The basic components and the technical specifications of the SES system are:

- Vacuum system
  - Baseline pressure: < $2 \cdot 10^{-6}$ Torr
  - Time of obtaining the best pressure: < 25 min
  - Partial pressure of residual gases: H_2O < $5.0 \cdot 10^{-7}$ Torr, H < $1.4 \cdot 10^{-8}$ Torr, O_2 < $3.0 \cdot 10^{-8}$ Torr, NO < $1.5 \cdot 10^{-9}$ Torr

- Laser detonation AO Source
  - CO_2 IR laser with electromagnetic emission at 10.6 µm
  - Pulsed beam (1-5 Hz, ~ 6 J pulse energy, 250 ns pulse duration)
  - Baseline pressure: < $2 \cdot 10^{-6}$ Torr (< $2 \cdot 10^{-5}$ Torr immediately after pulse)
  - O-atoms velocity: variable between 5 and 16 km/s (3.1 to 10 eV)
  - Irradiation zone: ≤ 20 cm in diameter
  - Effective AO flux: up to $2.4 \cdot 10^{16}$ atoms/cm^2/s of 5 eV atomic oxygen at a distance of 40 cm from the source
  - Beam composition: neutral O-atoms (~ 94%), oxygen ions (< 2%), O_2 (~ 4%)

- Microwave AO Source
  - High-power microwave plasma torch with a Skimmer/Sample system
  - Working pressure: between 1 and 8 Torr
  - Thermal unidirectional O-atoms within an energy range of 0-0.5 eV
  - Effective AO flux: up to $5.8 \cdot 10^{15}$ atoms/cm^2/s at 40 cm from the source

- VUV Source
  - Deuterium type lamp with lamp housing
  - UV output: continuous between approximately 115 and 200 nm
  - UV intensity ranging from 0.5 to 5 “suns”
  - Simultaneous irradiations with AO

- NUV Source
  - Mercury Xenon type lamp with lamp housing
  - UV output: continuous from 200 nm up to visible region
  - UV radiation power: 20 mW/cm^2 at a distance of 50 cm in the circle of 5 cm in diameter
  - Simultaneous irradiations with AO

- Heating/Cooling Nest
  - Irradiation zone: ≤ 20 cm in diameter
  - Displacement along the chamber axis within ±100 mm near the semi-sphere focal point
  - Heating, cooling and temperature cycling from -150 °C to +150 °C
  - Accuracy of temperature control: ±1°
  - Thermal treatment combined with irradiations