



TESCAN VEGA COMPACT

Compact analytical SEM for routine materials characterization, research and quality control applications at the micron scale.

TESCAN VEGA COMPACT, taking its pedigree from the highly acclaimed VEGA series, is an entry level, yet still powerful, analytical SEM. With a compact, simplified configuration that optimizes imaging and compositional analysis functions, VEGA COMPACT provide a cost-effective solution for laboratories where fundamental sample characterization is a

priority. VEGA COMPACT combines SEM imaging and elemental composition analysis in a single window of TESCAN's Essence™ software. This combination significantly simplifies acquisition of both morphological and elemental data from the sample, making VEGA COMPACT an efficient, cost effective analytical solution for routine materials

Key benefits:

- ✓ Analytical platform featuring fully integrated TESCAN Essence™ EDS, which efficiently combines SEM imaging with elemental composition analysis in a single Essence™ software window.
- ✓ Optimum imaging and analytical conditions immediately available thanks to TESCAN's unique apertureless design powered by In-Flight Beam Tracing™.
- ✓ Effortless and precise SEM navigation on the sample at magnification as low as 2× without the need for an additional optical navigation camera due to the unique Wide Field Optics™ design.
- ✓ Intuitive and modular Essence™ software designed for effortless operation regardless of a user's experience level.
- ✓ Ultimate safety of the chamber mounted detectors when the stage and sample are in motion is guaranteed with Essence™ 3D Collision model.
- ✓ Optional vacuum buffer significantly reduces vacuum rotary pump run-time to deliver both ecological and economic benefits.



Single Beam
(SEM)



Tungsten
Electron
Source



Integrated
EDS analyzer



inspection, quality control, failure analysis and research labs.

TESCAN VEGA COMPACT features an innovative optics design which guarantees immediate and seamless selection of imaging or analytical conditions whenever required, without need for mechanical re-alignment of any in-column element. With the fully integrated Essence™ EDS, switching from imaging to analytical operation is fast and easy. A single mouse click changes all set-up parameters through the software.

Furthermore, precise navigation to the desired area of interest is guaranteed by Wide Field Optics™, which provides the operator with a live SEM overview of the sample. Wide Field Optics™ replaces the traditional CCD camera and provides unprecedented depth of focus along with a view of the sample's actual topography for a more intuitive navigation process. Begin observation in the live SEM window at 2× magnification for a detailed overview, then continuously magnify directly over areas of interest—without the need for an optical navigation camera.

TESCAN VEGA COMPACT is operated from TESCANA Essence™ multiuser software, which features many tools to speed analytical work, like a quick search function, undo commands and presets. TESCANA Essence™ is built to allow users to define specific workflows that match their level of experience and/or specific application need. TESCANA Essence™ software also allows users to setup the on-screen interface layout so that only the functions and icons

necessary for a specific application are displayed. This simplified layout helps encourage novice users to perform SEM imaging and EDS analysis without hesitation. Additionally, Essence™ Collision model virtually replicates the chamber interior for a live visualization of hardware geometry, size and position of stage, samples and chamber mounted equipment. Essence™ Collision model predicts the intended movements and interactions for a particular imaging or analytical routine to make it nearly impossible for samples to collide with the retractable BSE detector.

VEGA COMPACT includes as standard secondary electron (SE) and four-quadrant backscatter electron (4Q BSE) detectors which allow inspection of samples based on their topographical (SE) or elemental contrast (BSE). Both signals can be acquired simultaneously to speed image analysis. To satisfy laboratories that also require fast and routine EDS inspection of all materials samples, VEGA COMPACT guarantees high vacuum (10^{-3} Pa) conditions to deliver non-compromised, high quality EDS results through a single, simplified interface. In addition, VEGA COMPACT's chamber accommodates samples with a diameter of >100 mm and a height of >50 mm, ensuring maximum flexibility in the most demanding laboratories.

These features make TESCANA VEGA COMPACT a fit-for-purpose analytical solution for a variety of materials characterization requirements in quality analysis labs of manufacturing industries, as well as R&D facilities.





Essential Specifications

TESCAN VEGA™ column

- Electron source - Tungsten heated cathode
- Electron beam landing energy range: 200 eV–30 keV
- Setup of beam current by electromagnetic beam aperture control (Intermediate Lens™)
- Probe current: 1 pA–2 μA, continuously adjustable
- Maximum field of view: 7.7 mm at WD=10 mm, >50 mm at max. WD

Electron Beam Resolution:

SE detector

3 nm @ 30 keV

8 nm @ 3 keV

4Q BSE detector

3.5 nm @ 30 keV

Essence™ EDS*

EDS analysis is available in live SEM scanning window of the Essence™ software using fully integrated energy dispersive X-ray spectroscopy (EDS) detector.

- Manual retraction*
- Acquisition modes: Spectrum from region, point & ID, line scan and elemental mapping are included
- EDS detector chip/window size 30 mm²
- EDS detector with Si₃N₄ window
- 129 eV resolution @ Mn Kα
- Number of pulse processing settings: 3
- Maximum input count rate: up to 1,000,000 CPS
- Maximum output count rate: up to 300,000 CPS
- Quantification: standardless, ZAF corrected
- Reporting: Yes

Vacuum Chamber

Internal diameter: 230 mm

Ports: 6

Chamber view (IR) camera

Stage

- Motorized, 5-axis goniometer stage
- X & Y axis travel range: 80 (X) x 60 (Y) mm
- Z axis travel range: 50 mm
- Tilt range: compucentric, -80° to +80°
- Rotation: compucentric, 360 degrees (continuous)
- Max. specimen height: 54 mm (81 mm without rotation platform)
- Maximum sample size: 145 (X) x 145 (Y) mm
- Maximum sample weight: 500 g (X,Y,Z,tilt)
- Without rotation platform: 1000 g (X,Y,Z)

Vacuum System

- High vacuum: 10⁻³ Pa
- Pump types: Oil rotary pump
- Vacuum buffer*

Detectors and Analyzers

- pA meter incl. touch alarm function
- Everhart-Thornley chamber detector (SE)
- Solid state, manually retractable, 4 quadrant BSE (4Q BSE)
- EDS (3rd party)*

SEM Scanning Systems

- Dwell time: 20 ns–10 ms, in steps or continuously adjustable
- Full frame, selected area, line or point
- Image shift, scan rotation, tilt correction
- Line and frame accumulation
- Dynamic focus
- Drift-corrected frame accumulation (DCFA)

Image Acquisition

- Max. frame size: 16k x 16k
- Aspect ratio: 1:1, 4:3 and 2:1
- Image stitching* (requires Essence™ Image Snapper)
- Color mapping and multi-channel signal mixing

*Optional equipment



- Multitude of image formats incl. TIFF, PNG, BMP, JPEG and GIF
- Dynamic range: 8 or 16 bits

User Interface:

- Keyboard and Mouse
- Trackball
- Control Panel*
- TESCAN Essence™ graphical user interface

Microscope Control PC

- Intel® Core i3-9100F, Quad Core 3.60 GHz, RAM Hyper Fury 2x 4GB 2400MHz DDR4, 500 GB SSD M.2, nVIDIA GT1030 2GB GDDR5 PCI-E x16, Windows 10 Pro 64-bit
- CCC PC: PC which has China Compulsory Certification (CCC) - Intel® Core i7-6700 Quad Core 3.40 GHz, RAM 16 GB, HDD 2TB, AMD FirePro W5100 4GB, Windows 10 Pro 64-bit *
- 24" Full-HD monitor

TESCAN Essence™ Software:

- Customizable GUI layout
- Multi-user account management
- Quick search bar
- Undo/Redo commands
- Single, dual, quad or hexa live image(s) display
- Multi-channel colored live image

Automated and Semi-Automated Routines

- SEM emission control
- Electron source Heating
- Electron source Centering
- Column Centering
- Vacuum Control
- Auto diagnostic
- Electron source alignment
- Contrast and brightness, autofocus
- In-Flight Beam Tracing™

Advanced Essence™ Modules

- Measurement, Tolerance Measurement
- Image Processing

- Presets
- Histogram and LUT
- SharkSEM™ Basic (required for integration of 3rd party EDS)*
- 3D Collision Model
- Object Area
- Positioner
- Switch-off Timer
- CORAL™*
- Image Snapper*
- Sample Observer*
- TESCAN Flow™ (offline processing) *

Installation Requirements*1:

- Power supply: 230 V ± 10% / 50 Hz (or 120 V / 60 Hz-optional), power 1300 VA
- Compressed nitrogen for venting: 1–7 bar (15–102 psi), 99.99% purity (4.0 purity level)
- Room for installation: min. 3 × 3 m; minimum door width 1.0 m

*1 Request site-survey by TESCAN authorized technician

Environmental Requirements*2:

- Temperature of environment: 17–24°C with stability better than 2°C with a rate of change 1°C/hour
- Relative humidity: <65 %
- Background magnetic field: Synchronous <300 nT, Asynchronous <100 nT
- Vibrations: <4 µm/s below 30 Hz, <8 µm/s above 30 Hz
- Acoustic noise: Less than 60 dBC
- Altitude: max. 3000 m above sea level

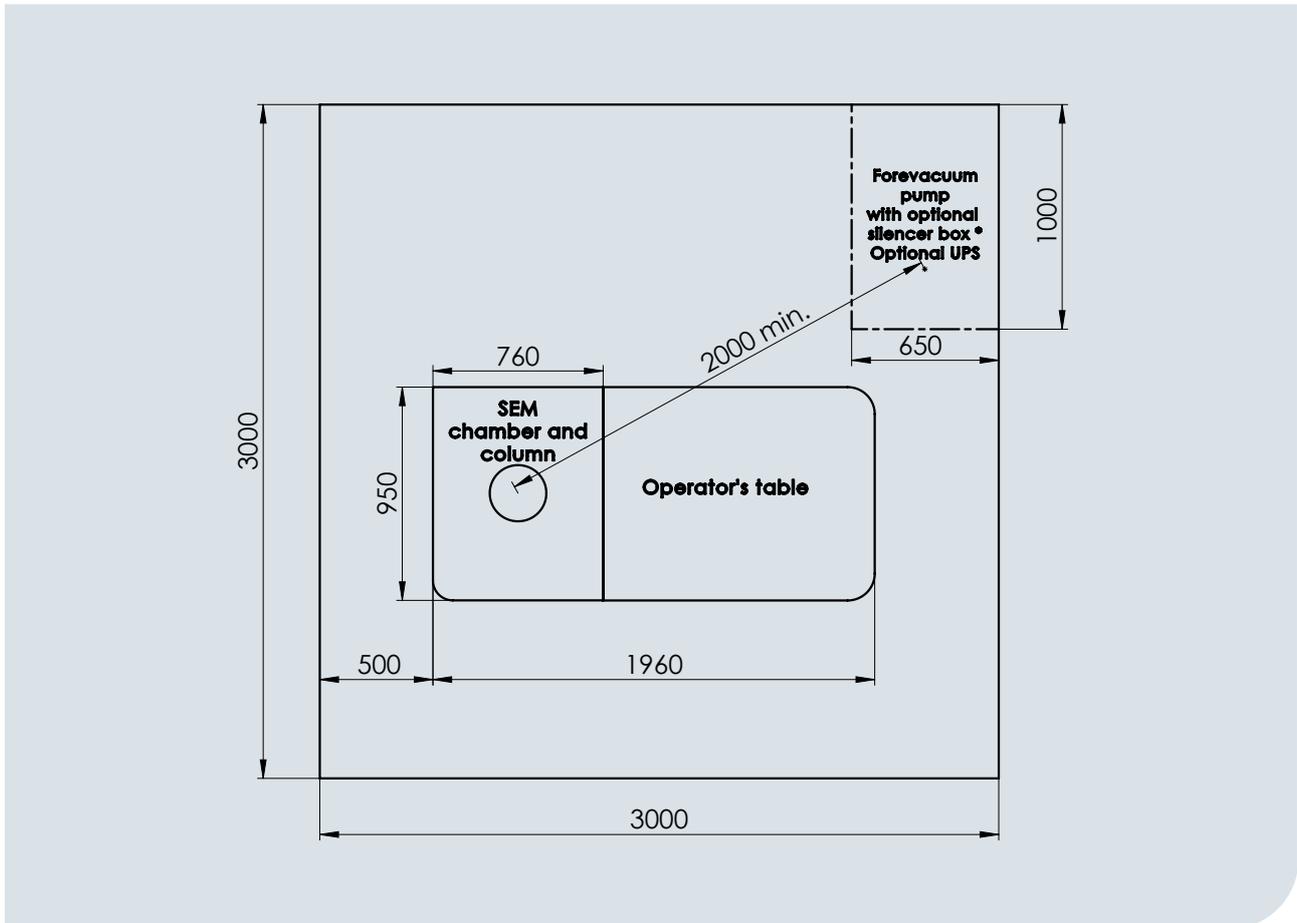
*2 Specification of background magnetic field is subject to actual acceleration voltage. Specified values are for 20 kV acceleration voltage.

Training:

- Introductory: by TESCAN engineer after installation
- Advanced (optional): at TESCAN facilities or on-site

**Footprint of the microscope (all dimensions in mm):**

If a fore-vacuum pump is to be placed in the same room as the TESCAN VEGA microscope, then it is highly recommended to purchase the TESCAN silencer box together with the microscope (to be ordered separately).



©TESCAN ORSAY HOLDING, a.s., rev. 1/2020

TESCAN VEGA is based on the TESCAN S5000 platform

Technologies used are protected by patents, for instance US7193222, EP2082413, DE202008018179, CZ 301692, US8779368, CZ305388, EA021273, CZ 304824, CZ305883 and others.

BrightBeam™, Wide Field Optics™, In-Flight Beam Tracing™, DrawBeam™, TESCAN Essence™ are trademarks of TESCAN Brno, s.r.o.

RISE™ is a trademark of WITec Wissenschaftliche Instrumente und Technologie GmbH

Windows™ is a trademark of Microsoft Corporation.

We are constantly improving the performance of our products, so all specifications are subject to change without notice.

TESCAN ORSAY HOLDING, a. s.

Libušina tř. 21, 623 00 Brno - Kohoutovice / Czech Republic
(phone) +420 530 353 411 / (email) sales@tescan.com / marketing@tescan.com