











## Fiducial marker comparison

Traditional fiducial markers were originally designed to be visible on MV-EPID imaging. MV x-ray is basically only stopped by mass (largely independent of material density). The contrast in MV images depends on the difference in mass that the MV x-rays have passed before hitting the imaging plate. Good visibility with MV therefore requires markers with a relatively large mass.

Gold Anchor has been designed for use with on-board kV imaging. The kV x-ray is heavily “attenuated” (weakened) whenever it passes through a material of high density, such as gold. **Good visibility of gold markers with kV therefore requires a sufficiently large cross-sectional area in the line of view.** A high kV, approximately 130 kV, should be used to fade away the skeleton structures.

Traditional markers (examples)	Needle gauge	Marker dimensions	Marker weight	Marker area (mm <sup>2</sup> )		
				Lateral	45°	Front
	18G	1.0 x 3 mm	45 mg	3	2.7	0.79
	18G	0.8 x 3 mm	29 mg	2.4	2.1	0.50
	20G	0.4 x 5 mm	12 mg	2	1.5	0.13
<b>Gold Anchor™</b>						
	22G or 25G	0.28 x 10 mm <i>When ball shaped:</i>	8 mg	2.2	1.6	0.06 <i>Appr. 1.3 mm<sup>2</sup> from all angles</i>
	20G or 22G	0.4 x 10 mm <i>When ball shaped:</i>	17 mg	3.2	2.3	0.13 <i>Appr. 1.9 mm<sup>2</sup> from all angles</i>
	22G or 25G	0.28 x 20 mm <i>When ball shaped:</i>	17 mg	4.4	3.2	0.06 <i>Appr. 2.5 mm<sup>2</sup> from all angles</i>
	20G or 22G	0.4 x 20 mm <i>When ball shaped:</i>	33 mg	6.4	4.6	0.13 <i>Appr. 3.6 mm<sup>2</sup> from all angles</i>

Note: Values above have been estimated and are therefore indicative.