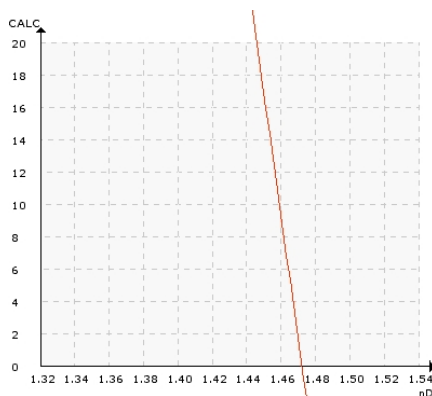


EKC IN SPRAY SOLVENT TOOLS

Typical end products

Silicon wafers

Chemical curve: Conc% bw water in EKC at Reference Temperature of 20°C



R.I. at Ref. temp.20°C

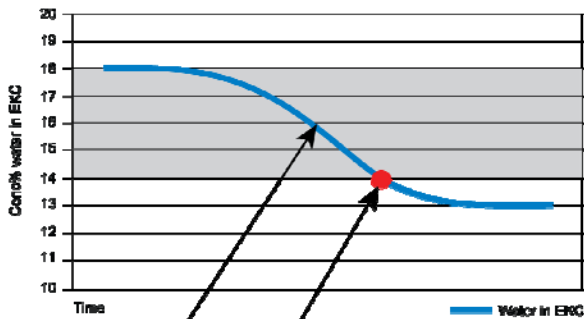
Spray solvent tools are used in the post etch polymer residual removal process to clean the surface of wafers. EKC is a commonly used chemical in the process that employs two tanks. The operating process temperature of EKC is kept between 65°C and 75°C. The actual residue removal takes place in the spray solvent tool where EKC is fed according to a pre-determined cycle of chemical re-circulation and wafer run.

Two control strategies can be adopted with the aid of K-Patents Semicon Refractometer PR-33-S: either to monitor water content in EKC or to control water content to a steady level. The former allows for setting high and low alarms for the amount of water that warrants safe wafer production. The latter has proved to provide a considerable reduction in the EKC consumption.

The re-circulation starts when the wafer run in the spray solvent tool is over and the chemical is delivered to the EKC tank. From the tank the chemical is partially drained and refilled with fresh

EKC and water. Water is known to evaporate at the spray solvent tool through the exhaust.

The amount of water in EKC is maintained with automated water spiking after each wafer run. The water spiking is activated using the K-Patents PR-33-S output signal. This arrangement provides the exact set point for water in EKC concentration and helps to optimize and to reduce EKC addition. The entire EKC tank might have to be replenished after certain runs.



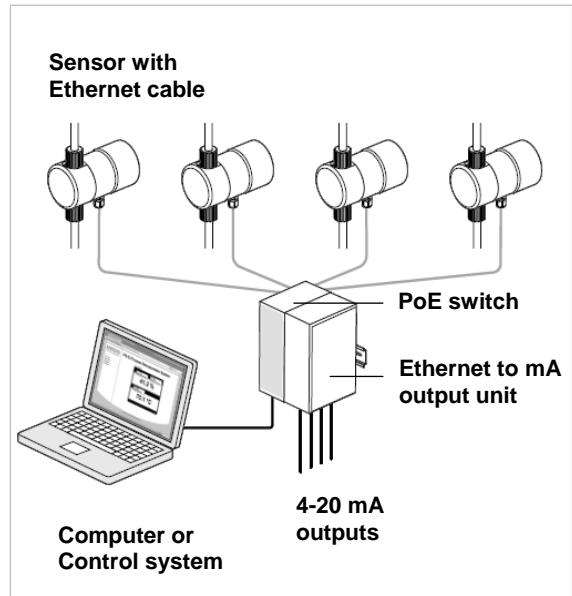
Bath is typically disposed here based on time or test wafers etc.


K-Patents low alarm activates water spiking here

Instrumentation and installation

The K-Patents Semiconductor Refractometer PR-33-S is installed in the re-circulation loop of EKC. The compact instrument is designed to suits perfectly for the water control in EKC.

Data logging software allows on-line printing of concentration and temperature profiles



Instrumentation	Description
	PR-33-S Semiconductor Refractometer. Installation in pipe with a Pillar or Flare connection. Process temperatures up to 85°C. Power and communication carried over Ethernet.
Benefits	Very high accuracy and absolute signal stability help to control water in EKC and to minimize chemical consumption costs. Air bubbles do not disturb measurement. Remote functionality over Ethernet facilitates viewing of instrument diagnostics and altering configuration settings without having to enter the cleanroom.
Measurement range:	Water in EKC 20%-10%
Process temperature:	60-75°C