

# SALVE III MICROSCOPE COMPONENTS AND FEATURES

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TITAN THEMIS properties required for SALVE microscopy	TITAN THEMIS improvements required for SALVE microscopy	TITAN THEMIS properties advantageous for SALVE microscopy	Upgrade options
<p><b>Illumination system</b>                      The XFEG/Mono gun provides high brightness and high energy resolution required to study bonding states and band gap structures at low voltages (0.15 eV). The hollow cone illumination enables flexibly for HRTEM and EELS momentum resolved experiments.</p> <p><b>Column frame</b>                      The PICO column frame provides the highest stability against environmental disturbances of the low voltage experiments.</p> <p><b>Pole piece</b>                      The SuperTWIN pole piece gap enables to incorporate retractable cryo blades for less water contamination of the specimens at low voltage. The 5.4 mm pole piece gap enables with its moderate <math>C_c</math> value the compensation of the <math>C_c</math> with the CEOS designed corrector and at the same time enables to do dynamic experiments with special holders like cooling and heating.</p> <p><b>Sample stage</b>                      The piezo-stage for precise sample movement/focusing and drift compensation.</p>	<p><b><math>C_c</math> corrector</b>                      Modified CEOS <math>C_c</math> aberration corrector for 20-80 kV with phase plate correction of <math>\geq 55</math> mrad.</p> <p><b>Objective</b>                      Adapted SuperTWIN objective to fit the <math>C_c</math> corrector.</p> <p><b>Pole piece</b>                      The adaptations of the lower pole piece region makes the <math>C_c</math> corrector design of CEOS compatible with the Titan Themis column for 20-80 kV.</p> <p><b>Seals</b>                      Special metal seals in the column to improve leakage in condenser and projector.</p> <p><b>Cryo shields</b>                      Special retractable cryo shields for SuperTWIN to maintain vacuum at specimen position.</p> <p><b>Sample stage</b>                      The NanoEx - i/v MEMS heating-biasing holder for graphene cleaning. Special low drift single-tilt cryo holder.</p> <p><b>Camera system</b>                      Retractable Ceta16M camera with up to 25 fps with special low voltage scintillator.</p> <p><b>Energy filter</b>                      Modified Gatan 966 Quantum filter with optimized scintillator for low voltage with a resolution of <math>&lt; 0.15</math> eV.</p>	<p><b>STEM/TEM tool for flexibility</b></p> <p><b>STEM mode</b>                      The full STEM/TEM capability allows not only for HRTEM imaging, but as well mapping applications in spectroscopy with the resolution of an uncorrected STEM tool.</p> <p><b>Double-tilt holder</b></p> <p><b>Scripting control</b>                      Velox software with FEI CPython scripting for tailor made experiments/processing.</p>	<p><b>Tomography holder</b></p> <p><b>Nanofactory holder</b></p> <p><b>Upgradable with STEM corrector</b>                      Additional corrector which allows for an extension of the project to low voltage STEM applications.</p>