



Measure Particle size after Millipore test-Vardhan SPM09

Foundries & machine shops manufacturing high quality castings for export market are required to measure degree of cleanliness after completion of the cleaning process. Degree of cleanliness is usually specified by the buyer. One or two castings out of a batch of 100 are used for the analysis. The casting is sprayed with a solvent. The solvent is allowed to drip through the casting's inner bores & is collected together with dissolved impurities. The solvent is then passed through a filter paper, after drying, the filter paper with the impurities is placed on the stage of the microscope for determining particle size.

By Software Method Vardhan SPM09 Microscope is interfaced with the computer & the images can be directly observed on the computer monitor with outstanding clarity & saved as traceable records. Particle size is then measured by a user friendly software. Image can be seen simultaneously in the eyepiece.

By Manual method The eyepieces of Vardhan SPM09 particle size measuring microscope are provided with a built in cross wire reticule. The large size mechanical stage is equipped with Digital micrometers on both X & Y axis to manually measure the length, width of the particles.

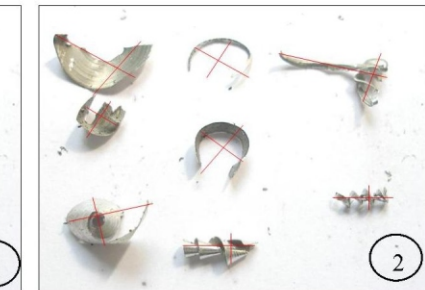
Microscope SPM09



Common C type chips & loops



By imaginary rectangle Method



By long axis & cross section method



By software (pixel area calculation)



By curvilinear method

By long axis & circle method



Method 1 - By calculating area of an imaginary rectangle around the particle.

Method 2 - By measuring long axis & widest cross section of the particle.

Method 3 - By calculating area by measuring long axis & forming a sphere.

Method 4 - By Measuring the curvilinear length of a particle.

Method 5 - By Software which extracts the image & measures the area in terms of pixels.



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Specifications SPM09 Microscope

Base	Box type 290x200x90 (LxBxH)
Focusing	Coarse by Rack & Penion Fine by knob graduated to 0.02 mm
Nose Piece	Revolving, mounts three Objectives
Illumination	From Bottom by 6V halogen lamp From Side by Two high power LED
Mech.Stage	Size 150 mm x 150 mm X & Y axis movement 25mm
Micrometers	Digital LC 0.001 mm mode Digital LC 0.001 inches mode
Power supply	Input 220 V A/C. Out put 12V DC for Camera 4.5V DC for LED
Eyepieces	5x & 10x Cross wire, 15x WF
Objectives	4x, 10x, 20x & 40x Achromats
Magnification	20 to 600 in stages (Refer table)
Size	290 x 200 x 450 (LxBxH) mm

Magnification Table		
Eyepiece	Objective	Magnification
5x	4x	20x
5x	10x	50x
5x	20x	100x
5x	40x	200x
10x	4x	40x
10x	10x	100x
10x	20x	200x
10x	40x	400x
15x	4x	60x
15x	10x	150x
15x	20x	300x
15x	40x	600x

With CCD Camera	
Objective	Magnification
4x	100x
10x	250x
20x	500x
40x	1000x

Computer interface attachment

Converts optical image from the microscope & sends it to the computer. Images with outstanding clarity can be seen on the computer monitor & saved for record. In absence of computer the Images can be seen on a TV . Computer interface attachment consists of a high resolution CCD camera, Opto mech. coupler & Frame grabber card (fits into the computer PCI slot), Camera power & video out cord & power supply for the camera.

CCD Camera Specifications

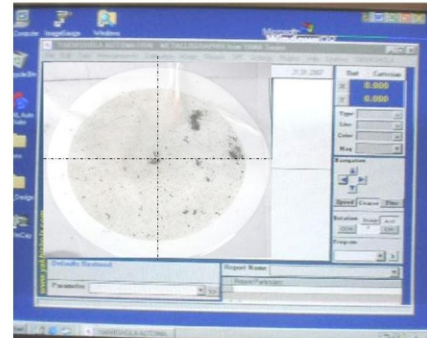
CCD Camera	Sony or Latest Equivalent
Pick up element	1/3" CCD Image sensor
Number of pixel	512(H)x582(V) PAL
Resolution	640 TV lines
Min.Illumination	5 Lux/F2.0
S/N Ratio	More than 45db (AGC off)
Electronic shutter	1/60(1/50) to 1/100000 auto
BLC function	Auto detect
White balance	Auto
Video balance	1 Vpp, 750
Power source	DC 12V
Current Consumption	150 ma

Following Material is to be provided by you

- ◆ Computer 2.6 GZ, 1GB RAM, 100GB HDD
- ◆ CD ROM Drive with Windows XP system
- ◆ Inkjet Printer HP PSC 1410 or equivalent

Measuring Software

- ◆ User friendly Licensed software
- ◆ Calibration Facility & full fledged Help Facility
- ◆ Measurement of Distance, Angle, Circle properties (Radius), Straightness, Parallelism, Perpendicularity
- ◆ SPC (statistical process control), Cause effect Pareto Analysis, X Chart, R Chart, X Bar Chart, Histogram, Cause effect chart, Process statistics & SPC Help
- ◆ Cross hair tool, Rectangle tool, Circle & double line tool
- ◆ Line width, type & color change, Annotation & Edit Mode
- ◆ DRO function, Cartesian & also Polar Coordinates
- ◆ Rotatable Image & also Rotatable coordinates
- ◆ Report generation & Printing



Vardhan microscopes are always very rugged & designed to work on the shop floor itself & are backed by easy availability of spares & an efficient after sales service network.

- ◆ Due to continuous R &D , Technical Specifications are subject to change without any notice

Dealers For: **VARDHAN WORKS PVT. LTD.**



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