



## Winner 2000ZDE Intelligent Laser Particle Size Analyzer



### 1. Overview:

Winner2000ZDE intelligent laser particle size analyzer, perform auto test, auto alignment, auto water supply, auto drainage, auto bubble removing, auto ultrasonic dispersion, auto cleaning etc., really realize one-key operation. It adopt full built-in sampling system, effectively prevents large particles sedimentation problems in the circulation pipeline, ensure good accuracy. It adopts comprehensive Laser diffraction particle size measurement principle with highly sensitive ring photoelectric detector improving the test accuracy greatly, Original designed unconstrained free fitting software technology, a true reflection of the particle size distribution, to ensure truth and accuracy of the test results. Therefore especially suits the laboratories of enterprises, colleges and universities and research institutes to use.

## 2. Main Specifications:

Model Name		Winner2000ZDE
Standard		ISO13320-1:1999, GB/T19077.1-2008, Q/JWN001-2009
Principle		MIE scattering principle
Measuring Range		0.1 $\mu$ m-300 $\mu$ m
Channels Number		39 PCS
Accuracy error		<0.5% ( CRM D50 )
Repeatability error		<0.5% ( CRM D50 )
Light source		High performance He-Ne Laser ( $\lambda$ = 632.8nm, P>2MW) Lifetime>25000hour
Dispersion Method	Ultrasonic	Frequency:40KHz Power:50W, Time: $\geq$ 1S
	Stir	Revolutions Speed: 0-3000RPM (Adjustable)
	Circulate	Rated Flow:8L/min Rated Power:10W
	Sample Pool	Volume:350mL
	Micro-Sample Pool	Volume: 10mL ( Available)
Operation Mode		Full automatic and manual control, freely choose
Output parameter		D10,D50,D90,D100,S/V referent parameters
Optical System	Calibration	Full automatic
Test Speed		<2mins for each time
Volume		L88cm $\times$ W39cm $\times$ H46cm
Net Weight		41Kg

## 2. Main Features:

### 1,Advanced design of light path:

A patented technique of Fourier transform of converging light released the scattered light at large-scattering-angles from the restriction of the aperture of the Fourier lens. The focal length is reduced to enhance the resolution of the instrument, and ring shaped of multi-element silicon photo-diode ensure gathering all the light signals of particles, highly improve the resolution.

### 2,Built-in dispersion units:

We carefully aligned the stirring set-up, the ultrasonic dispersing unit and the sample circulation pipes, and fixed them inside the instrument. Such a built-in design effectively prevents the inhomogeneous dispersion and sedimentation of big particles, which can be observed in the designs that these dispersing units are separated from the instruments, where the sample circulation pipes are therefore too long, The sample will be sufficiently dispersed.

### 3,Unconstrained fitting techniques:

The particle analysis software uses a unique unconstrained data fitting technique that we developed to obtain data of real particle size distribution, this is particularly important for researchers.

### 4,Micro sample chamber (optional):

The capacity of the sample chamber is as small as only 10ml. This helps with measuring expensive/precious samples, or samples difficult to be dispersed within medium.

### 5,Modern measurement control:(Intelligent SOP Operation)

Users can perform all measurement procedures by simply operating on the PC and have ideal results in a very short time.

### 6,User-friendly Operation:

manual mode and the automatic mode, freely choose, to measure according to the sample features. In some conditions (e.g. the sample have unknown features or there are special requirements for the measurements), users can make a test measurement in the manual mode first, and after having an idea of the sample features and the measurement conditions, measure the samples in the automatic mode.

### 7,Fully automatic light path alignment:

A precise four phase hybrid stepping motor automatically aligns the optical path and can adjust it at any moment, precision is up to 0.1um, This releases users from manual adjusting the optical path and improved accuracy and stability of the measurement results.

### 8,Quick measurements:

set " automatic" mode, all operation procedures are performed automatically,automatic water supply, automatic ultrasonic sample, stirring, circulation,background testing, sample testing,analysis , draining and cleaning, which significantly reduces the time for measurements, the full process only take 2 minutes.

### 9,Data analysis:

Errors in the data are rejected and the measurement results are automatically processed. Manual data processing is not necessary and the output is more standard.

## **3. Software Function**

### 1, Analysis Mode

Free Distribution, R-R Distribution, Logarithm Normal Distribution, Mesh number classification etc. meet different demands of particle size statistic in different industries.

### 2,Statistic Method

Volume Distribution, Quantity Distribution

### 3,Statistic Comparison

Statistic Several Testing Results to compare and analyze

Get difference by compare test result of different batches of samples, samples before and after processing, and different time.

Have great practical significance to industrial raw materials quality control

### 4,User-defined Analysis

Figure out percentage according to the particle size

Figure out particle size according to the percentage

Figure out percentage according to the particle size range

Meet demands of representation of particle test in different industries.

### 5,Test Report

Word, Excel,Photo( Bmp), Text etc.

### 6,Multiple language Support

Chinese&English (Others are available)

### 7,Intelligent Operation Mode

Automatically control water inflow, dispersion, test and analysis.

Better Repeatability after remove human-factor

## **4. Laser Particle Size Analyzer Application Field:**

1.Non-metallic powders such as calcium carbonate, talcum powder, kaolin, zirconium silicate, wollastonite, graphite, silica powder, tourmaline, mica, barite, plaster, bentonite, diamond, quartz, diatomite, feldspar, calamite,clay, garnet, vermiculite, Titanium white power, etc.

2. Metallic powder such as aluminum powder, iron powder, magnesium powder, molybdenum powder, copper powder, zinc powder, other rare metal power and varied alloy powder, etc.

3. Pharmaceutical, agricultural pesticide, grinding particle, foodstuff, scientific research, teaching, cement, ceramic, glass, chemical industry, military industry, soil, toner,pigment, oil exploration, geological analysis, river silt and electronic particle, etc.

## **5. Winner2000ZDE Laser Particle Size Analyzer Patents Technology:**

- Optical bench design is protected by patent No.- ZL 2014 2 0378380.8,
- Three dimensional-optical bench alignment system is protected by patent No.- ZL 2013

2 0835882.4.

- MIE scattering principle application patent is protected by patent No.- ZL 2013 2 0812021.4.
- Wet circulation installation is protected by patent No.-ZL2010 2 0593526.2.

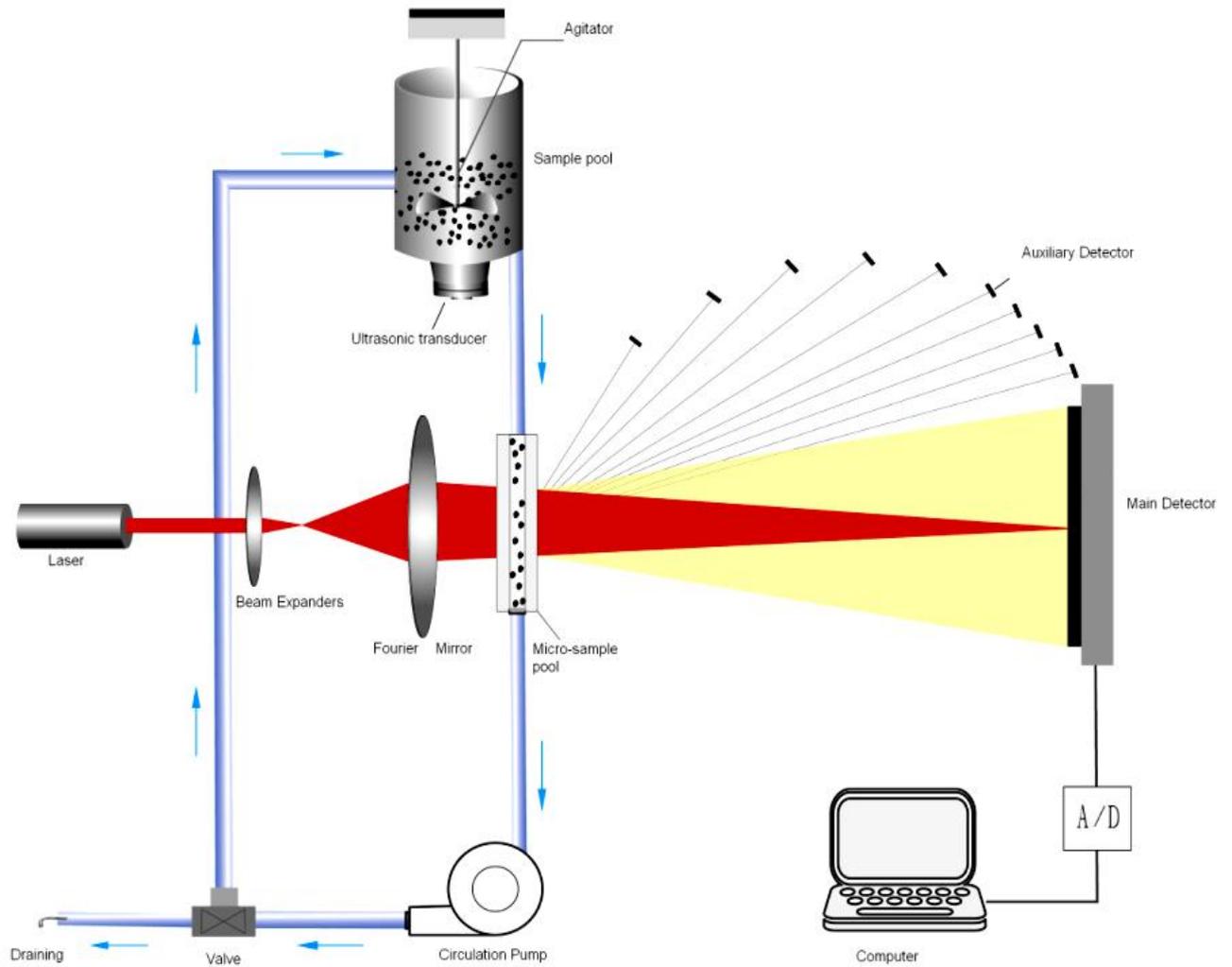


Figure-Working theory

## 6. Test Report



Jinan Winner 济南微纳

# Laser Particle Sizer Testing Report Winner2000ZDE

Test Range:0.1-300 μm

Printing Time:2017/3/3 10:36:57

### Sample Information

Sample Name:AL203 Delivery Co.: Delivery Date:2015-11-3  
Refractive Index:1.77-i\*0.100 Sample Density:2.4g/cm<sup>3</sup>

### Testing Information

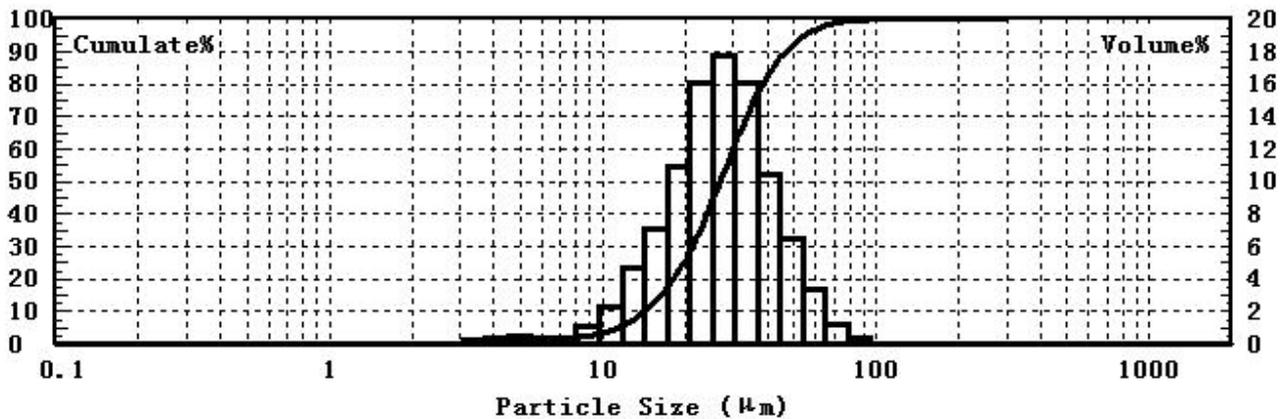
UltraSonic Time:120s Measuring Co.:JNWN  
Dispersed Phase:Water Measuring Man:002  
Dispersant: Measuring Time:2015/11/3 13:59:33

### Analyse Result (Analyse-Mode:Independent Statistics-Mode: By Volume)

D10=14.157 μm Dav=28.869 μm D[3,2]=22.559 μm  
D50=26.897 μm S/V=2659.643 cm<sup>2</sup>/cm<sup>3</sup> D[4,3]=28.869 μm  
D90=46.791 μm S/g=1108.185 cm<sup>2</sup>/g Fit Error:0.005  
Optics Concentration:8.1

### Custom Analyse Result

D97=60.653 μm D100=97.797 μm <2 μm:0.000% <5 μm:0.928%



Size (μm)	Volume%	Cumulate%	Size (μm)	Volume%	Cumulate%	Size (μm)	Volume%	Cumulate%
0.121	0.000	0.000	1.745	0.000	0.000	25.169	16.087	44.187
0.146	0.000	0.000	2.112	0.000	0.000	30.455	17.779	61.967
0.177	0.000	0.000	2.555	0.000	0.000	36.851	16.047	78.014
0.214	0.000	0.000	3.092	0.000	0.000	44.590	10.453	88.466
0.259	0.000	0.000	3.741	0.271	0.271	53.954	6.524	94.991
0.314	0.000	0.000	4.527	0.408	0.679	65.285	3.399	98.389
0.380	0.000	0.000	5.477	0.500	1.179	78.995	1.276	99.665
0.460	0.000	0.000	6.627	0.430	1.609	95.585	0.335	100.000
0.556	0.000	0.000	8.019	0.422	2.031	115.659	0.000	100.000
0.673	0.000	0.000	9.703	1.100	3.131	139.948	0.000	100.000
0.814	0.000	0.000	11.741	2.247	5.378	169.338	0.000	100.000
0.985	0.000	0.000	14.207	4.688	10.065	204.901	0.000	100.000
1.192	0.000	0.000	17.191	7.052	17.117	247.932	0.000	100.000
1.442	0.000	0.000	20.801	10.983	28.100	300.000	0.000	100.000

### Contact us

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## Report Interpretation

- 1)  $D_{10}=X$ , means  $\leq X$  particle size's particle volume content occupy 10% of all the particles.
- 2)  $D_{50}=Y$ , means  $\leq Y$  particle size's particle volume content occupy 50% of all the particles.
- 3)  $D_{90}=Z$ , means  $\leq Z$  particle size's particle volume content occupy 90% of all the particles.
- 4) DAV: Average particle size of particles group
- 5) S/V: Specific surface area, surface to volume ratio/ Surface area per unit volume
- 6)  $D[3,2]$  Weighted average surface area
- 7)  $D[4,3]$  Volume weighted average
- 8) Particle Size Analysis Chart illustration:
  - ✓ The transverse is the particle size value, and the value is logarithmic distribution.
  - ✓ The left column is the volume of the cumulative percentage, the corresponding curve is upward trend.
  - ✓ The right column is the percentage of the volume of a certain interval, corresponding to the histogram or undulating curve.
  - ✓ The data list is corresponding to the test result of analysis chart.

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