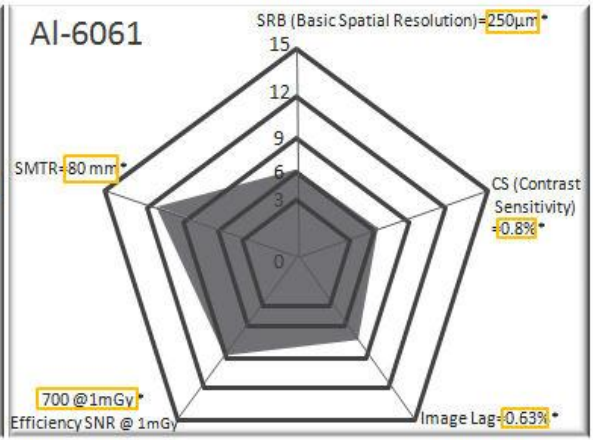
Vidisco RayzorX Pro System Achieves ASTM E2597-07 Exceptional Results

Vidisco's **RayzorX Pro** system was tested according to ASTM E2597-07 standard in 2012. The **RayzorX Pro** system has achieved outstanding results, which are clearly better than those of competing systems. A series of tests was conducted by BAM (Bundesanstalt für Materialforschung und -prüfung) laboratories of Germany. The following document is a summary of their tests' results (BAM reference: BAM 8.3 / 7342)***.

The ASTM E2597-07 is the first standard that is intended to enable the system user and purchaser to compare various Digital Radiography (DR) systems and to determine the level of performance of a system, by using a common set of technical measurements, as detailed in the standard guidelines. Never before has a standard been the means of making such a comparison of entire systems so easy. For the first time, a standard refers to performance factors that can be used to evaluate a Digital Radiography system as a whole.

The Vidisco **RayzorX Pro** system was tested for radiography of an Aluminum 6061 plate. Out of five testing criteria, Vidisco RayzorX Pro achieved an excellent score in three parameters, and very high score in the remaining two. Compared to other competing systems, which also have the same fluoroscopic screen Type of Gadox (Gadolinium Oxysulphide), **RayzorX Pro** is by far the better performing system. This is clearly seen in the below characterization chart comparison, in which the **RayzorX Pro** results show larger coverage of the standard's spider web diagram.

Vidisco **RayzorX Pro** (Gadox)



DXR-250V (Gadox) **

* Estimated values for the competition are based on the conversion of the spider web diagram published by the competitor, using the scale provided in the ASTM 2597-07 table No. 2: Quality Factors for Three Different Image Quality Indicators. The Quality Factor Numbers from this table, which are referring to Aluminum, are presented here below for your convenience.

	Aluminum				Quality Number															
Parameter	Unit	High	Low	Condition	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
SR_B (basic spatial resolution)	µm	32	1000	90 kV no filter	1000	800	630	500	400	320	250	200	160	130	100	80	63	50	40	32
CS (contrast sensitivity)	%	0,1	3,2	Al, 160 kV, 4 s, (% Σ 10 to 100 mm)/6	3,2	2,5	2	1,6	1,3	1	0,8	0,63	0,5	0,4	0,32	0,25	0,2	0,16	0,13	0,1
Image Lag	%	0,1	3,2	1st frame, normalized to [1 s]	3,2	2,5	2	1,6	1,3	1	0,8	0,63	0,5	0,4	0,32	0,25	0,2	0,16	0,13	0,1
Efficiency = dSNRn @ 1 mGy	–	1000	250	@ 120 kV, 40 mm Al	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
Specific Material Thickness Range	mm	100	20	Al, 160 kV, 4 s, SNR > 130	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100

1100

**The information regarding the competitor's Spider web diagram is published by the competitor and has been taken by Vidisco in good faith. Vidisco makes no warranty, expressed or implied, with respect to this information or its accuracy. Vidisco disclaims all liabilities from reliance on this information.

*** The testing of the systems was conducted in laboratory conditions.

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The Spider Web Diagram: Target- Maximum Coverage of the Performance Chart

The ASTM E2597-07 standard names 5 parameters, in order to compare the performance of Digital Radiography systems. These parameters are measured on a scale of 0 to 15, 15 being the best result. The 15 point quality number scale corresponds to each parameter. The five quality number scales are placed on a "spider/net" pentagon. If a system is to achieve 15 points in all 5 parameters, then the result would cover the entire pentagon. Hence the pentagon serves as a strong visual comparison between different systems, the higher the results achieved on the five scales, the more coverage of the pentagon and the better the performance results of the tested system.

The Five Performance Parameters

The following definitions for each of the five performance parameters are taken from the ASTM 2597-07 standard documentation; pages 1 and 2, under item 3. Terminology. (Remarks in blue are added by Vidisco.)

Basic Spatial Resolution (SRb)

3.1.5 basic spatial resolution (SRb)—the basic spatial resolution indicates the smallest geometrical detail, which can be resolved using the DDA. It is similar to the effective pixel size. The **RayzorX Pro** result for this parameter is 180µm. This result is significantly better than that of the competition.

Detector Signal to Noise Ratio – Normalized (dSNRn)/ Efficiency (dSNRn)

3.1.6 detector signal-to-noise ratio–normalized (dSNRn)—the SNR is normalized for basic spatial resolution SRb as measured directly on the detector without any object other than beam filters in the beam path.

3.1.8 efficiency—dSNRn (see 3.1.6) divided by the square root of the dose (in mGy) and is used to measure the response of the detector at different beam energies and qualities.

The **RayzorX Pro** result for this parameter is 1100 @ 1 mGy. This result exceeds the standard's maximum, which is 1000 @ 1 mGy!

Achievable Contrast Sensitivity (CSa)

3.1.9 achievable contrast sensitivity (CSa)—optimum contrast sensitivity (see Terminology E 1316 for a definition of contrast sensitivity) obtainable using a standard phantom with an x-ray technique that has little contribution from scatter. The **RayzorX Pro** result for this parameter is 0.5%, far outshining the competing results.

Specific Material Thickness Range (SMTR)

3.1.10 specific material thickness range (SMTR)—the material thickness range within which a given image quality is achieved. As applied here, the wall thickness range of a DDA, whereby the thinner wall thickness is limited by 80 % of the maximum gray value of the DDA and the thicker wall thickness by a SNR of 130:1 for 2 % contrast sensitivity and SNR of 250:1 for 1 % contrast sensitivity. Note that SNR values of 130:1 and 250:1 do not guarantee that 2 % and 1 % contrast sensitivity values will be achieved, but are being used to designate a moderate quality image, and a higher quality image respectively.

The **RayzorX Pro** result for this parameter is 100mm. This result is the standard's maximum, once again indicating the excellence of the system.

Image Lag (also known as "memory effect", "ghost image" etc.)

3.1.12 lag—residual signal in the DDA that occurs shortly after the exposure is completed.

Although the same composition (Gadox) is used for the fluoroscopic screen, the Image Lag of the Vidisco **RayzorX Pro** system is three times lower than that of the competing system.

Summary: The tests confirm that the **RayzorX Pro** DR system achieved exceptional results according to the ASTM E2597-07 Standard. The wide coverage of the Spider web diagram means that in all 5 parameters the **RayzorX Pro** is superior to the competitor system. It is essential to note that the systems compared in this document are both fitted with the same type of Scintillator (Gadox) thus enabling comparable results. Therefore, the results are also indicators of the significant and unique technological advantages embodied in the **RayzorX Pro** DDA. **RayzorX Pro** is thus proven to be the optimal choice for a Digital Radiography system for both lab and field applications.