Thermal processes in Centrotherm tubes

Part II_v1

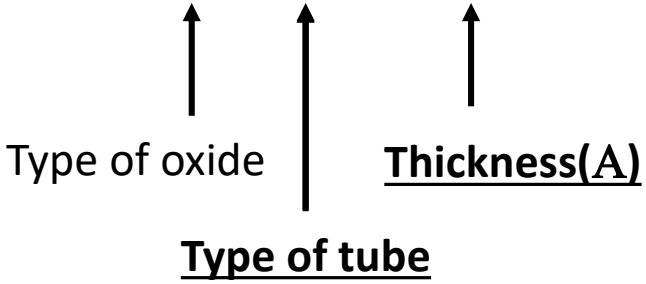
Dry oxidation

Oxidation in pure O_2 atmosphere - “dox”

Available tubes	2_1 Densification	2_4 Diffusion	3_4 MEMS
Recipes	dox	doxd	doxm
Parameters	Thickness Or Duration & Temperature	Thickness Or Duration & Temperature	Thickness Or Duration & Temperature
Min - Max	45 to 10 000A Or 1 to 4800 min 880 to 1050°C	45 to 10 000A Or 1 to 4800 min 880 to 1050°C	45 to 10 000A Or 1 to 4800 min 880 to 1050°C
Remark	Recommended	> 1050	NO RCA

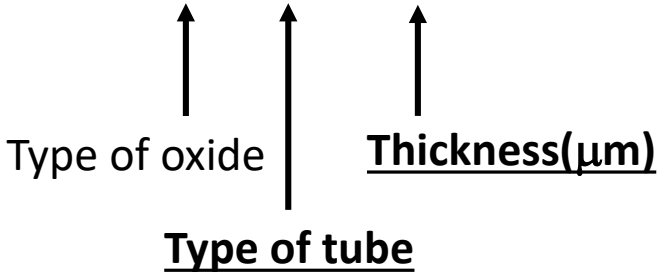
Dry oxide **1000 A** in the **MEMS** tube

doxm_1000



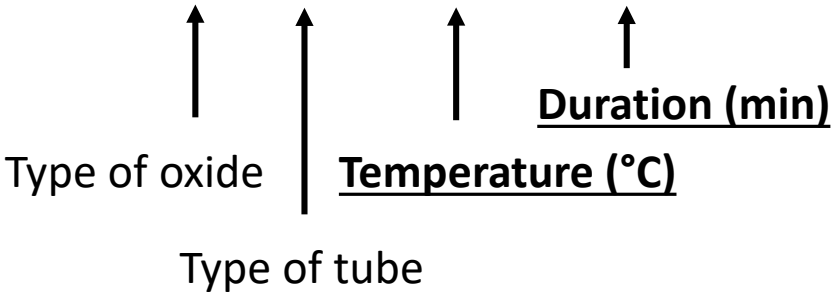
dry oxide **1.0μm** in the **diffusion** tube

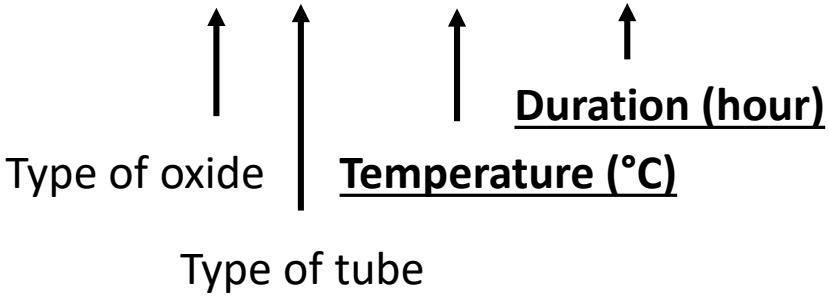
doxd_1.0



Dry oxide in densification tube @ **1050°C** during **3 hours**

dox_1050_180 or dox_1050_3H





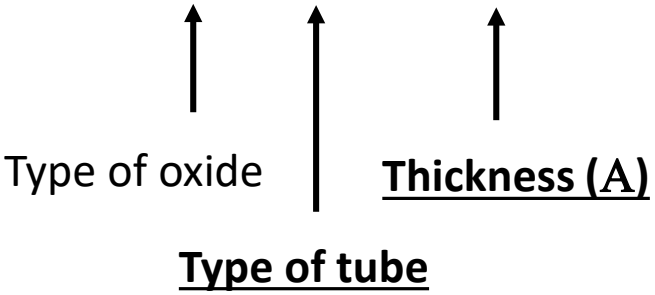
Wet oxidation

Oxidation in H_2/O_2 atmosphere - “Wox”

Available tubes	2_2 Wetox	2_4 Diffusion	3_4 MEMS
Recipes	Wox	Woxd	Woxm
Parameters	Thickness Or Duration & Temperature	Thickness Or Duration & Temperature	Thickness Or Duration & Temperature
Min - Max	100 to 40 000 A Or 1 to 4800 min 850 to 1050°C	100 to 50 000 A Or 1 to 4800 min 850 to 1050°C	100 to 30 000 A Or 1 to 4800 min 850 to 1050°C
Remark	Recommended	> 1050	NO RCA

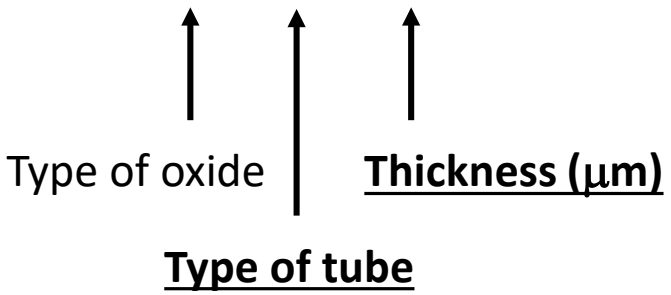
Wet oxide **1000 A** in the **MEMS** tube

woxm_1000



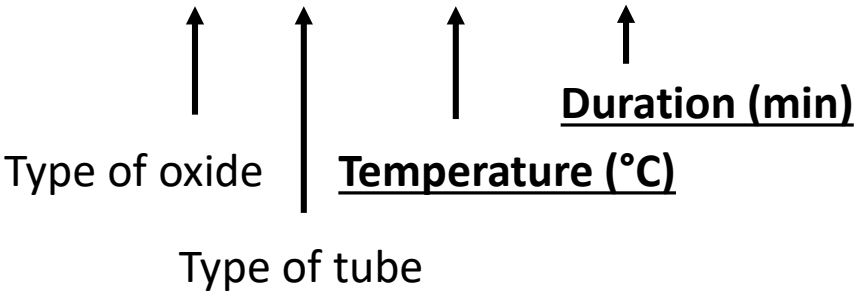
Wet oxide **1.0μm** in the **diffusion** tube

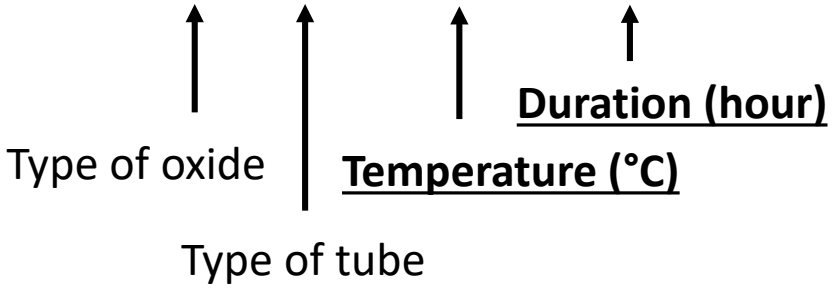
woxd_1.0



Wet oxide in Wetox tube @ **1050°C** during **3 hours**

wox_1050_180 or wox_1050_3H





Alloying, annealing, densification or diffusion

Thermal treatment in N2 or N2/H2 or

Available tubes	1_3 Alloy	2_2 Densification	2_4 Diffusion	3_4 MEMS
Recipes	AlSi	Dens	Diff	Rec
Parameters	Frozen recipe	Duration & Temperature	Duration & Temperature	Duration , Temperature , Atmosphere & steps
Duration Temperature Atmosphere Step	15 min 425 C N_2/H_2 1	1 to 1200 min 650 to 1050 C N_2 1 max	1 to 1800 min 700 to 1250 C N_2 1 max	1 to xxxx min 120 to 1050 C N_2, N_2/H_2, N_2/O_2, O_2 5 max
Remark		Recommended	> 1050	NO RCA

Annealing @ 1050 C during 3 hours

dens_1050_180

Tube Temperature (°C) Duration (min)

dens_1050_3H

Tube Temperature (°C) **Duration (hour)**

or

diff_1050_180

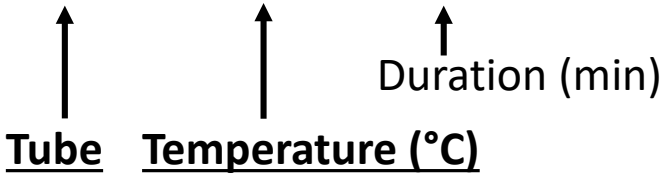
Tube Temperature (°C) Duration (min)

rec_1050_180

Tube Temperature (°C) Duration (min)

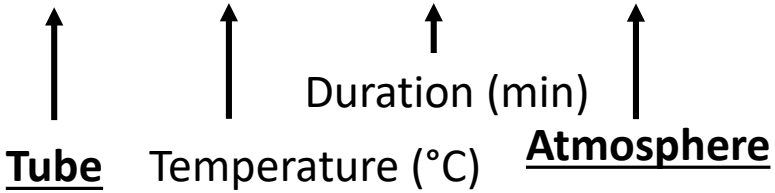
Annealing @ **1250 C** during 3 hours

diff_1250_180



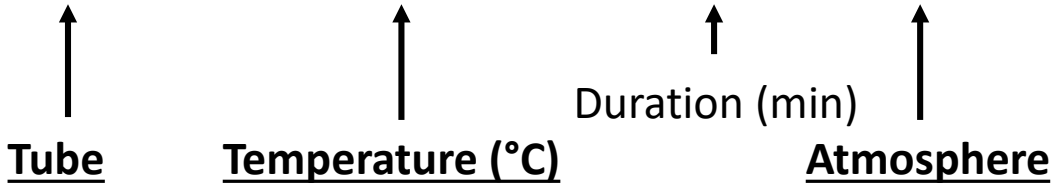
Annealing @ 1050 C during 3 hours **in H_2/N_2**

rec_1050_180_H_2/N_2



Annealing **@ 200 C @ 300 @ 400** during 20min **in H_2/N_2**

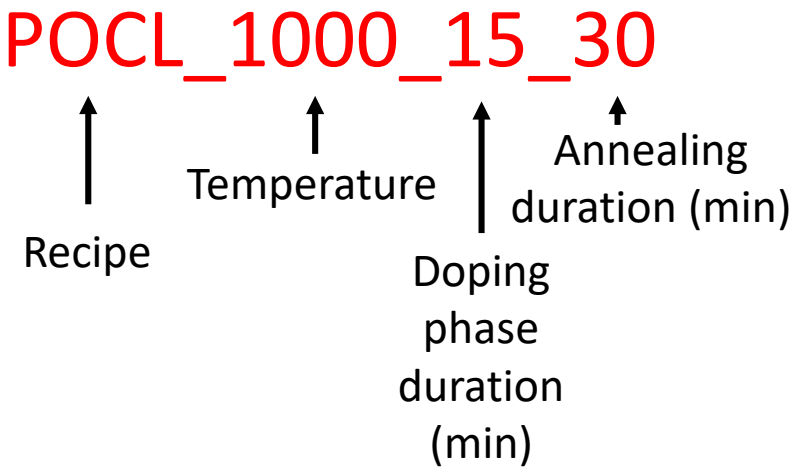
rec_200_300_400_20_H_2/N_2



Doping in vapor phase : POCL3

Tube 1_4	Parameter 1	Parameter 2	Parameter 3
POCL3	Temperature	Doping phase duration	Annealing duration
Min - Max	700 to 1100 °C	1 to 120 min	1 to 1200 min

Phosphorous doping @ 1000°C with a doping phase of 15 min and an annealing of 30 min



Gate Oxide for electronic applications

Available recipes in tube 2_3	Geox	Geox_C
Parameters	Thickness Or Duration & Temperature	Thickness
Min - Max	45 to 10 000A Or 1 to 4800 min 880 to 1050°C	45 to 300 A
Remark	No DCE	Recommended

Gate oxide of **500 A**

Geox_500

Recipe

Thickness (A)

Gate oxide @ **950 °C** during **15 mins** with **DCE**

Geox_C_950_15

Recipe

Temperature (°C)

Duration (min)