

# Neo Instruments Co

# INSIGHT

Coating thickness analyzer



Nanometer thickness measurement



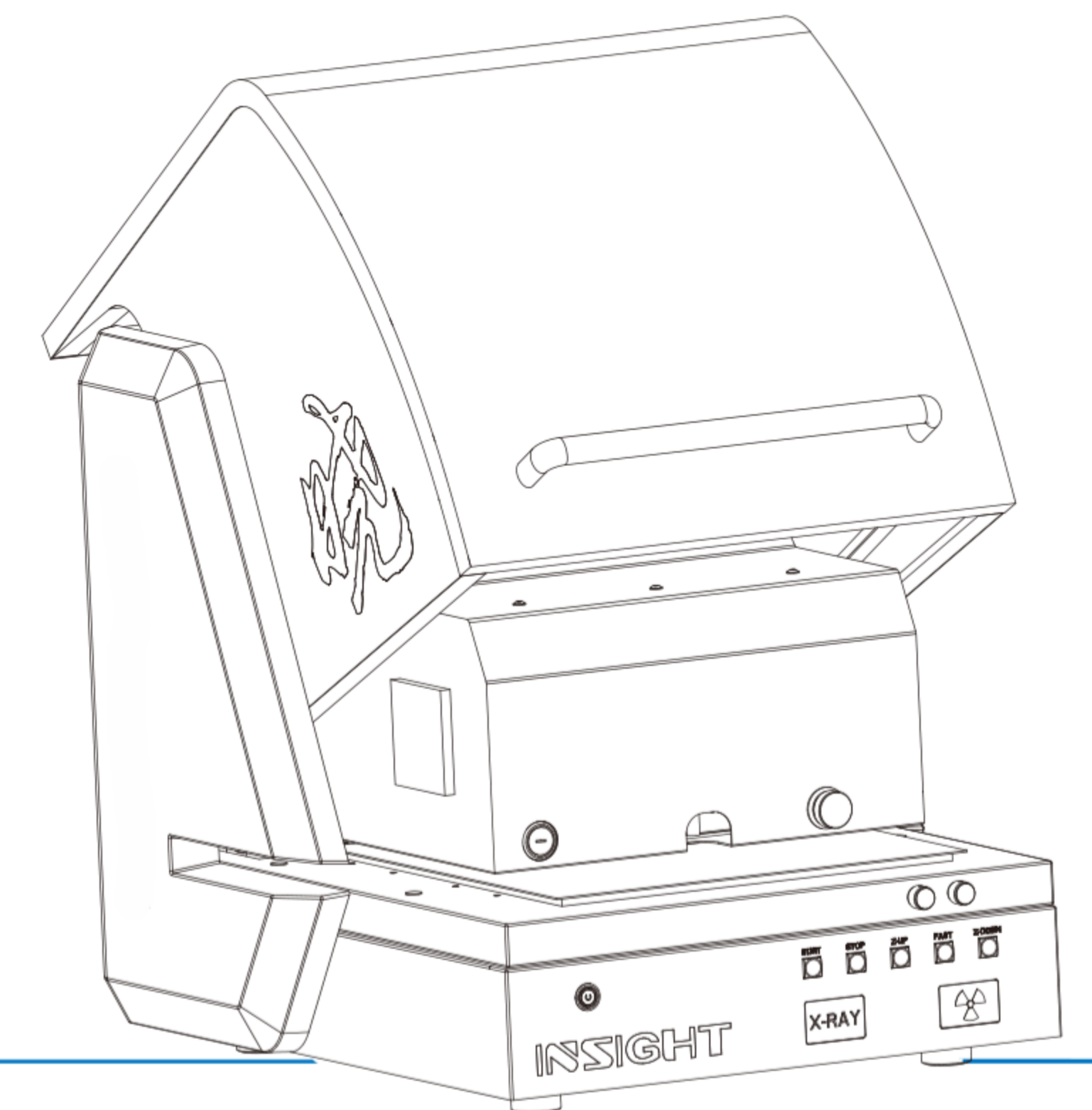
High-precision X-Y working platform



Multi-collimator



Helium system

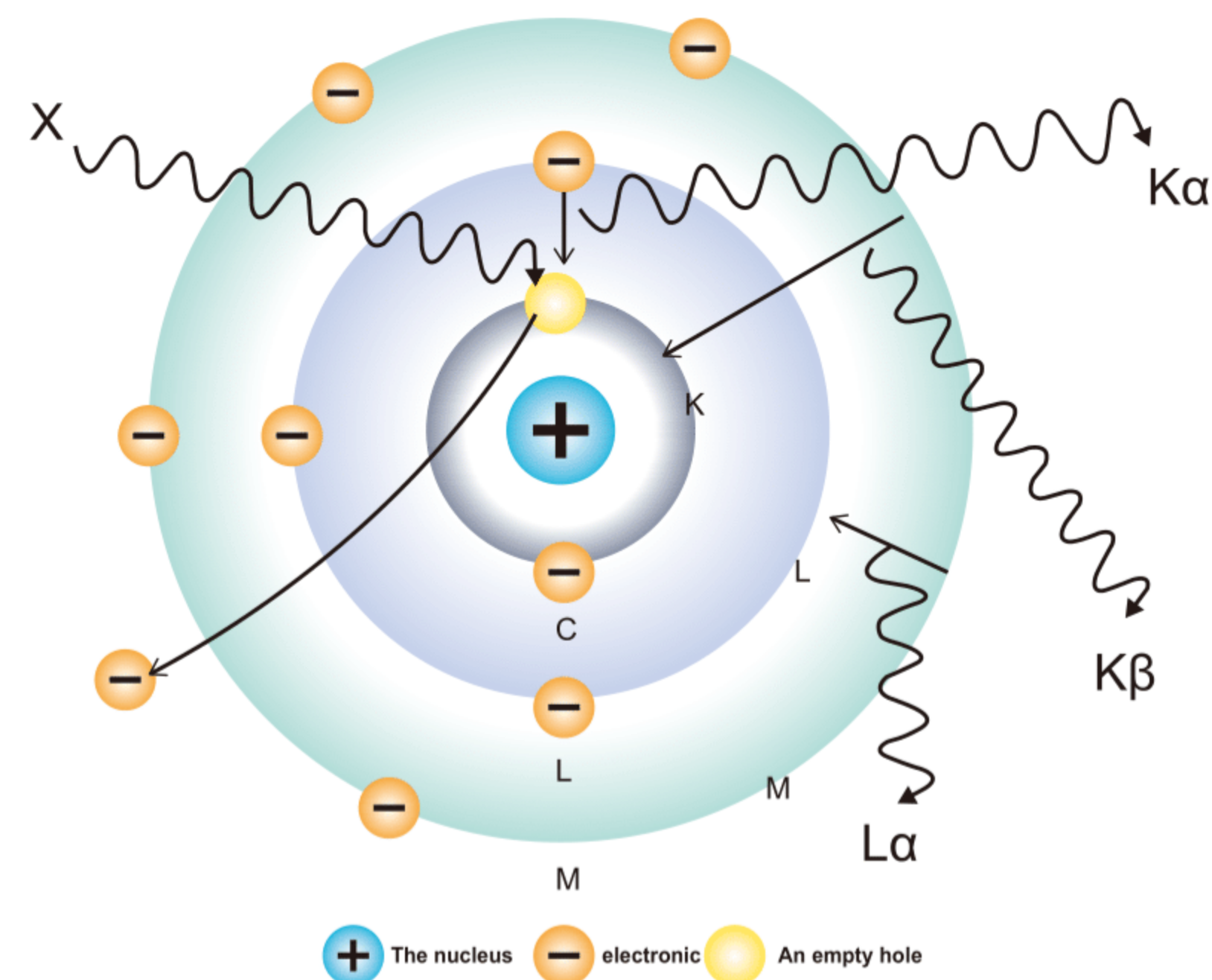


## Product introduction

INSIGHT coating analyzer is an Up irradiation design coating analyzer, with high sensitivity, nondestructive tests, simple operation, high precision, compact appearance, save space, not only can be used to uneven, irregular, and even small pieces of samples in the form of element analysis, can also used to measure the thickness of the coating and the coating system is, Realize rapid measurement and accurate analysis, widely used in all kinds of product quality control, incoming inspection and production process control links, to help customers reduce material costs, meet the corresponding industrial standards.

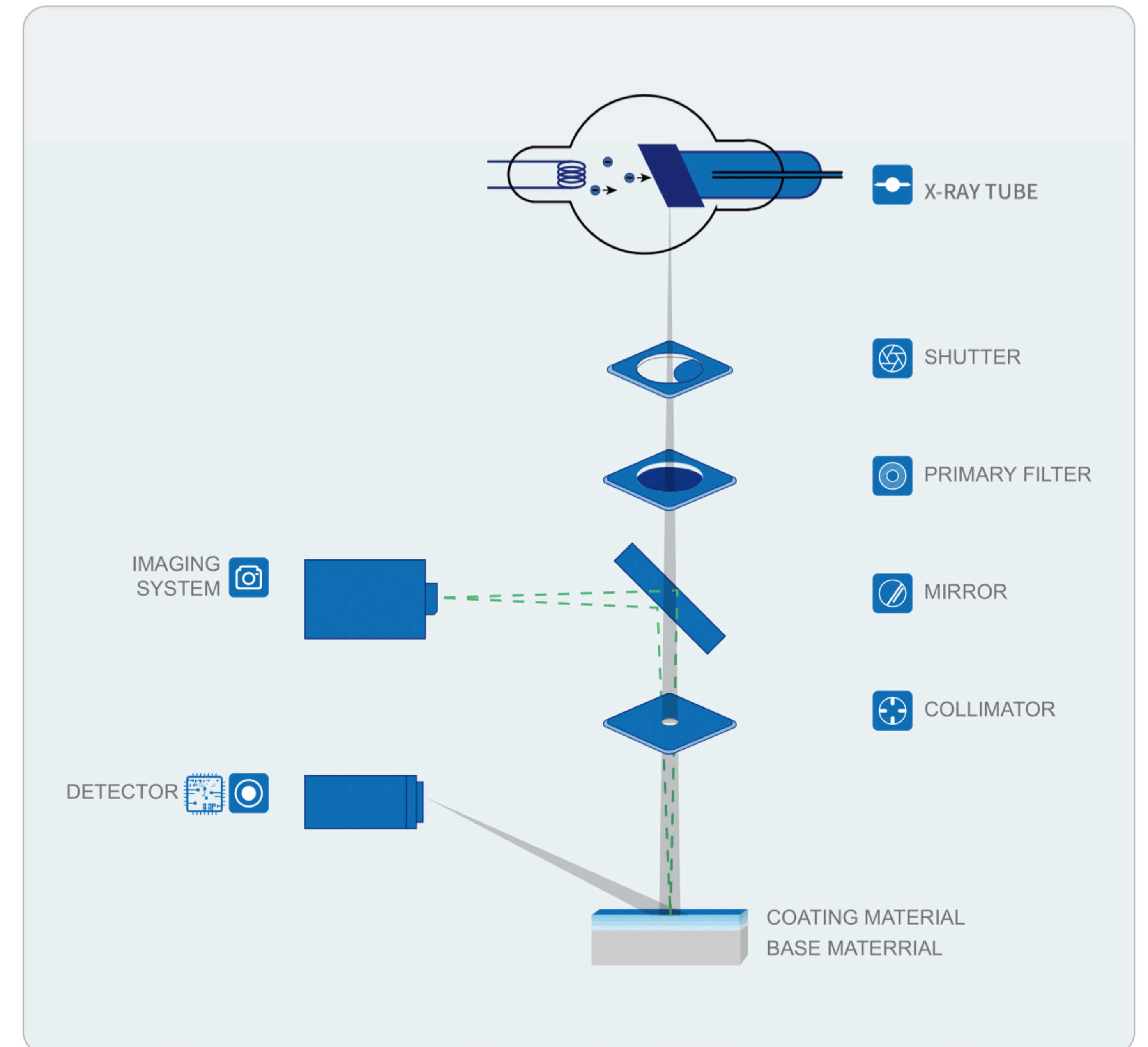
## Product feature

The sample is bombarded with X-rays, and the sample is excited to produce X-ray fluorescence, which usually punches the electrons in the inner layers of the K and L layers of the elemental atom layers out of the atoms, and the holes created are filled by high-energy outer electrons. High-energy electrons supplemented into low-energy orbits radiate excess energy in X-ray fluorescence. These radiated spectral lines contain the characteristics of various elements, like fingerprints, and are independent of the chemical valence state of the atom. The intensity of radiation is proportional to the concentration of this element in the sample.



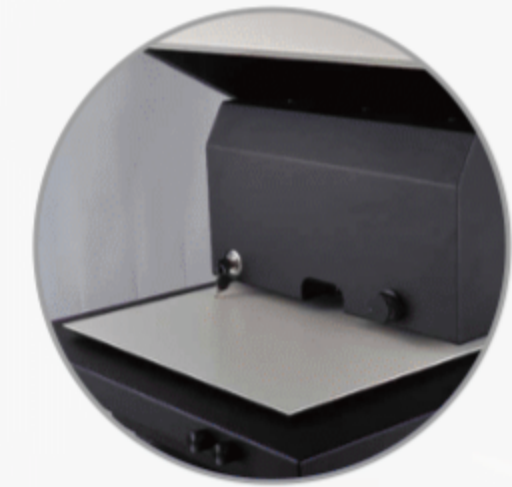
## Product Principle

INSIGHT coating analyzer using micro focus X-ray tube of the X-ray source to collect and gather into micro beam spot, irradiation in the position of the sample, so as to obtain good spatial resolution and strong fluorescent signal, through spectral probe and subsequent data processor, acquisition, processing and evaluate samples by the fluorescent signal after irradiation, Get the composition information of the sample. It enables rapid measurement and precise analysis for more complex applications, and is ideal for elemental analysis of unknown samples and microscopic objects that are inhomogeneous or irregular in shape.



# Product Configuration

## High-Performance Hardware Configuration



Sample Placement Table



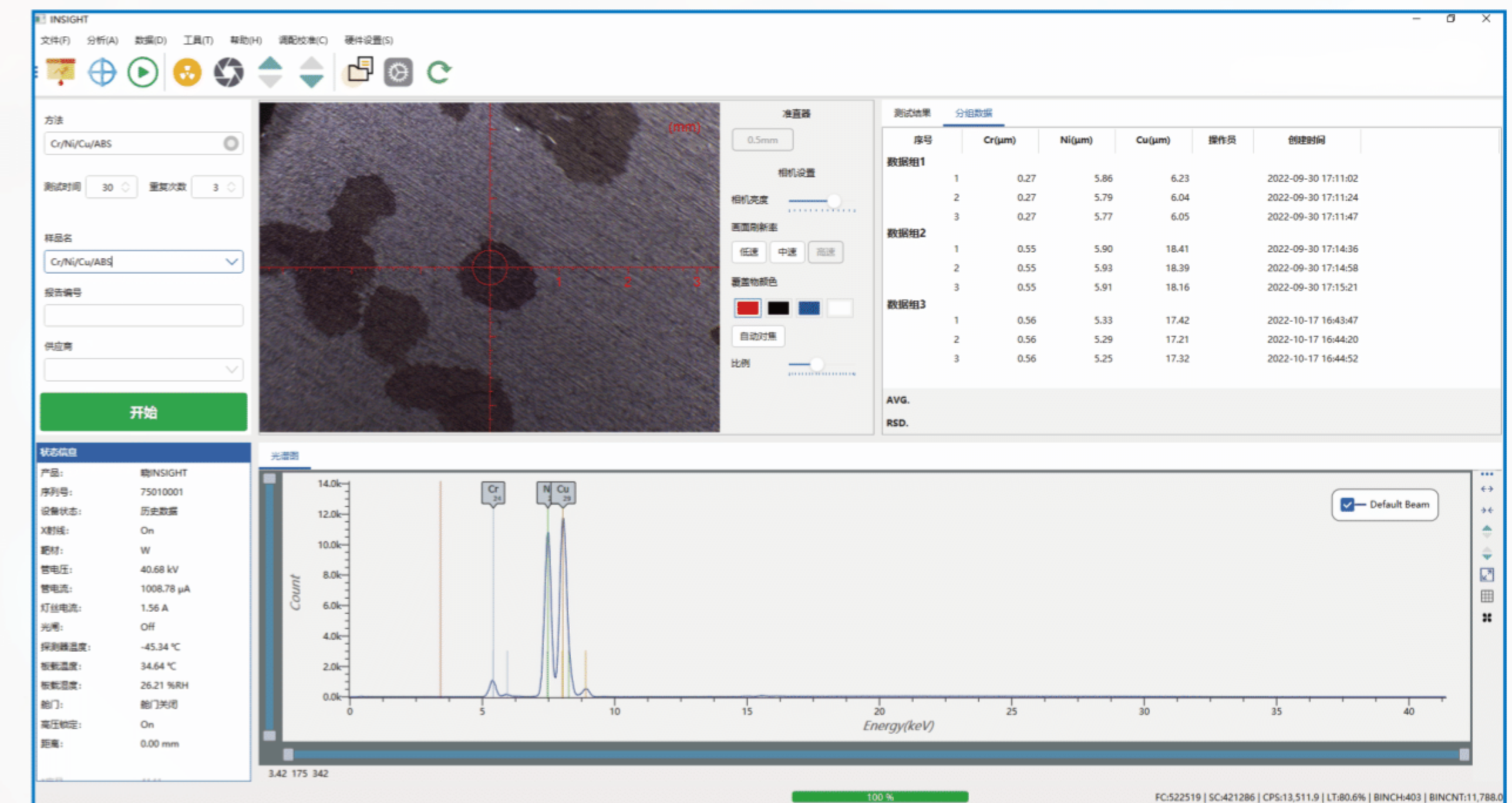
Perfect fuselage safety protection



High quality sandblasting oxidation paint surface technology

## Highly Intelligent Analysis Software

- 1 Intelligent operation, coating thickness measurement and analysis
- 2 An accurate and reliable method for quantification
- 3 Material species search
- 4 Measurement parameters adjustable (high pressure, filter, and collimation hole)
- 5 Automatic measurement, multiple excitations
- 6 A video image can be enlarged, contains crosshairs, and autofocus
- 7 Substrate material identification
- 8 Multi-form data output
- 9 Stores calibration results and Settings



## Performance Advantage



**Rapid analysis**  
Powerful and highly sensitive analysis assembly can measure coating thickness and composition in seconds.

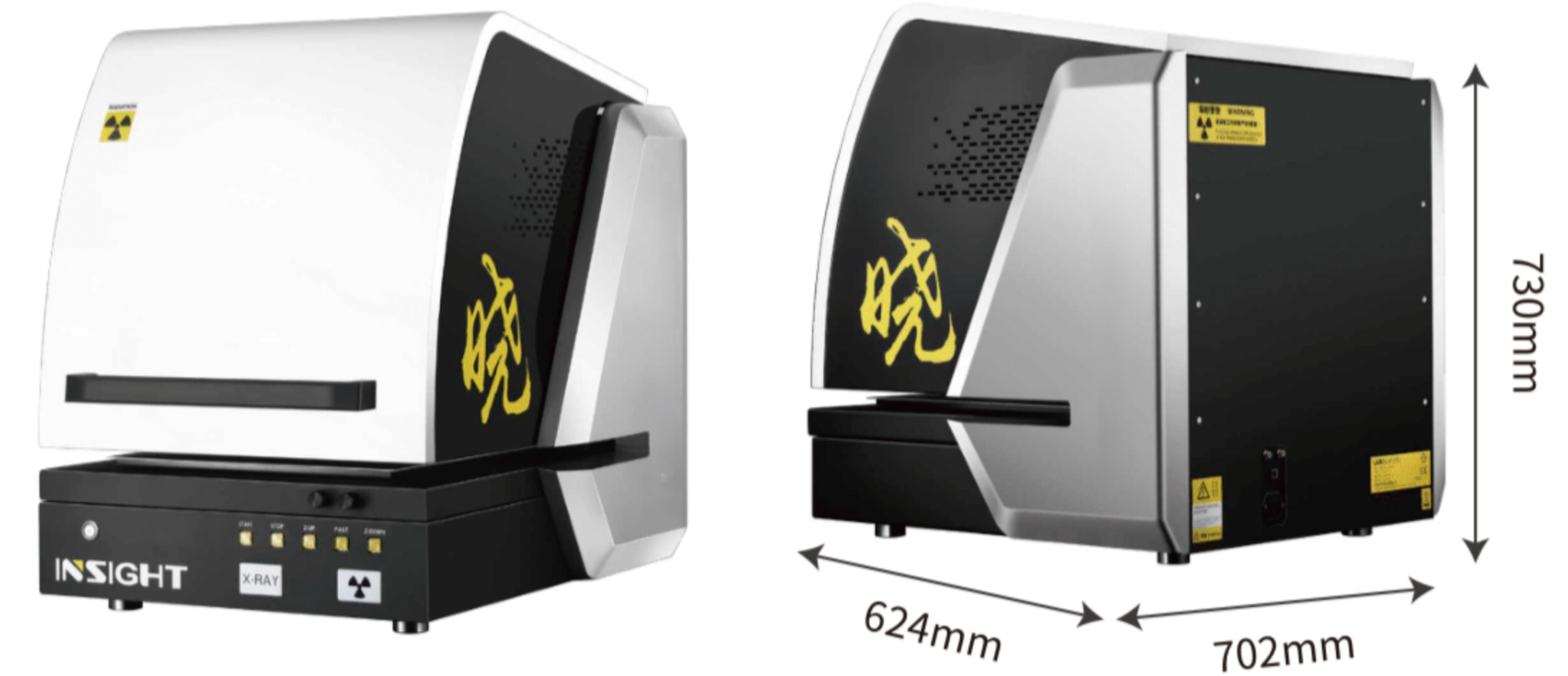
**Easy to operate**  
The instrument is tested with one key, easy to operate, the measuring door is convenient to open, the front of the instrument controls the face with a variety of functions, easy and convenient for daily use, anyone can operate and use through simple training.

**Improved production efficiency**  
The automated function of the instrument enables faster sample preparation and measurement, thus increasing the amount of analysis.

**Safety protection**  
The instrument has a professional multi-protection radiation treatment, the measurement system is developed from the perspective of eliminating the harm to the operator and the environment, to ensure that the X rays are strictly limited to the internal and external cover design of the instrument, to ensure that harmful rays will not leak out of the instrument during measurement without any radiation leakage.

**Large measuring chamber**  
the slotted design of the instrument shell (C-groove) makes the measuring space wide and the sample placement convenient. It can measure large and flat items such as printed circuit boards, and it can also place large samples with complex shapes.

## Technical Parameters



project	parameter
The characteristics of	Top-down measurement structure, XYZ measurement platform, MUTI-FP multilayer algorithm
Scope of element	Na(11)-Fm(100)
Analysis of the layer number of	5 layers (4 layers + substrate) each layer can analyze 10 elements, composition analysis can analyze up to 25 elements
X-ray tube	50 W (50 kv, 1mA) micro-focused tungsten palladium ray tube (target material is optional)
The detector	Si-Pin Detector/High Sensitivity Large Area SDD Detector(Optional)
collimator	Multiple collimators are optional, and multiple collimators can be combined
The camera	High resolution CMOS color camera, 5 megapixels
magnification	40x-160x
Manual sample XY platform	Moving range: 100 x 150 mm
Programmable XY platform	(Optional)
Z-axis range of movement	150 mm
Sample bin size	564×540×150mm
Overall dimensions	664×761×757mm
The weight of the	120kg
The power supply	AC 220V±5V 50Hz(The configuration varies slightly by region)
Rated power	150W

## Ironware and Bathroom Application Plant

The coating process is widely used in ironware products. The development of science and technology and modern industry has made the quality standards and control of ironware products more and more strict, and further standardized the development and quality control of coating technology. At our present market, the coatings on the metal surface of the ironware industry are mainly divided into three categories: protective coatings, protective-decorative coatings, and functional coatings.

The content of quality inspection of different coating products varies depending on the part and coating, but the appearance, thickness, corrosion resistance and bonding force with the base metal of the coating are the contents that must be checked. Among them, the thickness of the coating is the most important guarantee factor for the quality of the plated parts. INSIGHT is suitable for single-layer and multi-layer thickness and composition detection of ironware products of various shapes, and is widely used in quality control, incoming material inspection and production process control of various products.

Recommended models: INSIGHT 200

## Product Introduction



## Application Case

With the rapid development of the industry, the application of plastic electroplating is becoming more and more extensive, and it has become one of the important means of surface decoration in plastic products. There are many factors affecting the quality of plastic electroplating, and its electroplating process, operation and plastic process will have a greater impact on the quality of plastic electroplating. INSIGHT is an ideal tool for plastic electroplating analysis with its advantages of non-destructive testing, fast analysis speed and high precision.

The following picture shows the test report of plastic copper-nickel-chromium plating. It can be seen intuitively that Xiao INSIGHT can well solve the problems caused by the inability of the copper layer to be tested due to the excessively thick nickel layer and the problems caused by the penetration of the backside coating of thin copper-nickel samples.

Test results			
Sample:Cr/Ni/Cu/ABS		Testing Time:30S	
Test Value	Cr(μm)	Ni(μm)	Cu(μm)
NO.1	0.507	4.850	12.580
NO.2	0.518	4.890	12.630
NO.3	0.520	4.923	12.700
NO.4	0.530	4.932	12.750
NO.5	0.544	4.907	12.700
NO.6	0.537	4.827	12.800
NO.7	0.570	5.135	12.490
NO.8	0.568	5.020	12.480
NO.9	0.550	4.895	12.560
NO.10	0.560	4.920	12.680
Standard thickness	0.520	5.100	12.200
Average	0.540	4.930	12.637
standard deviation	0.022	0.089	0.108
Relative Standard Deviation	4.036%	1.797%	0.853%
Maximum Value	0.570	5.135	12.800
Minimum Value	0.507	4.827	12.480
Max-Min	0.063	0.308	0.320

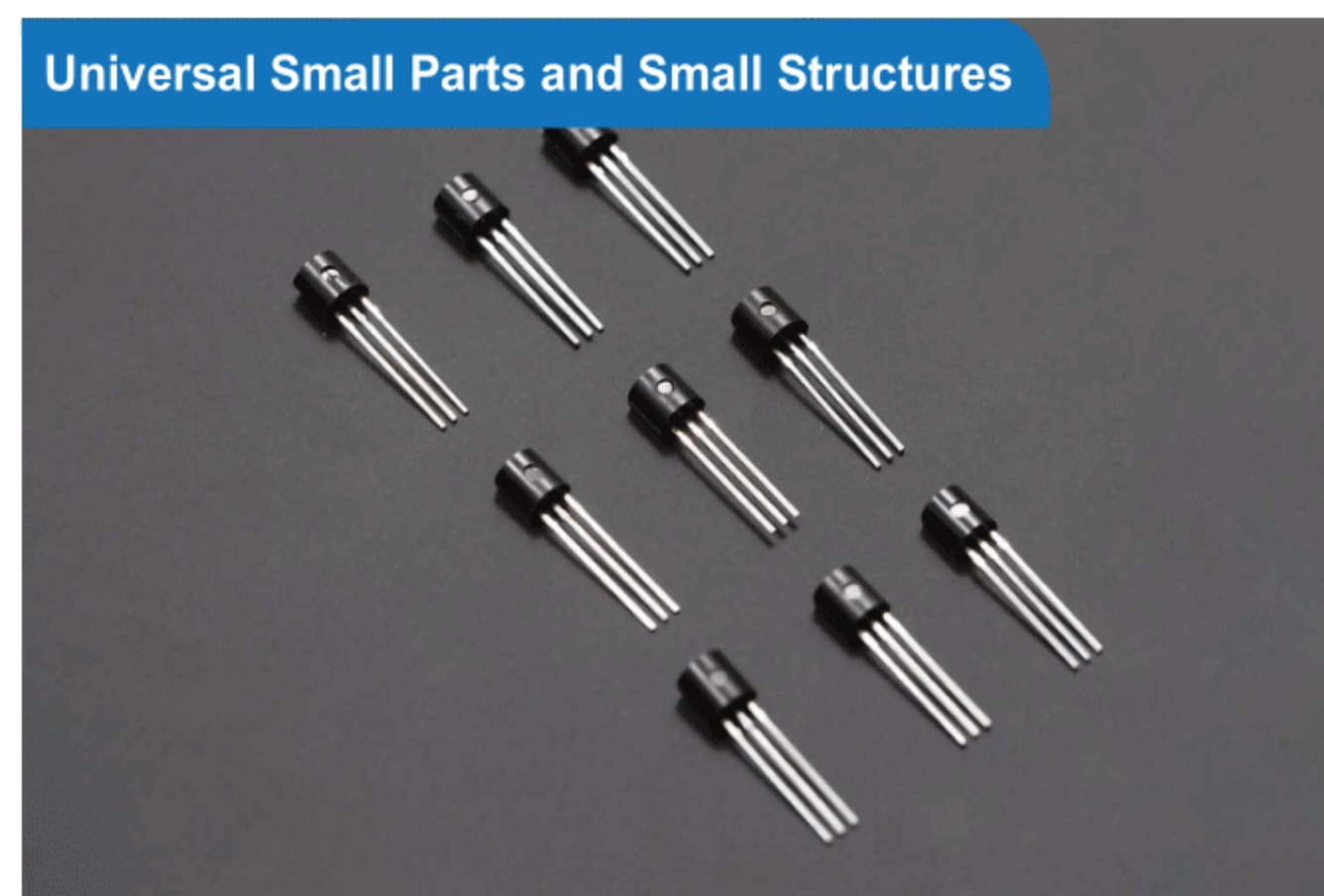
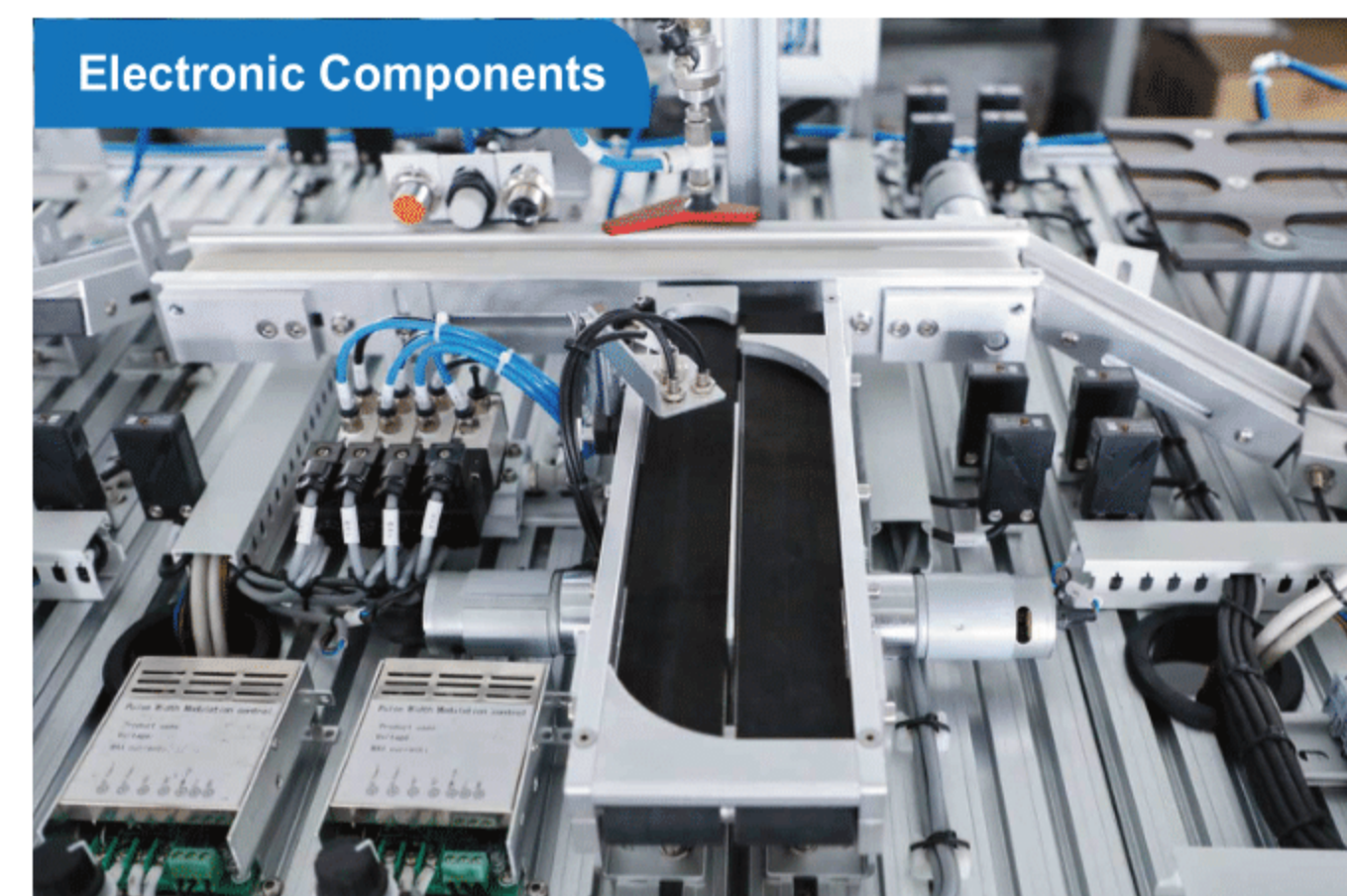
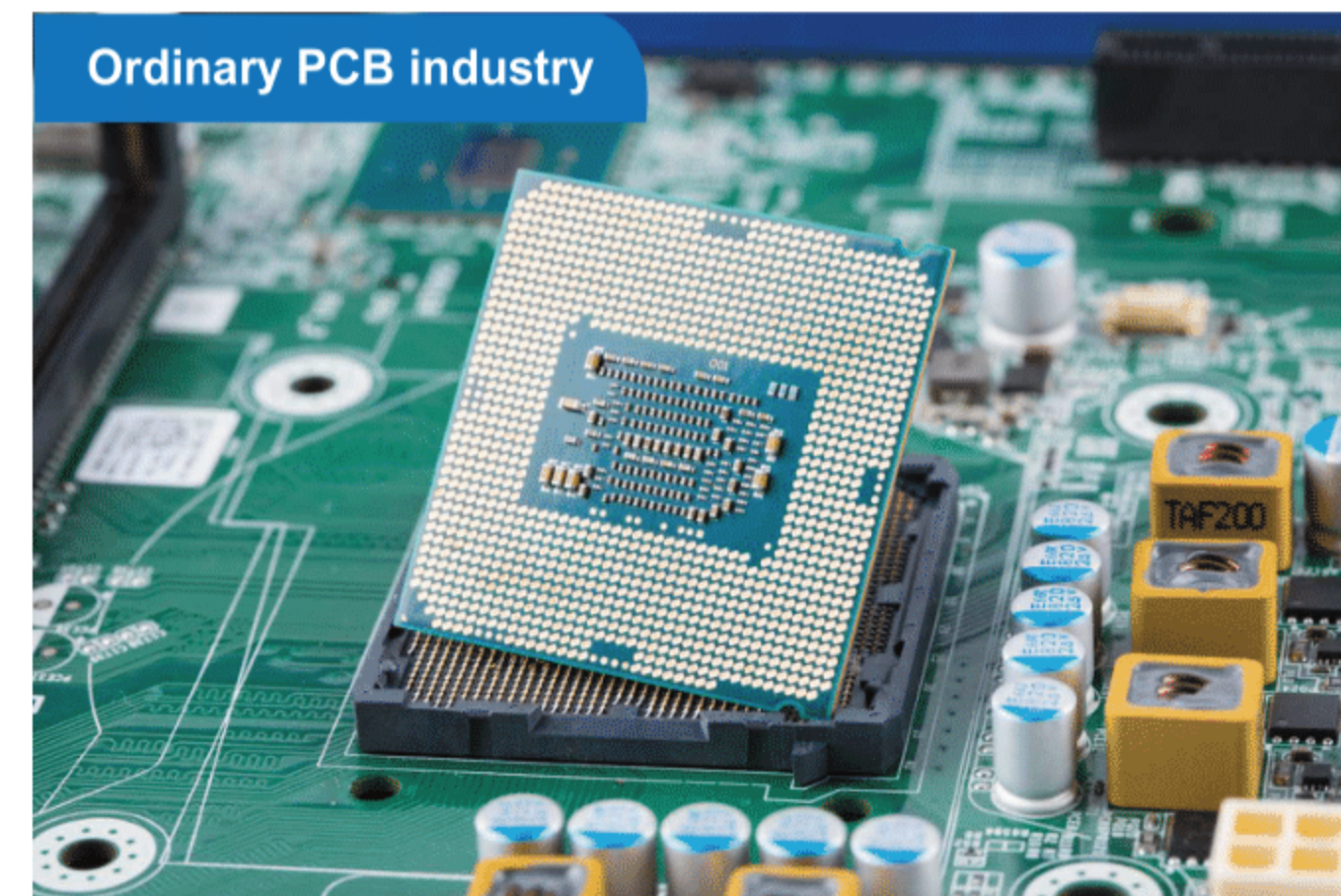
## Universal components

With the rapid development of science and technology, parts in various industries tend to be miniaturized. As an important surface treatment method for small parts, coating process is divided into rack plating, barrel plating, continuous plating and brush plating.

INSIGHT is widely used for elemental analysis and thickness detection of samples with conventional and complex coating structures, especially for samples with uneven, irregular, and even small shapes, ensuring customers obtain reliable and repeatable results to meet hundreds of Applications, including: jewelry, small parts, connector plating, general circuit boards and so on.

**Recommended models:** INSIGHT 300/INSIGHT 330/INSIGHT 360

## Application Field



## Application Case

With the continuous advancement of technology, the market demand for communication equipment, electronic wearable devices, and the increasing dependence on electronic products in the automotive and other industries are driving the rapid growth of the circuit board market.

The quality control of the internal PCB is also becoming more and more strict, and the development and upgrading of the PCB surface treatment technology is becoming more and more urgent. INSIGHT can provide you with efficient and intelligent XRF analysis methods to meet the requirements of industrial specifications such as IPC-4552B, IPC-4556, IPC-4554, and IPC-4553A. On-site testing using Ni-P/Cu samples, and the graph below shows the measurement results, which demonstrate the excellent performance and excellent stability and consistency of INSIGHT.

Test results			
Name of Sample: Ni-P/Cu		Testing Time: 30S	
Test Value	Ni-P (μm)	Ni(%)	P(%)
NO.1	6.532	92.239	7.761
NO.2	6.525	92.231	7.769
NO.3	6.538	92.264	7.736
NO.4	6.560	92.255	7.745
NO.5	6.490	92.326	7.674
NO.6	6.541	92.239	7.761
NO.7	6.600	92.231	7.769
NO.8	6.545	92.248	7.752
NO.9	6.498	92.326	7.674
NO.10	6.489	92.278	7.722
Average	6.532	92.264	7.736
standard deviation	0.034	0.036	0.036
Relative Standard Deviation	0.52%	0.04%	0.47%
Maximum Value	6.600	92.326	7.769
Minimum Value	6.489	92.231	7.674
Max-Min	0.111	0.095	0.095

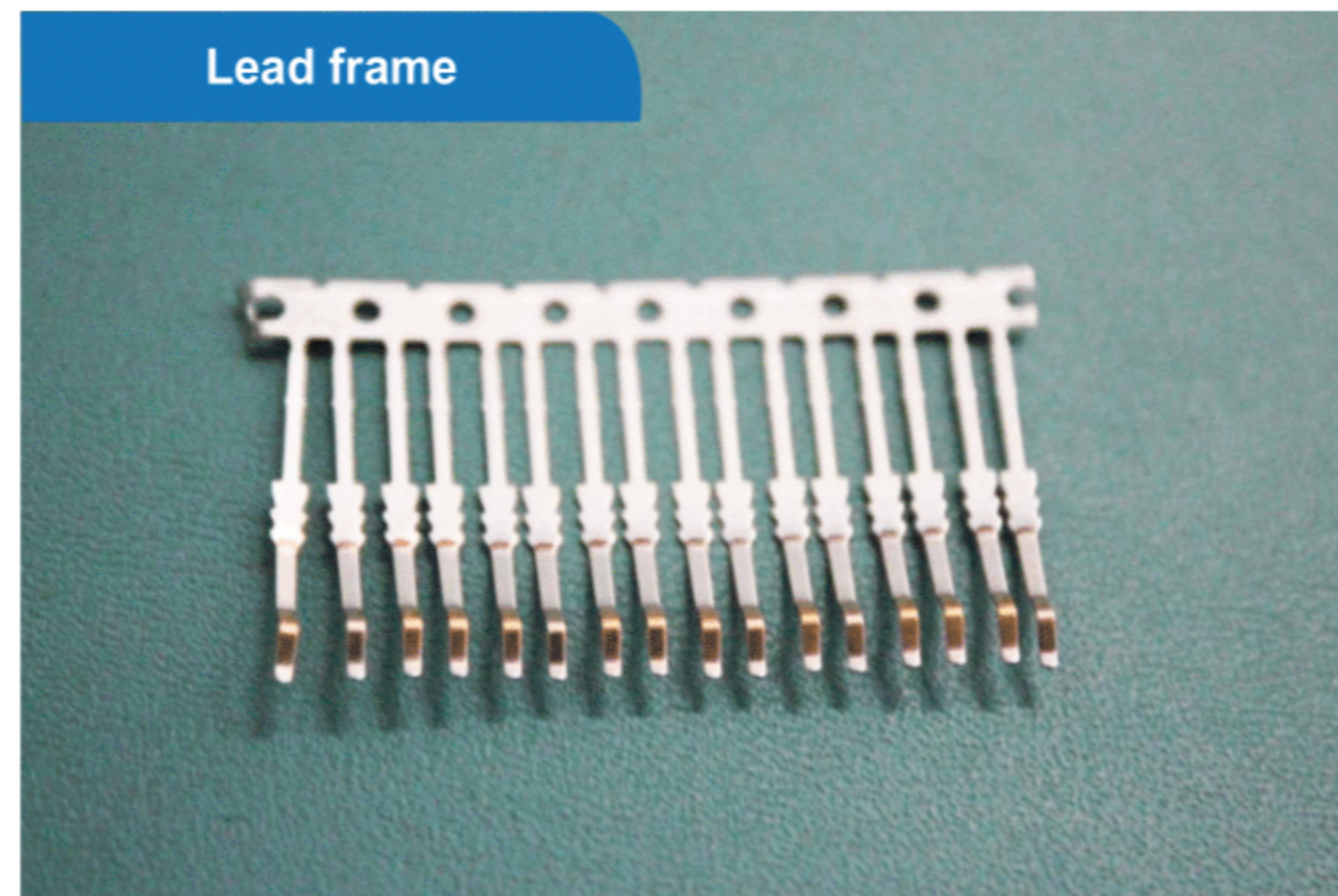
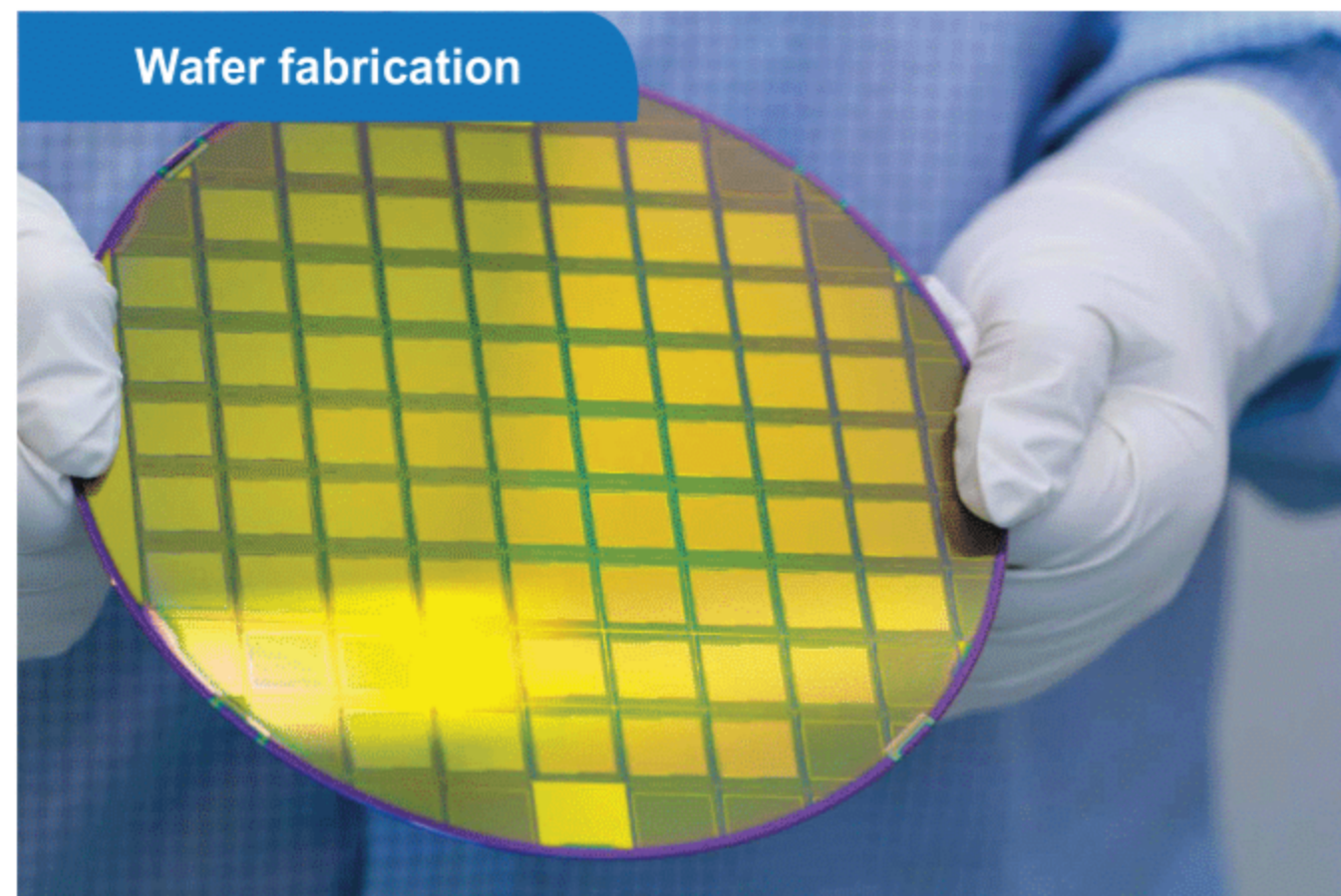
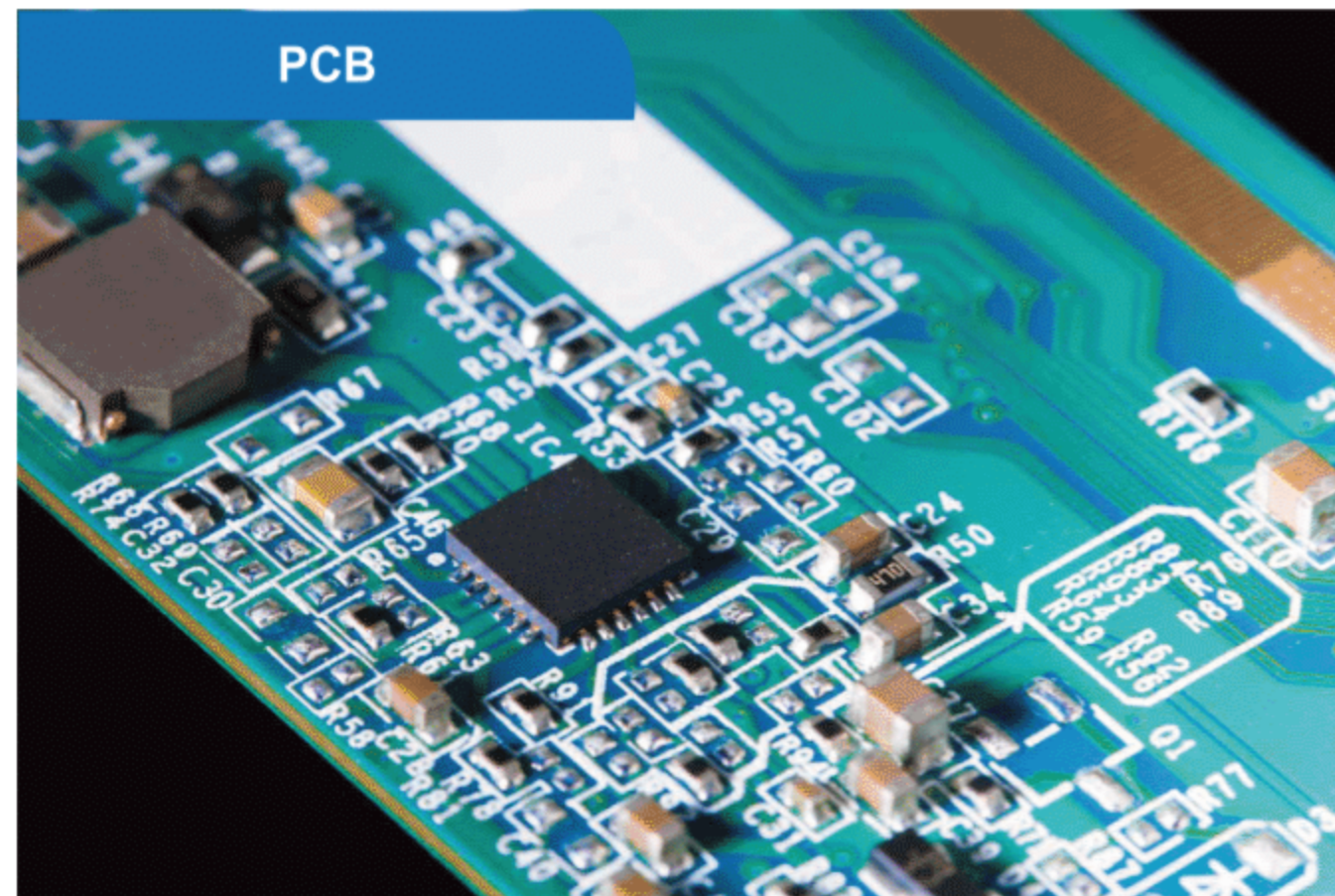
## PCB, wafer field

The market's increasing reliance on electronic products in communication electronics, aerospace, computer, automotive and other industries is driving the rapid growth of the electronics industry, which is constantly innovating to meet higher expectations, while the quality control of products is also increasingly stricter.

As the main process to ensure the reliability and stability of product quality in the electronic industry, the thickness of the coating is the most important guarantee factor for product quality. Therefore, the quality control/guarantee of the thickness of the coating is very important. Xiao INSIGHT has become a widely used coating thickness and composition measurement technology because of its non-destructive, fast measurement, and ease of use. It's easy to operate, flexible to configure, and can easily handle ultra-thin coating challenges!

**Recommended models:INSIGHT 500/INSIGHT 530/INSIGHT 560/INSIGHT μ-Spot**

## Application Field



## Application Case

Connectors are indispensable in the development of modern electronic materials, and different shapes (eg, straight pin, Z-shaped geometry) and sizes of connectors may present different challenges for analysis. INSIGHT can help many PCB, semiconductor and other electronics related industries effectively improve productivity and ensure compliance to specifications to avoid the risk of poor performance and costs associated with scrap or rework.

The following are the results of repeated testing of this connector sample using Xiao INSIGHT, which showed excellent detection accuracy and stability.

Test results				
Testing Sample:Sn/Ni/Cu Zn Testing Time:30S				
Number	Cu (%)	Zn(%)	Ni(μm)	Sn(μm)
NO.1	67.544	32.456	1.320	3.070
NO.2	68.030	31.970	1.280	3.060
NO.3	67.572	32.428	1.320	3.110
NO.4	67.718	32.282	1.280	3.000
NO.5	67.991	32.009	1.290	3.120
NO.6	67.517	32.483	1.310	3.050
NO.7	67.725	32.275	1.290	3.070
NO.8	68.011	31.989	1.310	3.040
NO.9	67.463	32.537	1.350	3.120
NO.10	67.689	32.311	1.310	3.040
Average	67.726	32.274	1.306	3.068
standard deviation	0.215	0.215	0.022	0.037
Relative Standard Deviation	0.317%	0.665%	1.662%	1.209%
Maximum Value	68.030	32.537	1.350	3.120
Minimum Value	67.463	31.970	1.280	3.000
Max-Min	0.567	0.567	0.070	0.120