporation

[www.shimadzu.com/an/](http://www.shimadzu.com/an/)

**For Research Use Only. Not for use in diagnostic procedures.**

This publication may contain references to products that are not available in your country. Please contact us to check the availability of these products in your country.

Company names, products/service names and logos used in this publication are trademarks and trade names of Shimadzu Corporation, its subsidiaries or its affiliates, whether or not they are used with trademark symbol "TM" or "®".

Third-party trademarks and trade names may be used in this publication to refer to either the entities or their products/services, whether or not they are used with trademark symbol "TM" or "®".

Shimadzu disclaims any proprietary interest in trademarks and trade names other than its own.

The contents of this publication are provided to you "as is" without warranty of any kind, and are subject to change without notice. Shimadzu does not assume any responsibility or liability for any damage, whether direct or indirect, relating to the use of this publication.