

Ion Beam Assist Source Selection Guide

The purpose of this guide is to aid in the selection of an Assist Ion Source for any given evaporation production coater. The front describes graphically the meaning of the dimensions in the chart. The back shows the chart itself. Dimensions given represent a range of approximate values for which the source and grid combination is optimal. Coverage diameter is calculated from “throw distance” (dimension B) and will therefore vary slightly within the dimensional window. Optimal source-grid selection assumes a standard >50% coverage of the substrate fixture by the ion beam. For fixtures without planetary motion the optimum focal point and/or source size may vary.

Data on the chart was calculated assuming standard source conditions for Assist applications of ~300eV beam voltage, 500V accelerator voltage, and the maximum stable beam current (~250mA for 12cm, ~400mA for 16cm).

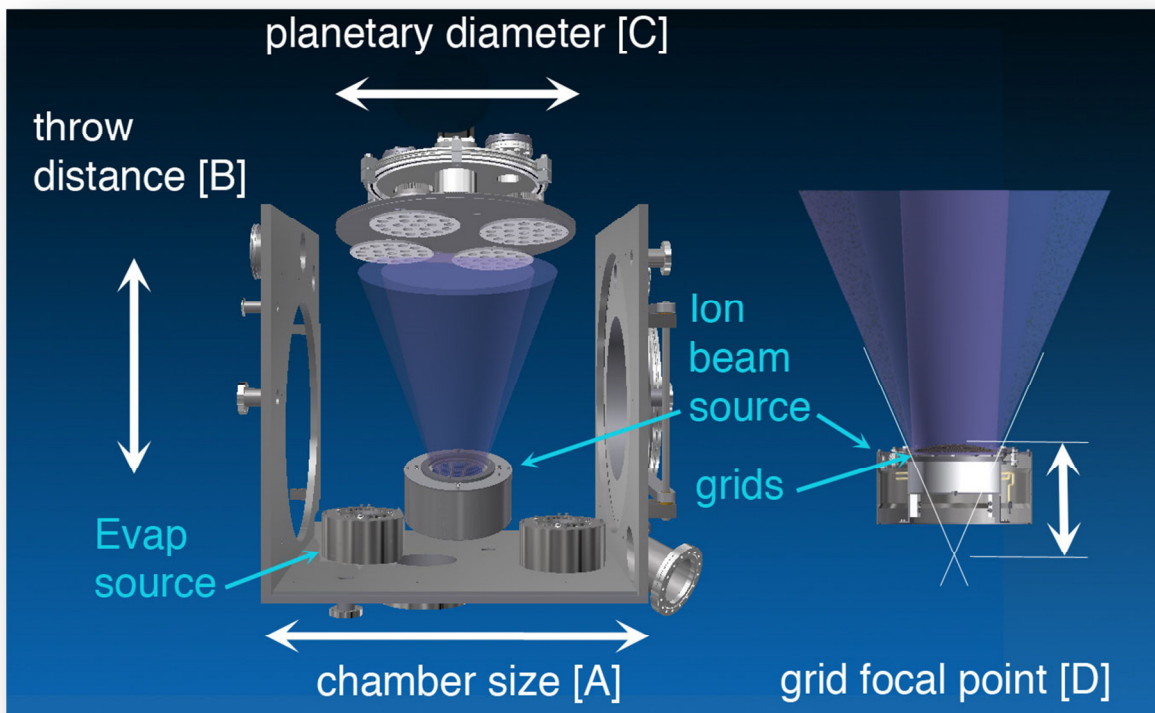


Figure 1. Ion Beam Assisted Deposition Setup

Assist Sources for your Production Coater

Chamber Size [A]	Throw Distance [B]	Planetary Fixture Diameter [C]	Recommended Assist Ion Source		Coverage diameter at Substrates	Avg. Beam Current Density (mA/cm ²)
			Source Size	Grid focal point [D]		
0.5m	20cm	25cm	12cm	25cm Divergent	22cm	0.79
	20cm	40cm	12cm	25cm Divergent	22cm	0.79
			16cm	33cm Divergent	26cm	0.85
	40cm	25cm	6cm	25cm Divergent	16cm	0.75
	40cm	40cm	12cm	25cm Divergent	31cm	0.40
1m	40cm	50cm	12cm	25cm Divergent	31cm	0.33
			16cm	33cm Divergent	35cm	0.42
	40cm	90cm	6x22cm Linear Ion Source, aligned radially		57cm	0.28
	60cm	50cm	12cm	25cm Divergent	41cm	0.23
			16cm	66cm Divergent	31cm	0.60
	60cm	90cm	16cm	33cm Divergent	45cm	0.28
	80cm	50cm	12cm	46cm Divergent	33cm	0.29
	80cm	90cm	16cm	33cm Divergent	55cm	0.17
23cm			66cm Divergent	51cm	0.29	
1.5m	40cm	90cm	23cm	30cm Divergent	51cm	0.29
	40cm	140cm	6x22cm Linear Ion Sources, paired, aligned radially		104cm	0.18
	80cm	90cm	16cm	33cm Divergent	55cm	0.19
			23cm	66cm Divergent	51cm	0.29
	80cm	140cm	23cm	30cm Divergent	79cm	0.12
	120cm	90cm	16cm	33cm Divergent	74cm	0.10
			23cm	66cm Divergent	65cm	0.18
120cm	140cm	23cm	30cm Divergent	107cm	0.07	