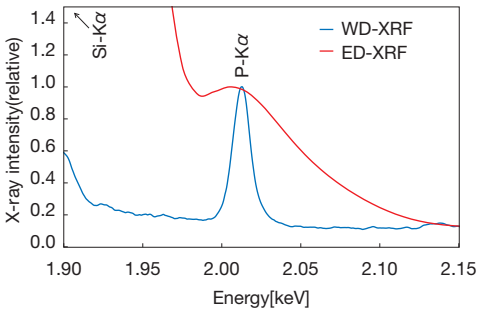
An Industry-standard Tool for Dopant Concentration and Film Thickness Measurement

X-ray Fluorescence Spectrometer for Thin Film Evaluation

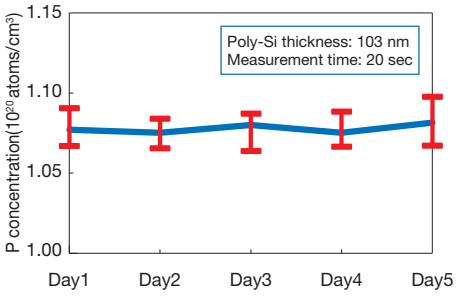
P concentration analysis in poly-Si film

WD-XRF is the *de facto* standard method for P concentration monitoring due to its high peak resolution and daily reproducibility compared with ED-XRF (Energy-Dispersive XRF) and FT-IR.

Clear separation of P-Kα from Si-Kα



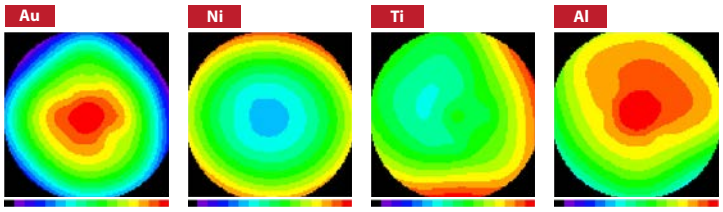
Daily stability of P concentration (10-time repeatability)

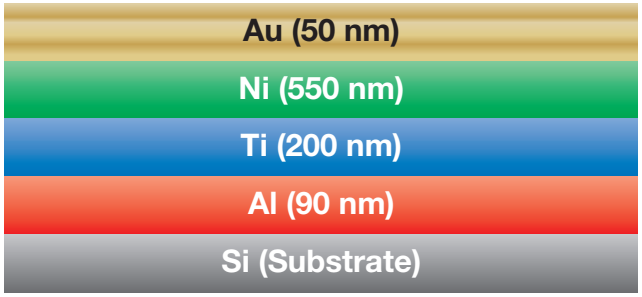


Day	1	2	3	4	5
Unit	P (10^{20} atoms/cm^3)				
AVERAGE	1.077	1.075	1.080	1.075	1.082
RANGE	0.024	0.018	0.023	0.022	0.031
Std. Dev.	0.0074	0.0064	0.0082	0.0064	0.0083
R.S.D.(%)	0.69	0.60	0.76	0.60	0.77

Au/Ni/Ti/Al backside electrode of a power device

All four layers, even the bottom Al, can be analyzed simultaneously thanks to the high-power (4 kW) X-ray source and the FP method.





X Y	Au	Ni	Ti	Al
	nm	nm	nm	nm
Average (nm)	49.3	551.3	198.2	89.5
Maximum (nm)	50.4	557.3	201.2	91.1
Minimum (nm)	48.1	544.8	195.3	87.9
Range (nm)	2.3	12.5	5.9	3.23
Sigma (nm)	0.90	3.59	1.61	0.87
RSD (%)	1.82	0.65	0.81	0.97

For high-precision QC, Rigaku has delivered more than 600 WD-XRF tools worldwide.