# Reactive sputtering of oxide thin films

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**Abstract**

We introduce the process of reactive sputtering in a magnetron sputtering discharge. Reactive sputtering is a process where metallic targets are sputtered in an reactive ambient to grow compound thin films. The target is sputtered in an oxygen ambient when growing oxides and in a nitrogen ambient when growing nitrides. Compound thin films grown by reactive sputtering of metalic targets are in general of higher quality than compound films grown by sputtering of compound targets. Reactive sputtering also offers higher deoposition rates than sputtering of compound targets. The main problems with reactive sputtering arise from poisoning of the target which may lead to charge build up and arcing. Charge build up can be avoided by applying rf–power or pulsed bipolar dc power to the target. Reactive sputtering is used extensively by manufacturers of coated architectural glass, to grow protective layers on hardware items, to grow optical coatings, and in microelectronic devices for high k dielectrics, barrier layers, and resistive films.