



High Quality Thermal Silicon Dioxide

CSIR-NPL has *State-of-the-Art* facility for oxidation and diffusion of silicon; housed in State-of-the-Art Solar Energy Clean room complex (Class 1000)

Type : Horizontal High Temperature Diffusion/Oxidation Furnace
 Model / Make : TS8603 ; Tempress Systems, BV, The Netherlands

Thermal Oxide : Introduction

Thermal oxide or silicon dioxide layer is formed on bare silicon surface at elevated temperature in presence of an oxidant, the process is called thermal oxidation. It is normally grown in a horizontal tube furnace, at temperature range from 900°C ~1100°C, using either a "Wet" or "Dry" growth method. The grown thermal oxide is highly uniform layer with high dielectric strength.

Why Thermal Oxide on Silicon?

Thermal oxide is essential building blocks for microelectronics, nanoelectronics or any silicon based opto-electronic devices. It may be used in many applications such as:

- Excellent dielectric for electrical insulation
- Anti-reflection coatings
- Gate oxide
- Surface passivation
- Masking material during doping (p/n)
- To provide protection for conductors
- To Isolate devices from each other
- A dielectric for a capacitor

Oxide Thickness	Applications
10 nm	Tunneling Gates
15 ~ 50 nm	Gate Oxides, passivation
20 ~ 50 nm	LOCOS Pad Oxide
200 ~ 500 nm	Masking Oxides
300 ~ 1000 nm	Field Oxides

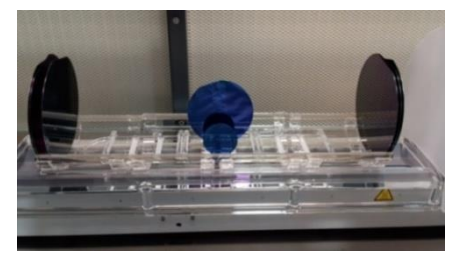
Oxidation Process Facility



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Dry/Wet thermal Oxide

Ultra-pure Dry Oxidation (for thinner oxides) and Ultra-pure Wet Oxidation processes are designed to ensure the highest quality films.



Thermal Oxide: Specifications

- Wafer size : 2-6" diameter
- Oxide thickness range : 10 nm- 2 μm
- Thickness tolerance target : ± 5% or better
- Within wafer uniformity : ± 3% or better
- Wafer to wafer uniformity : ± 3% or better
- Sides processed : Both
- Growth method : Wet or Dry Oxide
- Refractive Index : ~1.456
- Gases and precursors : N₂, O₂, H₂O
- Temperature : 900-1050 °C
- No. of wafers in a batch : 25 per batch

Contact

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