



- Versatile conventional SEM
- Low cost of ownership
- Windows NT- network compatible
- Standard motorized stage
- 5th generation windows graphical user interface

XL30 TMP Scanning Electron Microscope



The XL30 is the conventional scanning electron microscope of the XL Series from Philips and is suitable for a wide variety of applications.

The XL30 is a conventional SEM with optimum performance for both imaging and micro-analysis of conductive and/or coated specimens. This makes the system ideal for dedicated research in metallography as well as for routine operations such as control monitoring of a manufacturing process, with versatile yet easy to operate software control, the instrument is an excellent tool for both the experienced and first-time user. Extensive automation is at the same time possible through its open software architecture and

embedded control of the motorised stage. The electron optical column with its conical final lens and fixed final lens aperture is optimised for both high resolution imaging, X-ray microanalysis and low magnification performance. The fixed final lens aperture, column design and the computer controlled alignment guarantee alignment free selection of kV and spot size, even up to high beam currents.

User friendliness is a special benefit of the XL30. The integration of advanced electron optics and extensive system automation with a unique, high-level user shell has produced a precision instrument with exceptional levels of



PHILIPS



2 kV low magnification overview of watch, 5x

performance, flexibility and usability. In addition, an embedded EDX system can offer the user a total analytical capability within one single instrument.

A mouse-driven instrument operating within MS-Windows NT environment, the XL30 is geared towards the future with direct communication networking, digital images for storage and remote printing.

The tungsten gun/-turbo molecular pump package combines comprehensive capabilities with low cost of ownership, requiring only mains electricity for operation.

ELECTRON OPTICAL SYSTEM

Gun

Tungsten gun. Configuration control is fully automatic with auto saturation and auto alignment.

Standard auto bias control optimises emission for total voltage range including low voltage performance.

Alignment

Computer assisted alignment allows rapid change of spotsize

and high voltage without the necessity of realigning the system.

Resolution

3.5 nm at 30 kV, 25 nm at 1 kV

Continuously Variable Accelerating Voltage

Over the range 0.2 - 30 kV.

Image rotation and focus automatically compensated over the full range.

Continuously Variable Beam Current Control

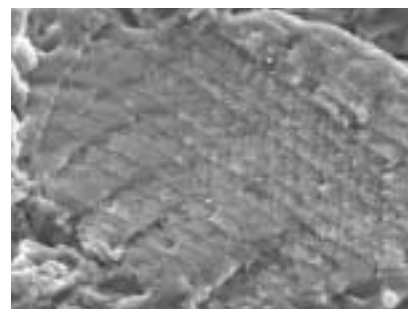
Maximum beam current: > 1 μ A at 30 kV. 10 pre-calibrated values (spotsizes) and choice of automatic coupling of spotsize to magnification.

Mechanically Pre-Centered Conical Objective Lens

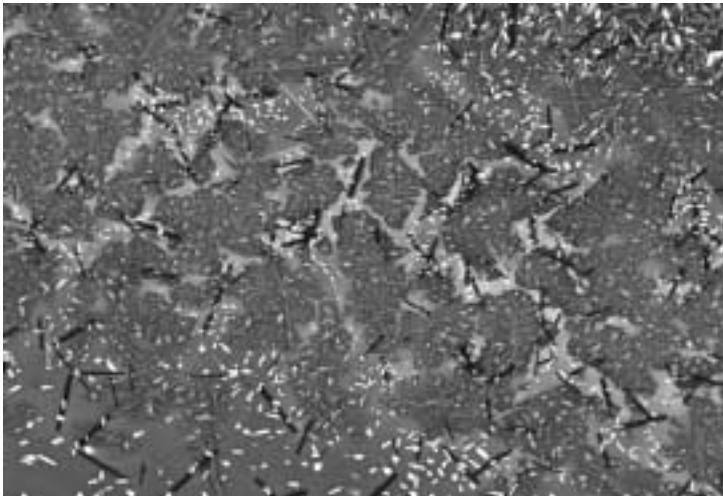
Two step conical objective lens: 45° and 60°. Simplified alignment procedure during setup. No alignment necessary in daily use. Focus range 3.0 mm to 99mm FWD. Autofocus standard. Precise mouse focus with magnification adjusted sensitivity. Dynamic focus \pm 80 degrees. Rotation free focusing.

Final Lens Aperture

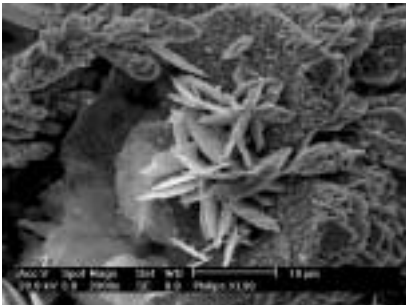
Pre-centered in the principle plane of the final lens. Standard size aperture



Metal fracture 20 kV, magnification 1500x



Inclusions in glass BS image, 15 kV



*Silver/Salt Crystal,
magnification 2300x*

optimised for both spotsize and beam current over the full range of accelerating voltages.

Stigmators

Autostigmator standard. Manual control of X and Y simultaneously. Visual indication of actual setting. Sensitivity automatically adjusted to the magnification.

Continuous Electronic Image Shift

Total range for both X and Y = 35 μm at 10 mm WD. Sensitivity adjusted to magnification. Direction always consistent and independent of scan rotation.

Scan rotation

Scan rotation at all available scan rates including TV. Range - 180 to +180 degrees.

SCANNING SYSTEM

Magnification

Can be controlled by user-defined presets, stepped or by continuous adjustment. Selected magnification is independent of working distance.

Automatically scaled μ-marker. On screen measurement standard. Range 6x to > 1.200,000x.

Survey Mode

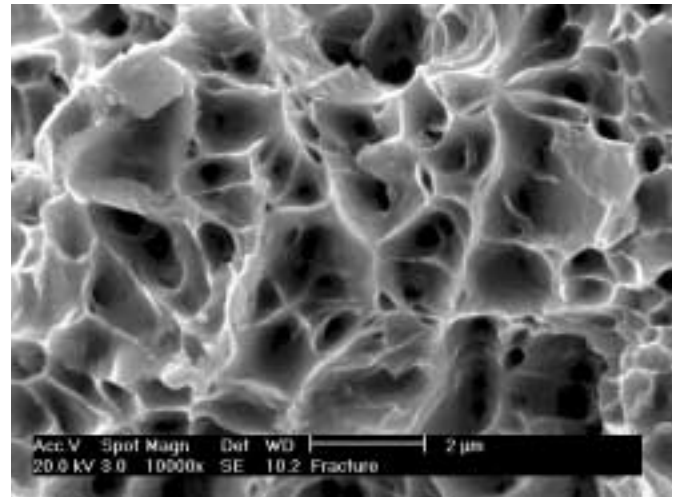
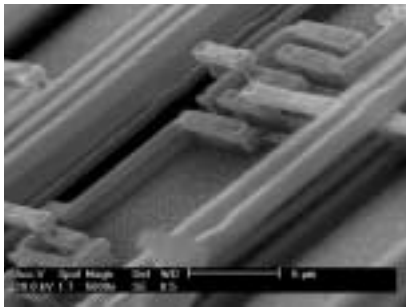
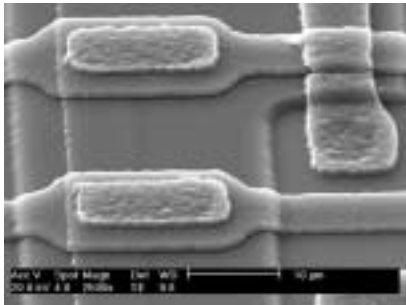
User selected region of interest automatically centered, followed by power zoom to required magnification. Image conditions and position can be stored and labeled, then survey resumed.

Scan Modes

Full frame, selected area, horizontal line, spot. Built-in low pass filter automatically adapted to selected line time and magnification. Size and position of selected area user defined. Optional external scan mode. Split screen, dual magnification and dual detector modes. Quad image display mode.

Scan Generator

TV plus 4 user-preset slow scans including photo-scan available. Preset conditions of Line-time and lines per frame can be chosen from > 80 combinations depending on user preference or application. Digital line scans for EDX up to 12 min. Chosen conditions are stored until changed.

*Metal fracture 10.000x**IC device 5.000x**IC device 2.500x*

SPECIMEN HANDLING

Eucentric Goniometer
Stage 4 axis motorised stage (X,Y,R,Z) with full manual override. Integrated read-out on-screen of all movements for motorised stage. Tilt setting continuously monitored through microscope control software. Motorised stage supported by extensive software capability including user coordinates, Compucentric rotation and up to 3 point specimen alignment. Tilt eucentric working distance at 10 mm with optimum detector geometries.

CompEucentric Stage Movement

Computerised stage control compensates the off centre rotation for any point of interest. This allows quick and convenient viewing of the same point of interest at any angle of rotation.

Specimen Movements

X = 50 mm, Y = 50 mm,
Rotation = 360° continuous.
Tilt range -15°, to +75°,
for large specimens 0° to +45°.
Z movement: 50 mm total.
Max. clearance 75 mm.

Specimen Exchange

Drawer type entry, operating vacuum regained <2.5 minutes (if vented with dry nitrogen). Automatic vacuum interlock.

Sample Chamber Dimensions

Inside chamber diameter 284mm.

ELECTRON DETECTION

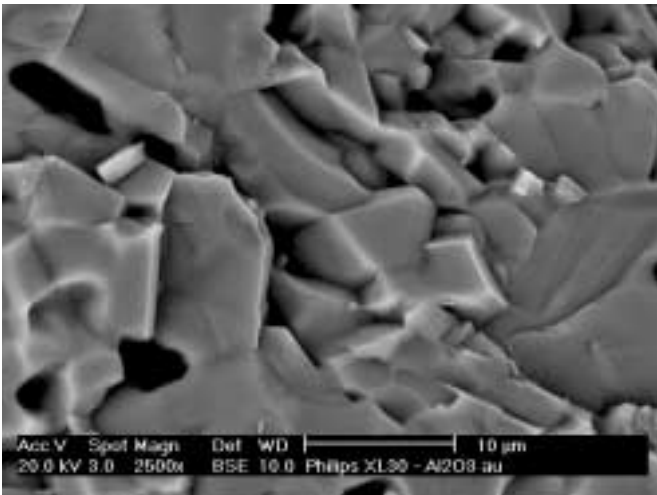
Basic Detection Modes

Secondary electrons with high efficiency longlife scintillator equipped Everhart-Thornley SE detector. Automatic control of contrast and brightness. Grid bias control continuous from -150 V to +300V. Backscattered electrons with 19 mm solid state back-scatter detector with two-segment switching.

IMAGE PROCESSOR

Video Outputs

User selectable displays from a maximum of 8 available images. Convenient analog videooutput at any scan rate. Optional output for second monitor, colour images, Red/



Al₂O₃ magnification 2.500 x

Green stereo, and image manipulation. Histogram and Videoscope display.

SCSI-bus Digital Interface

For internal communication between PC and built in control processors.

Image Storage

max.4k x 3k pixels, 8 bit. Up to 4 lower definition images can be kept in framestore. Storage of digital images on hard disk or on

floppy disk. Digital image store in TIFF format for transfer to other software packages. Burn in data bar. (optional 8)

Processing Capabilities

Fast processing: copy image, recursive filtering, integration and averaging, Image-in-image selected area display, lookup tables for enhancement, user selected gamma. Graphics: µ-marker and data bar with user selected microscope parameters.

Image Annotation and Measurement

Enhanced graphics editor including drawing and background facilities. On screen measurement x, y, random points and height standard.

Image Database

The standard XL-docu package provides image data base facilities, image annotations, differential contrast enhancement filter (DCE) and multiple image alignment software.

DISPLAY AND RECORDING

Viewing Monitor

One 17 inch Philips brilliance colour monitor or 15 inch LCD

or 18 inch LCD. Second monitor optional.

High Resolution Photomonitor

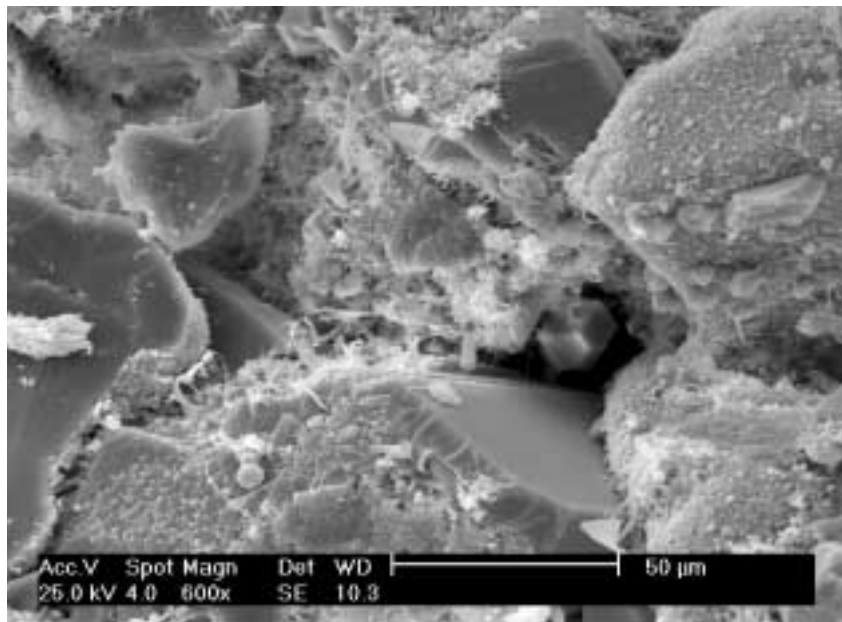
Optional vertically positioned 7", 2000 line monitor.

Recording Options

Video hardcopy unit, range of cameras for photomonitor. NTSC video output

Printing

Image print on Windows printer standard 1,2 or 4 images per page.



Gold coated rock, 600x

VACUUM SYSTEM

Turbo-Molecular Pumping System

End pressure < 5.10⁻⁴ Pa (< 5.10⁻⁶ mBar) after 24hr pumping. Edwards TMP. Edwards pre-vacuum rotary pump. Penning gauge standard.

HARDWARE OPTIONS

Second Monitor

For enhanced colour coding, colour stereo imaging, digital image mixing and image comparison.

Specimen Chamber

CCD camera fully integrated in SEM control software.

Specimen chamber image on main monitor.

Stage Accessory Kit

Multiple stub holder, pretilt holder, adjustable clamp, and analytical holders for 25mm and 32mm mounts.

Detectors

Cathodoluminescence detector, Robinson backscatter electron detector, various EDX detectors. Dedicated EBSP port available.

Cryo Transfer System

'In situ' investigation can be made on Life or Materials Science specimens with the addition of a high quality Cryo transfer system fitted to the specimen chamber.

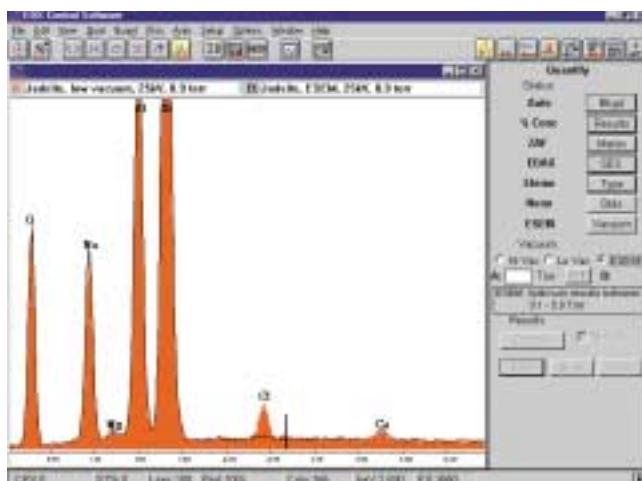
SOFTWARE OPTIONS

Options

- Multi-user software shell
- Serial communication software
- Metrology package
- Embedded EDS system

Fully MS Windows NT Compatible

Application programs including MS Word, MS Excel and Word-Perfect can be utilised for report writing. The XL software supports Windows' DDE mechanism and DLL protocol for communication between Windows based software module.



Embedded EDX system

