Routine Problems / Analysis Needs vs Analysis Tools Routinely Applied

Problem-Found Analysis-Needed	Auger *surface*	XPS *surface*	ToF-SIMS *mapping*	EDS-SEM *bulk*	FT-IR *bulk*	Raman *bulk*	XRF *bulk*	D-SIMS *profiling*	GD-OES *profiling*	GD-MS *bulk*	LA ICP-MS	ICP-MS *bulk*	EELS-STEM	EDS-STEM	XRD	XRR	2D X-ray *imaging*	3D X-ray *imaging*	TEM *imaging*	FIB-SEM *imaging*
Lateral Resolution/Beam Size	0.02-50 µ	30-500 µ	50-500 µ	1-3 µ	10-500 µ	1-50 µ	2000 µ	50-500 µ	0.5-4 mm	0.5-4 mm	1-5 µ	>10 cm	0.1-3 µ	0.1-3 µ	>1 mm	1x100 mm	0.5-3 µ	1.5-10 µ	0.1-3 µ	1-5 nm
Depth of Information	1-6 nm	1-12 nm	0.1-0.3 nm	0.2-3 µ	0.5-5 µ	0.3-1 µ	2000 µ	2-3 nm	0.1-2 nm	0.1-2 nm	0.3-1 µ	> 5 µ	20-300 nm	20-300 nm	1-3 µ	5nm-1µ	1-25 mm	1.5-10 µ	20-300 nm	5-10 nm
Detection Limit	PPTh	PPTh	PPB	PPTh	PPTh	PPTh	PPM	PPB	PPT	PPT	PPT	PPT	PPTh	PPTh	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
Adhesion Problem	*	*****	*****	*	***	*			*	*			***	***			***			
Atomic Scale Info	*	*	*						*				*****	*****	****				*****	
Bond Pad Failure	*****	**	*	*	*	*					***						**			
Bulk Chemistry Analysis		*****		*****		*	*****		*****	*****	*****	*****								
Chemical Surface Modification	**	*****	***		***			**	**	**										
Color Changed	*	*	**	*	*	*	*		***	***	***	***	*							
Corrosion or Rusting	*	***	*	*		**	*		***		**						*			
Depth Profile Needed	***	***	*			**		***	*****	*****			*****	*****						
Dirty Degrease Bath		*	***		***		*		***	***										
Dirty Drying Oven	*	*	***		*	*						***								
Dirty Plasma Chamber	*	***			*	*		*	**											
Electrical Problem	*		**	*				*****		*							**	****		
Exposed to Gases / Air		**	*****		**			*			*	**								
Film Thickness	**	*****	*	****			*	**	**				*****	*****		*****			*****	*****
Humidity-Temp Cycling Test	*	***	*****			*		*				***					*			
Gap-Hole-Defect Suspected	*		*	**									*	*				*****	*****	*****
Interdiffusion Problem		***	*					**	****	****			*	*						
Linear Uniformity	****	*****	*	****	***	***														
Metal Plating Failure	*	*	**	***	*	*	*		***	***	*									
Over-Heating Suspected			***	*	*	*	*	**	***	**										
Particles - micron size	*****			*****		****					*****									
Plasma Treatment	*	*****	****		**	*		**	**		*	*	*	*						
Residue, Haze, Wrong Color	*	*****	***		*	**			**			*								
Soldering Problem	***	*	*	*		**			*		***									
Surface Contamination	*	*****	***	*	**	***			**											
Target Shield Erosion Check	**	*	***			*			**	**										
Thin Film Analysis	**	***	*		*	**	*	***					***	***		*****			***	**
Uniformity of Thickness		*****	*	***	***	*		**					***	***					***	
Unknown Powder/Coating	**	*****	***	**	**	***			**	**	**				*****					
Unknown Chemistry	**	*****	***	**	***	**	**		**	**	***	*			**					
Vacuum Chamber Dirty	*	*	***		*	*			*											
Water Contaminated		*	**		*	**	***		*		*									
White Area turned Yellow			***		*	*	***	*	***	***	***	***								
XY Uniformity	***	***	***	***	***	***							***	***						