

OSRAM XERADEX™ 20 EXCIMER SYSTEM

NEW SURFACE TREATMENT SOLUTION

**HIGHEST EFFICIENCY
FOR WAFER CLEANING,
OZONE PRODUCTION
AND WATER PURIFICATION**

The revolutionary XERADEX™ 20 W excimer lamp system from OSRAM opens up entirely new possibilities in process technology. With the new pulsed operating principle, four times the radiation power is obtained with the XERADEX System as compared to conventional excimer radiators: 40 percent of the electrical energy is converted into useable VUV radiation. This unique efficiency makes the lamp ideal for flexible, highly efficient use, especially for surface cleaning and modification, as well as in the production of ozone, in water purification, and in numerous other specialty applications.

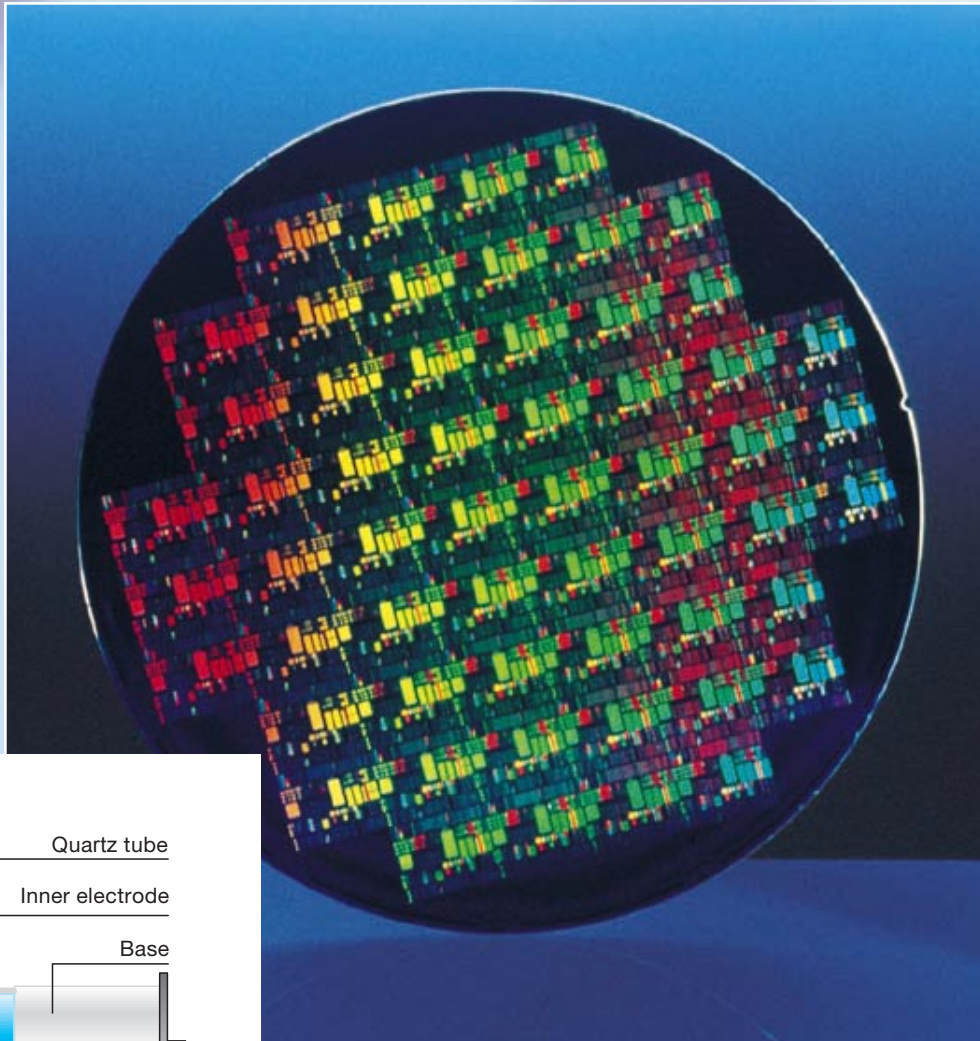
THERE IS LIGHT. AND THERE IS OSRAM.

OSRAM

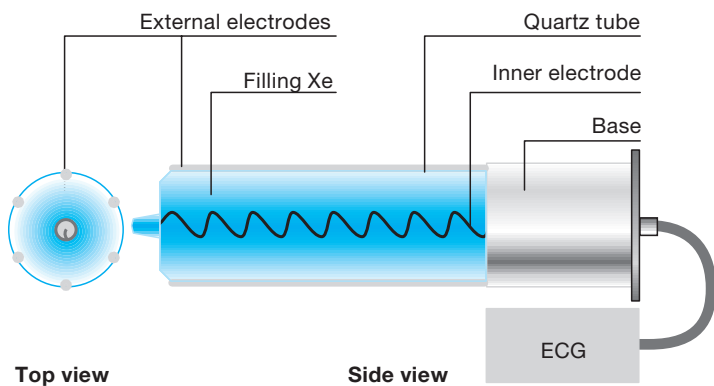
THE REVOLUTION IN EXCIMER RADIATION

THE INNOVATIVE OPERATING PRINCIPLE:

A dielectric is fitted between special electrodes, which prevents the formation of an electric arc during the discharge. If xenon gas is filled – as in the XERADEX™ 20 lamp – and a special pulsed voltage is supplied to the electrodes, then unstable xenon excimer molecules (Xe^*_2) are formed from the xenon atoms. These molecules dissociate by emitting VUV radiation ($\lambda = 172\text{ nm}$). The XERADEX™ 20 W lamp emits VUV radiation.



XERADEX 20 W System



NEW LAMP WITH FOUR TIMES THE EFFICIENCY

With the new pulsed operating process and the innovative lamp design of the XERADEX™ 20 W excimer lamp system, the efficiency of excimer lamps is revolutionized. Instead of 10 percent formerly, 40 percent of the input power is now available as high-energy VUV (vacuum ultra-violet) radiation.

By means of innovative lamp design and revolutionary technology, the XERADEX™ 20 Excimer System achieves unique efficiency.

FAST, THOROUGH, AND PRECISE: CLEANING OF WAFERS

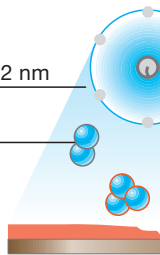
Due to the increasing packaging density on wafers and the more complex surface structures, the demands on cleaning are increasing. The XERADEX™ 20 W system offers new approaches for innovative cleaning processes. By means of the high photon energy of the radiation of 166 kcal/mol \Rightarrow (7.2 eV) even tenacious molecular bonds are broken up fast and efficiently. The combination of this radiation with the ozone produced at the same time accelerates the cleaning and thus reduces the process times considerably.

Wafer Cleaning

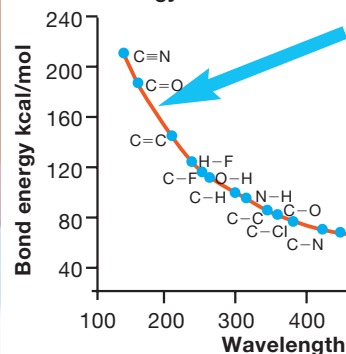
Radiation $\lambda = 172\text{ nm}$

Oxygen (O_2)

Air flow \rightarrow



A Bond energy





SURFACE TREATMENT AND MODIFICATION

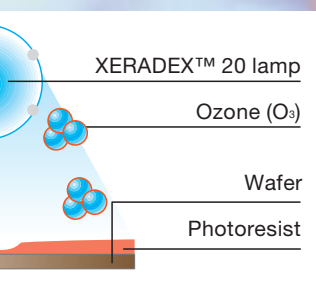
- VUV/ozone cleaning of wafers, printed circuit boards, liquid crystal glass substrates; an external ozone generator is no longer required
- Removal of polymers; cleaning of photo masks; improved coating properties of photosensitive resists; higher coating yield; removal of organic residue on surfaces
- Etching (e.g., of Teflon, PMMA, all kinds of plastics)
- Photo induced metallization
- Photo induced CVD at lower process temperature

OZONE PRODUCTION

- Direct dissociation of oxygen by the highly energetic XERADEX™ 20 radiation and formation of ozone: no by-products, such as NO_x are produced
- Highly efficient ozone production with a XERADEX™ 20 lamp.
Ozone yield: 82 g/kWh
- No cooling required
- Local ozone production

WATER CLEANING AND ULTRA-PURE WATER PREPARATION

- Efficient production of reactive OH radicals
- Complete mineralization of organic components, such as for the preparation of ultra-pure water
- The XERADEX™ 20 lamp can be used directly in the water as an immersion lamp



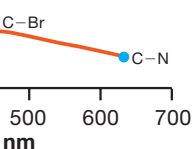
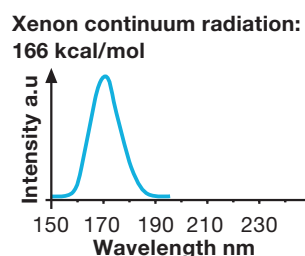
Combined effort for clean results: High-energy photons break up the molecular bonds, and the ozone produced by the radiation accelerates the cleaning process.

VERSATILE APPLICATIONS

The new excimer lamp system from OSRAM opens up entirely new possibilities in process technology. Its unique efficiency makes this lamp ideal for flexible, highly efficient use, especially for surface cleaning and modification as well as in the production of ozone, in water purification, and in numerous other applications.

A
At a wavelength of 172 nm, the XERADEX™ 20 Excimer System generates short-wave, pure ultraviolet light.

B
The XERADEX™ 20 VUV excimer radiation breaks up all molecular bonds with an energy of up to 166 kcal/mol.



UNIQUE ADVANTAGES

The new XERADEX™ 20 system is supplied as a 20 W lamp with an external electronic power supply (electronic control gear, or ECG). It offers the users a multitude of advantages:

- For the first time a highly efficient VUV radiation source is available for universal application
- Due to its high efficiency, the XERADEX lamp requires no cooling – the temperature of the radiator never exceeds 80° Celsius (176° F) (“cold radiation”)
- The system of lamp and electronic control gear is compact and easy to handle
- Instant start of the lamp (no warming-up phase); the ignition is independent of the ambient temperature
- Operation of the lamp in different environments is possible, such as in liquid and gaseous media
- The system can be switched without limits; parallel lamp operation is possible
- The lamp is environmentally friendly; it contains inert gases exclusively; no mercury is used

FIELDS OF APPLICATION

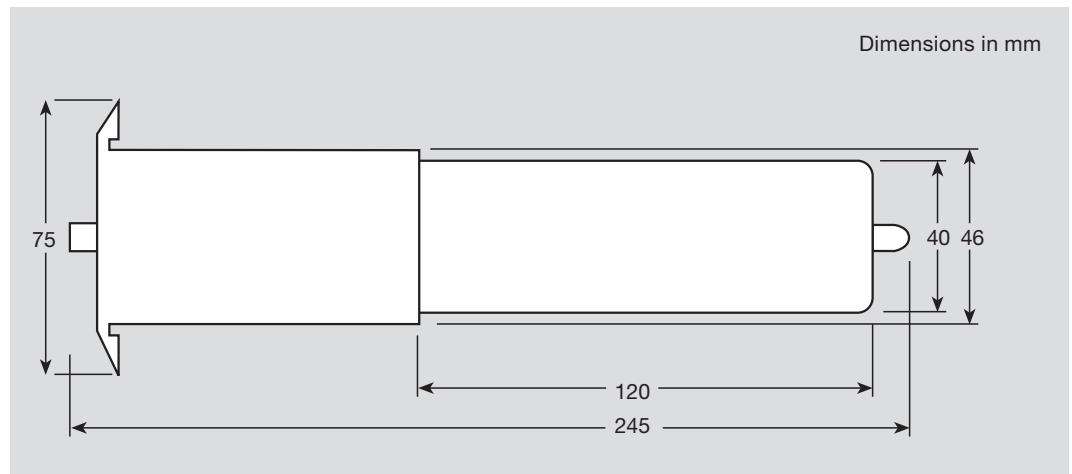
- Wafer cleaning
- Removal of polymers
- Display cleaning
- Photo induced CVD
- Etching
- Cleaning of printed circuit boards
- Ozone production
- Photo induced metallization
- Production of ultra-pure water

THE MOST IMPORTANT POINTS AT A GLANCE

- Technical lamp, which emits highly energetic VUV radiation ($\lambda = 172 \text{ nm}$)
- **For the first time:** High efficiency (40 percent) in generation of VUV radiation by new lamp design and revolutionary pulsed operation
- **For the first time:** Compact system of lamp and electronic control gear – easy to handle, no cooling required
- “Cold lamp” $< 80^\circ$ Celsius (176° F)
- Parallel switchable
- Instant start
- Environmentally friendly – no mercury



TECHNICAL DATA



Lamp	XERADEX™ 20
Electrical input power	20 W
VUV radiation power	8 W
Length	245 mm (9.6 in.)
Bulb diameter	40 mm (1.5 in.)
Bulb length	120 mm (4.7 in.)

Note: The radiator may only be operated with control gear DBD-20-110/240!

ECG	DBD-20-110/240
Supply voltage	110 V, 120 V, 230 V, 240 V optional
Mains frequency	50 Hz / 60 Hz
System power consumption	28 W
Dimensions (length, width, height)	(223 mm, 112 mm, 55 mm)

For Orders and General Information

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